Nova436Q Outdoor 4x1W Two-Carrier TDD eNodeB

Installation Guide

BaiBS_QRTB_2.6.2

November 2021

Version 1.15

About This Document

This document is intended for personnel who will be installing the Baicells Nova436Q Outdoor 4x1W Two-Carrier Time Division Duplexing (TDD) 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_QRTB_2.6.2.

Terms used in this document or related to 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	Author/Editor
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Support

- **Documentation** - Baicells product data sheets, 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

Baicells Technologies Co., Ltd. China	Baicells Technologies North America, Inc. North America
Address: 3F, Bldg. A, No. 1 Kai Tuo Rd, Haidian Dist, Beijing, China	Address: 5700 Tennyson Pkwy, #300, Plano, TX 75024, USA
Phone: +86-10-62607100	Phone: +1-888-502-5585
E-mail: *contact@Baicells.com*	E-mail: *sales_na@Baicells.com* or *support_na@Baicells.com*
Website: *www.Baicells.com*	Website: *https://na.Baicells.com*

Safety Information

For the safety of installation personnel and for 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

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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 Nova436Q is an outdoor 4x1W two-carrier eNodeB (eNB) that enables wired and wireless broadband access to Long-Term Evolution (LTE) Time Division Duplexing (TDD) backbone networks. The eNB makes use of the current LTE transmission resources to reduce the operator's investment in providing low-cost, enhanced Internet coverage.

As a two-carrier eNB, the Nova436Q hardware unit contains two separate eNBs inside one shell. Having two carriers provides versatile options in how you operate the eNB. The available operating modes are described in the next section, *Features*.

The 436Q's primary cell (Pcell) is referred to as Cell 1. The secondary cell (Scell) is referred to as Cell 2. It has 4 antenna ports and supports either one 4-port or two 2-port RF antenna installations. Each eNB comes pre-configured to simplify the installation. Baicells provides operators with local and Web-based Graphical User Interface (GUI) software applications to configure and manage individual eNBs and Customer Premise Equipment (CPE).

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

In this document you will find a general description, guidelines, and procedures for installing, entering basic configuration information, and verifying the operational status of the Nova436Q eNB (Figure 1-1).

Figure 1-1: Nova436Q eNB

1.2 Features

The two-carrier Nova436Q eNB is capable of operating in one of several modes:

- Single Carrier (SC)
- Carrier Aggregation (CA) mode (based on software license)
- Dual Carrier (DC)/split mode (based on software license)
- HaloB mode (embedded in the base software)
- Citizens Broadband Radio System (CBRS) Spectrum Access System (SAS)

SC describes a scenario where the operator wishes to use only one of the two available cells in the eNB. This may be necessary for operators who have limited licensed spectrum or who are planning to use the second carrier later as their network grows. In SC mode, only the primary cell (Pcell), *aka* Cell 1, is used.

CA provides the ability to aggregate channels from across the full CBRS range, even channels that are not adjacent. Using CA essentially doubles the downlink capacity when all users have Cat6/7 or later CPE.

DC (split sector) mode enables the operator to run the 436Q as two independent carriers for split sector coverage.

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.

CBRS SAS is a multi-vendor Spectrum Access System 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 Nova436Q, 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 covers only basic configuration of a single cell for the purpose of verifying that the eNB unit is operational during the process of installation. More detailed configuration guides are available on the Baicells website: Baicells.com > Resources > *Documents*:

- CloudCore Configuration & Network Administration Guide (OMC/BOSS)
- CPE Configuration Guide
- eNB Configuration Guide
- Carrier Aggregation & Dual Carrier (Split Mode) Configuration Guide
- HaloB User Guide
- SAS Deployment Guide

In addition to the 436Q eNB's two carriers and multiple operating modes, following is a list of other key features. The Nova436Q datasheet providing technical specifications is kept up-to-date on the *Baicells website*.

- Supports standard LTE TDD band 48 and partial bands 42, 43 (3550 – 3700 MHz)
- Complies with 3GPP Release 13 standards
- Supports 5/10/15/20 MHz bandwidth per carrier
- Provides excellent Non-Line-of-Sight (NLOS) coverage
- Has an aggregate peak rate: (up to) DL 220 Mbps, UL 28 Mbps @ 2x20 MHz spectrum using all Cat6/7 or higher CPEs
- Supports 96 concurrent users per carrier [x2 carriers (96+96) if operating in DC mode]
- 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
- Acts as a plug-and-play device with Self-Organizing Network (SON) capabilities
- Can be used for IoT with all mainstream Evolved Packet Core (EPC) vendors
- Ensures secure protection against illegal intrusion
- Supports one 4-port antenna or two 2-port antennas
- Integrated small cell form-factor for quick and easy installation
- Configured out of the box to work with Baicells CloudCore
- Embedded HaloB ("lite" EPC) solution
- Supports Citizens Broadband Radio Service (CBRS) with dual carrier

2 Installation Preparation

2.1 Materials

Check the Nova436Q package to ensure it contains everything on the packing list enclosed with the product. In addition to industry-standard tools, you will need the materials described in Table 2-1 during the installation.

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
RF antenna cable	50-ohm feeder
RF antenna	Omni or directional
Optical fiber	Single-mode optical fiber
Ethernet cable	Outdoor Cat6, shorter than 330 feet (100 meters)
Ground cable	5 AWG (16 mm²) diameter yellow-green wire

2.2 LEDs & Interfaces

Figure 2-1, Table 2-2, and Table 2-3 explain the eNB's LED status indicators and interfaces.

Figure 2-1: LEDs & Interfaces

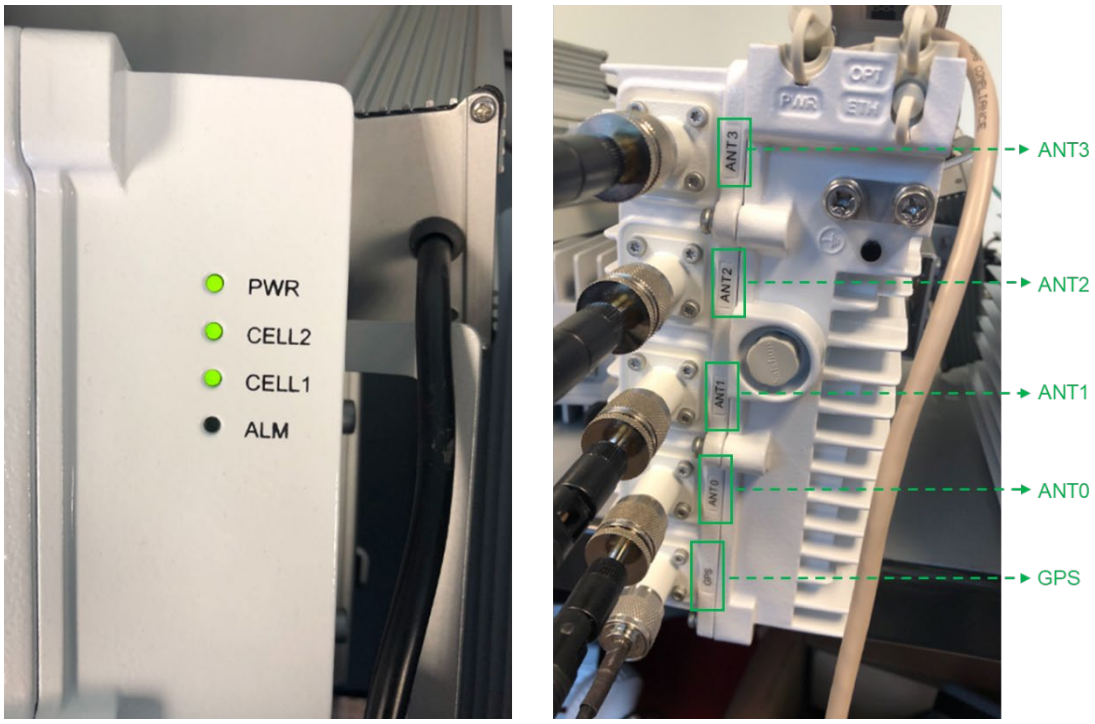


Table 2-2: LEDs

LED	Color	Status	Description
PWR	Green	Steady on	Power is on
		OFF	No power supply
CELL2	Green	Fast flash: 0.125 s on, 0.125 s off	CELL 2 inactivated
		Slow flash: 1 s on, 1 s off	CELL 2 activated
CELL1	Green	Fast flash: 0.125 s on, 0.125 s off	CELL 1 inactivated
		Slow flash: 1 s on, 1 s off	CELL 1 activated
ALM	Red	Steady on	Hardware (e.g., VSWR) alarm
		OFF	No alarm

Table 2-3: Interfaces

Interface	Description
PWR	Power supply: +48 V (+42 V to +60 V) DC
OPT	Optical backhaul interface to connect to the external transmission network
ETH	RJ-45 interface, used for debugging or data backhaul
GPS	Port for optional external GPS antenna, N-female connector
ANT	Port for external RF antenna, N-female connector

2.3 Location & Environment

In addition to network planning, when determining where to place the eNB you need to consider factors such as climate, hydrology, geology, the possibility of earthquakes, reliable electric power, and transportation access. Avoid locating the eNB in areas where there may be 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.

2.4 Grounding & Lightning Protection

You must protect the eNB, antenna, and GPS against lightning. All Nova eNBs have a floating ground on the power system. Following are guidelines concerning grounding.

- The yellow-green ground wire must be at least 5 AWG (16 mm^2) diameter.
- In principle, always place the grounding as near as possible to the equipment.
- Connect to a reliable outdoor grounding point (earth) using one ground screw.
- The connection of the grounding points and ground bar needs to be tight and reliable. Rustproofing the terminals, e.g., with anti-oxidant coating or grease, is required.

2.5 Weatherproofing

To protect the connection points from weather and climate, clean each connection point before installing cold shrink tubes, per the following (Figure 2-2).

1. Insert the cable into the cold shrink tube.
2. Tighten the connector.
3. Push the cold shrink tube to the top joint, and pull out the strip.
4. Ensure the cold shrink tube is tightly fitted with the connection.

Figure 2-2: Weatherproofing

2.6 CloudCore Account

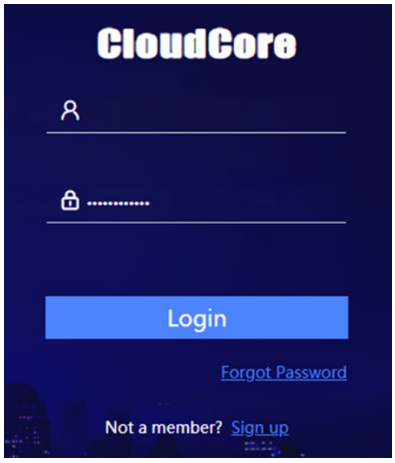
The Baicells CloudCore includes the Evolved Packet Core (EPC), managed by Baicells, and two operator applications, Operations Management Console (OMC) to manage network elements and Business & Operations Support System (BOSS) to manage subscribers. If you have not already set up a Baicells CloudCore account, follow the steps below.

Step 1: Open a web browser, and enter the CloudCore address (Figure 2-3): *https://cloudcore.cloudapp.net/cloudcore/*

Step 2: Click on the *Sign up* button.

Step 3: 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.

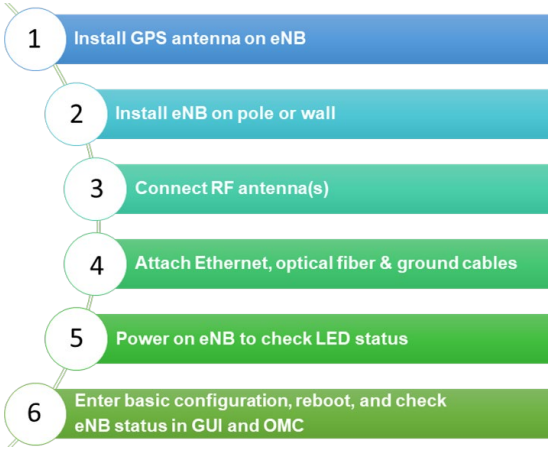
Enter your login user name (email address) and password to authenticate.

3 Installation

3.1 Process Overview

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

Figure 3-1: Installation Process



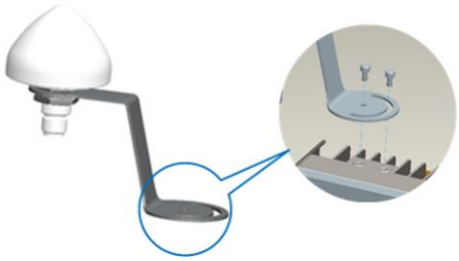
3.2 Install GPS Antenna

Read the following GPS antenna installation requirements before installing it on the eNB.

- No major blocking from buildings in the vicinity. Make sure the space atop is at least 45 degrees unblocked by any buildings.
- Avoid installing the GPS antenna in the vicinity of any other transmitting and receiving devices, to avoid interference.
- The GPS antenna should be installed within 45 degrees to the lightning rod.

The GPS antenna system is assembled in manufacturing before packing. The only installation step is to fix the GPS mounting bracket on the eNB with the M4*14 screws (Figure 3-2).

Figure 3-2: GPS Antenna Installation



3.3 Install eNB on Pole or Wall

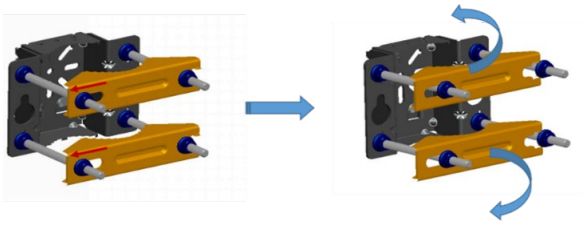
3.3.1 Install on Pole

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 1.6-3.9 in (40-100 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 eNB on a pole.

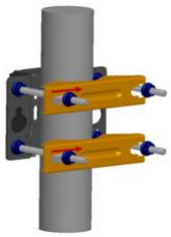
1. Unscrew the four screws of the assembled bracket. Slide the two omega clamps to the left, and then turn them up or down (Figure 3-3).

   Figure 3-3: Omega Clamps



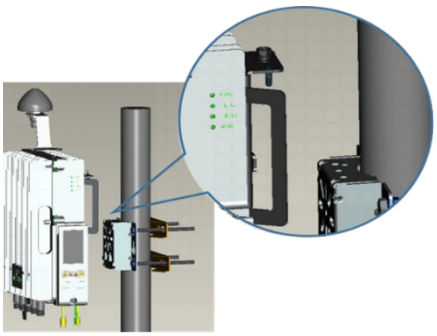
2. Attach the bracket to the pole, considering the height requirements described above. Fit the threaded rod of the bracket to the pole, and then turn the two clamps to the proper position as shown in Figure 3-4. Fasten with the four screws.

Figure 3-4: Attach Bracket to Pole



3. Using the two pins on the bracket on the back of the eNB, attach the eNB to the mounting bracket on the pole. Push the eNB until the hook is firmly attached to the mounting bracket (Figure 3-5).

Figure 3-5: Attach eNB to Bracket



4. Tighten the two screws on the top of the bracket using a cross screwdriver to complete the installation (Figure 3-6).

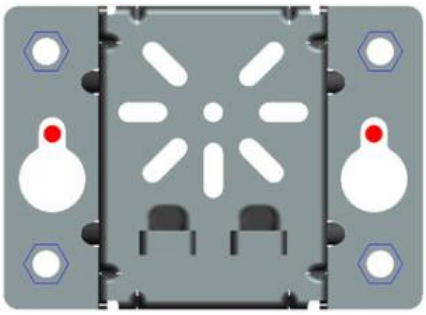
Figure 3-6: Completed Attachment

3.3.2 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 Nova436Q eNB on the wall.

1. Take apart the assembled installation bracket.
2. Fit the installation bracket on the wall, as shown in Figure 3-7. Mark the drilling locations using a pencil or marker.

Figure 3-7: Mark Drilling Locations



3. Drill two 0.4 in/10 mm diameter by 2.8 in/70 mm deep holes in the wall at the marked locations.
4. Check the up/down direction of the installation rack, and then attach to the wall using M8*80 expansion screws.
5. Fix the eNB to the bracket, and tighten the screws on the top of the bracket using a cross screwdriver.

3.4 Connect Cables

3.4.1 Cable Laying Requirements

General requirements:

- Bending radius of antenna feeder cable: 7/8” > 9.84 in (250 mm),
  4/5” > 14.96 in (380 mm)
- Bending radius of jumper cable: 1/4” > 1.38 in (35 mm),
  1/2” (super soft) > 1.97 in (50 mm), 1/2” (ordinary) > 5 in (127 mm)
- Bending radius of power cable and grounding cable: > triple the diameter of the cable
- The minimum bend radius of the optical fiber is 20 times the diameter of the optical fiber.
- Bind the cables according the type of the cable; intertwining and crossing are forbidden.
- An identification label should be attached after the cable is laid.

Optical fiber cable requirement:

- Avoid circling and twisting during the laying.
- Avoid binding on a turn.
- Avoid pulling and weighing down the optical fiber.
- The redundant optical fiber must enwind the dedicated device.

Grounding cable requirement:

- 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.

3.4.2 Connect GPS Antenna Cable

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 RF power amplifier devices.

1. Insert the GPS jumper into a cold shrink tube.
2. Connect one end of the GPS jumper to the GPS antenna.
3. Push the cold shrink tube to the top joint, and pull out the strip.
4. Connect the other end of the GPS jumper to the GPS interface on the eNB, which also needs weatherproof protection.

3.4.3 Connect RF Cable(s)

1. Open the dust caps of the **ANT0**, **ANT1**, **ANT2**, and **ANT3** interfaces.
2. Insert the RF cables into cold shrink tubes.
3. Connect RF cables to the ANT0, ANT1, ANT2, and ANT3 interfaces on the eNB, and tighten them with a wrench to 12-15 in-lbs or 1.4-1.7 NM torque.

   NOTE: Antenna ports ANT0 and ANT1 connect to the primary cell (Pcell), or Cell 1. Antenna ports ANT2 and ANT3 connect to the secondary cell (Scell), or Cell 2.

4. Push the cold shrink tube to the top joint, and pull out the strip.
5. Connect the other end of the RF cables to the external antennas, which also need weatherproof protection.

3.4.4 Connect Optical Fiber

1. Unscrew the three screws on the cover of the eNB's wiring cavity using an M4 cross screwdriver. Open the wiring cavity.
2. Connect the optical fiber to optical (OPT) interface in the wiring cavity.
3. Lay the cable along the wire groove, and stretch it out of the wiring cavity.

3.4.5 Connect Ethernet Cable

1. Connect the Ethernet cable to the ETH interface in the wiring cavity.
2. Lay the Ethernet cable along the wire groove, and stretch it out of the wiring cavity.

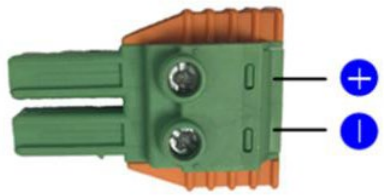
3.4.6 Connect Power Connector

Since the length of cable needed for power varies from site to site, the two ends of the power adaptor are bare terminal ends. You will need to make the power cable according to the actual measurements of the installation site, and assemble the power plug and power terminal on the two ends of the power adaptor.

Strip 0.47 in/12 mm insulating layer with a wire stripper. The power cord length should be kept below 330 ft/100 m. The connection steps for the power cable are as follows.

1. Assemble the power plug. The power plug will be installed on the end of the input direction. Refer to the labels on the power plug for connecting the live wire, neutral wire, and ground wire to the corresponding terminals separately, and tighten the screws.
2. Connect the output of the AC adaptor to the lightning protection box.
3. Assemble the power terminal. The power terminal will be installed on the end of the output direction. Refer to Figure 3-8 to connect the live wire and neutral wire.

Figure 3-8: Power Terminal



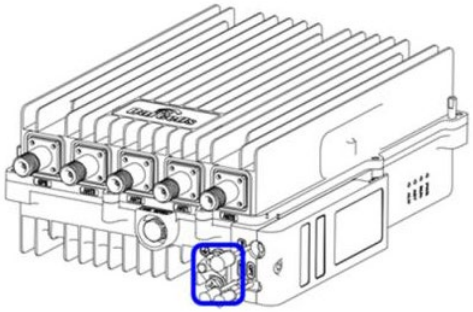
4. Connect the power cable to the PWR interface in the wiring cavity.
5. The power cable lays along the slot and stretches out of the wiring cavity.
6. The input of the power adaptor connects to the outlet.
   - If the outlet is indoors, place the power adaptor indoors.
   - If the outlet is outdoors, place the power adaptor in a waterproof box.
7. After the cable connection is complete in the wiring cavity, tighten the screws on the cover to close the wiring cavity using an M4 cross screwdriver.

3.4.7 Connect Ground Cable

Prepare the grounding cable according to the actual measurements and requirements of the specific installation site. The Nova436Q eNB has two grounding screws located on the bottom of the unit (Figure 3-9). Follow the steps below the figure to connect the ground cable.

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

Figure 3-9: Grounding Screws



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.

Before the eNB is installed at its final destination, perform the steps in sections 3.5 and 3.6. 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.

3.5 Power on to Check LED Status

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 RF power amplifier devices.

Power on the eNB, and check that the LED indicators are lighting as expected: Power is steady green, CELL1 and CELL2 are slow flash green, and there are no alarms (Figure 3-10) per previous Table 2-2.

Figure 3-10: Check LEDs

3.6 Configure Basic Parameters

Reference: *eNB Configuration Guide*

The Nova436Q eNB may be configured in Single Carrier (SC), Carrier Aggregation (CA), or Dual Carrier (DC)/split mode, depending on which licenses you have purchased, and/or in HaloB mode, which is embedded in the base software. The Nova436Q also supports CBRS SAS operation.

When first installing and testing the Nova436Q, Baicells recommends configuring the primary cell (Pcell)/Cell1 carrier settings (without enabling CA, DC, HaloB, or SAS) for simple verification that the new eNB unit is operational. Once it is confirmed to be operational, you can then refer to the appropriate configuration guide(s) for the operating mode you plan to use.

NOTE: For all GUI menus and fields, refer to the following documents on the Baicells website: Baicells.com > Resources > *Documents*.

- CloudCore Configuration & Network Administration Guide (OMC/BOSS)
- CPE Configuration Guide
- eNB Configuration Guide
- Carrier Aggregation & Dual Carrier (Split Mode) Configuration Guide
- HaloB User Guide
- SAS Deployment Guide

3.6.1 Launch the eNB GUI

Follow the steps below to connect to the GUI.

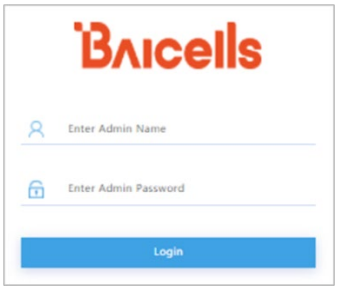
Step 1: Use an Ethernet cable to connect the eNB DATA port to the local network routed to the Internet. The DATA interface is set to DHCP client by default.

Optionally, you can plug a PC directly into the eNB MGMT port. On your PC you will need to assign a static IP address within the 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*

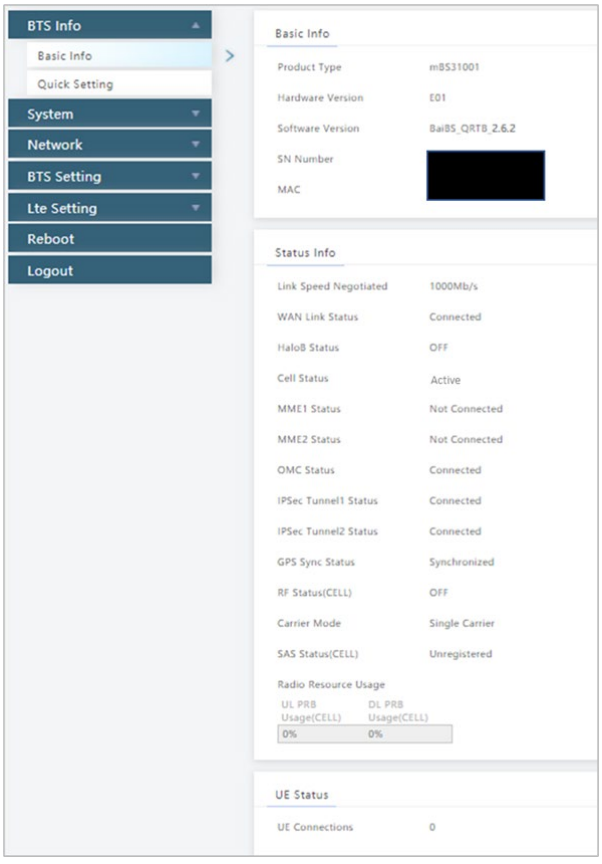
Step 3: At the login screen (Figure 3-11), enter the default user name (*admin*) and password (*admin*) and click on *Login* to open the home page.

Figure 3-11: GUI Login



The home page is the BTS Info > Basic Info menu, which reports the current eNB status (Figure 3-12). In section 3.6.7, you will use this page to confirm that the eNB is active.

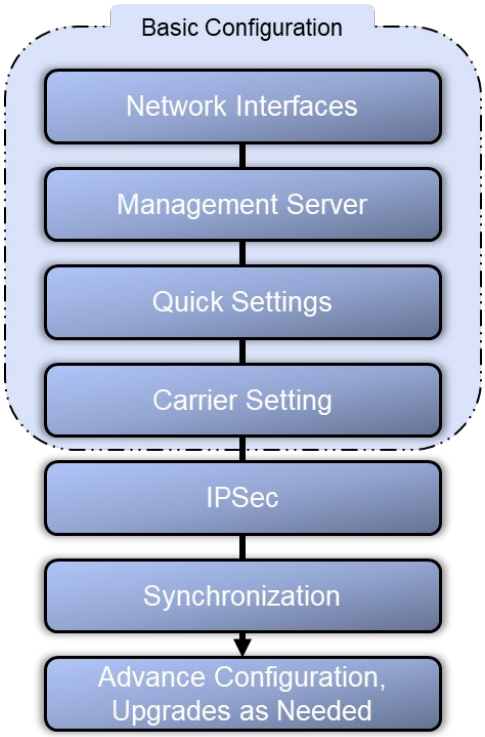
Figure 3-12: Home Page (Example is a lab Nova436Q)



3.6.2 Basic Configuration Overview

Figure 3-13 indicates four main steps for basic configuration: network interfaces, management server address, some quick settings pertaining to key LTE parameters, and the carrier setting.

Figure 3-13: Configuration Flow



3.6.3 Configure Network Interfaces

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

3.6.3.1 WAN/LAN

Go to the Network > WAN/LAN menu (Figure 3-14). 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 Mobility Management Entity (MME). If not using CloudCore, the eNB's NMS may be a Local OMC or the LTE NMS. All of the *Internet / WAN* fields are described in Table 3-1: Internet/WAN.

If the *Connect Via* field is set to *DHCP* and the LGW function is enabled (*section 3.6.3.2*), the *Connect Type* field must be modified. The IP address of the eNB will be changed due to the MAC address being changed. Therefore, modify the router server at the same time.

The *Local Network / LAN* 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 192.168.150.1.

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

Figure 3-14: WAN/LAN

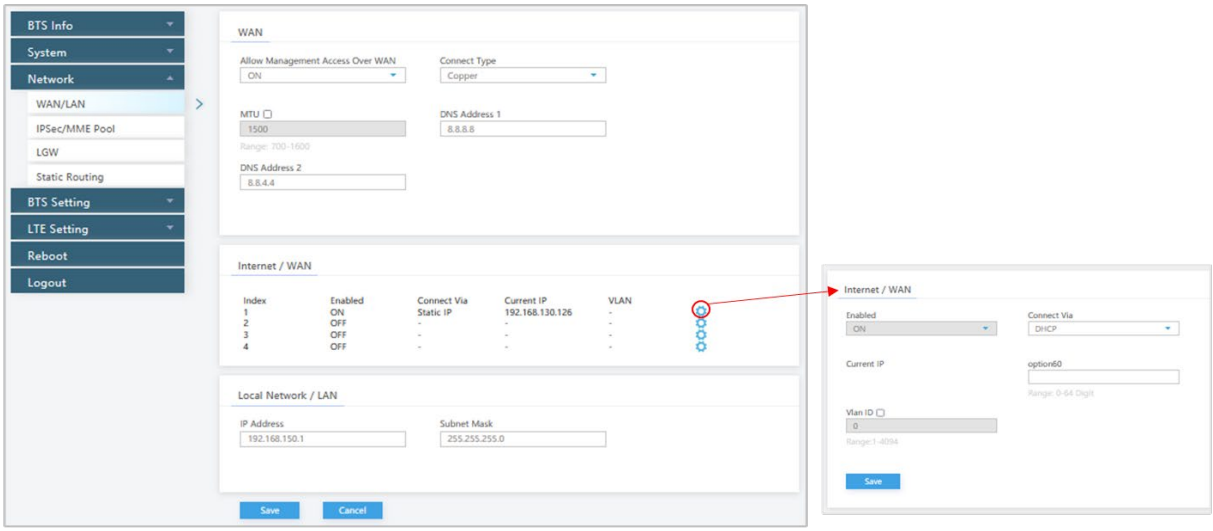


Table 3-1: WAN/LAN

Field Name	Description
Allow Management Access Over WAN	Enable or disable the Local Maintenance Terminal connection through the WAN port.
Connect Type	Used to select the type of connection for the eNB (Copper or Fiber)
MTU	Used to specify the size of the largest network layer protocol data unit that can be communicated in a single network transaction. Range is 500 to 1600.
DNS Address 1	Used to define the DNS 1 IP address
DNS Address 2	Used to define the DNS 2 IP address
Enabled	Used to enable the interface. Four IP addresses are the maximum number the eNB supports.
Connect Via	Used to select the desired interface protocol: DHCP, Static IP, IPv6 DHCP, or IPv6 Static IP
Current IP	The WAN interface IP address
Option60	Used to differentiate between different terminal when “Connect Via” is set to “DHCP”
Subnet Mask	Used to define subnet mask address if “Connect Via” is set to “Static IP”
Prefix	Prefix of IPv6 address for WAN interface if “Connect Via” is set to “IPv6 Static IP”
Gateway	Used to define gateway address if “Connect Via” is set to “Static IP”
Vlan ID	Used to configure more IP addresses for the WAN interface through the VLN when there is a need to transmit multi-types of data.

3.6.3.2 LGW

The Local GateWay (LGW) setting must be configured when using the Baicells CloudCore Evolved Packet Core (EPC). Refer to Figure 3-15 and Table 3-2. You must reboot the eNB when you make changes to these settings.

Figure 3-15: LGW

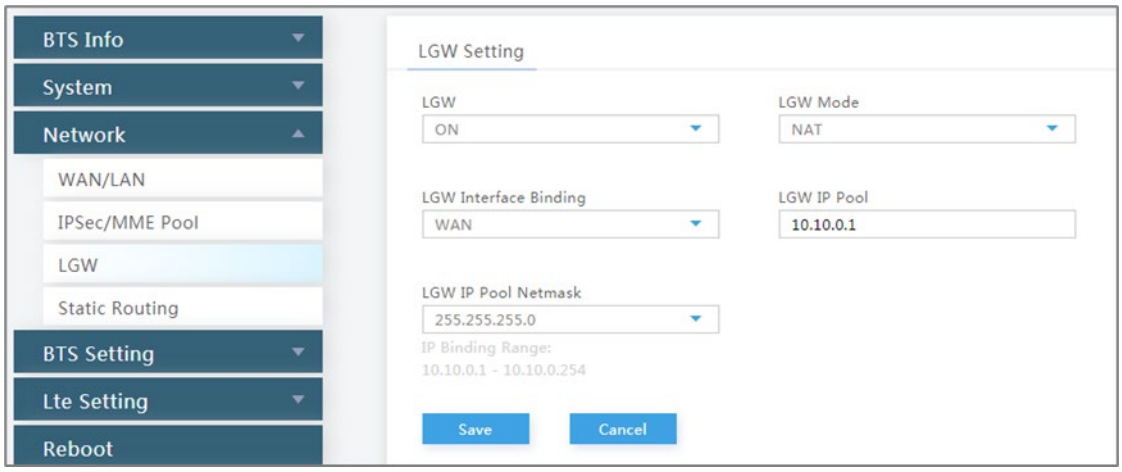


Table 3-2: LGW

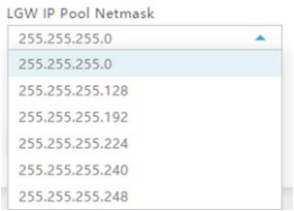
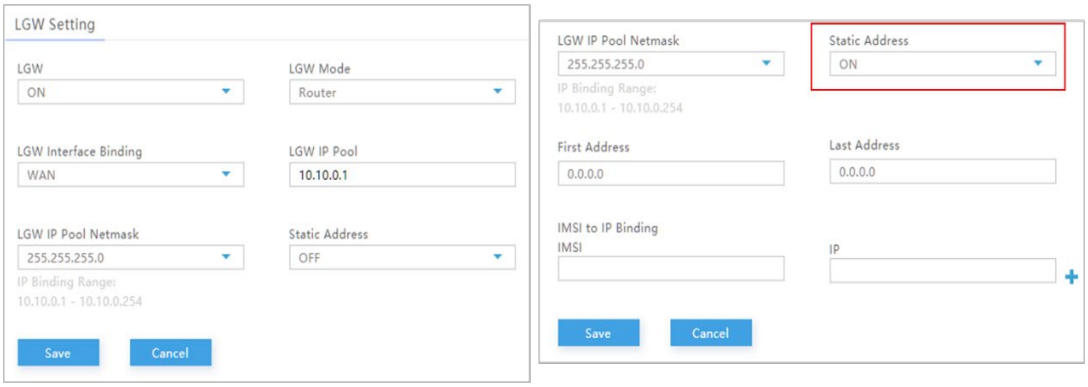
Field Name	Description
LGW	On or Off
LGW Mode	Select an option: NAT: Packages from the internal network to the external network need Network Address Translation Router: Select optimized route from the routing table (Figure 3-16) Bridge: Transfer in the data link layer
LGW Interface Binding	The IP address connects to the LGW. Select from configured interfaces. Default is WAN interface, the VLAN interface can also be used to separate different links.
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 pull-down menu: 
Static Address	If LGW Mode = Router (Figure 3-16), set to ON if you want to use a static IP address.
First Address	If LGW Mode = Router and Static Address = ON (Figure 3-16), enter the first static IP address in the range.
Last Address	If LGW Mode = Router and Static Address = ON (Figure 3-16), enter the first static IP address in the range.
IMSI to IP Binding - IMSI	If LGW Mode = Router and Static Address = ON (Figure 3-16), 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 3-16), enter the IP address to bind to the IMSI. You can add more than one IP address.

Figure 3-16 LGW = Router



3.6.3.3 Static Routing

When using static routing, go to Network > Static Routing to view the configured static route information (Figure 3-17). To edit or enable/disable a static route in the list, click on the icon, enter the information, and save. Field descriptions are in Table 3-3.

Figure 3-17: Static Routing

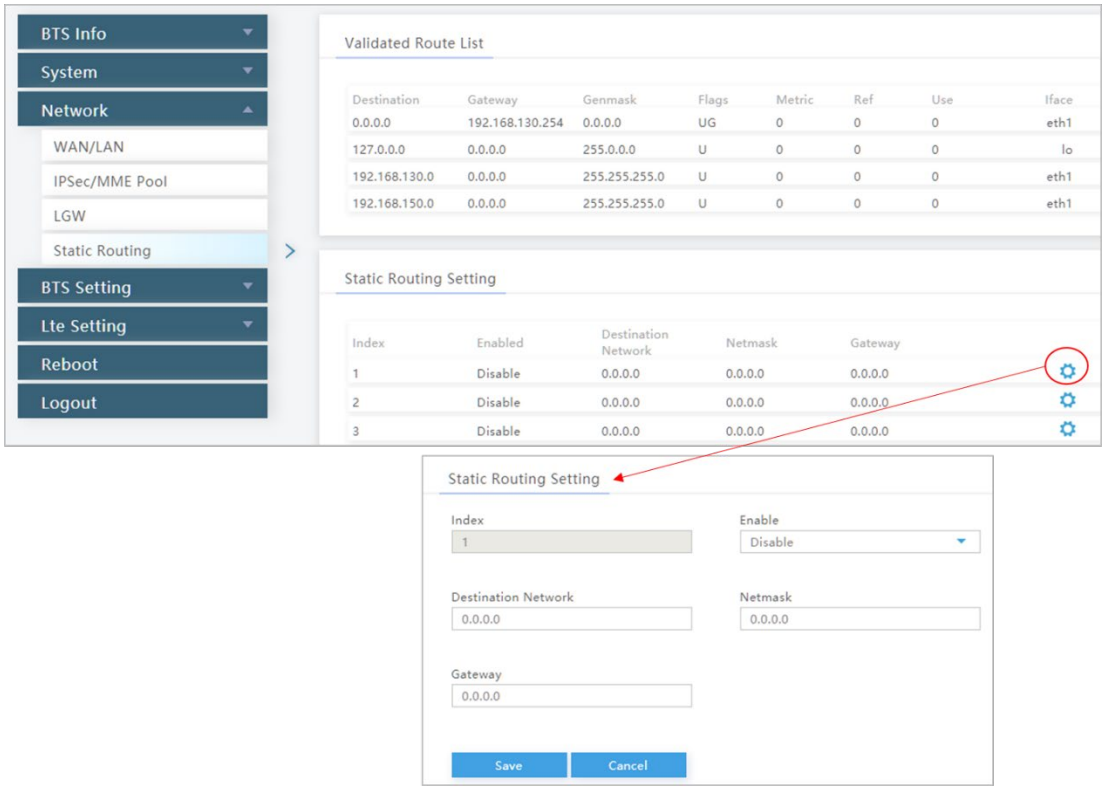


Table 3-3: Static Routing

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
Gateway	The destination gateway IP address

3.6.4 Configure the Management Server

In the BTS Settings > Management Server window you will enter the network management service (NMS) information (Figure 3-18). When using the Baicells CloudCore to manage the network, in the *http://* field enter the following URL address and port number: **baiomc.cloudapp.net:48080/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 3-18: Management Server

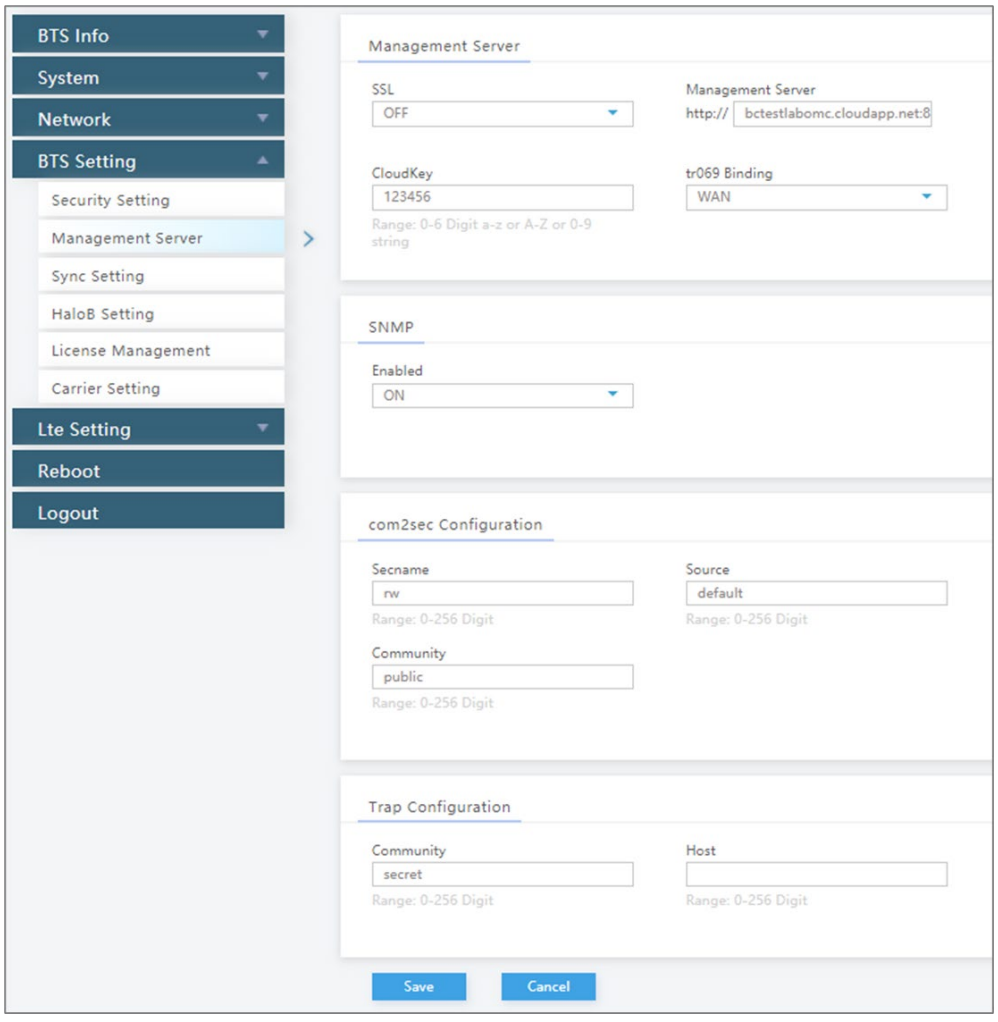


Table 3-4: Management Server

Field Name	Description
SSL	Enable/Disable Secure Socket Layer (SSL) using ON/OFF. When enabled the Management Server field changes to a secure http extension.
Management Server	Enter the management server IP address and port number
CloudKey	Operators using the Baicells CloudCore are provided a unique CloudKey identifier that may be used when configuring CPEs and eNBs. If entered in this field, when the device is powered on it will immediately associate to the operator's OMC account. You can find your CloudKey ID when you log in to the CloudCore. It is displayed in the top bar.
SNMP	Enabled= OFF/ON
Com2sec Configuration	Option available when SNMP option is enabled: • Secname • Source • Community
Trap Configuration	Option available when SNMP option is enabled: • Community • Host

3.6.5 Configure Quick Settings

Under the BTS Info > Quick Setting window (Figure 3-19) 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 PLMN and MME IP address:

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

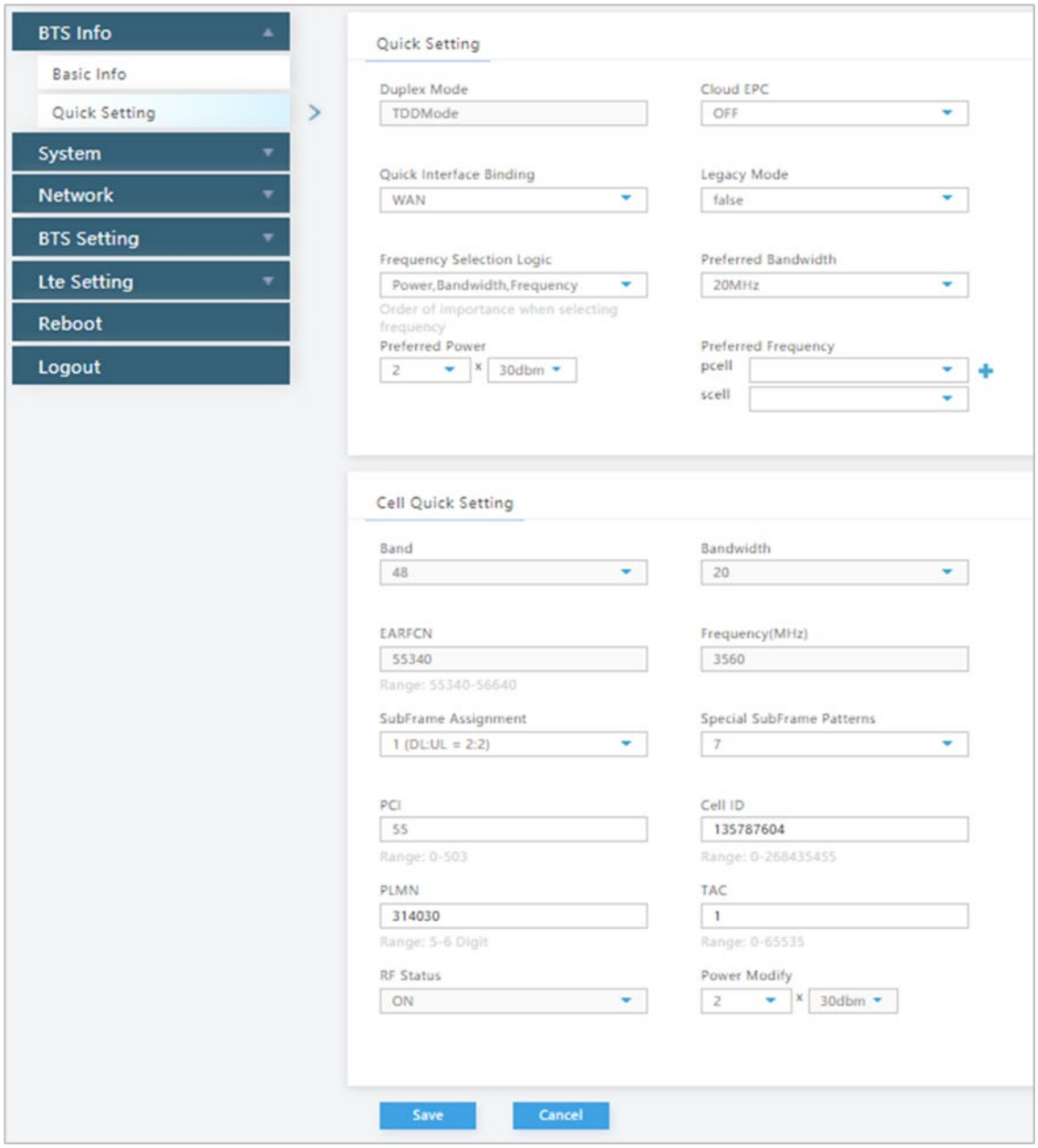
Do not change these settings except when connecting to a Local (private network) EPC or different vendor's Evolved Packet Core (EPC). Second, you must enter the operator's planned settings for Band, Bandwidth, EARFCN, Cell ID, PCI, TAC, etc. Some *Quick Setting* fields such as *Duplex Mode* and *Frequency* 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 will determine some of these parameters. Refer to the *SAS Deployment Guide* for more information. Legacy Gen 1 CPEs do not support SAS.

NOTE 2: Nova436Q does not support SFA = 0.

For a description of all the *Quick Setting* fields, refer to the *CPE Configuration Guide*.

Figure 3-19: Quick Setting



3.6.6 Configure Carrier Setting

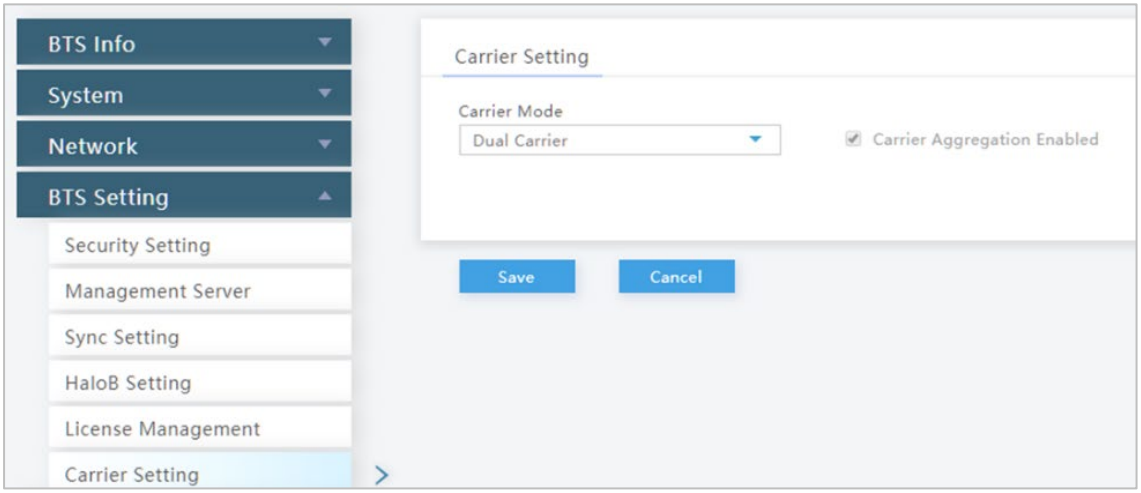
Reference: *Carrier Aggregation & Dual Carrier (Split Mode) Configuration Guide*

The *Carrier Setting* menu is used only in the two-carrier Nova436Q eNB (Figure 3-20). You can set the eNB to run as a single carrier, as two combined carriers using Carrier Aggregation (CA), or as two independent carriers using Dual Carrier (DC)/split mode, depending on which licenses you have purchased. Single carrier (no CA) means only Cell 1 will operate and use only two RF ports instead of four. Operators may need to use this mode if they have limited spectrum or are planning to change to CA or DC mode at a later time when more capacity is needed for the coverage area.

At the *Carrier Mode* field, if you select *Dual Carrier*, the *Carrier Aggregation* check box is automatically checked for the two carriers to operate in CA mode. If you want the eNB to operate in DC/split mode, uncheck the *Carrier Aggregation Enabled* check box.

Whenever you change the carrier setting, you must **reboot** the eNB for the change to take effect.

Figure 3-20: Carrier Setting



3.6.7 Verify eNB Operational Status

Once the basic configuration settings have been saved, you need to **reboot** the eNB. When the eNB is finished rebooting, check the eNB status using the eNB GUI and the OMC:

- **eNB GUI**: Go to BTS Info > Basic Info, and check the *Cell Status* field (Figure 3-21). It should show *Active*. Also, check that *GPS Sync* is reported as *Synchronized*.
- **OMC:** Go to eNB > Monitor to see if the *Active Status* shows *Active* and the *Sync Status* shows *GPS Synchronized* (Figure 3-22).

NOTE: Once the eNB is mounted at its intended destination and powered on, again check the status settings.

Figure 3-21: Cell Status (eNB GUI)

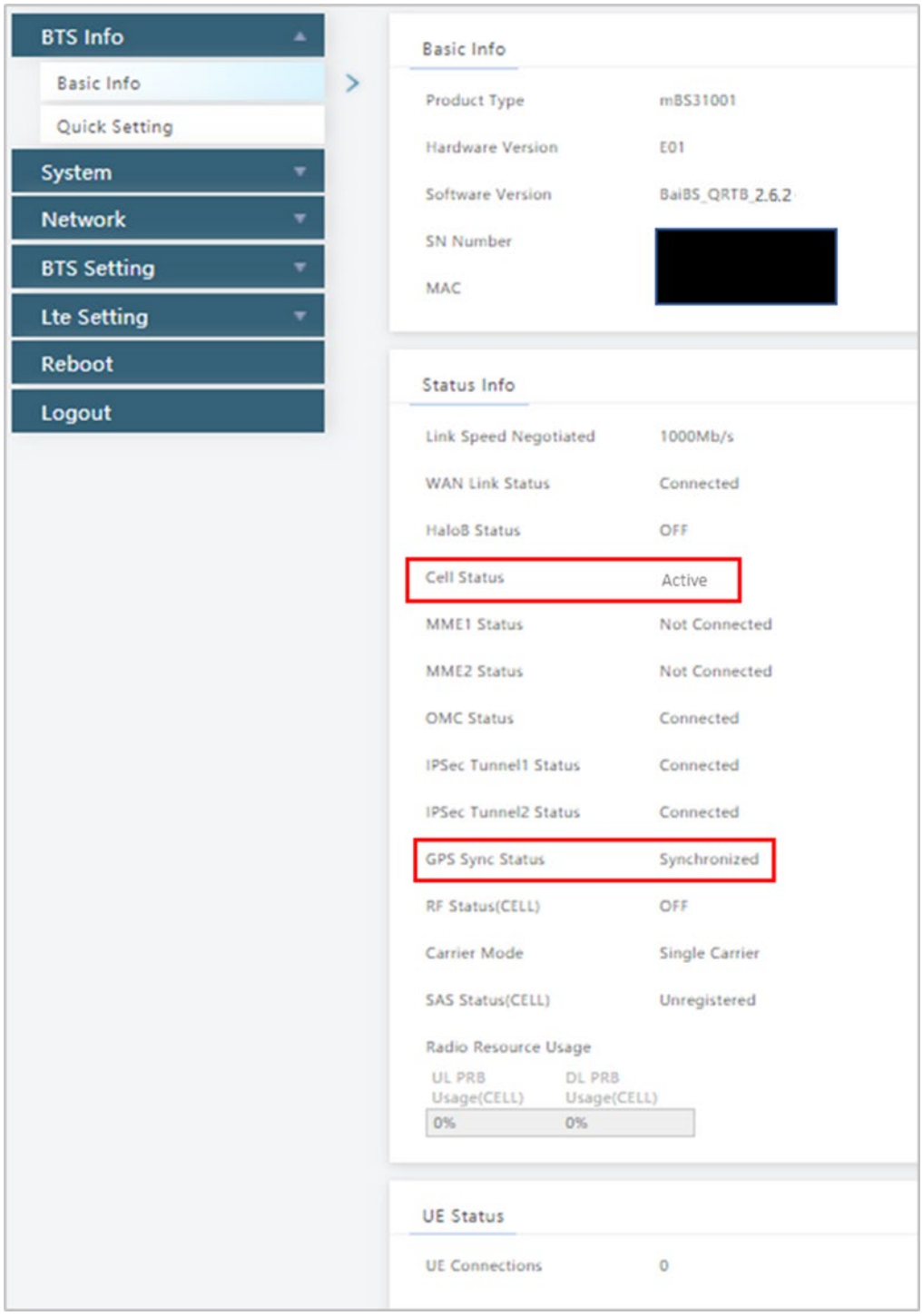
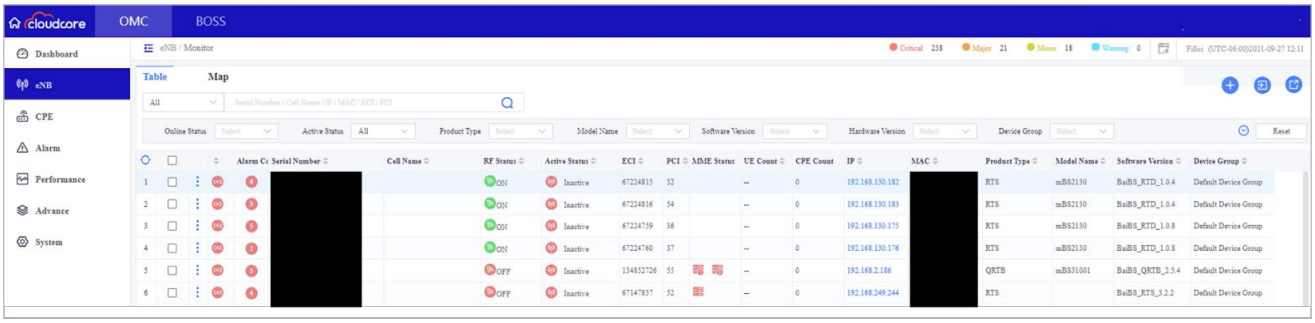


Figure 3-22: Cell Status (OMC)



Optionally, you may want to:

1. Change the login password.
2. Confirm the firmware version is the latest available from Baicells; upgrade if needed.
3. Set the Network Timing Protocol (NTP) and configure additional features if needed.

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

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 minimum distance 20 inches (50 cm) between the radiator & 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.