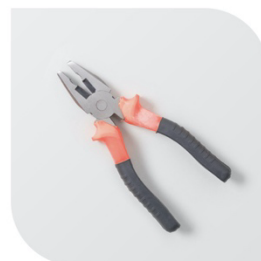


Aurora452/454

Outdoor 4x40/60W gNB

Installation Guide



About This Document

This document is intended for personnel who will be installing the Baicells Aurora452/454 Outdoor 4x40/60W gNB product. This Baicells equipment is based on 3GPP 5G New Radio (NR) technology. The product overview is followed by the procedures for proper installation. Please be advised that only personnel with the appropriate electrical skills and experience should install this device.

Copyright Notice

Baicells Technologies, Inc., copyrights the information in this document. No part of this document may be reproduced in any form or by any means without the prior written consent of Baicells Technologies, Inc.

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	SMEs/Contributors	Author/Editor
24 Nov. 2025	01	Initial release.	Zheng Xinkun	Yang Yanan

Contact Us

	Baicells Technologies Co., Ltd.	Baicells Technologies North America, Inc.
	China	North America
Address	9-10F, 1st Bldg., No. 81 Beiqing Road, Haidian District, Beijing, China	555 Republic Dr., #200, Plano, TX 75074, USA
Phone	400-108-0167	+1-888-502-5585
Email	contact@Baicells.com or support@Baicells.com	sales_na@Baicells.com or support_na@Baicells.com
Website	www.Baicells.com	https://na.Baicells.com

Table of Contents

1. Overview	1
1.1 Introduction	1
1.2 Highlights	1
1.3 Appearance	2
1.4 Technical Specification	4
1.4.1 Technology	4
1.4.2 Performance	5
1.4.3 Interface	6
1.4.4 Modulation Levels (Adaptive, DL LOS)	7
1.4.5 Physical	7
2. Installation Preparation	9
2.1 Support Materials	9
2.2 Installation Tools	10
2.3 Construction Safety	11
2.4 Installation Environment	11
2.4.1 Location Requirements	11
2.4.2 Environmental Requirements	13
2.5 Lightning & Grounding Protection	13
2.6 Weatherproofing	14
3. Installation	15
3.1 Unpacking	15
3.2 Installation Procedure	15
3.3 Install GPS Antenna	15
3.4 Install on Pole	17
3.5 Install on Wall	19

3.6 Connect Cables.....	21
3.6.1 Cable Laying Requirements.....	21
3.6.2 Connect GPS Antenna Cable	22
3.6.3 Connect RF Cables.....	22
3.6.4 Connect Ethernet Cable	23
3.6.5 Connect Optical Cable.....	23
3.6.6 Connect Power Cable	24
3.6.7 Connect Ground Cable	26
3.7 Power on to Check LED Status	29
4. Precautions	30
4.1 FAQ.....	30
4.2 Common Installation Errors	31
Appendix A Terminology & Acronyms	34

List of Figures

Figure 1-1	Aurora452/454 Appearance	2
Figure 2-1	Weatherproofing	14
Figure 3-1	Installation Process	15
Figure 3-2	GPS Installation Requirements	16
Figure 3-3	GPS Antenna Installation.....	17
Figure 3-4	Installation Height.....	17
Figure 3-5	Wall Bracket	19
Figure 3-6	Connection Order for Ethernet Cable	23
Figure 3-7	Connection Order for Optical Cable	24
Figure 3-8	Connection Sequence for Power Cables.....	25
Figure 3-9	Power Terminal.....	25
Figure 3-10	Pole Grounding.....	26
Figure 3-11	Grounding Screws	28
Figure 3-12	GPS Grounding	28

List of Tables

Table 1-1	Aurora452/454 Interface Description	2
Table 1-2	Aurora452/454 Interface Indicators.....	3
Table 2-1	Supporting Materials	9
Table 2-2	Environmental Requirements.....	13

1. Overview

1.1 Introduction

The Baicells Aurora 452 is an advanced outdoor 5G sub-6 GHz integrated all-in-one base station (gNB), which is designed and developed based on an up-to-date Qualcomm 5G SoC solution. This 4 × 40 W gNB has low power consumption, is subminiature, and is easy to maintain.

This product helps operators effectively enhance 5G network coverage, improve network capacity, eliminate coverage blind spots, and reduce system power consumption.

1.2 Highlights

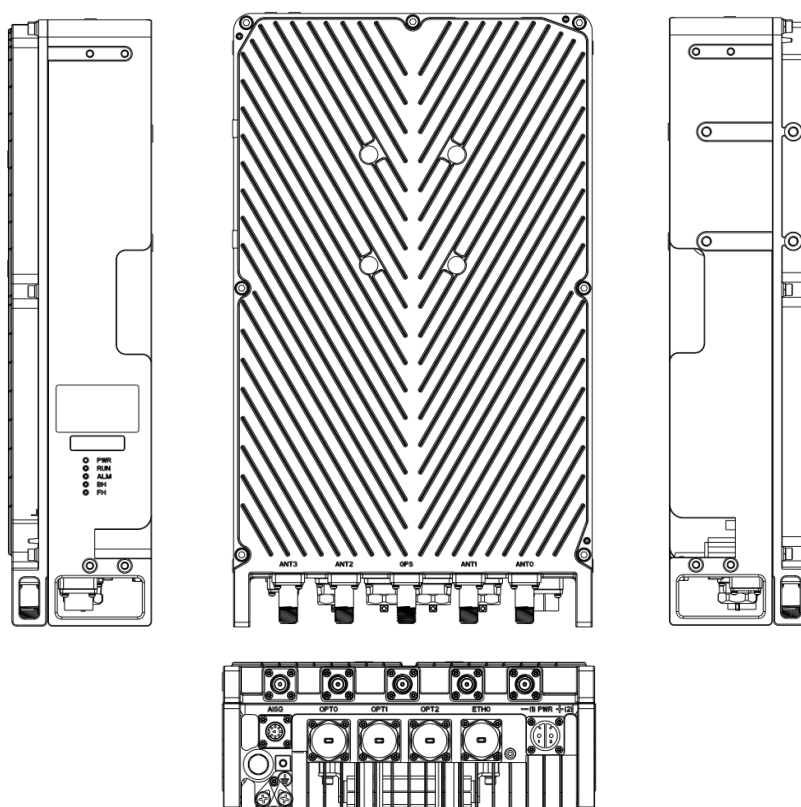
- Standard NR FR1 Bands n50, n40, n41, n78
- Complies with 3GPP Releases 16 and 17
- GUI-based local and remote Web management
- Supports 100 MHz carrier bandwidth for n40/41/78 and 80 MHz carrier bandwidth for n50, as well as two-carrier aggregation*
- Peak rate: Up to 1500 Mbps DL and 660 Mbps UL with 100 MHz bandwidth
- Supports up to 1200 users
- Supports Standalone (SA) mode
- Supports SCTP control (IKE SCTP)
- Integrated small cell form factor for quick and easy installation
- Supports flexible xHaul
- Highly secure with equipment certification against potential intrusion risk
- Supports TR-069 network management interface
- Lower power consumption reduces OPEX. The gNB can be powered easily by a compact outdoor smart UPS

* Planned for future release

1.3 Appearance

The appearance of Aurora452/454 is shown in Figure 1-1.

Figure 1-1 Aurora452/454 Appearance



The Aurora452/454 interfaces are described in Table 1-1.

Table 1-1 Aurora452/454 Interface Description

Interface	Description
ANT0~ANT3	Connect to external antenna 0 to antenna 3, N-type connector(mini-DIN for n40)
GPS	GPS antenna interface, N-type connector
AISG	RS485 interface, compliant with the AISG 2.0 standard
OPT0	Optical interface 0 (SFP+)
OPT1	Optical interface 1 (SFP+)

Interface	Description
OPT2	Optical interface 2 (SFP+), used for backhaul
ETH0	RJ-45 interface
PWR	Power interface: -48VDC (-40VDC to -57VDC)

The Aurora452/454 interface indicators are described in Table 1-2.

Table 1-2 Aurora452/454 Interface Indicators

Identity	Color	Status	Description
PWR	Green	Steady ON	Power on.
		OFF	No power supply.
RUN	Green	Steady ON	The device has been activated. (The device transmits power normally.)
		Slow flash: 1 s ON, 1 s OFF	The device has been deactivated. (The device does not transmit power.)
ALM	Red	Steady ON	A system alarm exists.
		OFF	No alarm, the device is normal.
BH	Green	Steady ON	Data link is normal.
		OFF	Data link is abnormal.
FH	Green	Steady ON	Data link is normal.
		OFF	Data link is abnormal.

1.4 Technical Specification

1.4.1 Technology

Item	Description
Standard	5G NR TDD (3GPP R16 and R17* compliant)
TDD UL/DL Configuration	5ms periodicity ($\mu=1$): DDDDD+DDSUU 2.5ms dual periodicity ($\mu=1$): DDDSU+DDSUU 2.5ms single periodicity ($\mu=1$): DSUUU
Frequency Band	n40 (2300 MHz – 2400MHz)* n41 (2496 MHz – 2690MHz)/(2545 MHz - 2645 MHz)* n50 (1432 MHz – 1512 MHz) n78L (3300 MHz – 3600 MHz) n78H (3500 MHz - 3800 MHz)
Channel Bandwidth	n40: 100MHz n41: 10/20/30/40/50/60/70/80/90/100MHz n50: 80MHz n78: 10/20/30/40/50/60/70/80/90/100MHz
Multiplexing	4x4 MIMO (DL: 4L, UL: SU 2L, and MU 4L*)
Security	Radio: Null/SNOW 3G/AES-128/ZUC Backhaul: IPsec (X.509 AES-128, AES-256, SHA-128, SHA-256)
Voice	VoNR/ViNR/EPS-FB
SON*	Self-Organizing Network - Automatic Neighbor Relation (ANR) - PCI conflict detection
VSWR	Support detection

Item	Description
Maintenance	- Local/Remote Web maintenance - Online status management - Performance statistics - Fault management - Local/Remote software upgrade - Logging - Connectivity diagnosis - Auto startup
Network Management	IPv4/IPv6, HTTP/HTTPS, TR-069, SSH
VLAN/VxLAN	802.1Q/VXLAN
Power Control	UL Open-loop/Closed-loop Power Control, DL Power Allocation (3GPP TS 38.213 compliant)
Quality of Service	Compliant with the 3GPP standard 5G QoS Identifier (5QI)
ARQ/HARQ	Supported
RET support	AISG 2.0, 20–30 V DC, RS-485, 3GPP TS 25.461
Synchronization	GNSS

1.4.2 Performance

Item	Description		
Peak Data Rate	100 MHz	DL (Mbps)	UL (Mbps)
	5ms periodicity (DDDDD+DDSUU, 6:4:4)	1500	230
	2.5ms dual periodicity (DDDSU+DDSUU, 10:2:2)	1300	330
	2.5ms single periodicity (DSUUU, 10:2:2)	660	660
	80 MHz	DL	UL (Mbps)**

Item	Description		
		(Mbps)	with 256QAM 2Layers
	5ms periodicity (DDDDD+DDSUU, 6:4:4)	1100	168(80MHz) 125(60MHz)
	2.5ms dual periodicity (DDDSU+DDSUU, 10:2:2)	1000	252(80MHz) 188(60MHz)
	2.5ms single periodicity (DSUUU, 10:2:2)	550	504(80MHz) 376(60MHz)
User Capacity	Up to 1200 users		
MAX Deployment Range	10+ km		
Latency	Round-trip delay (RTD) less than 10 milliseconds		
Receive Sensitivity	-98 dBm (per channel)		
Modulation	UL: MCS0 (QPSK) to MCS27 (256QAM) DL: MCS0 (QPSK) to MCS27 (256QAM)		
Transmit Power Range	37dBm to 46 dBm per channel (combined +52dBm, configurable) (1 dB interval)		

NOTE: The receiving sensitivity test method is specified in 3GPP TS 38.104 and is based on a 20 MHz bandwidth and FRC A1-5 in Annex A.1 (QPSK, R=1/3, 51 RBs).

1.4.3 Interface

Item	Description
Ethernet Interface	1 x 2.5GE RJ-45 3 x 10GE optical interface (SFP+)
Power Supply	-40VDC ~ -57VDC, nominal -48VDC

Item	Description
LED Indicators	5 x status LED PWR/RUN/ALM/BH/FH
RF Antenna	4T4R external high gain antenna with N-Type connectors (mini-DIN for n40), or integrated antenna*
GNSS Antenna	External GNSS antenna, N-Type connector

1.4.4 Modulation Levels (Adaptive, DL LOS)

MCS	Modulation Scheme	RSRP (dBm)
20~27	256QAM	$-90 \leq \text{RSRP} < -50$
11~19	64QAM	$-102 \leq \text{RSRP} < -90$
5~10	16QAM	$-107 \leq \text{RSRP} < -102$
0~4	QPSK	$-117 \leq \text{RSRP} < -107$

1.4.5 Physical

Item	Description
Surge Suppression	Power interface: Differential mode: 2 kA Common mode: 4 kA
Power Interface Lightning Protection	Differential mode: ± 10 kA Common mode: ± 20 kA
MTBF	≥ 150000 hours
MTTR	≤ 1 hour
Ingress Protection Rating	IP66
Operating Temperature	-40°F to 131°F / -40°C to 55°C
Storage Temperature	-58°F to 149°F / -50°C to 65°C
Humidity	5% to 95% RH
Atmospheric Pressure	70 kPa to 106 kPa

Item	Description
Power Consumption	Maximum: 500 W
Weight	18 kg
Dimensions (HxWxD)	527 × 308 × 123 mm
Installation	Pole or wall mount

* Planned for future release.

** According to UE's capability.

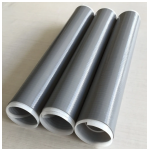
2. Installation Preparation

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
AC cord		An AC power cable is provided with the device. If the length is insufficient, the customer needs to prepare it. It is suggested that AWG11 is used. The cord is three-core cable and the length is less than 100 meters.
DC cord		(Optional) If the power supply is DC, a DC power cable must be prepared. The diameter of power cable must be AWG11 or greater. The cord is two-core cable and the length is less than 100 meters.
RF antenna cable		50 ohm feeder, 1/2 jumper
Optical fiber		Armored optical fiber It is suggested that the diameter of the cable is 7 ± 1 mm.
Optical module		SFP optical module
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.

Item	Figure	Description
Ground cable		If the length of lead is more than 10 meters, a ground cable with 16mm ² cross section should be used. If the length of lead is less than 10 meters, a ground cable with 10mm ² cross section should be used.
Pole		The pole should be a hot-dip galvanized steel pipe with a diameter between 40 mm and 100 mm. 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. However, the customer needs 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 screwdriver	Cable vice	Tape measure
				
5mm L-shape allen wrench	T7 screwdriver head	Ladder	compass	fixed pulley
				
multimeter	Square crimping pliers			

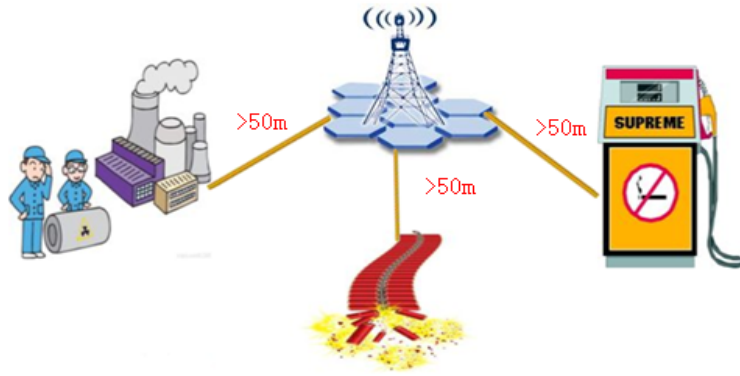
2.3 Construction Safety

1. The installation personnel must receive the required safety training and hold the corresponding qualifications.
2. Before installation, the installation personnel must be equipped with appropriate personal protective equipment, such as a safety helmet, safety belt, reflective clothing, gloves, and safety shoes.
3. Before installation, the installation personnel must cross-check each other to ensure that the above preparations have been completed.

2.4 Installation Environment

2.4.1 Location Requirements

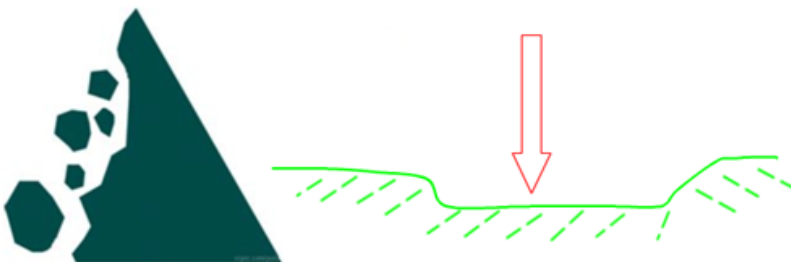
1. Avoid warehouses and gas stations containing flammable or explosive materials, as well as locations where fires or explosions are likely to occur during production. Do not install gNBs near dangerous industries and enterprises. Stay away from high voltage lines and railroads.



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 installing 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 installing on mountains. The mountain interference range is large, therefore the frequency reuse will be affected. Installing gNB on high mountains in rural areas is often not good for the coverage of towns and villages in small basins.



5. Avoid installing 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 mining areas or places that are prone to flooding or landslides
7. In urban areas, 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 areas, 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 where co-channel interference exists.
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

Table 2-2 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 DC voltage	-57VDC to -42VDC	-48VDC

2.5 Lightning & Grounding Protection

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

- The yellow-green ground wire must have a cross-sectional area of at least 10 mm².
- 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 connections between the grounding points and the ground bar must 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, then pull out the strip.
4. Ensure the cold shrink tube is tightly fitted with the connection.

Figure 2-1 Weatherproofing



CAUTION: Ensure the cold shrink tube remains intact and is not cut for use.

3. Installation

3.1 Unpacking

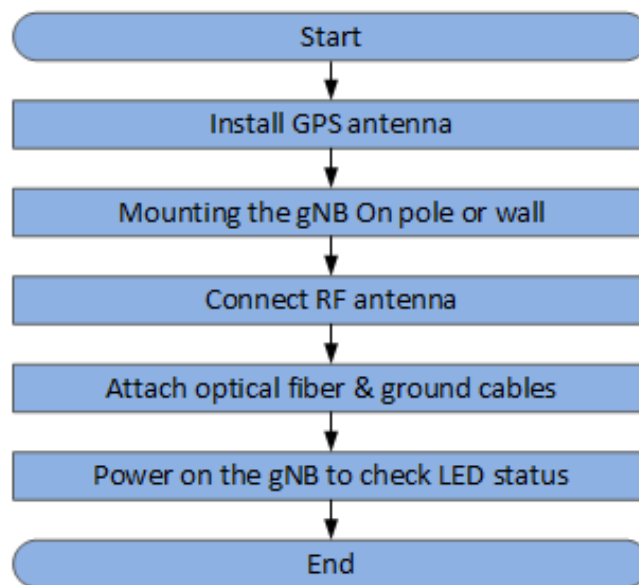
Before opening the box, make sure the package is in good condition, undamaged and not wet. During unpacking, avoid damage caused by impacts or excessive force.

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.

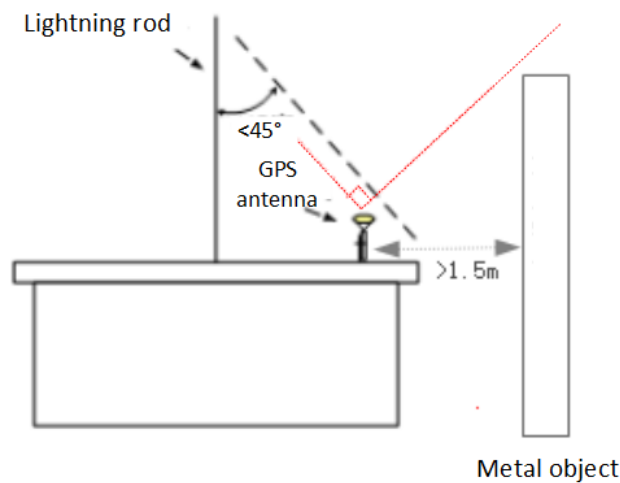
Figure 3-1 Installation Process



3.3 Install GPS Antenna

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

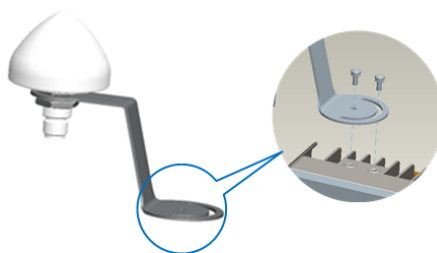
Figure 3-2 GPS Installation Requirements



- 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 GPS antenna system is assembled in manufacturing before packing. 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

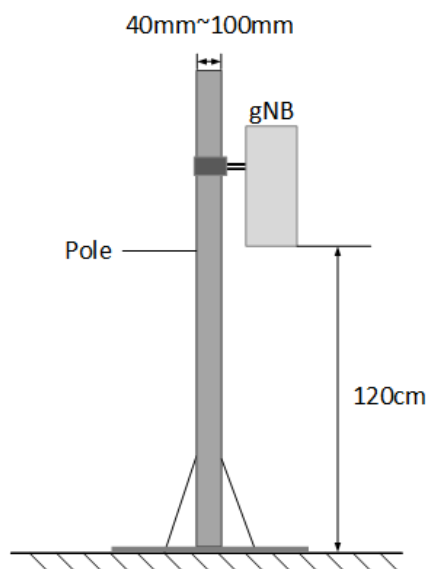


NOTE: The gNB may use different GPS antenna models, so the GPS antenna may differ from the one shown above. However, the installation steps for mounting it on the gNB are the same.

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.

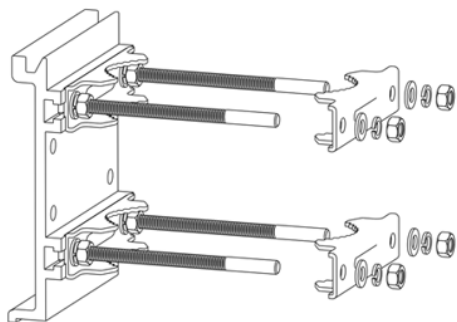
Figure 3-4 Installation Height



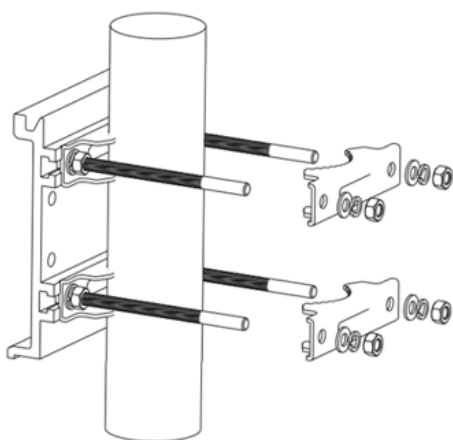
The brackets were pre-assembled during manufacturing before packing. They consist of two parts, one of which is pre-assembled on the back of the device.

The following steps describe how to secure the pre-assembled gNB to a pole.

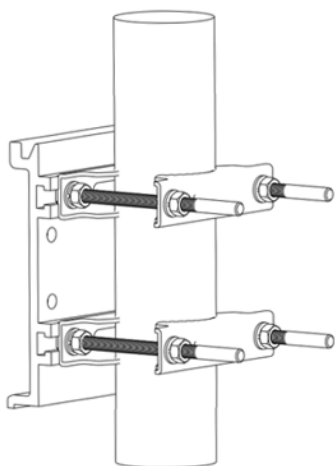
1. Remove the two clamps from the assembled bracket.



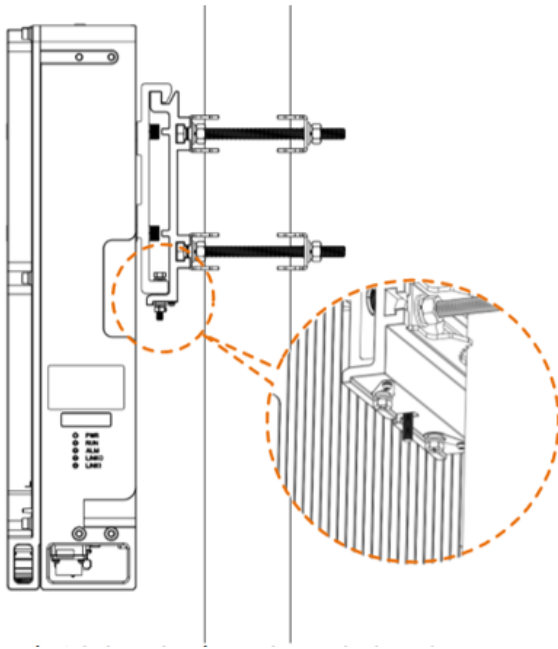
2. Place the bracket against the pole and reinstall the two clamps. Ensure that the flat washers, spring washers, and nuts remain in their original order.



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



4. Hang the gNB (with bracket) on the pole bracket. Ensure that the screw on the bottom of the bracket clips into the groove on the pole bracket, and fasten the screws on both sides.

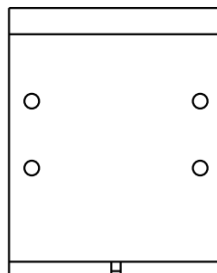


5. The installation is complete, then proceed to “3.6 Connect Cables”.

3.5 Install on Wall

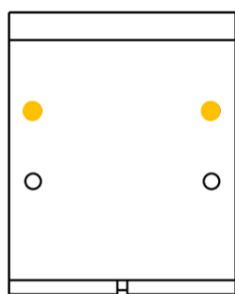
Disassemble the mounting bracket first, leaving only the wall bracket, as shown in Figure 3-5.

Figure 3-5 Wall Bracket



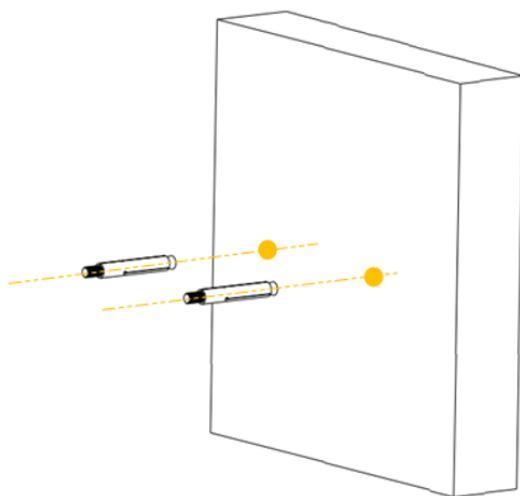
The following steps describe how to secure the pre-assembled gNB to a wall.

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

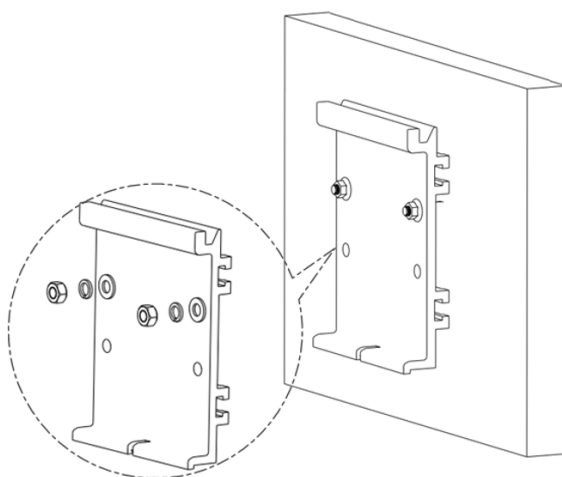


Ensure that the groove of the bracket is at the bottom.

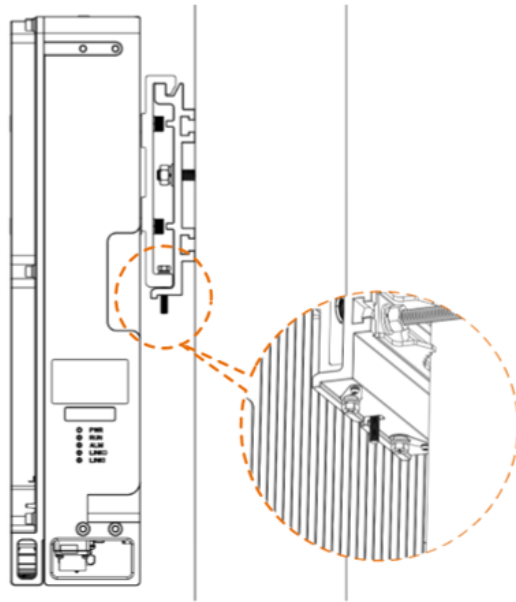
2. Drill two holes at the marked locations and install expansion bolts.



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



4. Refer to the pole-mounting steps to hang the gNB on the wall bracket.



5. The installation is complete, then proceed to “3.6 Connect Cables”.

3.6 Connect Cables

3.6.1 Cable Laying Requirements

General requirements:

- Minimum bending radius for repeated bends: 7/8" feeder cable: ≥ 250 mm; 4/5" feeder cable: ≥ 380 mm
- Bending radius of jumper cable: 1/4" > 35 mm, 1/2" (super soft) > 50 mm, 1/2" (ordinary) > 127 mm.
- Bending radius of the power cable and grounding cable: greater than three times the cable diameter.
- The minimum bend radius of the optical fiber is 20 times the fiber diameter.
- Bind the cables according to cable type. Intertwining and crossing are prohibited.
- 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 excess optical fiber must be neatly coiled on the dedicated device.

Grounding laying requirements:

- The grounding cable must connect to the grounding point.
- The grounding cable must be separated from the signal cables by a sufficient distance to avoid signal interference.

3.6.2 Connect GPS Antenna Cable

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, then pull out the strip.
4. Take out another cold shrink tube, then 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, then 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 **ANT3** interfaces.
2. Pass one end of the RF cable through a cold shrink tube.
3. Connect RF cables to the **ANT0** and **ANT3** interfaces on the gNB, then 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, then pass through the RF cable from the other end.
6. Connect the other end of the RF cables to the external antenna.
7. Push the cold shrink tube to the antenna connector, then pull out the strip.

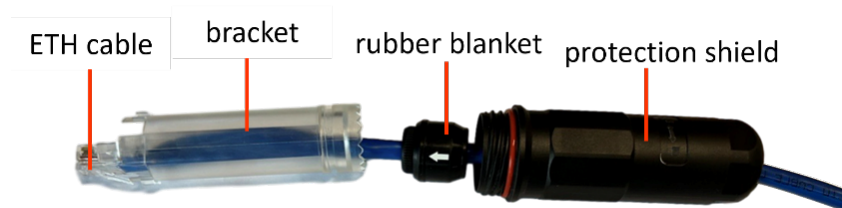
NOTE: The external antenna side interface at the other end of the feeder also needs waterproof treatment. Baicells does not provide the waterproofed materials for this part, so customers need to prepare and carry out waterproof operation by themselves.

3.6.4 Connect Ethernet Cable

Based on network planning, choose to use the network port (ETH0) to connect to the core network for data backhaul.

1. The Ethernet cable uses weatherproof connector for protection. Pass the Ethernet cable through the components of the waterproof connector, the connection order is shown in Figure 3-6.

Figure 3-6 Connection Order for Ethernet Cable



2. Connect the other end of the network cable to the switch.

CAUTION: The connection sequence of optical fibers/network cables and power cables must be strictly the same as that of optical fibers and then power cables.

3.6.5 Connect Optical Cable

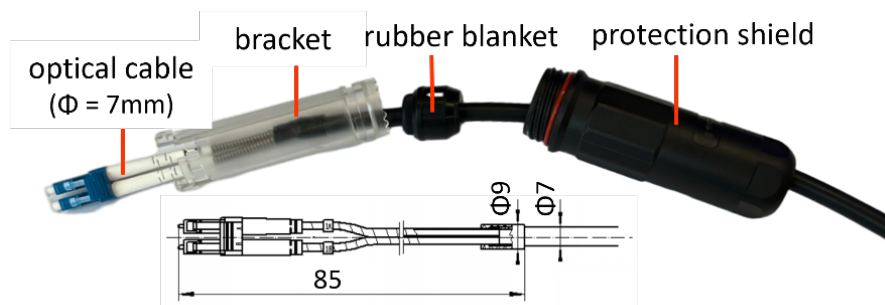
Based on network planning, choose to use the optical port (OPT0) to connect to the core

network for data backhaul.

If cascading is required, use **OPT2** as the backhaul interface and **OPT0** or **OPT1** as the cascading interface.

1. The optical cable uses weatherproof connector for protection. Pass the optical cable through the components of the waterproof connector, the connection sequence is shown in Figure 3-7.

Figure 3-7 Connection Order for Optical Cable



The excess optical cable should be neatly coiled.

2. Connect the other end to the optical fiber distribution frame.

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 grounded and have leakage protection.
- The length of power cord must be kept below 330 ft/100m.

Since the length of the cable needed for power supply varies from site to site, the customer needs to make the power cable according to the actual measurements of the installation site. Strip 0.47 in (12 mm) of insulation with a wire stripper to expose the conductor for connection.

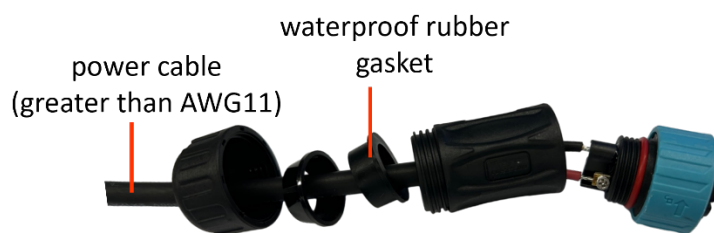
The connection steps for the power cable are as follows.

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

The gNB adopts -48VDC power supply. The power plug should be self-prepared by the customer according to the local standards. Refer to the markings and instructions on the plug to assemble it.

2. Assemble the power plug on the gNB side.
 - a) The power cable uses weatherproof connector for protection. Pass the power cable through the components of the waterproof connector, the connection sequence is shown in Figure 3-8.

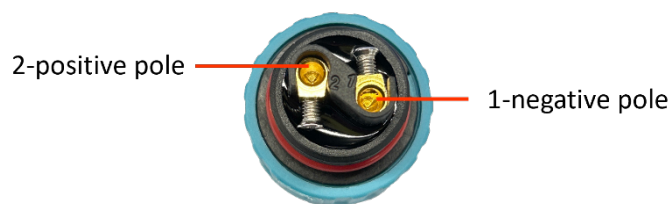
Figure 3-8 Connection Sequence for Power Cables



There are two types of waterproof rubber gasket. 14mm~16mm is suitable for AWG11 and above cable. When the power adapter is used, use 10mm~13mm waterproof rubber gasket, because the power adapter outlet cable is thinner.

- b) Refer to Figure 3-9 to connect the positive wire and negative wire.

Figure 3-9 Power Terminal



3. Connect the power cable to the **PWR** interface in the wiring cavity.
4. The other end connects to a reliable DC power supply.

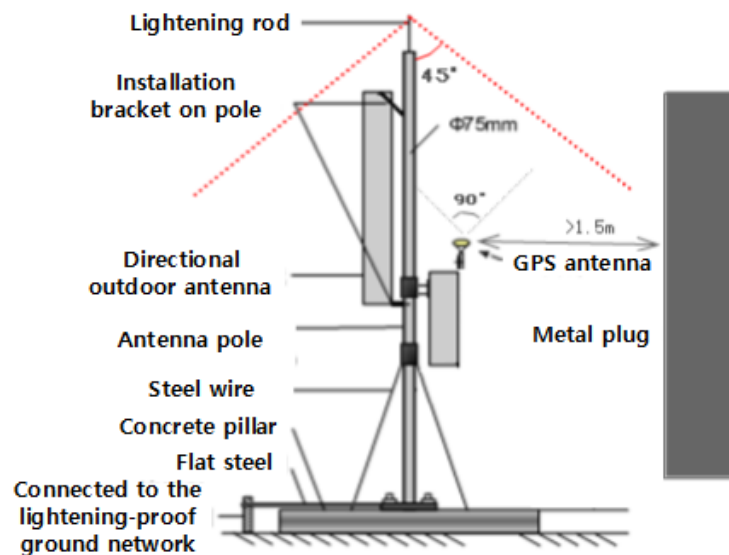
If the power plug is outdoors, comply with the above requirements for the power distribution box.

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 3-10.

Figure 3-10 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

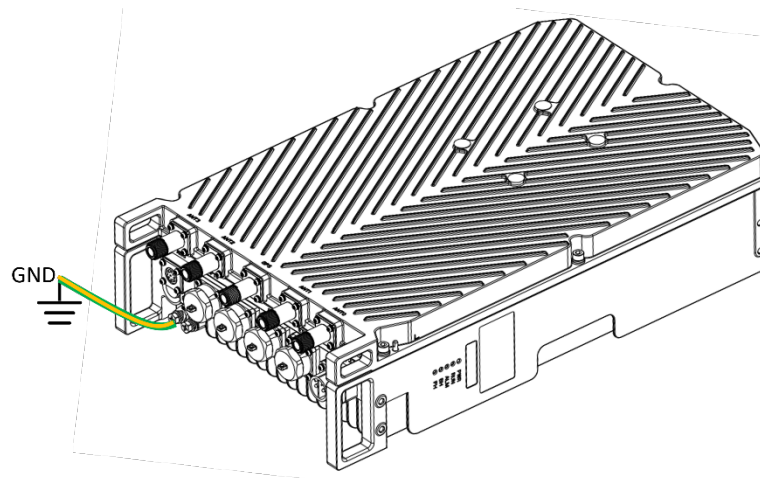
binding tape with a fixed spacing of 0.3m. The appearance should be straight and beautiful.

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, 300mm × 40mm × 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 Aurora452/454 has two grounding screws located on the bottom of the unit (Figure 3-11). Follow the steps below the figure to connect the ground cable.

Figure 3-11 Grounding Screws



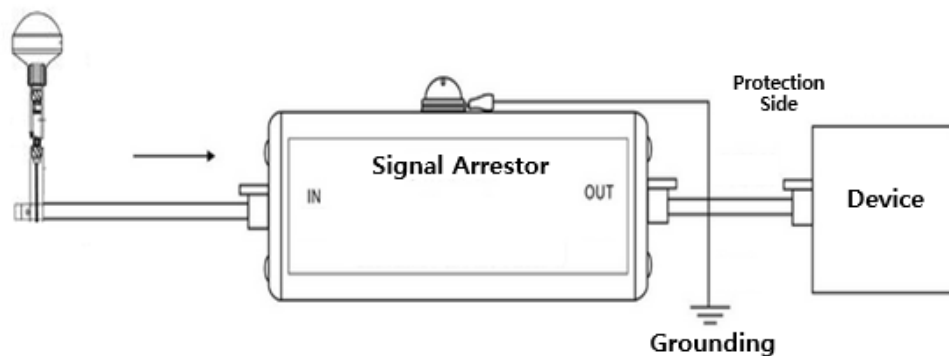
1. Unscrew one grounding screw, connect one end of the ground cable to the grounding screw, and fasten it again.
2. Repeat step 1 for the second grounding screw.

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 GPS antenna cable is longer than 5 meters, it is recommended to extend the installation distance. It is suggested to provide lightning protection for the GPS antenna, install a lightning protector, and connect the lightning protector to the grounding bar, as shown in Figure 3-12.

Figure 3-12 GPS Grounding



3.7 Power on to Check LED Status

Power on the gNB, then 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 lit as expected.

4. Precautions

4.1 FAQ

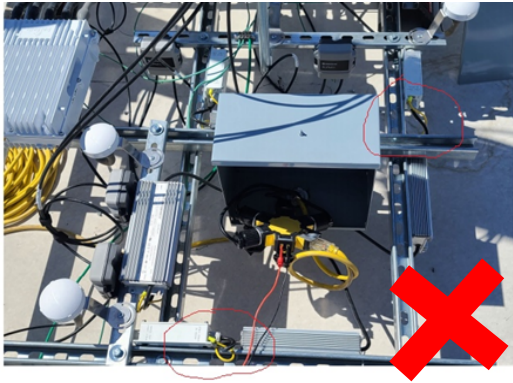
1. The PWR indicator does not light after the device is connected to the power supply.
 - 1) Maybe the power line is not connected well, and the contact is poor.
 - 2) There is no power in the circuit.
 - 3) Reverse connection of DC wire.
 - 4) The adapter does not work.
 - 5) Poor contact of equipment power interface.
2. How to connect the antenna feeder
 - 1) ANT0 is the main channel and ANT3 is the secondary channel.
3. The GPS is out of synchronization.
 - 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 substations and high-power motors or fans.
 - 4) The GPS antenna is installed directly in front of the 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 the mounting pole on the roof
 - 1) Not near the edge.
 - 2) The position of non-bearing beam cannot be selected.
 - 3) Do not select a position close to an obstruction. Select the most open position available.
5. The gNB signal coverage is not ideal after activation

- 1) Check whether the configured transmit power is set to the required level.
 - 2) Check whether the equipment has a VSWR alarm. If an alarm exists, address it promptly.
 - 3) Check whether the RF frequency band of the equipment is consistent with that of the antenna.
 - 4) Check whether the antenna downtilt plan of the base station is reasonable.
 - 5) Check whether there are obstructions in the antenna line of sight.
6. If a RET cable is used, no protection is required at the connector, and no cold shrink tube is needed.

4.2 Common Installation Errors

	
GPS antenna blocked	Disordered wiring

	
The lightning rod on the mounting pole is not connected to the grounding bar	The GPS antenna is mounted on the front of the RF antenna
	
No lightning rod is installed	Disordered wiring in the distribution box

	
Power line and signal cable are crossed	Multiple grounding points
	
The RF feeder system is not connected, but the cell is activated and transmitting.	

Appendix A Terminology & Acronyms

Acronym	Full Name
ANR	Automatic Neighbor Relation
ARQ	Automatic Repeat Request
CA	Carrier Aggregation
CC	Component Carrier
CSFB	Circuit Switched Fallback
DC	Dual Carrier
EPC	Evolved Packet Core
GPS	Global Positioning System
HARQ	Hybrid Automatic Repeat Request
IPsec	Internet Protocol Security
MIMO	Multiple-Input Multiple-Output
MME	Mobility Management Entity
MOCN	Multi-Operator Core Network
NLOS	Non-Line-of-Sight
OPEX	Operating Expense
PAP	Password Authentication Protocol

Acronym	Full Name
PCI	Physical Cell Identifier
PLMN	Public Land Mobile Network
QAM	Quadrature Amplitude Modulation
QCI	QoS Class Identifier
QoS	Quality of Service
QPSK	Quadrature Phase Shift Keying
RSRP	Reference Signal Received Power
SSH	Secure Shell
SON	Self-Organizing Network
TAC	Tracking Area Code