Nova846

Outdoor 8x5W eNodeB

Quick Guide

P/N: 1701000180

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1. Product Overview

1.1   Introduction

The Baicells Nova846 is an advanced dual-mode outdoor integrated eNodeB (eNB) product that operates in LTE Time Division Duplexing (TDD) mode. This 8x5W eNB is capable of operating in Carrier Aggregation (CA) mode or Dual Carrier (DC) / split mode. Combining a variety of technologies, the Nova846 provides wireless coverage solutions, which will offer users with high-speed broadband wireless Internet access. It also can help operators improve outdoor coverage, enhance network capacity, eliminate blind spots and improve cell edge rates.

In CA mode, contiguous or non-contiguous channels are aggregated to provide up to 40 MHz bandwidth. This essentially doubles the downlink capacity when the CA mode is used with all CAT6/7/15 user equipment. In DC mode, each carrier is treated as an independent cell, supporting 128+128 users, and each supporting 20 MHz bandwidth. Using a Nova846 in DC mode simplifies and streamlines the deployment of split sectors.

In addition to having the option to operate Nova846 in either CA or DC mode, HaloB (an embedded MME option) comes as a default feature in the base software. Baicells's patented HaloB solution migrates the necessary core network functions to the eNB.

The Nova846 can be widely used by telecom operators, broadband operators, and enterprises, etc.

1.2   Features

- Standard LTE TDD Bands 41,48.

- Support 5MHz/10MHz/15MHz/20MHz operation bandwidth.

- Peak rate (up to): DL 440 Mbps with 4x4 MIMO Carrier Aggregation (CA) mode, UL 28 (56) Mbps.

- 128+128 concurrent users, 256+256 RRC users.

- Support GPS synchronization.

- Supports Citizens Broadband Radio Service (CBRS).

- Embedded HaloB ("lite" EPC) solution.

- Lower power consumption, which reduces OPEX, can be powered easily by Baicells

compact outdoor Smart UPS EPB series.

- Plug-and-play with self-organizing network (SON) capabilities.

- IoT with all standard LTE Evolved Packet Core (EPC).

- GUI-based local and remote web management, cooperating with the BaiOMC NMS to support unified configuration, management, monitoring and maintenance.

- Highly secured with equipment certification against potential intrusion risk.

- TR-069 network management interface support.

□ Security services to provide timely protection against potential security risks and illegal intrusion.

□ Integration as required, easy to installation and deployment, accurate coverage and improved network capacity.
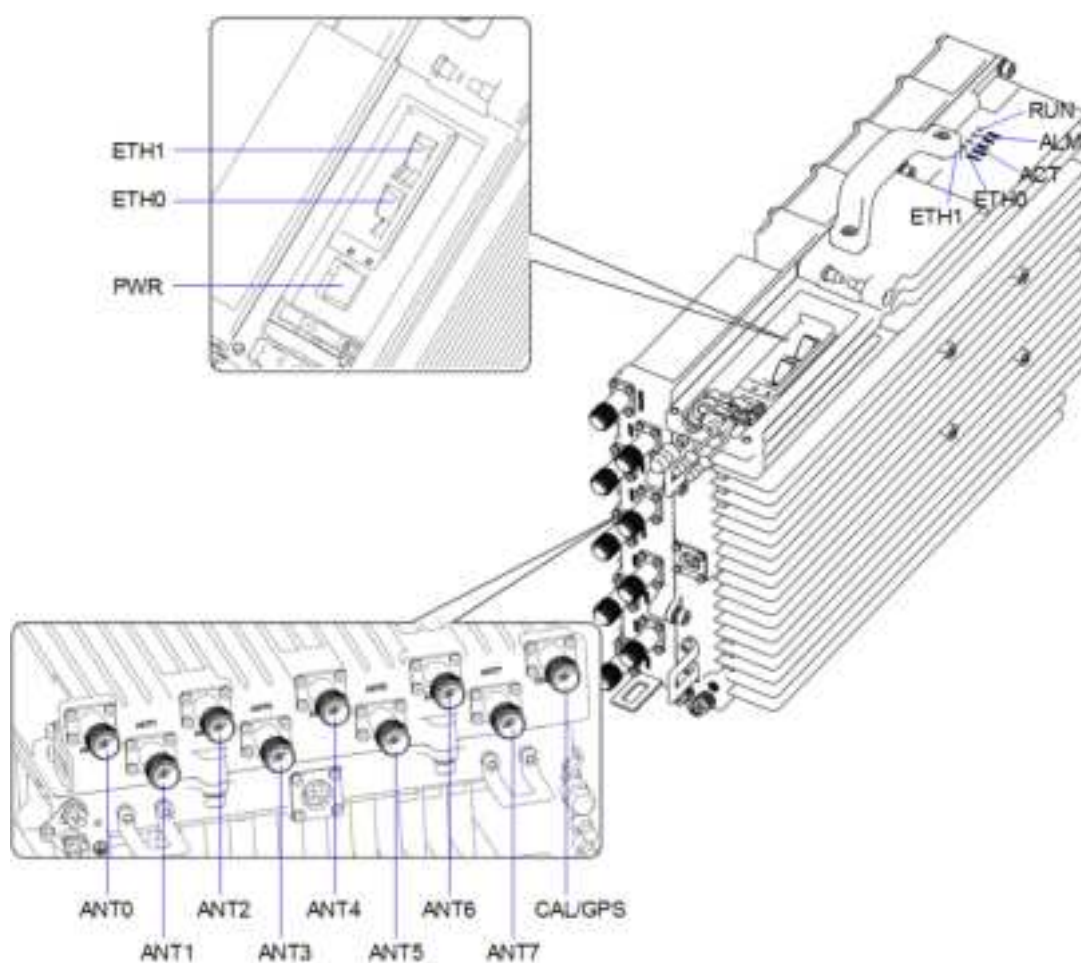
1.3   Appearance

The appearance of Nova846 is shown in Figure 1-1.

Figure 1-1 Nova846 Appearance
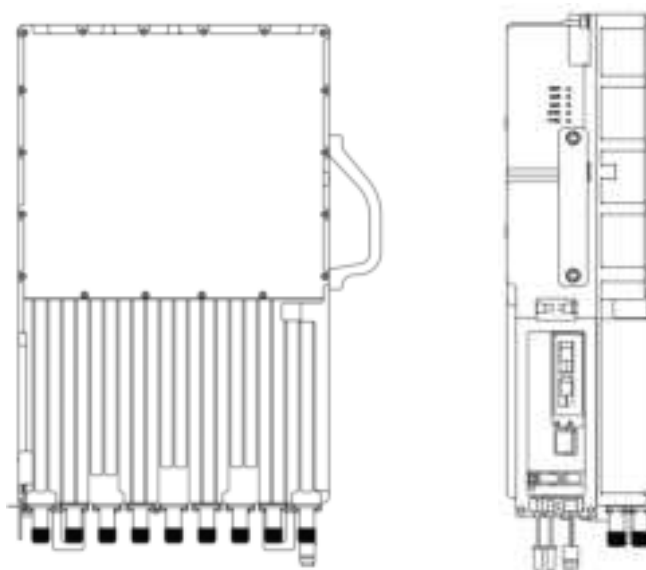
The interfaces and indicators Nova846 are shown in Figure 1-2.

Figure 1-2 Nova846 Interfaces and Indicators

The Nova846 interfaces are described in Table 1-1.

Table 1-1 Nova846 Interface Description

Interface	Description
ETH0	Ethernet interface 1 (SFP optical interface or GE electric interface), connect to external transmission network, used for data backhaul.
ETH1	Ethernet interface 2 (SFP optical interface), connect to external transmission network, used for data backhaul.
PWR	Power interface: -48V (-40.5V to 57V) DC
ANT0~ANT7	Connect to external antenna 0 to antenna 7, N-type connector.
CAL/GPS	CAL is used for antenna phase alignment. GPS is used to connect to external GPS antenna, N-type connector.

The Nova846 interface indicators are described in Table 1-2.

Table 1-2 Nova846 Interface Indicators

Identity	Color	Status	Description
RUN	Green	Steady On	Power on
		OFF	No power supply
ALM	Red	OFF	No alarm
		Steady On	The system exists alarms.
ACT	Green	Steady On	The device has been powered on.
		Fast flash: 0.125s on,0.125s off	Data is transmitting.
		Slow flash: 1s on,1s off	The cell has been activated.
ETH0	Green	Steady On	S1 link is up.
		OFF	SFP module is out of place, Ethernet cable is out of place, power of the optical module is powered off, or S1 link is down.
ETH1	Green	Steady On	S1 link is up.
		OFF	SFP module is out of place, Ethernet cable is out of place, power of the optical module is powered off, or S1 link is down.

1.4 Technical Specification

1.4.1 Hardware Specification

Item	Description
LTE Mode	TDD
RF Standard	3GPP 38.104 / Category B
LTE Bands	41, 48
Channel Bandwidth	5MHz, 10MHz, 15MHz, 20MHz
Carrier Config.	Maximum 2 carriers
MAX Output Power	37 dBm / channel x 8 channel
MIMO	DL 4x4
Receive Sensitivity	-102 dBm
Synchronization	GPS
Data Interface	1 x optical SFP + 1 x electrical GE or 2 x optical SFPs
Dimension	432mm (H) x 280mm (W) x 118mm (D)
Installation Type	Pole or wall mount
Antenna Port	8T8R
Antenna	• External high-gain antenna, N-type connector • External GPS antenna, N-type connector

Item	Description
Power consumption	≤ 300W
Power	+40.5V to 57 V DC, Nominal +54VDC
Weight	11.0kgs
Basic report function	RSSI , VSWR, TSSI(transmission signal strength), temperature, etc.
Cooling Method	Natural convection cooling @ vertical installation
Noise Figure	Room temperature: <2.5 All temperature: <3.5
MTBF	≥ 150000 hours
MTTR	≤ 1 hour

NOTE: The test method of receiving sensitivity is proposed by the 3GPP TS 36.104, which is based on 5MHz bandwidth, FRC A1-3 in Annex A.1 (QPSK, R=1/3, 25RB) standard.

1.4.2 Global Part Numbers

Model No.	Description
sBS71010	Band48, 10MHz, 20MHz per carrier, DL 4 x 4 or 2 x 2 on each carrier, 2 carriers.

1.4.3 Software Specification

Item	Description	
LTE Standard	3GPP Release 15	

Peak Rate	CA mode	• 2x20 MHz:
		  SA1: DL 320Mbps, UL 28 (56)Mbps
		  SA2: DL 440Mbps, UL 14 (28)Mbps
		• 2x10MHz:
		  SA1: DL 160Mbps, UL 14 (28)Mbps
		  SA2: DL 220Mbps, UL 7 (14)Mbps

	Single carrier	• 20 MHz:
		  SA1: DL 160Mbps, UL 28Mbps
		  SA2: DL 220Mbps, UL 14Mbps
		• 10MHz:
		  SA1: DL 80Mbps, UL 14Mbps
		  SA2: DL 110Mbps, UL 7Mbps

User Capacity	128+128 concurrent users 256+256 RRC users	
QoS Control	3GPP standard Quality of Service Class Identifier (QCI)	
Modulation	UL: QPSK, 16QAM, 64QAM	

Item	Description
	DL: QPSK, 16QAM, 64QAM, 256QAM*
Voice Solution	VoLTE, Circuit Switched Fallback (CSFB)*
Traffic Offload	Local breakout
SON	Self-organizing network: • Automatic setup • Automatic Neighbor Relation (ANR) • PCI confliction detection
RAN Sharing	Multi-Operator Core Network (MOCN)*
HaloB	Supported
Network Mgmt	TR-069
Maintenance	Support remote/local maintenance
	Support online status management
	Support performance statistics*
	Support failure management*
	Support configuration management
	Support local or remote software upgrading and loading
	Support log
	Support connectivity diagnosis
	Support self-start and self-configuration

***NOTE**: Future software version will release.

1.4.4 Environment Specification

Item	Description
Operating Temperature	-40°C to 55°C
Humidity	2% to 95%
Atmospheric Pressure	70kPa to 106kPa
Ingress Protection Rating	IP66
Power interface Lightning Protection	Differential mode: ±10 KA Common mode: ±20 KA

1.4.5 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. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

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 50cm between the radiator & your body.

2. Installation

2.1 Installation Material

In addition to industry standard tools, you will need the materials described in Table 2-1 during the installation. When selecting an RF antenna, be sure to match the frequency range of the antenna with the eNB.

Table 2-1 Support Materials

Item	Description
Power cord	The diameter of power cable must be AWG15 or greater (such as AWG14). And the length from the power adaptor's DC end to the device must be shorter than 100 meters (~109 yards).
Power plug	The power plug connecting to the electricity supply.
Antenna RF cable	50 ohm feeder

Item	Description
Optical fiber	Single mode optical fiber
Antenna	Omnidirectional, or directional antenna
Ground cable	The diameter of grounding cable must be 10mm^2 or greater.

2.2   Installation Tool

Knife	Vise	Wrench	Cross screw driver
Tape measure	Percussion drill and	Cable vice	hammer

NOTE: Other accessories have been packed in the packing box.

2.3   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 2-1).

Figure 2-1 GPS Antenna Installation

NOTE: The eNB may adopt different models of GPS antenna, so the GPS antenna may not the same as above figure. But the installation steps that fix it on the eNB is the same.

2.4 Weatherproofing

To protect the connection points from weather and climate, clean each connection point before installing cold shrink tubes, per the following figure.
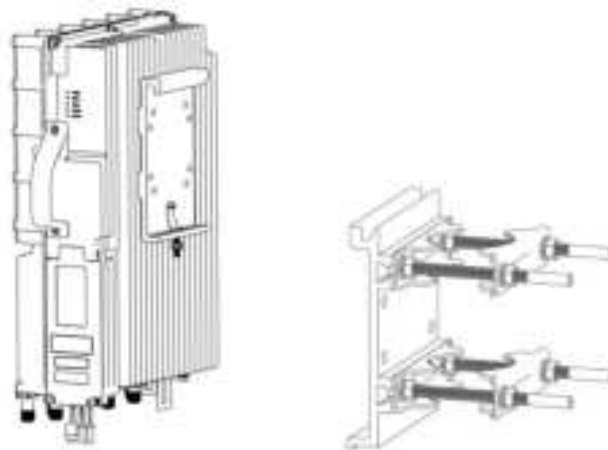

1. Insert the cable into the cold shrink tube.

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.

2.5 Install on Pole

Check to ensure the diameter of the pole is in the range of 1.6 inches to 3.9 inches (40mm to 100 mm). The position of the RRU on the pole should be at least 47 inches (120 cm) in height.

The brackets have been pre-assembled in manufacturing before packing. It includes two parts, one is pre-assembled on the back of the device. The other one is for pole mounting or wall mounting, as shown in Figure 2-2.
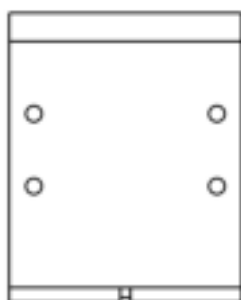
Figure 2-2 Pre-assembled Device

Following steps introduce how to fix the pre-assembled eNB on a pole.

① Take apart two clamps from the assembled bracket.

② Put the bracket against the pole and assemble two clamps back. Note that the sequence of flat washers, spring washers and nuts keeps the same with original.

③ Fasten the pole bracket to ensure the bracket is firmly fixed on the pole.

④ Hang the device (with bracket) on the pole bracket. Ensure the screw on the bottom of the bracket clip into the groove on the pole bracket, and then fasten the screw.
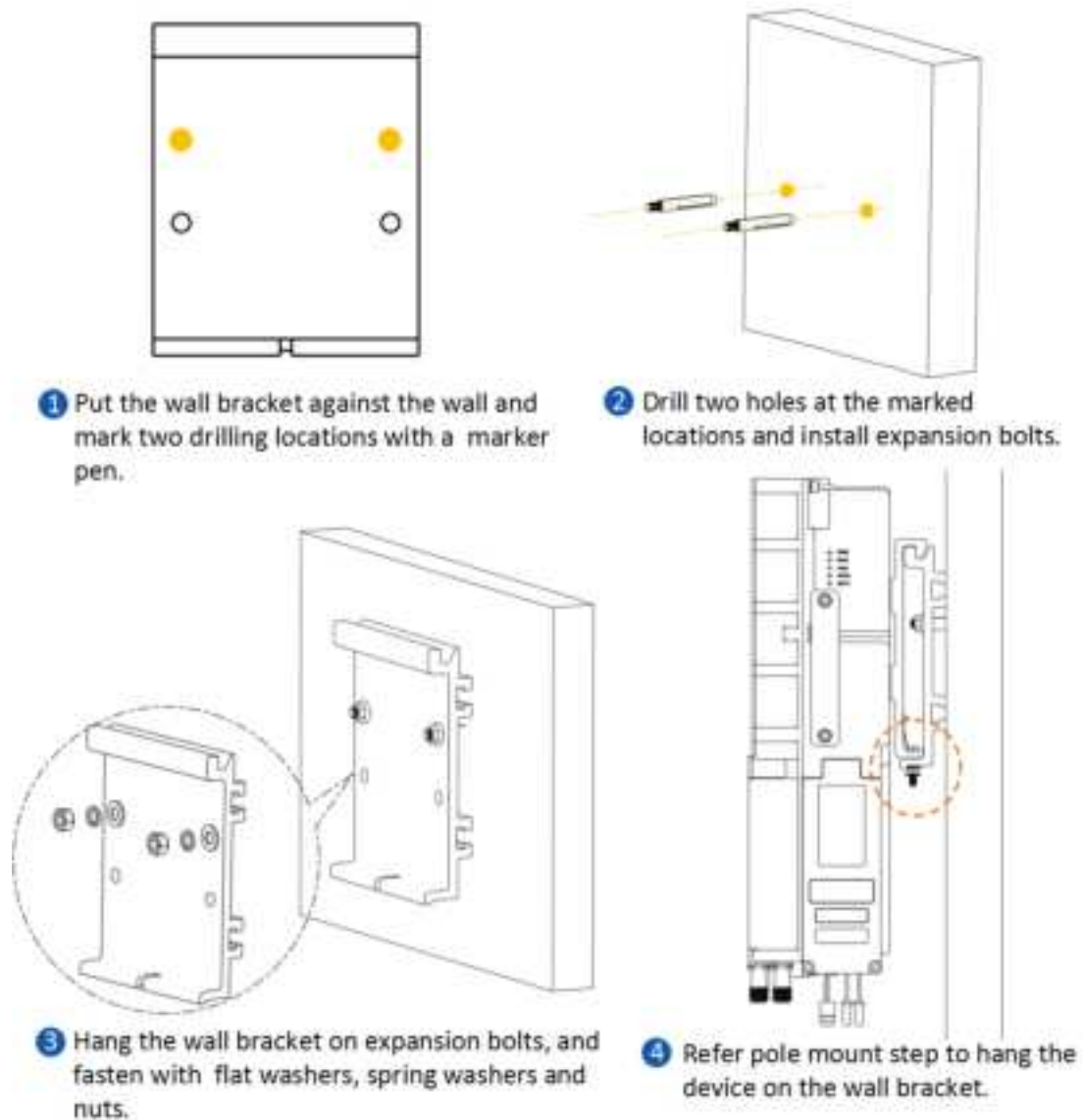
2.6 Install on Wall

Take apart assembly bracket first, only remains the wall bracket, as shown in Figure 2-3.

Figure 2-3 Wall Bracket
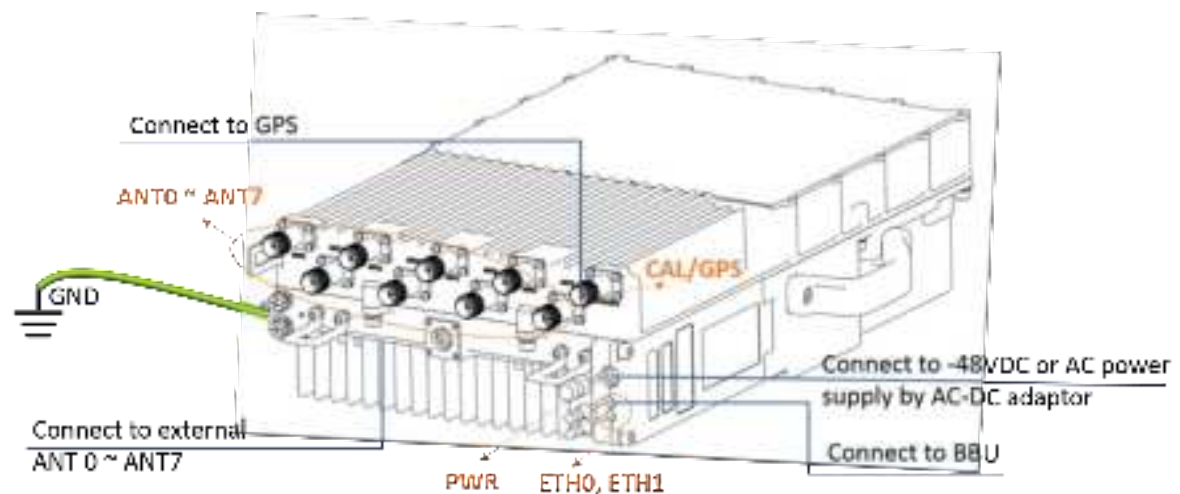
Following steps introduce how to fix the pre-assembled eNB on a wall.

❶ Put the wall bracket against the wall and mark two drilling locations with a marker pen.

❷ Drill two holes at the marked locations and install expansion bolts.

❸ Hang the wall bracket on expansion bolts, and fasten with flat washers, spring washers and nuts.

❹ Refer pole mount step to hang the device on the wall bracket.

2.7 Connect Cable

Connect to GPS

ANT0 ~ ANT7

GND

CAL/GPS

Connect to external ANT 0 ~ ANT7

Connect to -48VDC or AC power supply by AC-DC adaptor

Connect to BBU

PWR   ETH0, ETH1

NOTE:

1. According to the requirements of the site, both DC and AC power supply are provided to support different requirements of installation site. If DC power is selected, the power cable connects to the DC power supply directly. If AC power is selected, the power cable must connect to the AC power supply through a DC-AC adaptor.

2. The antenna ports and CAL/GPS port must have waterproof protection.

2.8   Power On

Power on the eNB, and wait a few minutes while the eNB boots up. Per the previous figures, check that the LED indicators are lighting as expected.