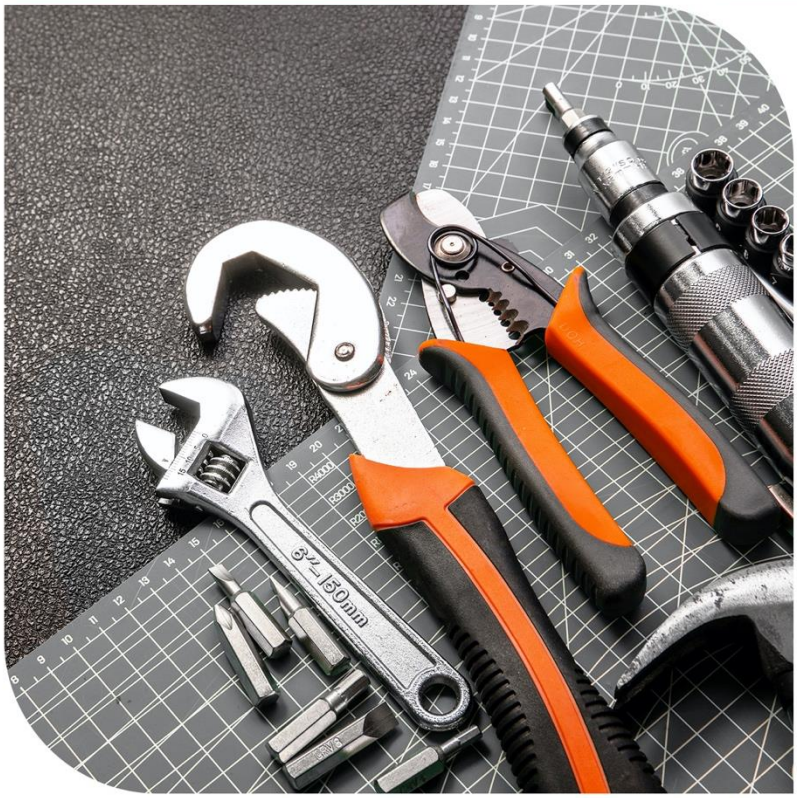
Aurora243

Outdoor gNB

Installation Guide



Document version: 01

About This Document

This document is intended for personnel who will be installing the Baicells Aurora243 outdoor integrated 2x5 watts gNB product. The product overview is followed by the procedures for properly installing. Please be advised that only personnel with the appropriate electrical skills and experience should install this device.

This document suits for the models of BSC7048A243 gNB.

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Disclaimer

The information in this document is subject to change at any time without notice. For more information, please consult with a Baicells technical engineer or the support team.

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
10 July, 2022	01	Initial Released.
20 Nov., 2022	02	Change the mounting bracket

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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.

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

Warning Installation of the equipment 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.

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1. Overview

1.1 Introduction

The Baicells Aurora243 is an advanced outdoor 5G Sub-6G integrated base station (gNB), which is designed and developed based on Qualcomm 5G SoC solution. This 2x5W gNB is low power, subminiature and easy to maintenance.

This product helps operators to enhance the coverage performance of 5G networks effectively, improve the capacity of 5G networks and eliminate the blind district, meanwhile it also can help to reduce the system power consumption.

The Aurora243 can be widely used by telecom operators, broadband operators, and enterprises, etc.

1.2 Highlights

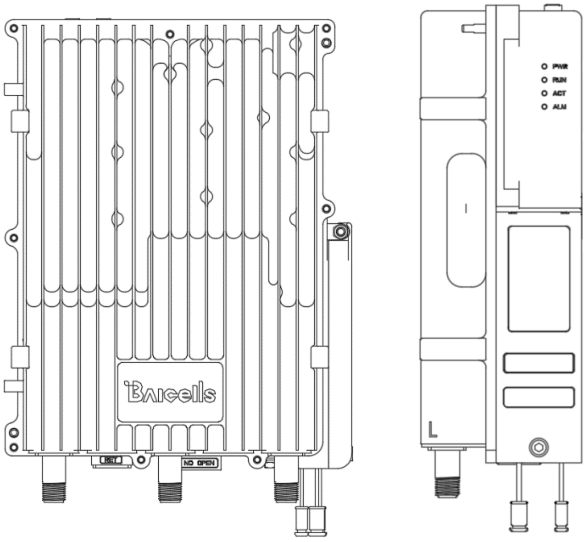
- Standard NR Band N48
- Comply with 3GPP Release 15
- GUI-based local and remote Web management
- Supports MAX 40MHz bandwidth
- Supports 32 active users, 64 RRC connected users
- Supports PDU session setting
- Supports cell setting
- Supports Stand Alone (SA) mode
- Supports NG setting
- Supports F1 setting
- Supports UE attaching
- Supports SCTP control (IKE SCTP)
- Integrated small cell form factor for quick and easy installation
- Configured out-of-the-box to work with Baicells Cloud Core
- Highly secured with equipment certification against potential intrusion risk
- Supports TR-069 network management interface

- Lower power consumption, which reduces OPEX, can be powered easily by Baicells compact outdoor smart UPS

1.3 Appearance

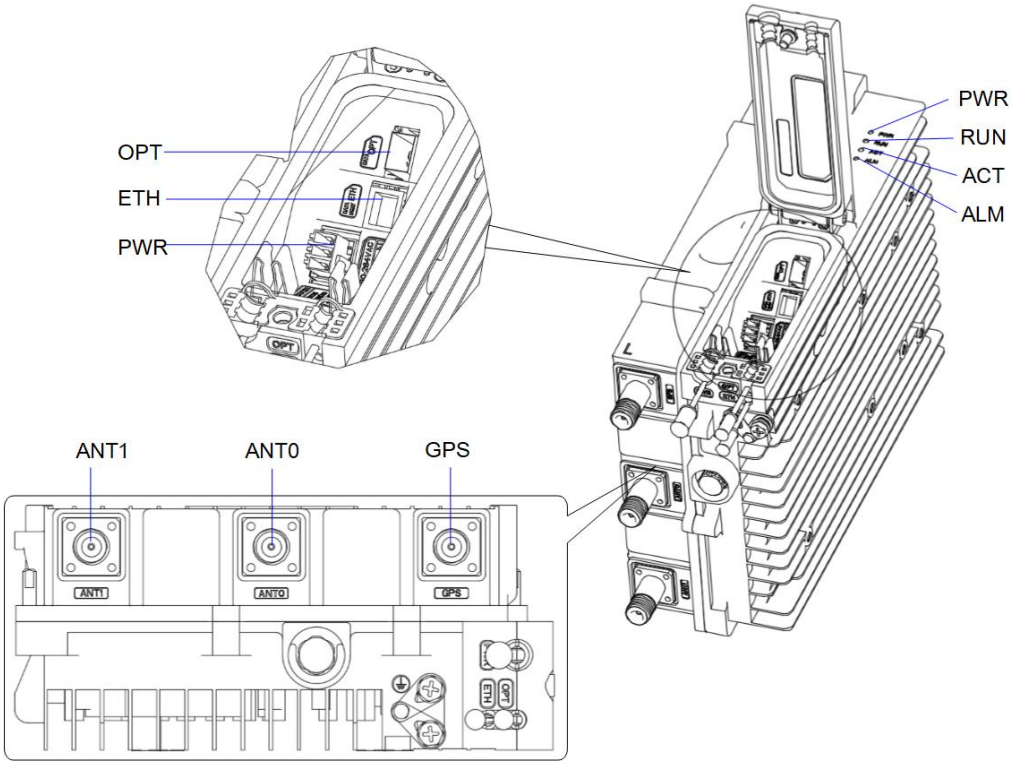
The appearance of Aurora243 is shown in Figure 1-1.

Figure 1-1 Aurora243 Appearance



The interfaces and indicators Aurora243 are shown in Figure 1-2.

Figure 1-2 Aurora243 Interfaces and Indicators



The Aurora243 interfaces are described in Table 1-1.

Table 1-1 Aurora243 Interface Description

Interface	Description
PWR	Power interface: The gNB supports DC power supply. DC: -40VDC to -57VDC, nominal -48VDC
ETH	RJ-45 interface, used for debug or data backhaul.
OPT	Optical interface, connect to external transmission network, used for data backhaul.
GPS	External GPS antenna, N-female connector.
ANT0	External antenna 0, N-female connector.
ANT1	External antenna 1, N-female connector.

The Aurora243 interface indicators are described in Table 1-2.

Table 1-2 Aurora243 Interface Indicators

Identity	Color	Status	Description
PWR	Green	Steady ON	(Reserved)
RUN	Green	Steady ON	The power supply is normal.
		Fast flash: 0.125s on,0.125s off	The device is starting up.
		Slow flash: 1s on, 1s off	The device is operating normally.
		OFF	No power supply or device fault.
ACT	Green	Steady ON	The cell is active.
		Slow flash: 1s on, 1s off	The cell is deactivated.
ALM	Red	Steady ON	The device is fault.
		OFF	No alarm.

1.4 Technical Specification

1.4.1 Technology

Item	Description
Standard	5G NR TDD (3GPP R15 compliant)
TDD UL/DL Configuration	5ms periodicity (μ=1): DDDDD+DDSUU 2.5ms dual periodicity (μ=1): DDDSU+DDSUU (with Special subframe Configuration: 10:2:2)
Model No.	BSC7048A243
Frequency Band	N48 (3550 MHz – 3700 MHz)

Item	Description
Channel Bandwidth	N48: 10/20/30/40 MHz
Multiplexing	2x2 MIMO (DL)
Security	Radio: SNOW 3G/AES-128 Backhaul: IPsec (X.509 AES-128, AES-256, SHA-128, SHA-256)

1.4.2 Interface

Item	Description
Ethernet Interface	1 optical (SFP+) and 1 RJ-45 Ethernet interface (1 GE)
Power Supply	-40VDC to -57VDC, nominal -48VDC
Protocols Used	IPv4, UDP, TCP, ICMP, NTP, SSH, IPsec, TR-069, HTTP/HTTPs, DHCP
Network Management	IPv4, HTTP/HTTPs, TR-069, SSH, Embedded EPC
VLAN/VxLAN	802.IQ/VxLAN
LED Indicators	4 x status LED PWR/ACT/RUN/ALM
Antenna Connection	2T2R N-Type connectors for external high-gain antenna
GPS Antenna	External GPS antenna, N-Type connector

1.4.3 Performance

Item	Description
User Capacity	32 active users, 64 RRC connected users
Latency	30 milliseconds
Receive Sensitivity	-95 dBm (per channel)
Modulation	UL: MCS0 (QPSK) to MCS28 (256QAM) DL: MCS0 (QPSK) to MCS27 (256QAM)
Transmit Power Range	0 to 37 dBm per channel (combined 40dBm, configurable) (1 dB interval)
Quality of Service	Complied with 3GPP standard 5G QoS Identifier (5QI)
ARQ/HARQ	Supported
Synchronization	GPS

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.

1.4.4 Features

Item	Description
Voice	VoNR
SON	Self-Organizing Network • Automatic Neighbor Relation (ANR) • PCI confliction detection
Traffic Offload	Local breakout
Maintenance	• Local/Remote Web maintenance • Online status management • Performance statistics • Fault management • Local/Remote software upgrade • Logging • Connectivity diagnosis • Auto startup

1.4.5 Link Budget

Item	Description
VSWR	<= 1.5
Power Control	UL Open-loop/Closed-loop Power Control, DL Power Allocation (3GPP TS 36.213 compliant)*

* Planned for future release

1.4.6 Physical

Item	Description
Surge Suppression	Network interface: 1KV Power Interface: Differential mode: 2KA; Common mode: 4KA
Power Interface Lightning Protection	Differential mode: ±10 KA Common mode: ±20 KA
MTBF	≥ 150000 hours
MTTR	≤ 1 hour
Ingress Protection Rating	IP65
Operating Temperature	-22°F to 131°F / -30°C to 55°C
Storage Temperature	-40°F to 149°F / -40°C to 65°C
Humidity	2% to 95% RH

Item	Description
Atmospheric Pressure	70 kPa to 106 kPa
Power Consumption	Maximum 150W
Weight	18.7lbs / 8.5kg
Dimensions (HxWxD)	13.1 x 9.4 x 4.3 inches 333 x 240 x 109 millimeters
Installation	Pole or wall mount

1.4.7 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 A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, 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 150cm between the radiator & your body.

2. Installation Preparation

2.1 Support Materials

In addition to industry standard tools, you will need the materials described in Table 2-1 during the installation.

Table 2-1 Supporting Materials

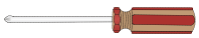
Item	Figure	Description
Power plug on the power side	None	Prepare the power plug according to the actual installation site. • The DC power supply is used, this is for two phase DC power plug.
DC cord		A DC power cable is provided with the device. If the length is insufficient, the customer needs to prepare it. It is suggested that AWG13 is used. The cord is two cores cable and the length is less than 100 meters.
AC cord		(Optional) If the power supply is AC, an AC power cable must be prepared. The diameter of power cable must be AWG13 or greater (such as AWG12). The cord is three cores cable and the length is less than 100 meters.
RF antenna cable		50 ohm feeder, 1/2 jumper
Optical fiber		Optical fiber (armor) It is suggested that the diameter of the cable is 7± 1mm.
Ethernet cable		Outdoor CAT6, shorter than 100 meters (~109 yards) It is suggested that the diameter of the cable is 7± 1mm.
RF antenna		Omni or directional dual polarized antenna When selecting an RF antenna, be sure to match the frequency range of the antenna with the gNB.
Ground cable		If the length of lead is more than 10 meters, 10mm² diameter grounding cable should be used. If the length of lead is less than 10 meters, 10mm² diameter grounding cable should be used.

Item	Figure	Description
Pole		The diameter of the pole is between 40mm to 100mm of hot-galvanized steel pipe Channel steel and equal angle steel installation are also supported. The width of the channel steel is 50mm to 100mm; the length of side of the angle steel is 63mm to 80mm.
Distribution box		AC Air switch, socket, power grounding point, broadband access is all in the distribution box, which must be waterproofed.
Cold shrink tube		The waterproof protection material on the gNB side is provided with the device. But the customer need to prepare the waterproof protection material on the peer side.

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

2.2 Installation Tools

The following standard tools may be needed during the installation.

				
Level bar	Marking pen	Knife	Vise	Wrench
				
Percussion drill and some drill heads	hammer	Cross screw driver	Cable vice	Tape measure
				
5mm L-shape allen wrench	T7 screwdriver head	Ladder	compass	fixed pulley

				
multimeter				

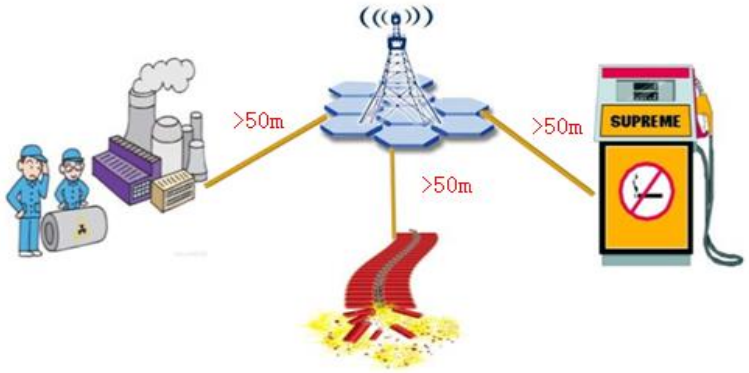
2.3 Construction Safety

1. The installation personnel must master the basic safe operation knowledge, through the training, and having the corresponding qualifications.
2. Before installation, the installation personnel must be prepared with safety protection, such as: safety helmet, safety belt, reflective clothing, gloves, and safety shoes, etc.
3. Before installation, the installation personnel must cross-check each other to ensure above preparations have done.

2.4 Installation Environment

2.4.1 Location Requirements

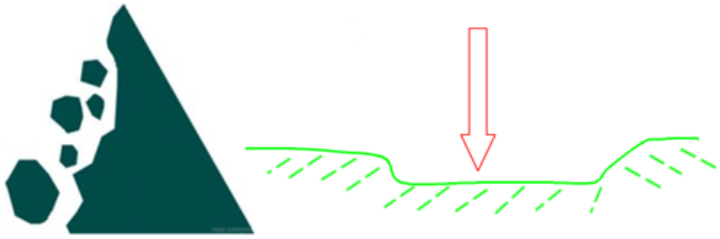
1. Avoid locations of warehouses and gas stations with flammable and explosive, and locations that fire and explosion are easy to happen during production. Do not install gNBs near dangerous industries and enterprises. Stay away from high voltage lines and railroads.



2. Under the premise of not affecting the layout of the gNB, the existing telecommunications building, post and telecommunication office or microwave station should be chosen as the site as far as possible. The existing machine room, power supply and tower facilities should be used sufficiently.

3. Avoid to install near high-power wireless transmitter stations, such as radar stations, television stations, etc. If the gNB must be installed in such locations, you should check whether there is mutual interference, and take measures to prevent it.

4. Avoid to install on mountains. The mountain interference range is large, therefor the frequency reuse will be affected. Install gNB on high mountains in rural areas is often not good for the coverage of towns and villages in small basins.



5. Avoid to install in the forest. If the gNB must be installed in such locations, the height of the gNB must be higher than the treetop.

6. It is strictly prohibited to install the gNB in the mining area and places where is easy to be submerged by flood and landslide

7. In urban area, for the macro gNB, the site should be selected that is higher than the average height of buildings but lower than the highest building. For the micro gNB, the site should be selected that is lower than the average height of buildings and the surrounding buildings are well shielded.

8. In urban area, the gNB should avoid obstructions caused by tall buildings near the front of the antenna or the reflection interferes the same frequency gNBs behind it.

9. Avoid selecting sites where new buildings may affect coverage or there are co-frequency interference.

10. As far as possible, the site of gNBs of the two communication network systems should be co-located or close.

2.4.2 Environmental Requirements

错误!未找到引用源。 provides typical environmental specifications for this gNB.

Table 2-2 Environmental Requirements

Item	Range	Typical value
Temperature	-40°C to 55°C	25°C
Relative humidity (no condensation)	0% to 100%	5% to 95%
Safety voltage (DC)	-40VDC to -57VDC	-48VDC

2.5 Lightening & Grounding Protection

You must protect the gNB, antenna, and GPS against lightning. Following are guidelines concerning grounding.

- The yellow-green ground wire must be at least 10mm^2 in 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 need to be tight and reliable. Rustproofing the terminals, e.g., with anti-oxidant coating or grease, is required.

2.6 Weatherproofing

To protect the connection points from weather and climate, clean each connection point before installing cold shrink tubes, per the following (Figure 2-1).

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 2-1 Weatherproofing

3. Installation

3.1 Unpacking

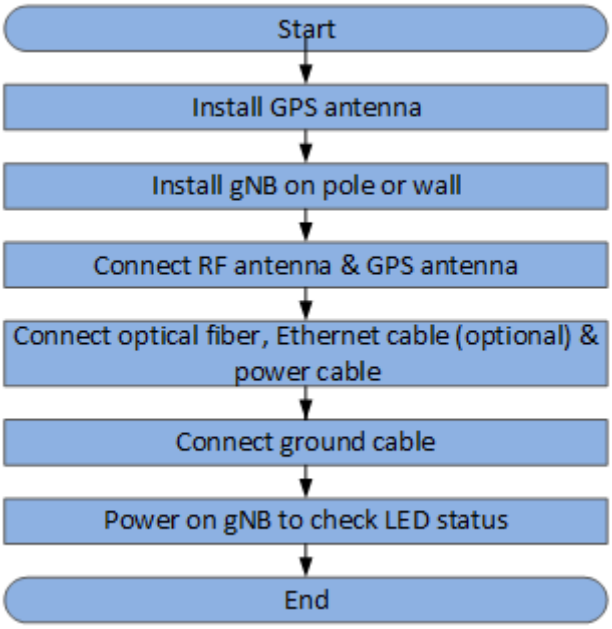
Before opening the box, make sure the package is in good condition, undamaged and not wet. During the unpacking, avoid potential damaging impacts from hits or excessive force.

Once unpacked, check whether the quantity is consistent with the packing list.

3.2 Installation Procedure

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

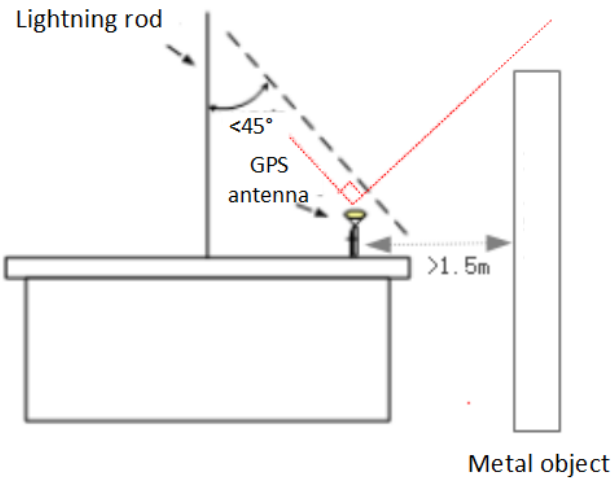
Figure 3-1 Installation Process



3.3 Install GPS Antenna

Read the following GPS antenna installation requirements before installing it on the gNB, as shown in Figure 3-2.

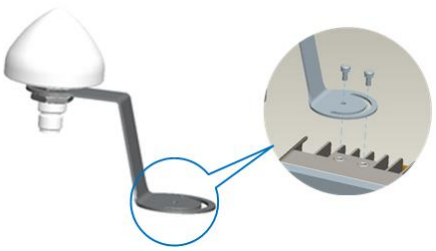
Figure 3-2 GPS Installation Requirements



- No major blocking from buildings in the vicinity. Keep the rooftop buildings a distance away from the GPS. Make sure the space atop within 90 degrees (at least 45 degrees) is not blocked by any buildings.
- Avoid installing the GPS in the vicinity of any other transmitting and receiving devices, such as under the microwave antenna or high voltage cable. Avoid interference from other transmitting antennas to the GPS antennas. Avoid the direction of radiation from other transmitting antennas to the GPS antenna
- The GPS antenna should be installed within 45 degrees to the lightning rod.
- When two or more GPS antennas are installed, it is recommended to keep the spacing of more than 2 meters and install multiple GPS antennas in different locations to prevent simultaneous interference.
- GPS antenna feeders cannot be grounded together with ground conductors of interfering equipment such as air conditioners, motors, and pump motors, etc. to prevent external interference from being introduced into the antenna system.

The only installation step is to fix the GPS mounting bracket on the gNB with the M4*14 screws (Figure 3-3).

Figure 3-3 GPS Antenna Installation

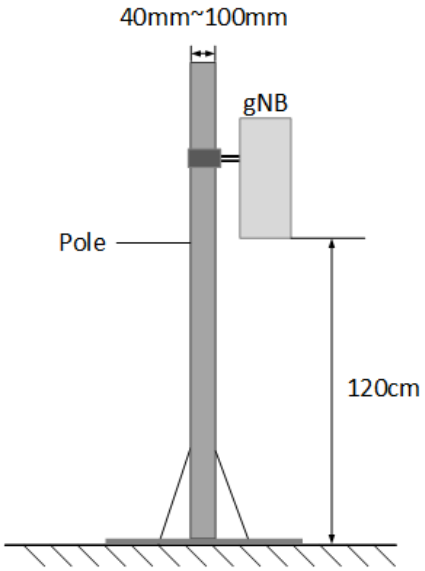


NOTE: The gNB may adopt different models of GPS antenna, so the GPS antenna may not the same as above figure. But the installation steps that fix it on the gNB is the same.

3.4 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 100mm). The position of the gNB on the pole should be at least 47 inches (120cm) in height, as shown in Figure 3-4.

Figure 3-4 Installation Height



The mounting brackets include two components. The bracket mounting on the gNB side has been pre-assembled on the back of the device, as shown in Figure 3-5. The other component is used for pole mounting or wall mounting. If the pole mounting is adopted, the pole mounting bracket is shown in Figure 3-6.

Figure 3-5 Mounting Bracket on the gNB Side

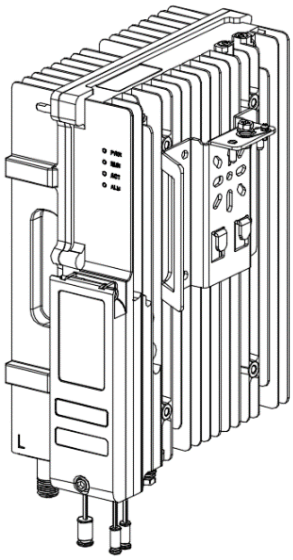
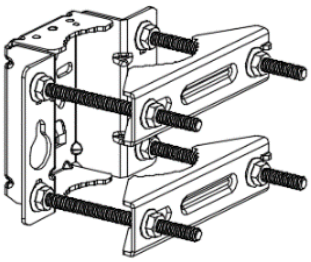
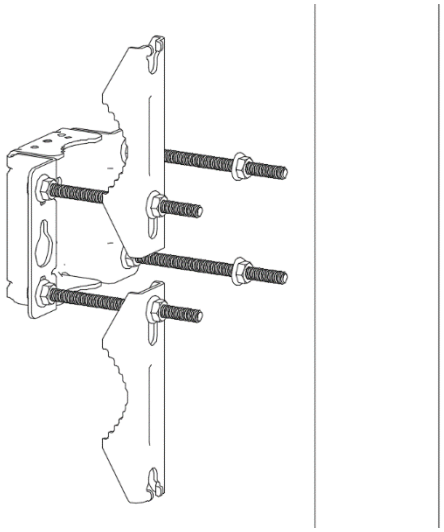


Figure 3-6 Pole Mounting Bracket

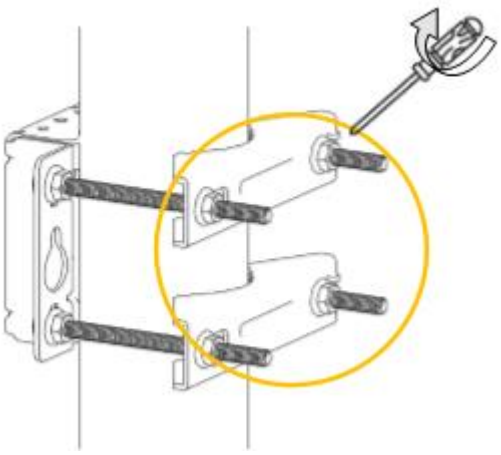


Following will introduce how to fix the pre-assembled gNB on a pole.

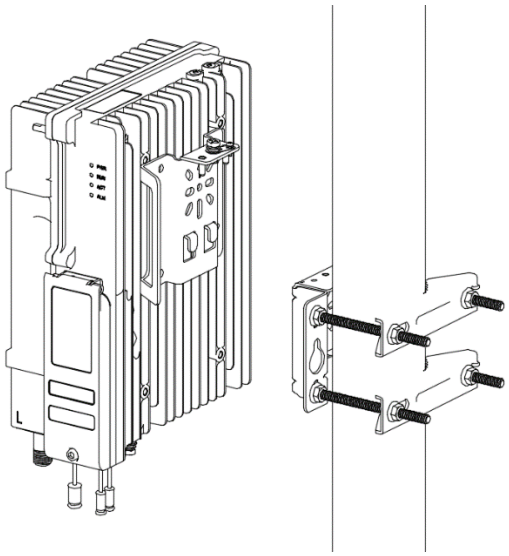
1. Unscrew 4 screws on the assembled Pole bracket. Slide the two omega clamps to the left, and then turn them up or down.



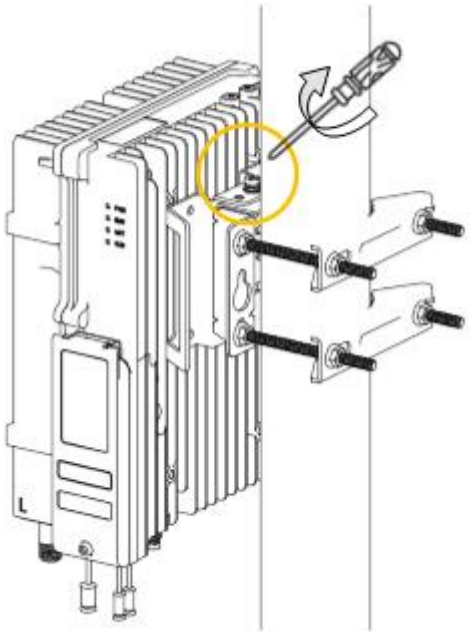
2. Put the pole mounting bracket against the pole, turn the clamps to the horizontal position, and then slide the pole clamp to right, and finally re-tighten the four screws.



3. Align the two pins on the gNB bracket with the pin holes on the pole mounting bracket and vertically put the gNB from top to bottom until the hook on the gNB is stuck firmly into the corresponding slot on the pole mounting bracket.



4. Tighten the screws on the top of the bracket using a cross screwdriver.

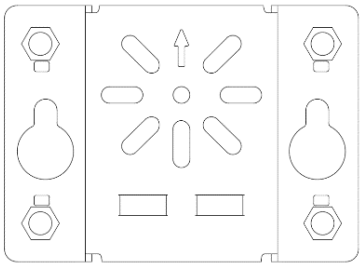


5. The installation is complete, and proceed to “3.6 Connect Cable”.

3.5 Install on Wall

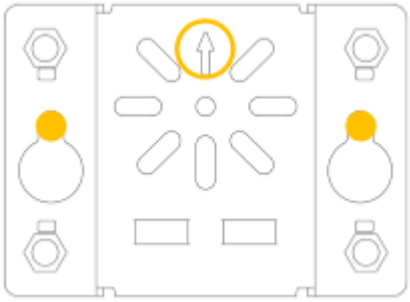
Ensure that the wall can bear at least four times the weight of the gNB. If the wall mounting is adopted, the wall mounting bracket is shown in Figure 3-7.

Figure 3-7 Wall Mounting Bracket



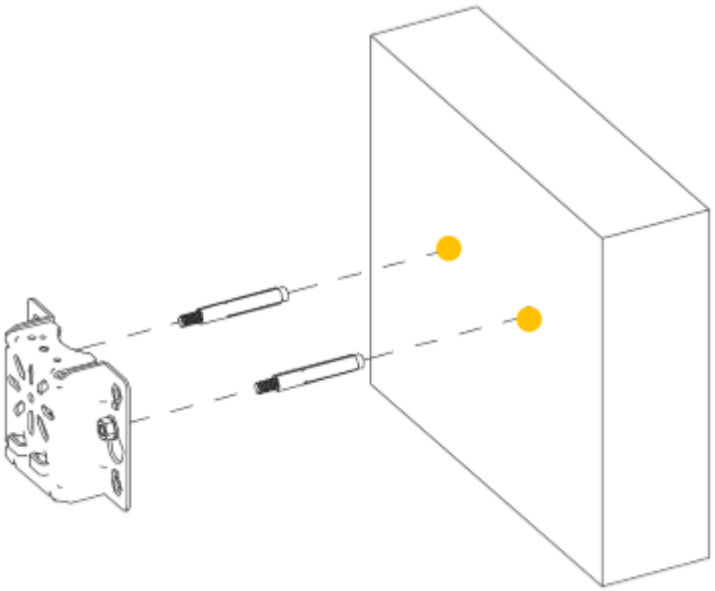
Following will introduce how to fix the gNB on a wall.

1. Put the wall mounting bracket on the wall with the arrow pointing up and mark the drilling locations using a pencil or marker.

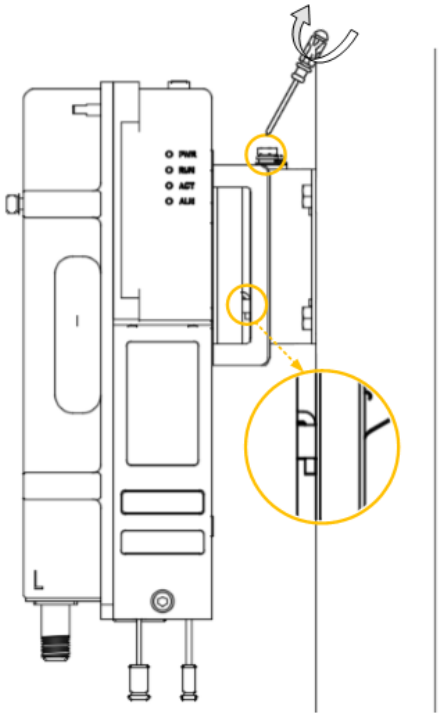


2. Drill two .4in/10mm diameter by 2.8in/70mm deep holes in the wall at the marked locations.

3. Insert expansion bolts, and then hang the wall mounting bracket on the expansion bolts, fasten with flat washers, spring washers and nuts.



4. Align the two pins on the gNB bracket with the pin holes on the wall mounting bracket and vertically put the gNB from top to bottom until the hook on the gNB is stuck firmly into the corresponding slot on the wall mounting bracket. Finally tighten the screws on the top of the bracket using a cross screwdriver.



5. The installation is complete, and proceed to “3.6 Connect Cable”.

3.6 Connect Cables

3.6.1 Cable Laying Requirements

General requirements:

- Bending radius of feeder cable: 7/8” > 250mm, 4/5” > 380mm.
- Bending radius of jumper cable: 1/4” > 35mm, 1/2” (super soft) > 50mm, 1/2” (ordinary) > 127mm.
- Bending radius of power cable and grounding cable: > tripled of the diameter of the cable.
- The minimum bend radius of the optical fiber is the 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 laying requirements:

- 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 laying requirements:

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

3.6.2 Connect GPS Antenna

The top of the GPS antenna should avoid the frontal position of the directional antenna as far as possible. In the case of obstruction, it is recommended to pull away and install the GPS antenna, that is, the GPS antenna be installed in an open and lightning protected position.

1. Pass the GPS jumper through a cold shrink tube.
2. Connect one end of the GPS jumper to the GPS interface and fasten.
3. Push the cold shrink tube to the top joint, and pull out the strip.
4. Take out another cold shrink tube, and pass through the GPS jumper from the other end.

   NOTE: Baicells does not provide the waterproof materials for the peer, therefore customers need to prepare and carry out the waterproof operation by themselves.

5. Connect the other end of the GPS jumper to the GPS antenna and fasten.
6. Push the cold shrink tube to the GPS antenna joint, and pull out the strip.

3.6.3 Connect RF Cables

CAUTION:

It is strictly prohibited to activate the cell and transmit RF if the antenna feed system is not connected properly. The wireless signal transmission power of the outdoor gNBs is large, if the gNB transmits without the antenna feed system,

which may cause injury to the body of the construction personnel and the damage of RF power amplifier devices.

1. Take off dust caps of the **ANT0** and **ANT1** interfaces.
2. Pass one end of the RF cable through a cold shrink tube.
3. Connect RF cables to the **ANT0** and **ANT1** interfaces on the gNB, and tighten them with wrench.
4. Push the cold shrink tube to the top joint and pull out the strip.
5. Take out another cold shrink tube, and pass through the RF cable from the other end.

   NOTE: Baicells does not provide the waterproof materials for the peer, therefore customers need to prepare and carry out the waterproof operation by themselves.
6. Connect the other end of the RF cables to the external antenna.
7. Push the cold shrink tube to the antenna connector, and pull out the strip.

3.6.4 Connect Optical Fiber Cable

The optical interface is located in the gNB's wiring cavity. First, you should unscrew screws on the cover of the gNB's wiring cavity and open the wiring cavity.

1. Connect the optical fiber to **OPT** interface in the wiring cavity.
2. Lay the optical fiber along the wire groove, and stretch out the wiring cavity from **OPT** hole respectively.

   The redundant optical fiber should enwind neatly.
3. Connect the other end of the optical fiber to the optical distribution frame.

3.6.5 Connect Ethernet Cable

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

   Use hose sleeves to protect network cables.
3. Connect the other end of the network cable to the switch.

CAUTION: The optical fiber/Ethernet cable must be connected first, and then connect the power cable.

3.6.6 Connect Power Cable

The power cable must meet the following requirements

- It is recommended to install an air switch in the distribution box for lightning protection and leakage protection, or a socket or plug with a fuse.
- The power cord needs to be protected by a hose sleeve or wiring tube.
- The distribution box should be grounding and have leakage protection.
- The length of the AC power cord and the DC power cord must be kept below 330 ft/100m.

Since the length of cable needed for power supply varies from site to site, the customer need to make the power cable according to the actual measurements of the installation site. Strip .47in/12mm insulating layer with a wire stripper to reserve the conductor for connection.

The connection steps for the power cable are as follows.

1. Assemble the power plug on the power supply side.

   According to the installation requirements of installation, the gNB supports DC or AC power supply. The power plug should be self-prepared by the customer according to the local standards.

   - If both the gNB side and the power supply side are DC, assemble the plug according to the sign and instructions on the plug.
   - If both the gNB side and the power supply side are AC, assemble the plug according to the sign and instructions on the plug.
   - If the gNB side is DC and the power supply side is AC. The power adaptor must be used. The power plug of the power side is installed at 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.

     The power adaptor is shown in the following figure.

ATTENTION: If the power adaptor is used, it must be connect to a surge arrester and grounding. It must be placed in a waterproof distribution box.

2. Assemble the power terminal on the gNB side.

   The gNB supports DC or AC power supply. The gNB provides power terminals based on the power supply mode selected by the customer.

   - DC power supply

     Refer to the labels on the power terminal for connecting the positive terminal (+) and negative terminal (-) to the corresponding terminals separately, and tighten the screws.

   - AC power supply

     Refer to the labels on the power terminal for connecting the live wire, neutral wire, and ground wire to the corresponding terminals separately, and tighten the screws.

3. Connect the power terminal to the **PWR** interface in the wiring cavity.
4. The power cable lays along the lint slot, and stretch out the wiring cavity from the **PWR** hole.
5. The other end connects to a reliable AC power supply.

   If the power plug is outdoors, note that above requirements for power distribution box.

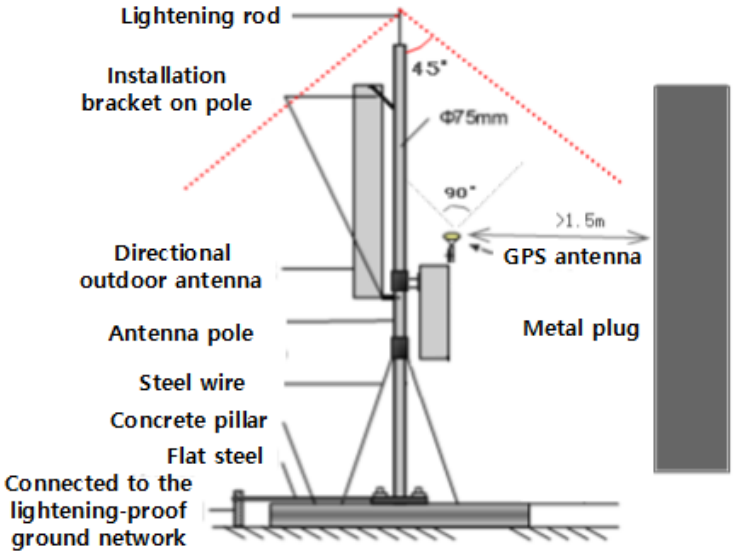
6. After the cable connection is complete in the wiring cavity, tighten the screws on the cover to close the wiring cavity using M4 cross screwdriver.

3.6.7 Connect Ground Cable

3.6.7.1 Pole Grounding

The purpose of the pole grounding is to protect the equipment in the station from the damage of lightning overvoltage as far as possible. However, the interfaces between the gNB and the outside world mainly include power system, grounding system, antenna feeder and lightning receiving device, and signal line. Therefore, the damage caused by lightning mainly comes from the voltage difference between the equipment in the gNB and one or more of the four interfaces. The pole grounding is shown in Figure 3-8.

Figure 3-8 Pole Grounding



1. The installation position of the grounding bar shall 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 meets 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 code or binding tape with a fixed spacing of 0.3m. The appearance should be straight and beautiful.
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 × 4mm 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.

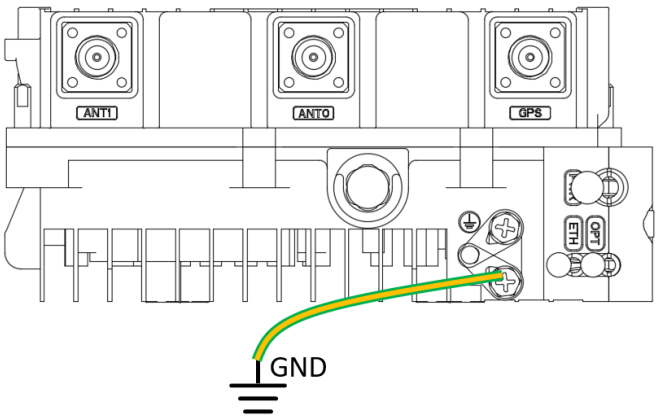
7. The grounding electrode of the self-built grounding grid for the outdoor antenna of the tunnel must meet the design requirements. The buried depth of the grounding electrode and the welding quality of the flat iron meet the specification requirements. In principle, the buried depth of the grounding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

8. The gNB 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.

3.6.7.2 gNB Grounding

Prepare the grounding cable according to the actual measurements and requirements of the specific installation site. The Aurora243 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.

Figure 3-9 Grounding Screws

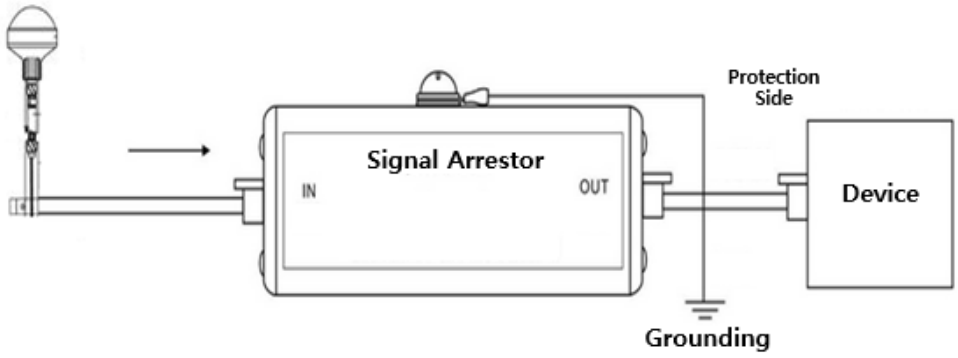


1. Unscrew one grounding screw, connect one end of the ground cable to the grounding screw, and fasten it again.
2. Repeat step 1 for the second grounding screw.
3. Once the gNB is installed at the outdoor location, the other end of the ground cable needs to connect to a good grounding point.

3.6.7.3 GPS Antenna Grounding

If the length of GPS antenna is more than 5 meters, it is recommended to extend the installation distance. It is suggested to carry out lightning protection of GPS antenna, add lightning protector, and connect the lightning protector to the grounding bar, as shown in Figure 3-10.

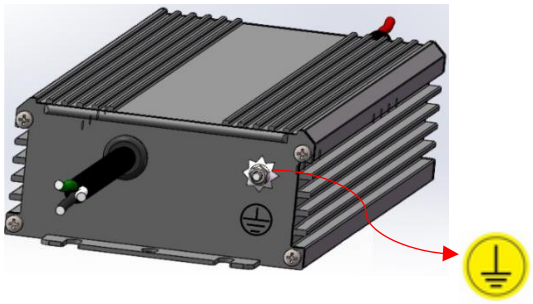
Figure 3-10 GPS Grounding



3.6.7.4 (Optional) Power Adapter Grounding

The adapter ground terminal is connected to the ground bar conforming to the local standard through the ground wire, as shown in Figure 3-11.

Figure 3-11 Power Adapter Grounding



3.7 Maintenance Chamber Waterproofing

When all the installation has been completed, it is necessary to close the maintenance chamber of the equipment and play the role of waterproof at the same time.

1. Clamp the power cord to the wire position and seal the wire diameter 9 ± 1mm.
2. Put the pigtail / network cable on the wire, and seal the wire diameter 7 ± 1mm.

3.8 Power on to Check LED Status

Power on the gNB, and wait a few minutes while the gNB boots up. Per the previous Table 1-2 in “1.3 Appearance”, check that the LED indicators are lighting as expected.

4. Attentions

4.1 FAQ

1. After the device is connected with the power line, the PWR of the device will not be displayed when it is powered on.

   1） Maybe the power line is not connected well, and the contact is poor.

   2） There is no power in the circuit.

   3） Poor contact of equipment power interface.

2. How to connect the antenna feeder

   1) ANT0 is the main channel and ANT1 is the secondary channel.

3. GPS has been out of sync

   1) The antenna is not installed in an open place.

   2) The antenna is blocked, which affects the search.

   3) There are strong interference sources around the installation location, such as large transformer station and high-power motor fan.

   4) Installed under the front cover of wireless antenna, strong signal interference and so on.

   5) GPS satellite search is slow and takes a long time. The number of satellites and signal strength can be observed in the maintenance page.

4. How to choose the position of holding pole in the roof

   1) Not near the edge.

   2) The position of non-bearing beam cannot be selected.

   3) Do not choose the side close to the barrier, you need to choose the most open position.

5. The coverage of gNB signal is not ideal after opening

   1) Check if the power is full in the base station configuration.

   2) Check whether the equipment has standing wave alarm. If there is any alarm, please handle it in time.

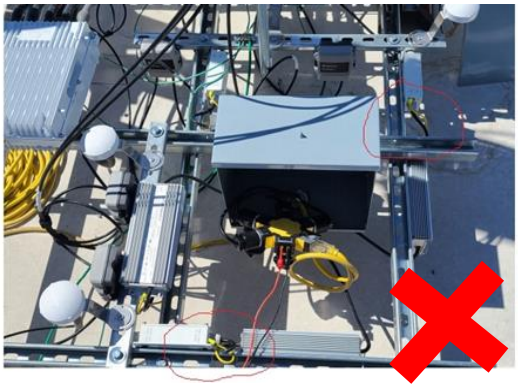
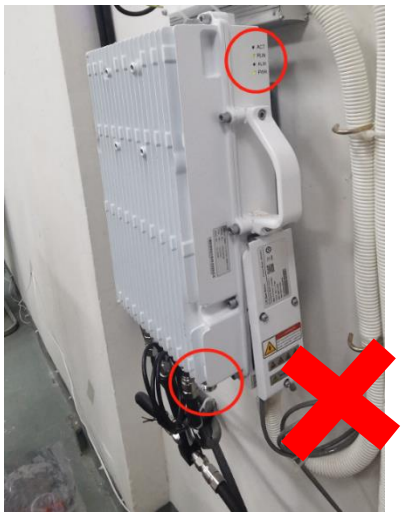
   3) Check whether the RF frequency band of the equipment is consistent with that of the antenna.

4) Check whether the dip angle planning of the base station is reasonable.

5) Whether there is blocking in antenna coverage direct vision.

4.2 Common Installation Errors

	
GPS antenna blocked	Disordered wiring
	
The holding pole lightning rod is not led to the ground bar	The GPS antenna is mounted on the front of the RF antenna

	
Without the lightning rod	Disordered wiring of distribution box
	
Power line and signal cable are crossed	Multiply the grounding point
	
The RF feed system does not connect, the cell is activated and RF transmits signal	