Rosenberger

User Manual

IRU-O-15-091921-QF-01

(Rosenberger Active Das With Intelligent Antenna system-Radiant System)

Manual Version 1.0

No part of this documentation may be

excerpted, reproduced, translated, annotated or duplicated.

In any form or by any means

without the prior written permission of Rosenberger Technologies Co., Ltd

Contents

Rosenberger

Revision Record

Title	**Rosenberger Active Das With Intelligent MIMO Antenna system**			
Document NO.				
Revision	**Description**	**Date**	**Writer**	**Approved by**
V1.0	Initial version	2016-4-8	Gary	Tracy
V2.0	Update new IRU	2018-4-8	Gary	Vincent
V3.0	Update FCC required content in			

1 Safety instructions

It is important to read safety instructions before installing the equipment. These instructions are supplementary to any local safety regulations in place. In case of any conflict, local safety regulations shall prevail.

Installation personnel should be qualified support personnel about safety operations and must have received training on Rosenberger equipment installation, maintenance and operations.

Some important safety instructions are discussed in the chapter. Rosenberger shall not bear any liabilities incurred by violation of universal safety operation requirements, or violation of safety standards for designing, manufacturing and equipment usage.

1. The equipment must follow system requirements with proper grounding & thunder-proof facilities.

2. Power supply voltage must satisfy safety requirements. Anybody who operates equipment must cut off power supply first. Only certified maintenance staff can operate with power-on.

3. The equipment radiates electromagnetic wave, which will cause damage to human body. People other than maintenance staff please keep away.

4. Do not expose yourself long time to the RADIANT system in working condition because the electromagnetic field emitted by equipment may do harm to your health.

5. If installed at height (onto the pole), the equipment shall be securely fixed to prevent body injuries from dropping parts.

6. The equipment must be away from fire, as electronic components may explode upon fire.

7. Static electricity produced by human body can damage sensitive components on the circuit board, such as large integrated circuits (ICs). The equipment must be away from fire, as electronic components may explode upon fire.

Rosenberger

8. Assume no responsibility for use of unauthorized antennas, cables, and/or coupling devices not conforming with ERP/EIRP and/or indoor-only restrictions.

9. The device doesn't support home/personal use, only the people who has the certification can operation the device.

10. The warning label message shown as below.

WARNING. This is **NOT** a **CONSUMER** device. It is designed for installation by **FCC LICENSEES** and **QUALIFIED INSTALLERS**. You **MUST** have an **FCC LICENSE** or express consent of an FCC Licensee to operate this device. Unauthorized use may result in significant forfeiture penalties, including penalties in excess of $100,000 for each continuing violation.

11. The device doesn't contain any licensee contact information.

2 Product Overview

2.1 General Information

Rosenberger **A**ctive **D**AS with **I**ntegrated **Ant**enna system (**RADIANT** abbreviation below) consists of Intelligent multi-sector unit (**IM2U** abbreviation below) and remote unit with optical input (**IRU-O** abbreviation below) and network extender unit(NEU). The number of **IRU-O** depends on the hardware and software configuration. One **IM2U** is capable of supporting up to 4 NEUs, and NEU is capable of supporting up to 16 **IRU-O**s.

Rosenberger RADIANT system is combined with base stations, used for amplifying GSM, DCS, WCDMA and LTE signals. It effectively enhances the shadow signals in urban areas like hotel, office buildings, shopping centers, Stadium as well as basements.

Refer to the application diagram in figure 1; **IM2U** captures the signals from donor BTS and converts the RF signal to optical signal and transmit to NEU via optical cable, and NEUs get the optical signals, split to each **IRU-O** through the hybrid cable, **IRU-O** reconverts the optical signal to RF signal and amplifies it, in the case extends signal coverage.
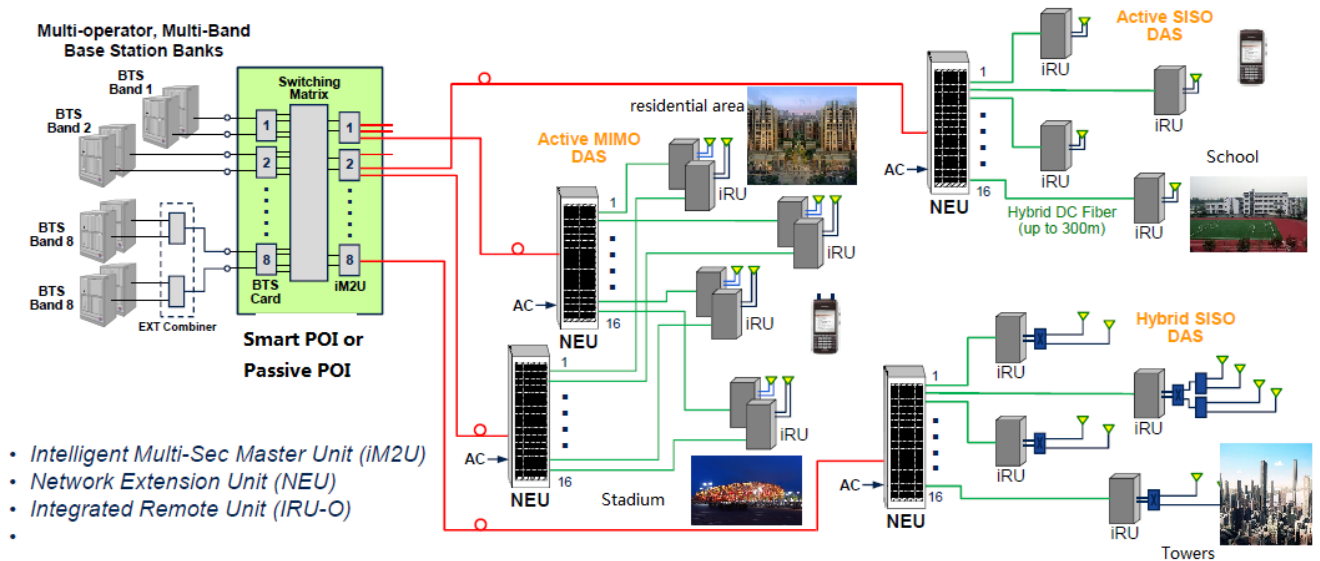
Figure 1   Radiant System Application

Rosenberger RADIANT has remote control and monitoring function, and it can be self-diagnosis. In case of an external power off, RADIANT can keep sending alarm message to network management center for four hours, facilitating monitoring, configuring and maintenance.

Rosenberger RADIANT is modular design, users can deploy diversified RF output rate and power supply options for various projects. That provides a low-cost and highly-capable solution of mobile communication network optimization. RADIANT is a new platform of BTS coverage extension system to improve the signal in large building.
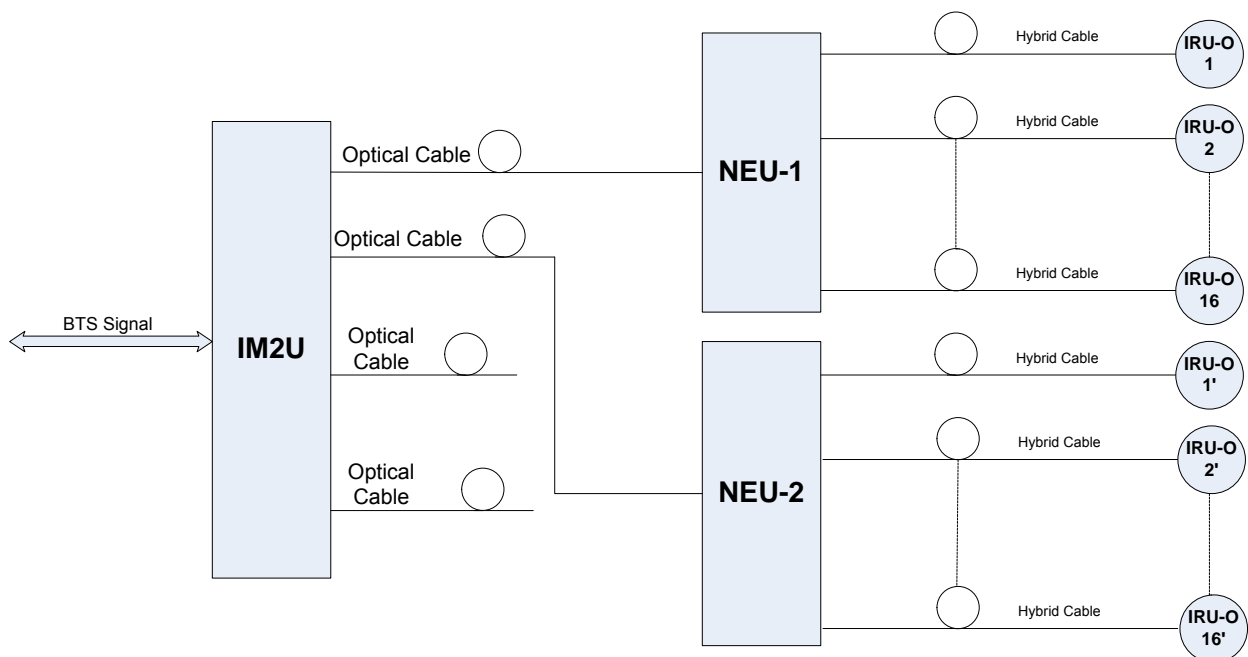

Figure 2   RADIANT System Diagram

2.2 Main Features

● Complete Frequency Range

Rosenberger RADIANT system can cover full band GSM&DCS&WCDAM&LTE frequency band.

● Sleek, Efficient, Compact Design

The IRU-O provides an innovative design to integrate both a low power remote unit and antenna into a single package.   The IRU-O can provide up to 28.5dBm EIRP for omni applications and up to 31dBm for panel applications to ensure coverage and maximum throughput for multiple LTE and WCDMA carriers.   The unit weighs less than 3kg and consumes less than 20W DC power, suitable for hybrid DC/fiber applications

● Precise RF tuning and coverage
Due to the inherent distributed design, each IRU-O can be individually fine-tuned for gain adjustment in each zone to provide precise coverage.   The gain adjustment can be fine tuned to a resolution within 0.25dB within each band.   Traditional high power remote units with passive distribution are unable to achieve this level of precision and control per antenna as any change in gain in the remote unit affects an entire group of antennas

● No additional feeder losses
Traditional remote units do not have an antenna, so an external feeder cable is required to connect with the servicing antenna.   This results in less RF power due to the inherent loss of the feeder cable.   The IRU-O antenna mates directly with the active portion and guarantees full RF power at the antenna interface.   This allows the maximum available RF power for any application.

● PIM-Free, VSWR free Installation
The IRU-O assembly is factory tested for PIM and VSWR.   This eliminates the possibility of facing PIM or Return Loss issues related to mismatched components and poor installation practices.   This significantly improves installation and commissioning time.

● Low Noise Figure and Low System Noise Rise
The IRU-O features a lower noise figure than traditional remote units, that combined with the distributed active architecture provides a significant improvement in DAS noise rise and SNR compared with high power traditional solutions with passive distribution.   The combination of which can improve KPI's and throughput.

● Fault Tolerance
The active distribution architecture of RADiAnt provides fault tolerance.   In the event that one remote unit fails, only a single antenna/coverage area is affected.   In a traditional solution with high power DAS and passive distribution, if the remote unit fails, an entire group of antennas is down affecting the service in a much larger area.

● Easy Installation and Low Project Cost
Radiant is much more than replacing coax with fiber, the core network (IM2U and NEU) will only deal with the signal processing and covert RF signals to fiber signals and transmit over fiber with very small loss and no increased noises, and the network extender unit (NEU) only use hybrid cable (integrated cable with power and fiber) to connect IRU-O, each NEU can connect 16 pieces IRU-O, it means that save project time and cost.

2.3 Product Outline Drawing

Figure 3   IM2U Outline

Figure 4   NEU Outline

2*QM Connector

2*NF Connector

Figure 5   IRU-O Outline(Quad-band Cabinet)

Figure 6   IRU-O Outline(Hexa-band Cabinet)
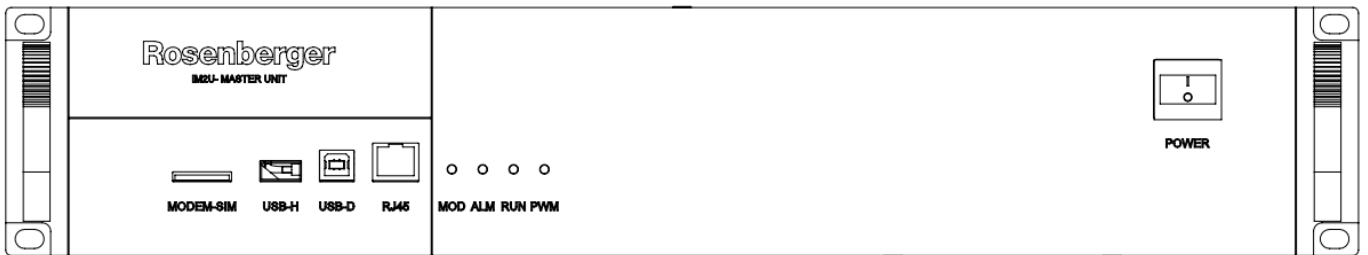
2.4 Product Interface
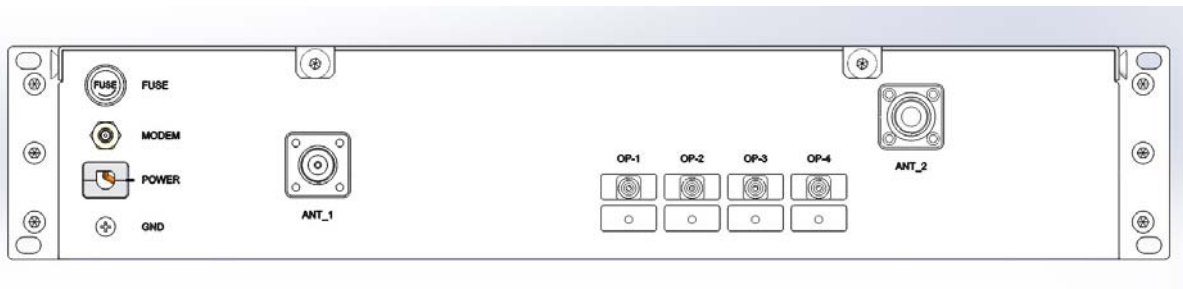
2.4.1 IM2U Interface

Figure 7 IM2U Front Panel

Figure 8 IM2U Rear Panel for SISO

Table 1   IM2U Interface Description

Identifier		Functional Description
Front Panel	MODEM_SIM	SIM card port
	USB_H	USB port
	USB_D	USB port
	RJ45	LAN port, local monitor port, or network monitor port
	MOD	Modem running indicator, Blinking, Control unit communicates normally; OFF, Control unit cannot communicate
	ALM	Peripheral alarm indicator, normally ,the indicator is green; the indicator is red when got alarms.
	RUN	Monitor boarding running indicator, normally, keep blinking; off, Device does not work
	PWR	IM2U power supply indicator, normally, the LED is green, no power , off.
	POWER	Power Switch
Rear Panel	POWER	DC -48V input terminal
	FUSE	Fuse Port, Normally, the fuse model is 5x20 , 250VAC3A
	GND	Grounding connector.
	MODEM	Modem antenna port.
	Op1~ op4	This port is the fiber connector port for SISO (FC/APC type optical

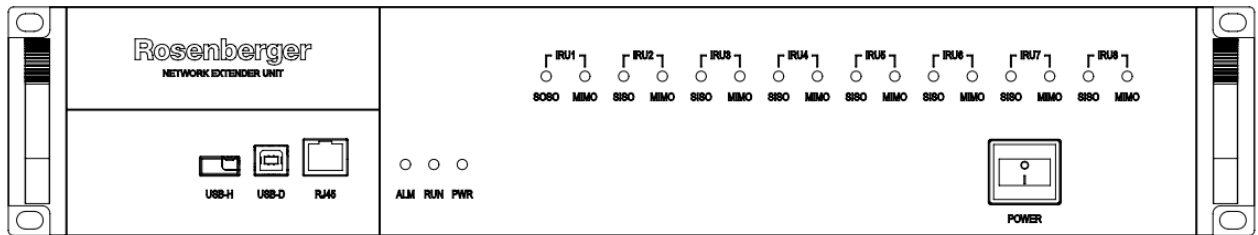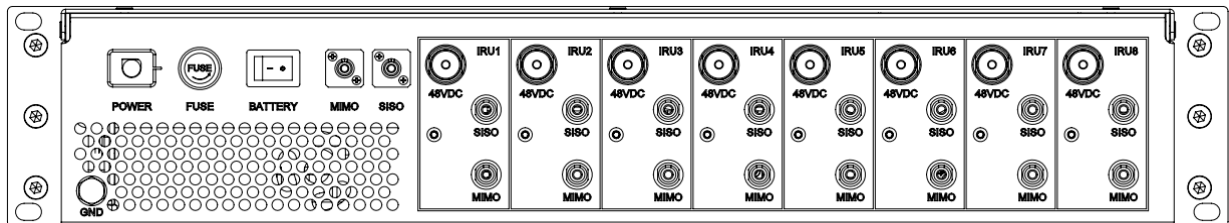|	TX/RX	This port is service antenna port. For simplex repeater, this port is DL (downlink) input port of SISO.

2.4.2 NEU Interface

Figure 9 NEU Front Panel

Figure 10 NEU Rear Panel for MIMO

Table 2   NEU Interface Description

Identifier		Functional Description
Front Panel	USB_H	USB port
	USB_D	USB port
	RJ45	LAN port, local monitor port, or network monitor port
	ALM	Peripheral alarm indicator, normally, the indicator is green; the indicator is red when got alarms.
	RUN	Monitor boarding running indicator, normally, keep blinking; off, Device does not work
	PWR	IM2U power supply indicator, normally, the LED is green, no power, off.
	POWER	Power Switch
	IRU1-IRU8 SISO/MIMO	IRU-O connection indicator for SISO/MIMO, the indicator will on when the corresponding to IRU-O is connected.
Rear Panel	GND	Grounding connector.
	POWER	AC220V input terminal
	FUSE	Fuse Port, Normally, the fuse model is 5x20, 250VAC10A
	BATTERY	Battery Switch
	OP MIMO	Optical port of MIMO (FC/APC type)
	OP SISO	Optical port of SISO (FC/APC type)
	IRU1~IRU8 48VDC	IRU-O connectors (DC port)
	IRU1~IRU8 SISO/MIMO	SISO/MIMO IRU-O connectors (FC/APC type)

2.4.3 IRU-O Interface

Figure 11   IRU-O Panel(Quad-band Cabinet)

**Figure 12 IRU-O Panel (Hexa-band Cabinet)**

Table 3   IM2U Interface

Identifier	Functional Description
POWER	DC-48V input port
OP SISO	SISO Optical Port (FC/APC type)
OP MIMO	MIMO Optical Port (FC/APC type)

2.5 Equipment Layout

2.5.1 IM2U Layout

The MU is constructed into a 19" shelf and 3U, it is connected via the connector located on the front and rear panel, the RF connector is N female type, and the optic connector is FC/APC type. **IM2U** is composed of optic module of **IM2U**, duplexer, control unit （contain modem）, RF control unit and a WDM. Please see the following figure.
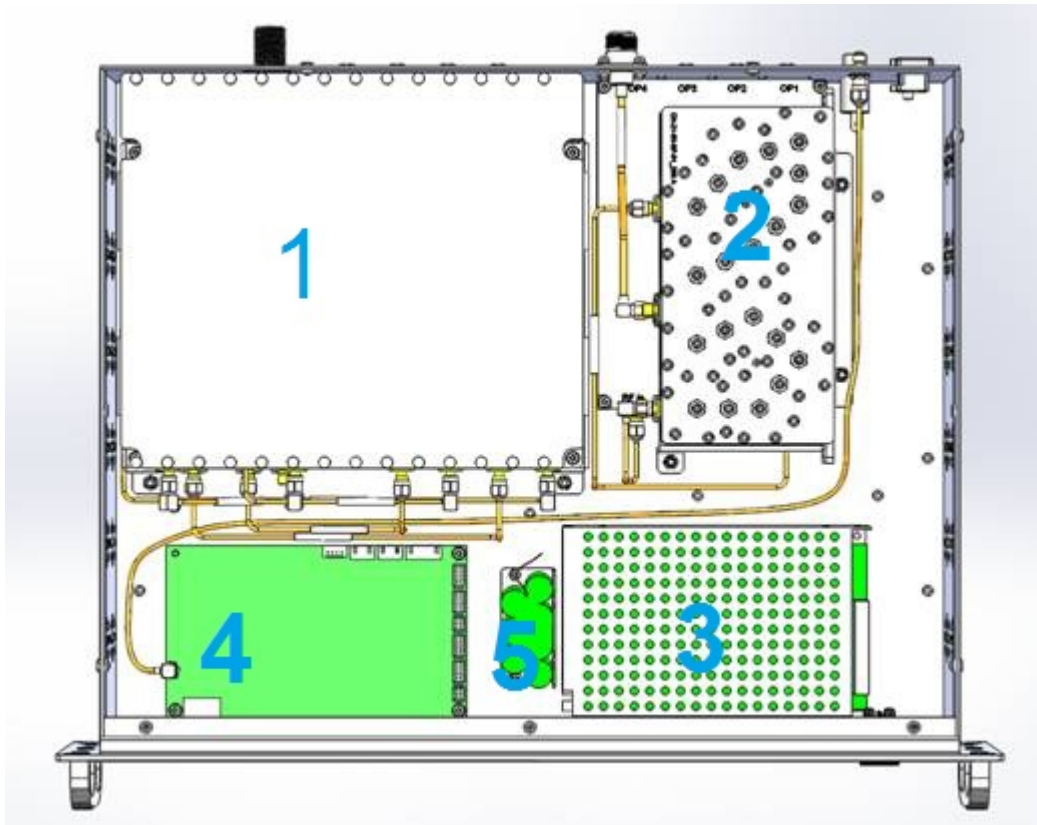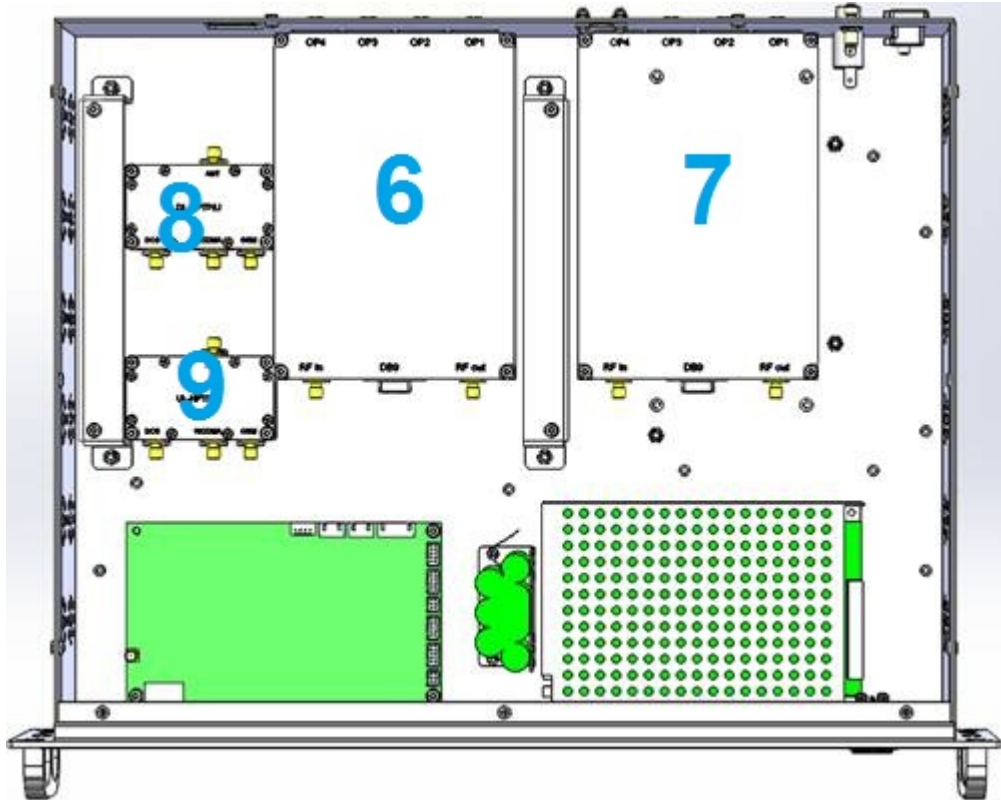
Figure 13   Internal layout for IM2U

Table 4 Modules for IM2U

Identifier	Function Description
1	900MHz,1800MHz,2100MHz Tri-band Diplexer, filter 900MHz,1800MHz,2100MHz signals Or 700MHz, 850MHz, 1900MHz Tri-band Diplexer, filter 700MHz, 850MHz, 1900MHz signals.
2	2100 Duplexer Or 700MHz Duplexer
3	70W Power module, DC-48V input, DC12V output
4	Main Monitor Board, control the whole operation and provides the various functions such as the alarm detection, local control, remote control etc. This module contains Modem. Wireless Modem.
5	Battery module
6,7	2pcs optical module 1x4, convert RF signal to optical signal for downlink, and reconvert optical signal to RF signal for uplink.
8	900MHz,1800MHz,2100MHz uplink splitter Or 700MHz,850MHz,1900MHz uplink splitter
9	900MHz,1800MHz,2100MHz downlink combiner Or 700MHz,850MHz,1900MHz downlink combiner

2.5.2 NEU Layout
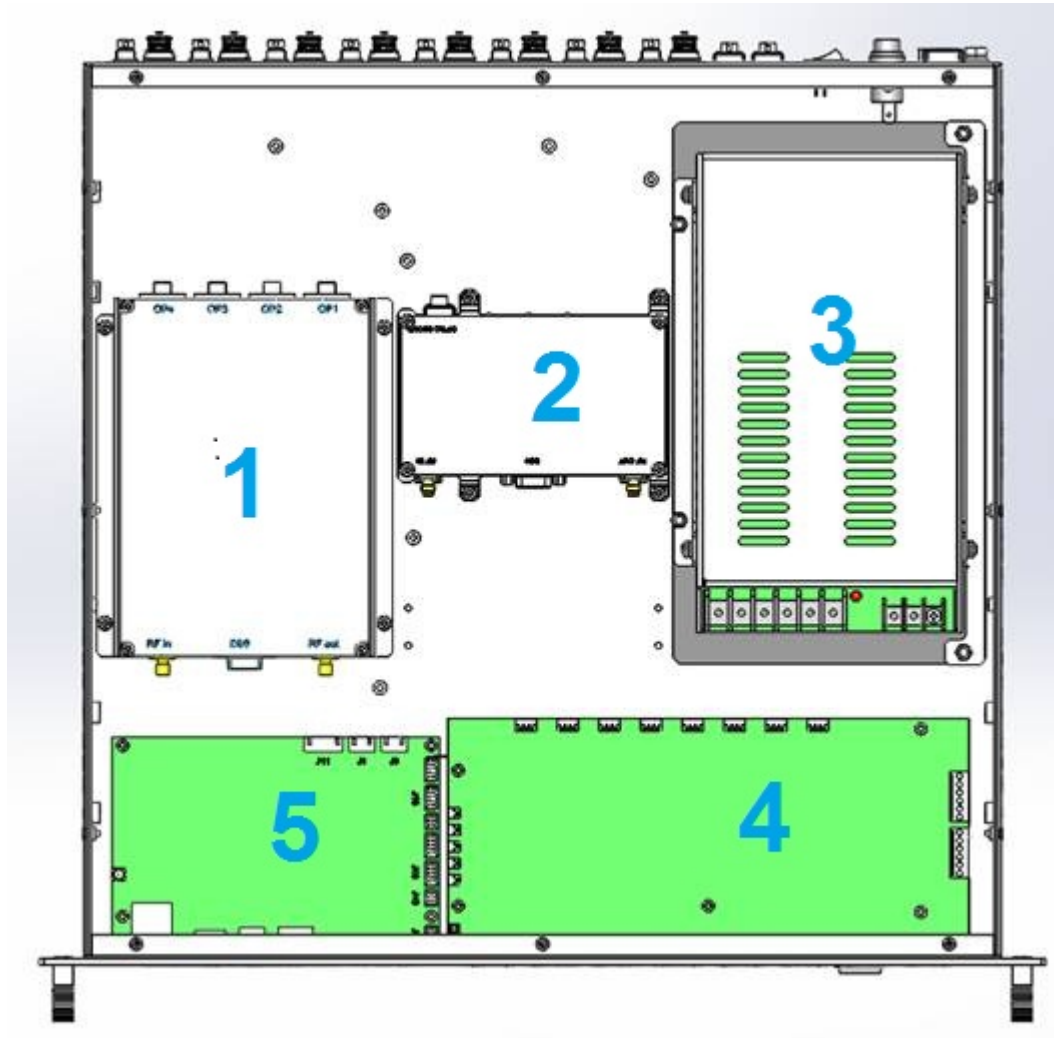
Figure 14   Internal layout for NEU

Table 5   Modules for NEU

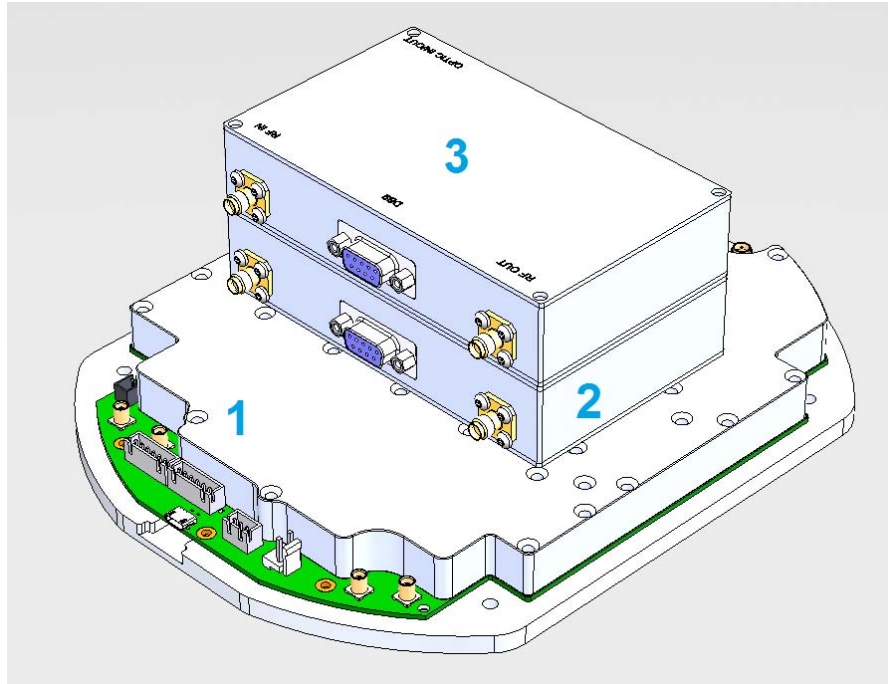| Identifier	Function Description
1	2pcs optical module 1x8
2	2pcs optical module 1x1
3	Power supply, DC 90V~250V, output DC48V
4	Power Management Module, one input port, 16 output ports
5	Main Monitor Board (no wireless modem)

2.5.3 IRU-O Layout

Figure 65　Internal layout for IRU-O

Table 6　Modules for IRU-O

Identifier	Function Description
1	RF modules, RF signal amplify and control, has ALC, AGC function.
2	Optical module 1x1 for SISO
3	Optical module 1x1 for MIMO

.

3 Installation

3.1 Engineering Installations

Overview

This chapter introduces installation and commissioning flow of equipment to help installation personnel understand the entire process. Brief introduction to some physical parameters of Radiant system, such as size, weight, humidity and temperature is also included in this chapter.

Equipment Installation and Commissioning Flow

Normal and reliable operation of Radiant system is based on the quality of installation project. It is important to establish a set of systematic and standardized installation and commissioning procedures.

Workflow for installation, debugging, acceptance and handing over of the equipment is shown above Figures .

The installation and commissioning workflow is as follows:

1. Engineering survey

    Inspect the suggested site environment to provide related data for design and engineering.

2. Engineering design

    Planning department shall design according to the engineering inspection results and make out relevant design comments and drawings.

3. packing acceptance

    After equipment delivery at the site, construction team is responsible to specify the unpacking time according to engineering preparations. The construction team, the operator, the engineering team and Rosenberger shall all be present at the time of unpacking inspection. If any damage to equipment or shortage in shipment is found during unpacking by a single party, only the unpacking party shall bear all the liability.

4. Hardware installation

    Qualified engineering personnel shall supervise the whole installation process, including positioning, base installation, BSC rack installation, BSC board installation, DC power installation, and connection of internal and external cables.

5. System and power-on check

    Conduct necessary check and power-on the equipment after installation.

6. Parameters settings

    Set related parameters after installation.

7. System test

    Test the system to check if the system operates normally. If it fails the test, adjust the system to meet the requirements.

8. Trial run

    In the first few months after equipment commissioning, the equipment remains in trial run stage. Rosenberger is responsible for offering full technical support to the user.

9. Final acceptance

It means that operation of the equipment is stable and meets all requirements. The user and Rosenberger agree upon this and sign the final acceptance certificate.

Note: Refer to the related contract terms for details about project survey, engineering design, trial run and final acceptance
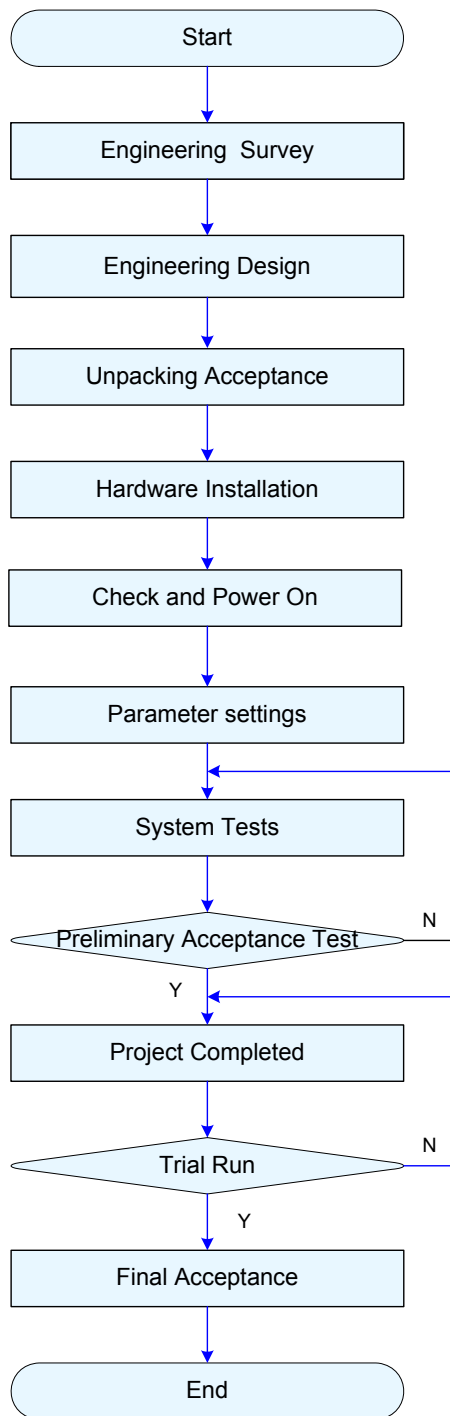
```
                        ┌──────────────────────┐
                        │        Start         │
                        └──────────────────────┘
                                   │
                                   ▼
                        ┌──────────────────────┐
                        │  Engineering  Survey  │
                        └──────────────────────┘
                                   │
                                   ▼
                        ┌──────────────────────┐
                        │  Engineering Design  │
                        └──────────────────────┘
                                   │
                                   ▼
                        ┌──────────────────────┐
                        │ Unpacking Acceptance │
                        └──────────────────────┘
                                   │
                                   ▼
                        ┌──────────────────────┐
                        │ Hardware Installation│
                        └──────────────────────┘
                                   │
                                   ▼
                        ┌──────────────────────┐
                        │  Check and Power On  │
                        └──────────────────────┘
                                   │
                                   ▼
                        ┌──────────────────────┐
                        │  Parameter settings  │
                        └──────────────────────┘
                                   │
                                   ▼
                        ┌──────────────────────┐
                        │     System Tests     │◄──────┐
                        └──────────────────────┘       │
                                   │                   │
                                   ▼                 N │
                        ◇ Preliminary Acceptance Test ◇┘
                                   │ Y
                                   ▼           ◄────────┐
                        ┌──────────────────────┐        │
                        │   Project Completed  │        │
                        └──────────────────────┘        │
                                   │                   N│
                                   ▼                    │
                              ◇ Trial Run ◇─────────────┘
                                   │ Y
                                   ▼
                        ┌──────────────────────┐
                        │   Final Acceptance   │
                        └──────────────────────┘
                                   │
                                   ▼
                        ┌──────────────────────┐
                        │         End          │
                        └──────────────────────┘
```

Figure 16   Equipment Installations and Commissioning Flow

3.2 Before Installation

3.2.1 Choosing a site location

Make sure access is restricted to qualified personnel

Install the product where power supply and feeder cable are accessible.

Site location should be far away from heat source and damp environment.

IRU-O should be put in a well-ventilated work area. It should be hung on the wall or ceiling to ensure being ventilated. If the IRU-O is mounted on the ceiling, there should be care the ceiling capability of the weight , should be greater than 3kg.

3.2.2 Installation tools

No.	parts	Model	Quantity	Comments
1	Tape		1	To measure the installation holes
2	Monkey Wrench		1	To tighten or loose hex bolts
3	Electric drill		1	Drill holes on the wall

3.3 Installation

3.3.1 Installation of IM2U and NEU

IM2U AND NEU are 19"3U in size. It shall be generally installed in the 19-inch communication rack,

as show on the following figure 9. Use four expansion bolts (M6*12) to fix the panel of the master unit.

IM2U AND NEU dimensions are 440x360x132 mm and 15 kg in weight.

Make sure access is restricted to qualified personnel

Install the product where power supply and feeder cable are accessible.

Site location should be far away from heat source and damp environment. Repeater should be put in a well-ventilated area with indoor temperature range at 0~+40°C and relative humidity ≤85%. Please avoid direct sunlight.

If the repeater is mounted on the wall, there should be at least 80cm ~100cm away from the wall or other equipment.

① 19" rack   ② master unit   ③ fix tool
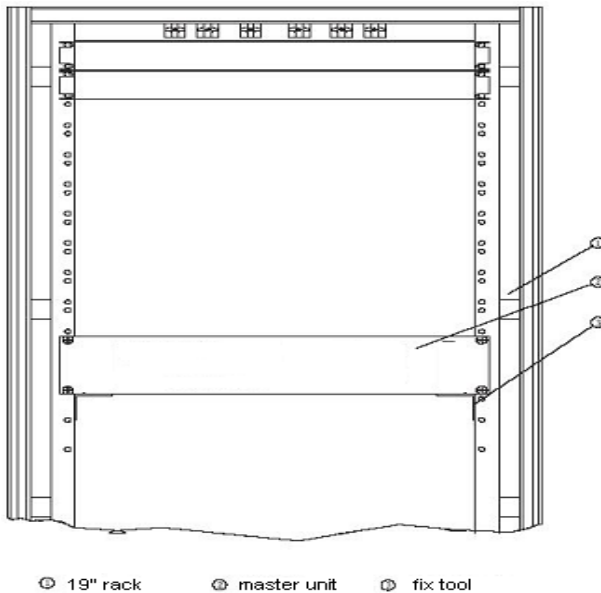
Figure 17   Installation of IM2U and NEU

Rosenberger

3.3.2 Installing onto the ceiling(quad-band)
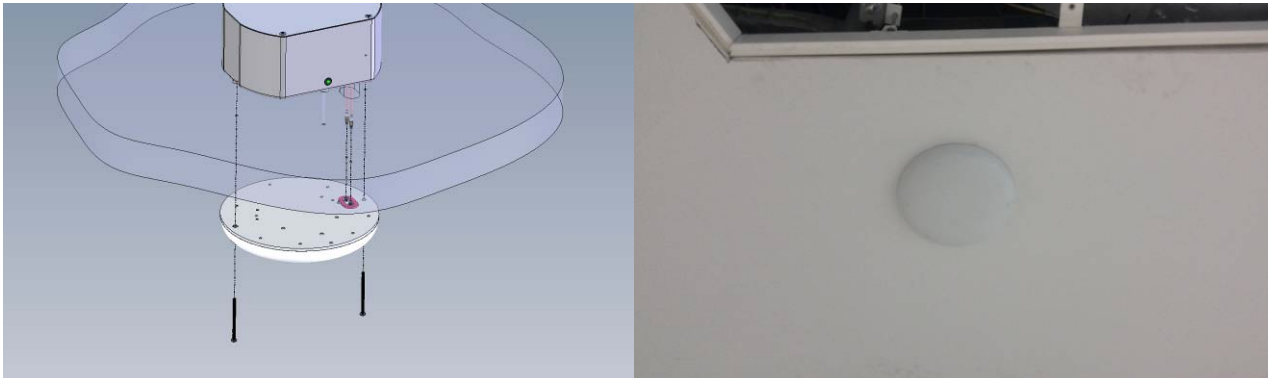
Figure 18   Installing onto the ceiling and video

1. Using paper template to position mounting and cable passage holes, drill four 4.4mm diameter holes and cut one 23mm diameter by 37mm long oblong opening in the opening in ceiling.

2. Position IRU-O above ceiling as shown and fasten to ceiling by passing two M4X55mm flathead screws up through ceiling and threading into bosses on IRU- case.

3. View of IRU-O installed above ceiling.

4. Position antenna below ceiling as shown and connect two mcx cables from IRU-O. Position antenna against ceiling by carefully forming excess cable into oblong opening in ceiling,fasten to ceiling by passing two M4X60MM pan head screws up through antenna and ceiling and threading into bosses on IRU-O case.

5. Position antenna below ceiling as shown and connect two mcx cables from IRU-O. Position antenna against ceiling by carefully forming excess cable into oblong opening in ceiling, fasten to ceiling by passing two M4X60MM pan head screws up through antenna and ceiling and threading into bosses on IRU-O case.

3.3.3 Installing onto the ceiling (Hexa-band)

Step 1 Use the tools to drill the square holes one the ceiling, as shown in figure 19,
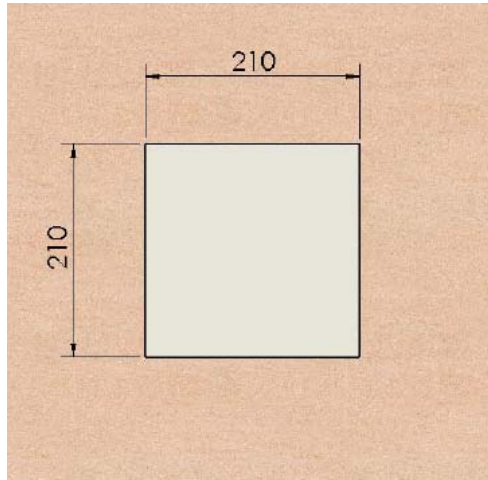
Figure 19

Step 2 Use M4 screw fit bracket A, bracket B and Bracket C together. As Shown in figure 20.
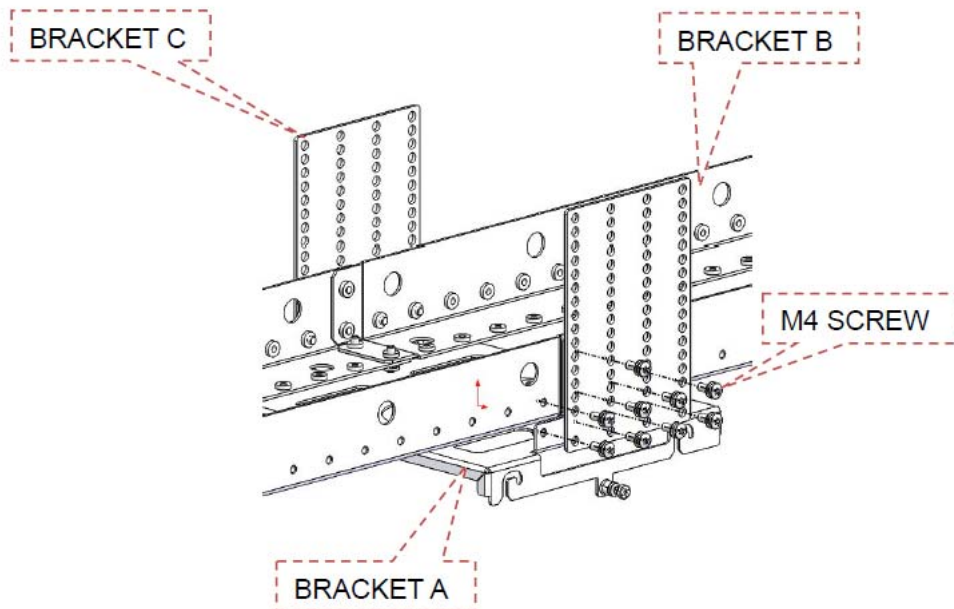
Figure 20

Step 3 Use metal wire mount the bracket unit onto the ceiling keel, as shown in figure 21.
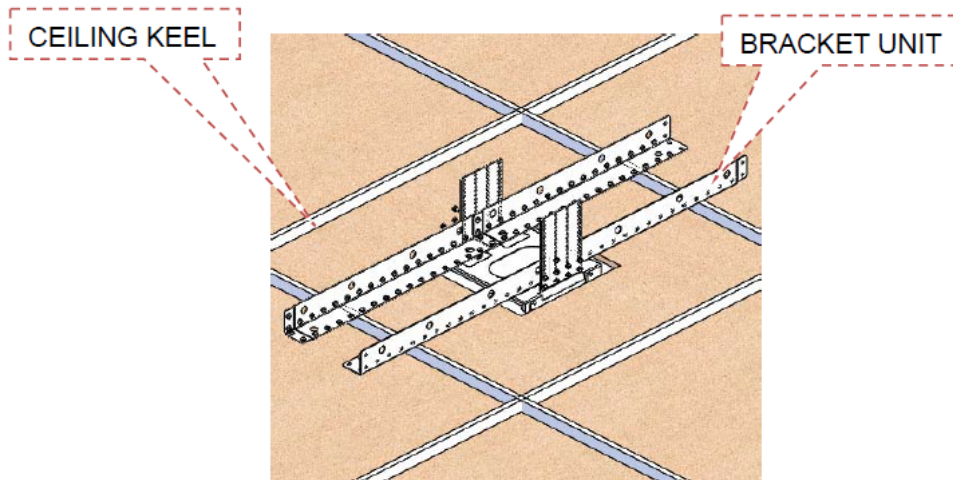
Figure 21

Step 4 Joint the connector with system, as shown in figure 22.
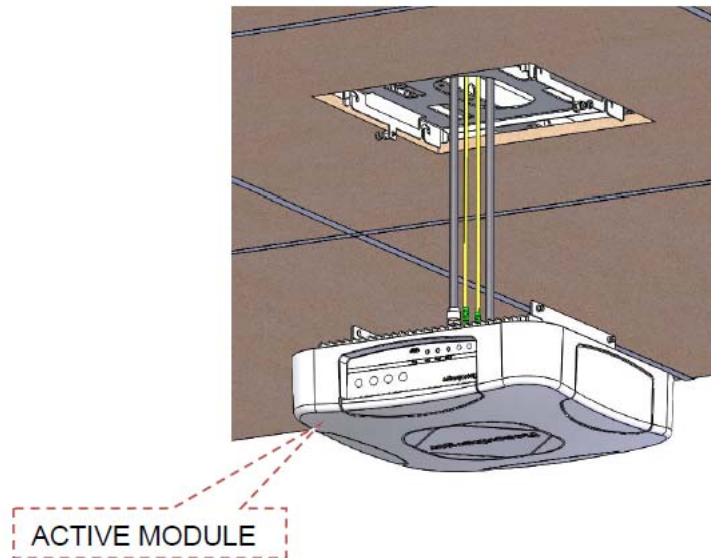
Figure 22

Step 5 The active module clamp on the bracket, as shown in figure 23.
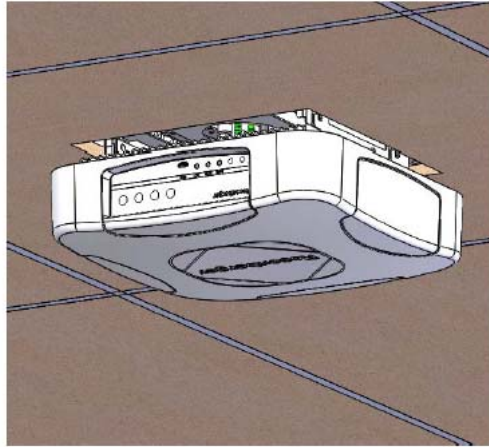
Figure 23

Step 6 Use Phillips screw driver to tighten the captive screw, as shown in figure 24
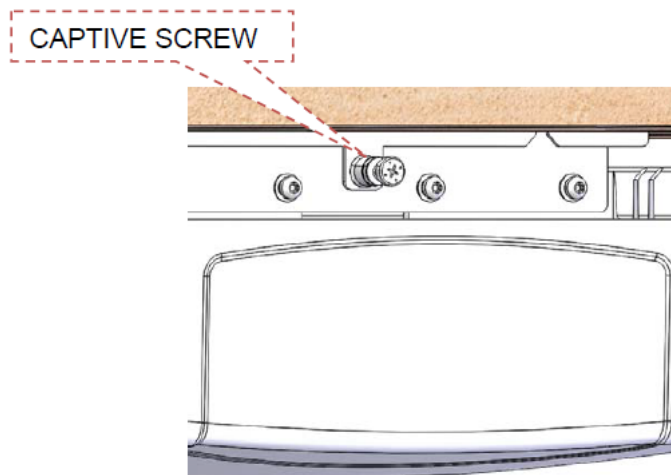
Figure 24

3.3.4 Installing onto the wall (Hexa-band)

Step 1 Use the tools to drill the holes on the wall, as shown in figure 25.
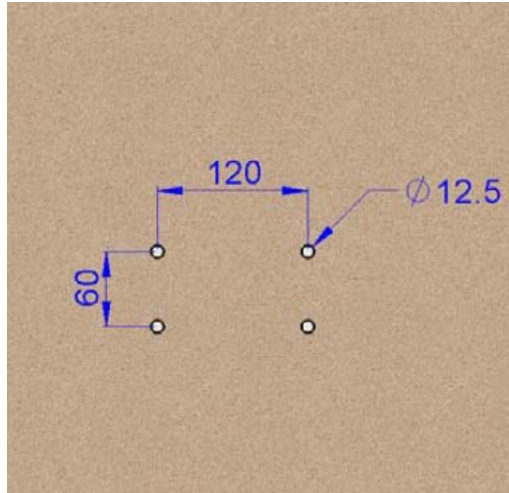
Figure 25

Step 2 The M8 expansion blot put into the hole, as shown in figure 26.
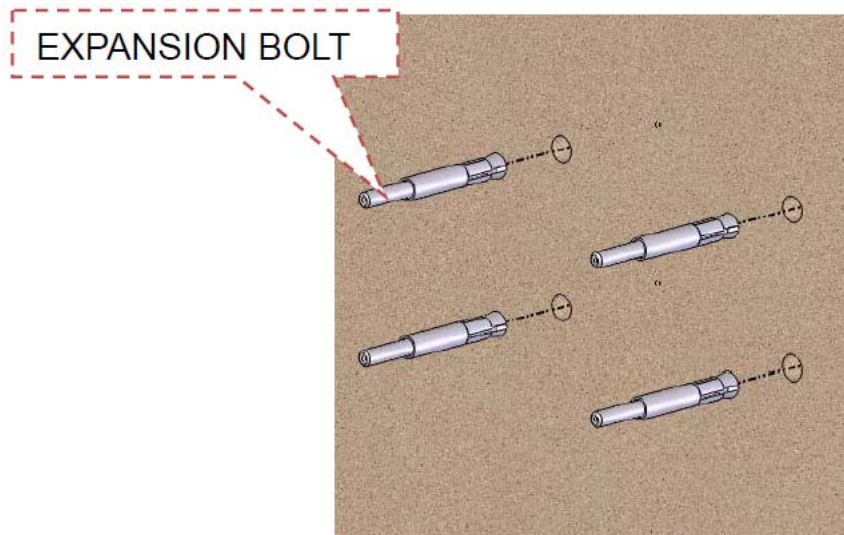
Figure 26

Step 3 Align the holes on the bracket A with the expansion blot, as shown in Figure 27
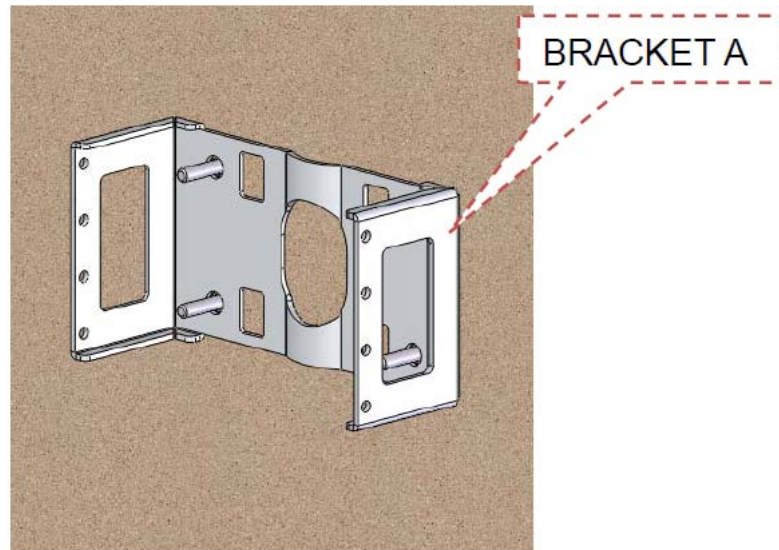
Figure 27

Step 4 Use M8 washer, M8 spring washer and M8 nut to bracket A onto the wall, as shown in figure 28
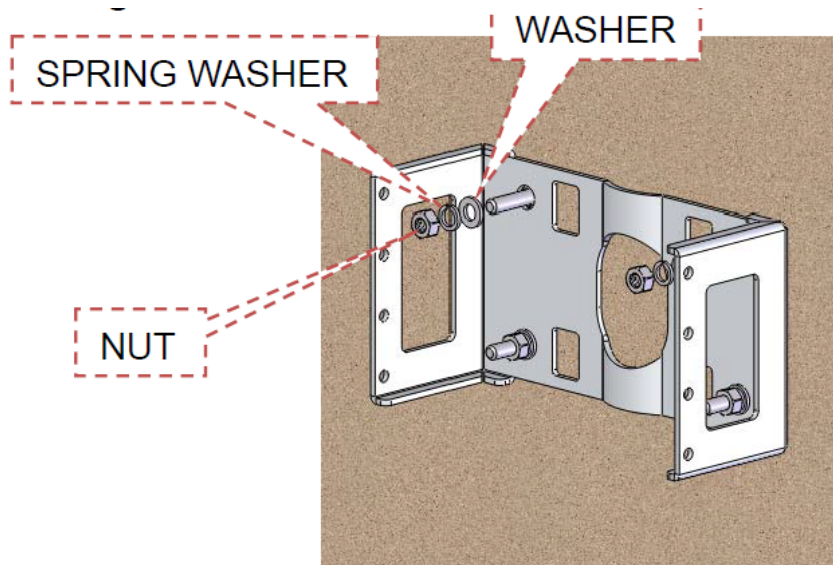
Figure 28

Step 5. Use M4 screw fit bracket A and bracket B together, as shown in Figure 29
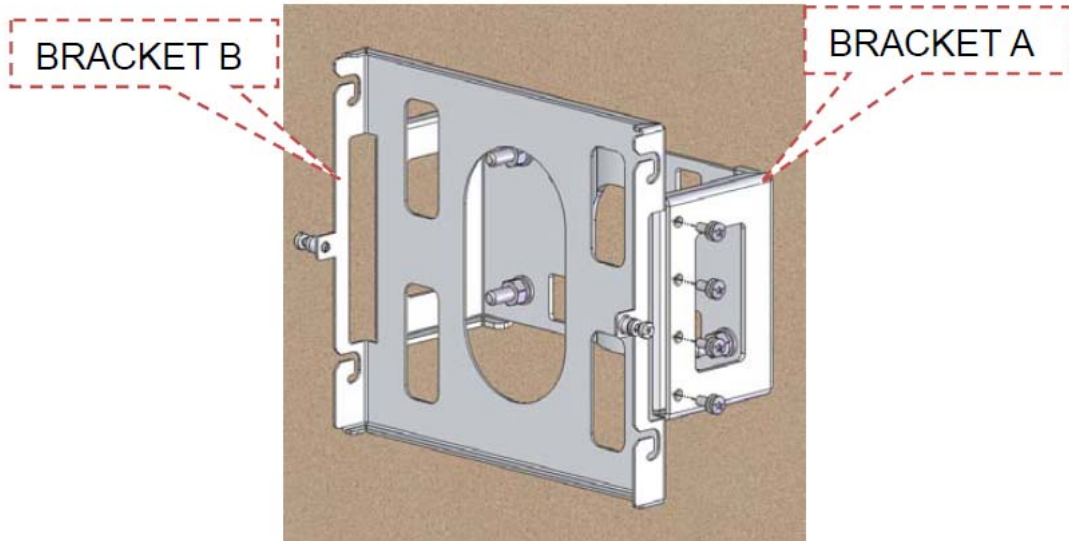
Figure 29

Step 6. Joint the connector with system, as shown in Figure 30.
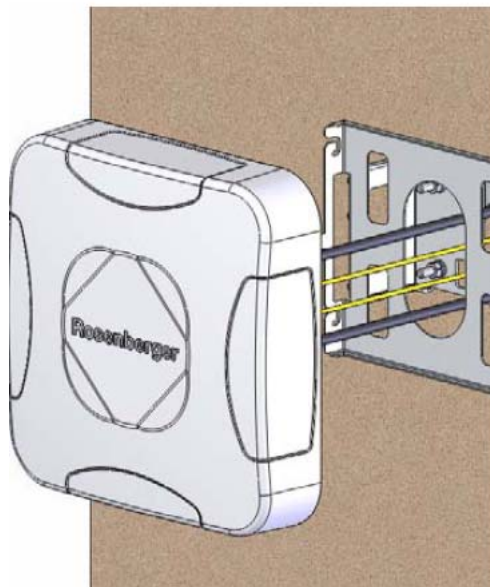
Figure 30

Step 7. The active module clamp on the bracket, as shown in Figure 31.
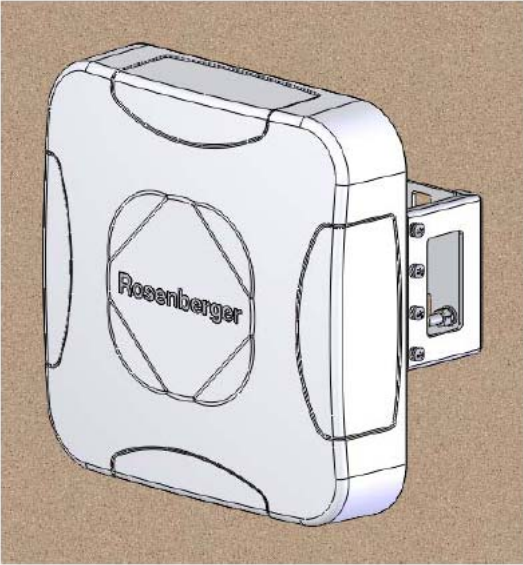
Figure 31

Step 8, Use the Phillips screw driver to tighten the captive screw, as shown in figure 32

CAPTIVE SCREW
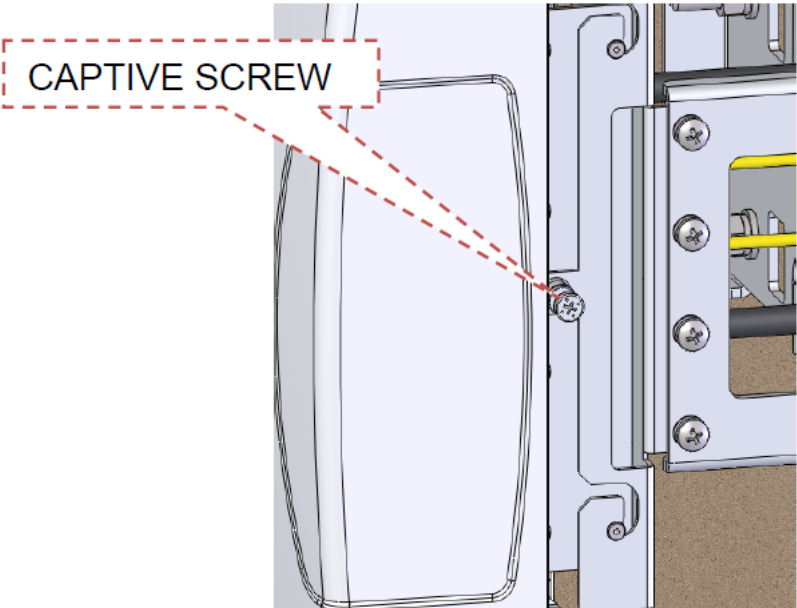
Figure 32

4 Connection

This chapter introduces devices connection and antenna connection.

4.1 IM2U/NEU/IRU-O Connection

Optical fiver can be used to connect IM2U with NEU. The optical connector is FC/APC. IRU-O is power supplied by NEU remotely. Hybrid cable can be used to connect NEU and IRU-O. The hybrid cable requires users to order separately.

The RF input ports of IM2U is N-Female, RF cable is required to connect IM2U with BTS. The length depends on the distance between IM2U and BTS.
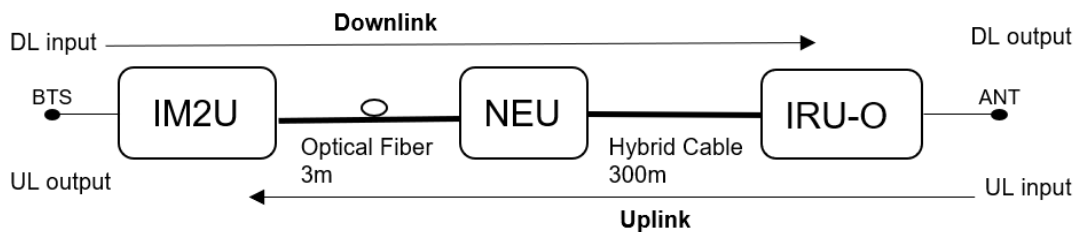
4.2 Antenna Connection

The IRU-O output ports are QMA. It requires to use the RF cable to connect to antenna system. The antenna selection depends on user solution. Users can use high gain omni-antenna or high gain directional antenna. The gain suggested no more than 8dBi.

Rosenberger

5 Commissioning

Before commissioning, the engineer should be checking IM2U&NEU&IRU-O according to the following chart, you can be commissioning when finish checking:
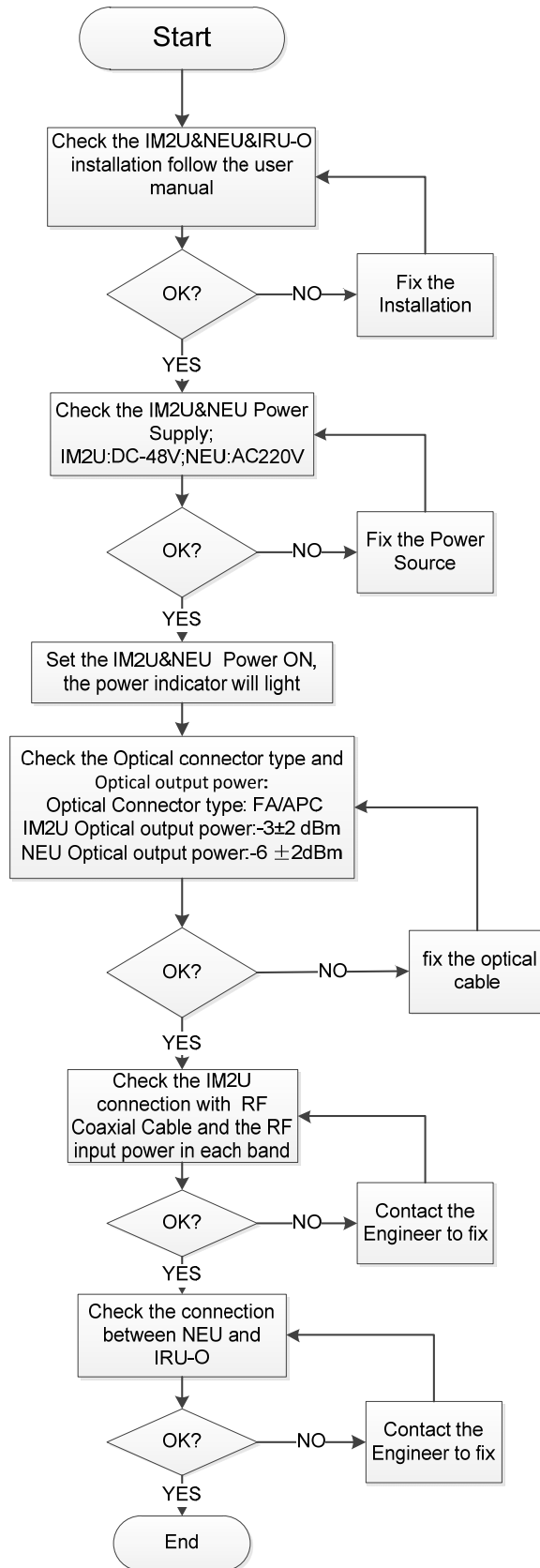
Start

Check the IM2U&NEU&IRU-O installation follow the user manual

OK? —NO→ Fix the Installation

YES

Check the IM2U&NEU Power Supply; IM2U:DC-48V;NEU:AC220V

OK? —NO→ Fix the Power Source

YES

Set the IM2U&NEU Power ON, the power indicator will light

Check the Optical connector type and Optical output power: Optical Connector type: FA/APC IM2U Optical output power:-3±2 dBm NEU Optical output power:-6 ±2dBm

OK? —NO→ fix the optical cable

YES

Check the IM2U connection with RF Coaxial Cable and the RF input power in each band

OK? —NO→ Contact the Engineer to fix

YES

Check the connection between NEU and IRU-O

OK? —NO→ Contact the Engineer to fix

YES

End

Figure 33   IM2U &NEU&IRU-O checking Chart

5.1   Adding Device

For a **Radiant** site, it contains IM2U, NEU and IRU-O. NEU is the sub device under IM2U, and IRU-O is the sub device under NEU.

5.1.1 Adding Device Manually

Through this function, you can add a main device and its sub devices manually.

Procedure

● Adding Device through Short-cut Button

1. Click [icon] to open the **Create New Device** page, as shown in Figure.
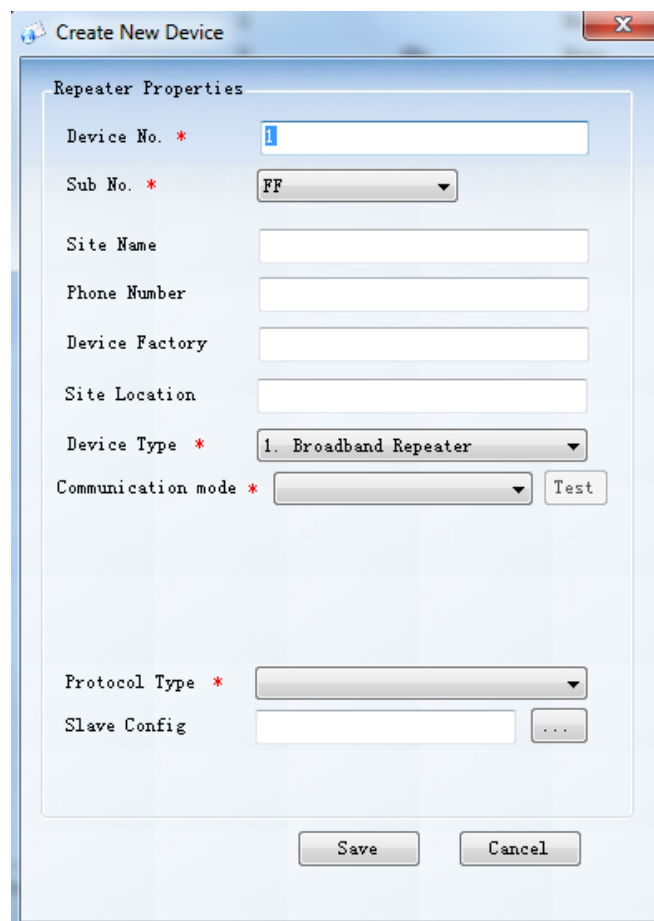
Figure 34   Creating New Device Page

2. Configure parameters for the adding device, as shown in Figure 19.

For the description of device, see Table.
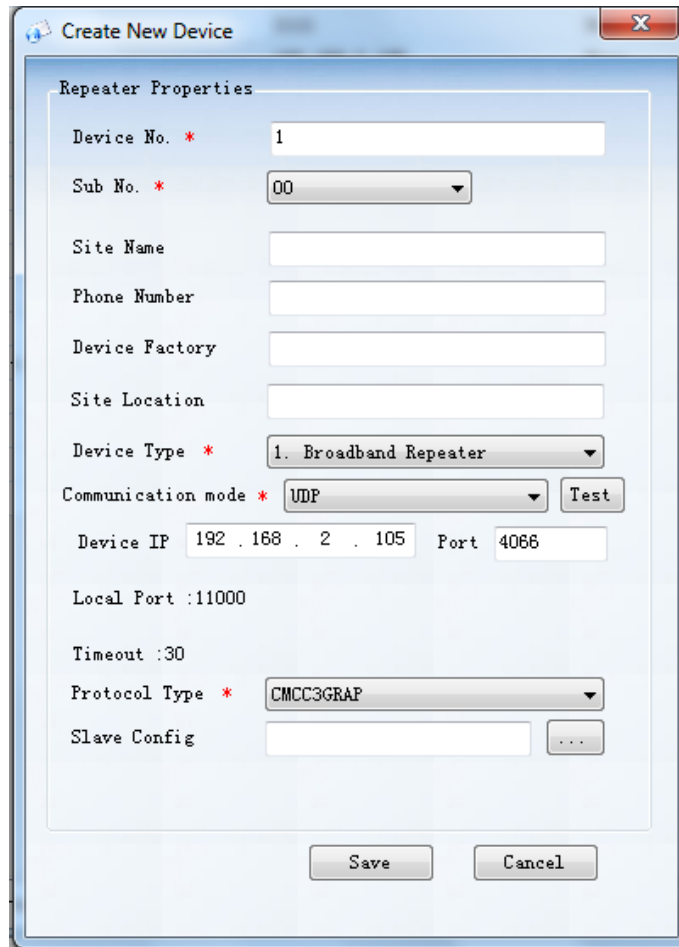
Figure 35 Configure Parameter

Table7 Parameter Description of Creating New Device

Parameter	Description	Input Method
Device No.	Indicates the unique code for each repeater.	Enter a unique number in the text box.
Sub No.	It is the equipment type.	● When the adding device is a single device, select **FF** from the drop down list box. ● When the adding device has sub device, select **00**.
Site Name	It is recommended a name associated with the installation site. It is also used for identifying the location of the repeater and displayed on the device list.	Enter a site name in the text box.

- 37 -

Parameter	Description	Input Method
Phone Number	Configure the phone number which is used to connect the device in remote mode. The phone number must match with the SIM install on the device.	Enter the phone number in the text box.
Device Factory	Indicates the manufacturer of the device.	Enter the manufacturer in the text box.
Site Location	Indicates the detailed installation address of the adding device.	Enter the address in the text box.
Device Type	Indicates the type of the device.	Select the repeater type from drop down list box.
Communication Mode	Indicates the communication mode of the device. The communication mode must be the same as that set on the adding device. After selected a mode, click **Test** to check whether the communication is normal.	Select the communication mode from the dropdown list box. For the configuration of the popup page.
Protocol Type	Indicates the supported protocol.	Select the protocol from drop down list box.

3. Click [...] to enter the **Slave Properties** page, as shown in Figure 20.
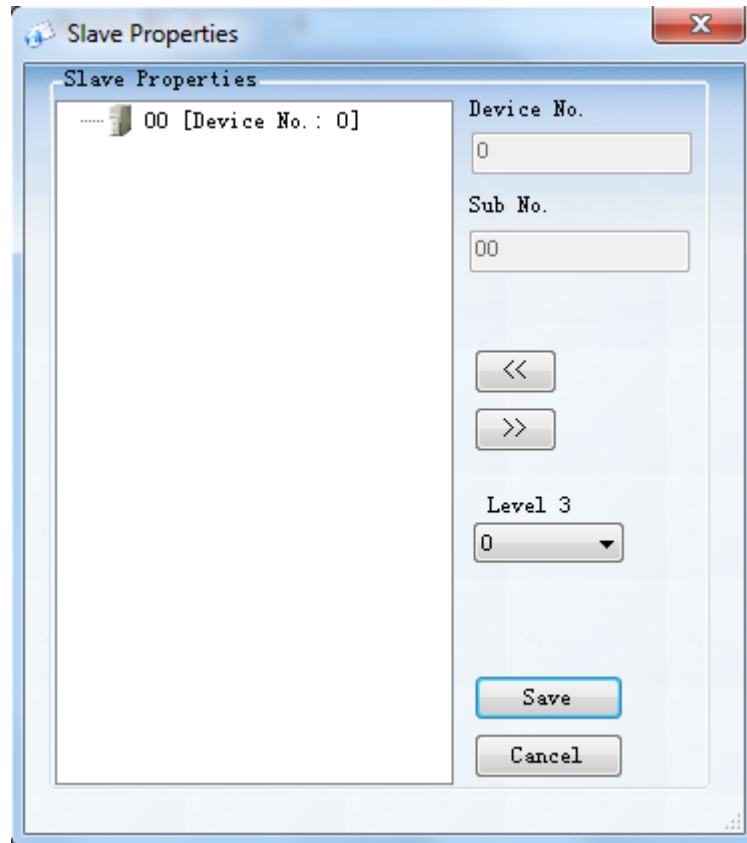
Figure 367   Slave Properties Page

4. Adding slave device.

- ● When the adding site is a repeater site, it contains two-level device, and you can add four RUs as slave device for it.

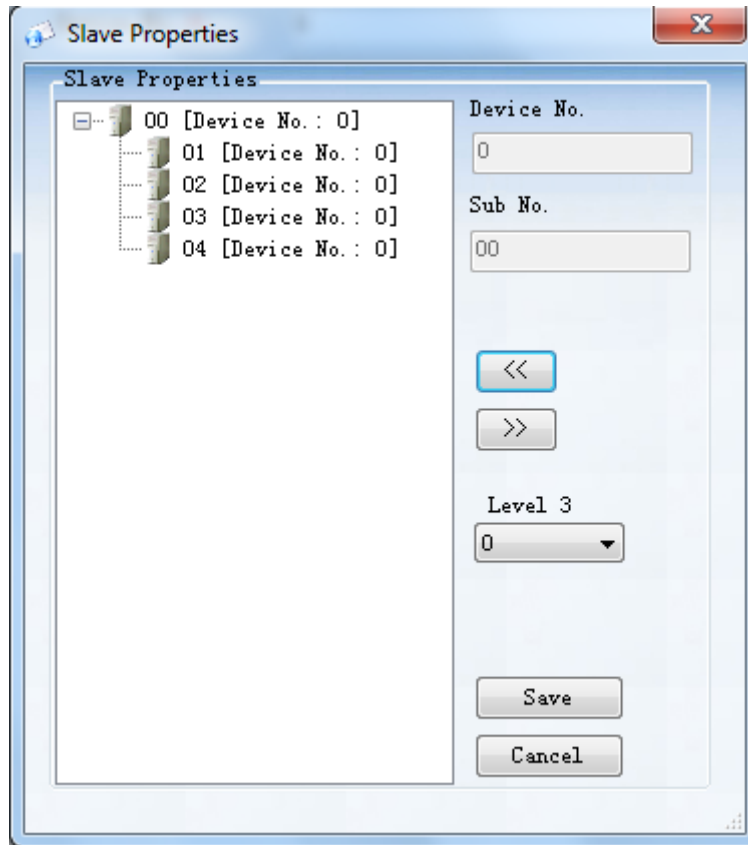 Click to add RUs, as shown in Figure 21.

Figure 37   Adding NEUs

● When the site is a Radiant site, it contains three-level device, and you can add NEU and IRU-O as slave device for it.

The maximum of NEU or IRU-O can be set   according   to the actual situation. The setting in the following steps is a default value.

1. Select **16** from **Level 3** drop down list box, as shown in Figure 22
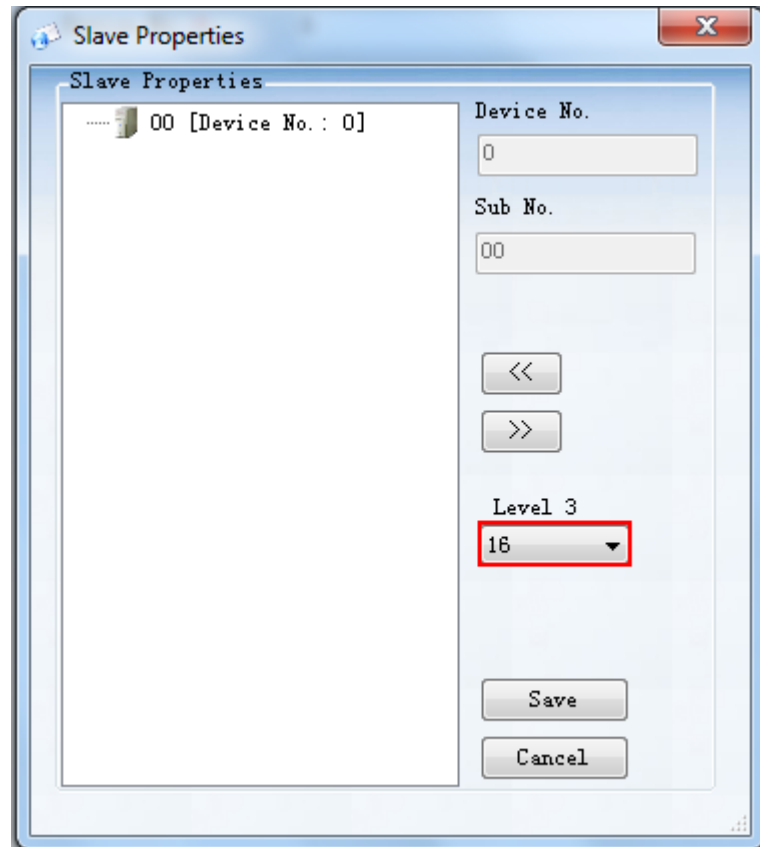
Figure 38   Set IRU-O Number

5. Click **Save** and return to the **Create New Device** page, as shown in Figure 23.
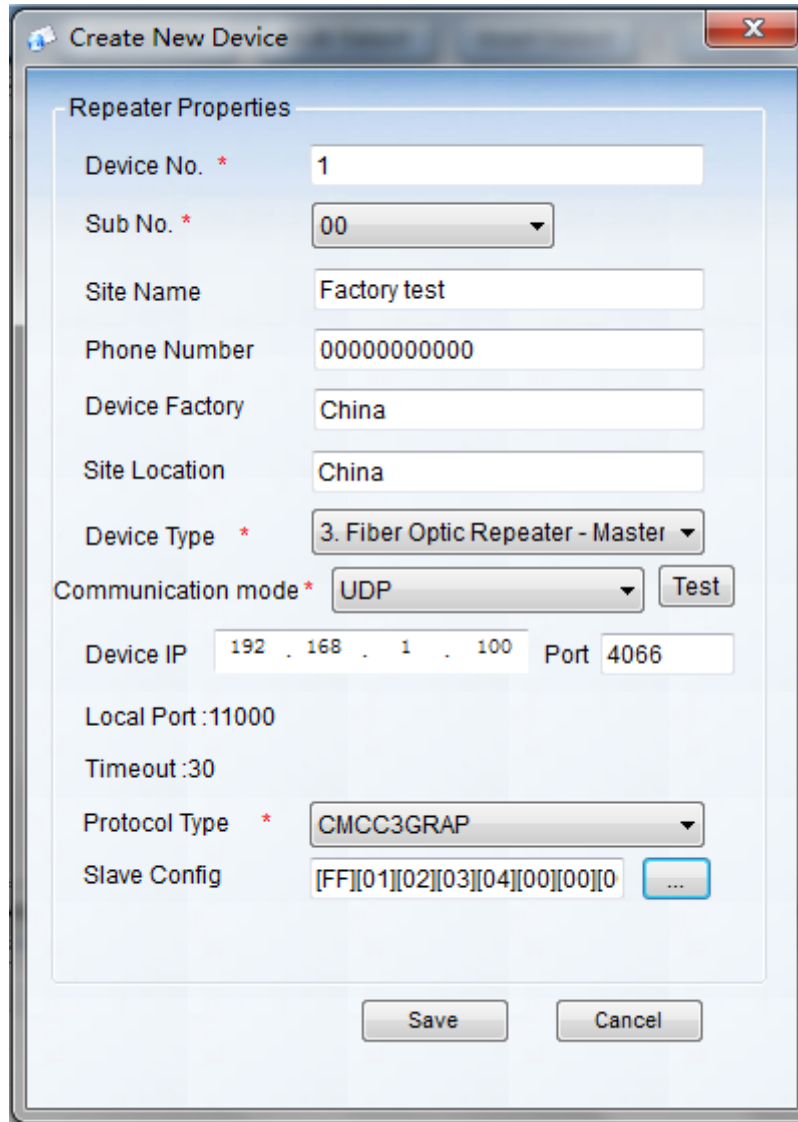
Figure 39   Adding NEU

6. Click **Test button** to check settings whether there are ok, if not available , you may get a pop-up information as show in Figure 24.
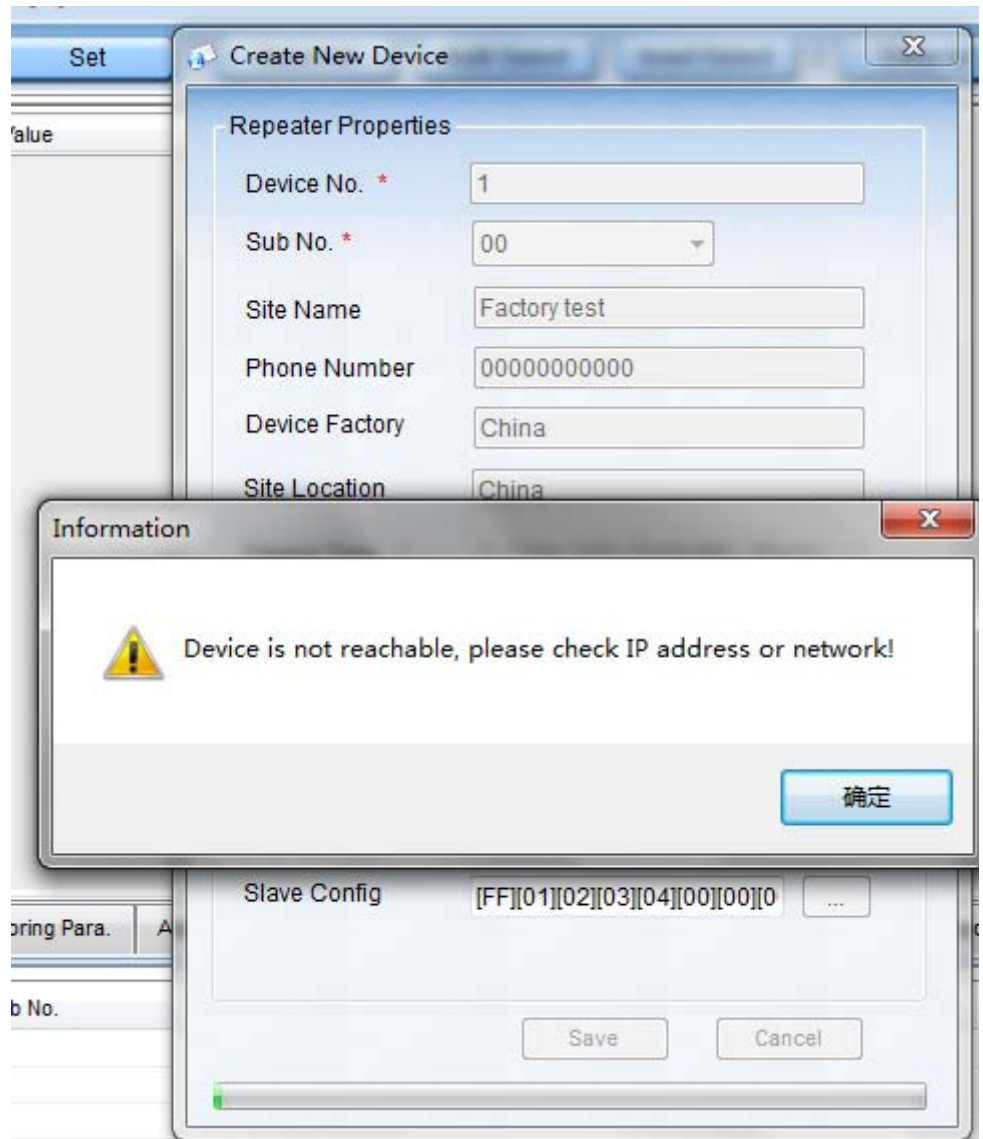
Figure 40   Testing Configuration for A New Device

---End

5.2   Device Management

After successfully adding device, you can start to get and set the device parameters.

Procedure:

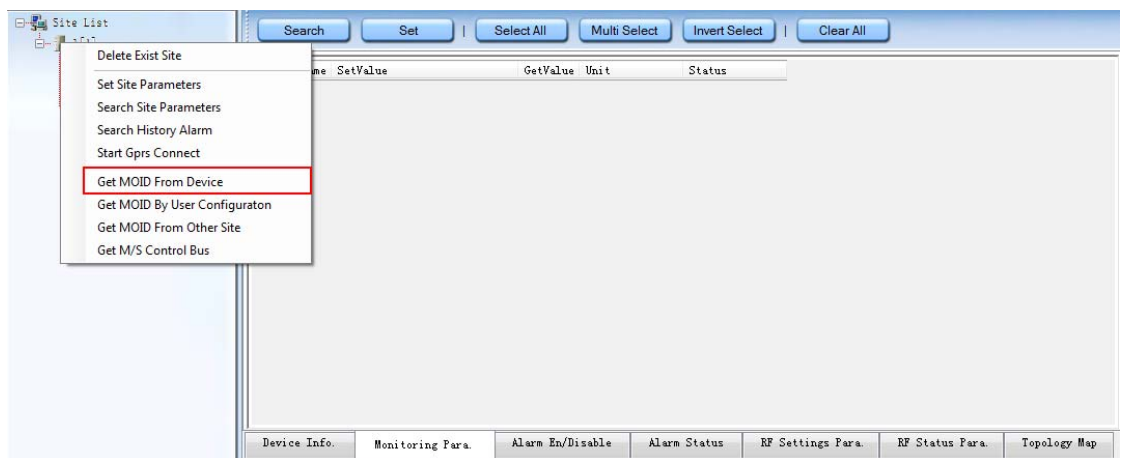1. Right-click a newly added device and then select **Get MOID From Device** from the short-cut menu, as shown in Figure 25.

Figure 41   Get MOID from Device Menu

After getting parameter successfully, a pop-up information box is displayed, click **OK** and the parameter of the device is displayed, as shown in following figures and descriptions.
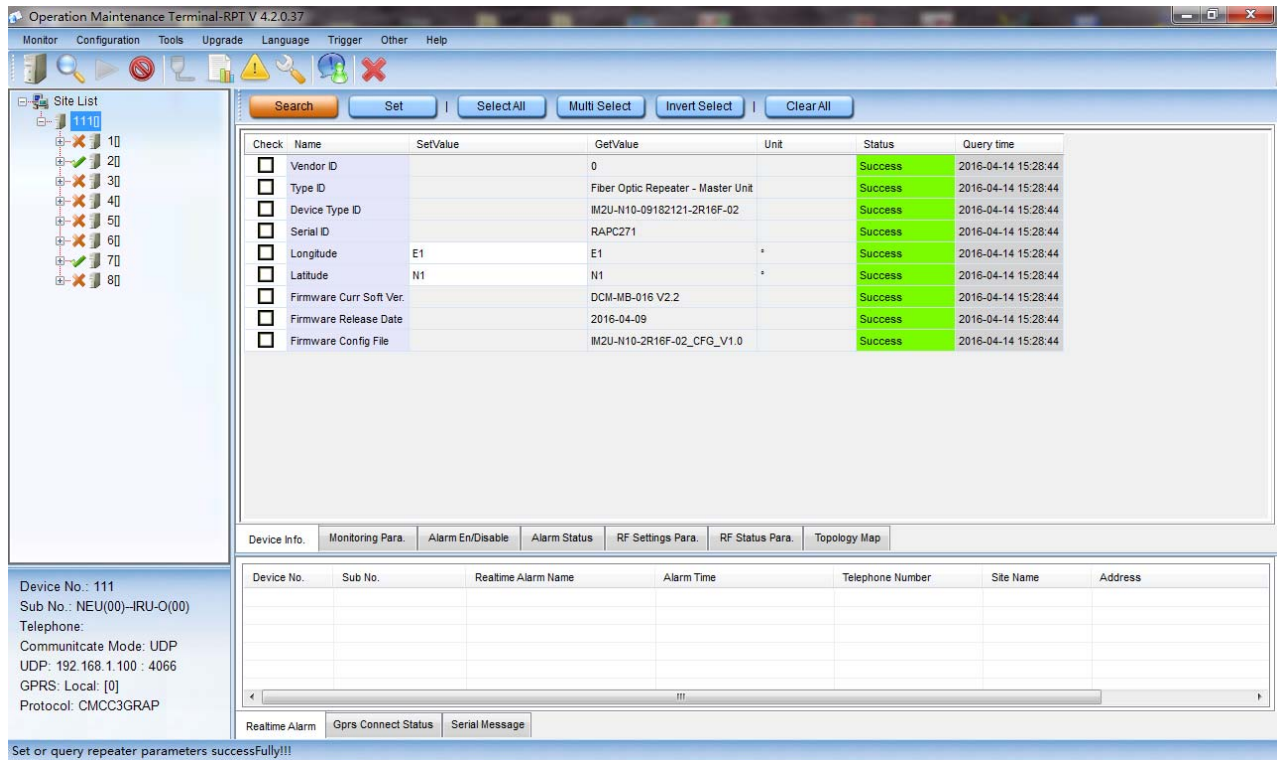
5.2.1 Device info.

5.2.1.1 IM2U parameters

Figure 42   IM2U Device parameters
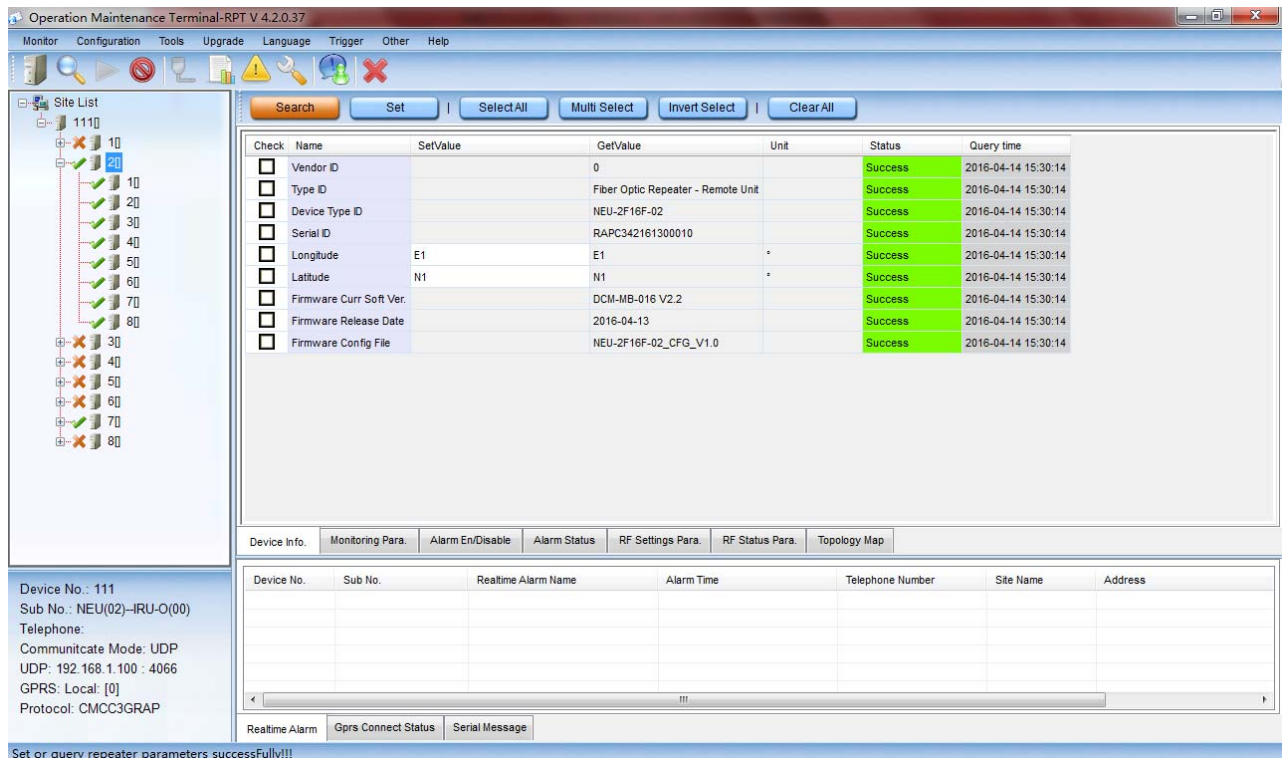
5.2.1.2 NEU parameters

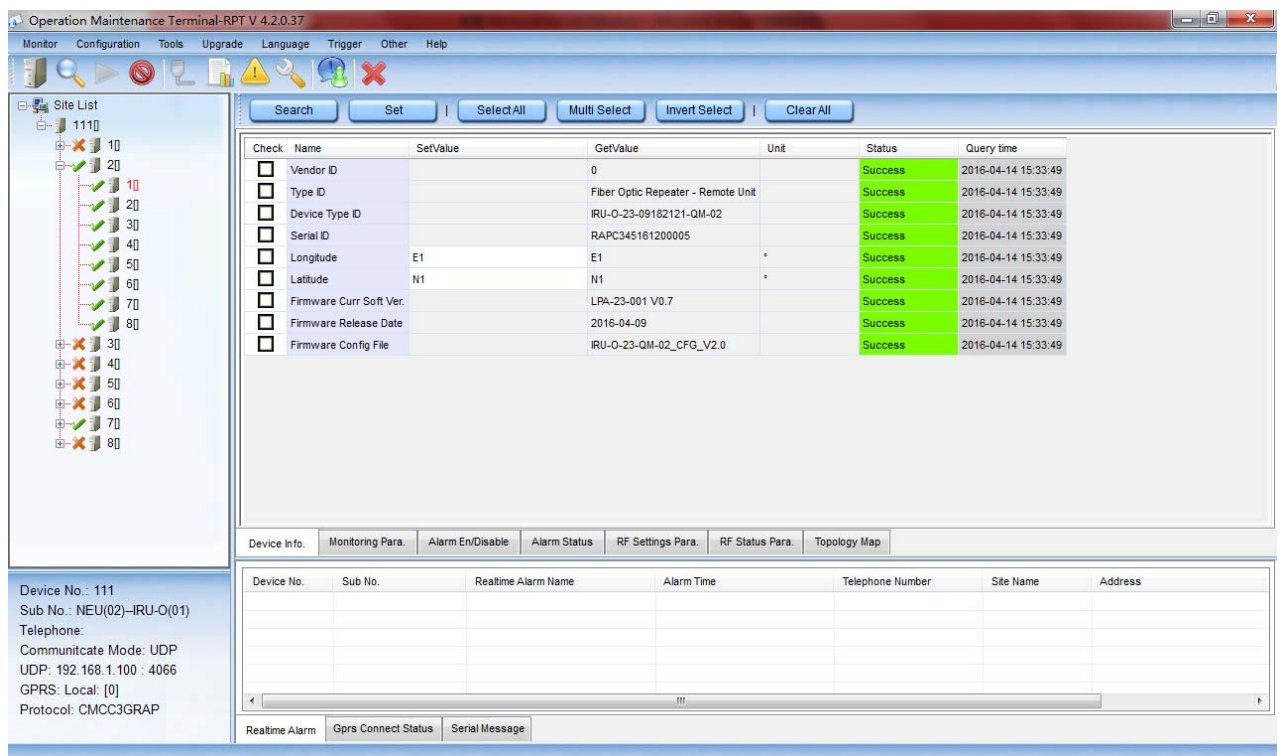**Figure 43   NEU Device Parameters**

5.2.1.3 IRU-O parameters

Figure 44   IRU-O Device Parameters

Table 8   Description of the Device information

Parameter items	Description	Note
Vender ID	Supplier ID	Reference
Type ID	Product Description	Reference
Device Type ID	Product Number	Reference
Serial ID	Product serial number	Reference
Longitude	Product installation location	Option item: enter the Longitude
Latitude	Product installation location	Option item: enter the Latitude
Firmware Curr Soft Version	Product firmware current version	Reference
Firmware Release Date	Product firmware release Date	Reference
Firmware Config File	Product Firmware config file version	Reference

5.2.2 Monitoring Para.
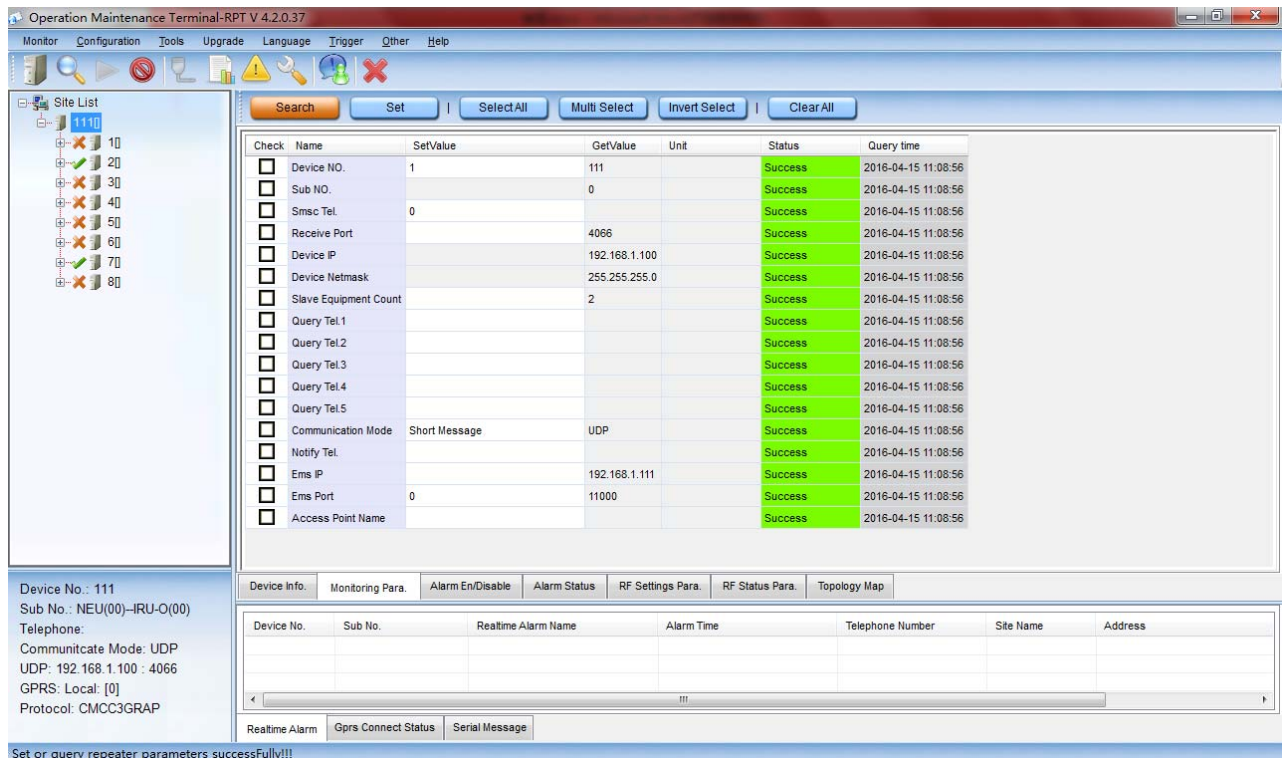
5.2.2.1 IM2U monitoring parameters

Figure 45   IM2U monitoring parameters
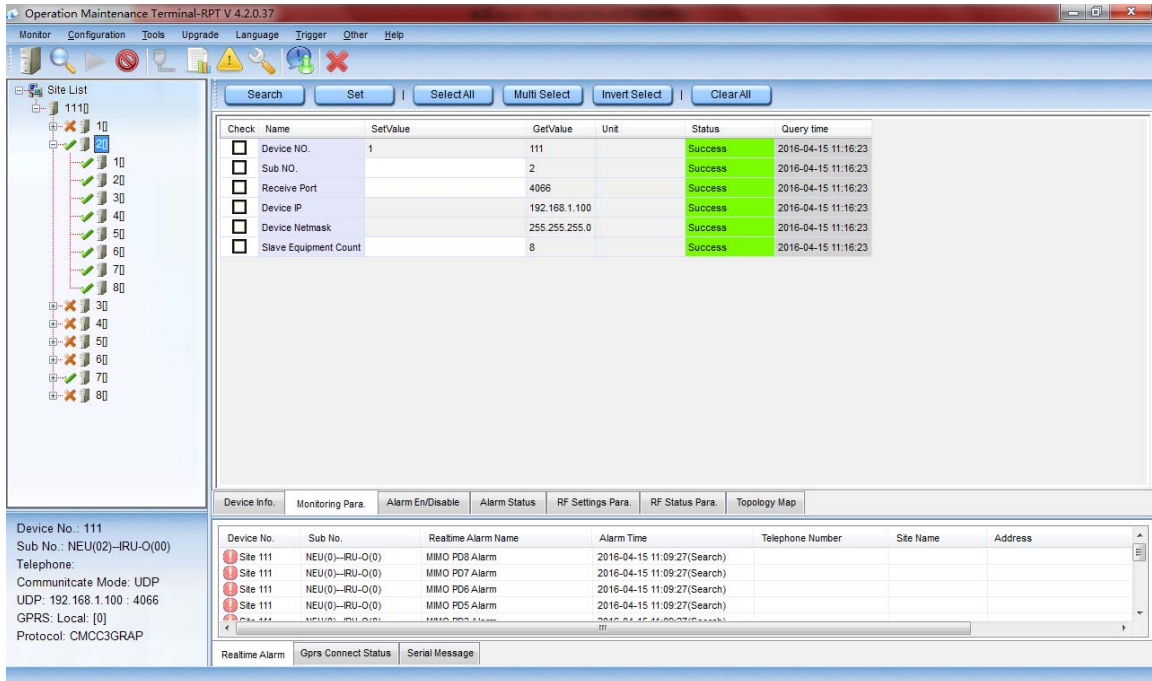
5.2.2.2 NEU monitoring parameters

Figure 46 NEU monitoring parameters
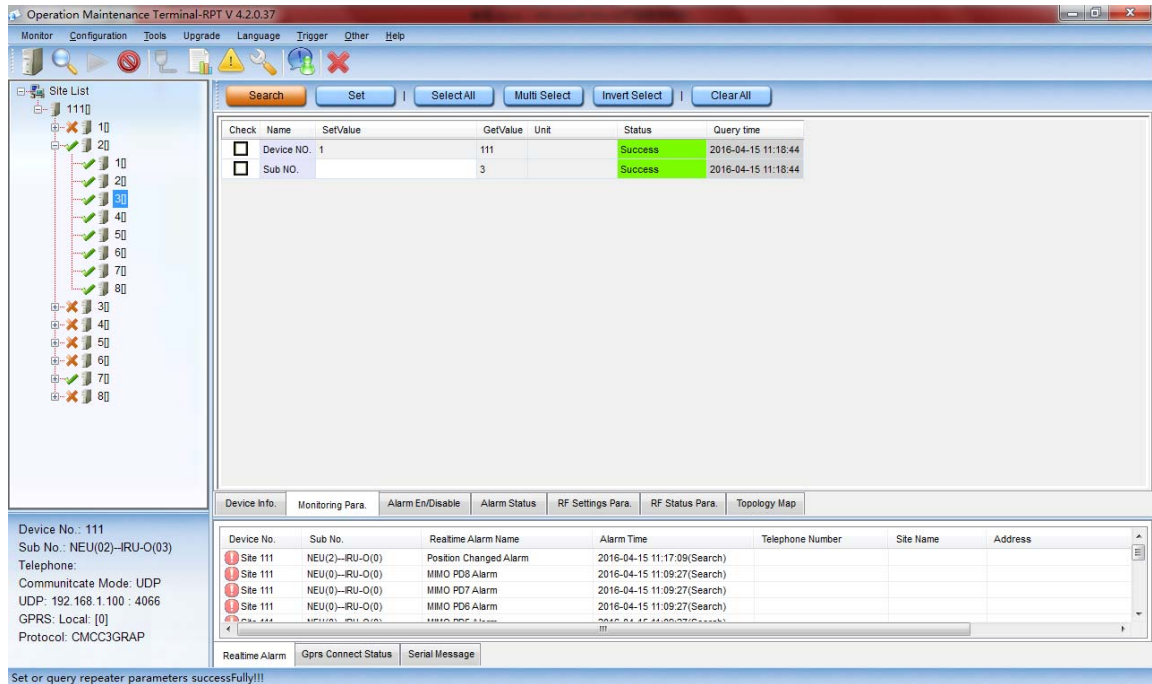
5.2.2.3 IRU-O monitoring parameters

Figure 47 IRU-O monitoring parameters

Table 9　Description of the monitoring information

Parameter items	Description	Note
Device NO.	It is a site ID	Enter a unique number for each site, different site need different number. IM2U: can be set the number from 1 to 254 NEU: same as the IM2U IRU: will be auto set by NEU
Sub NO.	Device ID	Every equipment needs an ID for identifying code. IM2U: Default:0, cannot be set. NEU: can be set the number from 1 to 254 IRU: will be auto set by NEU
Smsc Tel	SMSC is short for Short message server Center	enter the operator 's SMSC number or NA
Receive Port	Device receive port	Default :4066
Device IP	Device IP	Default:192.168.1.100
Device network mask	Device network mask	Default: 255.255.255.0
Salve equipment count	Indicates that master unit can connect how many pieces slave equipment.	IM2U: normally, one IM2U can connect 4 pieces NEU. NEU: normally,
Start sub NO.	Sub equipment start number	Enter a number from 1-256
Query Tel.1~5	Modem Sim Card number	Enter the Modem Sim Card number
Communication Mode	Remote Communication mode	Select one mode for remote control
Notify Tel.	Sim Card Number	If want to monitor alarm all the time, please enter a Sim Card number, the cellphone can receive every piece alarm and notice
Ems IP	The public network IP address	Enter a IP address if want to use the GPRS mode or TCP mode
Ems port	the device communication port number	Enter a port number if want to use the GPRS ,TCP or UDP mode
Access Point Name	The access point name of the mobile network operator.	Enter a APN if want to use GPRS ,TCP or UDP mode

5.2.3 Alarm Status

Device alarm status column corresponds to the Device alarm En/Disable column, if don't want to get an alarm, you can set the item is disable.
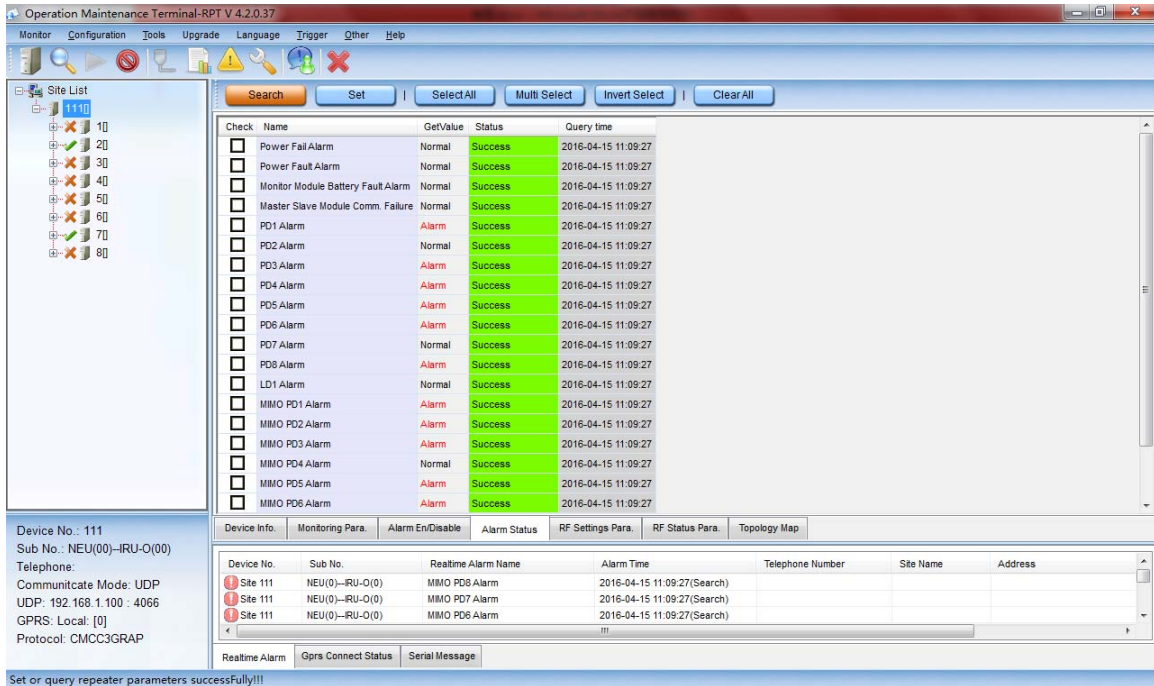
5.2.3.1 IM2U Alarm Status

Figure 48   IM2U Alarm Status
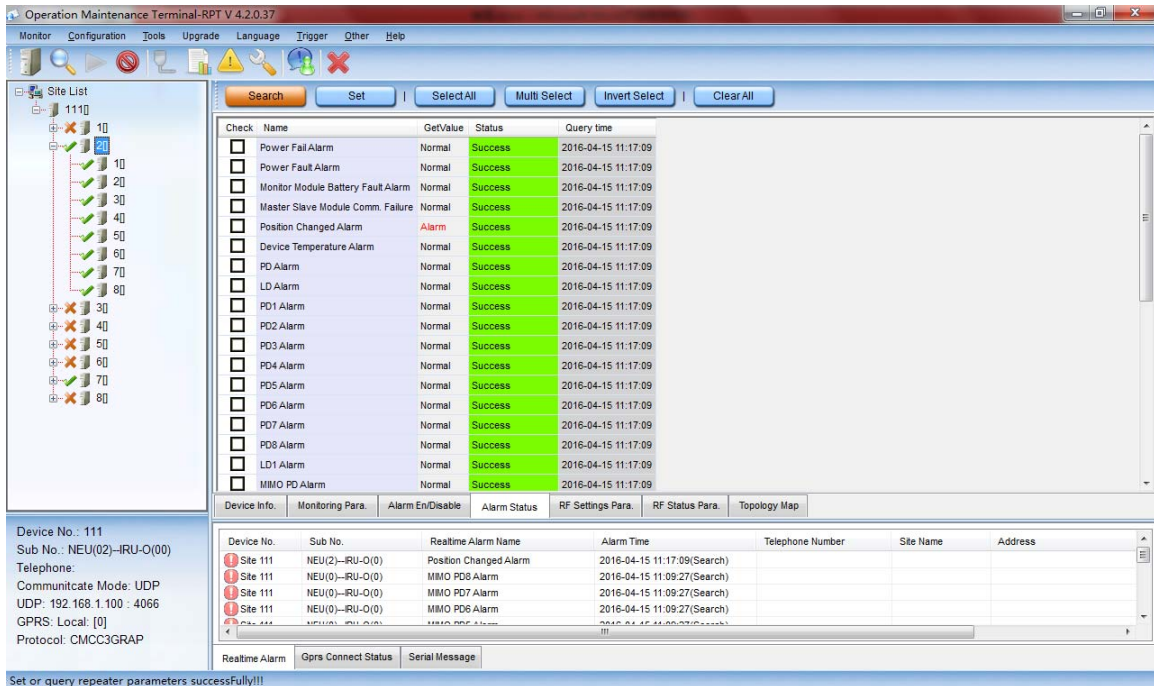
5.2.3.2 NEU Alarm Status

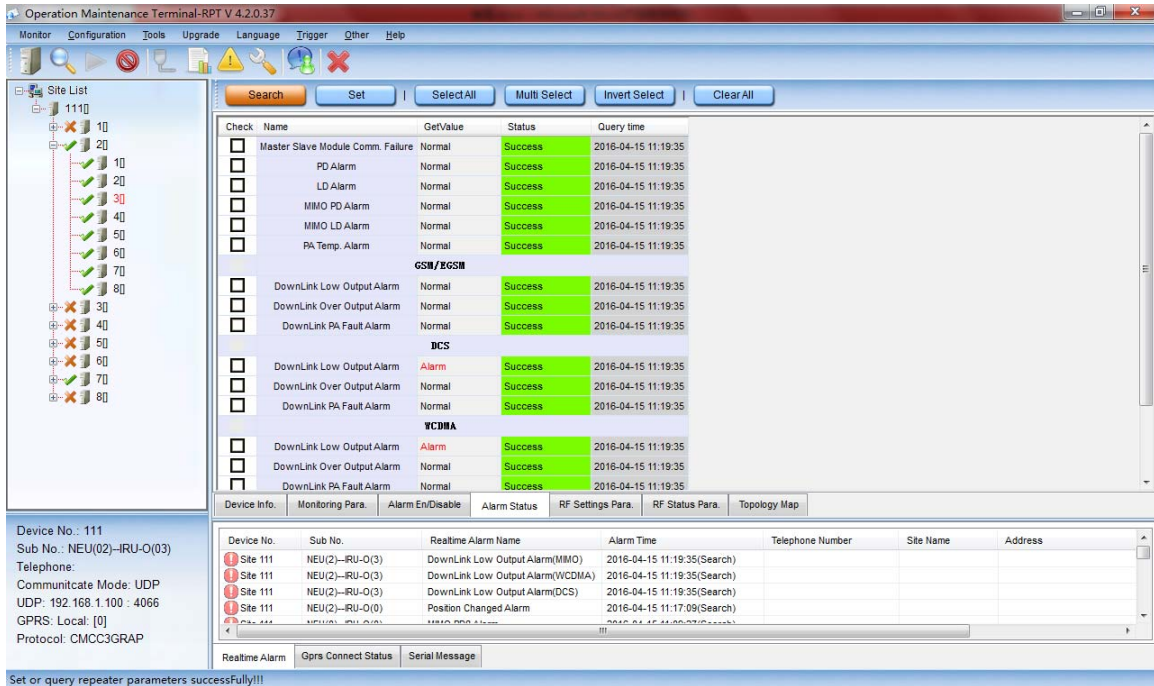**Figure 49   NEU Alarm Status**

5.2.3.3 IRU-O Alarm Status

Figure 50   IRU-O Alarm Status

Table 10 Description of the monitoring information

Parameter items	Description	Note
Power Fail alarm	If the main power supply down, will alarm.	If got the alarm, it means that it has no main power supply.
Power Fault alarm	If the internal power supply voltage is not stable, and the voltage ripple is greater than 10%, will alarm.	If got the alarm, it means that the power supply voltage is not stable, should check the voltage by multimeter.
Monitor module battery fault alarm	If the battery voltage is lower than 8.5V,will alarm	If got the alarm, it means that the battery is not good, should replace a new one.
Master slave link alarm	If the master unit cannot detect the remote unit, will alarm.	If got the alarm, maybe the extender unit or remote unit failed.
Master slave module comm. Failure	If the monitor board cannot detect the module, will alarm.	If got the alarm, maybe have following several status: 1. There is something wrong about the data cable between the monitor board and modules. 2. The modules failed.
PD1~PD16 alarm	If the master unit cannot receive the optical signal, will alarm.	If got the alarm, maybe have following several status: 1. There is something wrong about the fiber optical cable among the Master unit, extender unit and remote unit. 2. The remote unit failed.
LD, LD1,LD2 alarm	If the master unit cannot send the optical signal, will alarm.	If got the alarm, it means the master unit or extender unit failed.
Position changed alarm	Position alarm, if the Device had been moved, will alarm.	If got the alarm ,maybe have following several status: 1. Forgot to connect the position

Parameter items	Description	Note
		cable to Ground.
		2. The Device had been moved by somebody.
Device temperature alarm	If the equipment temperature is higher than setting temperature, will alarm	If got the alarm ,maybe have following several status: 1. Unsuitable temperature value has be set .normally: 55℃ 2. The Device is too hot, and the fan failed if have 3. The Device's program has something wrong.
IRU 1 ~ IRU 16 over current alarm	If the IRU's current is higher than 500mA, will alarm.	If got the alarm, it means the remote unit has something wrong.
Downlink PA Fault alarm	It indicates the PA maybe fail.	If got the alarm, it means the downlink PA has something wrong.
PA temperature alarm	It will alarm if the PA temperature is higher than setting value.	If got the alarm ,maybe have following several status: 1. Unsuitable temperature value has be set .normally: 55℃ 2. The Device is too hot, and the fan failed if have 3. The PA's program has something wrong.
Downlink low output alarm	It indicates the down link output power is lower than the setting value,	If got alarm, the Remote unit maybe have following several status: 1. check Downlink output min.value whether it is appropriate, 2. check downlink attenuation setting ,maybe set too more 3. PA failed. 4. Reference IM2U or NEU, check the input power, maybe the input power is too low.
Downlink over output alarm	It indicates the downlink output power is higher than the setting value.	If got alarm , the Remote unit maybe have following several status 1. need to check the setting value , the setting value should not be greater than the rated out power plus 2 2. If the PA runs well, maybe the PA's program has something wrong. 3. PA failed

5.2.4 RF Setting Parameters

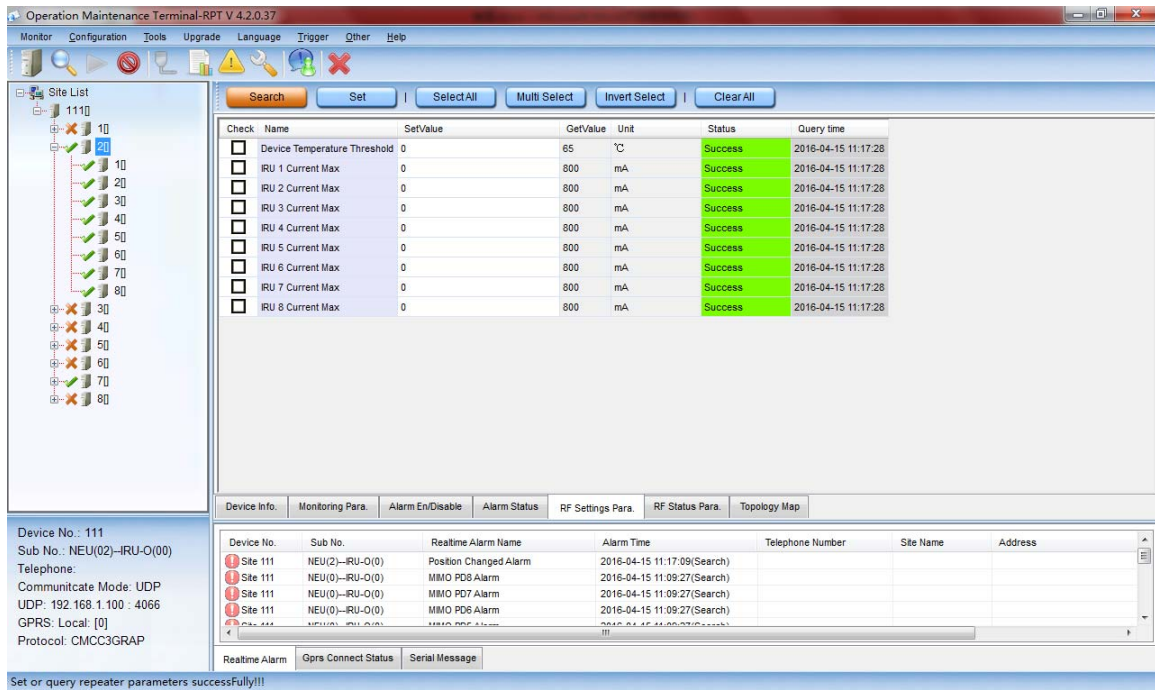### 5.2.4.1 NEU RF Setting Parameters

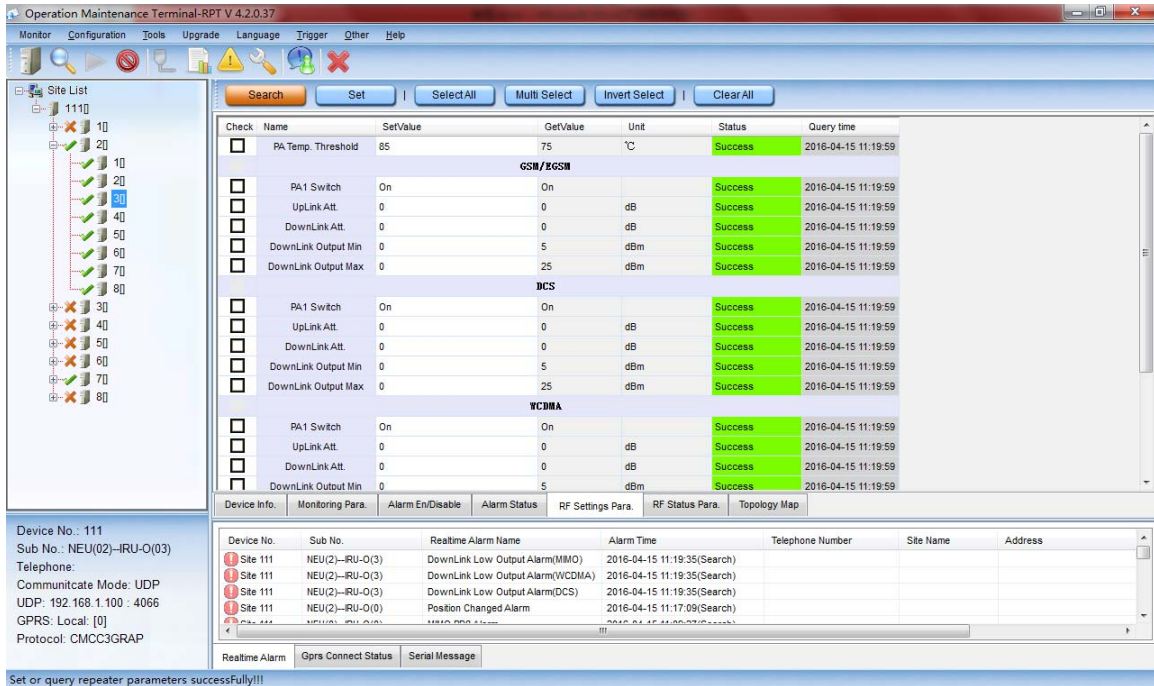**Figure 51   NEU RF Setting Parameters**

5.2.4.2 IRU-O RF Setting Parameters

Figure 52   IRU-O RF Setting Parameters

Table 11 Description of the monitoring information

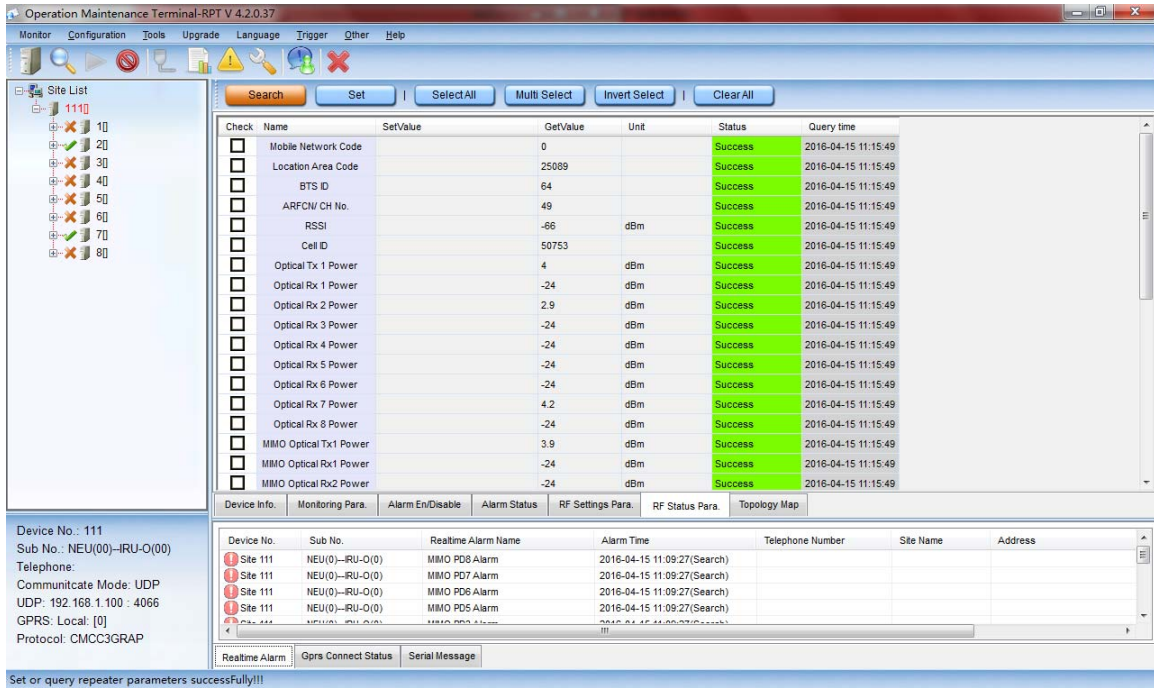| Parameter items	Description	Note
Device Temperature threshold	NEU's temperature setting	Normally, set the number is 55
RF Module switch	IRU's RF module switch	Normally ON
PA Temp. Threshold	IRU's Temperature setting	Normally, set the number is 55
Uplink Att	IRU's uplink attenuation setting	According to the actual situation
Downlink Att	IRU's downlink attenuation setting	According to the actual situation
Downlink Output min	IRU's Downlink Output minimum alarm threshold value	default
Downlink output max	IRU's Downlink Output maximum alarm threshold value	default

5.2.5 RF Status

5.2.5.1 IM2U RF Status

Figure 53   IM2U RF Status
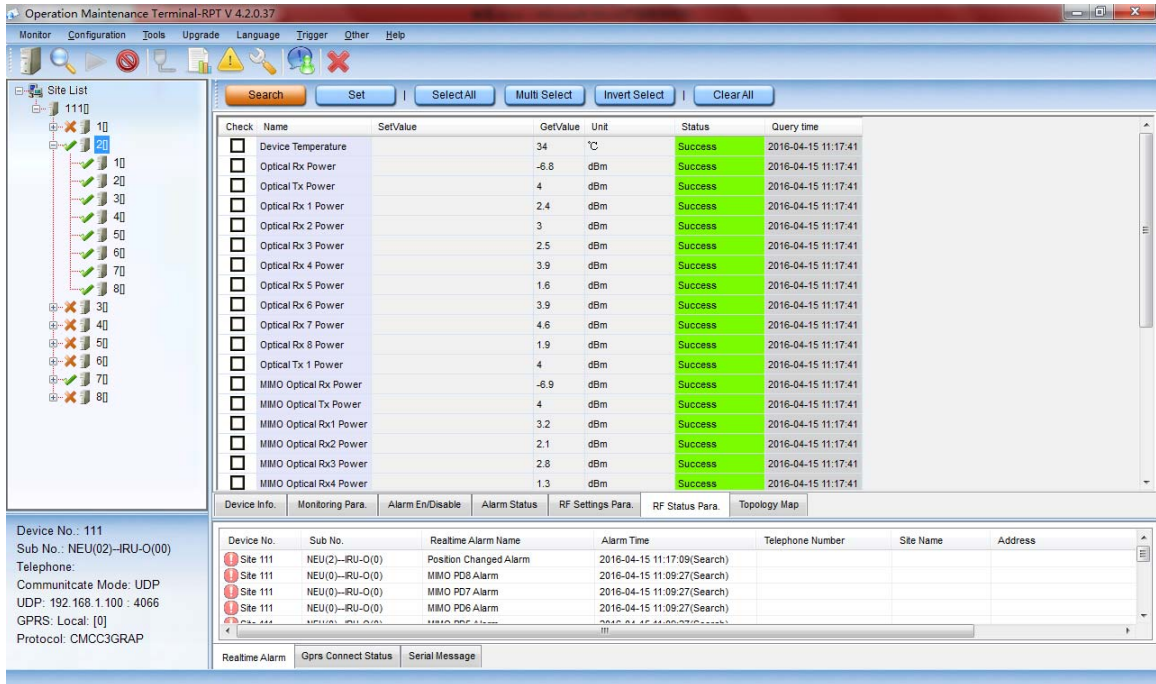
5.2.5.2 NEU RF Status

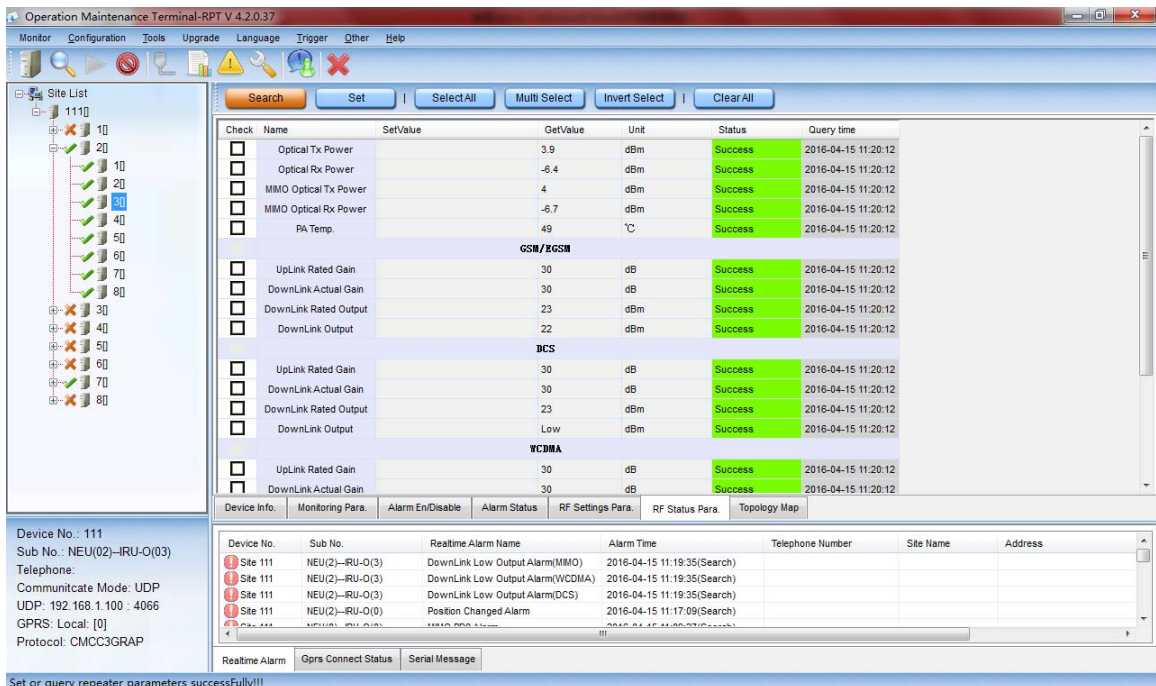

Figure 54   NEU RF Status

5.2.5.3 IRU-O RF Status

Figure 55   IRU-O RF Status

Table 12 Description of the monitoring information

Parameter items	Description	Note
Mobile Network Code	Master unit Modem parameters, only read	Reference
Location Area Code	Master unit Modem parameters, only read	Reference
BTS ID	Master unit Modem parameters, only read	Reference
RFCN/CH NO.	Master unit Modem parameters, only read	Reference
RSSI	Master unit Modem parameters, only read	Reference
CELL ID	Master unit Modem parameters, only read	Reference
Optical TX Power	Device optical output power	Real time data
Optical Rx Power	Device optical receiving power	Real time data
PA Temp.	IRU's PA temperature	Real time data
Uplink Rated Gain	Device uplink rated gain	reference
Downlink Actual Gain	Device downlink actual Gain	Real time data
Downlink Rated Output	Device downlink actual Gain	reference
Downlink output	Device downlink RF output power	Real time data
Downlink input	Device downlink RF input power	Real time data

6   System Monitor Introduce

Operation & maintenance terminal (OMT) interact with the Radiant to set and lookup its status and RF parameters. It can display alarms real-time. OMT can set local connection, SMS connection with the device for operation and maintenance at any time, or at any location.

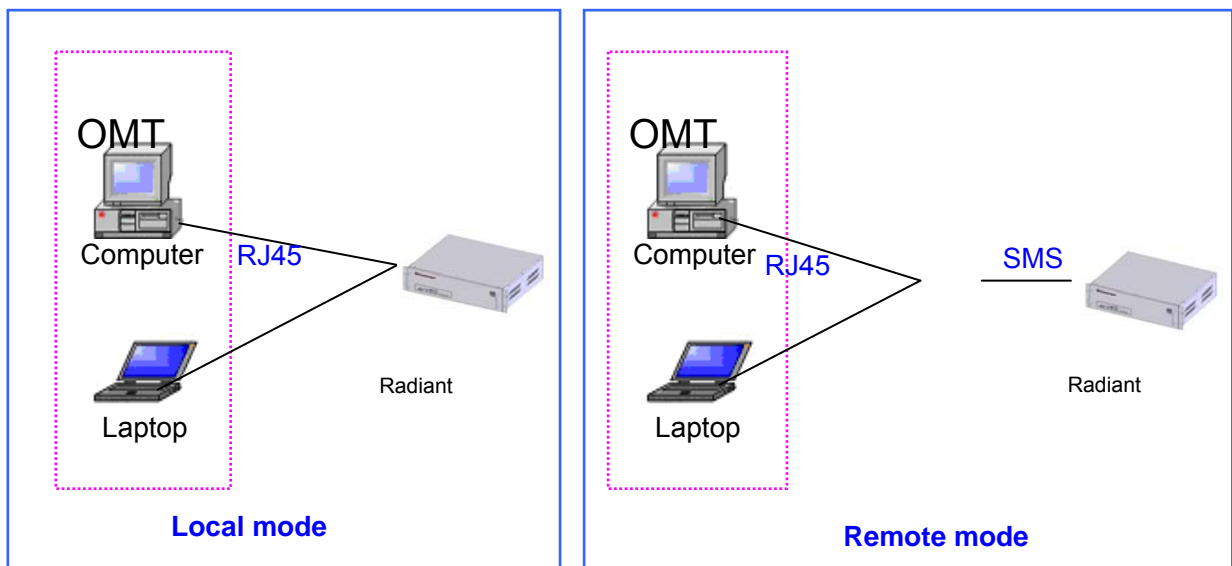OMT and FOR connection topology showed as Figure 39:

Figure 56   OMT Connection mode

Please refer to

Operation/Maintenance Terminal OMT Software User Manual

FCC Statement:

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator& your body.