Nova230i

Outdoor 2x500 mW eNodeB

Installation Guide

BaiBS_QRTA 2.11

April 2023
Version 1.01

About This Document

This document is intended for personnel installing the Baicells Nova230i Outdoor 2x500 mW eNodeB (eNB) product. The product overview is followed by the procedures for properly installing, performing basic configuration, and verifying the eNB is operational. Please be advised that only personnel with the appropriate electrical skills and experience should install this device. This document is based on software version BaiBS_QRTA_2.11. The Nova230i model number is pBS41010.

Terms used in this document or related to Long-Term Evolution (LTE) are listed in alphabetical order and described in *Acronyms and Abbreviations*, which can be found at Baicells.com > Resources > *Documents*.

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Disposal of Electronic and Electrical Waste

Pursuant to the WEEE EU Directive, electronic and electrical waste must not be disposed of with unsorted waste. Please contact your local recycling authority for disposal of this product.

Revision Record

Date	Version	Description	SMEs/Contributors
20-Apr-2023	1.01	Initial release for BaiBS_QRTA 2.11	Blake Volk

Resources

- **Documentation** - Baicells product datasheets, this document, and other technical manuals can be found at Baicells.com > Resources > *Documents*.
- **Support** - How to open a support ticket, process an RMA, and the Support Forum are at Baicells.com > *Support*.

Contact Us

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Safety Information

For the safety of installation personnel and the protection of the equipment from damage, please read all safety warnings. If you have any questions concerning the warnings, before installing or powering on the base station, contact the *Baicells support team*.

WARNING: IMPORTANT SAFETY INSTRUCTIONS

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry, and be familiar with standard practices for preventing accidents

WARNING: Read the installation instructions before you connect the system to its power source.

WARNING: Equipment installation must comply with local and national electrical codes.

WARNING: This product relies on the existing building or structure for short-circuit (overcurrent) protection. Ensure that the protective device is rated no greater than 20A.

WARNING: Do not operate this wireless network device near unshielded blasting caps or in an explosive environment unless the device has been modified and qualified for such use.

WARNING: To comply with the United States Federal Communications Commission (FCC) radio frequency (RF) exposure limits, antennas should be located at a minimum of 20 centimeters (7.9 inches) or more from the body of all persons.

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1 Overview

1.1 Introduction

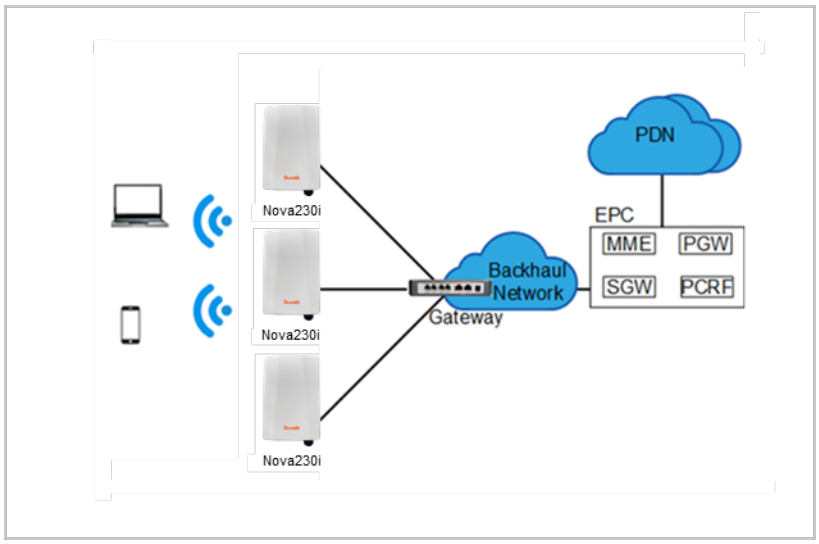
The Baicells Nova230i (Figure 1-1) is a low-power outdoor eNodeB (eNB). This 2x500 mW microcell eNB is especially designed for tightly clustered pockets of customers, coverage holes, and edges of your network. The design also enables opportunistic micro-targeting, like use in RV parks, marinas, and high-density dwellings such as townhomes and apartments. This eNodeB can be used by operators to improve capacity and throughput while eliminating existing dead zones. Nova230i supports LTE technology and operates in Time Division Duplexing (TDD) mode.

Nova230i can be paired with self-installed indoor Customer Premise Equipment (CPE), and this microcell is perfect for clusters of cameras, such as those used at traffic intersections, and other devices for private network operators.

Figure 1-1: Nova230i eNB

The network structure of the Nova230i is shown in Figure 1-2.

Figure 1-2: Network Structure



The Nova230i has a built-in antenna and is pre-configured so that installation is simplified, and connection to the core network is plug-and-play with Self-Organizing Network (SON) capabilities.

Baicells provides operators with local and Web-based Graphical User Interface (GUI) software applications to configure and manage individual eNBs and CPEs.

Additionally, Baicells offers a centralized Software-as-a-Service (SaaS) solution called CloudCore. CloudCore includes all the essential LTE Evolved Packet Core (EPC) network functions, an Operations Management Console (OMC) for managing multiple sites across the network, and a Business and Operation Support System (BOSS) for subscriber management.

In this document is a general description, guidelines, and procedures for installing, entering basic configuration information, and verifying the operational status of the Nova230i eNB.

1.2 Features

The Nova230i eNB can operate in one of several modes:

- HaloB mode (embedded in the base software)
- Citizens Broadband Radio System (CBRS) Spectrum Access System (SAS)

HaloB allows the eNB to function with embedded Mobility Management Entity (MME) capabilities on board so that the eNB operates independently from the usual cloud connection. HaloB is standard in the Nova230i as part of the basic software. This enables the user to migrate core network functions to the eNB.

CBRS SAS is a multi-vendor SAS database where CBRS spectrum use is managed dynamically across operators. The CBRS band covers 3.55–3.70 GHz. Operators must sign up with a SAS provider, which handles the dynamic frequency assignment and release process. Baicells provides FCC Part 96 certified eNBs, including the Nova230i, and CPEs that operate within the Part 96 rules for CBRS. The Baicells eNBs and CPEs use a Domain Proxy (DP) to connect to the SAS server by leveraging the existing connection with the OMC.

NOTE 1: Legacy Gen 1 CPEs do not support SAS.

NOTE 2: This installation guide only covers the basic configuration of a single cell for verifying that the eNB unit is operational during installation. More detailed configuration guides are available on the Baicells website:

Baicells.com > Resources > *Documents*:

- CloudCore Configuration & Network Administration Guide (OMC/BOSS)
- CAT4 CPE Configuration Guide
- CAT6/CAT15 CPE Configuration Guide
- HaloB Solution User Guide
- SAS Deployment Guide

The following is a list of other key features. The Nova230i datasheet providing technical specifications is kept up-to-date on the *Baicells website*.

- Supports standard LTE TDD band 48 (3550 MHz–3700 MHz)
- Complies with 3GPP Release 15 standards
- Supports 5/10/15/20 MHz bandwidth
- Provides excellent Non-Line-of-Sight (NLOS) coverage
- Peak rate is a configurable parameter using special Subframe Assignment (SA):
  - 20 MHz:
    - SA1: DL 80 Mbps, UL 28 Mbps
    - SA2: DL 110 Mbps, UL 14 Mbps
    - SA6: DL 65 Mbps, UL 35 Mbps
  - 10 MHz:
    - SA1: DL 38 Mbps, UL 14 Mbps
    - SA2: DL 52 Mbps, UL 7 Mbps
    - SA6: DL 31 Mbps, UL 17 Mbps
- 32 concurrent users
- Interoperable with standard LTE EPC
- Supports TR-069 network management interface
- Can be accessed via GUI-based local and remote web management
- Connects to any IP-based backhaul, including public transmission
- Is lightweight and uses low power consumption to reduce OPEX, can be powered easily by Baicells compact outdoor SmartUPS
- Compact, plug-and-play device with SON capabilities
- Can be used for Internet of Things (IoT) with all mainstream EPC vendors.
- Ensures secure protection against illegal intrusion
- Integrated high-gain internal antenna
- Compact, all-in-one design of internal antenna and Global Positioning System (GPS)
- Configured out-of-the-box to work with Baicells CloudCore

- Cloud/Local/Embedded EPC (HaloB) is supported for more convenient and economical deployment
- Supports CBRS Part 96 certified
- Built-in GPS synchronization
- Built-in Dynamic Host Configuration Protocol (DHCP) Server, Domain Name System (DNS) Client, and Network Access Translation (NAT) functionality, providing strong high-speed routing
- Supports Transparent Bridge Mode

2 Installation Preparation

2.1 Materials

Check the Nova230i package to ensure it contains the primary components in the packout (Figure 2-1). In addition to industry-standard tools, you need the materials described in Table 2-1 and the tools described in Table 2-2 during the installation.

Figure 2-1: Packout

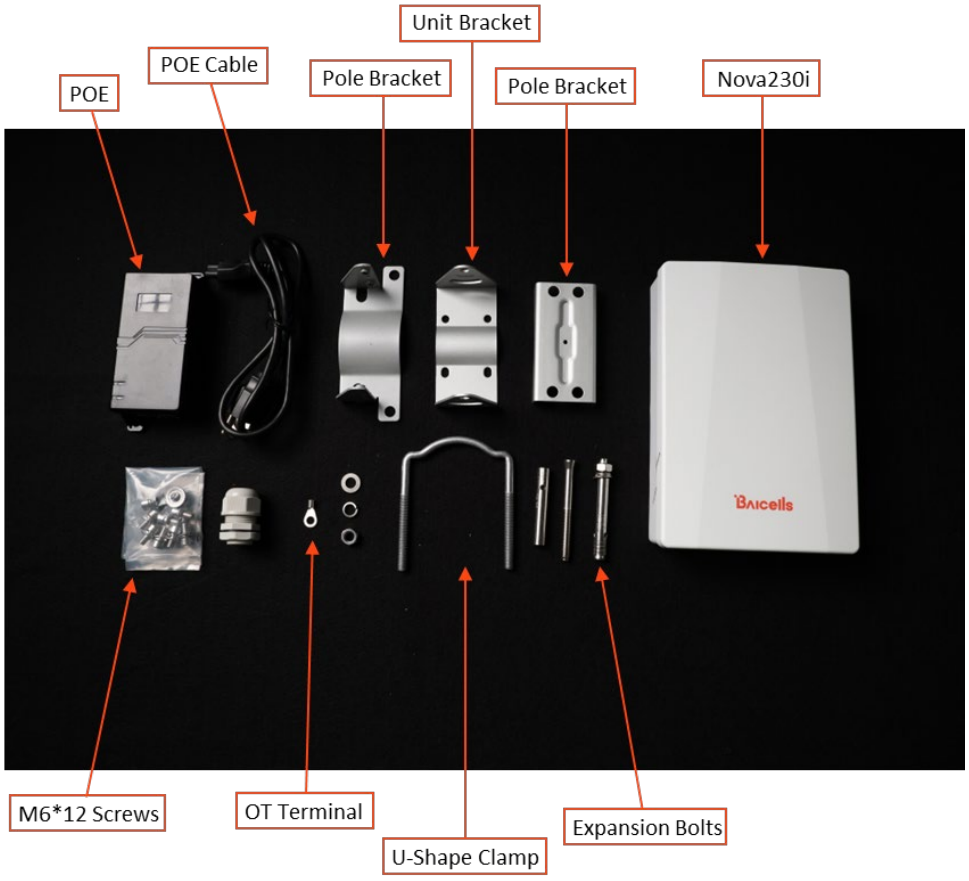
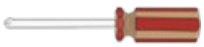


Table 2-1: Materials

Item	Description
Power cable	< 16 AWG, e.g., 14 AWG, shorter than 330 feet (100 meters).
Power plug	The plug that connects the power cable to the electricity supply.
Ethernet cable	Outdoor CAT6, shorter than 109 yards (100 meters) It is suggested that the diameter of the cable is 7 mm ± 1 mm (0.3 in ± 0.04 in).
Ground cable	If the length of lead is more than 10 meters (33 ft), 6 AWG (10 mm^2) grounding cable should be used.

Table 2-2: Installation Tools

			
Level bar	Marker pen	Knife	Pliers
			
Wrench	Percussion drill and drill heads	Hammer	Phillips-head screwdriver
			
Cable vice (crimper)	Tape measure	0.05 cm (5 mm) L-shape Allen wrench	T7 screwdriver head

2.2 LEDs and Interfaces

Figure 2-2, Table 2-3, and Table 2-4 explain the eNB's LED status indicators and interfaces.

Figure 2-2: LEDs and Interfaces

Table 2-3: LEDs

LED	Color	Status	Description
PWR	Green	Steady on	Power is on
		OFF	No power supply
ACT	Green	Steady on	The cell is activated
		OFF	The cell is deactivated
RUN	Green	OFF	No power input or device fault
		Fast flash: 0.1 s on, 0.1 s off	The device is starting up
		Slow flash: 1 s on, 1 s off	The device is running normally
ALM	Red	Steady on	Hardware alarm
		OFF	No alarm

Table 2-4: Interfaces

Interface Name	Description
ETH/POE+	RJ-45 interface (FE/GE) Used for power supply, debug or data backhaul/maintenance PoE++, complies with IEEE 802.3bt standard

2.3 Location and Environment

The Nova230i can be installed on a pole or a wall. For the best signal coverage, place the eNB in an unobstructed location. In addition to network planning, when determining where to place the eNB, consider the best location for signal coverage. Avoid locating the eNB in areas with extreme temperatures, harmful gases, unstable voltages, volatile vibrations, loud noises, flames, explosives, or electromagnetic interference (e.g., large radar stations, transformer substations). Avoid areas prone to impounded water, soaking, leakage, or condensation. Environmental specifications are shown in Table 2-5.

Table 2-5: Environment Specifications

Item	Description
Operating Temperature	-40°F to 131°F / -40°C to 55°C
Storage Temperature	-49°F to 158°F / -45°C to 70°C
Humidity	5% to 95% RH
Atmospheric Pressure	70 kPa to 106 kPa
Safety voltage	42 V to 58 V

2.4 CloudCore Account

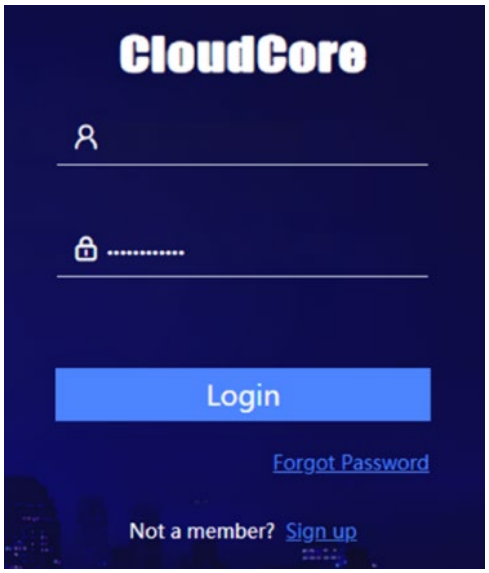
The Baicells CloudCore includes the EPC, managed by Baicells, and two operator applications, OMC to manage network elements, and BOSS to manage subscribers. If you have not already set up a Baicells CloudCore account, follow the steps below.Figure 2-3: CloudCore Login Page

Open a web browser, and enter the CloudCore address (Figure 2-3):
https://cloudcore.cloudapp.net/cloudcore/

Step 1: Click on the *Sign up* button.

Step 2: Complete the mandatory fields, and again click on *Sign up*.

Figure 2-3: CloudCore Login Page



You will receive an email from Baicells. Click on the CloudCore link to go to the login page.

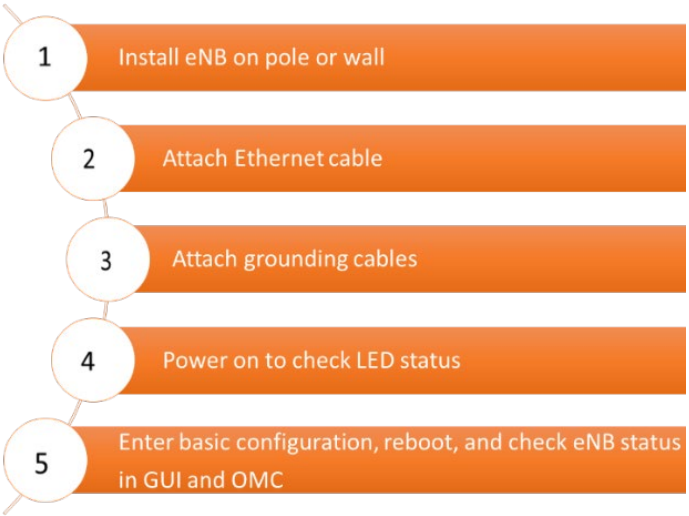
Enter your login user name (email address) and password to authenticate.

3 Installation

3.1 Process Overview

Figure 3-1 provides an overview of the installation process.

Figure 3-1: Installation Process Overview



3.2 Install eNB on Pole or Wall

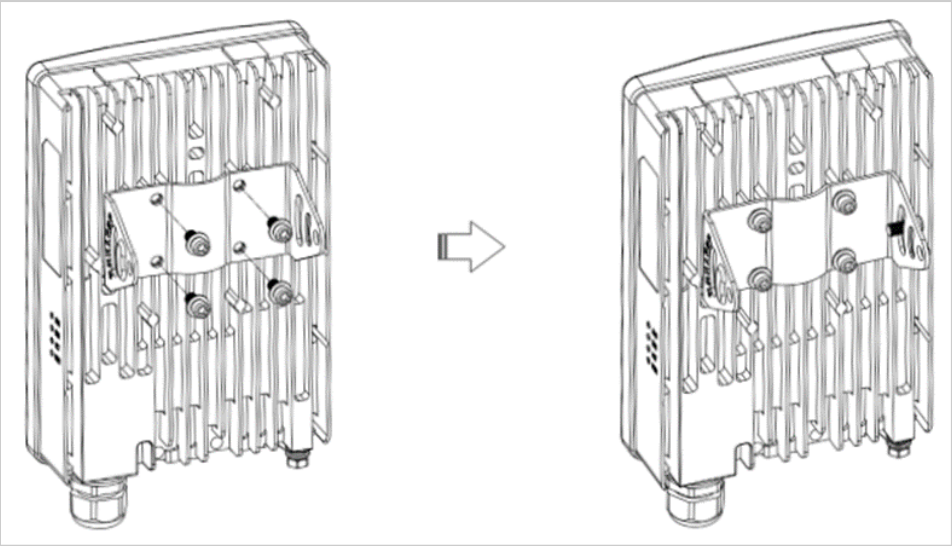
3.2.1 Install on Pole

The eNB mounting bracket is assembled in manufacturing before packing. The only action required by the installer is to attach the assembly to the pole.

Check to ensure the diameter of the pole is in the range of 1.6–2.8 in (40–70 mm). The position of the eNB on the pole should be at least 47 in (120 cm) in height. Follow the steps below to install the Nova230i eNB on a pole.

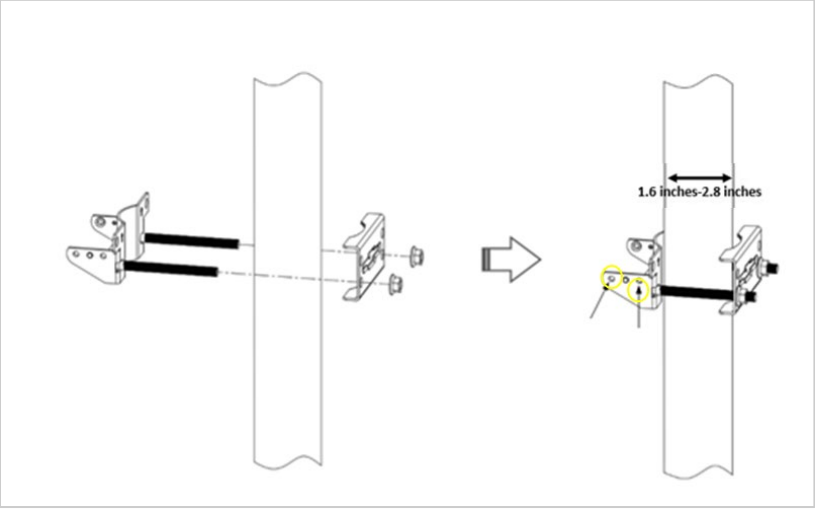
1. Assemble the back bracket on the back of the eNB with four screws (Figure 3-2).

Figure 3-2: Assemble the Back Bracket



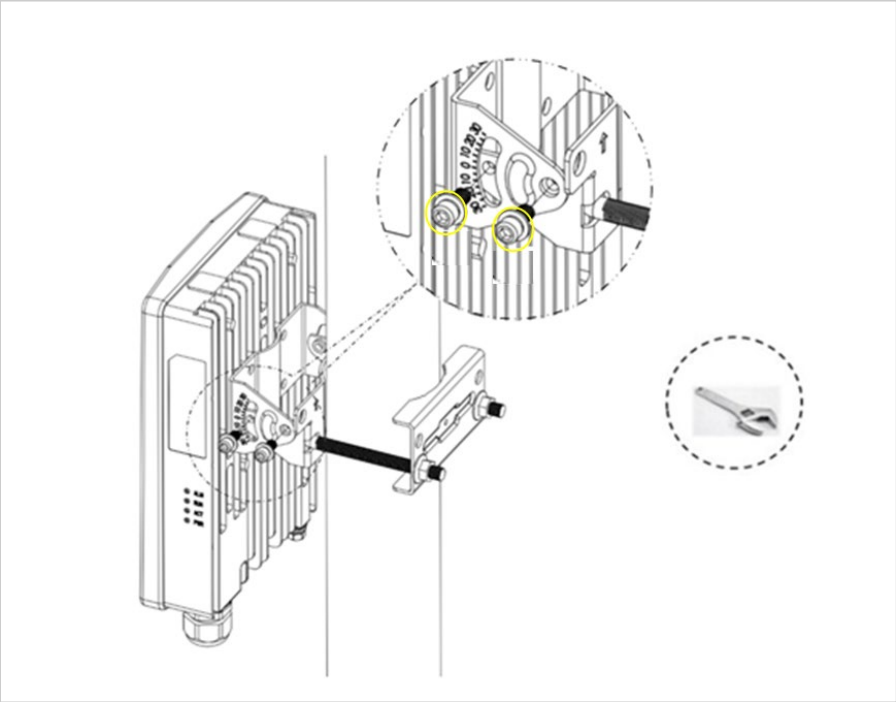
2. Assemble the pole mount and fix it on the pole (Figure 3-3).

Figure 3-3: Attach Bracket to Pole



3. Assemble the clamp and tighten the screws (Figure 3-4).

Figure 3-4: Tighten Screws

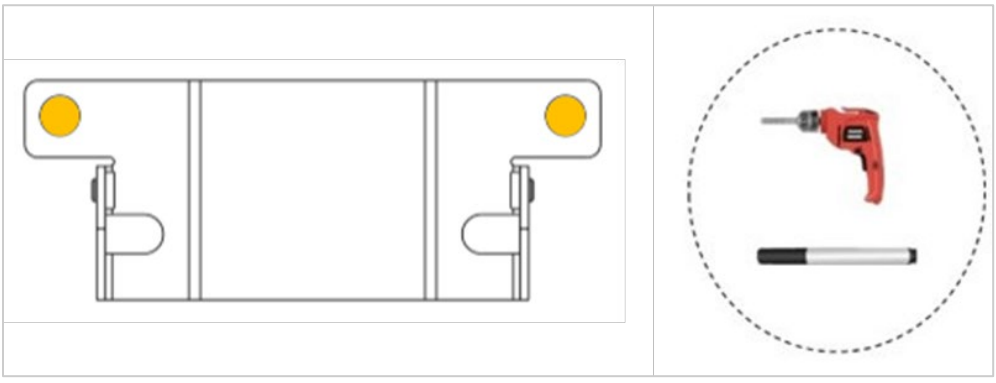


3.2.2 Install on Wall

Ensure that the wall can bear at least four times the weight of the eNB. Follow the steps below to install the Nova230i eNB on a wall.

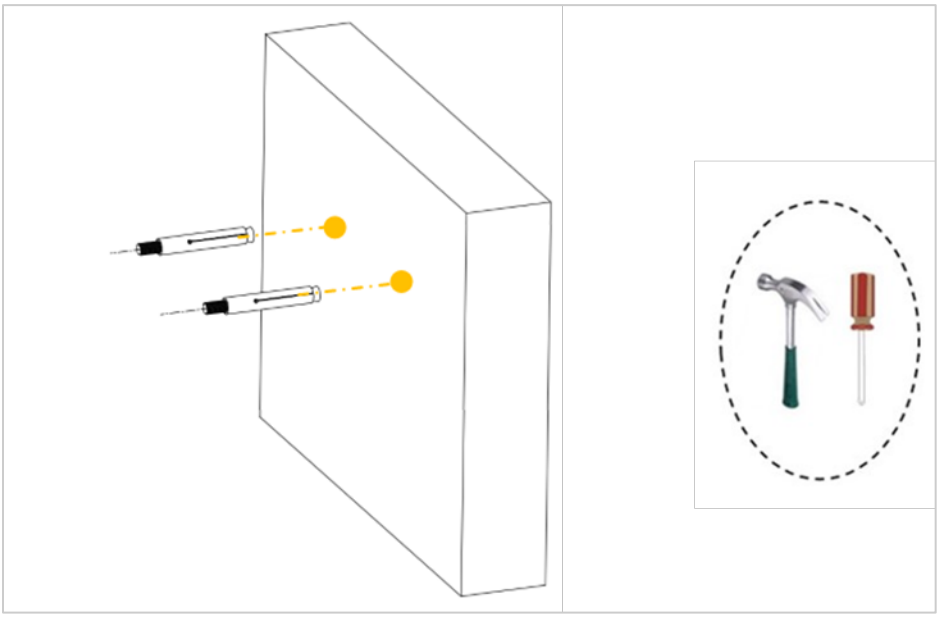
1. Take apart the assembled installation bracket.
2. Place the device against the wall mounting bracket on the wall. Mark the drilling locations using a pencil or marker.
3. Drill two holes measuring 0.4 in (10 mm) diameter by 2.8 in (70 mm) deep on the wall to match the size of the wall bracket holes (Figure 3-5).

Figure 3-5: Mark and Drill Holes



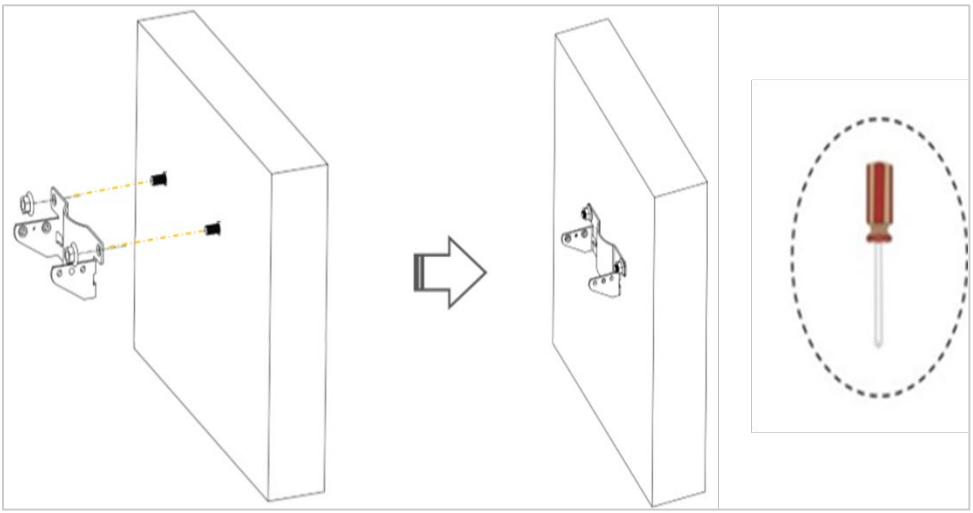
4. Insert expansion bolts into the two drilled holes (Figure 3-6).

Figure 3-6: Attach With Expansion Bolts



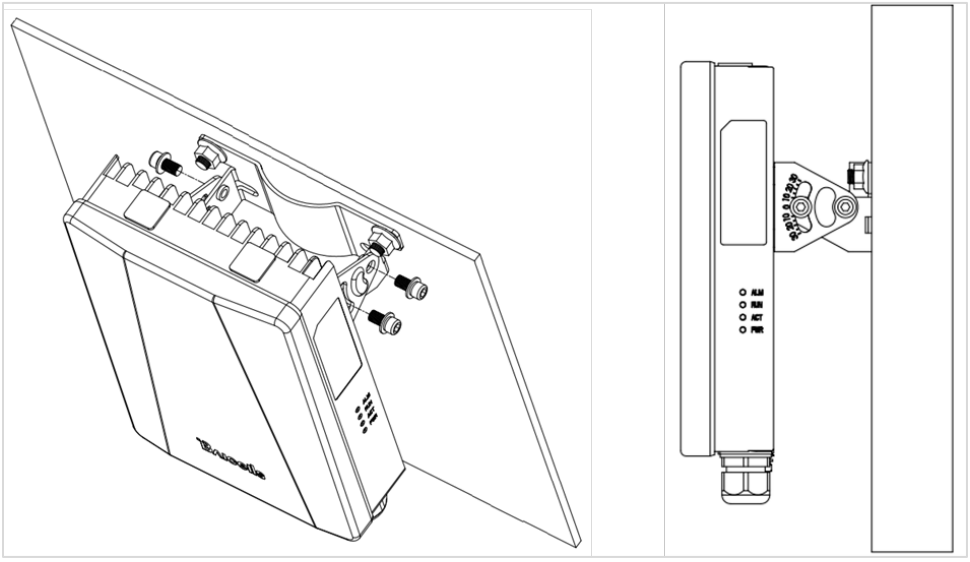
5. Hang the eNB on the mounting bracket with expansion bolts. Tighten the washers, spring washers and nuts in a sequence using a Phillips-head screwdriver (Figure 3-7).

Figure 3-7: Tighten Washers



6. Align the screw holes on the bracket with the corresponding screw holes to mount the device and tighten the screws in sequence to complete the installation (Figure 3-8).

Figure 3-8: Completed Installation



3.3 Connect Cables

WARNING: Ensure the antenna is connected before powering up the eNB. The wireless signal transmission power can cause bodily injury, and damage to the eNB and Radio Frequency (RF) power amplifier devices.

3.3.1 Cable Laying Requirements

General requirements:

- Bending radius of power cable and grounding cable: > triple the diameter of the cable.
- Bind the cables according to the type of cable; intertwining and crossing are forbidden.
- An identification label should be attached after the cable has been laid.

Grounding cable laying requirements:

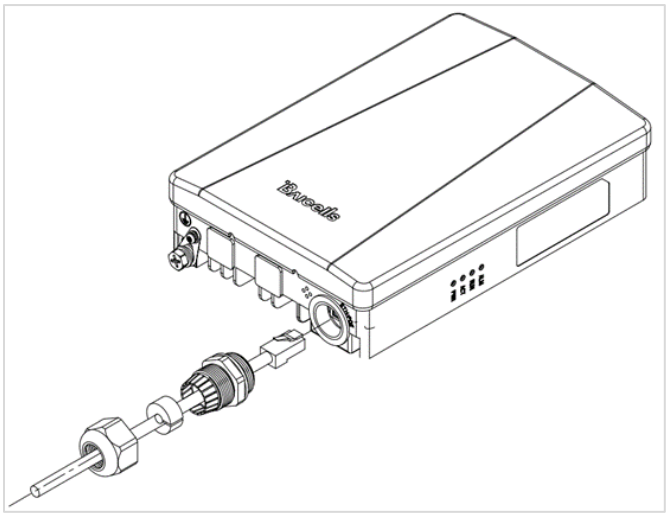
- The grounding cable must connect to the grounding point.
- The grounding cable must be separated from the signal cables, of enough distance to avoid signal interference.

3.3.2 Connect Ethernet Cable

Refer to *section 3.4.1* (Figure 3-10) to complete the Ethernet cable connection.

1. Unscrew the ETH connector.
2. Pass the Ethernet cable through unscrewed connector based on the original sequence.
3. Insert RJ-45 connector to ETH/POE port at the bottom right of the eNB, and tighten the connector port (Figure 3-9).

Figure 3-9: Connect Ethernet Cable



4. The Ethernet cable connects to the Power over Ethernet (PoE) interface of the PoE adapter.
5. The Local Area Network (LAN) interface of the PoE adaptor connects to a LAN switch or a router for maintenance and backhaul.

NOTE: The PoE adaptor must be placed in the distribution box for waterproofing.

3.4 eNB Grounding

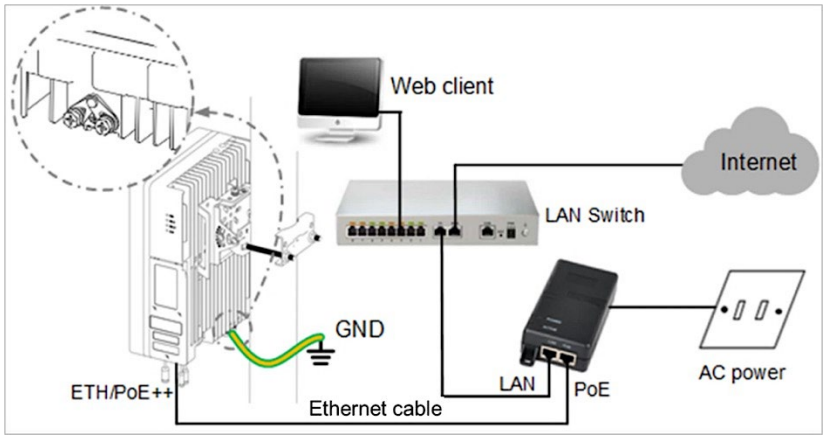
3.4.1 Connect Grounding Cables

Prepare the grounding cable according to the actual measurements and requirements of the specific installation site. The Nova230i eNB has two grounding screws located on the bottom of the unit, as shown in Figure 3-10.

NOTE: All Nova eNBs have a floating ground on the power system.

1. Unscrew one grounding screw, connect one end of the ground cable to the grounding screw, and retighten the screw.
2. Repeat step 1 for the second grounding screw.
3. Once the eNB is installed at the outdoor location, the other end of the ground cable needs to connect to a good earth grounding point.

Figure 3-10: Connect Cables and Grounding Screws

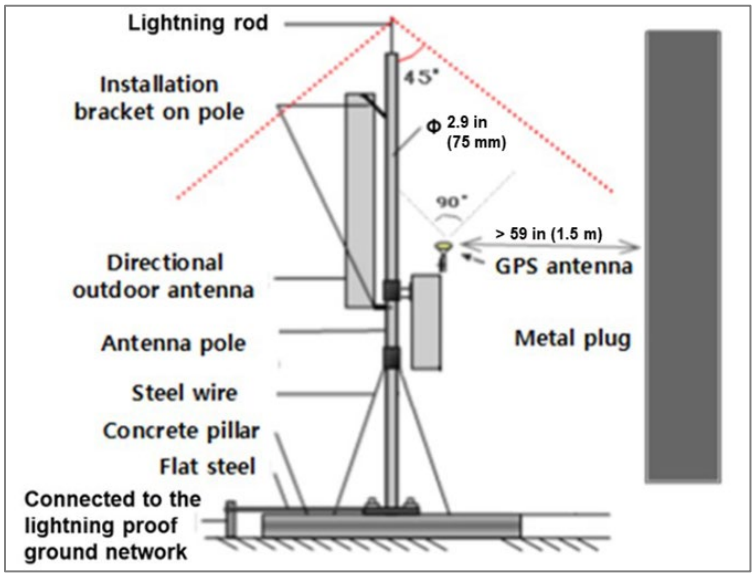


Before installing the eNB at its final destination, perform the steps in *section 3.6* and *section 3.7*. Upon successful testing, the eNB will be ready for installation at the cell site. Seal and weatherproof all the connection points, and rustproof where needed.

3.4.2 Pole Grounding

The purpose of pole grounding is to protect the equipment as much as possible from potential damage of lightning overvoltage. However, the interfaces between the eNB and the outside world mainly include power system, grounding system, antenna feeder and lightning receiving device, and signal line. Therefore, any damage caused by lightning primarily comes from the voltage difference between the equipment in the eNB and one or more of the four interfaces. The pole grounding is shown in Figure 3-11.

Figure 3-11: Pole Grounding



1. The installation position of the grounding bar should meet the design requirements. The holding pole and tower body must be connected to the lightning protection network, or grounded with a separate lead.

2. The diameter of the grounding wire should meet the design requirements. The copper nose must be used for grounding, and the grounding resistance is required to be less than 10 ohms. If the resistance of the public network communication equipment placed in other systems is less than 10 ohms, the grounding network of the system should be overlapped.

3. The grounding wire must be the whole wire material. When laying, it should be bound separately with other cables. All grounding wires should be fixed with wire core or binding tape with a fixed spacing of 0.3 m (12 in).

4. The copper bar must be used for the grounding bar, and the specification of the grounding bar shall meet the design requirements. If there are no specific requirements in the design, 300 × 40 × 4 mm (12 x 1.5 x 0.16 in) and fixed with expansion bolts.

5. The grounding wire must be made of the whole cable material, the intermediate joint is strictly prohibited, and the excess length should be cut. The skin shall be complete, and the insulation resistance of the core wire to the ground (or metal isolation layer) shall meet the technical requirements of the cable.

6. The grounding wire shall be connected to the integrated grounding bar of the building. If it is impossible to connect to the integrated grounding bar of the building, the appropriate grounding point can be selected according to the integrated grounding situation of the indoor building. The selection of grounding point must be higher than the grounding grid, and the feeder grounding shall be towards the downward direction of the feeder, never upward.

7. The grounding electrode of the self-built grounding grid for the outdoor antenna of the tunnel must meet the design requirements. The buried depth of the grounding electrode and the welding quality of the flat iron meet the specification requirements. In principle, the buried depth of the grounding electrode shall not be less than 0.7 m (27.5 in). The non-self-built grounding network shall be connected to the grounding network of the owner.

8. The eNB grounding, power adapter grounding, distribution box grounding and feeder grounding must be connected to the grounding bar independently, and the grounding bar must have a path from the lead to the earth.

3.5 Maintenance Chamber Waterproofing

Once the installation is complete, you must close the maintenance chamber of the equipment and waterproof the chamber.

Put the Ethernet cable on the wire and seal the wire diameter 7 mm ± 1 mm (0.3 in ± 0. 04 in).

3.6 Power on to Check LED Status

After the Nova230i is powered on, check that the LED indicators are lighting as expected: Power is steady green, cell activated is slow flash green, and there are no alarms (Figure 3-12) per previous Table 2-3.

Figure 3-12: Check LEDs

3.7 Configure Basic Parameters

The initial basic configuration of the eNB covers the minimal parameters required for the eNB to connect to the backhaul and to the Baicells CloudCore. This section does not cover all the configuration options available through the eNB GUI.

3.7.1 Launch the eNB GUI

Follow the steps below to connect to the Nova230i GUI.

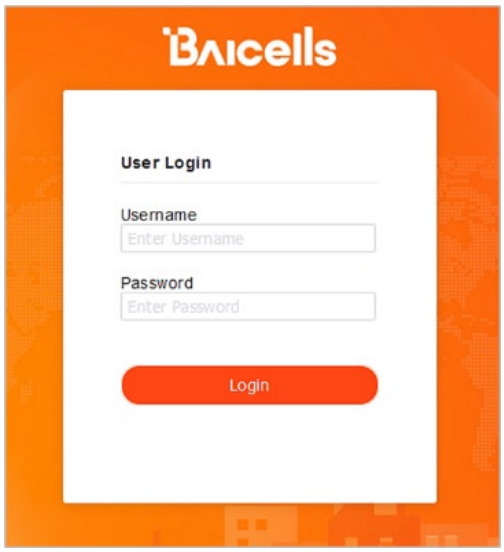
Step 1: Use an Ethernet cable to connect the eNB WAN/PoE+ port to the local network routed to the Internet. The DATA interface is set to Dynamic Host Configuration Protocol (DHCP) client by default.

Optionally, you can plug a Personal Computer (PC) directly into the eNB MGMT port. On your PC you will need to assign a static IP address within the Management (MGMT) subnet. The default IP address for the MGMT interface is *http://192.168.150.1/24*.

Step 2: Open a Web browser, and enter the following IP address: *http://192.168.150.1*.

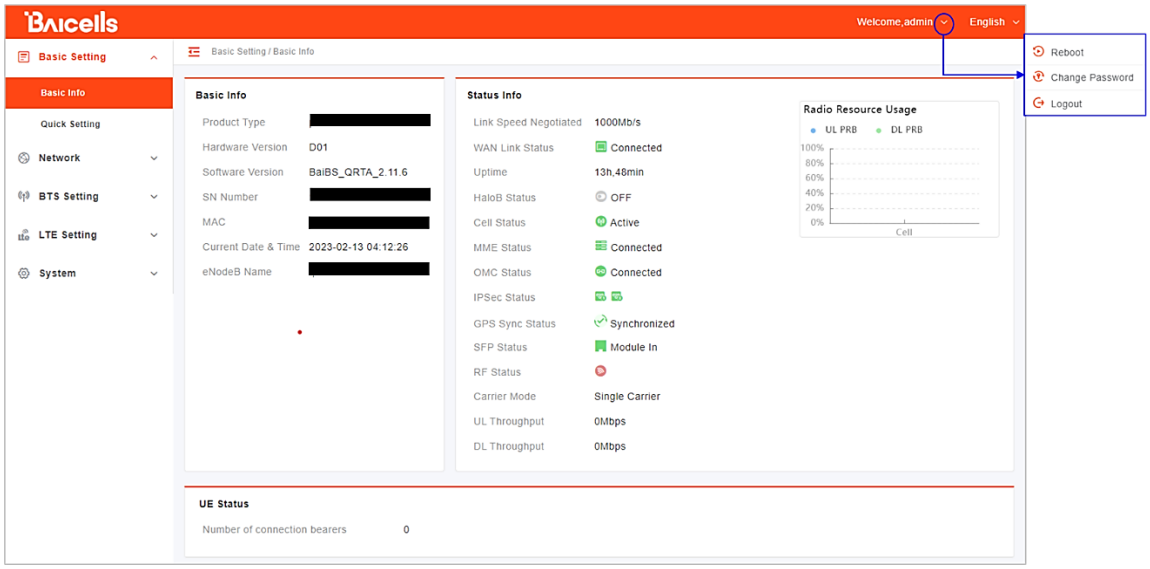
Step 3: At the login screen (Figure 3-13), enter the default user name (*admin*) and password (*admin*) and click on *Login* to open the home page.

Figure 3-13: GUI Login



The home page is the *Basic Setting > Basic Info* menu, which reports the current eNB status (Figure 3-14). In section 3.7.8, you will use this page to confirm that the eNB is active.

Figure 3-14: Home Page



Optionally, you may want to:

1. Change the login password.
2. Confirm the firmware version is the latest available from Baicells; upgrade if needed. Firmware upgrades can be found at Baicells.com > Support > *Firmware*. See *section 3.7.2* for detailed instructions regarding firmware upgrades.
3. Set the Network Timing Protocol (NTP).

For help, refer to the *CloudCore Configuration & Network Administration Guide*.

3.7.2 Upgrade Firmware

To ensure you are using the most recent software version before configuring the eNB, follow the steps below.

3.7.2.1 Upgrade Firmware from the eNB GUI

1. Download the most recent firmware file from Baicells.com > Support > *Firmware*, and save on local computer.
2. Go to *System* > *Upgrade*, and select whether to preserve the current settings.
3. Select *Choose File*, and navigate to the firmware file saved on local computer.

   NOTE: The file type is *.IMG.

4. Click *Upgrade*.
5. In the pop-up window click *PROCEED*.
6. The base station reboots after approximately three minutes.
7. On the *Basic Setting* > *Basic Info* page, the upgraded version is displayed in *Software Version.*

3.7.2.2 Upgrade Firmware from the OMC

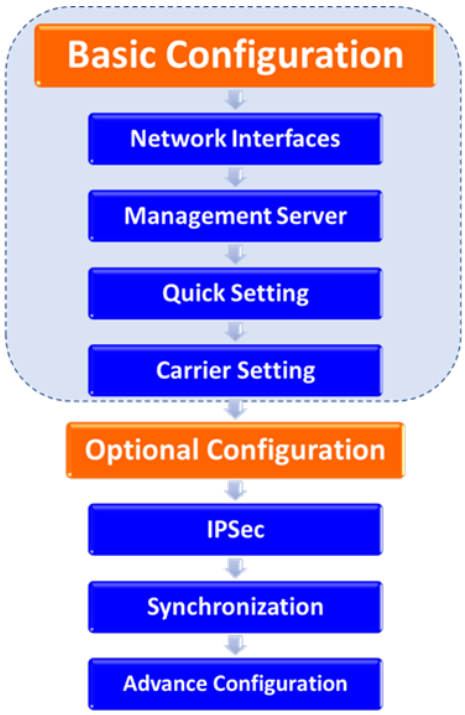
1. Go to *eNB > Upgrade > Upgrade&Rollback*.
2. Select the correct *Product Type* from the list.
3. Select the checkbox next to the eNB(s) you want to upgrade.
4. In the *New Task* window, select the *Upgrade Type*.
5. In the eNB section, select the checkbox(es) next to the eNB(s) you want to upgrade.
6. Next to *File List*, select/deselect *Retain Configuration*. Under *Select*, choose the software version by clicking in the empty cell (a blue checkmark gets displayed).
7. Choose the *Execute Type*, which determines when the upgrade will occur.
8. Select *OK*.

3.7.3 Basic Configuration Overview

Figure 3-15 indicates four main steps for basic configuration: network interfaces, management server address, quick settings pertaining to key LTE parameters, and the carrier setting.

NOTE: The carrier setting configuration does not apply to any of the Single Carrier (SC) eNBs including the Nova230i.

Figure 3-15: Configuration Flow



3.7.4 Configure Network Interfaces

The network interfaces defined as part of the initial, basic setup include the WAN/LAN/VLAN interfaces, DHCP and the Local Gateway (LGW) mode.

3.7.4.1 WAN/LAN/VLAN

Go to the *Network* > *WAN/LAN/VLAN* menu (Figure 3-16). The WAN interface is an external communication portal (Internet connection) between the eNB's Network Management System (NMS) – in most cases, the CloudCore OMC – and the MME If not using CloudCore, the eNB's NMS may be a Local OMC or the LTE NMS. The *WAN/LAN/VLAN* fields are described in Table 3-1.

If the *IP Access Mode* field is set to *DHCP* (Figure 3-16) and the LGW function is *ON* (*section 3.7.4.2*), the *Connect Type* field must be modified. The IP address of the eNB will be changed due to the Message Authentication Code (MAC) address being changed. Therefore, modify the router server at the same time.

The *LAN Config* interface is used only as a local maintenance port during initial eNB setup and basic configuration; it is not used during normal eNB operation. Enter the IP address and subnet mask address for the local network connection. The default IP address for the LAN interface is 255.255.255.0.

> NOTE: If the LAN IP address is changed, the eNB will reboot, and you will have to log in to the GUI again.

Figure 3-16: WAN/LAN/VLAN

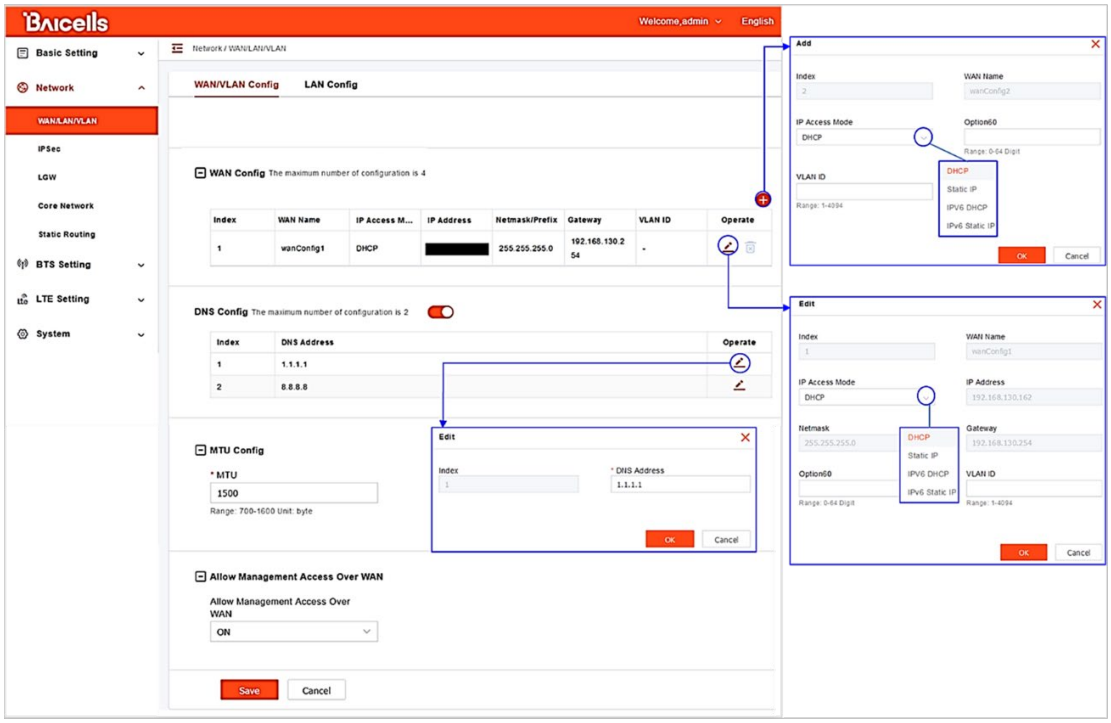


Table 3-1: WAN/LAN/VLAN

Field Name	Description
WAN/LAN Config Tab	
WAN Config Pane	
Index	The WAN index number, which is generated automatically. Four WAN interfaces are the maximum number the eNB supports.
WAN Name	The WAN Name is generated automatically.
IP Access Mode	Used to select the desired interface protocol to be used by the WAN interface: • DHCP: only the Option60 parameter needs to be configured if DHCP is the interface protocol selected. • Static IP • IPv6 DHCP • IPv6 Static IP
Option60	Used to differentiate between different terminals when *IP Access Mode* is set to *DHCP*. Range is 0–64 digits.
Netmask/Prefix	The IP address' subnet mask address. This parameter displays when *IP Access Mode* is set to *Static IP*. The IPv6 address' prefix for the WAN interface. This parameter displays when *IP Access Mode* is set to *IPv6 Static IP*. Range is 0–128
Gateway	The default gateway's IP address. This parameter displays when *IP Access Mode* is set to *Static IP*.
IP Address	The WAN interface's IP address. This parameter displays when *IP Access Mode* is set to *Static IP* or *IPv6 Static IP*.
VLAN ID	Used to configure more IP addresses for the WAN interface through the VLAN when there is a need to transmit multi-types of data through a separate channel. Range is 1–4094.
DNS Config Pane	
Index	The DNS index number, which is generated automatically.
DNS Address	The IP address assigned to the DNS. Up to two DNSes are supported.
MTU Config Pane	
MTU	Used to specify the size of the largest network layer protocol data unit that can be communicated in a single network transaction. Specifying the correct MTU for the network can help to improve data transmission efficiency. Range is 700 to 1600 bytes. The default value is 1500 bytes.

Field Name	Description
Allow Management Access Over WAN Pane	
Allow Management Access Over WAN	Used to enable/disable the Local Maintenance Terminal connection through the WAN port (*ON* or *OFF*) for management purposes. If set to *ON*, the administrator can maintain the eNB through the WAN interface.
LAN Config Tab	
LAN Config Pane	
IP Address	The LAN interface IP address. The default value is **192.168.150.1**.
Subnet Mask	Used to define the subnet mask address for the LAN interface. The default value is **255.255.255.0**.

3.7.4.2 LGW

The LGW setting must be configured when using the Baicells CloudCore EPC. Refer to Figure 3-17 and Table 3-2. You must reboot the eNB when you make changes to these settings.

Figure 3-17: LGW

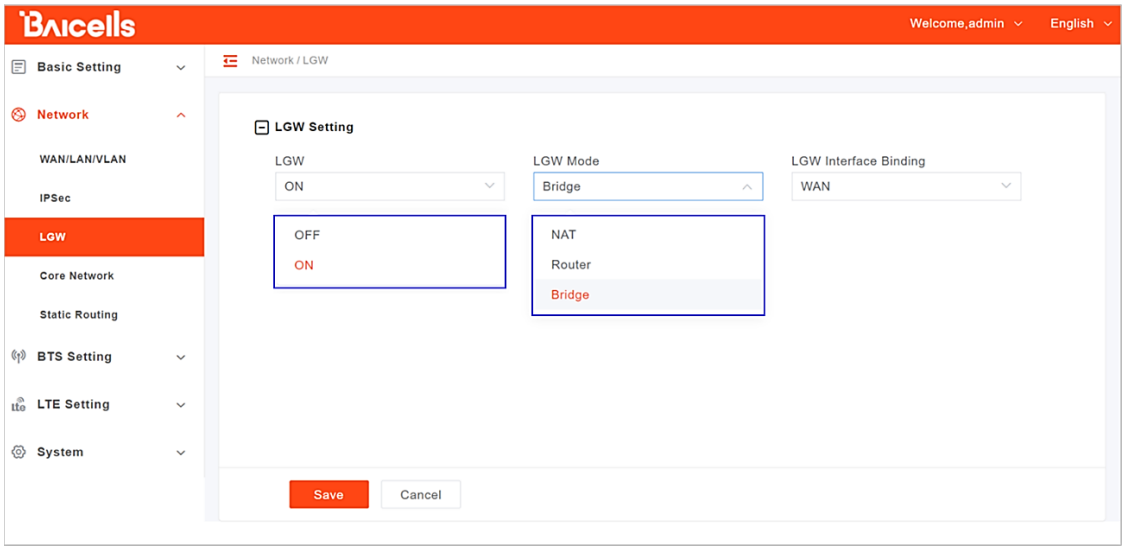


Table 3-2: LGW

Field Name	Description
LGW	On or Off
LGW Mode	Select an option: NAT: Packages from the internal network to the external network need Network Address Translation Router: Select optimized route from the routing table (Figure 3-18) Bridge: Transfer in the data link layer
LGW Interface Binding	The IP address connects to the LGW. Select from configured interfaces. Default is WAN interface. The VLAN interface can also be used to separate different links.

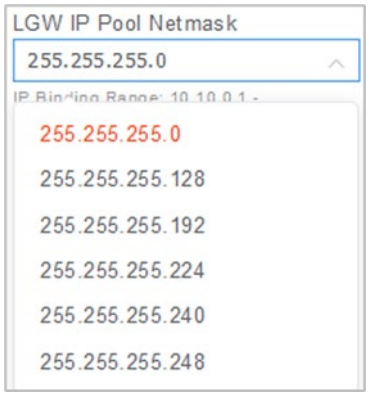
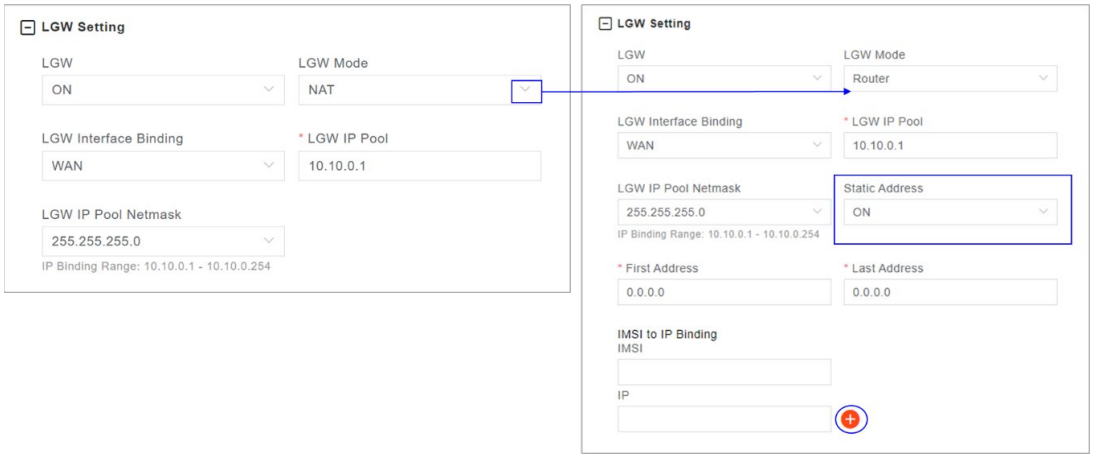
Field Name	Description
LGW IP Pool	Enter the starting IP address of the dynamic IP address pool
LGW IP Pool Netmask	For example, if the first IP address is 10.10.10.1 and the netmask is 255.255.255.0, the IP address pool includes 255 IP addresses. The options are shown in the drop-down menu: 
Static Address	If *LGW Mode = Router* (Figure 3-18), set to *ON* if you want to use a static IP address.
First Address	If *LGW Mode = Router* and *Static Address = ON* (Figure 3-18), enter the first static IP address in the range.
Last Address	If *LGW Mode = Router* and *Static Address = ON* (Figure 3-18), enter the last static IP address in the range.
IMSI to IP Binding - IMSI	If *LGW Mode = Router* and *Static Address = ON* (Figure 3-18), if you want to bind an IMSI number to the IP address, enter the IMSI number.
IMSI to IP Binding - IP	If *LGW Mode = Router* and *Static Address = ON* (Figure 3-18), enter the IP address to bind to the IMSI. You can add more than one IP address.

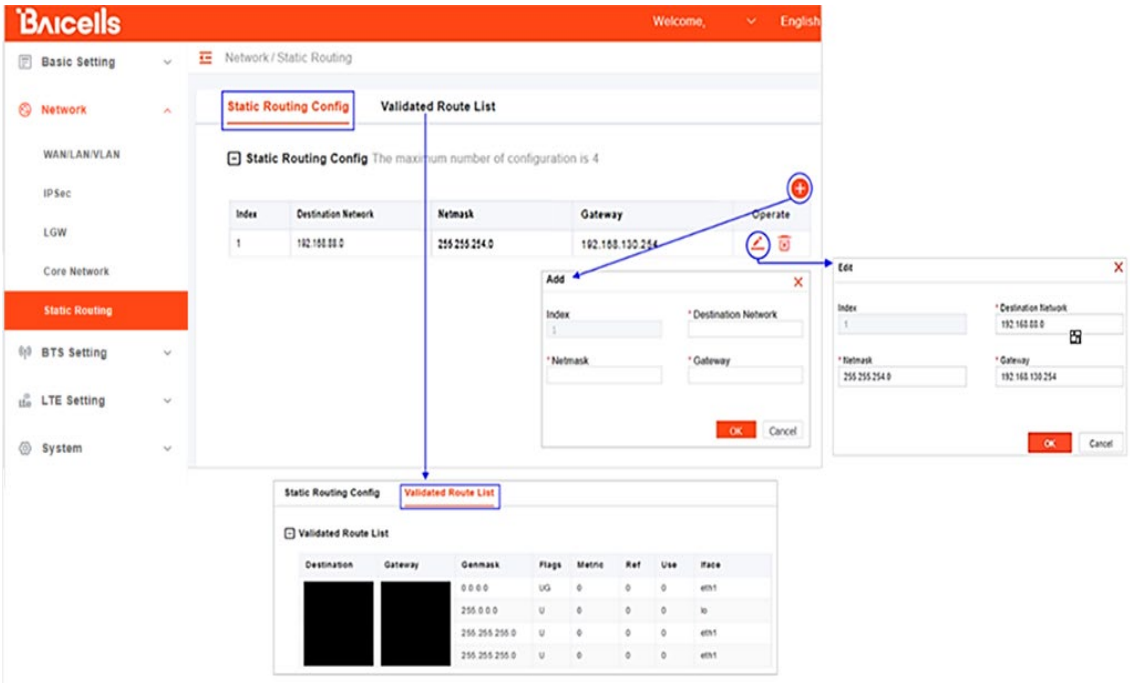
Figure 3-18: LGW = Router



3.7.4.3 Static Routing

When using static routing, go to *Network > Static Routing*. The *Network > Static Routing* landing page has two main sections, *Static Routing Config* and *Validated Route List* (Figure 3-19). The configured static route information is displayed under *Static Routing Config*. To edit a static route in the list, click on the ***Edit*** icon, enter the information, and click *OK*. To add a static route, click the ***Add*** icon. Fill in the information and click *OK*. Field descriptions are in Table 3-3.

Figure 3-19: Static Routing



NOTE: For each field description, refer to the *CAT4 CPE Configuration Guide* and *CAT6/CAT15 Configuration Guide*.

Table 3-3: Static Routing

Field Name	Description
Index	Auto-generated router index number
Enable	Enable/Disable the static route
Destination Network	The destination IP address
Netmask	The destination subnet mask

3.7.5 Configure the Management Server

In the *BTS Setting > Management Server* window, you will enter the network management service (NMS) information (Figure 3-20). When using the Baicells CloudCore to manage the network, in the *http://* field, enter the following URL address and port number:

http://baiomc.cloudapp.net:8443/smallcell/AcsService

If you are using Local OMC or another NMS, enter its server address and port number. Refer to the field descriptions in Table 3-4.

Figure 3-20: Management Server

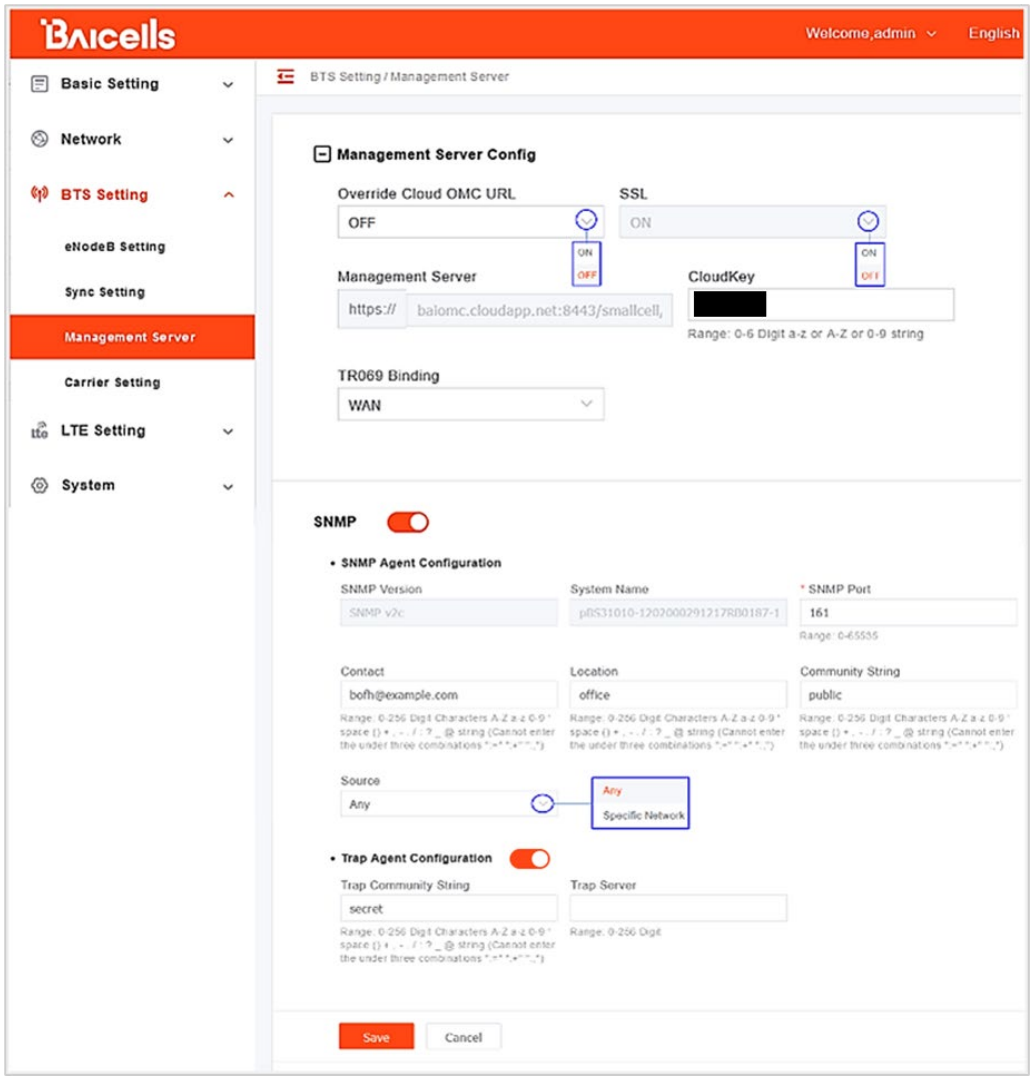


Table 3-4: Management Server

Field Name	Description
Management Server Config	
Override Cloud OMC URL	Select *ON* or *OFF*. Selecting *ON* allows you to configure the URL and port number in the *Management Server* field in the *Management Server Config* pane of the *BTS Setting > Management Server* sub-menu. NOTE: This field only displays when the eNB operating mode is set to Cloud EPC in the *Network > Core Network* menu.
SSL	Optional: The SSL connection adds enhanced security when it is turned on.
Management Server	The management server's IP address.
CloudKey	The NMS assigns this unique identifier for each operator. Range is 0–6 characters (using upper-case letters A–Z, lower-case letters a–z, and digits 0–9).

Field Name	Description
TR069 Binding	The interface binding with TR069 protocol. Default is WAN.
SNMP Agent Configuration	
SNMP Version	The current supported SNMP version, which is generated automatically and is SNMP v2c.
System Name	The community name, which is generated automatically.
SNMP Port	The SNMP protocol port used. Range is 0–65535.
Contact	The contact email. Range is 0–256 characters (using upper-case letters A–Z, lower-case letters a–z, and digits 0–9). ‘ space ( ) + , - . / : ? _ @ string Cannot enter the following three combinations ":=" ":+" and ":,"
Location	The system’s location. Range is 0–256 characters (using upper-case letters A–Z, lower-case letters a–z, and digits 0–9). ‘ space ( ) + , - . / : ? _ @ string Cannot enter the following three combinations “:=" “:+” and “:,”.
Community String	Used to define a community. Default is *public*. Range is 0–256 characters (using upper-case letters A–Z, lower-case letters a–z, and digits 0–9). ‘ space ( ) + , - . / : ? _ @ string Cannot enter the following three combinations “:=" “:+” and “:,”.
Source	The source address of acquiring information. Default is Any.
Trap Agent Configuration	
Trap Community String	Used to define a community. Default is *secret*. Range is 0–256 characters (using upper-case letters A–Z, lower-case letters a–z, and digits 0–9). ‘ space ( ) + , - . / : ? _ @ string Cannot enter the following three combinations “:=" “:+” and “:,”.
Trap Server	The IP address for the host. Range is 0–256 characters.

3.7.6 Configure Quick Settings

Under the *Basic Setting > Quick Setting* window (Figure 3-21) are several important fields you must configure and/or verify. First, if the operator is using the Baicells CloudCore EPC, you must enter a fixed Public Land Mobile Network (PLMN) and MME IP address:

- PLMN = **314030**
- MME IP = **10.3.0.9 and 10.5.0.9**

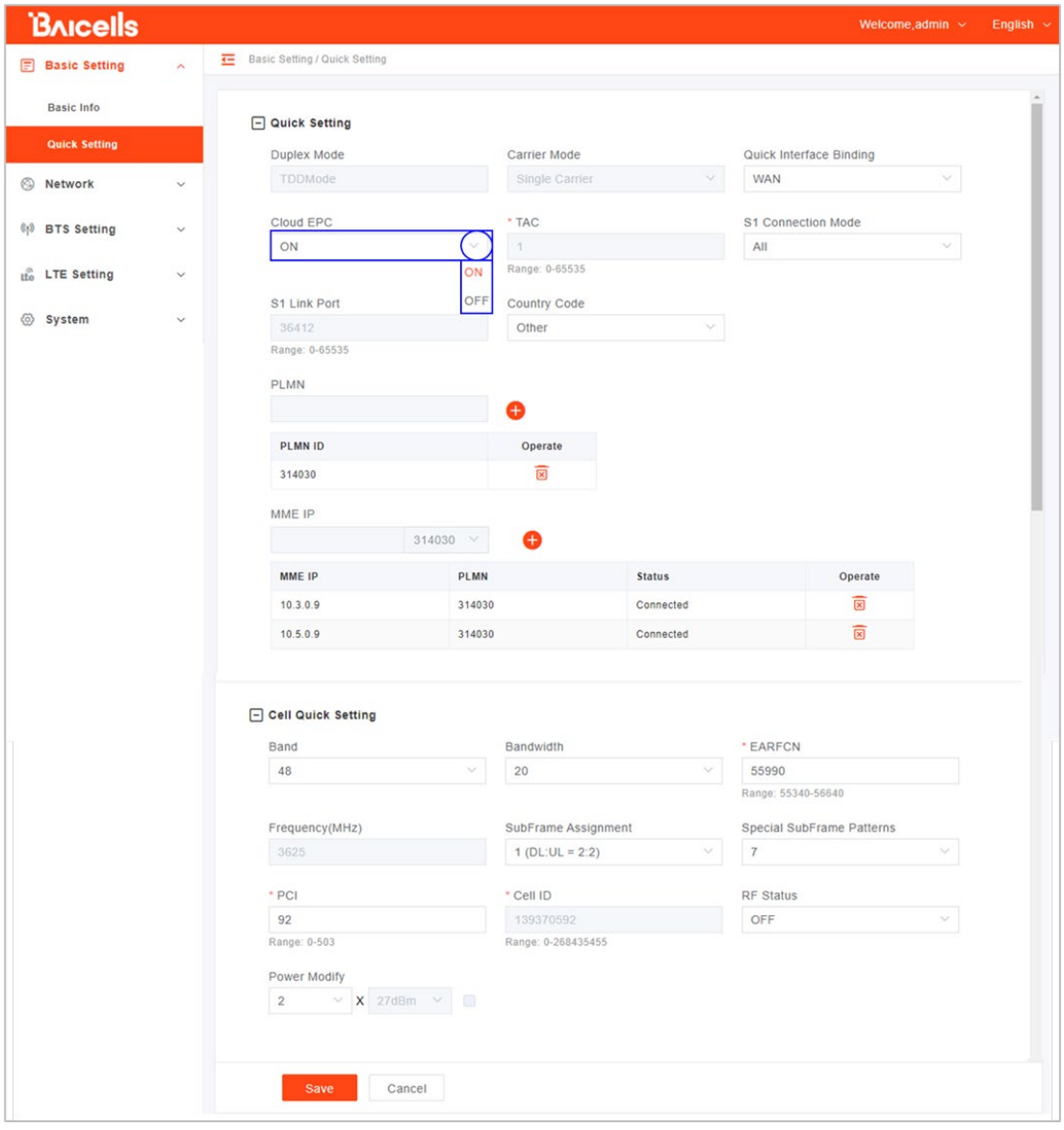
Do not change these settings except when connecting to a Local (private network) EPC or different vendor’s EPC. Second, you must enter the operator’s planned settings for Band, Bandwidth, EARFCN, Cell ID, PCI, TAC, etc. Some *Quick Setting* fields such as *Duplex Mode* and *Frequency* will auto-fill based on the eNB hardware model. Make sure the *Cloud EPC* field is set to *ON* when using the Baicells CloudCore. If you are testing the eNB in a lab environment, turn the power down as low as it will go under the *Power Modify* field.

NOTE 1: If planning to use CBRS SAS, the SAS vendor determines some of these parameters. Refer to the *SAS Deployment Guide* for more information.

NOTE 2: Nova230i does not support SFA = 0.

NOTE 3: Cloud EPC mode is enabled using the *Network > Core Network* menu.

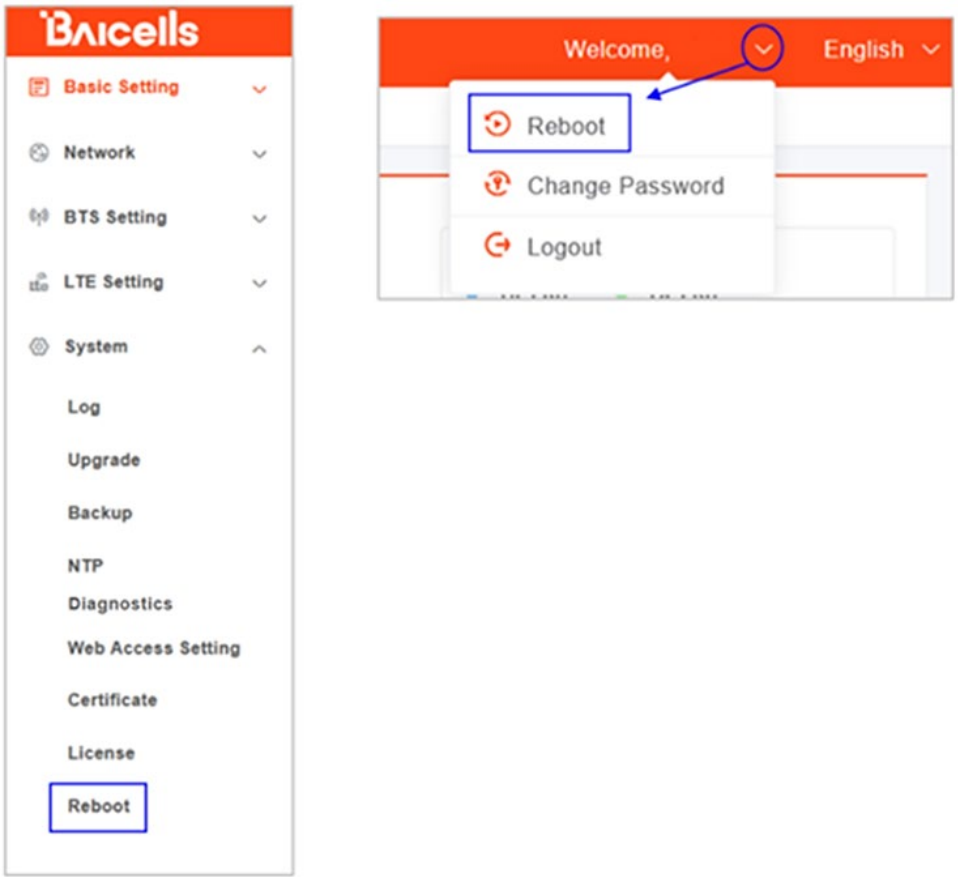
Figure 3-21: Quick Setting



3.7.7 Reboot

Once the basic configuration settings are saved, reboot the eNB. There are two options for rebooting in the eNB GUI. From the landing page of the eNB GUI, navigate to *System > Reboot*, or select *Reboot* under the *Welcome* banner (Figure 3-22).

Figure 3-22: Reboot



3.7.8 Verify eNB Operational Status

When the eNB is finished rebooting, check the eNB status using the eNB GUI and the OMC. Once the eNB is mounted at its intended destination and powered on, recheck the status settings.

eNB GUI: Go to *Basic Setting > Basic Info* and check the *Cell Status* field (Figure 3-23). It should show *Active*. Also, check that *GPS Sync* is reported as *GPS Sync Status.*

- **OMC:** Go to *eNB > Monitor* to see if the *Cell Status* shows *Active* and the *Sync Status* shows *GPS Synchronized* (Figure 3-24).

NOTE: Ensure you have selected ALL in the display settings window in the *OMC > eNB > Monitor* page to view *Cell Status* (Figure 3-24) and *Sync Status* (Figure 3-25).

Figure 3-23: Cell Status (eNB GUI)

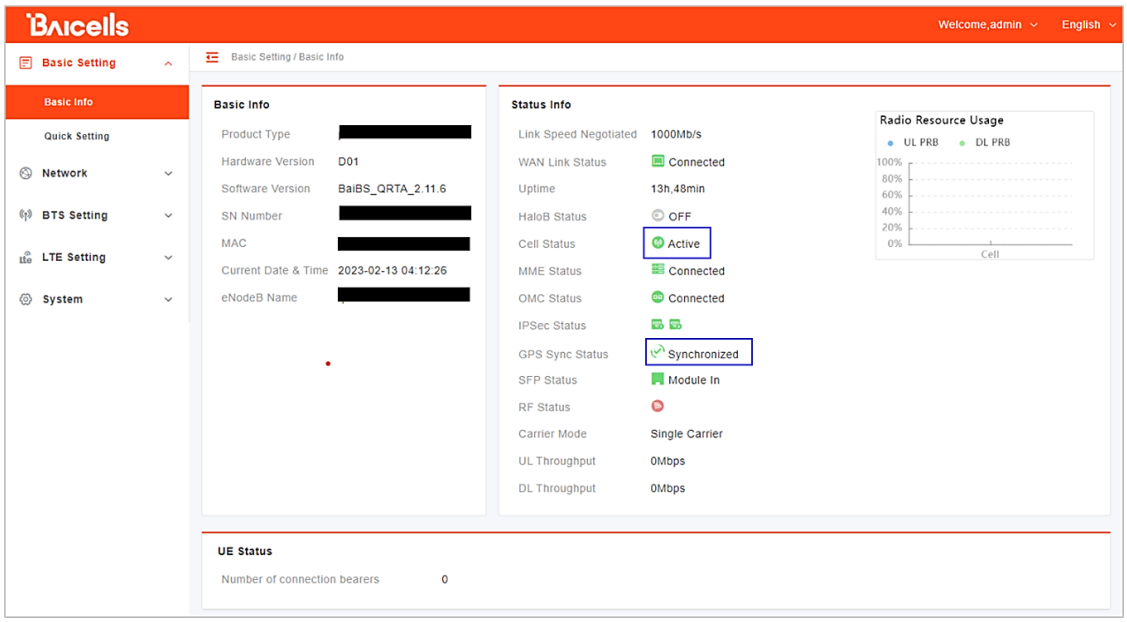
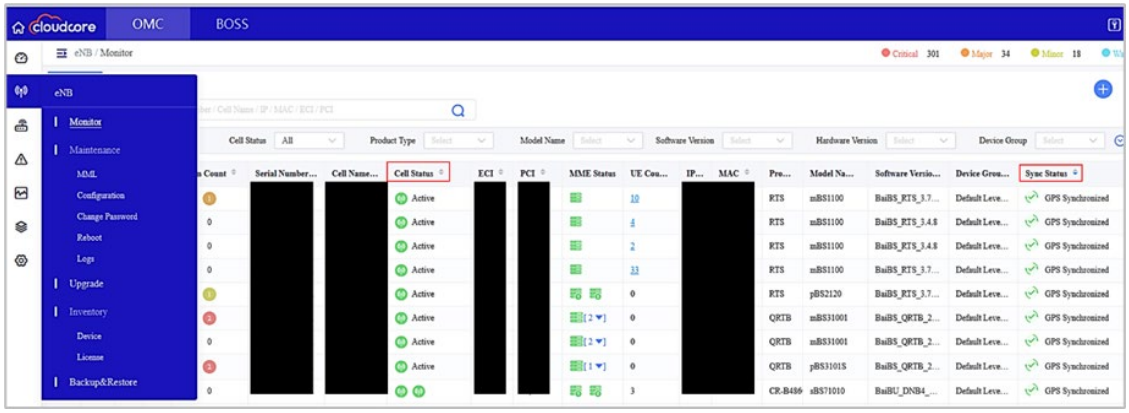
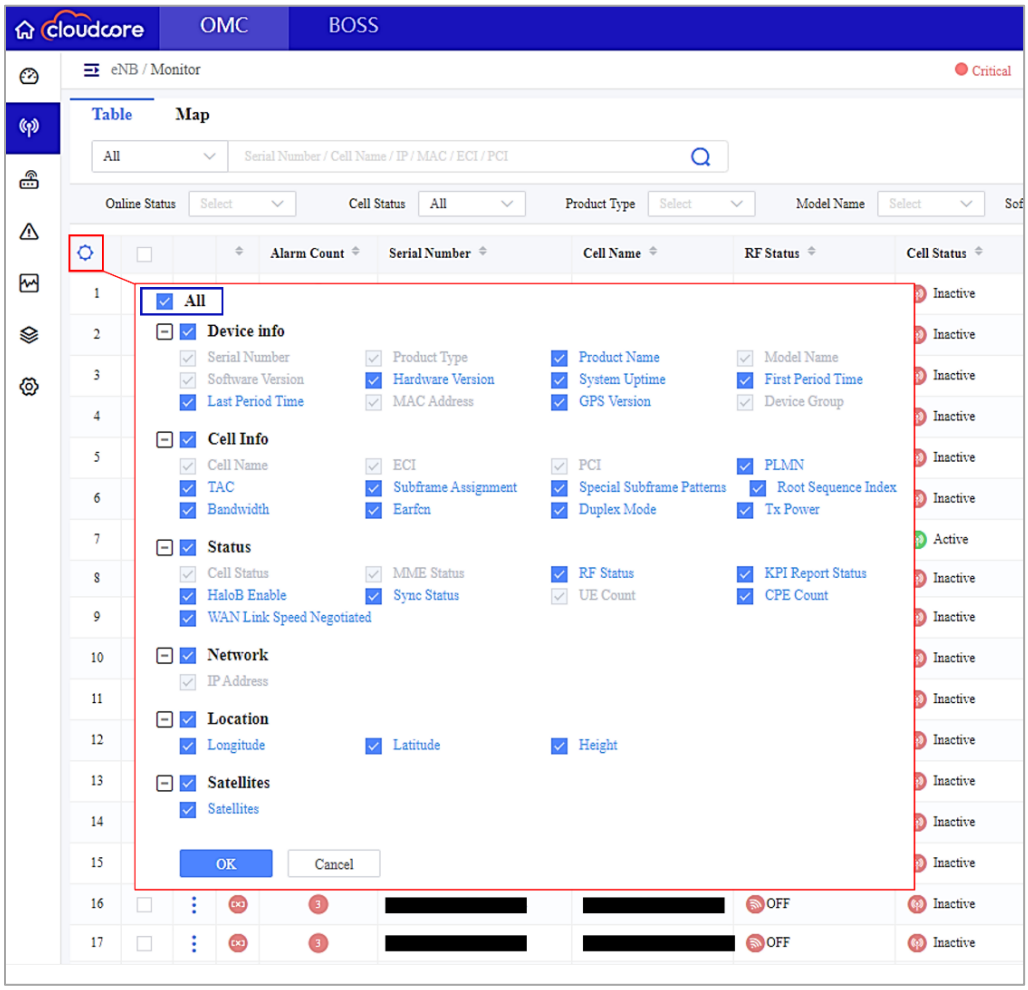


Figure 3-24: Cell Status (OMC)



NOTE: This image is captured by applying filters to show Cell Status and Sync Status.

Figure 3-25: OMC > eNB > Monitor > Display Settings



Before commercial operation, Baicells recommends implementing cell site acceptance testing of a new site to ensure the service meets expectations, to document network speeds at various locations in the cell, and to verify RF coverage.

Appendix: Regulatory Compliance

FCC Compliance

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

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

WARNING: This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 inches (50 cm) between the radiator and your body.

ISEDC Compliance

This device complies with Innovation, Science, and Economic Development Canada license-exempt RSS standard(s).

Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) This device must accept any interference, including interference that may cause undesired operation of the device.

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 inches (50 cm) from all persons and must not be collocated or operating in conjunction with any other antenna or transmitter, End-Users must be provided with transmitter operation conditions for satisfying RF exposure compliance.