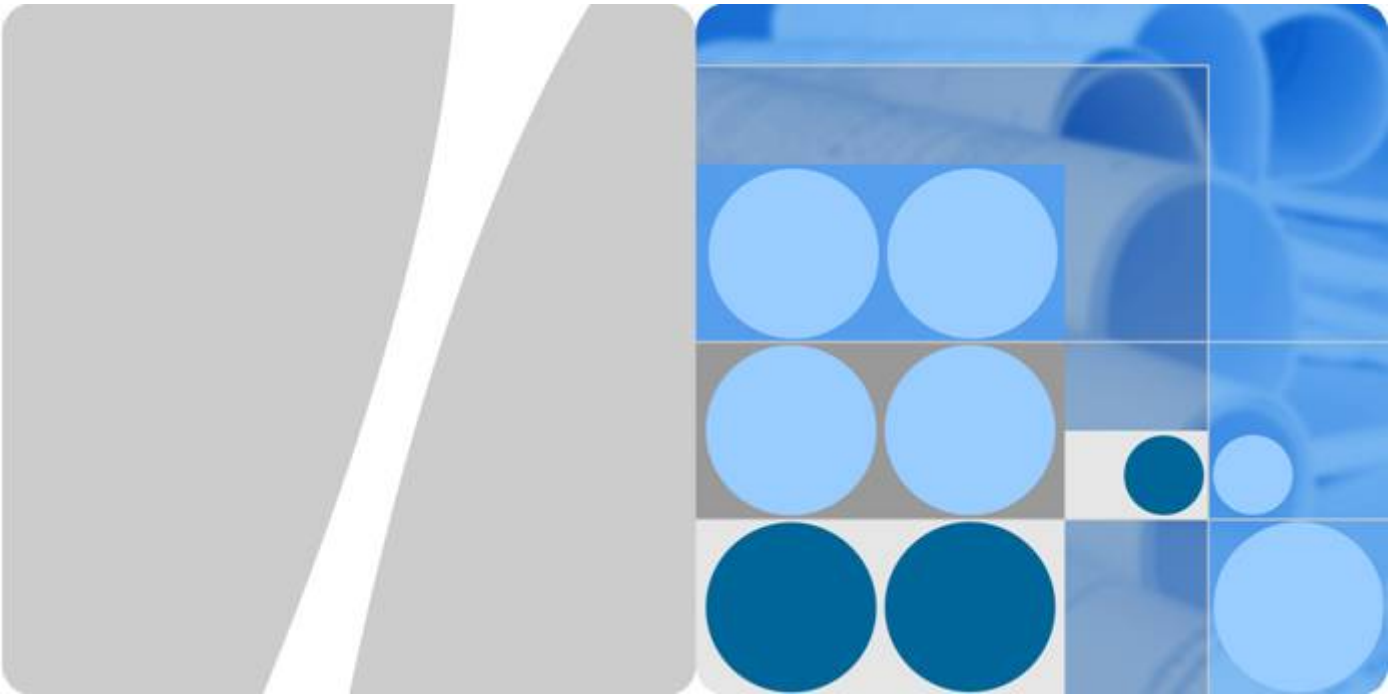

DBS3900 LampSite

Installation Guide

Issue 06

Date 2015-10-30

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About This Document

Overview

This document describes how to install the modules and cables for the BBU, DCU, RHUB, pRRU3901, pRRU3902, and pRRU3907 indoors. It also provides checklists for hardware installation.

NOTE

- Unless otherwise specified, BBU in this document refers to BBU3900 and BBU3910.
- DCU3900 in this document refers to DCU.
- RHUB3908 in this document refers to RHUB.
- Unless otherwise specified, pRRU in this document refers to pRRU3901, pRRU3902, and pRRU3907.

Product Version

The following table lists the product version related to this document.

Product Name	Solution Version	Product Version
DBS3900 LampSite	● SRAN10.1 and later versions ● RAN17.1 and later versions ● eRAN8.1 and later versions ● eRAN TDD 8.1 and later versions	V100R010C10 and later versions

Intended Audience

This document is intended for:

- BTS installation personnel

Contents

1 Changes in DBS3900 LampSite Installation Guide

This chapter describes the changes in the *DBS3900 LampSite Installation Guide*.

06 (2015-10-30)

This is the sixth commercial release.

Compared with 05 (2015-08-30), this issue includes the following new topics:

- **9 Installing a pRRU3907**

Compared with 05 (2015-08-30), no information is changed.

Compared with 05 (2015-08-30), no information is deleted.

05 (2015-08-30)

This is the fifth commercial release.

Compared with 04 (2015-07-30), no information is added.

Compared with 04 (2015-07-30), this issue incorporates the following changes

Content	Change Description
6.4.7 Installing CRPI Optical Cables	Added the descriptions about the CPRI optical fiber connection in sharing BBUs with Macro Networks scenario.

Compared with 04 (2015-07-30), no information is deleted.

04 (2015-07-30)

This is the fourth commercial release.

Compared with 03 (2015-06-30), no information is added.

Compared with 03 (2015-06-30), this issue incorporates the following changes.

Content	Change Description
Entire document	Added the RHUB that has no electrical transmission port.

Compared with 03 (2015-06-30), no information is deleted.

03 (2015-06-30)

This is the third commercial release.

Compared with 02 (2015-05-08), this issue includes the following new topics:

- **5 Installing a DCU**

Compared with 02 (2015-05-08), this issue incorporates the following changes:

Content	Change Description
Entire document	Added the descriptions about the DCU.

Compared with 02 (2015-05-08), no information is deleted.

02 (2015-05-08)

This is the second commercial release.

Compared with 01 (2015-03-23), no information is added.

Compared with 01 (2015-03-23), this issue incorporates the following changes:

Content	Change Description
6.4.9 Installing Power Cable	Modified the RHUB configurations of upper-level circuit breakers.
8.1.2 pRRU3902 Installation Scenario	Deleted the minimum space requirements of the pRRU3901.
8.1.3 Space Requirements	Deleted the minimum space requirements of the pRRU3902.
8.3.2 Installing a pRRU3902 on a Wall	Added the step about locking the protection screw of pRRU3902.
8.3.3 Installing a pRRU3902 on a Ceiling	
8.3.4 Installing a pRRU3902 on a Plate	
8.3.5 Installing a pRRU3902 on a Keel	

Compared with 01 (2015-03-23), no information is deleted.

01 (2015-03-23)

This is the first commercial release.

Compared with draft B (2015-02-10), this issue includes the following new topics:

- **8 Installing a pRRU3902**

Compared with draft B (2015-02-10), this issue incorporates the following changes:

Content	Change Description
Entire document	Added the descriptions about the pRRU3902.

Compared with draft B (2015-02-10), no information is deleted.

Draft B (2015-02-10)

This is a draft release.

Compared with draft A (2015-01-15), no information is added.

Compared with draft A (2015-01-15), this issue incorporates the following change:

Content	Change Description
6.1.1 Installation Scenarios	Added the descriptions about the RHUB panel must not face upwards.

Compared with draft A (2015-01-15), no information is deleted.

Draft A (2015-01-15)

This is a draft release.

Compared with Issue 08 (2014-12-30) of V100R009C00, no information is added.

Compared with Issue 08 (2014-12-30) of V100R009C00, this issue incorporates the following change:

Content	Change Description
Entire document	The base station in the LampSite solution is renamed DBS3900 LampSite.

Compared with Issue 08 (2014-12-30) of V100R009C00, no information is deleted.

2 Installation Preparations

About This Chapter

Before starting the installation, you must obtain the required reference documents, tools, and instruments, and familiarize yourself with the skills required.

2.1 Reference Documents
Before the installation, you must read the following documents:

2.2 Preparing Tools and Instruments
This section describes the tools and instruments that must be prepared before the installation.

2.3 Requirements for Installation Personnel
This section describes requirements for installation engineers. They must be qualified and trained, and familiar with correct operation methods and safety precautions before performing any operations.

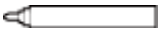
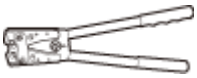
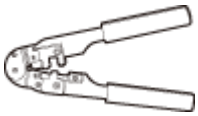
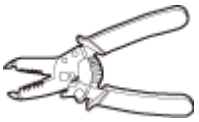
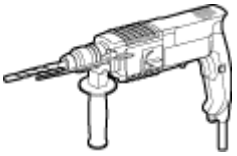
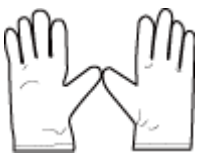
2.1 Reference Documents

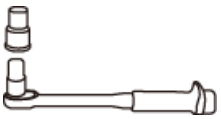
Before the installation, you must read the following documents:

- *DBS3900 LampSite Hardware Description*
- *Installation Reference*

2.2 Preparing Tools and Instruments

This section describes the tools and instruments that must be prepared before the installation.

Marker  Level 	Torque screwdriver   (M4 to M6)	Diagonal pliers 
Power cable crimping tool 	RJ11 crimping tool 	Cable cutter 
Rubber mallet 	Crown saw (Ø60) 	Wire stripper 
Hammer drill (Ø6, Ø8 and Ø12) 	Torque wrench (Ø10 mm) 	Protective gloves 
Guarded blade utility knife 	ESD gloves 	Long measuring tape 

Multimeter 	Network cable tester 	Vacuum cleaner 
Ladder 	Torque wrench for SMA connector 	Socket wrench (M6) 
Hole screwdriver (T20) 	-	-

2.3 Requirements for Installation Personnel

This section describes requirements for installation engineers. They must be qualified and trained, and familiar with correct operation methods and safety precautions before performing any operations.

Before the installation, pay attention to the following items:

- Technical engineers must take Huawei training and be familiar with proper installation and operation methods.
- The number of installation personnel depends on the engineering schedule and installation environment. Generally, three to five persons are required. Generally, only three to five onsite personnel are necessary.

3 Unpacking and Checking

This section describes how to unpack and check the delivered equipment to ensure that the materials are complete and intact.

Context

NOTE

The following lists important notes when you are transporting, lifting, or installing the equipment or components:

- Protect them from colliding with doors, walls, shelves, or other objects.
- Wear clean gloves and do not touch them with bare hands, sweat-soaked gloves, or dirty gloves.

NOTICE

You must power on the RHUB or pRRU within 7 days after it is unpacked.

Procedure

Step 1 Count the total number of the shipments.

If...	Then...
The total number of the components is consistent with that recorded in the packing lists on all packing boxes	Go to **Step 2**.
The total number of the components is inconsistent with that recorded in the packing lists on all packing boxes	Report the problems and causes to the local Huawei office.

Step 2 Check the exterior of each packing box.

If...	Then...
The exterior of each packing box is intact	Go to **Step 3**.
It is damaged or soaked	Report the problems and causes to the local Huawei office.
The collision label is red	Do not unpack the packing box and claim for compensation from the transportation company.

Step 3 Check the type and quantity of the equipment in the boxes according to the packing list.

If...	Then...
The type and number are consistent with the packing list on each packing list	Sign the *Packing List* with the operator.
There is any shortage, wrong delivery, or damaged equipment	Report the problems and causes to the local Huawei office.

NOTICE

Perform the following operations to protect the components from any damages and help find out the cause of any damage in future: 1. Store the unpacked equipment and packing materials indoors. 2. Take photos of the storeroom, rusted or eroded equipment, packing box, and packing materials. 3. File the photos.

----End

4 Installing a BBU

This chapter describes the process of installing a BBU.

For details about the installation of the BBU, see *DBS3900 Installation Guide*.

5 Installing a DCU

This chapter describes the process of installing a DCU.

For details about the installation of the DCU, see DCU3900 Installation Guide.

6 Installing an RHUB

About This Chapter

This chapter describes the process of installing an RHUB. RHUBs are classified into those with electrical transmission ports and those with no electrical transmission ports. Unless otherwise specified, this document uses the RHUBs with no electrical transmission ports as an example.

6.1 Information About the Installation
This section describes the information to be learnt before RHUB installation, including the RHUB installation scenarios, clearance, and installation environment.

6.2 Installation Process
The RHUB installation involves installing an RHUB module, installing RHUB cables, checking the RHUB hardware installation, and powering on the RHUB.

6.3 Installing an RHUB
An RHUB can be installed in a cabinet, rack, shelf, or on a wall.

6.4 Installing RHUB Cables
This section describes how to install cables for an RHUB.

6.5 Checking the RHUB Hardware Installation
After an RHUB is installed, check the installation of hardware including the devices and related cables.

6.6 Power-on Check on an RHUB
This section describes the power-on check on the RHUB after the RHUB hardware is installed and checked.

6.1 Information About the Installation

This section describes the information to be learnt before RHUB installation, including the RHUB installation scenarios, clearance, and installation environment.

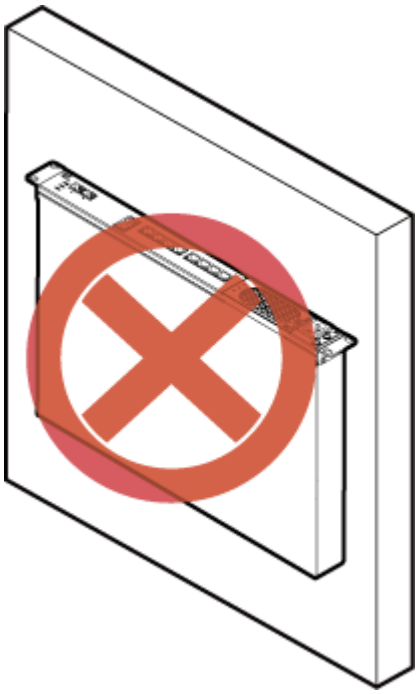
6.1.1 Installation Scenarios

An RHUB can be installed in a 19-inch cabinet, rack, shelf, or on a wall.

NOTICE

To prevent the RHUB from water drops, the RHUB panel must not face upwards (shown in **Figure 6-1**) in any installation scenarios.

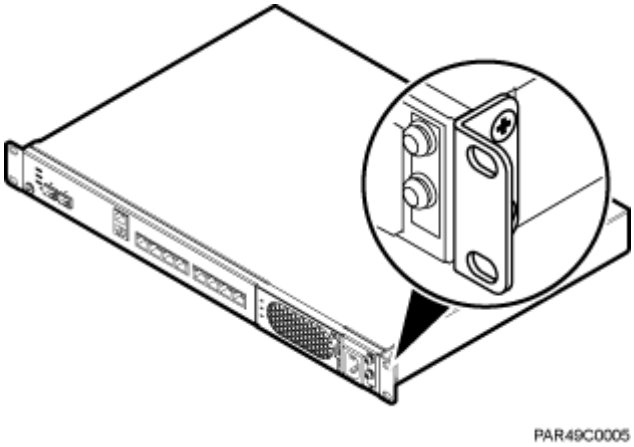
Figure 6-1 Improper installation mode



The RHUB mounting ears are installed in standard mode or reverse mode. The reverse mode is used by default. The two installation modes are defined as follows:

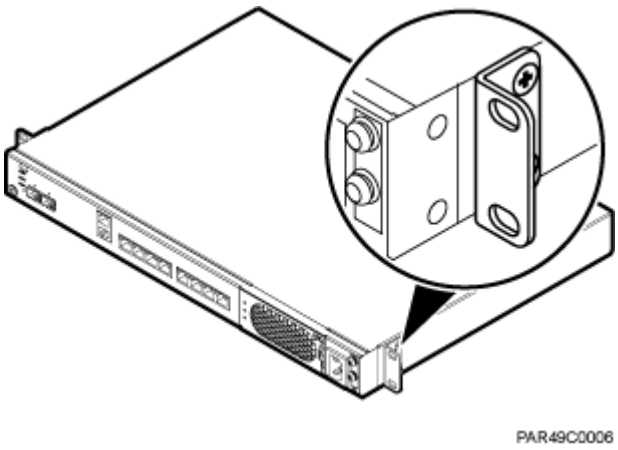
- In standard mode, the front of the mounting ear is aligned with the RHUB panel, as shown in **Figure 6-2**.

Figure 6-2 Installing mounting ears in standard mode



- In reverse mode, the front of the mounting ear is 31 mm away from the RHUB panel, as shown in **Figure 6-3**.

Figure 6-3 Installing mounting ears in reverse mode



Installing an RHUB in a 19-Inch Cabinet or Rack

Installing an RHUB in a 19-inch cabinet or rack: Secure the mounting ear to the mounting bracket by using M6 screws.

- If there are no other modules installed in the 1 U space near the RHUB, install the RHUB directly. Otherwise, remove the modules before installing the RHUB.
- Before installation, you need to check the installation mode supported by the rack and adjust the position of the mounting ear.

Figure 6-4 and **Figure 6-5** show RHUBs installed in a cabinet or rack, respectively.

Figure 6-4 Installing an RHUB in a 19-inch cabinet or rack in standard mode

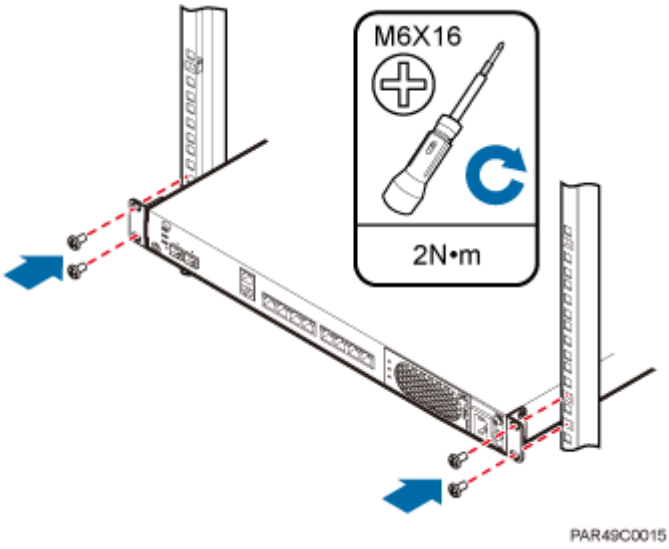
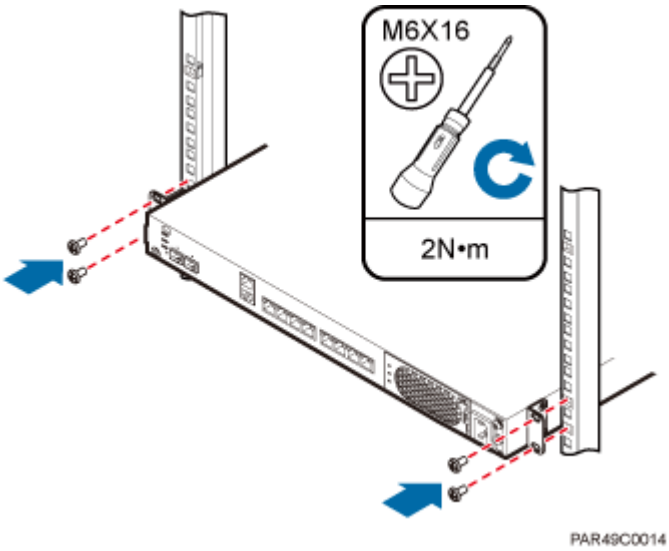


Figure 6-5 Installing an RHUB in a 19-inch cabinet in reverse mode



Installing an RHUB in a 19-Inch Shelf

When an RHUB is installed in a 19-inch shelf, the shelf must be installed on a wall. One shelf can house multiple RHUBs with 1 U space between two RHUBs.

Figure 6-6 and **Figure 6-7** show RHUBs installed in a 19-inch shelf.

Figure 6-6 RHUB installed in a 19-inch shelf in standard mode

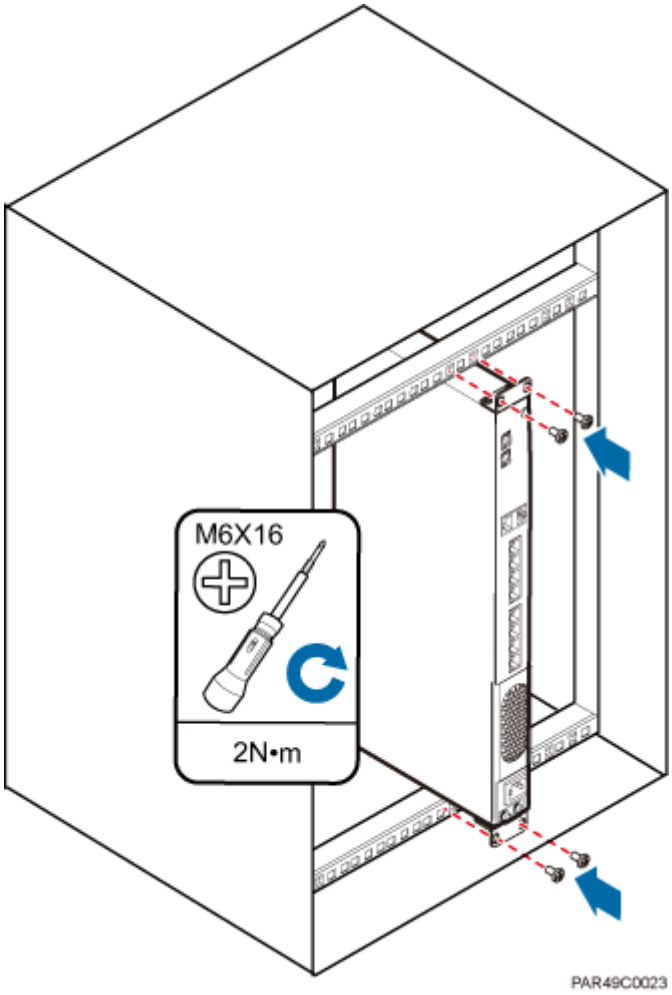
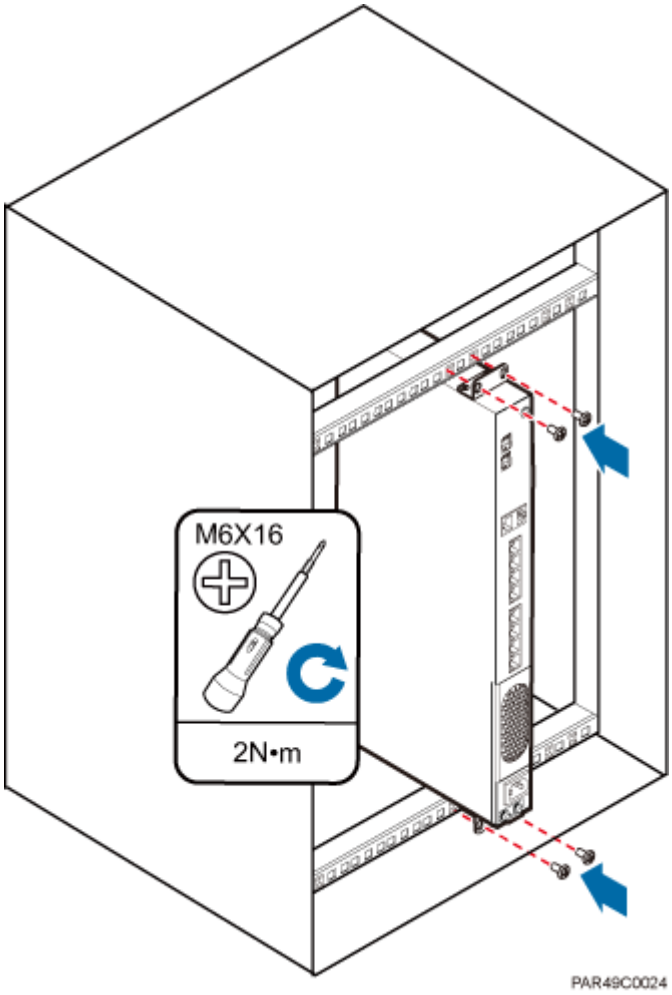


Figure 6-7 RHUB installed in a 19-inch shelf in reverse mode



Installing an RHUB on a Wall

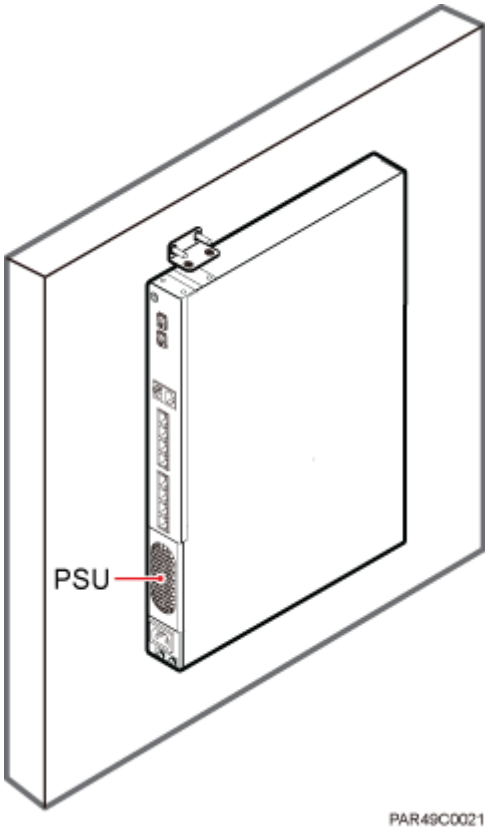
An RHUB can be installed on a wall.

The wall on which an RHUB is installed must meet the following requirements:

- When a single RHUB is installed, the wall must have a capacity of bearing at least four times the weight of the RHUB.
- Expansion bolts must be tightened to 10 N·m (88.507 bf·in.) to ensure the bolts work properly and the wall remains intact without cracks in it.

Figure 6-8 shows an RHUB installed on a wall.

Figure 6-8 RHUB installed on a wall



6.1.2 Installation Clearance Requirements

When an RHUB is installed in a 19-inch cabinet, rack, shelf, or on a wall, a minimum clearance is required for easy cabling and operation and maintenance. A recommended installation clearance is provided based on experience.

NOTICE

- Do not install or place inflammable materials above or under an RHUB.
- A clearance of 350 mm must be reserved in front of the air intake vent of the fan of the power supply unit (PSU) for maintenance.

Figure 6-9 shows the installation clearance for the RHUB installed in a 19-inch cabinet, rack, or shelf.

Figure 6-9 Installation clearance for an RHUB installed in a 19-inch cabinet, rack, or shelf

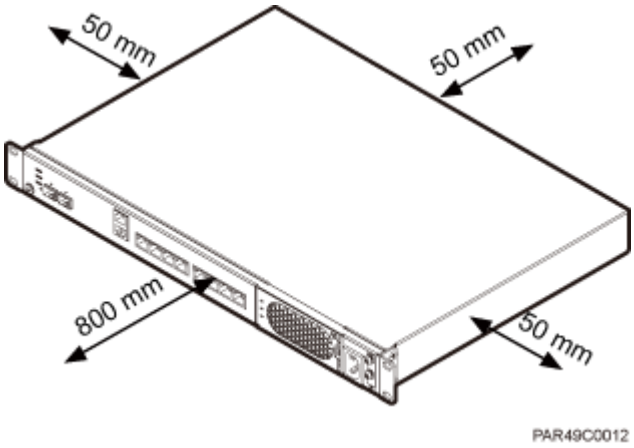


Figure 6-10 and **Figure 6-11** shows the recommended and minimum installation clearance respectively when the RHUB is installed on a wall.

Figure 6-10 Recommended installation clearance for a wall-mounted RHUB (unit: mm)

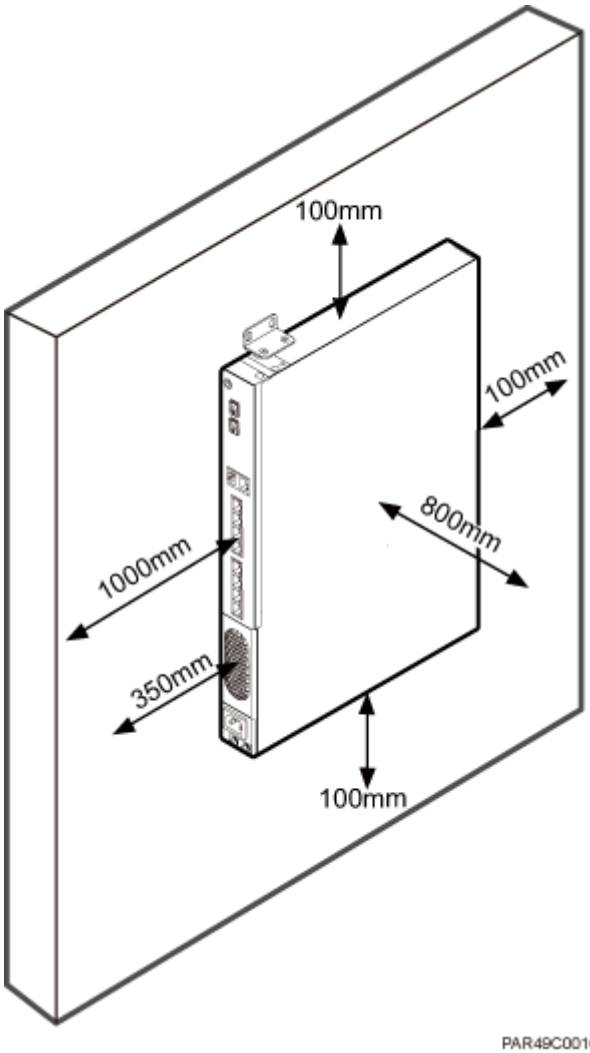
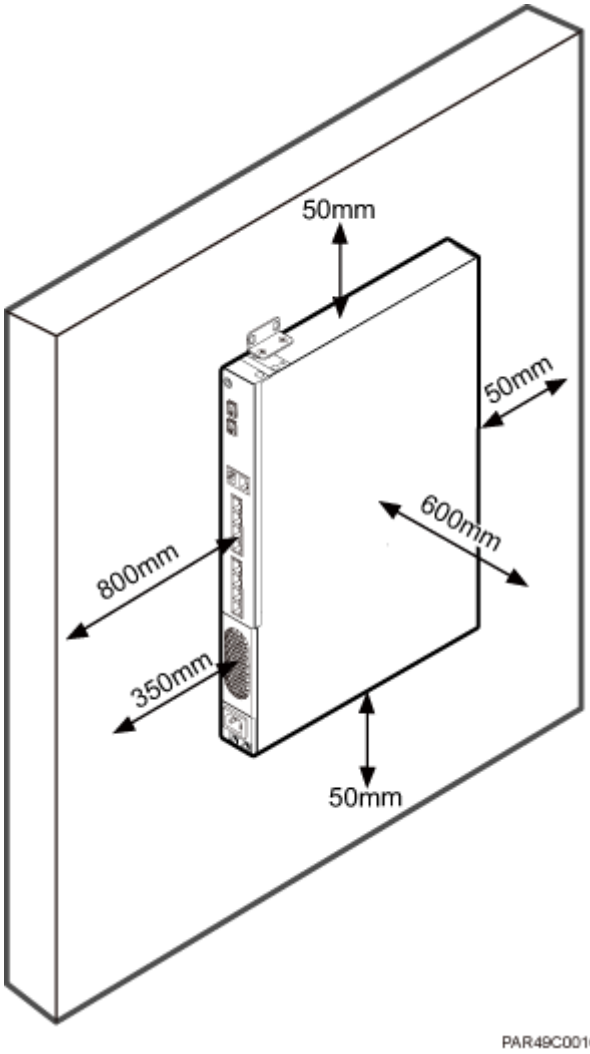


Figure 6-11 Minimum installation clearance for a wall-mounted RHUB (unit: mm)



6.1.3 Installation Environment

The installation environment of an RHUB involves the running environment specifications for the RHUB and other specifications.

RHUB Running Environment Specifications

Table 6-1 shows the environment specifications for the RHUB installed indoors.

- The temperature and humidity of the installation position must ensure normal operation. A cool and ventilated place is recommended.
- The heat dissipation holes on the RHUB cannot be blocked.

Table 6-1 RHUB environment specifications

Specifications	Installation Scenario	RHUB Quantity	Condition	Remarks
Operating temperature	Installed on a wall or in a 19-inch rack.	N/A	-5°C to +50°C	N/A
	Installed in a shelf.	1	-5°C to +45°C	N/A
		2	-5°C to +43°C	N/A
		3	-5°C to +40°C	N/A
Relative humidity	Installed in all scenarios.	N/A	5% RH to 95% RH	N/A
Altitude	N/A	N/A	-60 m to +1800 m	Works properly.
			1800 m to 4000 m	Above the 1800 m altitude, the maximum operating temperature decreases by 1°C each time the altitude increases by 220 m.

NOTE

Installing more than one RHUB, 1 U space is required between two RHUBs.

Other Running Environment Specifications

- The RHUB cannot be installed at an air outlet of the heat dissipation box of an air conditioner or other heat-generating appliances.
- The RHUB cannot be installed near a strong heat source.
- The RHUB cannot be installed in a position with water dripping, such as outdoor equipment of air conditioners, pipe, and leaking or dripping roofs.
- The installation position must be far from rains. If the RHUB is installed on a wall, there must be no window on either side of the wall.
- The installation position must be far away from high voltage, highly corrosive devices, flammable or explosive substances, and electromagnetic interference (such as power stations, high-voltage substations, and wired TV towers.
- The RHUB must be installed in a dry, ventilating, and dust-proof place.
- If the RHUB is installed in parking areas or basements, the installation position must be well-ventilated.

Requirements for the Upper-level Circuit Breaker

Type C upper-level AC circuit breakers or slow-blow fuses must be used for power cables. The maximum current must not exceed 16 A. **Table 6-2** describes the recommended specifications.

Table 6-2 Circuit breaker specifications for power cables

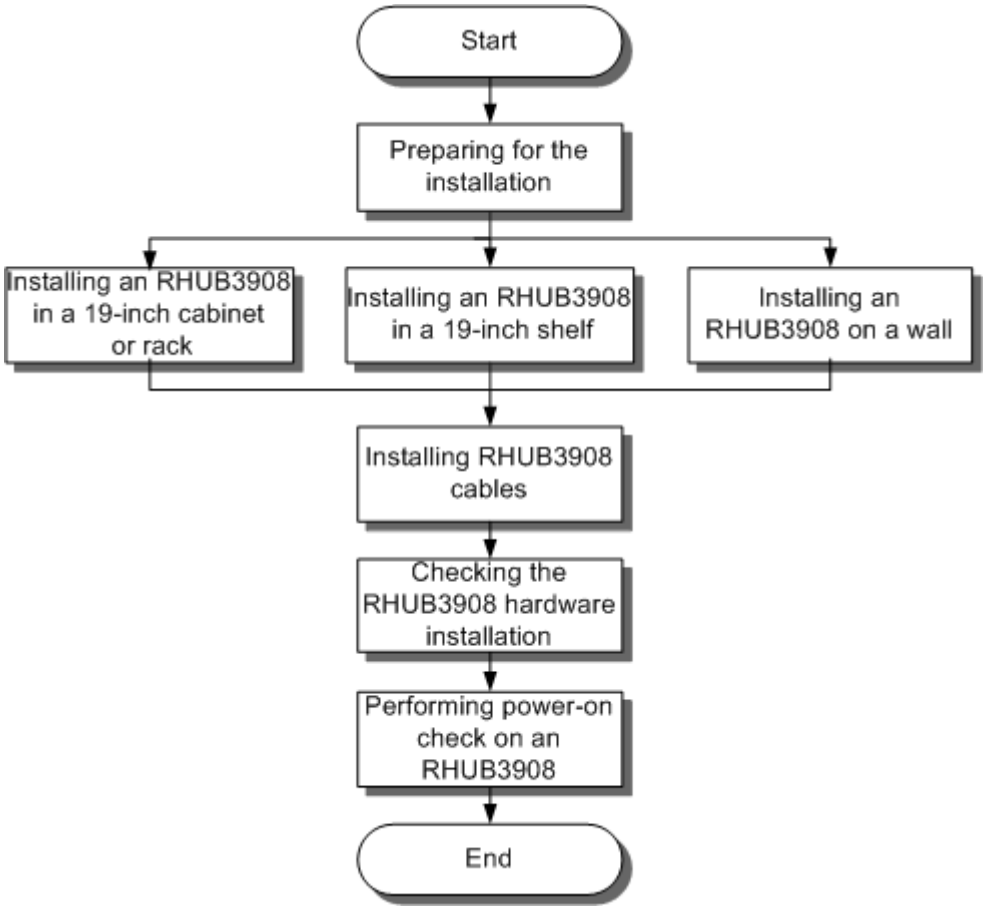
Power Supply	Upper-level AC Circuit Breaker (For a single RHUB)	Cross-Sectional Area of the Input Power Cable
220 V AC single-phase	≥ 6 A	1.5 mm^2
110 V AC dual-live-wire		
110 V AC single-phase	≥ 12 A	

6.2 Installation Process

The RHUB installation involves installing an RHUB module, installing RHUB cables, checking the RHUB hardware installation, and powering on the RHUB.

Figure 6-12 shows the RHUB installation process.

Figure 6-12 RHUB installation process



6.3 Installing an RHUB

An RHUB can be installed in a cabinet, rack, shelf, or on a wall.

6.3.1 Installing an RHUB in a 19-Inch Cabinet or Rack

This section describes how to install an RHUB in a 19-inch cabinet.

Procedure

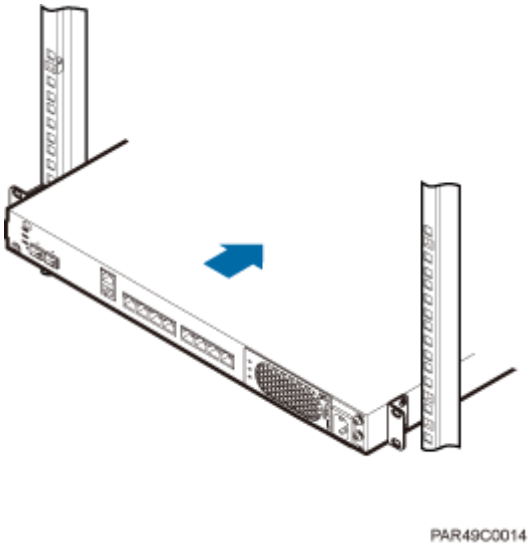
- The following describes how to install an RHUB with mounting ears in reverse mode:

  NOTE

  If necessary, request one more person for assistance.

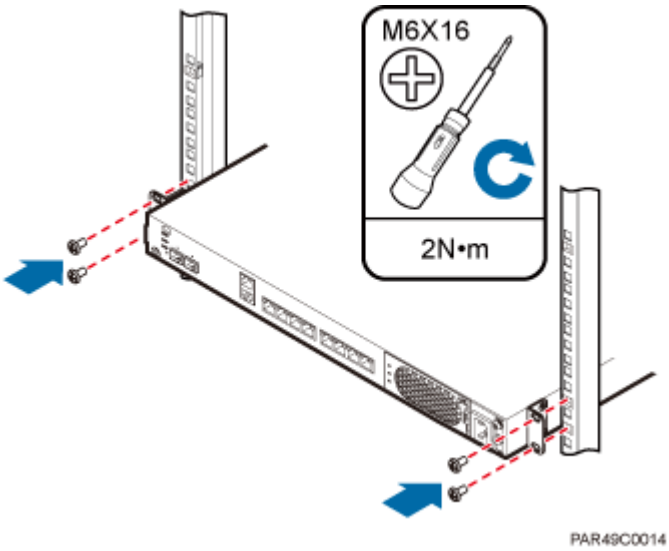
  a. With one hand holding it, align the mounting holes with the installation holes, slowly push the RHUB into the required position in the cabinet, as shown in **Figure 6-13**.

Figure 6-13 Pushing an RHUB into a cabinet



b. Use a torque screwdriver or Phillips screwdriver to tighten the four M6×16 screws with a torque of 2 N•m, as shown in **Figure 6-14**.

Figure 6-14 Tightening screws



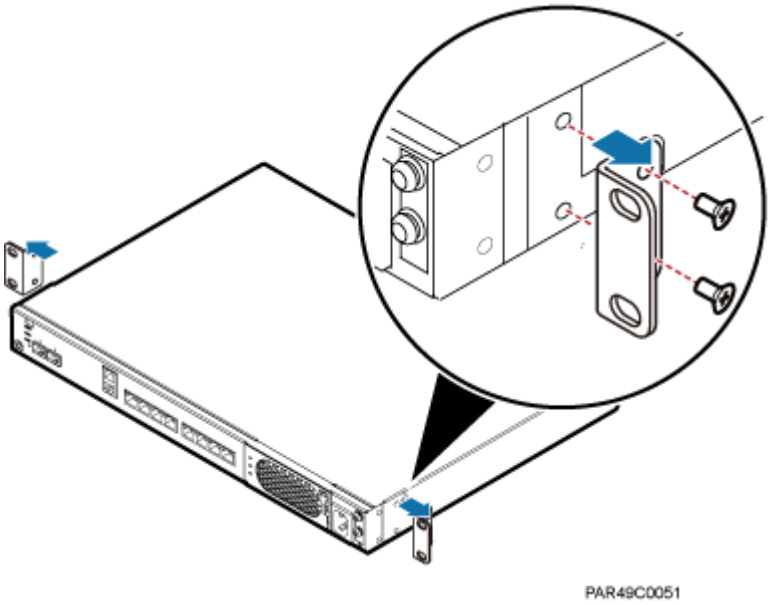
- The following describes how to install an RHUB with mounting ears aligned with the RHUB panel:

  NOTE

  If necessary, request one more person for assistance.

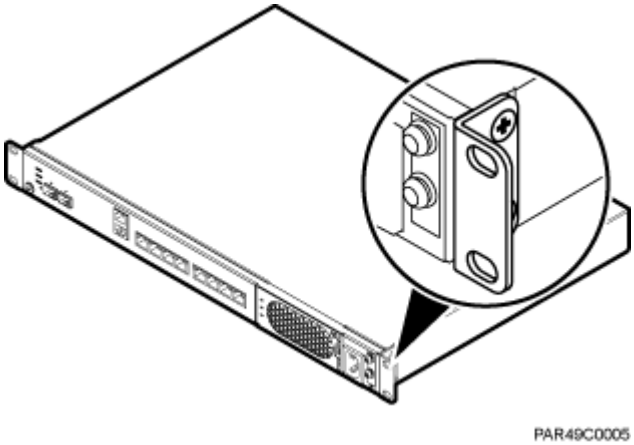
  a. Remove the mounting ears on both sides of the RHUB by removing the four M4×8 screws, as shown in **Figure 6-15**.

Figure 6-15 Removing mounting ears and screws



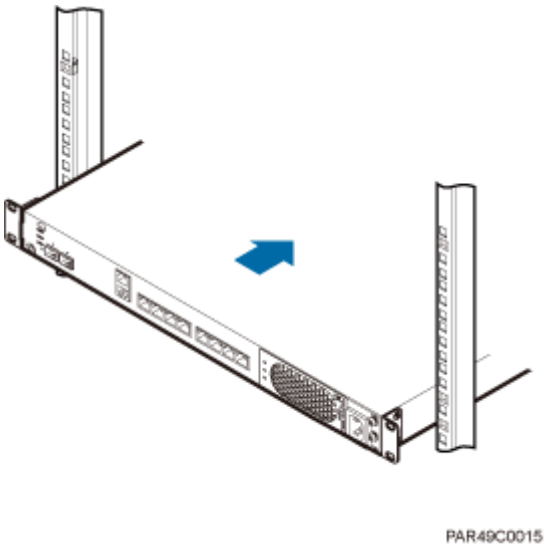
b. Use a torque screwdriver or Phillips screwdriver to tighten the four M4×8 screws with a torque of 1.4 N•m to install the removed mounting ears again, as shown in **Figure 6-16**. The mounting ears must be aligned with the RHUB panel.

Figure 6-16 Installing mounting ears in standard mode



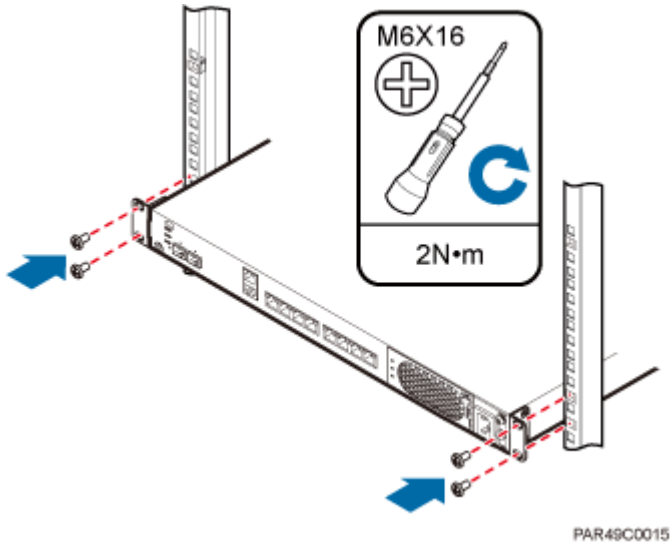
c. With one hand holding it, align the mounting holes with the installation holes, slowly push the RHUB into the required position in the cabinet, as shown in **Figure 6-17**.

Figure 6-17 Pushing an RHUB into a cabinet



d. Use a torque screwdriver or Phillips screwdriver to tighten the four M6×16 screws with a torque of 2 N•m, as shown in **Figure 6-18**.

Figure 6-18 Tightening screws



----End

6.3.2 Installing an RHUB in a 19-Inch Shelf

If a shelf houses more than one RHUB, 1 U space is required between two RHUBs. The PSU must be installed at the bottom of the cabinet.

Procedure

- The following describes how to install an RHUB with mounting ears installed in reverse mode:

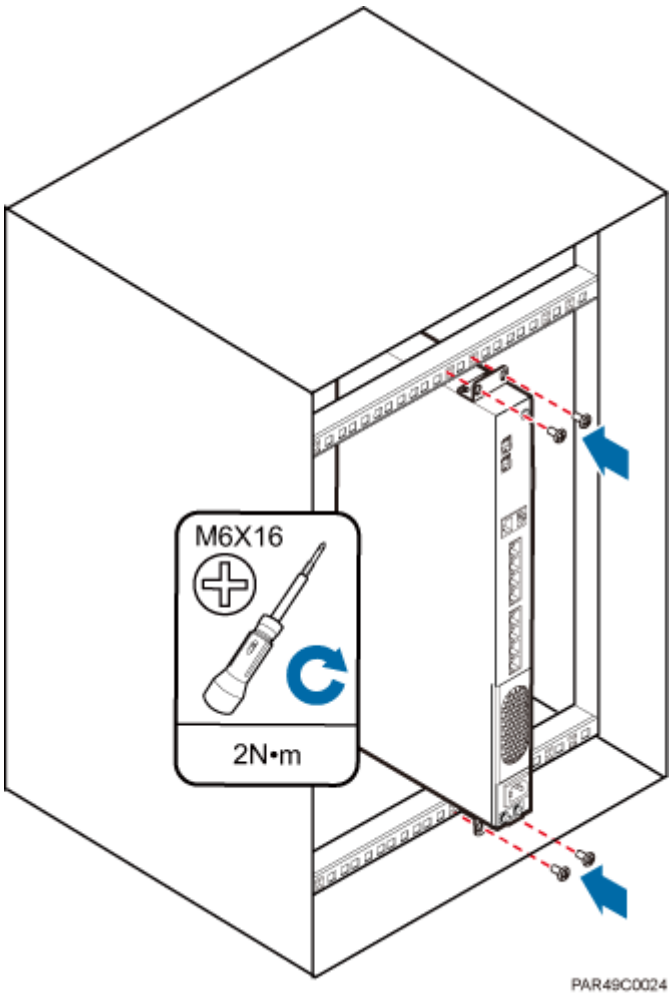
  NOTE

  If necessary, request one more person for assistance.

a. With one hand holding it, align the mounting holes with the installation holes, slowly push the RHUB into the required position in the shelf.

b. Use a torque screwdriver or Phillips screwdriver to tighten the four M6×16 screws with a torque of 2 N•m, as shown in **Figure 6-19**.

Figure 6-19 Tightening screws



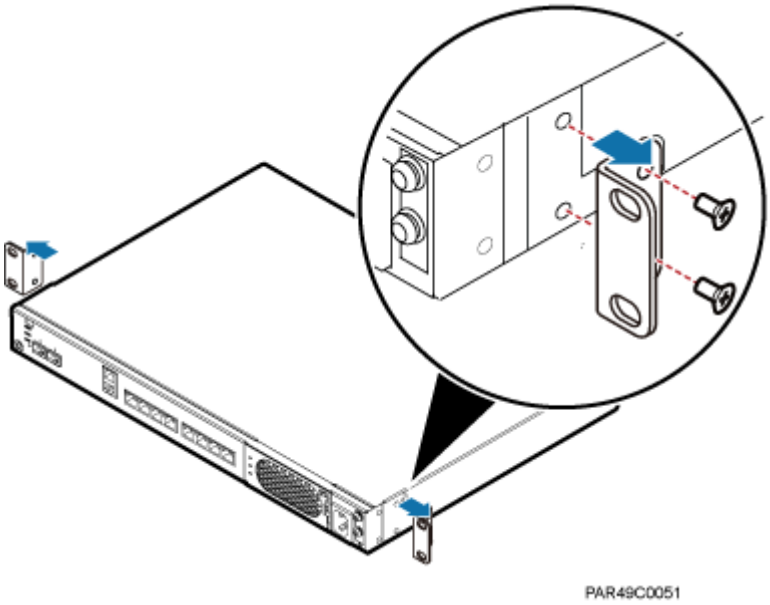
- The following describes how to install an RHUB with mounting ears installed in standard mode:

  NOTE

  If necessary, request one more person for assistance.

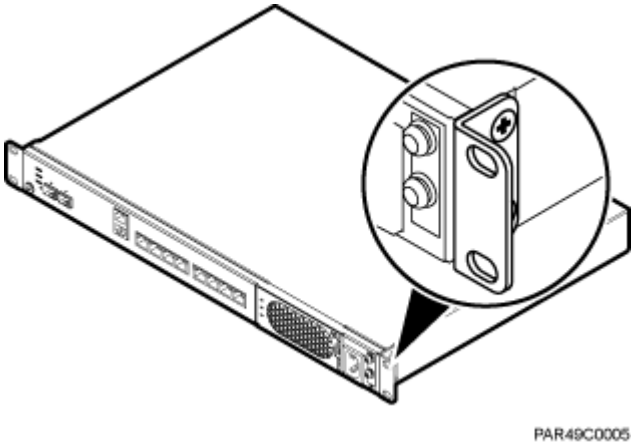
  a. Remove the mounting ears on both sides of the RHUB by removing the four M4×8 screws, as shown in **Figure 6-20**.

Figure 6-20 Removing mounting ears and screws



b. Use a torque screwdriver or Phillips screwdriver to tighten the four M4×8 screws with a torque of 1.4 N•m to install the removed mounting ears again, as shown in **Figure 6-21**. The mounting ears must be aligned with the RHUB panel.

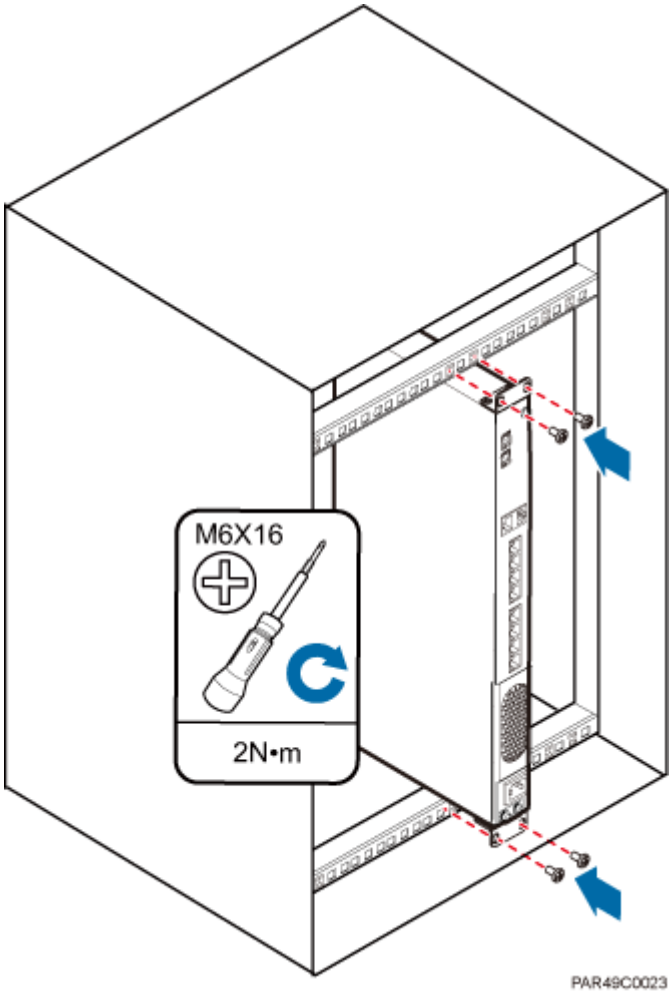
Figure 6-21 Installing mounting ears in standard mode



c. With one hand holding it, align the mounting holes with the installation holes, slowly push the RHUB into the required position in the cabinet, as shown in .

d. Use a torque screwdriver or Phillips screwdriver to tighten the four M6×16 screws with a torque of 2 N•m, as shown in **Figure 6-22**.

Figure 6-22 Tightening screws



----End

6.3.3 Installing an RHUB on a Wall

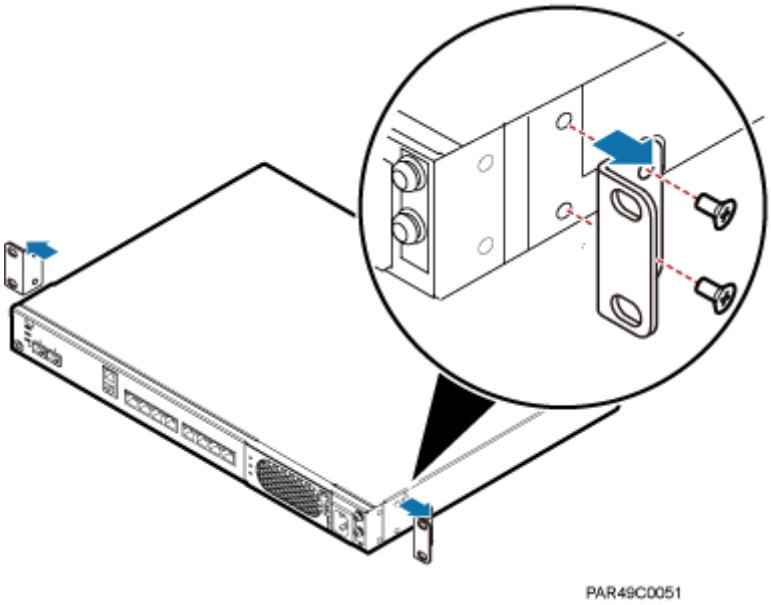
An RHUB can be installed on a wall.

Procedure

Step 1 The mounting ears are installed in reverse mode by default. Before installing an RHUB on a wall, modify the installation mode of the mounting ears on the RHUB.

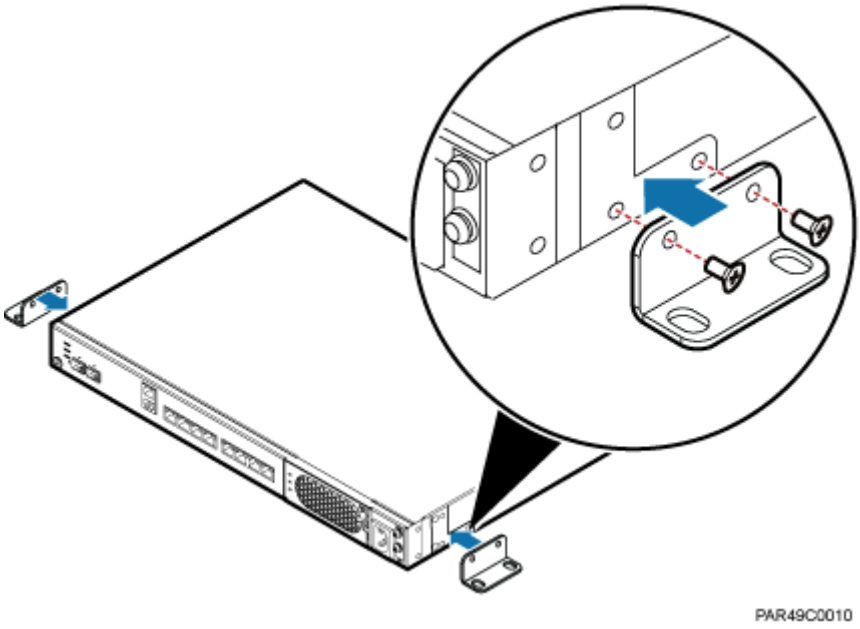
- Use a torque screwdriver or Phillips screwdriver to remove the mounting ears on both sides of the RHUB by removing the four M4×8 screws, as shown in **Figure 6-23**.

Figure 6-23 Removing screws and mounting ears



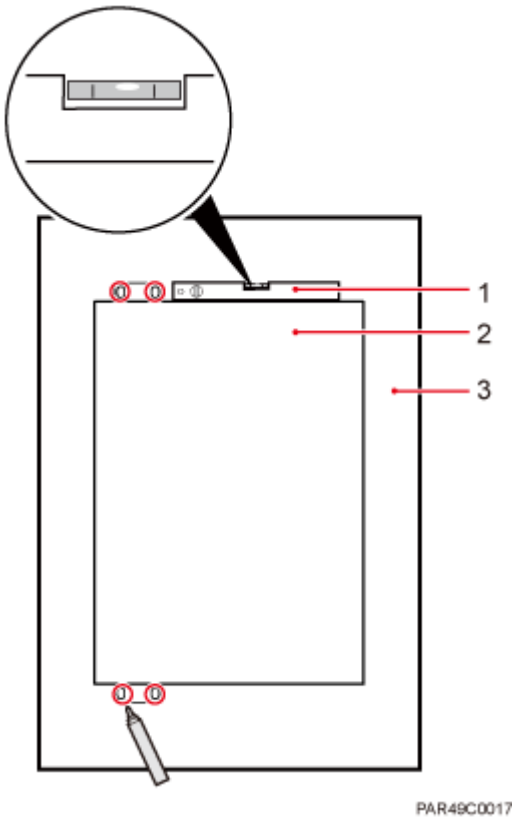
- Rotate the mounting ears 90 degrees clockwise, and use a torque screwdriver or Phillips screwdriver to secure the mounting ear with a torque of 1.4 N•m, as shown in **Figure 6-24**.

Figure 6-24 Installing mounting ears and screws



Step 2 Determine the position on the wall for installing the RHUB based on the requirements in the engineering blueprint and **6.1.2 Installation Clearance Requirements**. Place the RHUB to the position to be installed against the wall, and then mark the four anchor points where the mounting ear screws are fastened using a marker, as shown in **Figure 6-25**.

Figure 6-25 Anchor points for installing an RHUB on a wall



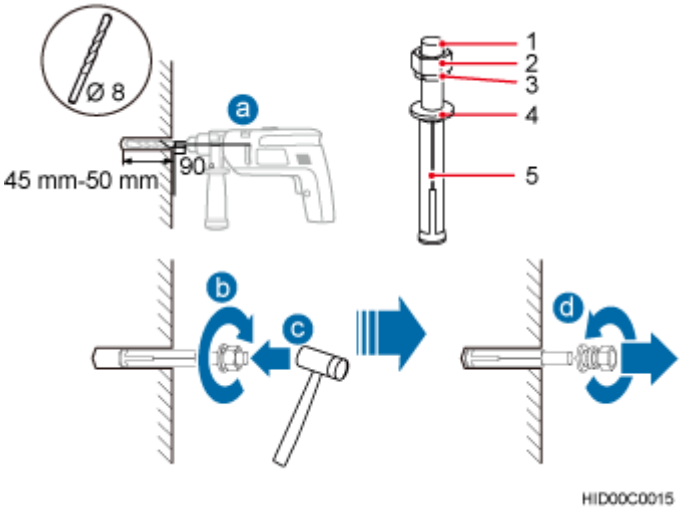
(1) Level (2) RHUB (3) Wall

CAUTION

To prevent inhalation or eye contact with dust, take adequate preventive measures when drilling holes.

Step 3 Drill holes at the anchor point and install expansion bolts, as shown in **Figure 6-26**.

Figure 6-26 Drilling holes and installing expansion bolts



(1) M6×60 expansion bolt (2) Nut (3) Spring washer (4) Flat washer (5) Extension tub

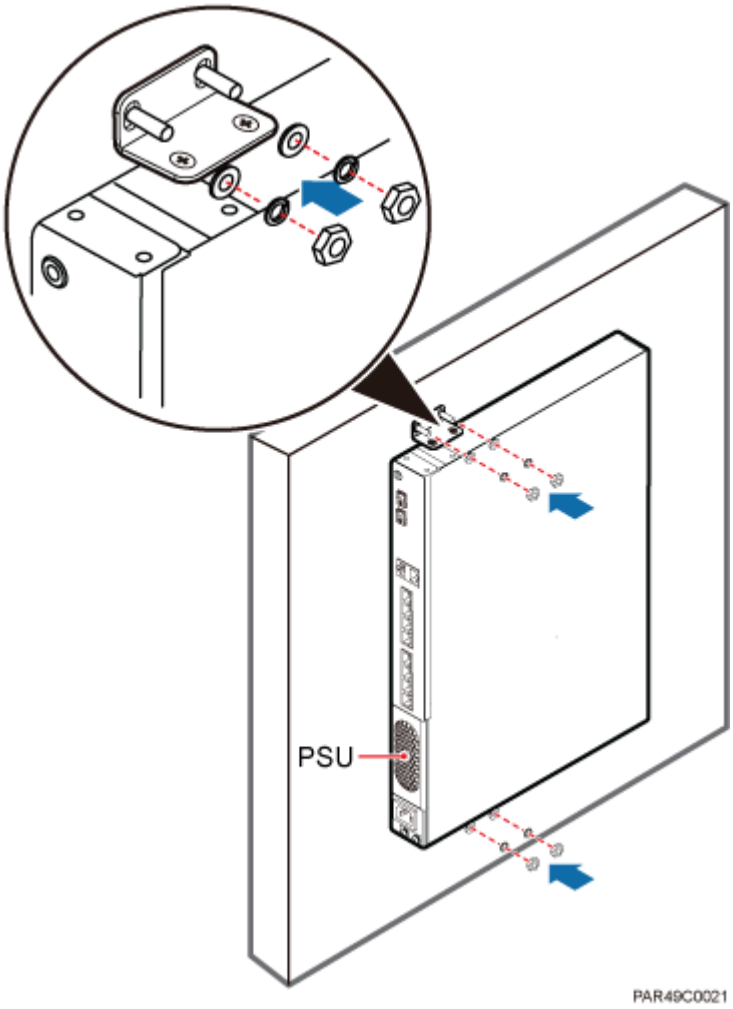
1. Use a hammer drill with bit 8 to drill holes with a diameter of 8 mm and a depth of 45 mm to 50 mm at the marked anchor points. All the holes have the same depth.
2. Use a vacuum cleaner to clear the dust inside and around each hole. If the distance between two holes is incorrect, mark and drill holes again.
3. Partially tighten an expansion bolt and place it vertically into each hole.
4. Use a rubber mallet to hit the expansion bolt until the entire expansion sleeve is in the hole.
5. Remove the M6×60 bolt, nut, spring washer, and flat washer from each expansion bolt in sequence.

NOTICE

After removing an expansion bolt, ensure that the top of the expansion sleeve is level with the wall. If it is not level, the RHUB cannot be installed on the concrete floor evenly and securely.

Step 4 Align the mounting holes with the four M6×60 expansion bolts. Install spring washer 6 and flat washer 6 in sequence on each M6×60 expansion bolt, insert the bolts to each expansion tub, and then use a torque wrench or socket wrench to tighten the four M6×60 bolts with a torque of 5 N•m to secure the RHUB to the wall, as shown in **Figure 6-27**.

Figure 6-27 Installing an RHUB on a wall



NOTE

As shown in the preceding figure, when the RHUB is placed against the wall, ensure that the RHUB panel is vertical to the ground and the PSU is on the lower part of the RHUB panel.

----End

6.4 Installing RHUB Cables

This section describes how to install cables for an RHUB.

6.4.1 Requirements for Cable Layout

Cables must be routed according to the specified cabling requirements to prevent signal interference.

NOTE

If a cable listed below is not required, skip the requirements for routing the cable.

General Requirements for Cable Layout

National Standards

- Code for Engineering Design of Generic Cabling System for Building and Campus (GB 50311-2007)
- Code for Engineering Acceptance of Generic Cabling System for Building and Campus (GB50312-2007).
- Security Protection Engineering Technology Specifications (GB 50348-2004)
- Code for Construction and Acceptance of the Electronic Information System Room (GB 50462-2008)
- Code for Quality Acceptance of the Intelligent Building Engineering (GB 50339-2003)
- Code for Quality Acceptance of Electric Engineering Construction in Building (GB 50303-2002)
- Technical Specification for Construction and Acceptance of Telecommunication Conduit Engineering (GB 50374-2006)

International Standards

- Generic Cabling for Customer Premises (ISO/IEC 11801)
- Commercial Building Telecommunications Cabling Standard (EIA/TIA 568)
- Commercial Building Standard for Telecommunication Pathways and Spaces (EIA/TIA 569)
- Administration Standard for Commercial Telecommunications Infrastructure (EIA/TIA 606)
- Grounding and Bonding Requirements for Telecommunications in Commercial Buildings (EIA/TIA 607)
- Generic Cabling Systems for Information Technology (EN 50173)
- Cabling Installation for Information Technology (EN 50174)

Bending radius

- The bending radius of a power cable or a protection ground (PGND) cable is at least five times the diameter of the cable.
- The bending radius of an optical cable is at least 20 times the diameter of the optical cable, and the minimum bending radius of the branch at each end of the optical cable is 30 mm.
- The bending radius of the signal cable must be at least five times the diameter of the cable.

Cable Binding

- Cables of the same type are bound together.
- Different types of cables must be separately routed with a minimum spacing of 30 mm and cannot be entangled or crossed.
- The cables are bound tightly and neatly and the cable sheath is intact.
- The cable ties face the same direction and all cable ties bound at similar positions must be in a straight line.
- The extra length of each indoor cable tie must be cut off. A slack of 5 mm is reserved for each outdoor cable tie. All cut surfaces have no sharp edges.
- Labels or nameplates are attached to both ends, joints, or turns of cables after they are installed.

Safety

- The steel pipe or fire-resistant rigid polyvinyl chloride pipe should be used for the cable duct or for routing cables. The cross-sectional usage of the cable duct should be 30% to 50% and that of the pipe for routing cables should be 25% to 30%.
- Cables are placed away from sharp objects or wall burrs. If these positions are inevitable, protection pipes are required for the cables.
- Cables are routed away from heat sources, or heat-insulation materials are added between cables and heat sources.
- Cables are routed away the cooling vents of the RHUB.
- A clearance is reserved at turns of a cable or the position close to a device, facilitating cable and device maintenance. The recommended clearance is about 0.1 m.

Requirements for Special Cables

Ethernet Cable

- A maximum of 100 Ethernet cables can be bundled if no PVC pipes are used. If pipes are used, a maximum of 24 Ethernet cables can be led through a pipe. In this case, ensure that 1/3 space inside the pipes must be vacant.
- The point at which an Ethernet cable is bundled must be spaced 400 mm or less from the Ethernet port on an RHUB.
- For the RHUB used in the elevator engine room on the rooftop, generator set for the subway engine, and equipment room with central air conditioning, Ethernet cables must be led through metallic conduits that are reliably grounded at both ends.

Power cable

- Positions for routing power cables meet requirements of the engineering design.
- Cables are routed only by qualified and trained personnel before all preparations are made.
- Cables are routed in an untangled and orderly fashion.

PGND cable

- PGND cables are buried in the ground or routed indoors. They cannot be routed overhead before they are routed into the equipment room.
- Outer conductors of coaxial cables and both ends of the shield layers on shielded cables are in proper electrical contact with the metal surface of the equipment to which they are connected.
- PGND cables and signal cables are installed in an untangled and orderly fashion. A certain distance is reserved between them to prevent interference from each other.
- Fuses or switches are not allowed on PGND cables.
- Other devices cannot be used for electrical connections of PGND cables.
- All the metal parts in the equipment are reliably connected to the ground terminal.

Optical cable

- Cables are routed in an untangled and orderly fashion.
- Optical fibers cannot be bound at turns.
- Optical fibers cannot be stretched with too much force or stepped on, and they are far away from sharp objects. Heavy objects cannot be placed on optical cables.
- When optical cables are routed, the extra length of the cables is coiled around special devices, such as a fiber coiler.

- Even strength is applied when optical cables are coiled and optical cables cannot be bent in a forcible manner.
- Vacant optical connectors are covered with dust-proof caps.
- Fiber optic cables cannot be squeezed by the cabinet door when routed through the cabinet.
- If optical cables need to be routed on the tower platform, the optical cables are routed along the inner side of the guard rail and the distance between the guard rail and the cable is the shortest one.
- If optical cables need to be routed close to a device on the tower, the optical cables are secured to the guard rail or pole with cable clips and the device cannot be far away from the position for securing the optical cables.
- If the optical cable close to a device on the tower is too long, the optical cables are wrapped and secured to the tower.

6.4.2 Cable List

This section describes the connector types and connections of the RHUB cables.

Table 6-3 lists RHUB cables.

Table 6-3 RHUB cable list

Cable	One End		The Other End	
	Connector	Connected to...	Connector	Connected to...
PGND cable	OT terminal (M4, 6 mm^2 [0.009 $in.^2$])	Ground screws on the RHUB	OT terminal (M6, 6 mm^2 [0.009 $in.^2$])	Ground terminal on the external ground bar
Power Supply Cable	C13 female connector	AC power input socket on the RHUB	3-pin connector	External power input socket
CPRI Optical Fiber	DLC connector	CPRI port on the LBBP, WBBP or UBBP in the BBU	DLC connector	CPRI0 or CPRI1 port on the RHUB
		CPRI port on the LBBP, WBBP or UBBP in the BBU	DLC connector	CPRI port on the DCU
		CPRI port on the DCU		CPRI0 or CPRI1 port on the RHUB

Cable	One End		The Other End	
	Connector	Connected to...	Connector	Connected to...
		CPRI0 or CPRI1 port on the RHUB	DLC connector	CPRI0 or CPRI1 port on the RHUB
		CPRI port on the LBBP, WBBP or UBBP in the BBU	FC connector, SC connector, or LC connector	ODF
		CPRI port on the DCU		
		CPRI0 or CPRI1 port on the RHUB		
Ethernet Cable	RJ45 connector	CPRI_E0~CPRI_E7 port on the RHUB	RJ45 connector	CPRI_E0~CPRI_E1 port on the pRRU3901
(Optional) Alarm Cable	RJ45 connector	EXT_ALM port on the RHUB	Bare end	Alarm signal port of the monitored equipment

NOTE

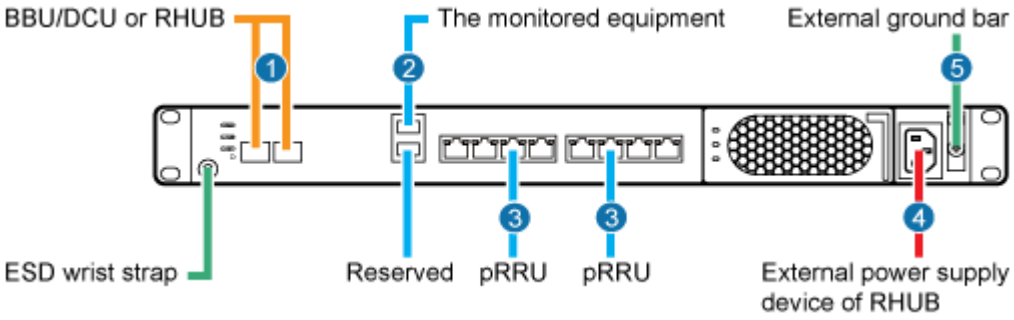
- If one end of the CPRI cable is connected to the DLC connector, the other end connects the BBU, DCU or RHUB through the DLC connector. If one end of the CPRI cable is connected to the ODF adapter, the other end connects the BBU or RHUB through a connector corresponding to the adapter. The connectors include the FC connector, SC connector, and LC connector.
- The Extender can be used to lengthen the distance between the RHUB and the pRRU connected using the Ethernet cable. If the Extender is used, the Ethernet cable is divided into two parts, one between the RHUB and the Extender and the other between the Extender and the pRRU.

6.4.3 Cable Connections

This section describes the cable connections for an RHUB.

Figure 6-28 shows the cable connections for an RHUB. The port of ETH are reserved.

Figure 6-28 Cable connections for an RHUB



(1) CPRI optical cable	(2) Alarm cable	(3) Ethernet cable
(4) Power cable	(5) PGND cable	-

NOTE

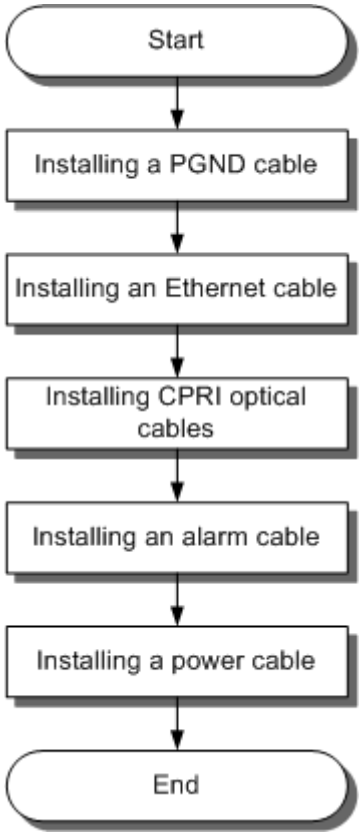
The Extender can be used to lengthen the distance between the RHUB and the pRRU connected using the Ethernet cable. If the Extender is used, the Ethernet cable is divided into two parts, one between the RHUB and the Extender and the other between the Extender and the pRRU.

6.4.4 Cable Installation Process

This section describes the process of installing RHUB cables.

Figure 6-29 shows the RHUB cable installation process.

Figure 6-29 RHUB cable installation process



6.4.5 Installing PGND Cable

An RHUB PGND cable ensures proper grounding of an RHUB.

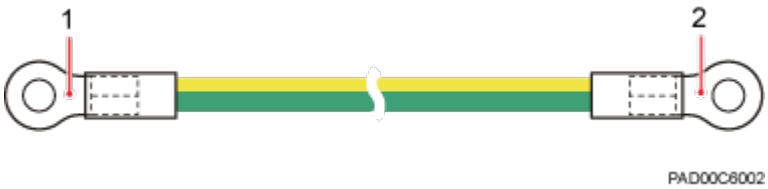
Prerequisites

The OT terminals at both ends of the PGND cable are prepared.

Context

The yellow and green or green PGND cable is a single cable. The cross-sectional area of the PGND cable is 6 mm^2 (0.009 $in.^2$). Both ends of the cable are OT terminals, as shown in Figure 1.

Figure 6-30 Exterior of a PGND cable



(1) OT terminal (6 mm^2 [0.009 $in.^2$], M4) (2) OT terminal (6 mm^2 [0.009 $in.^2$], M6)

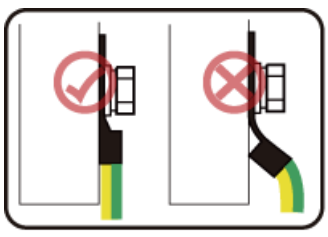
NOTE

- If the PGND cable is provided by the customer, a copper-core cable with a minimum cross-sectional area of 6 mm^2 (0.009 $in.^2$) or 10 AWG is recommended.
- The OT terminals at both ends of the PGND cable are assembled at the site.
- The M6 OT terminal has the default size. You can replace it with another OT terminal of the expected size based on the site requirement.

NOTICE

- Ensure proper grounding of the RHUB using a PGND cable.
- When installing the PGND cable, tightly press the OT terminal in the correct direction, as shown in **Figure 6-31**.

Figure 6-31 Correct direction of an OT terminal for the PGND cable

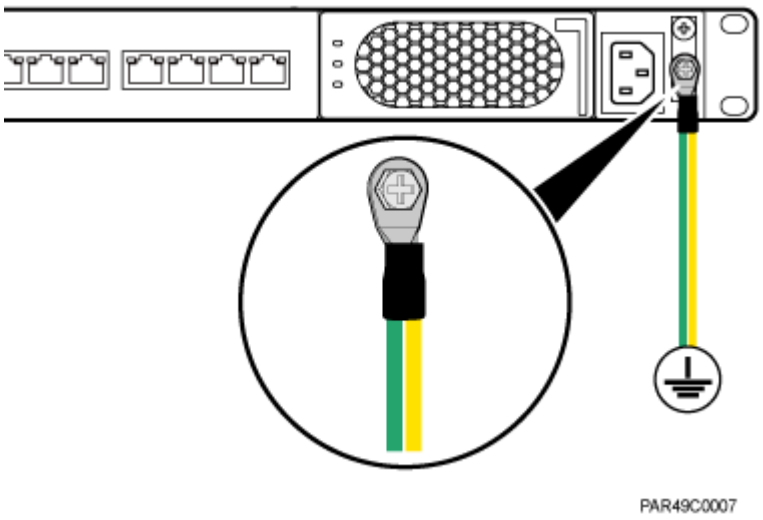


Procedure

Step 1 Route the PGND cable by referring to **6.4.1 Requirements for Cable Layout**.

Step 2 Use a torque screwdriver or Phillips screwdriver to secure the M4 OT terminal at one end of the PGND cable to the ground screw on the RHUB panel with a torque of 1.4 N•m. If the OT terminal is a one-hole OT terminal, connect it to the ground screw on the lower part of the RHUB panel, as shown in **Figure 6-32**.

Figure 6-32 Installing an RHUB PGND cable



Step 3 Use a torque screwdriver or Phillips screwdriver to secure the M8 OT terminal at one end of the PGND cable to the wiring terminal on the ground bar at the site with a torque of 1.4 N•m.

----End

Follow-up Procedure

1. Route the cable, and then use a cable tie to bind the cable. For details, see **6.4.1 Requirements for Cable Layout**.
2. Label the installed cable. For details, see section **11.3 Attaching an L-Shaped Label**.

6.4.6 Installing Ethernet Cable

This section describes how to install an Ethernet cable.

Prerequisites

- The Ethernet cable must be of Category 5e (enhanced) or higher. In addition, its cross-sectional area must be 24 AWG or larger and frame spread rating must be CM or higher.
- The Ethernet cables can be straight-through cables or crossover cables.
- With the internal PoE module providing power, the maximum length of an Ethernet cable is 100 m. With the Extender, the distance of the pRRU and RHUB can be extended by the Extender up to a total distance of 200 m.
- Ethernet cables are not delivered, and they must be prepared onsite. You need to use a network cable tester to test the Ethernet cable connection.

Context

The Ethernet cable has the following functions:

- Provides power supply for the pRRU when connected to the CPRI_E0 port on the pRRU.
- Transmits CPRI signals between an RHUB and a pRRU.

Using the CPRI_E1 port on the pRRU3901 has the same Ethernet cable connection to the RHUB as using the CPRI_E0 port. The following section describes the connection using the CPRI_E0 port.

Procedure

Step 1 Make the Ethernet cables.

1. Assemble an RJ45 connector and an Ethernet cable by following instructions in Assembling the Unshielded RJ45 Connector and the Ethernet Cable of *Installation Reference*.

   NOTE

   Follow pin assignment instructions described in section Ethernet Cable in *DBS3900 LampSite Hardware Description* to assemble the unshielded RJ45 connector and the Ethernet cable. Otherwise, the transmission signal quality deteriorates and CPRI links may be disconnected.
2. Check whether the made RJ45 connector is qualified by following instructions in Checking the Appearance of Metal Contact Strips.
3. To complete the assembly of the other end, repeat **Step 1.1** and **Step 1.2**.
4. Check whether the touch points on the connectors at both ends are normally conducted and well contacted and whether the connections are correct by following instructions in Testing the Connection of Assembled Cables of *Installation Reference*.

Step 2 Connect the RJ45 connector at the other end of the Ethernet cable to any port ranging from CPRI_E0 to CPRI_E7 on the RHUB panel based on the engineering design.

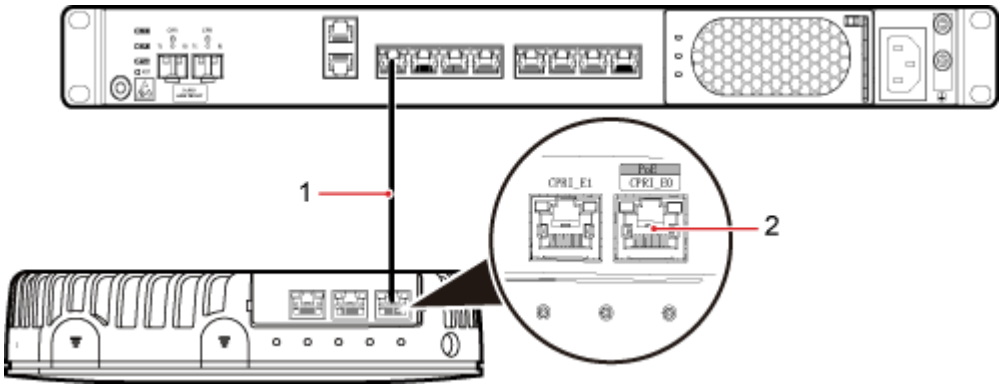
Step 3 **Optional:** Connect the RJ45 connector at the other end of the Ethernet cable to the output port of the Extender. Then, connect the RJ45 connector at one end of another Ethernet cable to the input port of the Extender.

If the Extender is used, the Ethernet cable is divided into two parts, one between the RHUB and the Extender and the other between the Extender and the pRRU.

Step 4 Remove the dustproof cap of the CPRI_E0 port on the pRRU.

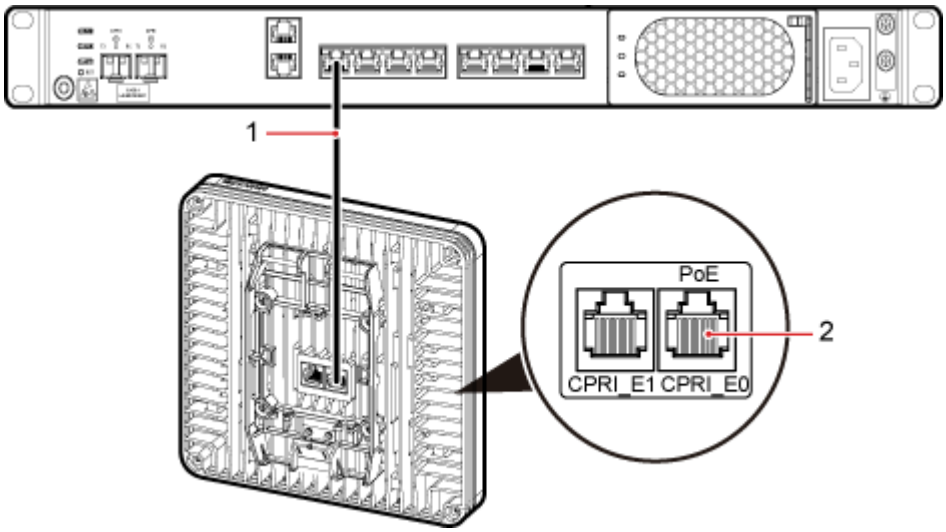
Step 5 Connect the RJ45 connector at one end of the Ethernet cable to the CPRI_E0 port on the pRRU panel, as shown in **Figure 6-33**, **Figure 6-34**.

Figure 6-33 Install an Ethernet cable between an RHUB and a pRRU3901



(1) Ethernet cable (2) CPRI_E0 port on the pRRU3901

Figure 6-34 Install an Ethernet cable between an RHUB and a pRRU3902



(1) Ethernet cable (2) CPRI_E0 port on the pRRU3902

----End

Follow-up Procedure

1. Route the cable, and then use a cable tie to bind the cable. For details, see **6.4.1 Requirements for Cable Layout**.
2. Label the installed cable. For details, see section **11.3 Attaching an L-Shaped Label**.

6.4.7 Installing CRPI Optical Cables

Optical fibers can be used to interconnect BBU and RHUBs, or cascade RHUBs.

Context

- Multi-mode optical modules for CPRI ports are labeled MM and each has a black or gray puller.
- Single-mode optical modules are labeled SM and each has a blue puller.

- For details about the connection of CPRI optical cables, see **CPRI Topology** in *DBS3900 LampSite Technical Description*.
- An optical module to be installed must match the rate of its corresponding port.

NOTE

The performance of an optical module that is exposed to the air for more than 20 minutes may be abnormal. Therefore, you must insert a fiber optic cable into an unpacked optical module within 20 minutes.

Procedure

Step 1 Install an optical module, as shown in **Figure 6-35** and **Figure 6-36**.

1. Remove the dust-proof cap from the CPRI port on the RHUB panel.
2. Remove the dust-proof cap on the optical module.
3. Lower the puller of the optical module.
4. Insert the optical module into the CPRI port on the RHUB, DCU, BBU or ODF.
5. Raise the puller of the optical module.

Figure 6-35 Removing the dust-proof cap from a port

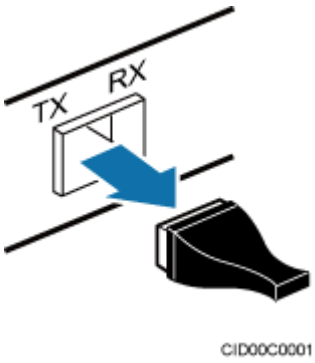
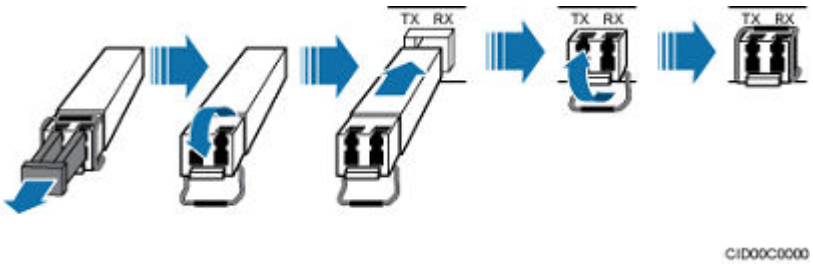


Figure 6-36 Installing an optical module



Step 2 Install a CPRI optical cable, as shown in **Figure 6-37**.

1. Remove the dust-proof cap from the optical cable connector.
2. Install the optical cables by referring to **Table 6-4**.

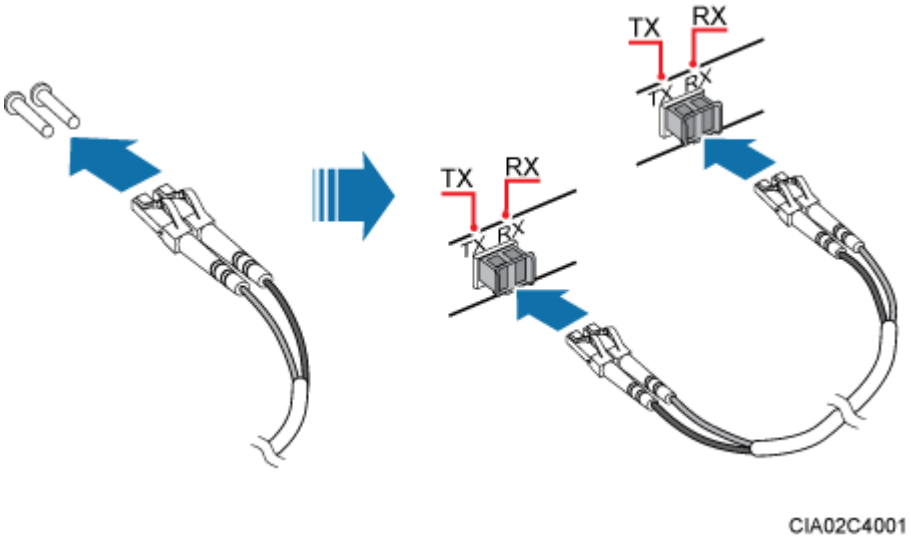
Table 6-4 CPRI optical cable connections

One End		The Other End	
Connector	**Connected to**	**Connector**	**Connected to**
DLC connector	BBU/LBBP&WBBP/CPRI port	DLC connector	CPRI0 or CPRI1 port on the RHUB
	BBU/LBBP&WBBP/CPRI port	DLC connector	CPRI port on the DCU
	CPRI port on the DCU		CPRI0 or CPRI1 port on the RHUB
	CPRI0 or CPRI1 port on the RHUB	DLC connector	CPRI0 or CPRI1 port on the RHUB
	BBU/LBBP&WBBP/CPRI port	FC, SC, or LC connector	ODF
	CPRI port on the DCU		
	CPRI0 or CPRI1 port on the RHUB		

NOTE

- In sharing BBUs with Macro Networks scenario, RHUBs share only main control boards with with RF modules on macro base stations, not baseband processing units.
- If one end of the CPRI cable is connected to the DLC connector, the other end connects the BBU or RHUB through the DLC connector. If one end of the CPRI cable is connected to the ODF adapter, the other end connects the BBU/DCU or RHUB through a connector corresponding to the adapter. The connectors include the FC connector, SC connector, and LC connector.
- When connecting the CPRI cable to the TX and RX ports of the optical module through connectors in a cross manner, ensure that one end of a core of the CPRI cable is connected to the TX port and the other end is connected to the RX port. **Figure 6-37** shows how to install a CPRI optical cable for connecting the BBU and RHUBs.

Figure 6-37 Installing an CRPI optical cable



----End

Follow-up Procedure

1. Route the cable, and then use a cable tie to bind the cable. For details, see **6.4.1 Requirements for Cable Layout**.
2. Label the installed cable. For details, see section **11.3 Attaching an L-Shaped Label**.

6.4.8 Installing Alarm Cable (Optional)

An RHUB alarm cable transmits dry node alarm signals.

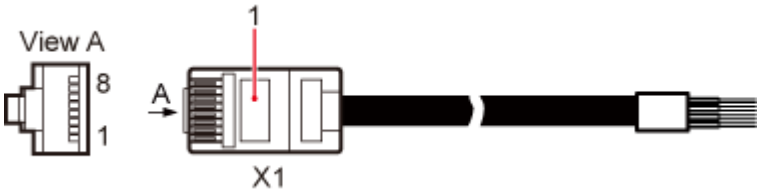
Prerequisites

Connectors for an alarm cable are prepared.

Context

Figure 6-38 shows the exterior of an RHUB alarm cable. **6.4.2 Cable List** shows the installation position on both ends of the RHUB cable.

Figure 6-38 RHUB alarm cable



Procedure

Step 1 Connect the RJ45 connector on one end of the alarm cable to the EXT_ALM port on the RHUB.

Step 2 Connect the other end of the alarm cable to the alarm cable port on the device to be monitored.

----End

Follow-up Procedure

1. Route the cable, and then use a cable tie to bind the cable. For details, see **6.4.1 Requirements for Cable Layout**.
2. Label the installed cable. For details, see section **11.3 Attaching an L-Shaped Label**.

6.4.9 Installing Power Cable

The RHUB power cable provides 110 V AC/220 V AC power supply for the RHUB.

Context

Table 6-5 lists the recommended configurations of upper-level circuit breakers and power cables for a RHUB.

Table 6-5 Configurations of upper-level circuit breakers and power cables

Power Supply	Upper-level AC Circuit Breaker (For a single RHUB)	Cross-Sectional Area of the Input Power Cable
220 V AC single-phase	≥ 6 A	1 mm^2
110 V AC single-phase	≥ 10 A	1.25 mm^2

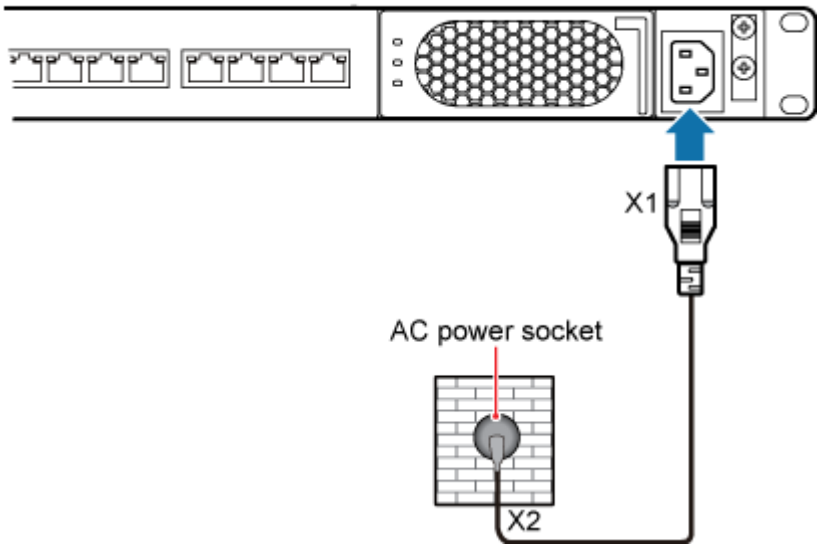
Procedure

Step 1 Route the power cable by referring to **6.4.1 Requirements for Cable Layout**.

Step 2 Connect the power connector on the X1 end to the AC power input port on the RHUB panel, as shown in **Figure 6-39**.

Step 3 Connect the power connector on the X2 end to the external power supply port, as shown in **Figure 6-39**.

Figure 6-39 Installing an RHUB power cable



----End

Follow-up Procedure

1. Route the cable, and then use a cable tie to bind the cable. For details, see **6.4.1 Requirements for Cable Layout**.
2. Label the installed cable. For details, see section **11.3 Attaching an L-Shaped Label**.

6.5 Checking the RHUB Hardware Installation

After an RHUB is installed, check the installation of hardware including the devices and related cables.

Table 6-6 lists the hardware installation checking items.

Table 6-6 Hardware installation checking list

No.	Item
1	The position for each device conforms to the engineering design and meets the space requirement.
2	Ensure that the RHUB is properly installed.
3	The surface of the RHUB is neat and clean. The external paint is intact. The labels, tags, and nameplates are correct, legible, and complete.

Table 6-7 lists the checking list of the power cable and PGND cable connections.

Table 6-7 Checklist for power cable and PGND cable connections

No.	Item
1	The power cables and PGND cables comply with the requirements of local regulations.
2	The power cables or the PGND cables are not inversely connected or short-circuited.
3	The power cables and PGND cables are bound separately from other cables.
4	Labels are attached to both ends of the power cables, PGND cables, optical fibers, and Ethernet cables.
5	The power cables and PGND cables are intact.
6	The power cables and PGND cables have no weld nugget.
7	No breaking device such as a switch or fuse lies in the electric connection of the grounding system.
8	The redundant part of PGND cable is stripped off.
9	The lugs at both ends of the power cable or PGND cable are securely soldered or crimped.
10	The flat washers and spring washers are fixed securely and closely at all the wiring terminals.
11	The work GND cable and PGND cable of the BTS share a group of grounding conductors with the lightning and GND cables of the building.

Table 6-8 lists the check items of the signal cable connection.

Table 6-8 Checklist for the signal cable connection

No.	Item
1	The connectors of the signal cables must securely connected.
2	The connectors of the signal cables are intact.
3	The signal cables are intact.
4	The cable ties are evenly spaced. The signal cables are bound neatly with cable ties to proper tightness, and arranged at even intervals in the same direction.
5	The extra length of the cable ties is cut and removed. The cut surfaces of the indoor cables are smooth and have no sharp edges.
6	The cable layout facilitates maintenance and expansion.
7	Correct and clear labels are attached to both ends of the signal cables.

No.	Item
8	The distance between the bundled fiber tails and the RHUB panel is less than 70 mm.

Table 6-9 lists the checking items for other cable connections.

Table 6-9 Checklist for other cable connections

No.	Item
1	The connectors of the other cables must securely connected.
2	Labels on the cables are legible and bound based on the engineering requirements. The cables must be bound tightly and neatly. The sheaths of the cables must not be damaged.
3	Positions for routing the cables must meet requirements of the engineering design.

6.6 Power-on Check on an RHUB

This section describes the power-on check on the RHUB after the RHUB hardware is installed and checked.

Context

DANGER

Power-on check involves high-voltage operation. Be cautious when conducting the power-on check. Any direct contact with the input voltage or indirect contact through damp objects might endanger your life.

Procedure

Step 1 Measure the RHUB earth resistance.

If...	Then...
The RHUB earth resistance is less than 10 ohms	Go to **Step 2**.
The RHUB earth resistance is equal to or larger than 10 ohms	Find out the cause and ensure that the resistance meets requirement. Then, go to **Step 2**.

Step 2 Measure the voltage of the RHUB.

If...	Then...
The external power supply ranges from 100 V AC to 240 V AC	Go to **Step 3**.
The external power supply does not range from 100 V AC to 240 V AC	Find out the cause and ensure that the resistance meets requirement. Then, go to **Step 3**.

Step 3 Power on the RHUB. Wait 3 to 5 minutes, check the status of the RUN indicator of the RHUB after the RHUB runs properly.

If the Status of the RUN Indicator...	It Indicates that...	Then...
Steady on	The power supply is normal while the board is faulty.	Power off the RHUB, and power on it again after rectifying the board fault.
Steady off	There is no power input or the board is faulty.	Power off the RHUB, and check the power input again. Rectify the board faulty and power on the RHUB again if the power input is normal.
On for 1s and off for 1s	The devices work properly.	End the operation.
On for 0.125s and off for 0.125s	The board software is being uploaded.	Power off the RHUB if the uploading is not finished in 5 minutes, and check whether the configuration file is correct. Power on the RHUB again after the fault is rectified.

----End

7 Installing a pRRU3901

About This Chapter

This chapter describes the pRRU3901 installation process. The pRRU3901 can have two transmission ports (plus PWR port) or three transmission ports (plus PWR port or no PWR port). Unless otherwise specified, this document uses the pRRU3901 with three transmission ports plus no PWR port as an example.

7.1 Information About the Installation

This section describes the information that you must be familiar with before installing a pRRU3901, including the pRRU3901 product family, installation scenarios, installation space and environment requirements.

7.1.1 Product Family

This chapter describes the configurations and functions of the pRRU3901 components.

Table 7-1 lists the pRRU3901 product family.

Table 7-1 pRRU3901 product family

Category	Equipment	Optional or Mandatory	Quantity	Function
Main equipment	pRRU3901	Mandatory	1	Processes the radio frequency signals.
	External antenna	Optional	2	Provides external antennas for the pRRU3901. **NOTE** Configure two external antennas for each RF daughter board.
Auxiliary device	Mounting kits	Mandatory	1	Supports the pRRU3901 installation on a wall, pole, ceiling, or keel. The mounting kits vary with the pRRU3901 installation mode.
	Extender	Optional	1 or 2 **NOTE** The quantity depends on the number of Ethernet cables in use.	Extends the distance between the pRRU3901 and RHUB.

7.1.2 Installation Scenario

The pRRU3901 can be installed on a wall, ceiling, pole, or keel. The following table describes the installation in different scenarios.

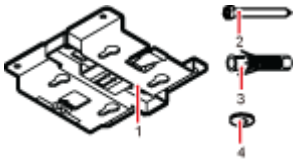
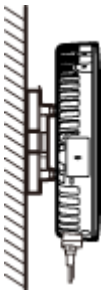
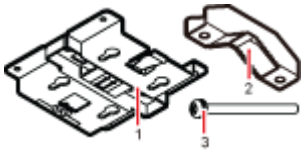
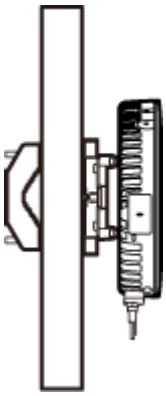
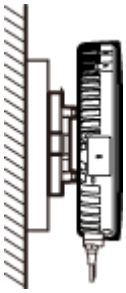
Installing a pRRU3901 on a wall

NOTE

- The pRRU3901 must keep a minimum of 0.5 m away from the power equipment with interference, and keep a minimum of 2 m away from the source with radiation.
- The pRRU3901 must keep away from a metal wall to avoid the impact on the antenna performance.

When a pRRU3901 is installed on a wall, installation modes vary with the quality of wall, as shown in **Table 7-2**.

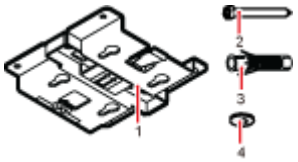
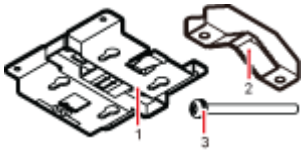
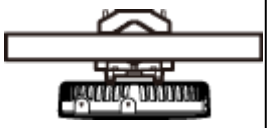
Table 7-2 Wall-mounted suggestion

Installation Mode	Requirements	Mounting Brackets	Installation Diagram
Installing the pRRU3901 on a wall by drilling holes For details, see **7.4.2 Installing a pRRU3901 on a Wall**.	● The wall can bear a load at least four times the weight of a pRRU3901. ● The screws must be tightened with a torque of 10 N·m. This ensures the screws work properly and the wall remains intact without cracks in it.	1. Plate 2. Screw (M6X50) 3. Plastic expansion sleeve 4. Flat washer 	
Installing the pRRU on a wall using a V clamp through an attachment plate For details, see **7.4.5 Installing a pRRU3901 on a Plate**.	● The wall can bear a load at least four times the weight of a pRRU3901. ● The thickness of the wall is less than 80 mm.	1. Plate 2. V clamp 3. Bolt (M6X80) 	
Installing the pRRU3901 on a wall using a plate on a metal wall	The wall cannot bear a load at least four times the weight of the pRRU. For example, EPS walls, MDF walls, or walls cannot be drilled.	The plate is prepared by customers.	

Installing a pRRU3901 on a ceiling

When a pRRU3901 is installed on a ceiling, installation modes vary with the quality of the ceiling, as shown in **Table 7-3**.

Table 7-3 Ceiling-mounted suggestion

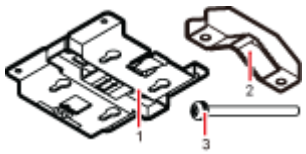
Installation Mode	Requirements	Mounting Brackets	Installation Diagram
Installing the pRRU3901 on a ceiling by drilling holes For details, see **7.4.3 Installing a pRRU3901 on a Ceiling**.	● The ceiling, such as a concrete ceiling, can bear a load at least four times the weight of the pRRU3901. ● The screws must be tightened with a torque of 10 N·m. This ensures the screws work properly and the ceiling remains intact without cracks in it.	1. Plate 2. Screw (M6X50) 3. Plastic expansion sleeve 4. Flat washer 	
Installing the pRRU3901 on a ceiling using a V clamp through an attachment plate For details, see **7.4.5 Installing a pRRU3901 on a Plate**.	● The ceiling, such as a concrete ceiling, can bear a load at least four times the weight of the pRRU3901. ● The thickness of the ceiling is less than 80 mm.	1. Plate 2. V clamp 3. Bolt (M6X80) 	
Installing the pRRU3901 on a pole For details, see **7.4.4 Installing a pRRU3901 on a Pole**.	A pole under the ceiling can bear a load at least four times the weight of the pRRU3901.	For details, see **Table 7-4**.	For details, see **Table 7-4**.

Installation Mode	Requirements	Mounting Brackets	Installation Diagram
Installing the pRRU3901 on a keel For details, see **7.4.6 Installing a pRRU3901 on a Keel**.	A keel under the ceiling can bear a load at least four times the weight of the pRRU3901.	For details, see **Table 7-5**.	For details, see **Table 7-5**.

Installing the pRRU3901 on a pole

When a pRRU3901 is installed on a pole, installation modes vary with the diameter of the pole, as shown in **Table 7-4**.

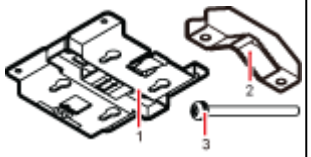
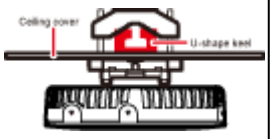
Table 7-4 Pole-mounted suggestion

Installation Mode	Requirements	Mounting Brackets	Installation Diagram
Installing the pRRU3901 on a pole For details, see **7.4.4 Installing a pRRU3901 on a Pole**.	The diameter of the pole ranges from 30 mm to 70 mm.	1. Plate 2. V clamp 3. Bolt (M6X80) 	
	The diameter of the pole ranges from 70 mm to 110 mm.	1. Plate 2. Hose clamp, which is prepared by the customer 	

Installing the pRRU3901 on a keel

The pRRU3901 can be installed on a keel of U-shape, T-shape, or H-shape. For the keels of other shapes, they are determined based on the onsite requirements.

Table 7-5 Keel-mounted installation suggestion

Installation Mode	Requirements	Mounting Brackets	Installation Diagram
Installing the pRRU3901 on a keel For details, see **7.4.6 Installing a pRRU3901 on a Keel**.	The keel is in U-shape, T-shape, H-shape, or other shapes.	1. Plate 2. V clamp 3. Bolt (M6X80) 	 shows the pRRU installed on a U-shaped keel.

7.1.3 Space Requirements

This chapter describes the space requirements of the pRRU3901.

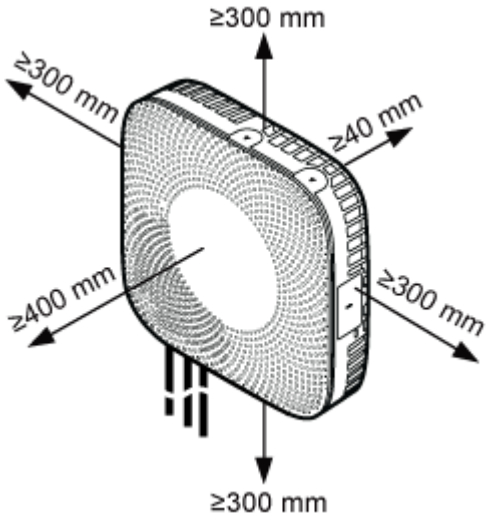
When the pRRU3901 is installed on a wall, ceiling, pole or keel, the minimum space is required for easy cabling and O&M. Based on the engineering practice, the recommendation for the installation space is provided.

NOTE

During installation, a minimum clearance of 2 m must be reserved between the pRRU3901 working on the 2.6 GHz band and the Wi-Fi module if they need to process services concurrently.

Figure 7-1 shows the recommended space requirements of the pRRU3901.

Figure 7-1 Recommended space requirements of the pRRU3901



The recommended space for installing a single pRRU3901 is described as follows:

- At least 300 mm above the pRRU3901 is reserved for maintenance.
- At least 300 mm under the pRRU3901 is reserved for cabling.
- At least 300 mm on the left of the pRRU3901 is reserved for maintenance.

- At least 300 mm on the right of the pRRU3901 is reserved for maintenance.
- At least 400 mm in front of the pRRU3901 is reserved for maintenance
- At least 40 mm on the back of the pRRU3901 is reserved for ventilation.

7.1.4 Installation Environment Requirements

The installation environment of a pRRU3901 involves the running environment specifications for the pRRU3901 and other specifications.

Running Environment Specifications

Table 7-6 shows the environment specifications for the pRRU3901 installed indoors.

Table 7-6 pRRU3901 environment specifications

Specifications	Condition	Remarks
Operating temperature	- 5°C to + 40°C	-
Relative humidity	5% RH to 95% RH	-
Altitude	- 60 m to + 1800 m	Works properly.
	1800 m to 4000 m	Above the 1800 m altitude, the maximum operating temperature decreases by 1°C each time the altitude increases by 220 m.

Other Running Environment Specifications

- The pRRU3901 cannot be installed at an air outlet of the heat dissipation box of an air conditioner or other heat-generating appliances.
- The pRRU3901 cannot be installed near a strong heat source.
- The pRRU3901 cannot be installed in a position with water dripping, such as outdoor equipment of air conditioners, pipe, and leaking or dripping roofs.
- The installation position must be far from rains. If the pRRU3901 is installed on a wall, there must be no window on either side of the wall.
- The installation position must be far away from high voltage, highly corrosive devices, flammable or explosive substances, and electromagnetic interference (such as power stations, high-voltage substations, and wired TV towers.
- The pRRU3901 must be installed in a dry, ventilating, and dust-proof place.
- If the pRRU3901 is installed in parking areas or basements, the installation position must be well-ventilated.

7.2 Obtaining the MAC Address (Optional)

Before installing a pRRU3901, record the media access control (MAC) address, which will be used during pRRU3901 commissioning. This section applies only when a pRRU3901 with three transmission ports is configured with a Wi-Fi daughter board.

Context

The MAC address indicates the IP address through which a device can be reached.

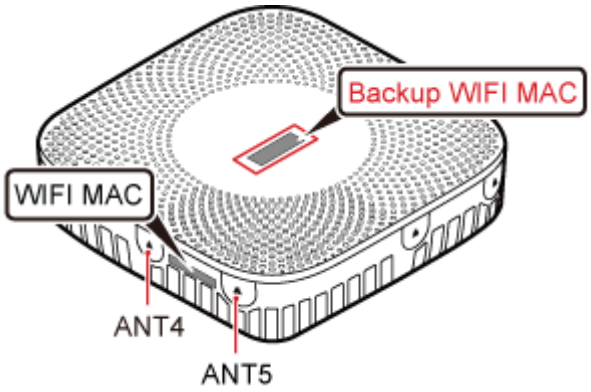
Procedure

Step 1 Remove the backup WIFI MAC label from the front housing of the pRRU3901 and keep them secure, as shown in **Figure 7-2**.

NOTE

- Do not remove the WIFI MAC label on the side of the pRRU3901 housing.
- Before removing the backup WIFI MAC label, photograph it.

Figure 7-2 Removing backup WIFI MAC label



Step 2 Save the MAC according to **11.1 MAC Collection Template**, and report it to the pRRU3901 commissioning personnel.

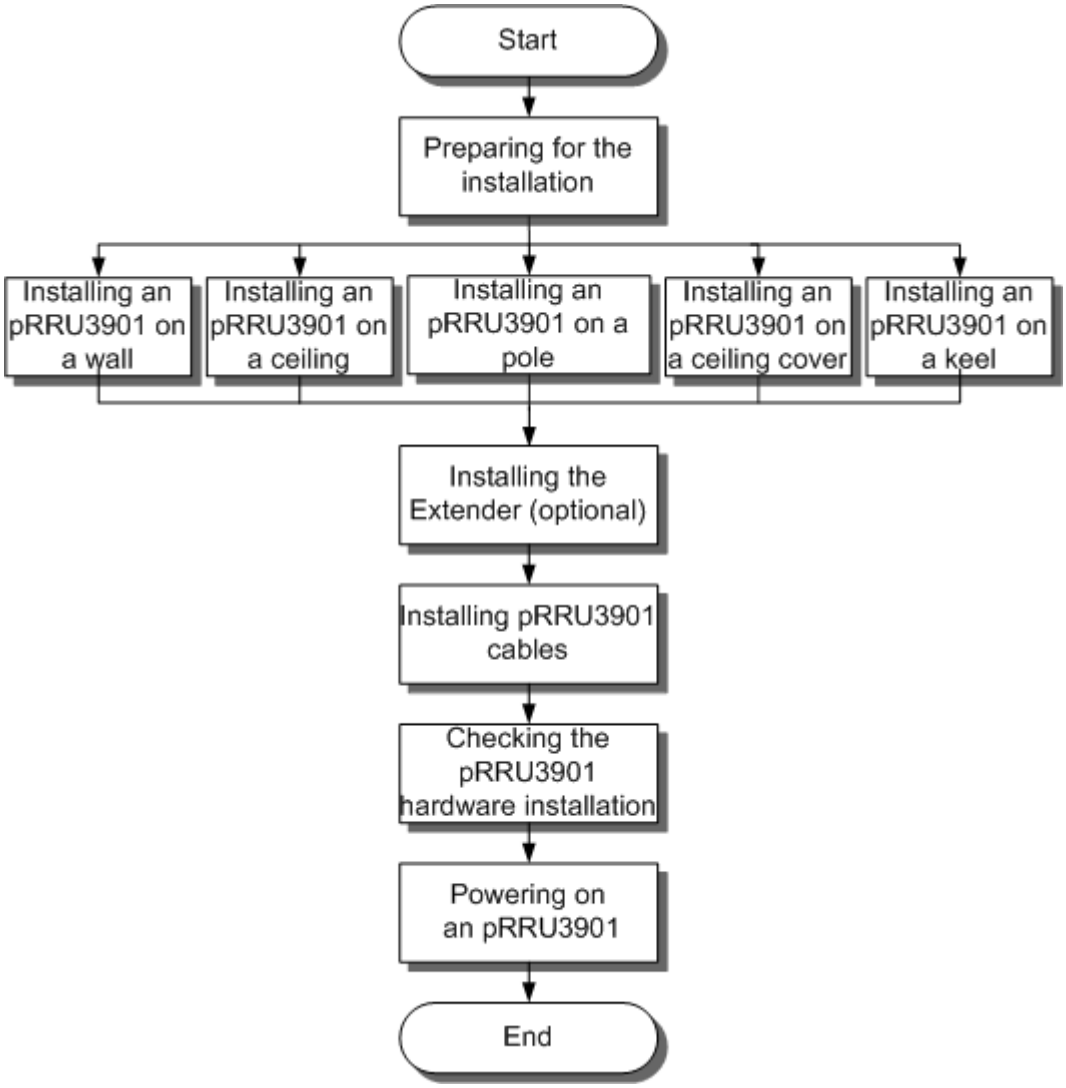
----End

7.3 Installation Process

This section describes the pRRU3901 installation process, which involves installing a pRRU3901, and cables, checking the pRRU3901 hardware installation, and powering on the pRRU3901.

Figure 7-3 shows the pRRU3901 installation process.

Figure 7-3 pRRU3901 installation process



7.4 Installing a pRRU3901

This section describes the pRRU3901 installation process. A pRRU3901 can be installed on a wall, ceiling, indoor metal pole, or standard keel, but not on an aluminum panel or a non-standard keel.

NOTE

Note the following when installing the pRRU3901:

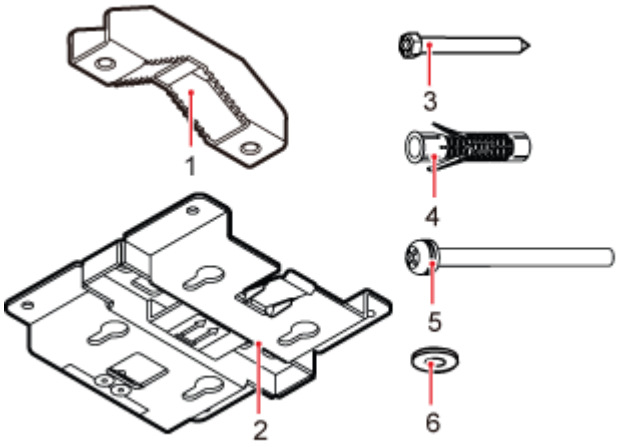
- The pRRU3901 cannot be grounded. If the pRRU3901 is grounded but the RHUB connected to this pRRU3901 is not, the pRRU3901 may fail to be powered on.
- A minimum distance of 50 cm must be reserved between the pRRU3901 and the incandescent lamp.
- The installation spacing between the pRRU3901 and the temperature sensor must be greater than 50 cm.
- It is good practice to install the pRRU3901 on materials that can tolerate a temperature higher than 65°C and have an ignition point higher than 70°C.

7.4.1 pRRU3901 Mounting Kits

This section describes the pRRU3901 mounting kits.

Figure 7-4 shows the exterior of the pRRU3901 mounting kits.

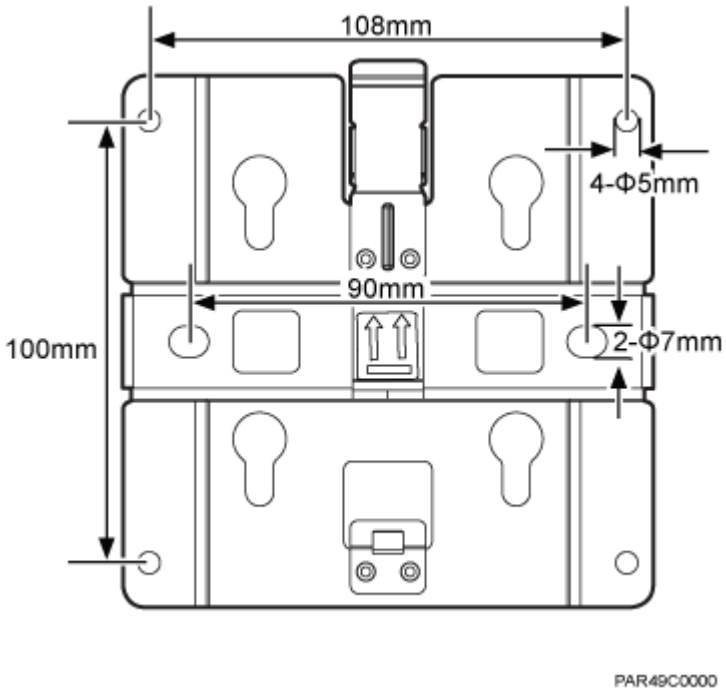
Figure 7-4 pRRU3901 mounting kits



(1) V clamp	(2) Mounting bracket	(3) Screw (M6x50)
(4) Plastic expansion sleeve	(5) Bolt (M6x80)	(6) Flat washer

The following figure shows the specifications of the mounting bracket.

Figure 7-5 Mounting bracket specifications



7.4.2 Installing a pRRU3901 on a Wall

This section describes how to install a pRRU3901 on an indoor wall. If a wall indoors has adequate load bearing capacity and installation space, it is good practice to install the pRRU3901 on the wall. If the wall does not have adequate load bearing capacity, choose an installation mode based on site requirements.

Context

NOTICE

This section describes only the wall-mounted installation in which mounting kits are directly installed on the wall without auxiliary devices. The procedure for other wall-mounted installation modes is similar.

Procedure

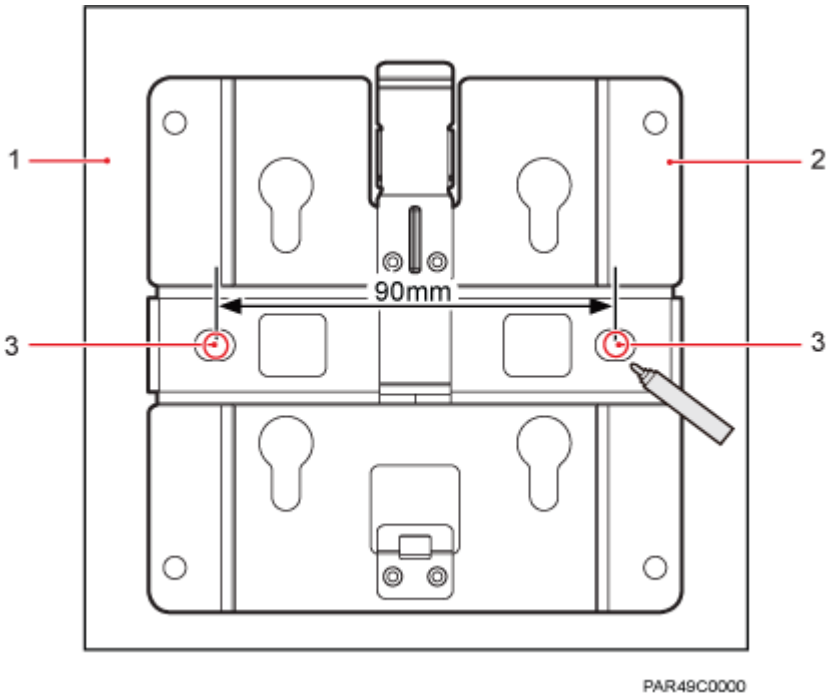
Step 1 Determine the position for installing the pRRU3901 based on the construction blueprint and the clearance requirements.

NOTE

For details about the clearance requirements, see **7.1.3 Space Requirements**.

Step 2 Place the mounting bracket in the installation position against the wall. Then, level the mounting bracket and use a marker to mark two anchor points. See **Figure 7-6**.

Figure 7-6 Anchor points on the pRRU3901 mounting bracket (unit: mm)



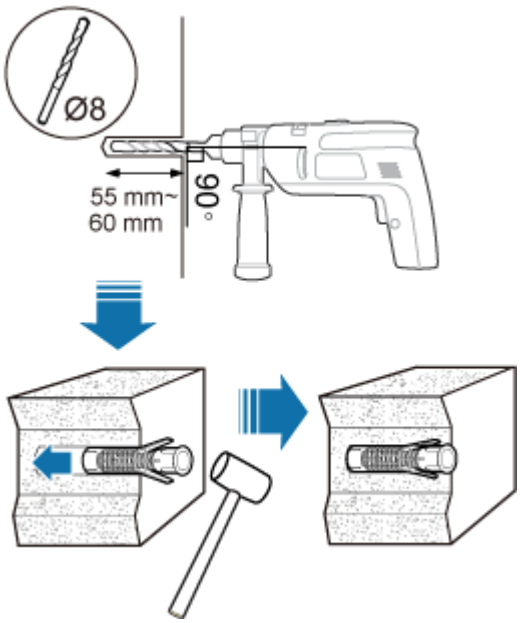
(1) Wall (2) Mounting bracket (3) Anchor point

CAUTION

To prevent inhalation or eye contact with dust, take adequate preventive measures when drilling holes.

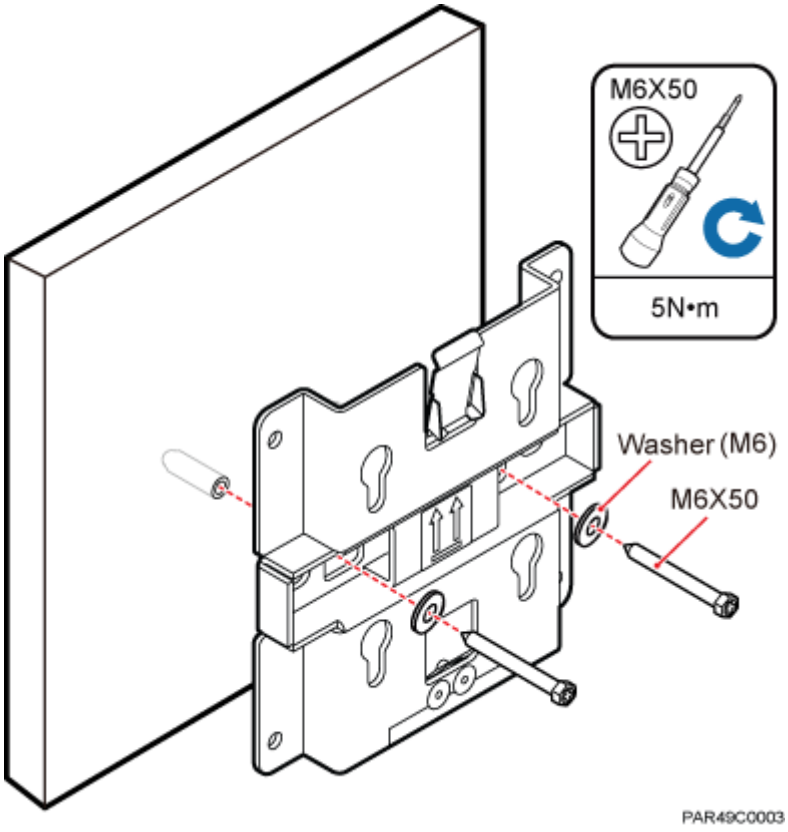
Step 3 Use a hammer drill with φ8 bore to drill holes at the marked anchor points, as shown in **Figure 7-7**. Use a vacuum cleaner to clean the dust inside and around the holes and measure the distance between them. If they are inaccurately positioned, re-measure and re-drill the holes. Then, use a rubber mallet to hit a plastic expansion sleeve into each hole.

Figure 7-7 Drilling holes and installing expansion bolts



Step 4 Lead the M6x50 screws through the washers, and then through the drilling holes on the mounting bracket to the plastic expansion sleeves, and torque the screws to 5 N•m, as shown in **Figure 7-8**.

Figure 7-8 Installing the mounting bracket



NOTE

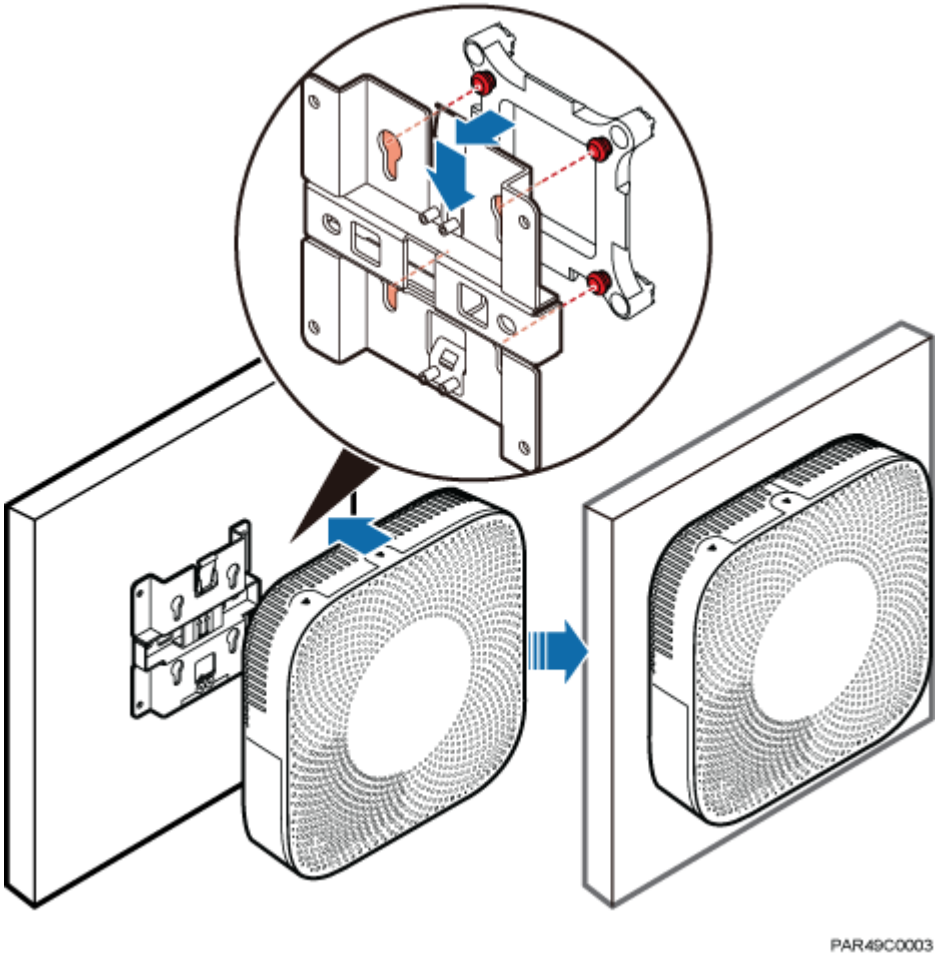
If the screws cannot be tightened using a Phillips screwdriver, use a hex key or an electric screwdriver to assist the installation.

Step 5 Fit the four hooks of the pRRU3901 into the mounting holes on the mounting bracket and then press the pRRU3901 downwards until a click is heard. See **Figure 7-9**.

NOTE

It is good practice to perform the installation from the side view to promptly align the hooks with the mounting holes.

Figure 7-9 Installing the pRRU3901 on a wall



----End

7.4.3 Installing a pRRU3901 on a Ceiling

This section describes how to install a pRRU3901 on the ceiling, such as the concrete ceiling, when the ceiling has adequate load bearing capacity and installation space.

Context

NOTICE

If the pRRU3901 is installed on a ceiling, the temperature of the ceiling may increase by a maximum of 30 degrees. Therefore, whether a pRRU3901 can be installed on a ceiling depends on the ceiling material.

Procedure

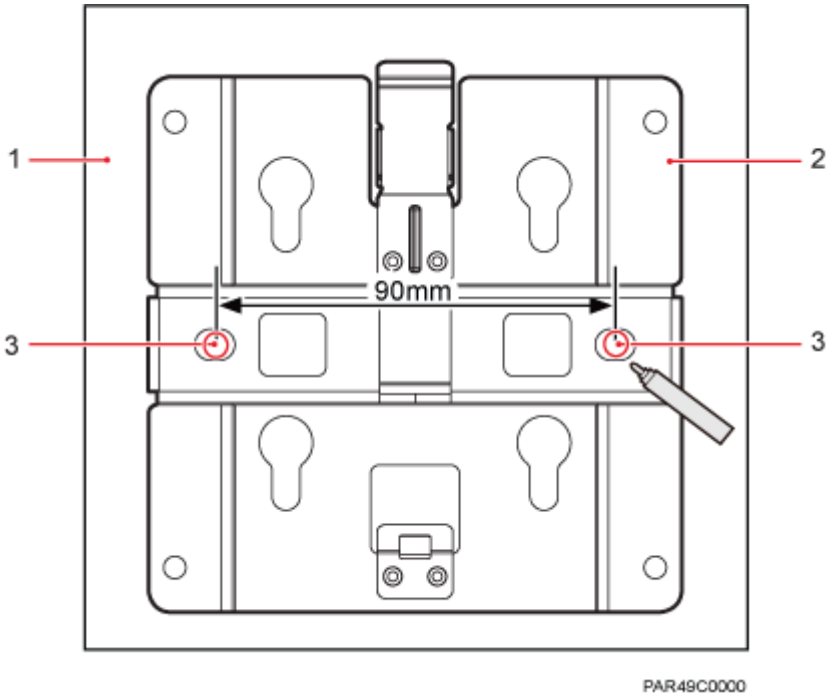
Step 1 Determine the position for installing the pRRU3901 based on the construction blueprint and the clearance requirements.

NOTE

For details about the clearance requirements, see **7.1.3 Space Requirements**.

Step 2 Place the mounting bracket in the installation position against the ceiling. Then, level the mounting bracket and use a marker to mark two anchor points. See **Figure 7-10**.

Figure 7-10 Anchor points on the pRRU3901 mounting bracket (unit: mm)



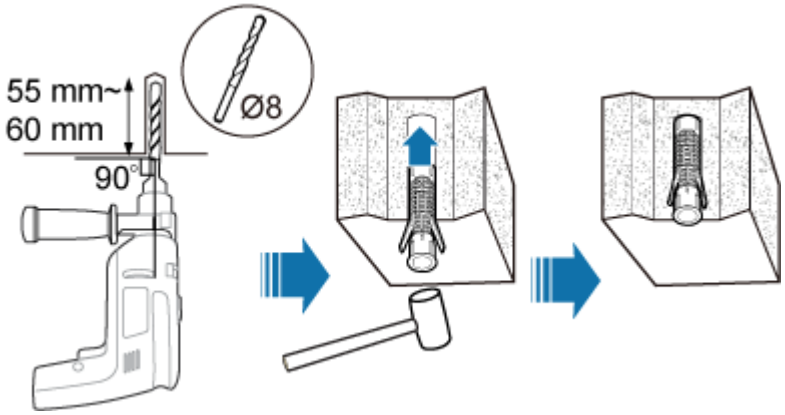
(1) Ceiling (2) Mounting bracket (3) Anchor point

CAUTION

To prevent inhalation or eye contact with dust, take adequate preventive measures when drilling holes.

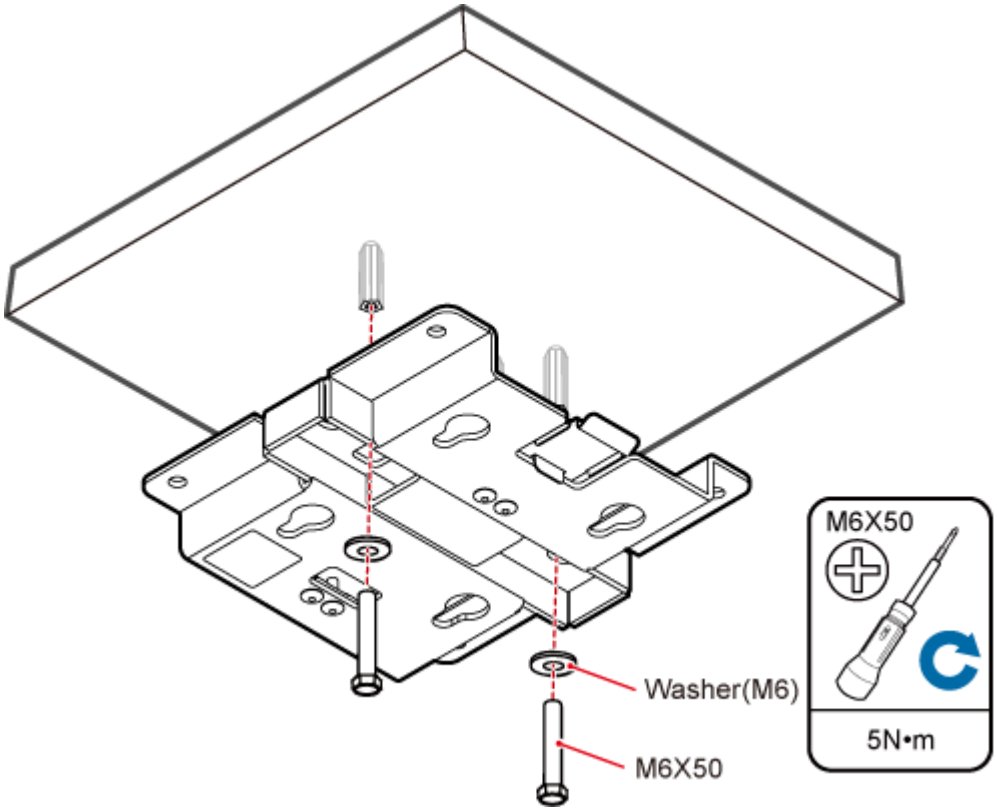
Step 3 Use a hammer drill with φ8 bore to drill holes at the marked anchor points, as shown in **Figure 7-11**. Use a vacuum cleaner to clean the dust inside and around the holes and measure the distance between them. If they are inaccurately positioned, re-measure and re-drill the holes. Then, use a rubber mallet to hit a plastic expansion sleeve into each hole.

Figure 7-11 Drilling holes and installing expansion bolts



Step 4 Lead the M6x50 screws through the washers, and then through the drilling holes on the mounting bracket to the plastic expansion sleeves, and use a torque screwdriver to torque the screws to 5 N•m, as shown in **Figure 7-12**.

Figure 7-12 Installing the mounting bracket



NOTE

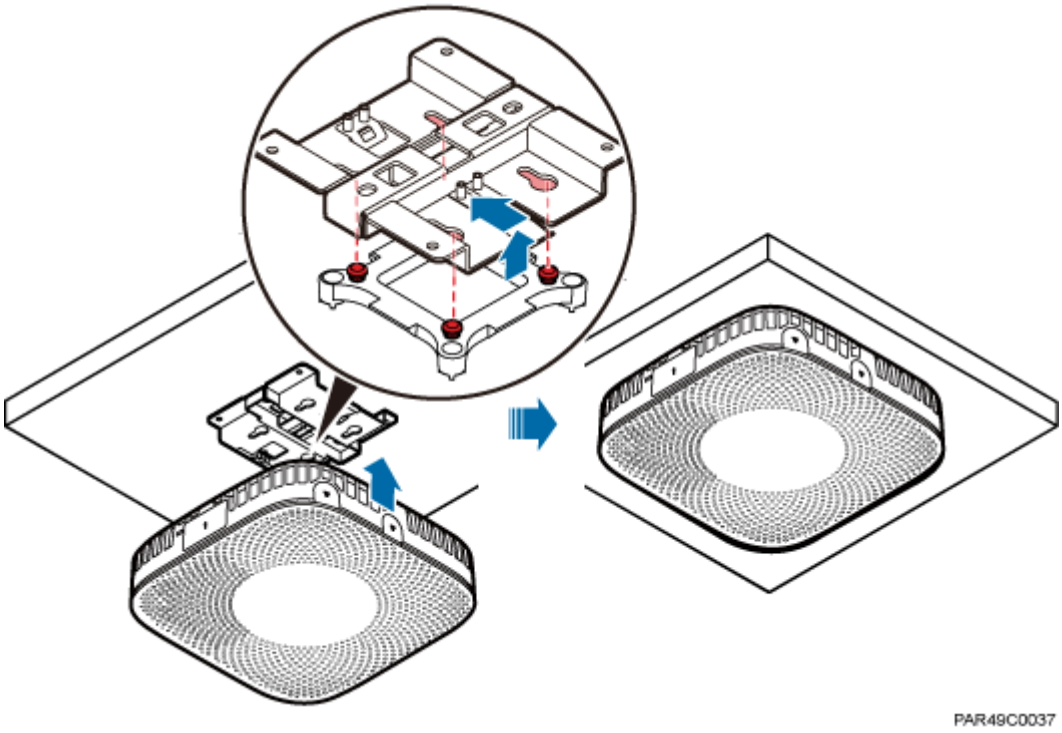
If the screws cannot be tightened using a Phillips screwdriver, use a hex key or an electric screwdriver to assist the installation.

Step 5 Fit the four hooks of the pRRU3901 into the mounting holes on the mounting bracket and then press the pRRU3901 downwards until a click is heard. See **Figure 7-13**.

NOTE

It is good practice to perform the installation from the side view to promptly align the hooks with the mounting holes.

Figure 7-13 Installing a pRRU3901 on a ceiling



----End

7.4.4 Installing a pRRU3901 on a Pole

This section describes how to install a pRRU3901 on a metal pole indoors.

Procedure

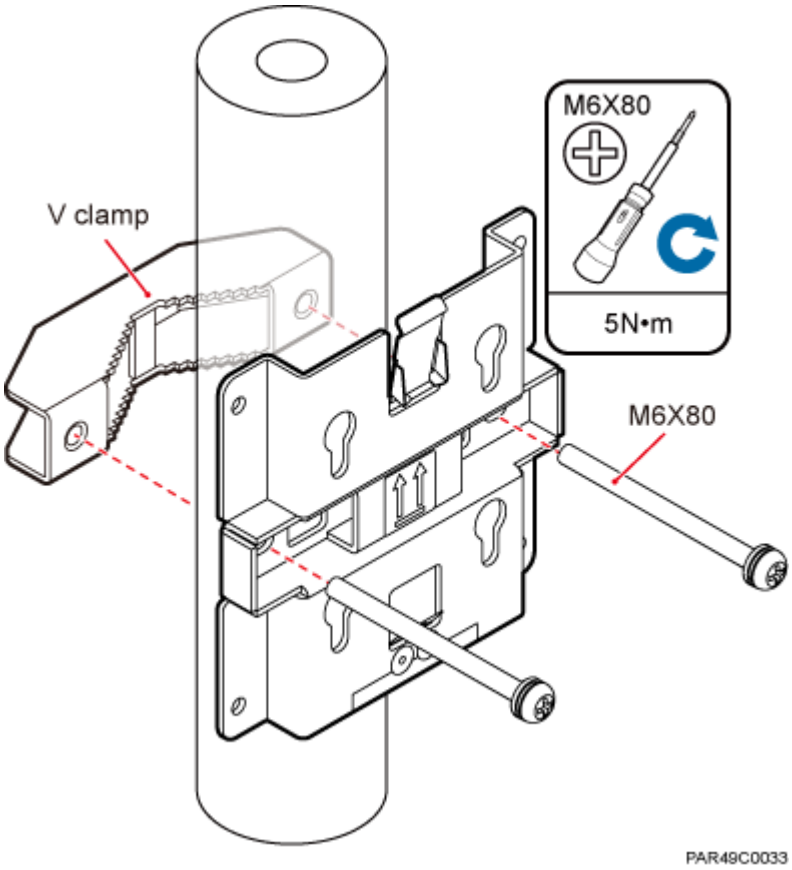
Step 1 Determine the position for installing the pRRU3901 based on the construction blueprint and the clearance requirements.

NOTE

For details about the clearance requirements, see **7.1.3 Space Requirements**.

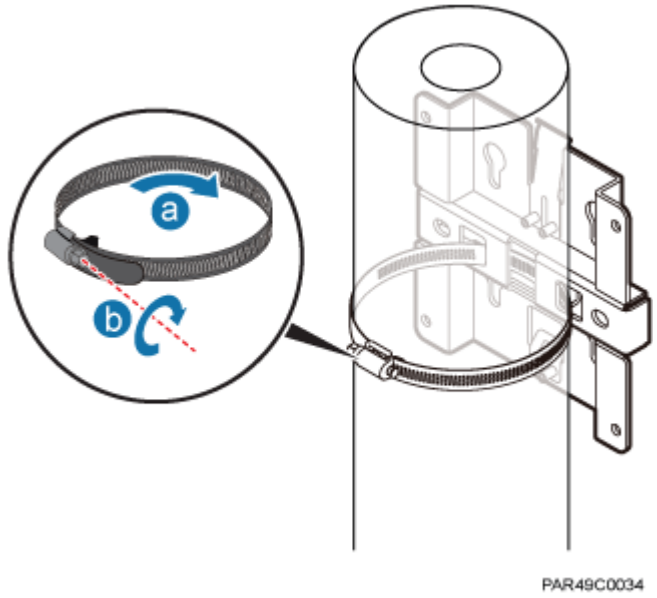
Step 2 If the diameter of the pole ranges from 30 mm to 70 mm, use the delivered V clamp, mounting bracket, and bolts to install the pRRU3901 on the pole. Lead the M6x80 bolts through the mounting bracket, and torque the bolts to 5 N•m, as shown in **Figure 7-14**.

Figure 7-14 Securing the pRRU3901 mounting bracket on the metal pole



If the diameter of the pole is greater than 70 mm, use the hose clamp to install the mounting bracket on the pole. The hose clamp is prepared by customers. Torque the bolts to 5 N•m, as shown in **Figure 7-15**.

Figure 7-15 Securing the pRRU3901 mounting bracket on the metal pole

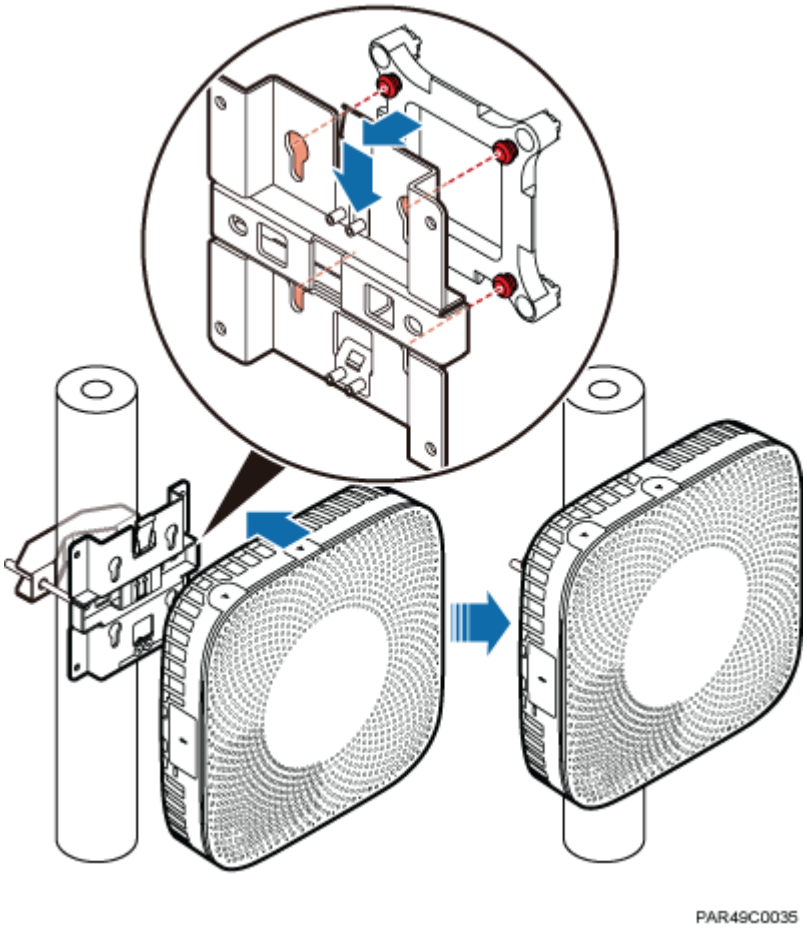


Step 3 Fit the four hooks of the pRRU3901 into the mounting holes on the mounting bracket and then press the pRRU3901 downwards until a click is heard. See **Figure 7-16**.

NOTE

It is good practice to perform the installation from the side view to promptly align the hooks with the mounting holes.

Figure 7-16 Installing a pRRU3901 on a pole



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7.4.5 Installing a pRRU3901 on a Plate

This section describes how to install a pRRU3901 on a plate. If a suspended ceiling plate has adequate load bearing capacity and installation space, the pRRU3901 can be installed on the plate. However, it is good practice not to install a pRRU3901 on an aluminum plate.

Procedure

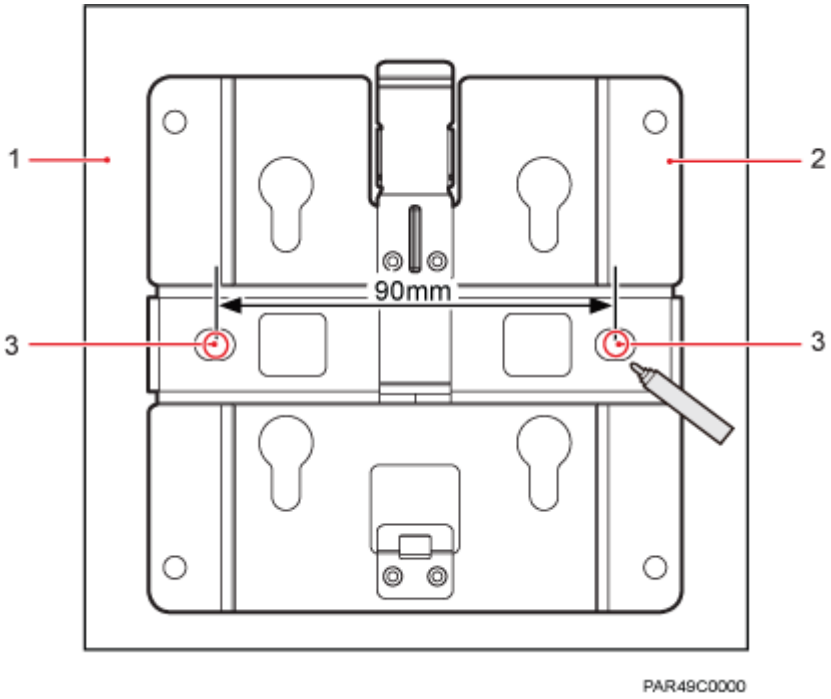
Step 1 Determine the position for installing the pRRU3901 based on the construction blueprint and the clearance requirements.

NOTE

For details about the clearance requirements, see **7.1.3 Space Requirements**.

Step 2 Place the mounting bracket in the installation position against the wall. Then, level the mounting bracket and use a marker to mark two anchor points. See **Figure 7-17**.

Figure 7-17 Anchor points on the pRRU3901 mounting bracket (unit: mm)



(1) Plate (2) Mounting bracket (3) Anchor point

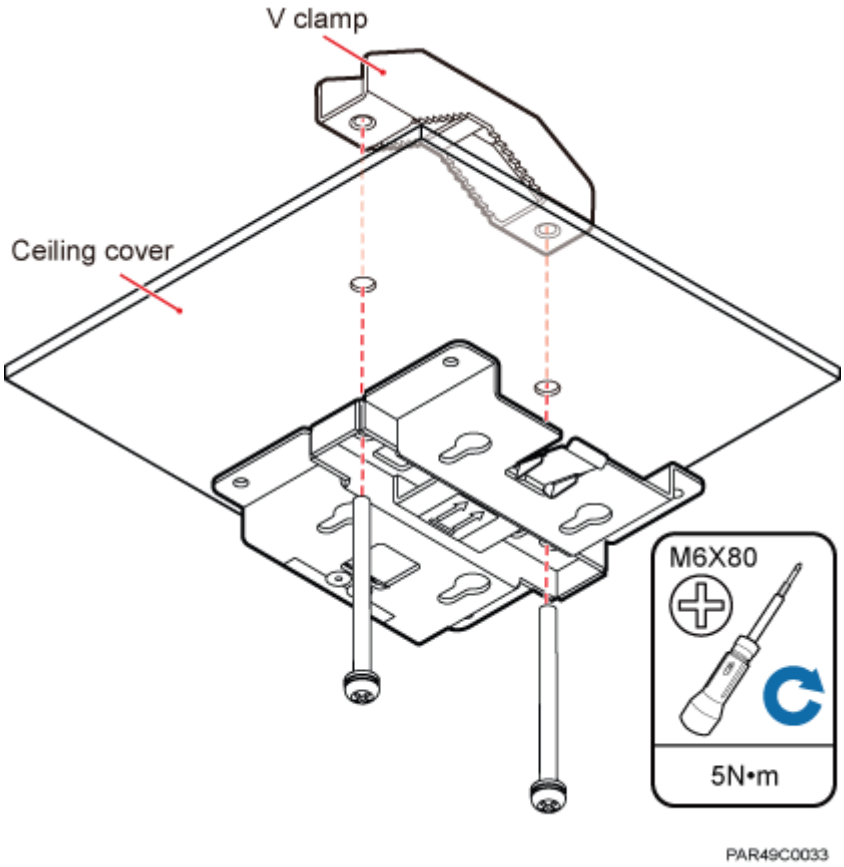
CAUTION

To prevent inhalation or eye contact with dust, take adequate preventive measures when drilling holes.

Step 3 Use a hammer drill with φ8 bore to drill holes at the anchor points.

Step 4 Lead the M6x80 bolts through the mounting bracket and the ceiling plate, and use a torque screwdriver to torque the bolts to 5 N•m, as shown in **Figure 7-18**.

Figure 7-18 Installing the pRRU3901 mounting bracket

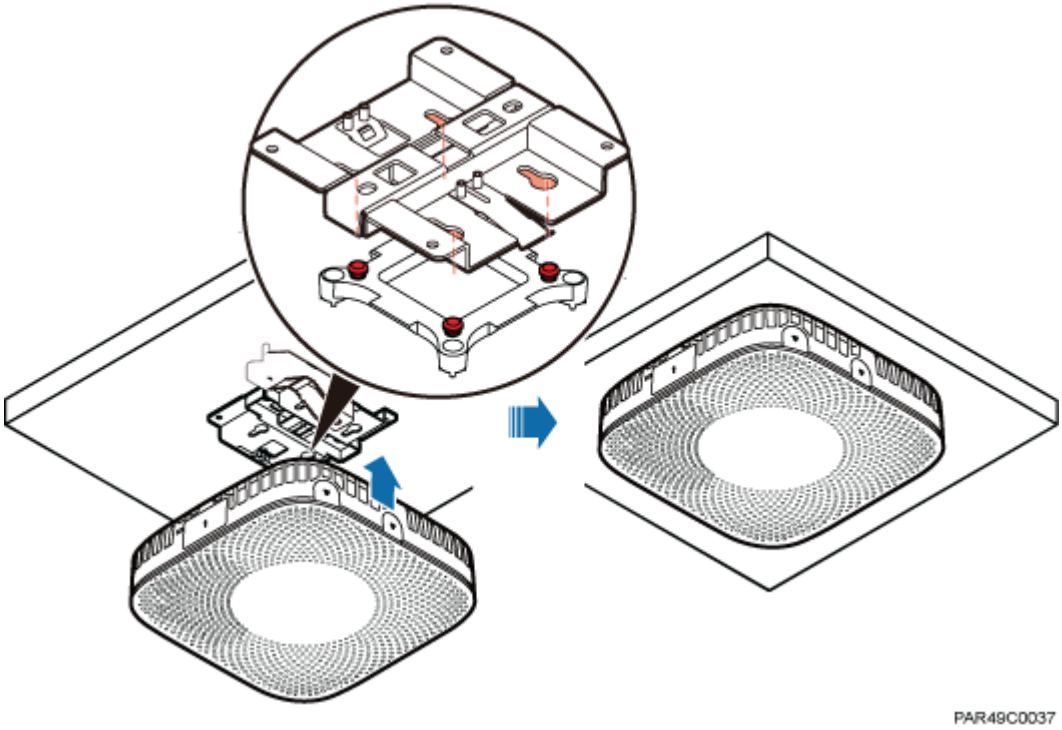


Step 5 Fit the four hooks of the pRRU3901 into the mounting holes on the mounting bracket and then press the pRRU3901 downwards until a click is heard. See **Figure 7-19**.

NOTE

It is good practice to perform the installation from the side view to promptly align the hooks with the mounting holes.

Figure 7-19 Installing a pRRU3901 on a plate



----End

7.4.6 Installing a pRRU3901 on a Keel

This section describes how to install a pRRU3901 on a keel. If a suspended ceiling plate cannot bear the pRRU3901, the pRRU3901 can be installed on the keel on the ceiling.

Context

Before installing the pRRU3901 on a keel, ensure that the keel is strong enough to bear the pRRU3901.

- The mounting bracket of the pRRU3901 can be installed on the keel of the following specifications: GBT 11981-2008, JIS A6517-2002, and ASTM C635 C635M-2007. The installation mode depends on onsite requirements because there are various keels.
- This section describes the procedure of installing a pRRU3901 on the keel of JIS standard used in Japan. The procedure of installing a pRRU3901 on other keels is the same as that of installing a pRRU3901 on the keel of JIS standard.

Procedure

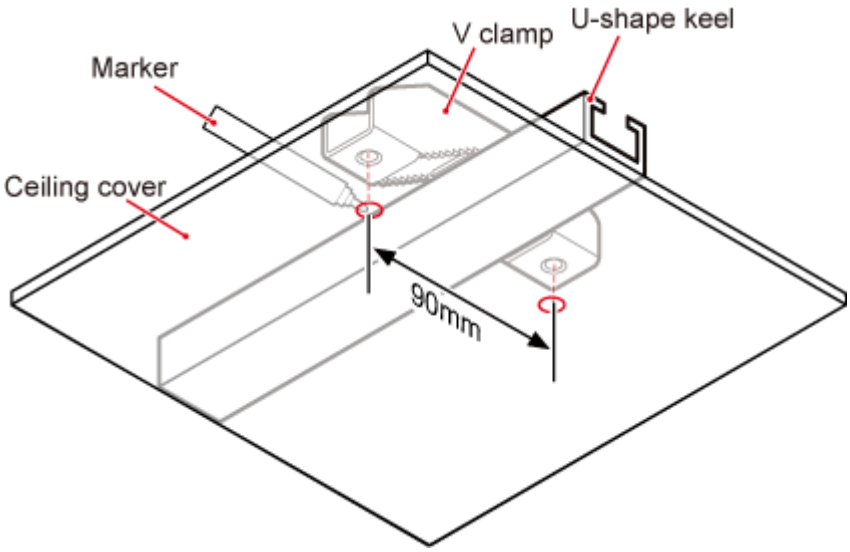
Step 1 Determine the position for installing the pRRU3901 based on the construction blueprint and the clearance requirements.

NOTE

For details about the clearance requirements, see **7.1.3 Space Requirements**.

Step 2 Place the V clamp across the keel, and use a marker to mark the projective positions of the mounting holes on the suspended ceiling plate, as shown in **Figure 7-20**.

Figure 7-20 Anchor points on the suspended ceiling plate (unit: mm)



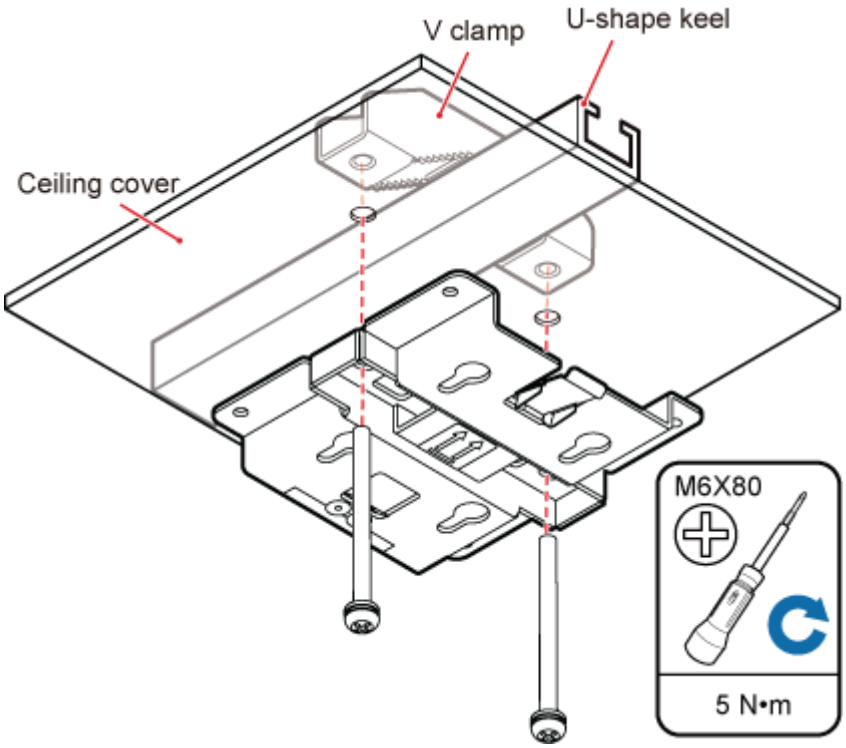
CAUTION

To prevent inhalation or eye contact with dust, take adequate preventive measures when drilling holes.

Step 3 Use a hammer drill to drill holes at the anchor points. You are advised to use the hammer drill with Φ12 bore.

Step 4 Lead the M6x80 bolts through the mounting bracket and the suspended ceiling plate. Use a torque screwdriver to torque the bolts to 5 N•m, as shown in **Figure 7-21**.

Figure 7-21 Installing the pRRU3901 mounting bracket

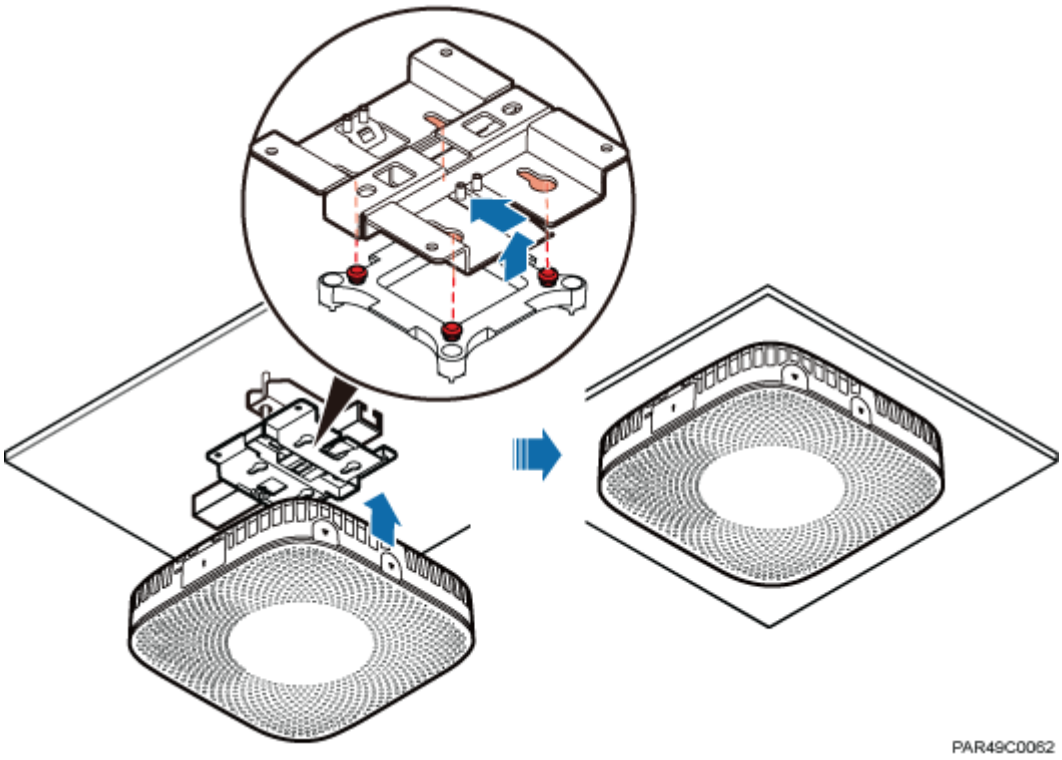


Step 5 Fit the four hooks of the pRRU3901 into the mounting holes on the mounting bracket and then press the pRRU3901 downwards until a click is heard. See **Figure 7-22**.

NOTE

It is good practice to perform the installation from the side view to promptly align the hooks with the mounting holes.

Figure 7-22 Installing a pRRU3901 on a keel



----End

7.5 Installing pRRU3901 Cables

This section describes the procedure of installing the pRRU3901 cables.

7.5.1 Requirements for Cable Layout

Cables must be routed according to the specified cabling requirements to prevent signal interference.

NOTE

If certain cables listed below are not required, skip the requirements for routing these cables.

General Requirements for Cable Layout

National Standards

- Code for Engineering Design of Generic Cabling System for Building and Campus (GB 50311-2007)
- Code for Engineering Acceptance of Generic Cabling System for Building and Campus (GB50312-2007).
- Security Protection Engineering Technology Specifications (GB 50348-2004)
- Code for Construction and Acceptance of the Electronic Information System Room (GB 50462-2008)
- Code for Quality Acceptance of the Intelligent Building Engineering (GB 50339-2003)

- Code for Quality Acceptance of Electric Engineering Construction in Building (GB 50303-2002)
- Technical Specification for Construction and Acceptance of Telecommunication Conduit Engineering (GB 50374-2006)

International Standards

- Generic Cabling for Customer Premises (ISO/IEC 11801)
- Commercial Building Telecommunications Cabling Standard (EIA/TIA 568)
- Commercial Building Standard for Telecommunication Pathways and Spaces (EIA/TIA 569)
- Administration Standard for Commercial Telecommunications Infrastructure (EIA/TIA 606)
- Grounding and Bonding Requirements for Telecommunications in Commercial Buildings (EIA/TIA 607)
- Generic Cabling Systems for Information Technology (EN 50173)
- Cabling Installation for Information Technology (EN 50174)

Bending radius

- The bending radius of a 1/4" jumper, a 1/2" softer jumper, and a 1/2" common jumper must be longer than 35 mm, 50 mm, and 127 mm, respectively.
- The bending radius of a power cable is at least three times the diameter of the cable.
- The bending radius of a signal cable must be at least five times of the diameter of the cable.

Cable binding

- Cables of the same type are bound together.
- Different types of cables must be separately routed with a minimum spacing of 30 mm and cannot be entangled.
- The cables are bound tightly and neatly and the sheaths of the cables is intact.
- The cable ties face the same direction and all cable ties bound at similar positions must be in a straight line.
- The extra length of each indoor cable tie must be cut off. A slack of 5 mm is reserved for each outdoor cable tie before the extra length is cut off. All cut surfaces are without sharp edges.
- Labels or nameplates are attached to both ends, joints, or turns of cables after they are installed.

Safety

- The steel pipe or fire-resistant rigid polyvinyl chloride pipe should be used for the cable duct or for routing cables. The cross-sectional usage of the cable duct should be 30% to 50% and that of the pipe for routing cables should be 25% to 30%.
- Cables are placed away from sharp objects or wall burrs. If these positions are inevitable, protection pipes are required for the cables.
- Cables are routed away from heat sources, or heat-insulation materials are added between cables and heat sources.
- A clearance is reserved at turns of a cable or the position close to a device, facilitating cable and device maintenance. The recommended clearance is about 0.1 m.

Requirements for Special Cables

Ethernet Cable

- A maximum of 100 Ethernet cables can be bundled if no PVC pipes are used. If pipes are used, a maximum of 24 Ethernet cables can be led through a pipe. In this case, ensure that 1/3 space inside the pipes must be vacant.
- The point at which an Ethernet cable is bundled must be spaced 400 mm or less from the Ethernet port on a pRRU.
- For the pRRU3901 used in the elevator engine room on the rooftop, generator set for the subway engine, and equipment room with central air conditioning, Ethernet cables must be led through metallic conduits that are reliably grounded at both ends.

7.5.2 pRRU3901 Cable List

This section describes pRRU3901 cable connections.

Table 7-7 lists pRRU3901 cables.

Table 7-7 List of pRRU3901 cables

Cable	One End		The Other End	
	Connector	Connected to ...	Connector	Connected to ...
Ethernet Cable	RJ45 connector	CPRI_E0~CPRI_E7 port on RHUB	RJ45 connector	CPRI_E0~CPRI_E1 port on pRRU3901
	RJ45 connector	Transmission port on Access Control(AC)	RJ45 connector	GE port on pRRU3901
(Optional) RF Jumper	SMA straight male connector	External antenna TX/RX RF port on pRRU3901	Based on the port model of the antenna system.	Antenna system

NOTE

- The Extender can be used to lengthen the distance between the RHUB and the pRRU3901 connected using the Ethernet cable. If the Extender is used, the Ethernet cable is divided into two parts, one between the RHUB and the Extender and the other between the Extender and the pRRU3901.
- The Ethernet cable used for connecting the GE port on the pRRU3901 to the transmission port on the AC is required only when the pRRU3901 have three transmission ports and is configured with the Wi-Fi daughter board.

7.5.3 Cable Connections

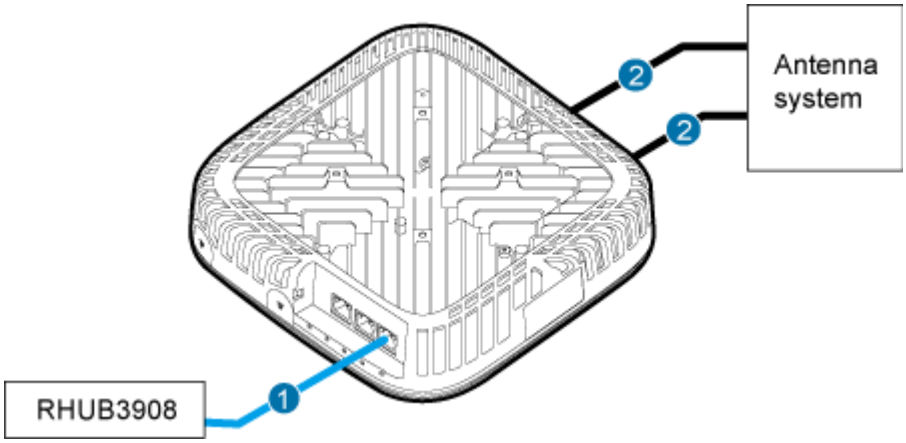
This section describes the cable connections for a single pRRU3901 and multiple pRRU3901s in UMTS, LTE FDD, UMTS+LTE FDD, LTE FDD+LTE FDD mode.

Before installing the pRRU3901 cables, you must be aware of the following information:

- The pRRU3901 can obtain power supply through the power over Ethernet (PoE).
- For external antennas corresponding to RF daughter board 1, the TX port and RX port are ANT0 and ANT1, respectively. For external antennas corresponding to RF daughter board 2, the TX port and RX port are ANT2 and ANT3, respectively. For external antennas corresponding to RF daughter board 3, the TX port and RX port are ANT4 and ANT5, respectively.
- The external antenna system is optional, and the pRRU3901 jumpers are not delivered. By default, the pRRU3901s are configured with built-in antennas. If the external antenna system is connected, the antenna system automatically switches to the external one. One end of the pRRU3901 RF jumper is the SMA male connector, which is connected to the external antenna TX/RX RF port on the pRRU3901. The other end of the pRRU3901 RF jumper is the type N male connector, which is connected to the antenna system. For the standard of the pRRU3901 RF jumper, see (Optional) RF Jumper of the *DBS3900 LampSite Hardware Description*.

Figure 7-23 shows the cable connection when the pRRU3901 is configured with only one RF Daughter Board.

Figure 7-23 pRRU3901 cable connection (1)



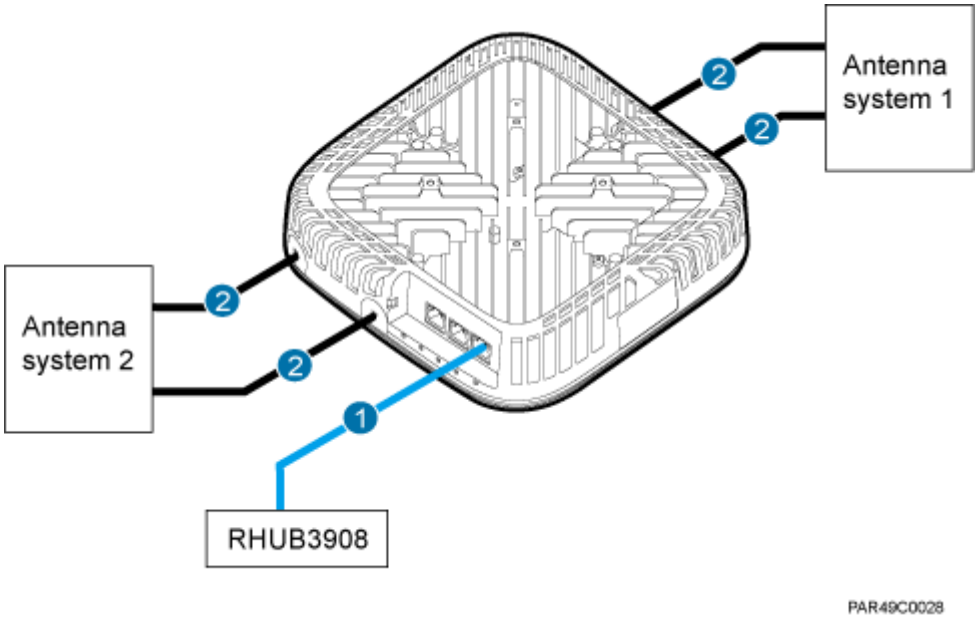
(1) Ethernet cable (2) RF jumper

NOTE

- The Extender can be used to lengthen the distance between the RHUB and the pRRU3901 connected using the Ethernet cable. If the Extender is used, the Ethernet cable is divided into two parts, one between the RHUB and the Extender and the other between the Extender and the pRRU3901.
- When two Ethernet cables are used to transmit CPRI signals, connect one end of the cables to the CPRI_E0 and CPRI_E1 ports on the pRRU panel and the other end to any two ports of CPRI_E0 to CPRI_E7 on the RHUB panel. On the RHUB panel, CPRI_E0 and CPRI_E1, CPRI_E2 and CPRI_E3, CPRI_E4 and CPRI_E5, and CPRI_E6 and CPRI_E7 are used in pairs. CPRI_E0 on the pRRU panel connects to the even-numbered CPRI port (for example, CPRI_E0, CPRI_E2, CPRI_E4, or CPRI_E6) on the RHUB panel, and CPRI_E1 on the pRRU panel connects to the odd-numbered CPRI port (for example, CPRI_E1, CPRI_E3, CPRI_E5, or CPRI_E7). This document describes signal transmission using one Ethernet cable as an example.

Figure 7-24 shows the cable connection when the pRRU3901 is configured with two RF Daughter Boards.

Figure 7-24 pRRU3901 cable connection (2)



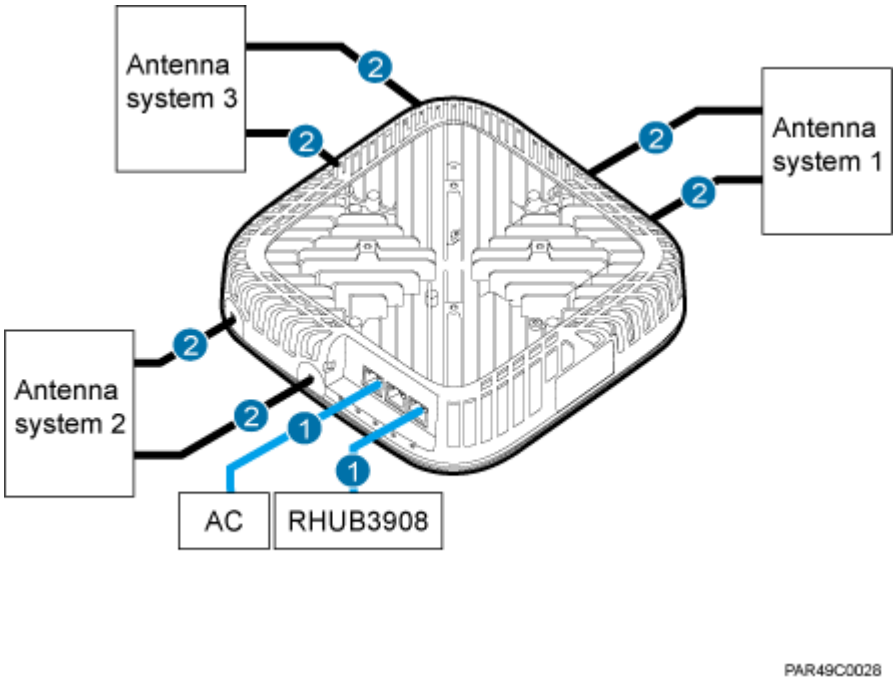
(1) Ethernet cable (2) RF jumper

NOTE

- The Extender can be used to lengthen the distance between the RHUB and the pRRU3901 connected using the Ethernet cable. If the Extender is used, the Ethernet cable is divided into two parts, one between the RHUB and the Extender and the other between the Extender and the pRRU3901.
- When two Ethernet cables are used to transmit CPRI signals, connect one end of the cables to the CPRI_E0 and CPRI_E1 ports on the pRRU panel and the other end to any two ports of CPRI_E0 to CPRI_E7 on the RHUB panel. On the RHUB panel, CPRI_E0 and CPRI_E1, CPRI_E2 and CPRI_E3, CPRI_E4 and CPRI_E5, and CPRI_E6 and CPRI_E7 are used in pairs. CPRI_E0 on the pRRU panel connects to the even-numbered CPRI port (for example, CPRI_E0, CPRI_E2, CPRI_E4, or CPRI_E6) on the RHUB panel, and CPRI_E1 on the pRRU panel connects to the odd-numbered CPRI port (for example, CPRI_E1, CPRI_E3, CPRI_E5, or CPRI_E7). This document describes signal transmission using one Ethernet cable as an example.

Figure 7-24 shows the cable connection when the pRRU3901 is configured with two RF Daughter Boards and one Wi-Fi daughter board.

Figure 7-25 pRRU3901 cable connection (3)



(1) Ethernet cable (2) RF jumper

NOTE

- The Extender can be used to lengthen the distance between the RHUB and the pRRU3901 connected using the Ethernet cable. If the Extender is used, the Ethernet cable is divided into two parts, one between the RHUB and the Extender and the other between the Extender and the pRRU3901.
- When two Ethernet cables are used to transmit CPRI signals, connect one end of the cables to the CPRI_E0 and CPRI_E1 ports on the pRRU panel and the other end to any two ports of CPRI_E0 to CPRI_E7 on the RHUB panel. On the RHUB panel, CPRI_E0 and CPRI_E1, CPRI_E2 and CPRI_E3, CPRI_E4 and CPRI_E5, and CPRI_E6 and CPRI_E7 are used in pairs. CPRI_E0 on the pRRU panel connects to the even-numbered CPRI port (for example, CPRI_E0, CPRI_E2, CPRI_E4, or CPRI_E6) on the RHUB panel, and CPRI_E1 on the pRRU panel connects to the odd-numbered CPRI port (for example, CPRI_E1, CPRI_E3, CPRI_E5, or CPRI_E7). This document describes signal transmission using one Ethernet cable as an example.

7.5.4 Cable Connections (LTE TDD)

This section describes the cable connections for a single pRRU3901 and multiple pRRU3901s in LTE TDD mode.

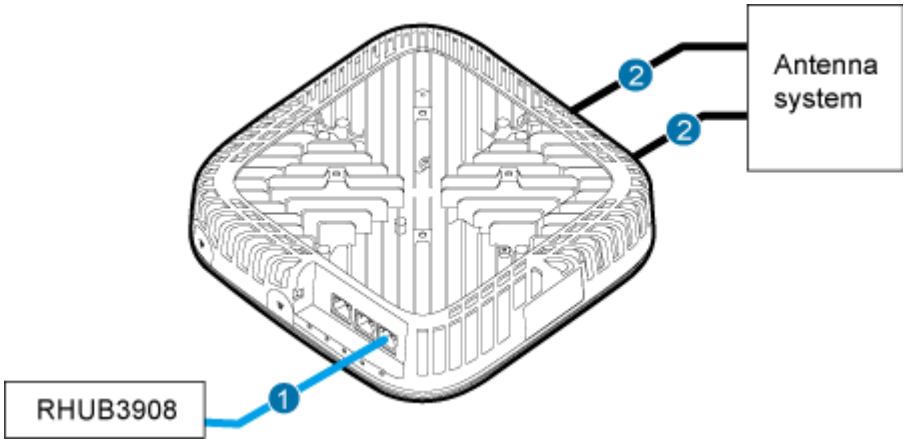
Before installing the pRRU3901 cables, you must be aware of the following information:

- The pRRU3901 can obtain power supply through the power over Ethernet (PoE).
- For external antennas corresponding to RF daughter board 1, the TX port and RX port are ANT0 and ANT1, respectively. For external antennas corresponding to RF daughter board 2, the TX port and RX port are ANT2 and ANT3, respectively. For external antennas corresponding to RF daughter board 3, the TX port and RX port are ANT4 and ANT5, respectively.
- The external antenna system is optional, and the pRRU3901 jumpers are not delivered. By default, the pRRU3901s are configured with built-in antennas. If the external antenna system is connected, the antenna system automatically switches to the external one. One end of the pRRU3901 RF jumper is the SMA male connector, which is connected to the

external antenna TX/RX RF port on the pRRU3901. The other end of the pRRU3901 RF jumper is the type N male connector, which is connected to the antenna system. For the standard of the pRRU3901 RF jumper, please see (Optional) RF Jumper of the *DBS3900 LampSite Hardware Description*.

Figure 7-26 shows the cable connection when the pRRU3901 is configured with only one RF Daughter Board.

Figure 7-26 pRRU3901 cable connection (1)



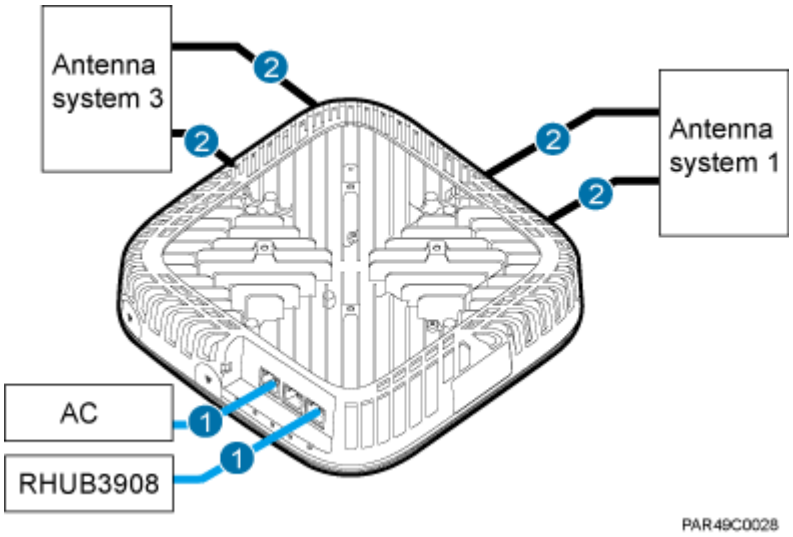
(1) Ethernet cable (2) RF jumper

NOTE

The Extender can be used to lengthen the distance between the RHUB and the pRRU connected using the Ethernet cable. If the Extender is used, the Ethernet cable is divided into two parts, one between the RHUB and the Extender and the other between the Extender and the pRRU.

Figure 7-27 shows the cable connection when the pRRU3901 is configured with one RF Daughter Boards and one Wi-Fi daughter board.

Figure 7-27 pRRU3901 cable connection (2)



(1) Ethernet cable (2) RF jumper

NOTE

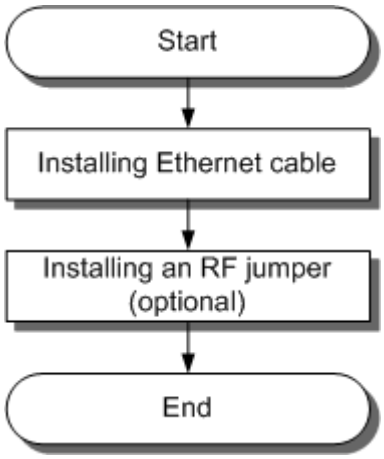
The Extender can be used to lengthen the distance between the RHUB and the pRRU connected using the Ethernet cable. If the Extender is used, the Ethernet cable is divided into two parts, one between the RHUB and the Extender and the other between the Extender and the pRRU.

7.5.5 pRRU3901 cable installation process

This section describes the process of installing pRRU3901 cables.

Figure 7-28 shows the process of installing pRRU3901 cables.

Figure 7-28 pRRU3901 cable installation process



7.5.6 Installing an Ethernet Cable

This section describes how to install an Ethernet cable.

Prerequisites

- The Ethernet cable must be of Category 5e (enhanced) or higher. In addition, its cross-sectional area must be 24 AWG or larger and frame spread rating must be CM or higher.
- The Ethernet cables can be straight-through cables or crossover cables.
- With the internal PoE module providing power, the maximum length of an Ethernet cable is 100 m. With the Extender, the distance of the pRRU3901 and RHUB can be extended by the Extender up to a total distance of 200 m.
- Ethernet cables are not delivered, and they must be prepared onsite. You need to use a network cable tester to test the Ethernet cable connection.

Context

The Ethernet cable has the following functions:

- Provides power supply for the pRRU3901 when the cable connects the CPRI_E0 port on the pRRU3901 to the RHUB.
- Transmits CPRI signals between an RHUB and a pRRU3901.
- Provides Wi-Fi services for the pRRU3901 when the cable connects the GE port on the pRRU3901 with three transmission ports to the AC.

Using the CPRI_E1 port on the pRRU3901 has the same Ethernet cable connection to the RHUB as using the CPRI_E0 port. The following section describes the connection using the CPRI_E0 port.

Procedure

Step 1 Make the Ethernet cables.

1. Assemble an RJ45 connector and an Ethernet cable by following instructions in Assembling the Unshielded RJ45 Connector and the Ethernet Cable of *Installation Reference*.

   NOTE

   Follow pin assignment instructions described in section Ethernet Cable in *DBS3900 LampSite Hardware Description* to assemble the unshielded RJ45 connector and the Ethernet cable. Otherwise, the transmission signal quality deteriorates and CPRI links may be disconnected.

2. Check whether the made RJ45 connector is qualified by following instructions in Checking the Appearance of Metal Contact Strips.
3. To complete the assembly of the other end, repeat **Step 1.1** and **Step 1.2**.
4. Check whether the touch points on the connectors at both ends are normally conducted and well contacted and whether the connections are correct by following instructions in Testing the Connection of Assembled Cables of *Installation Reference*.

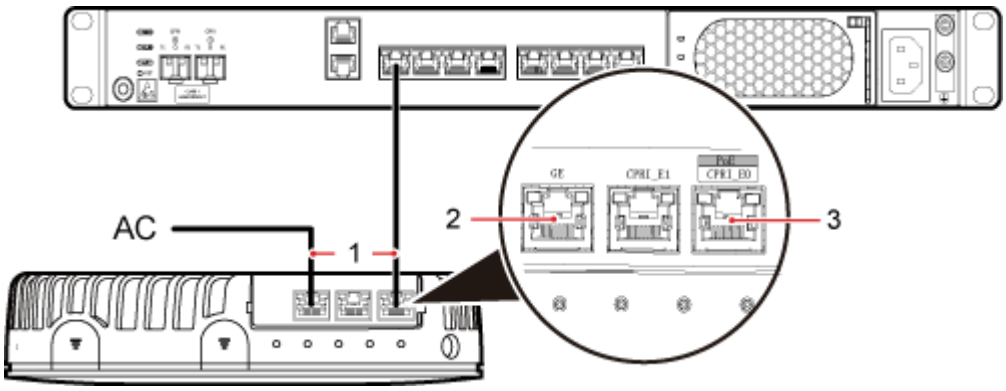
Step 2 Install an Ethernet cable between an RHUB and a pRRU3901.

1. Remove the dustproof cap of the CPRI_E0 port on the pRRU3901.
2. Connect the RJ45 connector at one end of the Ethernet cable to the CPRI_E0 port on the pRRU3901 panel.
3. **Optional:** Connect the RJ45 connector at the other end of the Ethernet cable to the output port of the Extender. Then, connect the RJ45 connector at one end of another Ethernet cable to the input port of the Extender.
4. Connect the RJ45 connector at the other end of the Ethernet cable to any port ranging from CPRI_E0 to CPRI_E7 on the RHUB panel based on the engineering design, as shown in **Figure 7-29**.

Step 3 **Optional:** Install the Ethernet cable between the pRRU3901 and the AC. This operation is required when the pRRU3901 with three transmission ports is configured with a Wi-Fi daughter board.

1. Remove the dustproof cap of the GE port on the pRRU3901.
2. Connect the RJ45 connector at one end of the Ethernet cable to the GE port on the pRRU3901 panel.
3. Connect the RJ45 connector at the other end of the Ethernet cable to the transmission port of the AC based on the engineering design, as shown in **Figure 7-29**.

Figure 7-29 Installing an Ethernet cable



(1) Ethernet cable (2) GE port on the pRRU3901 (3) CPRI_E0 port on the pRRU3901

NOTE

The pRRU3901 can have two transmission ports plus one PWR port or three transmission ports (plus one PWR port or no PWR port), requiring the same installation operations. This section uses the pRRU3901 with three transmission ports no PWR port as an example.

----End

Follow-up Procedure

1. Route the cable, and then use a cable tie to bind the cable. For details, see **7.5.1 Requirements for Cable Layout**.
2. Label the installed cable. For details, see section **11.3 Attaching an L-Shaped Label**.

7.5.7 Installing an RF jumpers (Optional)

The RF jumpers transmit radio frequency signals. One end of the RF jumpers is the SMA straight male connector, and the other end is the type N connector.

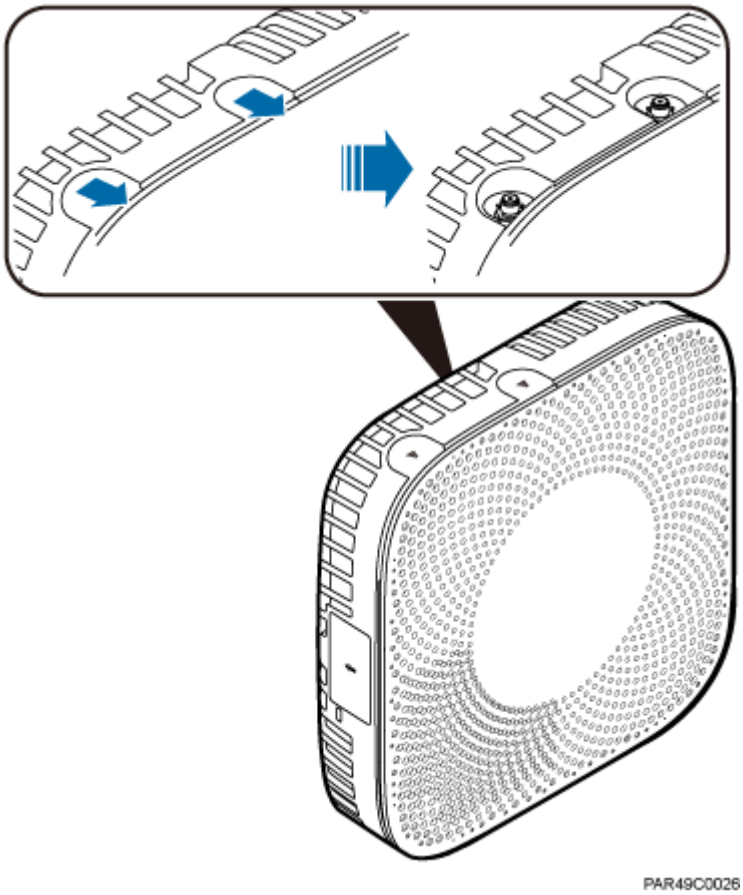
Context

- If the RF jumper is provided by the customer, the jumper must not be lower than the RG316 specifications. In addition, the jumpers can be used after they are checked by Huawei engineers.
- pRRU3901s can be connected to external whip antennas or external remote antennas (through pRRU3901 RF jumpers). Whip antennas are delivered optionally. RF jumpers are not delivered.

Procedure

Step 1 Expose the SMA female connector by removing the pRRU3901 antenna housing, as shown in **Figure 7-30**.

Figure 7-30 Removing the pRRU3901 antenna housing



Step 2 Use a torque wrench with a torque of 0.6 N•m to connect the SMA straight male connector on a jumper to the ANT port on the pRRU3901 panel.

NOTICE

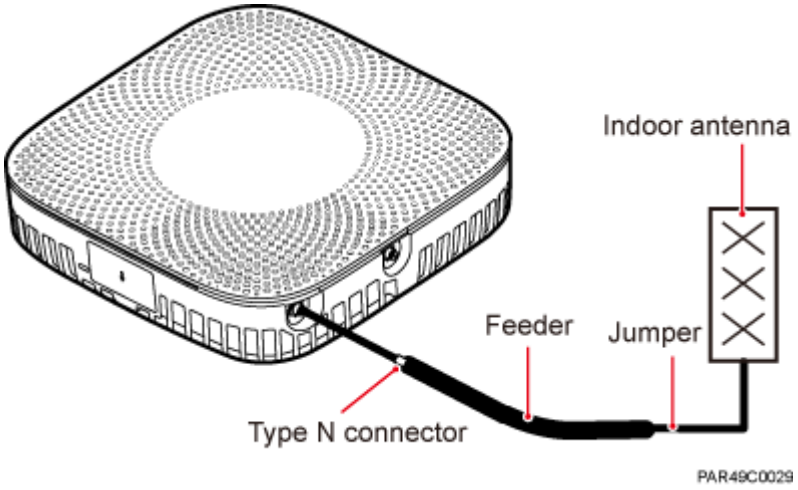
Tighten it with hands, and then use a torque wrench to tighten it with a rotational speed of less than or equal to 2.4 rpm to tighten it.

Step 3 Connect the type N female connector of the jumper to the type N male connector of the RF feeder connected to the built-in antenna.

NOTICE

Tighten the feeder close to the type N connector to ensure that the jumper is not tightened. In this way, the connectors on both ends of a jumper are not affected by the external force.

Figure 7-31 Installing jumpers between the pRRU3901 and external antennas



----End

Follow-up Procedure

1. Route the cable, and then use a cable tie to bind the cable. For details, see **7.5.1 Requirements for Cable Layout**.
2. Label the installed cable. For details, see section **11.3 Attaching an L-Shaped Label**.

7.6 Checking the pRRU3901 Hardware Installation

pRRU3901 hardware installation checking includes hardware and cable installation checking.

Table 7-8 lists the hardware installation checking items.

Table 7-8 Hardware installation checking list

No.	Item
1	Ensure that the pRRU3901 is not grouned.
2	The position for each device conforms to the engineering design and meets the space requirement.
3	Ensure that the pRRU3901 is properly installed.
4	The surface of the pRRU3901 is neat and clean. The external paint is intact. The labels, tags, and nameplates are correct, legible, and complete.

Table 7-9 lists the check items of the signal cable connection.

Table 7-9 Checklist for the signal cable connection

No.	Item
1	The connectors of the signal cables must securely connected.
2	The connectors of the signal cables are intact.
3	The signal cables are intact.
4	The cable ties are evenly spaced. The signal cables are bound neatly with cable ties to proper tightness, and arranged at even intervals in the same direction.
5	The extra length of the cable ties is cut and removed. The cut surfaces of the indoor cables are smooth and have no sharp edges.
6	The cable layout facilitates maintenance and expansion.
7	Correct and clear labels are attached to both ends of the signal cables.

Table 7-10 lists the checking items for other cable connections.

Table 7-10 Checklist for other cable connections

No.	Item
1	The connectors of the other cables must securely connected.
2	Labels on the cables are legible and bound based on the engineering requirements. The cables must be bound tightly and neatly. The sheaths of the cables must not be damaged.
3	Positions for routing the cables must meet requirements of the engineering design.

7.7 Powering on the pRRU3901

This section describes the power-on check on the pRRU3901 after the pRRU3901 hardware is installed and checked.

Procedure

Step 1 Power on the pRRU3901. Wait 3 to 5 minutes, check the status of the RUN indicator on the pRRU3901.

If the RUN Indicator...	Because...	Then...
Steady on	There is power input, but the board is faulty.	Power off the power supply, rectify the fault, and power on the pRRU3901.

If the RUN Indicator...	Because...	Then...
Steady off	There is no power input, or an alarm is reported on the board.	Power off the power supply and check the power input. If no fault is found after the pRRU3901 is powered off, clear the fault on the board, and power on the pRRU3901.
On for 1s and off for 1s	The device works properly.	End this operation.
On for 0.125s and off for 0.125s	The software of the board is loading.	Wait five minutes for the software to be successfully loaded. If the software is loading five minutes later, shut off the power supply. Check whether the data configuration file is correct. After the fault is rectify, power on the pRRU3901 again.

----End

8 Installing a pRRU3902

About This Chapter

This chapter describes the pRRU3902 installation process.

8.1 Information About the Installation
This section describes the information that you must be familiar with before installing a pRRU3902, including the pRRU3902 product family, installation scenarios, installation space and environment requirements.

8.2 Installation Process
This section describes the pRRU3902 installation process, which involves installing a pRRU3902, and cables, checking the pRRU3902 hardware installation, and powering on the pRRU3902.

8.3 Installing a pRRU3902
This section describes the pRRU3902 installation process. A pRRU3902 can be installed on a wall, ceiling, indoor metal pole, or keel, but not on an aluminum panel or a non-standard keel.

8.4 Installing pRRU3902 Cables
This section describes the procedure of installing the pRRU3902 cables.

8.5 (Optional) Installing a Combiner
This section describes how to install a combiner.

8.6 Checking the pRRU3902 Hardware Installation
pRRU3902 hardware installation checking includes hardware and cable installation checking.

8.7 Powering on the pRRU3902
This section describes the power-on check on the pRRU3902 after the pRRU3902 hardware is installed and checked.

8.1 Information About the Installation

This section describes the information that you must be familiar with before installing a pRRU3902, including the pRRU3902 product family, installation scenarios, installation space and environment requirements.

8.1.1 pRRU3902 Product Family

This chapter describes the configurations and functions of the pRRU3902 components.

Table 8-1 lists the pRRU3902 product family.

Table 8-1 pRRU3902 product family

Category	Equipment	Optional or Mandatory	Quantity	Function
Main equipment	pRRU3902 with internal antennas	Mandatory	1	Functions as a remote radio unit that processes RF signals.
	pRRU3902 supporting external antennas	Mandatory	1	Functions as a remote radio unit that processes RF signals. It has no internal antennas and must connect to external antennas.
	Combiner	Optional	2	Combines signals of RF units operating in different frequency bands.

Category	Equipment	Optional or Mandatory	Quantity	Function
Auxiliary device	Mounting kits	Mandatory	1	Supports the pRRU3902 installation on a wall, ceiling, or keel. The mounting kits vary with the pRRU3902 installation mode.
	Extender	Optional	1 or 2 **NOTE** The quantity depends on the number of Ethernet cables in use.	Extends the distance between the pRRU3902 and RHUB.

8.1.2 pRRU3902 Installation Scenario

The pRRU3902 can be installed on a wall, ceiling, or keel. The following table describes the installation in different scenarios.

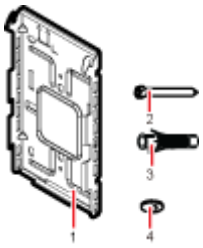
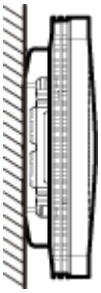
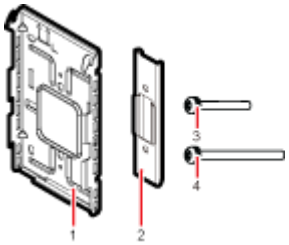
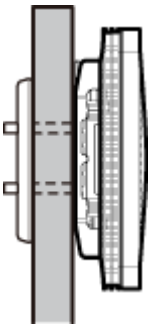
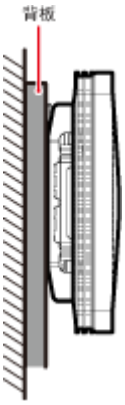
Installing a pRRU3902 on a wall

NOTE

- The pRRU3902 must keep a minimum of 0.5 m away from the power equipment with interference, and keep a minimum of 2 m away from the source with radiation.
- The pRRU3902 must keep away from a metal wall to avoid the impact on the antenna performance.

When a pRRU3902 is installed on a wall, installation modes vary with the quality of wall, as shown in **Table 8-2**.

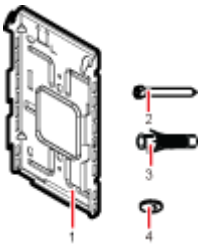
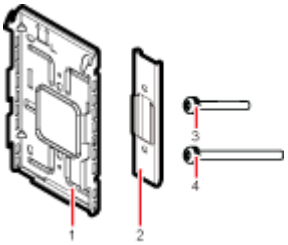
Table 8-2 Wall-mounted suggestion

Installation Mode	Requirements	Mounting Brackets	Installation Diagram
Installing the pRRU3902 on a wall by drilling holes For details, see **8.3.2 Installing a pRRU3902 on a Wall**.	● The wall can bear a load at least four times the weight of a pRRU3902. ● The screws must be tightened with a torque of 1.5 N·m. This ensures the screws work properly and the wall remains intact without cracks in it.	1. Plate 2. Screw (M3.5x35) 3. Plastic expansion sleeve 4. Flat washer 	
Installing the pRRU3902 on a wall using a clamp through an attachment plate For details, see **8.3.4 Installing a pRRU3902 on a Plate**.	● The wall can bear a load at least four times the weight of a pRRU3902. ● The thickness of the wall is less than 45 mm.	1. Plate 2. Clamp 3. Bolt (M4x35) 4. Bolt (M4x60) 	
Installing the pRRU3902 on a wall using a plate on a metal wall	The wall cannot bear a load at least four times the weight of the pRRU3902. For example, EPS walls, MDF walls, or walls cannot be drilled.	The plate is prepared by customers.	

Installing a pRRU3902 on a ceiling

When a pRRU3902 is installed on a ceiling, installation modes vary with the quality of the ceiling, as shown in **Table 8-3**.

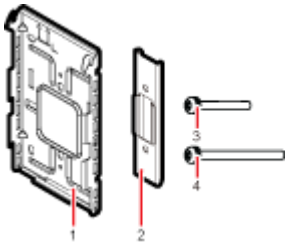
Table 8-3 Ceiling-mounted suggestion

Installation Mode	Requirements	Mounting Brackets	Installation Diagram
Installing the pRRU3902 on a ceiling by drilling holes For details, see **8.3.3 Installing a pRRU3902 on a Ceiling**.	● The ceiling, such as a concrete ceiling, can bear a load at least four times the weight of the pRRU3902. ● The screws must be tightened with a torque of 1.5 N·m. This ensures the screws work properly and the ceiling remains intact without cracks in it.	1. Plate 2. Screw (M3.5 x 35) 3. Plastic expansion sleeve 4. Flat washer 	
Installing the pRRU3902 on a ceiling using a clamp through an attachment plate For details, see **8.3.4 Installing a pRRU3902 on a Plate**.	● The ceiling, such as a concrete ceiling, can bear a load at least four times the weight of the pRRU3902. ● The thickness of the ceiling is less than 45 mm.	1. Plate 2. U-shaped metal plate 3. Bolt (M4 x 35) 4. Bolt (M4 x 60) 	
Installing the pRRU3902 on a keel For details, see **8.3.5 Installing a pRRU3902 on a Keel**.	A keel under the ceiling can bear a load at least four times the weight of the pRRU3902.	For details, see **Table 8-4**.	For details, see **Table 8-4**.

Installing the pRRU3902 on a keel

The pRRU3902 can be installed on a keel of U-shape, T-shape, or H-shape. For the keels of other shapes, they are determined based on the onsite requirements.

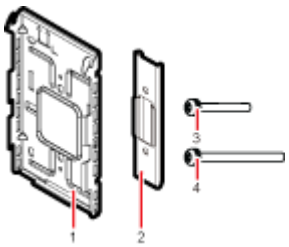
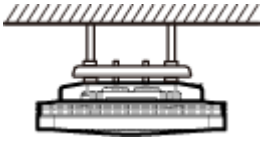
Table 8-4 Keel-mounted installation suggestion

Installation Mode	Requirements	Mounting Brackets	Installation Diagram
Installing the pRRU3902 on a keel For details, see **8.3.5 Installing a pRRU3902 on a Keel**.	The keel is in U-shape, T-shape, H-shape, or other shapes.	1. Plate 2. U-shaped metal plate 3. Bolt (M4 x 35) 4. Bolt (M4 x 60) 	 shows the pRRU3902 installed on a U-shaped keel.

Installing the pRRU3902 on a on steel hangers

Either M6 or M8 steel hangers can be used for installation.

Table 8-5 Steel hangers installation suggestion

Installation Mode	Requirements	Mounting Brackets	Installation Diagram
Installing the pRRU3902 on a steel hangers For details, see **8.3.6 Installing a pRRU3902 on Steel Hangers**.	Either M6 or M8 steel hangers can be used for installation.	1. Plate 2. U-shaped metal plate 3. Bolt (M4 x 35) 4. Bolt (M4 x 60) 	

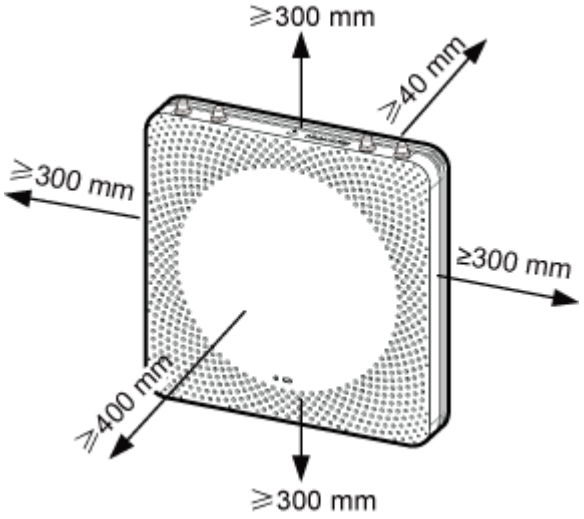
8.1.3 Space Requirements

This chapter describes the space requirements of the pRRU3902.

When the pRRU3902 is installed on a wall, ceiling, pole or keel, the minimum space is required for easy cabling and O&M. Based on the engineering practice, the recommendation for the installation space is provided.

Figure 8-1 shows the recommended space requirements of the pRRU3902 when the external antenna is required.

Figure 8-1 Recommended space requirements of the pRRU3902



When the external antenna is required, the recommended space for installing a single pRRU3902 is described as follows:

- At least 300 mm above the pRRU3902 is reserved for maintenance.
- At least 300 mm under the pRRU3902 is reserved for cabling.
- At least 300 mm on the left of the pRRU3902 is reserved for maintenance.
- At least 300 mm on the right of the pRRU3902 is reserved for maintenance.
- At least 400 mm in front of the pRRU3902 is reserved for maintenance
- At least 40 mm on the back of the pRRU3901 is reserved for ventilation.

8.1.4 Installation Environment Requirements

The installation environment of a pRRU3902 involves the running environment specifications for the pRRU3902 and other specifications.

Running Environment Specifications

Table 8-6 shows the environment specifications for the pRRU3902 installed indoors.

Table 8-6 pRRU3902 environment specifications

Specifications	Condition	Remarks
Operating temperature	- 5°C to + 40°C	-
Relative humidity	5% RH to 95% RH	-
Altitude	- 60 m to + 1800 m	Works properly.

Specifications	Condition	Remarks
	1800 m to 4000 m	Above the 1800 m altitude, the maximum operating temperature decreases by 1°C each time the altitude increases by 220 m.

Other Running Environment Specifications

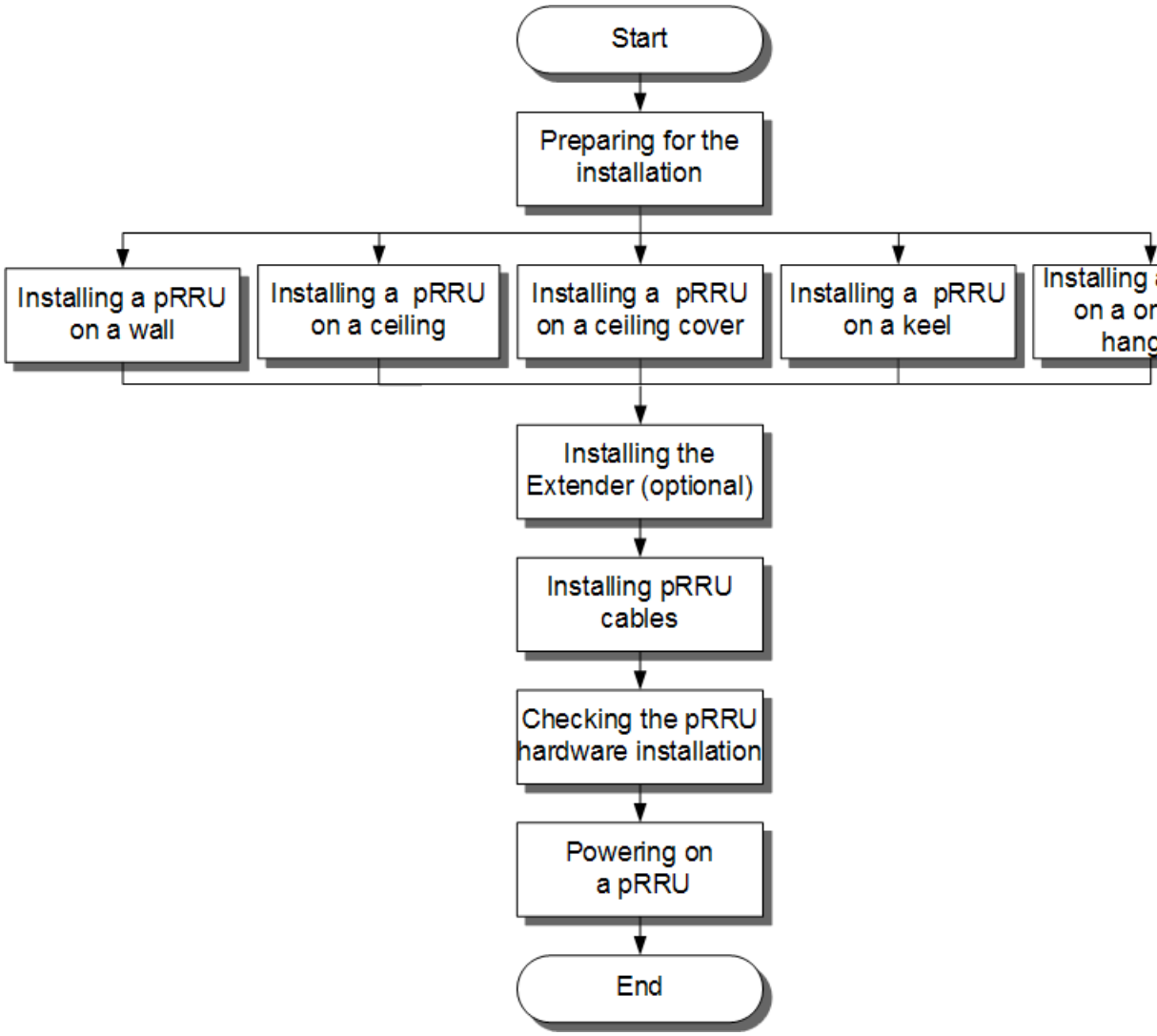
- The pRRU3902 cannot be installed at an air outlet of the heat dissipation box of an air conditioner or other heat-generating appliances.
- The pRRU3902 cannot be installed near a strong heat source.
- The pRRU3902 cannot be installed in a position with water dripping, such as outdoor equipment of air conditioners, pipe, and leaking or dripping roofs.
- The installation position must be far from rains. If the pRRU3902 is installed on a wall, there must be no window on either side of the wall.
- The installation position must be far away from high voltage, highly corrosive devices, flammable or explosive substances, and electromagnetic interference (such as power stations, high-voltage substations, and wired TV towers.
- The pRRU3902 must be installed in a dry, ventilating, and dust-proof place.
- If the pRRU3902 is installed in parking areas or basements, the installation position must be well-ventilated.

8.2 Installation Process

This section describes the pRRU3902 installation process, which involves installing a pRRU3902, and cables, checking the pRRU3902 hardware installation, and powering on the pRRU3902.

Figure 8-2 shows the pRRU3902 installation process.

Figure 8-2 pRRU3902 installation process



8.3 Installing a pRRU3902

This section describes the pRRU3902 installation process. A pRRU3902 can be installed on a wall, ceiling, indoor metal pole, or keel, but not on an aluminum panel or a non-standard keel.

NOTE

Note the following when installing the pRRU3902:

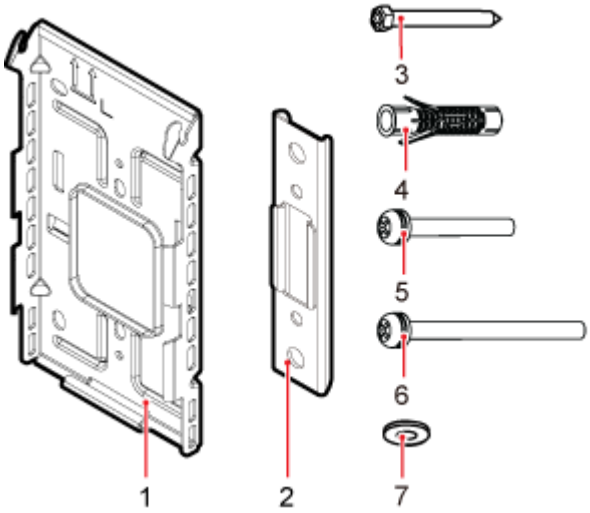
- The pRRU3902 cannot be grounded. If the pRRU3902 is grounded but the RHUB connected to this pRRU3902 is not, the pRRU3902 may fail to be powered on.
- A minimum distance of 50 cm must be reserved between the pRRU3902 and the incandescent lamp.
- The installation spacing between the pRRU3902 and the temperature sensor must be greater than 50 cm.
- It is good practice to install the pRRU3902 on materials that can tolerate a temperature higher than 65°C and have an ignition point higher than 70°C.

8.3.1 pRRU3902 Mounting Kits

This section describes the pRRU3902 mounting kits.

Figure 8-3 shows the exterior of the pRRU3902 mounting kits.

Figure 8-3 pRRU3902 mounting kits



(1) Mounting bracket	(2) U-shaped metal plate	(3) Screw (3.5X35)
(4) Plastic expansion sleeve	(5) Bolt (M4X35)	(6) Bolt (M4X60)
(7) Flat washer	-	-

Figure 8-4, **Figure 8-5** show the specifications of the mounting bracket.

Figure 8-4 Mounting bracket specifications

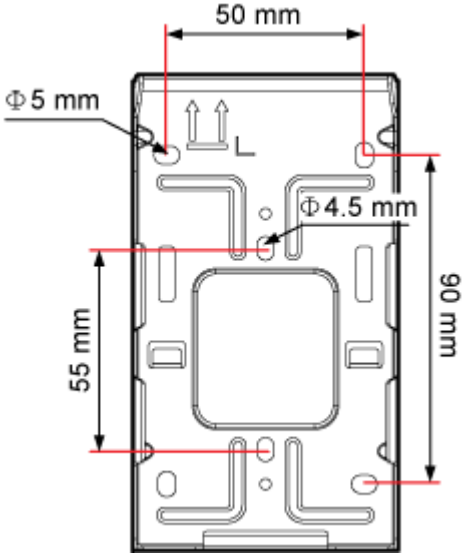
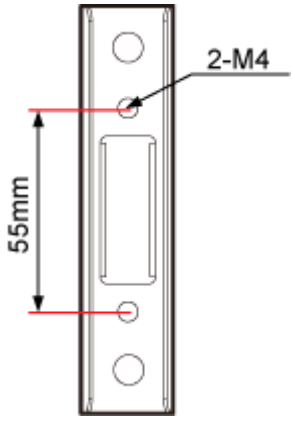


Figure 8-5 U-shaped metal plate specifications



8.3.2 Installing a pRRU3902 on a Wall

This section describes how to install a pRRU3902 on an indoor wall. If a wall indoors has adequate load bearing capacity and installation space, it is good practice to install the pRRU3902 on the wall. If the wall does not have adequate load bearing capacity, choose an installation mode based on site requirements.

Context

NOTICE

This section describes only the wall-mounted installation in which mounting kits are directly installed on the wall without auxiliary devices. The procedure for other wall-mounted installation modes is similar.

Procedure

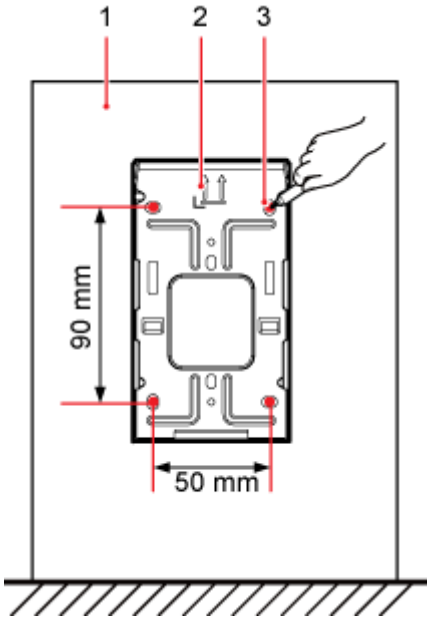
Step 1 Determine the position for installing the pRRU3902 based on the construction blueprint and the clearance requirements.

NOTE

For details about the clearance requirements, see **8.1.3 Space Requirements**.

Step 2 Place the mounting bracket in the installation position against the wall. Then, level the mounting bracket and use a marker to mark four anchor points. See **Figure 8-6**.

Figure 8-6 Anchor points on the pRRU3902 mounting bracket



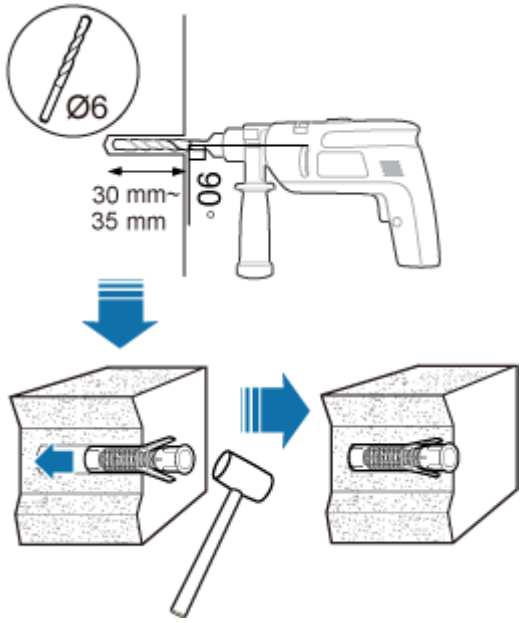
(1) Wall (2) Mounting bracket (3) Anchor point

CAUTION

To prevent inhalation or eye contact with dust, take adequate preventive measures when drilling holes.

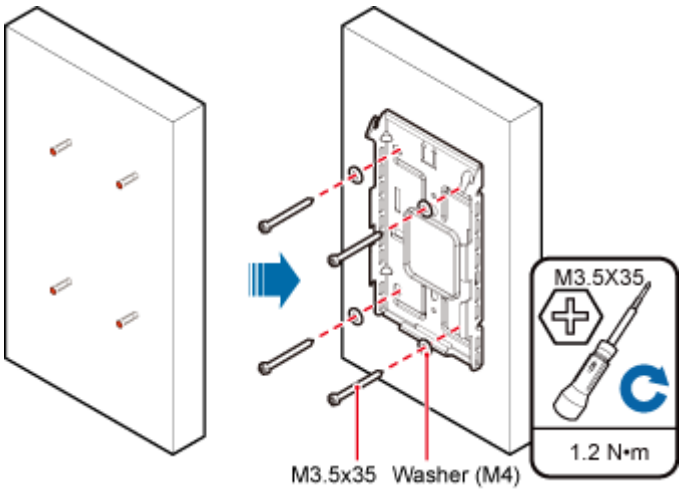
Step 3 Use a hammer drill with φ6 bore to drill holes at the marked anchor points, as shown in **Figure 8-7**. Use a vacuum cleaner to clean the dust inside and around the holes and measure the distance between them. If they are inaccurately positioned, re-measure and re-drill the holes. Then, use a rubber mallet to hit a plastic expansion sleeve into each hole.

Figure 8-7 Drilling holes and installing expansion bolts



Step 4 Lead the M3.5x35 screws through the washers, and then through the drilling holes on the mounting bracket to the plastic expansion sleeves, and torque the screws to 1.2 N•m, as shown in **Figure 8-8**.

Figure 8-8 Installing the mounting bracket

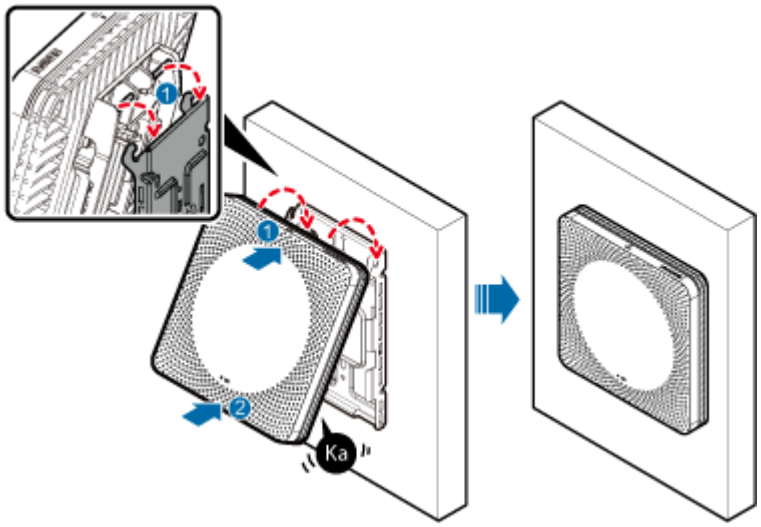


NOTE

If the screws cannot be tightened using a Phillips screwdriver, use a hex key or an electric screwdriver to assist the installation.

Step 5 Fit the rotation axis on the pRRU3902 into the hooks on the mounting bracket, and then push the pRRU3902 against the mounting bracket until a click is heard. See **Figure 8-9**.

Figure 8-9 Installing a pRRU3902 on a wall



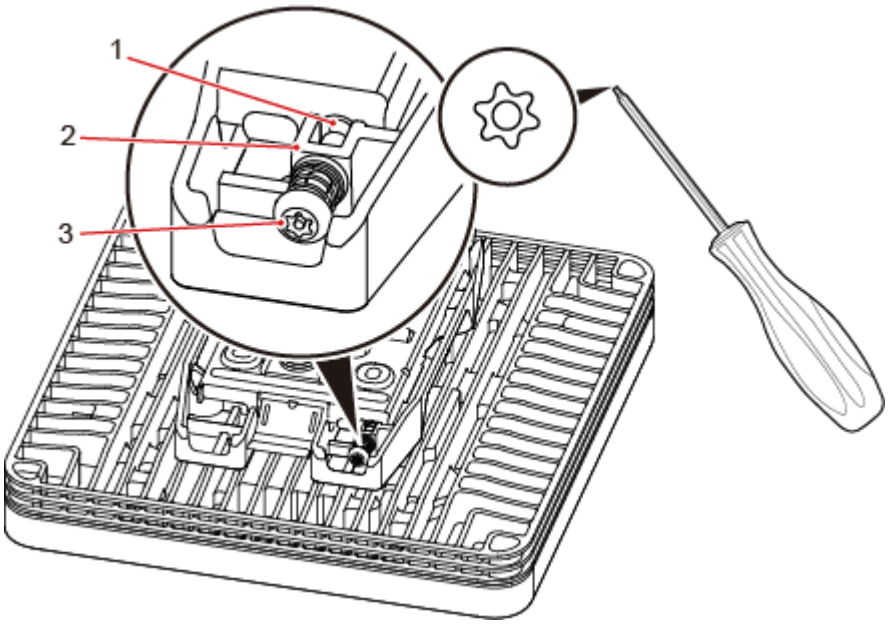
NOTE

- Before installing the pRRU3902, connect one end of the Ethernet cable to the CPRI_E0 port on pRRU3902.
- It is good practice to perform the installation from the side view to promptly align the hooks with the rotation axis.

Step 6 **Optional:** Use T20 with hole screwdriver to lock the protection screw on the attachment plate. See **Figure 8-10**.

The protection screw protects the pRRU3902 from being removed and must be locked if required.

Figure 8-10 Locking the protection screw



(1) M4 threaded hole (2) Hole for self-tapping screws (3) Quincunx screw

----End

8.3.3 Installing a pRRU3902 on a Ceiling

This section describes how to install a pRRU3902 on the ceiling, such as the concrete ceiling, when the ceiling has adequate load bearing capacity and installation space.

Context

NOTICE

If the pRRU3902 is installed on a ceiling, the temperature of the ceiling may increase by a maximum of 30 degrees. Therefore, whether a pRRU3902 can be installed on a ceiling depends on the ceiling material.

Procedure

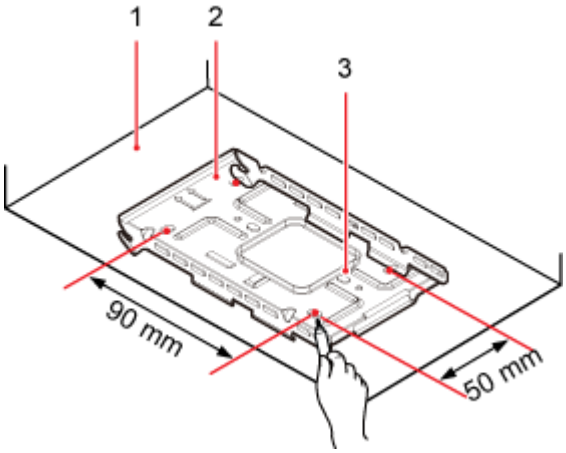
Step 1 Determine the position for installing the pRRU3902 based on the construction blueprint and the clearance requirements.

NOTE

For details about the clearance requirements, see **8.1.3 Space Requirements**.

Step 2 Place the mounting bracket in the installation position against the ceiling. Then, level the mounting bracket and use a marker to mark four anchor points. See **Figure 8-11**.

Figure 8-11 Anchor points on the pRRU3902 mounting bracket



(1) Ceiling (2) Mounting bracket (3) Anchor point

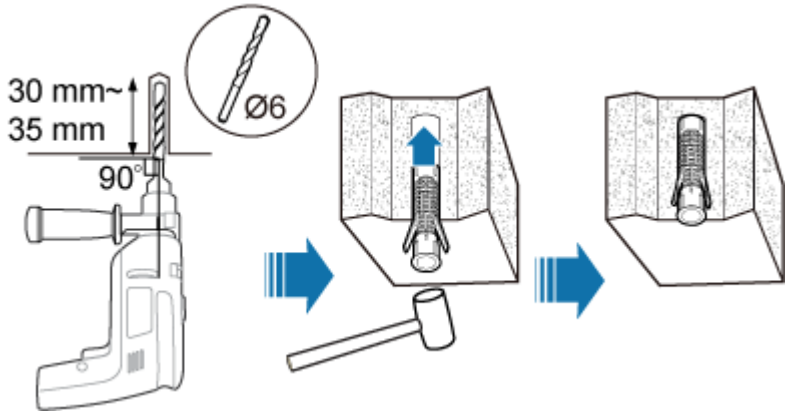
CAUTION

To prevent inhalation or eye contact with dust, take adequate preventive measures when drilling holes.

Step 3 Use a hammer drill with φ6 bore to drill holes at the marked anchor points, as shown in **Figure 8-12**. Use a vacuum cleaner to clean the dust inside and around the holes and measure

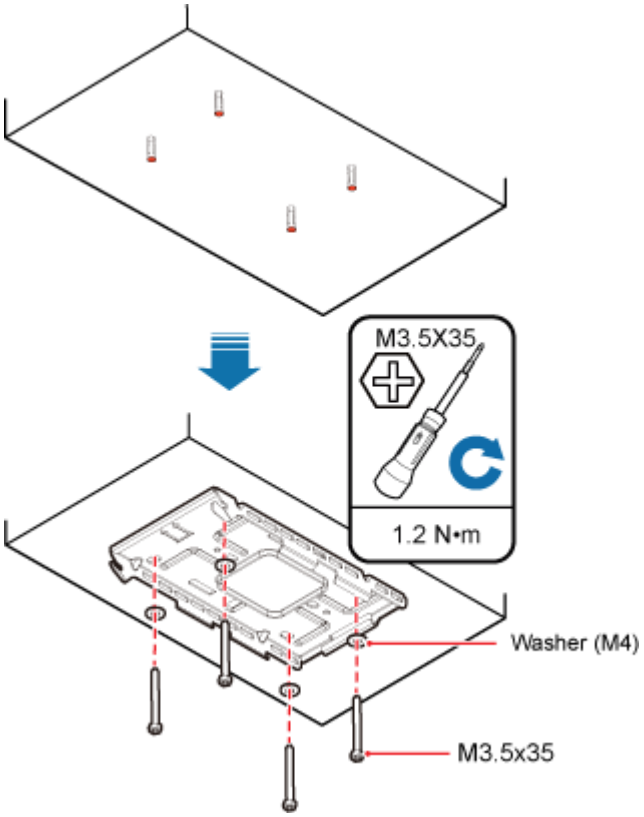
the distance between them. If they are inaccurately positioned, re-measure and re-drill the holes. Then, use a rubber mallet to hit a plastic expansion sleeve into each hole.

Figure 8-12 Drilling holes and installing expansion bolts



Step 4 Lead the M3.5x35 screws through the washers, and then through the drilling holes on the mounting bracket to the plastic expansion sleeves, and use a torque screwdriver to torque the screws to 1.2 N•m, as shown in **Figure 8-13**.

Figure 8-13 Installing the mounting bracket

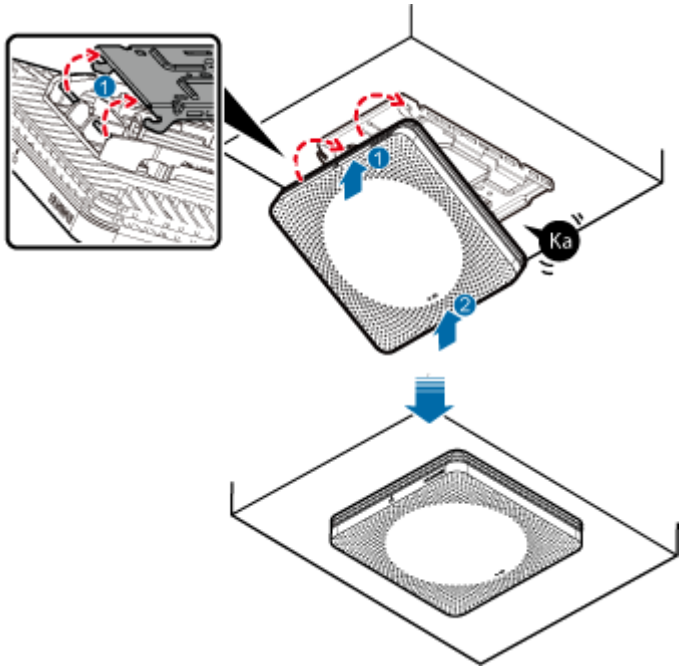


NOTE

If the screws cannot be tightened using a Phillips screwdriver, use a hex key or an electric screwdriver to assist the installation.

Step 5 Fit the rotation axis on the pRRU3902 into the hooks on the mounting bracket, and then push the pRRU3902 against the mounting bracket until a click is heard. See **Figure 8-14**.

Figure 8-14 Installing a pRRU3902 on a ceiling



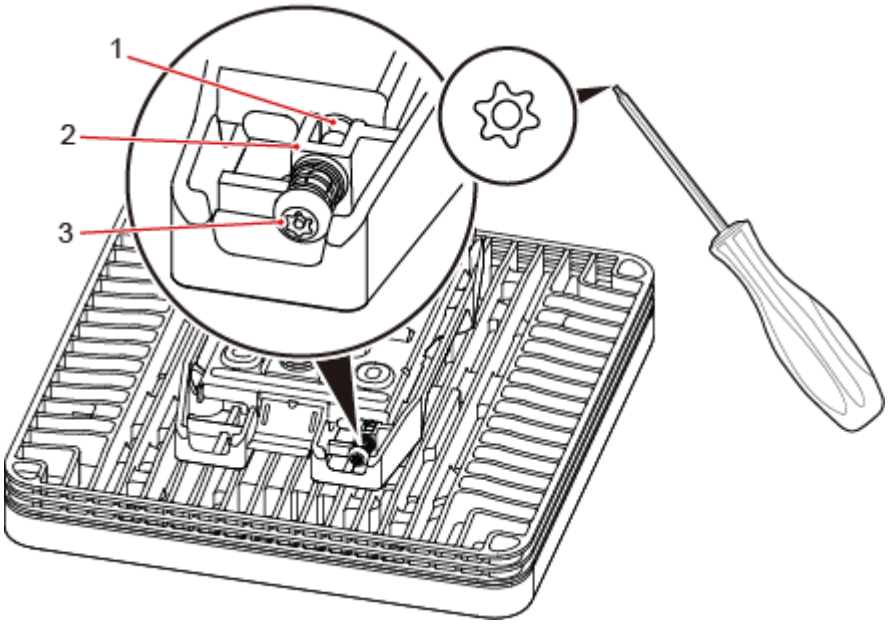
NOTE

- Before installing the pRRU3902, connect one end of the Ethernet cable to the CPRI_E0 port on pRRU3902.
- It is good practice to perform the installation from the side view to promptly align the hooks with the rotation axis.

Step 6 **Optional:** Use T20 with hole screwdriver to lock the protection screw on the attachment plate. See **Figure 8-15**.

The protection screw protects the pRRU3902 from being removed and must be locked if required.

Figure 8-15 Locking the protection screw



(1) M4 threaded hole (2) Hole for self-tapping screws (3) Quincunx screw

----End

8.3.4 Installing a pRRU3902 on a Plate

This section describes how to install a pRRU3902 on a plate. If a suspended ceiling plate has adequate load bearing capacity and installation space, the pRRU3902 can be installed on the plate. However, it is good practice not to install a pRRU3901 on an aluminum plate. The installation modes are classified into installation on a removable suspended ceiling plate and installation on an overall suspended ceiling.

Procedure

- Installation on a removable suspended ceiling plate

  This installation mode applies when the suspended ceiling plate (for example, a metal plate) is removable.

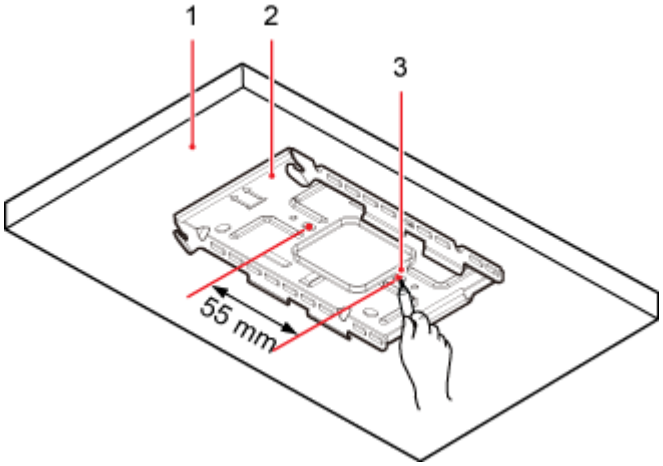
  a. Determine the position for installing the pRRU3902 based on the construction blueprint and the clearance requirements.

  NOTE

  For details about the clearance requirements, see **8.1.3 Space Requirements**.

  b. Place the mounting bracket in the installation position against the wall. Then, level the mounting bracket and use a marker to mark two anchor points. See **Figure 8-16**.

Figure 8-16 Anchor points on the pRRU3902 mounting bracket



(1) Suspended ceiling plate (2) Mounting bracket (3) Anchor point

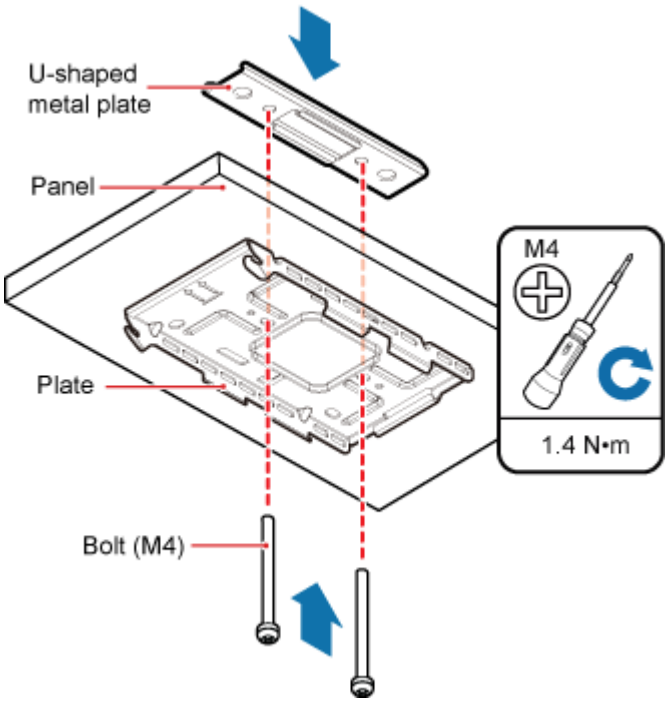
CAUTION

To prevent inhalation or eye contact with dust, take adequate preventive measures when drilling holes.

c. Use a hammer drill with φ6 bore to drill holes at the anchor points.

d. Lead two bolts (M4) through the mounting bracket and the suspended ceiling plate, and use a torque screwdriver to torque the bolts to 1.4 N•m, as shown in **Figure 8-17**.

Figure 8-17 Installing the pRRU3902 mounting bracket

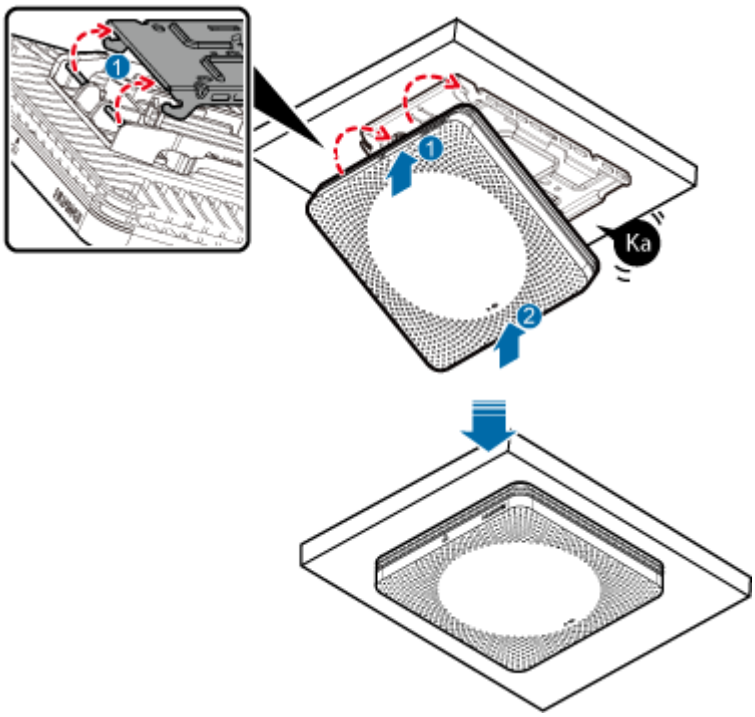


NOTE

- The bolt used for installing the pRRU3902 on a suspended ceiling plate depends on the plate thickness:
  - The delivered bolt (M4x35) is used if the plate thickness is less than 25 mm.
  - The delivered bolt (M4X60) is used if the plate thickness ranges from 25 mm to 45 mm.
- If the screws cannot be tightened using a Phillips screwdriver, use a hex key or an electric screwdriver to assist the installation.

e. Fit the rotation axis on the pRRU3902 into the hooks on the mounting bracket, and then push the pRRU3902 against the mounting bracket until a click is heard. See **Figure 8-18**.

Figure 8-18 Installing a pRRU3902 on a plate



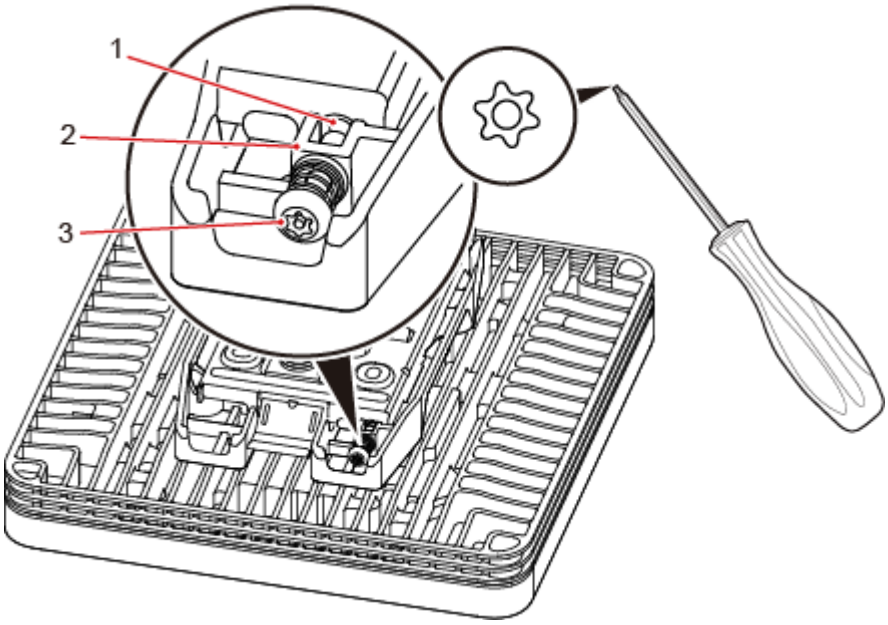
NOTE

- Before installing the pRRU3902, connect one end of the Ethernet cable to the CPRI_E0 port on pRRU3902.
- It is good practice to perform the installation from the side view to promptly align the hooks with the rotation axis.

f. Use T20 with hole screwdriver to lock the protection screw on the attachment plate. See **Figure 8-19**.

The protection screw protects the pRRU3902 from being removed and must be locked if required.

Figure 8-19 Locking the protection screw



(1) M4 threaded hole (2) Hole for self-tapping screws (3) Quincunx screw

- Installation on an overall suspended ceiling

  This installation mode applies when the suspended ceiling (for example, made of plaster board) cannot be removed.

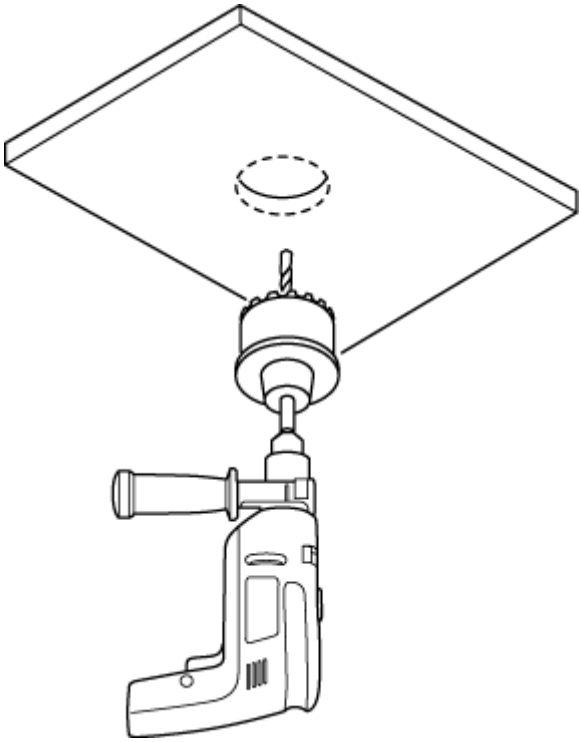
  a. Determine the position for installing the pRRU3902 based on the construction blueprint and the clearance requirements.

     NOTE

     For details about the clearance requirements, see **8.1.3 Space Requirements**.

  b. Use a crown saw to drill a hole with a diameter of 60 mm to 65 mm at the installation position for the pRRU3902, as shown in **Figure 8-20**.

Figure 8-20 Drilling holes by using a crown saw

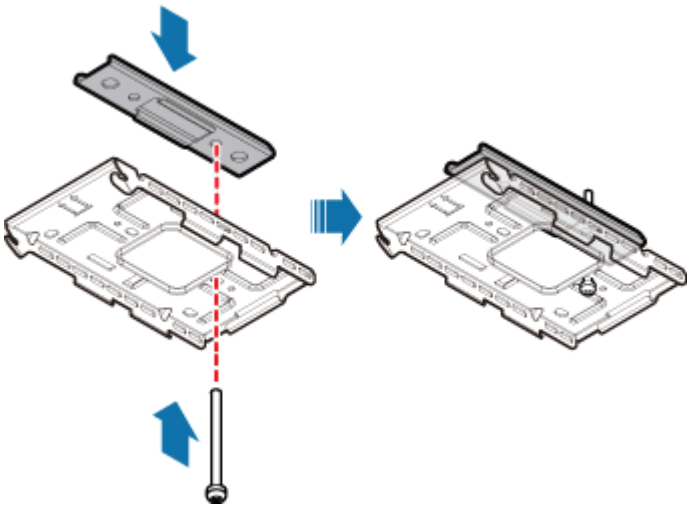


CAUTION

To prevent inhalation or eye contact with dust, take adequate preventive measures when drilling holes.

c. Use a bolt (M4) to partially connect the mounting bracket and the U-shaped metal plate, as shown in **Figure 8-21**.

Figure 8-21 Partially connecting the mounting bracket and the U-shaped metal plate



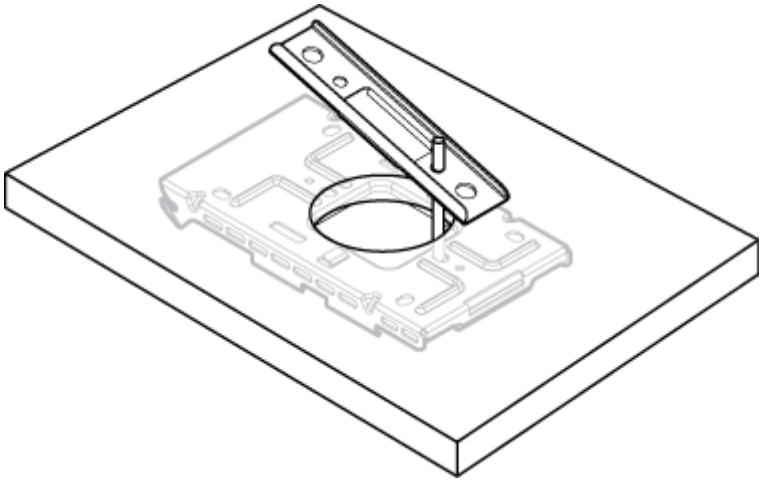
NOTE

The bolt used for installing the pRRU3902 on a suspended ceiling plate depends on the plate thickness:

- The delivered bolt (M4x35) is used if the plate thickness is less than 25 mm.
- The delivered bolt (M4X60) is used if the plate thickness ranges from 25 mm to 45 mm.

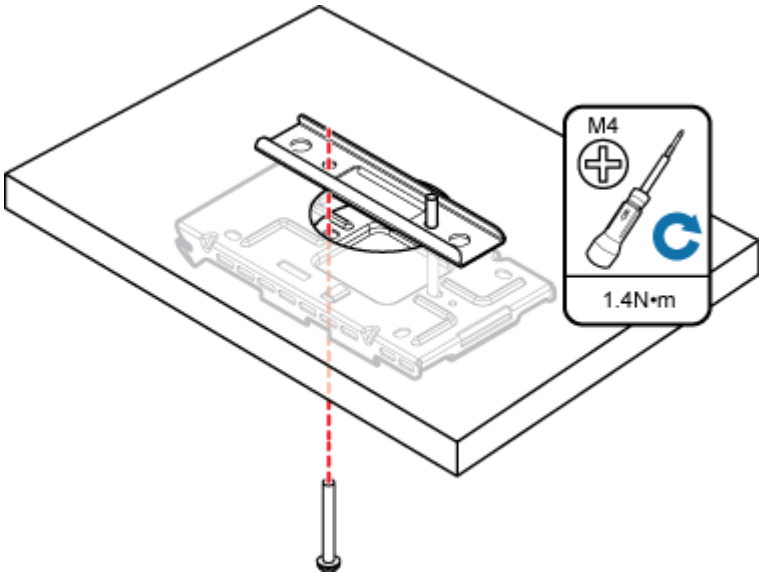
d. Lead the U-shaped metal plate through the hole on the ceiling, as shown in **Figure 8-22**.

Figure 8-22 Routing the U-shaped metal plate through the hole on the ceiling



e. Install another bolt with the same length and use a torque screwdriver to torque the bolts to 1.4 N·m, as shown in **Figure 8-23**.

Figure 8-23 Assembling the mounting bracket and the U-shaped metal plate

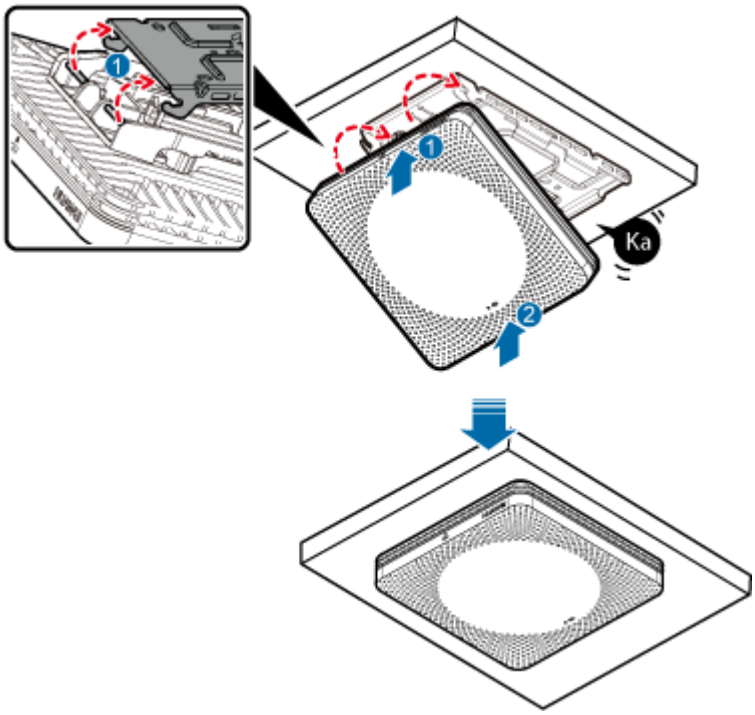


NOTE

If the screws cannot be tightened using a Phillips screwdriver, use a hex key or an electric screwdriver to assist the installation.

f. Fit the rotation axis on the pRRU3902 into the hooks on the mounting bracket, and then push the pRRU3902 against the mounting bracket until a click is heard. See **Figure 8-24**.

Figure 8-24 Installing a pRRU3902 on a plate



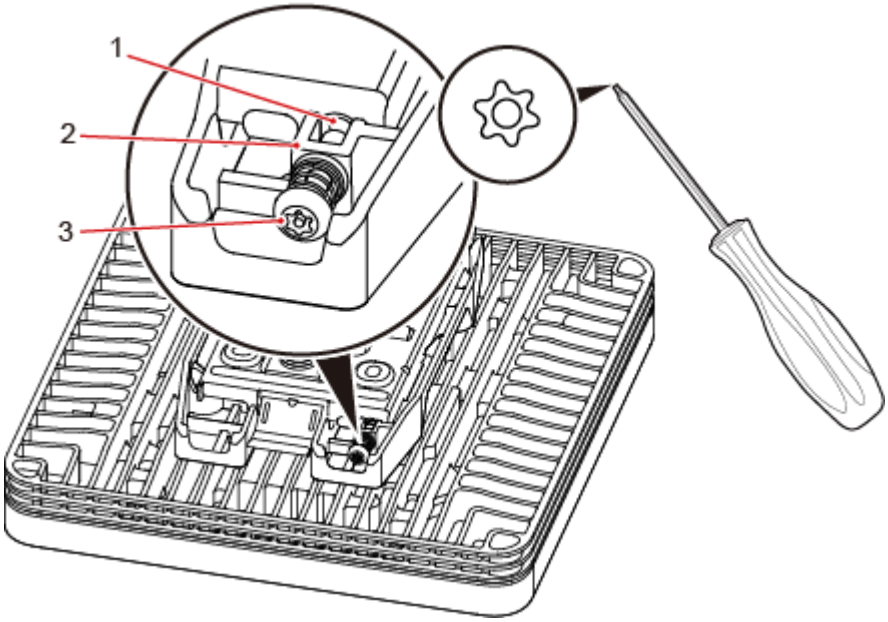
NOTE

- Before installing the pRRU3902, connect one end of the Ethernet cable to the CPRI_E0 port on pRRU3902.
- It is good practice to perform the installation from the side view to promptly align the hooks with the rotation axis.

g. Use T20 with hole screwdriver to lock the protection screw on the attachment plate. See **Figure 8-25**.

The protection screw protects the pRRU3902 from being removed and must be locked if required.

Figure 8-25 Locking the protection screw



(1) M4 threaded hole (2) Hole for self-tapping screws (3) Quincunx screw

----End

8.3.5 Installing a pRRU3902 on a Keel

This section describes how to install a pRRU3901 on a keel. If a suspended ceiling plate cannot bear the pRRU3902, the pRRU3902 can be installed on the keel on the ceiling. The standard keel with a width less than 45 mm, instead of the non-standard keel, is recommended.

Context

Before installing the pRRU3902 on a keel, ensure that the keel is strong enough to bear the pRRU3902.

- The mounting bracket of the pRRU3902 can be installed on the keel of the following specifications: GBT 11981-2008, JIS A6517-2002, and ASTM C635 C635M-2007. The installation mode depends on onsite requirements because there are various keels.
- This section describes the procedure of installing a pRRU3902 on the keel of JIS standard used in Japan. The procedure of installing a pRRU3902 on other keels is the same as that of installing a pRRU3902 on the keel of JIS standard.

The keel used on the ceiling is thin. During installation, fix the mounting kits onto the large surface instead of the small surface of the keel to prevent distorting the keel.

Procedure

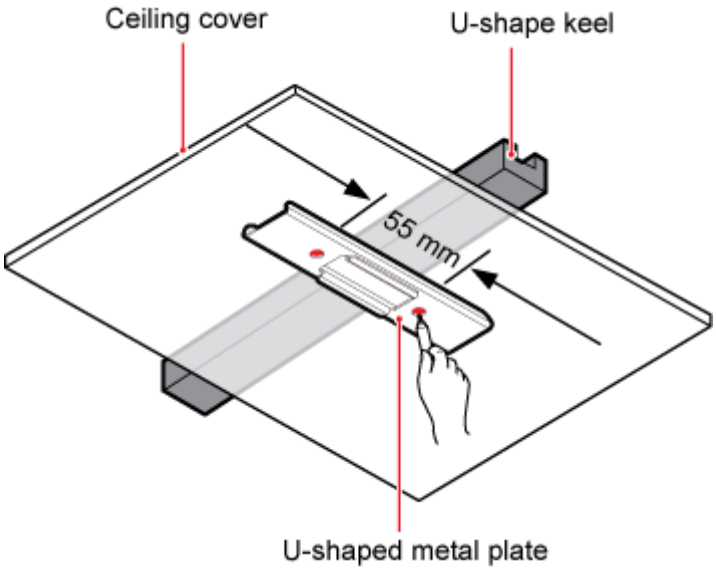
Step 1 Determine the position for installing the pRRU3902 based on the construction blueprint and the clearance requirements.

NOTE

For details about the clearance requirements, see **8.1.3 Space Requirements**.

Step 2 Place the U-shaped metal plate across the keel. Use a marker to mark the projective positions of the mounting holes on the suspended ceiling plate, as shown in **Figure 8-26**.

Figure 8-26 Anchor points on the suspended ceiling plate



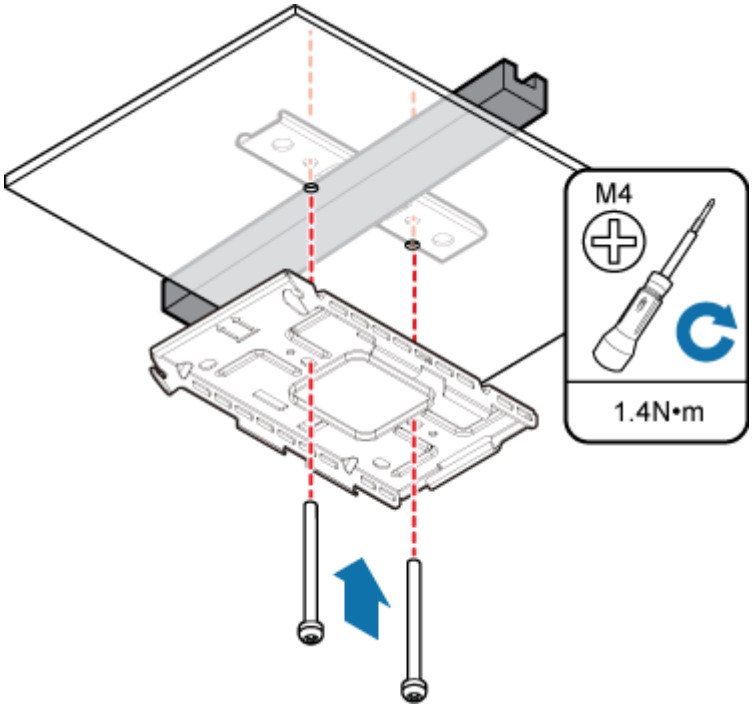
CAUTION

To prevent inhalation or eye contact with dust, take adequate preventive measures when drilling holes.

Step 3 Use a hammer drill to drill holes at the anchor points. You are advised to use the hammer drill with Φ12 bore.

Step 4 Lead two bolts (M4) through the mounting bracket and the ceiling plate. Use a torque screwdriver to torque the bolts to 1.4 N•m, as shown in **Figure 8-27**.

Figure 8-27 Installing the mounting bracket

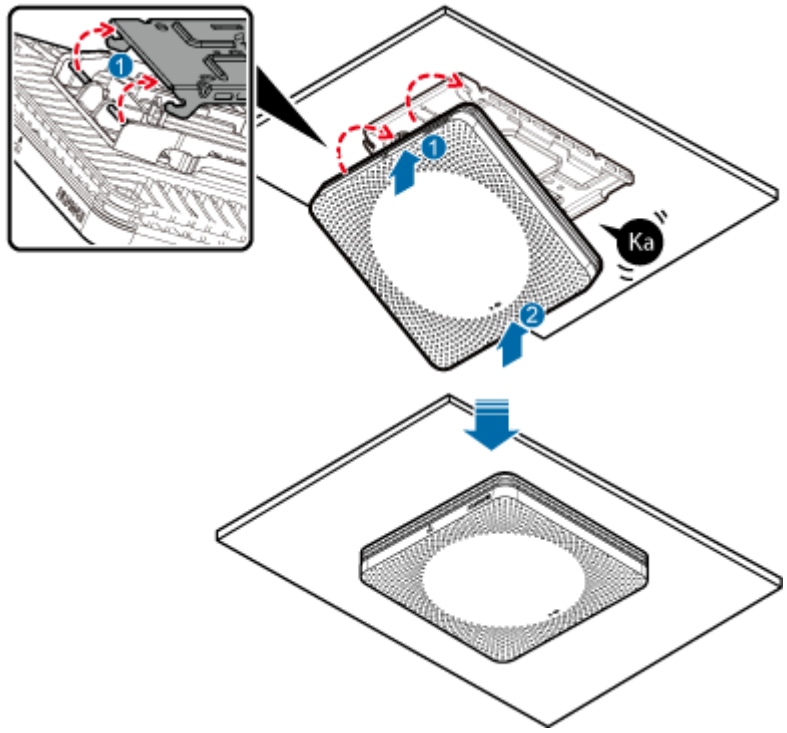


NOTE

- The bolt used for installing the pRRU3902 on a suspended ceiling plate depends on the plate thickness:
  - The delivered bolt (M4 x 35) is used if the plate thickness is less than 25 mm.
  - The delivered bolt (M4 x 60) is used if the plate thickness ranges from 25 mm to 45 mm.
- If the screws cannot be tightened using a Phillips screwdriver, use a hex key or an electric screwdriver to assist the installation.

Step 5 Fit the rotation axis on the pRRU3902 into the hooks on the mounting bracket, and then push the pRRU3902 against the mounting bracket until a click is heard. See **Figure 8-28**.

Figure 8-28 Installing a pRRU3902 on a keel



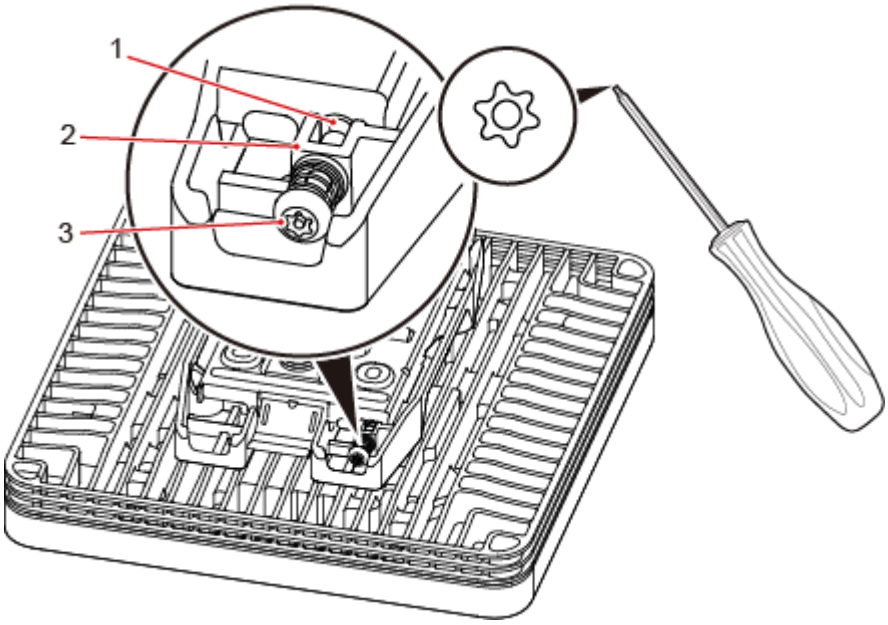
NOTE

- Before installing the pRRU3902, connect one end of the Ethernet cable to the CPRI_E0 port on pRRU3902.
- It is good practice to perform the installation from the side view to promptly align the hooks with the rotation axis.

Step 6 **Optional:** Use T20 with hole screwdriver to lock the protection screw on the attachment plate. See **Figure 8-29**.

The protection screw protects the pRRU3902 from being removed and must be locked if required.

Figure 8-29 Locking the protection screw



(1) M4 threaded hole (2) Hole for self-tapping screws (3) Quincunx screw

----End

8.3.6 Installing a pRRU3902 on Steel Hangers

This section describes how to install a pRRU3902 on steel hangers.

Context

Either M6 or M8 steel hangers can be used for installation.

Procedure

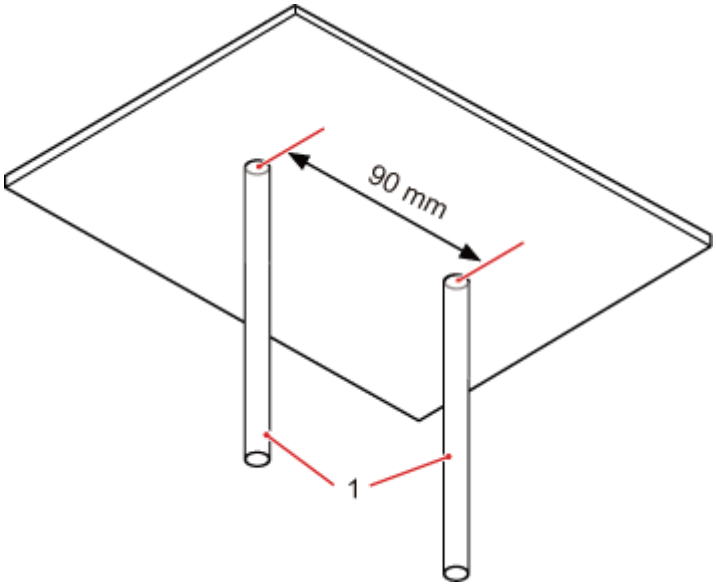
Step 1 Determine the position for installing the pRRU3902 based on the construction blueprint and the clearance requirements.

NOTE

For details about the clearance requirements, see **8.1.3 Space Requirements**.

Step 2 Install two steel hangers onto the ceiling. A distance of 90 mm must be retained between the two hangers, as shown in **Figure 8-30**.

Figure 8-30 Installing steel hangers

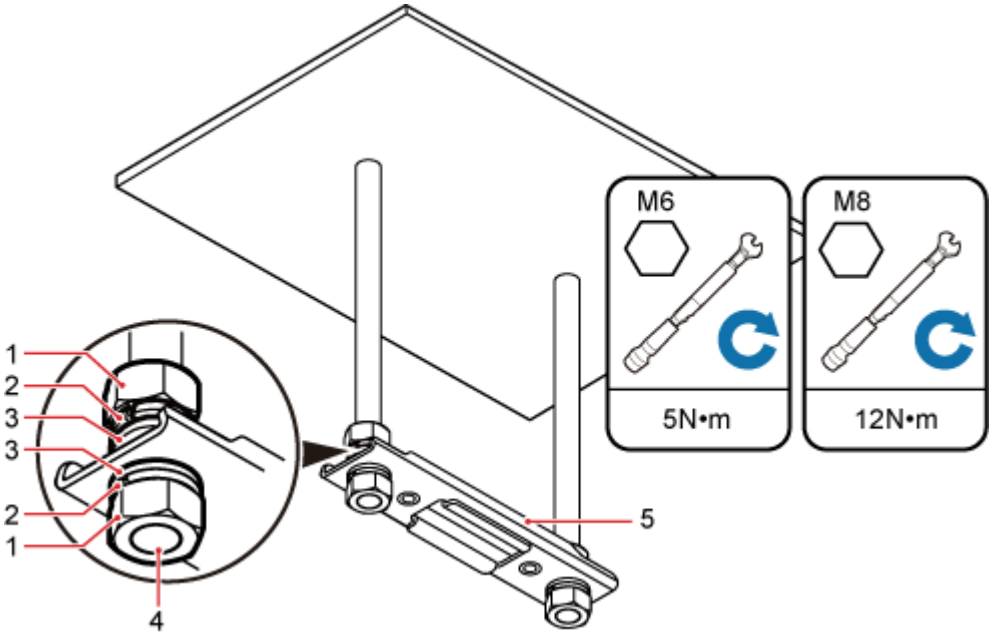


Step 3 Install the nuts, spring washers, flat washers, and a U-shaped metal plate onto the steel hangers, and use a torque wrench to torque the U-shaped metal plate to 5 N•m (on M6 steel hangers) or 12 N•m (on M8 steel hangers). See **Figure 8-31**.

CAUTION

- The edge side of the U-shaped metal plate must face upwards.
- The nuts on the underside of the U-shaped metal plate must be completely fixed into the steel hangers, and the lower surface of a nut cannot be exposed on the end side of steel hangers, as shown in **Figure 8-31**.

Figure 8-31 Installing the U-shaped metal plate onto the steel hangers

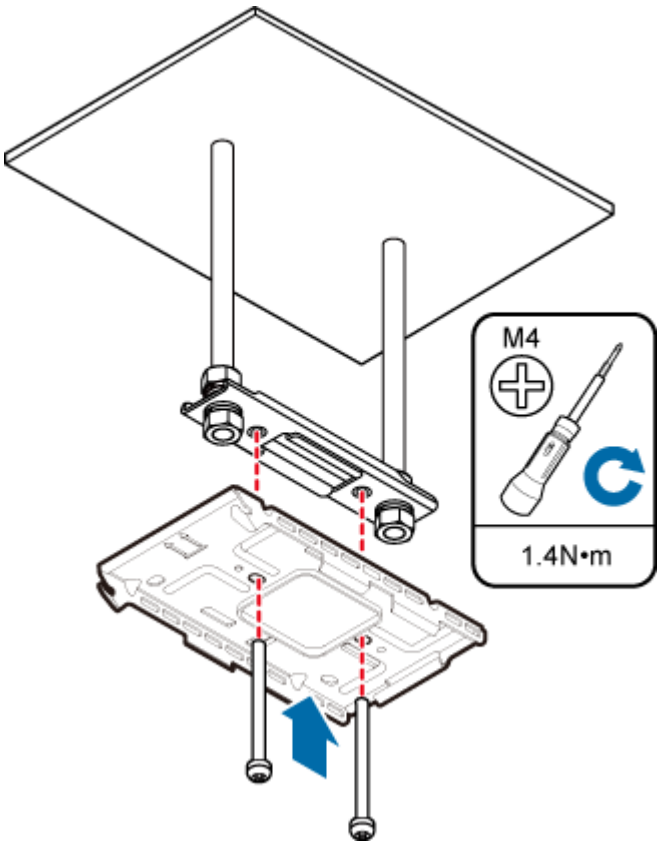


(1) Nuts (2) Spring washers (3) Flat washers

(4) Steel hangers (5) U-shaped metal plate –

Step 4 Lead two bolts (M4x35) through the mounting bracket and the ceiling plate. Use a torque screwdriver to torque the bolts to 1.4 N•m, as shown in **Figure 8-32**.

Figure 8-32 Installing the mounting bracket

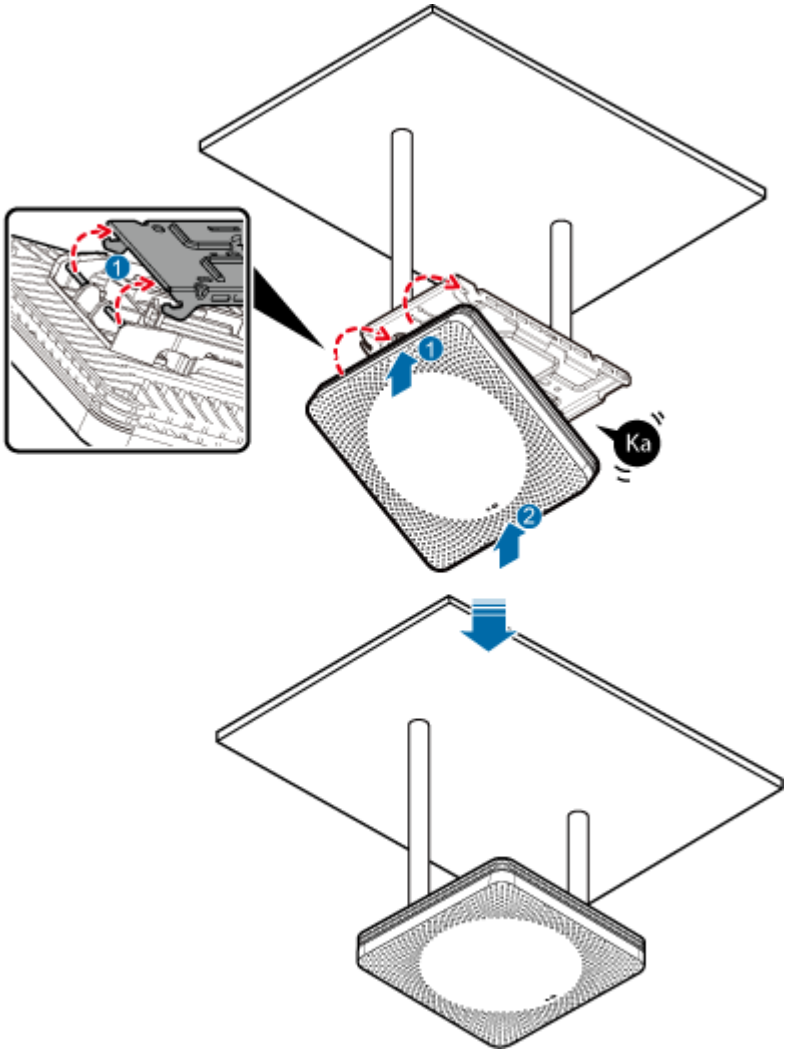


NOTE

If the screws cannot be tightened using a Phillips screwdriver, use a hex key or an electric screwdriver to assist the installation.

Step 5 Fit the rotation axis on the pRRU3902 into the hooks on the mounting bracket, and then push the pRRU3902 against the mounting bracket until a click is heard. See **Figure 8-33**.

Figure 8-33 Installing a pRRU3902 on a keel



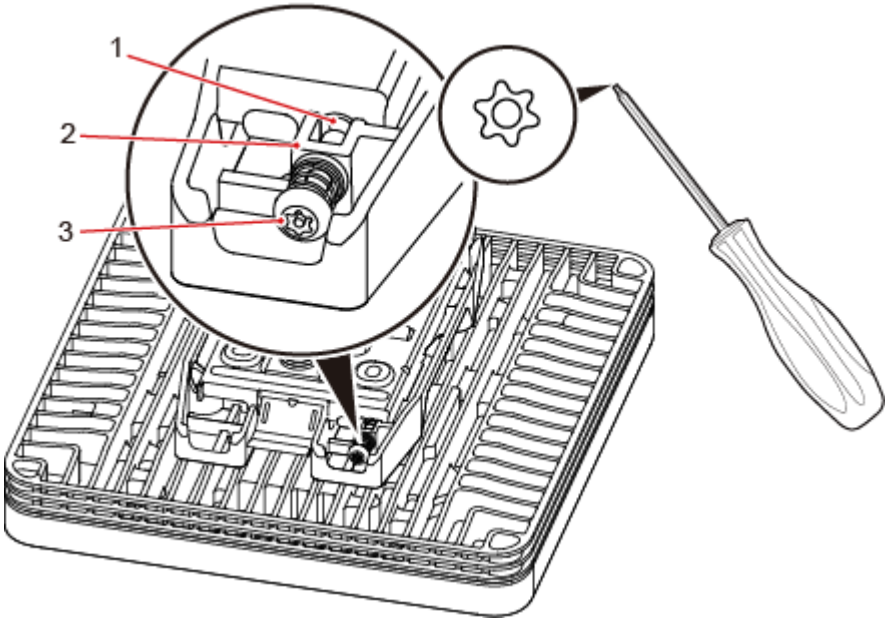
NOTE

- Before installing the pRRU3902, connect one end of the Ethernet cable to the CPRI_E0 port on pRRU3902.
- It is good practice to perform the installation from the side view to promptly align the hooks with the rotation axis.

Step 6 **Optional:** Use T20 with hole screwdriver to lock the protection screw on the attachment plate. See **Figure 8-34**.

The protection screw protects the pRRU3902 from being removed and must be locked if required.

Figure 8-34 Locking the protection screw



(1) M4 threaded hole (2) Hole for self-tapping screws (3) Quincunx screw

----End

8.4 Installing pRRU3902 Cables

This section describes the procedure of installing the pRRU3902 cables.

8.4.1 Requirements for Cable Layout

Cables must be routed according to the specified cabling requirements to prevent signal interference.

NOTE

If certain cables listed below are not required, skip the requirements for routing these cables.

General Requirements for Cable Layout

National Standards

- Code for Engineering Design of Generic Cabling System for Building and Campus (GB 50311-2007)
- Code for Engineering Acceptance of Generic Cabling System for Building and Campus (GB50312-2007).
- Security Protection Engineering Technology Specifications (GB 50348-2004)
- Code for Construction and Acceptance of the Electronic Information System Room (GB 50462-2008)
- Code for Quality Acceptance of the Intelligent Building Engineering (GB 50339-2003)
- Code for Quality Acceptance of Electric Engineering Construction in Building (GB 50303-2002)

- Technical Specification for Construction and Acceptance of Telecommunication Conduit Engineering (GB 50374-2006)

International Standards

- Generic Cabling for Customer Premises (ISO/IEC 11801)
- Commercial Building Telecommunications Cabling Standard (EIA/TIA 568)
- Commercial Building Standard for Telecommunication Pathways and Spaces (EIA/TIA 569)
- Administration Standard for Commercial Telecommunications Infrastructure (EIA/TIA 606)
- Grounding and Bonding Requirements for Telecommunications in Commercial Buildings (EIA/TIA 607)
- Generic Cabling Systems for Information Technology (EN 50173)
- Cabling Installation for Information Technology (EN 50174)

Bending radius

- The bending radius of a 1/4" jumper, a 1/2" softer jumper, and a 1/2" common jumper must be longer than 35 mm, 50 mm, and 127 mm, respectively.
- The bending radius of a power cable is at least five times the diameter of the cable.
- The bending radius of a signal cable must be at least five times the diameter of the cable.

Cable binding

- Cables of the same type are bound together.
- Different types of cables must be separately routed with a minimum spacing of 30 mm and cannot be entangled.
- The cables are bound tightly and neatly and the sheaths of the cables is intact.
- The cable ties face the same direction and all cable ties bound at similar positions must be in a straight line.
- The extra length of each indoor cable tie must be cut off. A slack of 5 mm is reserved for each outdoor cable tie before the extra length is cut off. All cut surfaces are without sharp edges.
- Labels or nameplates are attached to both ends, joints, or turns of cables after they are installed.

Safety

- The steel pipe or fire-resistant rigid polyvinyl chloride pipe should be used for the cable duct or for routing cables. The cross-sectional usage of the cable duct should be 30% to 50% and that of the pipe for routing cables should be 25% to 30%.
- Cables are placed away from sharp objects or wall burrs. If these positions are inevitable, protection pipes are required for the cables.
- Cables are routed away from heat sources, or heat-insulation materials are added between cables and heat sources.
- A clearance is reserved at turns of a cable or the position close to a device, facilitating cable and device maintenance. The recommended clearance is about 0.1 m.

Requirements for Special Cables

Ethernet Cable

- A maximum of 100 Ethernet cables can be bundled if no PVC pipes are used. If pipes are used, a maximum of 24 Ethernet cables can be led through a pipe. In this case, ensure that 1/3 space inside the pipes must be vacant.
- The point at which an Ethernet cable is bundled must be spaced 400 mm or less from the Ethernet port on a pRRU.
- For the pRRU3902 used in the elevator engine room on the rooftop, generator set for the subway engine, and equipment room with central air conditioning, Ethernet cables must be led through metallic conduits that are reliably grounded at both ends.

8.4.2 pRRU3902 Cable List

This section describes pRRU3902 cable connections.

Table 8-7 lists pRRU3902 cables.

Table 8-7 List of pRRU3902 cables

Cable	One End		The Other End	
	Connector	Connected to ...	Connector	Connected to ...
Ethernet Cable	RJ45 connector	RHUB/ CPRI_E0~CPRI_E7 port	RJ45 connector	pRRU3902/ CPRI_E0~CPRI_E1 port
(Optional) RF Jumper	SMA straight male connector	External antenna TX/RX RF port on pRRU3902	Type N male connector	Combiner/ PORT1~2

NOTE

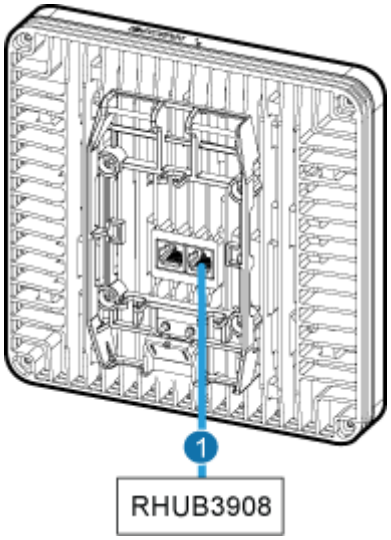
The Extender can be used to lengthen the distance between the RHUB and the pRRU3902 connected using the Ethernet cable. If the Extender is used, the Ethernet cable is divided into two parts, one between the RHUB and the Extender and the other between the Extender and the pRRU3902.

8.4.3 Cable Connections

This section describes the cable connections for a single pRRU3902.

Figure 8-35 shows the cable connection when the pRRU3902 with internal antenna.

Figure 8-35 pRRU3902 cable connection (1)



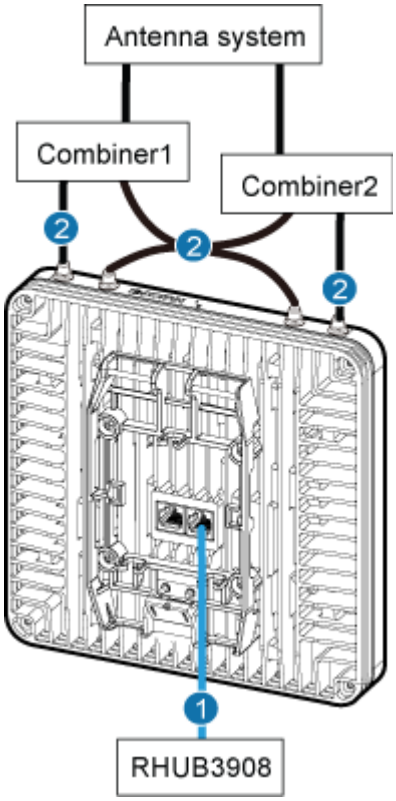
(1) Ethernet cable –

NOTE

The Extender can be used to lengthen the distance between the RHUB and the pRRU3902 connected using the Ethernet cable. If the Extender is used, the Ethernet cable is divided into two parts, one between the RHUB and the Extender and the other between the Extender and the pRRU3902.

Figure 8-36 shows the cable connection when the pRRU3902 supporting external antennas.

Figure 8-36 pRRU3902 cable connection (2)



(1) Ethernet cable (2) RF jumper

NOTE

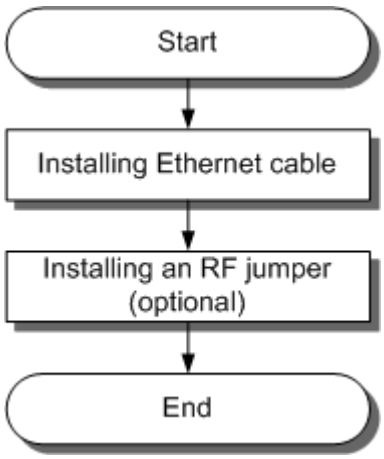
The Extender can be used to lengthen the distance between the RHUB and the pRRU3902 connected using the Ethernet cable. If the Extender is used, the Ethernet cable is divided into two parts, one between the RHUB and the Extender and the other between the Extender and the pRRU3902.

8.4.4 pRRU3902 cable installation process

This section describes the process of installing pRRU3902 cables.

Figure 8-37 shows the process of installing pRRU3902 cables.

Figure 8-37 pRRU3902 cable installation process



8.4.5 Installing an Ethernet Cable

This section describes how to install an Ethernet cable.

Prerequisites

- The Ethernet cable must be of Category 5e (enhanced) or higher. In addition, its cross-sectional area must be 24 AWG or larger and frame spread rating must be CM or higher.
- The Ethernet cables can be straight-through cables.
- With the internal PoE module providing power, the maximum length of an Ethernet cable is 100 m. With the Extender, the distance of the pRRU3901 and RHUB can be extended by the Extender up to a total distance of 200 m.
- Ethernet cables are not delivered, and they must be prepared onsite. You need to use a network cable tester to test the Ethernet cable connection.

Context

The Ethernet cable has the following functions:

- Provides power supply for the pRRU3902 when the cable connects the CPRI_E0 port on the pRRU3902 to the RHUB.
- Transmits CPRI signals between an RHUB and a pRRU3902.

Procedure

Step 1 Make the Ethernet cables.

1. Assemble an RJ45 connector and an Ethernet cable by following instructions in Assembling the Unshielded RJ45 Connector and the Ethernet Cable, Assembling the Shielded RJ45 Connector and the Ethernet Cable.

   NOTE

   - Follow pin assignment instructions described in section Ethernet Cable in *DBS3900 LampSite Hardware Description* to assemble the RJ45 connector and the Ethernet cable. Otherwise, the transmission signal quality deteriorates and CPRI links may be disconnected.
   - The pRRU3902 supports both unshielded and shielded Ethernet cables. It is good practice to use unshielded Ethernet cables.

2. Check whether the made RJ45 connector is qualified by following instructions in Checking the Appearance of Metal Contact Strips.
3. To complete the assembly of the other end, repeat **Step 1.1** and **Step 1.2**.
4. Check whether the touch points on the connectors at both ends are normally conducted and well contacted and whether the connections are correct by following instructions in Testing the Connection of Assembled Cables of *Installation Reference*.

Step 2 Install an Ethernet cable between an RHUB and a pRRU3902.

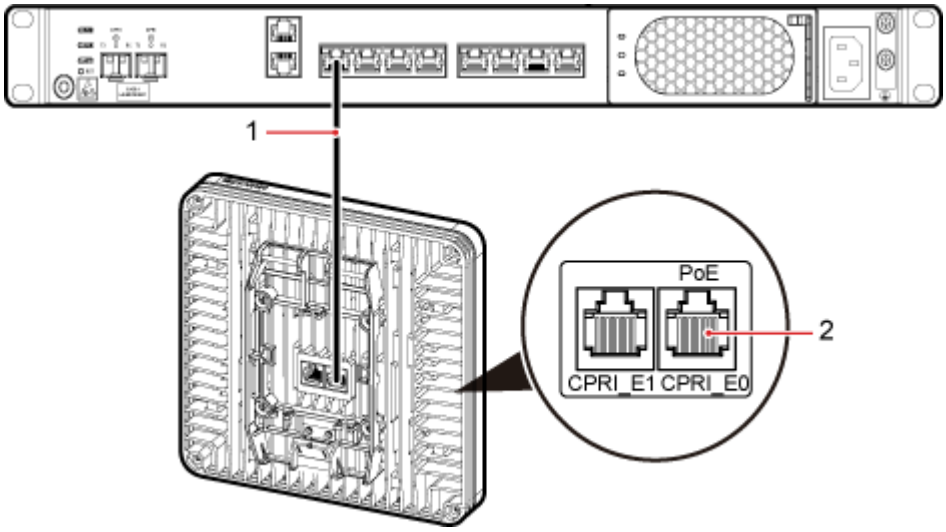
Step 3 Connect the RJ45 connector at one end of the Ethernet cable to the CPRI_E0 port on the pRRU3902 panel.

Step 4 **Optional:** Connect the RJ45 connector at the other end of the Ethernet cable to the output port of the Extender. Then, connect the RJ45 connector at one end of another Ethernet cable to the input port of the Extender.

In this scene, the Ethernet cable is divided into two parts, one between the RHUB and the Extender and the other between the Extender and the pRRU3902.

Step 5 Connect the RJ45 connector at the other end of the Ethernet cable to any port ranging from CPRI_E0 to CPRI_E7 on the RHUB panel based on the engineering design, as shown in **Figure 8-38**.

Figure 8-38 Installing an Ethernet cable



(1) Ethernet cable (2) CPRI_E0 port on the pRRU3902

----End

Follow-up Procedure

1. Route the cable, and then use a cable tie to bind the cable. For details, see **8.4.1 Requirements for Cable Layout**.
2. Label the installed cable. For details, see section **11.3 Attaching an L-Shaped Label**.

8.4.6 Installing an RF Jumpers (Optional)

The RF Jumpers transmit radio frequency signals. One end of the jumper is the SMA straight male connector, and the other end is the type N connector.

Context

- An RF jumpers delivered is 50 cm at most.
- If the RF jumper is provided by the customer, the jumper must not be lower than the RG316 specifications. In addition, the jumpers can be used after they are checked by Huawei engineers.
- pRRU3902s can be connected to external whip antennas or external remote antennas (through pRRU3902 RF jumpers). Whip antennas are delivered optionally. RF jumpers are not delivered.

Procedure

Step 1 Use a torque wrench with a torque of 0.6 N•m to connect the SMA straight male connector on a jumper to the ANT port on the pRRU3902 panel.

NOTICE

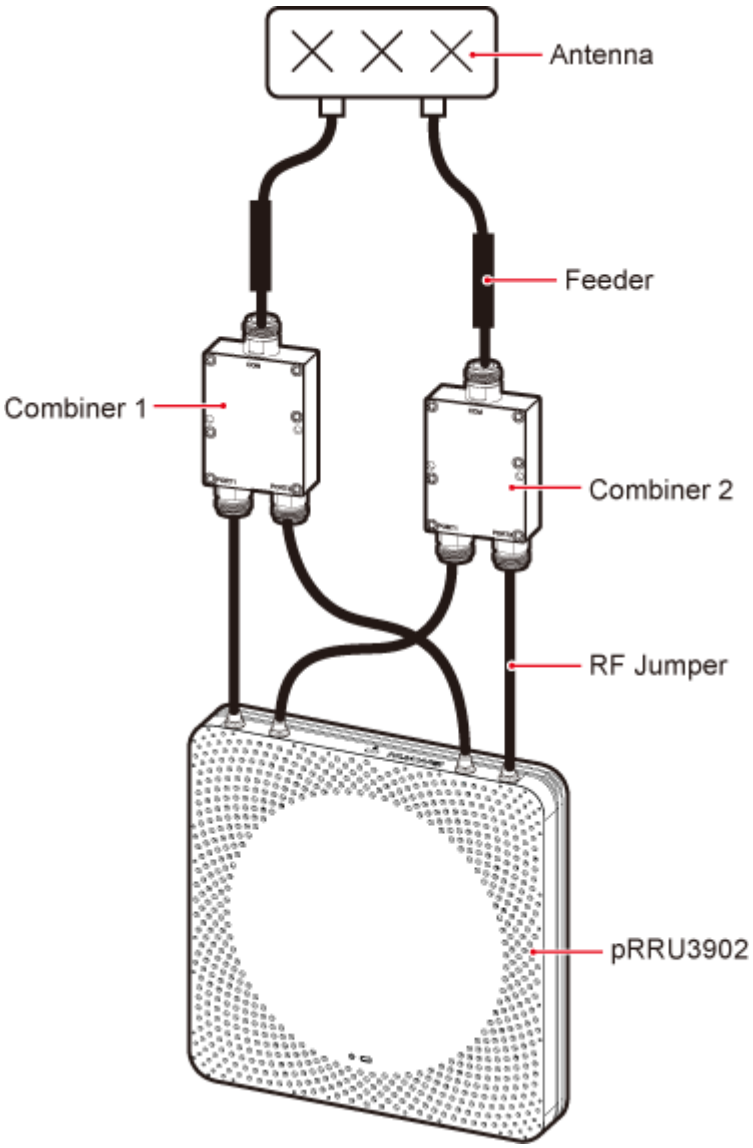
Tighten it with hands, and then use a torque wrench to tighten it with a rotational speed of less than or equal to 2.4 rpm to tighten it.

Step 2 Connect the type N female connector of the jumper to the type N male connector of the RF feeder connected to the PORT port of the combiner, as shown as **Table 8-8**.

Table 8-8 Connections of the RF jumper between pRRU3902 and combiners

One End		The Other End	
Connector	**Connected to...**	**Connector**	**Connected to...**
SMA straight male connector	pRRU3902/ANT0 RF port	Type N male connector	Combiner1/PORT1 or PORT2 prot
	pRRU3902/ANT1 RF port		Combiner2/PORT1 or PORT2 prot
	pRRU3902/ANT2 RF port		Combiner1/PORT2 or PORT2 prot
	pRRU3902/ANT3 RF port		Combiner2/PORT2 or PORT1 prot

Figure 8-39 Installing jumpers between the pRRU3902 and Combiners



----End

Follow-up Procedure

1. Route the cable, and then use a cable tie to bind the cable. For details, see **8.4.1 Requirements for Cable Layout**.
2. Label the installed cable. For details, see section **11.3 Attaching an L-Shaped Label**.

8.5 (Optional) Installing a Combiner

This section describes how to install a combiner.

Context

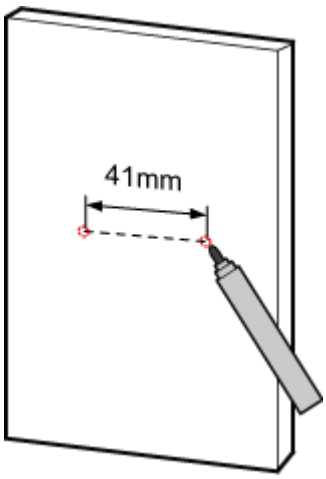
The pRRU3902 using external antennas must be configured with a combiner.

This section describes how to mount a combiner on a wall as an example. The actual installation mode depends on actual requirements.

Procedure

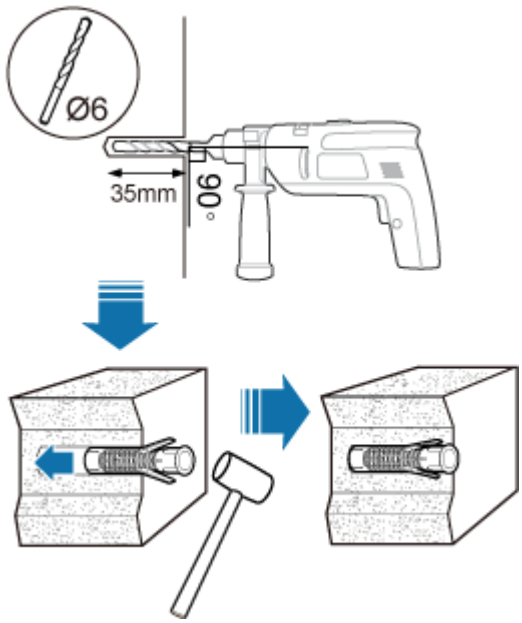
Step 1 Use a marker to mark two anchor points according to inter-hole spacing, as shown in **Figure 8-40**.

Figure 8-40 Marking anchor points



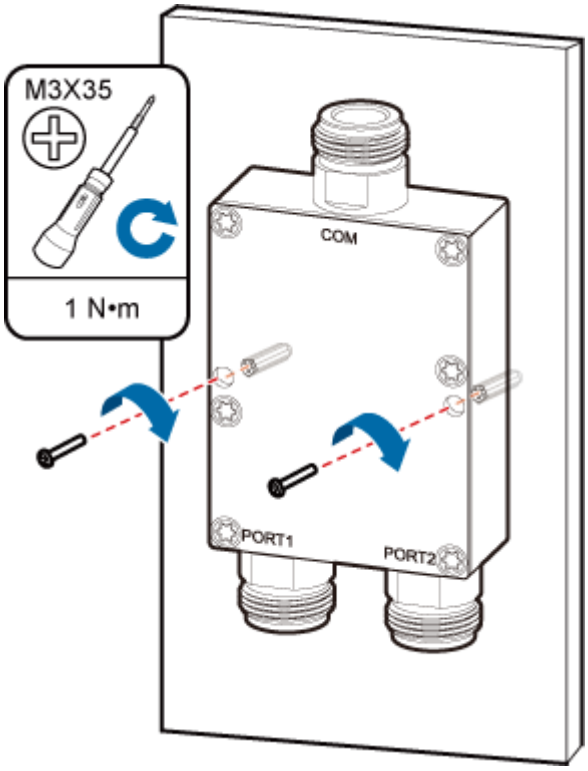
Step 2 Use a hammer drill with φ6 bore to drill holes at the marked anchor points, as shown in **Figure 8-41**. Use a vacuum cleaner to clean the dust inside and around the holes and measure the distance between them. If they are inaccurately positioned, re-measure and re-drill the holes. Then, use a rubber mallet to hit a plastic expansion sleeve into each hole.

Figure 8-41 Drilling holes and installing expansion bolts



Step 3 Place the Extender in the corresponding position and use an M3 Phillips screwdriver to torque the screws to 1 N•m, as shown in **Figure 8-42**.

Figure 8-42 Installing the Extender



----End

8.6 Checking the pRRU3902 Hardware Installation

pRRU3902 hardware installation checking includes hardware and cable installation checking.

Table 8-9 lists the hardware installation checking items.

Table 8-9 Hardware installation checking list

No.	Item
1	Ensure that the pRRU3902 is not grounded.
2	The position for each device conforms to the engineering design and meets the space requirement.
3	Ensure that the pRRU3902 is properly installed.
4	The surface of the pRRU3902 is neat and clean. The external paint is intact. The labels, tags, and nameplates are correct, legible, and complete.

Table 8-10 lists the check items of the signal cable connection.

Table 8-10 Checklist for the signal cable connection

No.	Item
1	The connectors of the signal cables must securely connected.
2	The connectors of the signal cables are intact.
3	The signal cables are intact.
4	The cable ties are evenly spaced. The signal cables are bound neatly with cable ties to proper tightness, and arranged at even intervals in the same direction.
5	The extra length of the cable ties is cut and removed. The cut surfaces of the indoor cables are smooth and have no sharp edges.
6	The cable layout facilitates maintenance and expansion.
7	Correct and clear labels are attached to both ends of the signal cables.

Table 8-11 lists the checking items for other cable connections.

Table 8-11 Checklist for other cable connections

No.	Item
1	The connectors of the other cables must securely connected.
2	Labels on the cables are legible and bound based on the engineering requirements. The cables must be bound tightly and neatly. The sheaths of the cables must not be damaged.
3	Positions for routing the cables must meet requirements of the engineering design.

8.7 Powering on the pRRU3902

This section describes the power-on check on the pRRU3902 after the pRRU3902 hardware is installed and checked.

Procedure

Step 1 Power on the pRRU3902.

The pRRU3902 supports PoE. The RHUB supplies power to the pRRU3902 in PoE mode through the CPRI_E0 port on the pRRU3902.

Step 2 Power on the pRRU3902. Wait 3 to 5 minutes, check the status of the 3GPP indicator on the pRRU3902.

If the 3GPP Indicator...	Because...	Then...
Blinks white at 4 Hz	The pRRU3902 is loading software, configuring data, or it is not running.	Wait until the software is loaded. If the loading is not completed in five minutes, power off the pRRU3902 and check whether the data configuration file is correct. After the fault is rectified, power on the pRRU3902 again.
Blinks white at 0.5 Hz (on for 1s and off for 1s)	The pRRU3902 is working properly and does not transmit power.	Check whether the services have been configured and power amplification have been enabled on the pRRU3902.
Is steady white	The cell is set up and transmits power properly.	No further action is required.
Is steady orange.	There is power input, but the hardware is faulty.	Power off the pRRU3902, rectify the hardware fault, and then power it on again.
Blinks orange at 0.5 Hz (on for 1s and off for 1s)	A minor alarm (indicating an HDLC link disconnection, for example) is generated.	Troubleshoot based on the alarm information.
Is off	The board is not powered on.	Turn off the power supply switch and check whether the power input is normal. If the power input is normal, check for and rectify board faults, and turn on the power supply switch again.

----End

9 Installing a pRRU3907

About This Chapter

This chapter describes the pRRU3907 installation process.

9.1 Information About the Installation
This section describes the information that you must be familiar with before installing a pRRU3907, including the pRRU3907 product family, installation scenarios, installation space and environment requirements.

9.2 Installation Process
This section describes the pRRU3907 installation process, which involves installing a pRRU3907, and cables, checking the pRRU3907 hardware installation, and powering on the pRRU3907.

9.3 Installing a pRRU3907
This section describes the pRRU3907 installation process.

9.4 Installing pRRU Cables
This chapter describes the procedures for installing pRRU cables.

9.5 Checking the pRRU3907 Hardware Installation
pRRU3907 hardware installation checking includes hardware and cable installation checking.

9.6 Powering on the pRRU3907
This section describes the power-on check on the pRRU3907 after the pRRU3907 hardware is installed and checked.

9.1 Information About the Installation

This section describes the information that you must be familiar with before installing a pRRU3907, including the pRRU3907 product family, installation scenarios, installation space and environment requirements.

9.1.1 pRRU3907 Product Family

This chapter describes the configurations and functions of the pRRU3907 components.

Table 9-1 lists the pRRU3907 product family.

Table 9-1 pRRU3907 product family

Category	Equipment	Optional or Mandatory	Quantity	Function
Main equipment	pRRU3907	Mandatory	1	Functions as a remote radio unit that processes RF signals.
Auxiliary device	Mounting kits	Mandatory	1	Supports the pRRU3907 installation on a wall or pole. The mounting kits vary with the pRRU3907 installation mode.
	Extender	Optional	1/2 **NOTE** The quantity depends on the number of Ethernet cables in use.	Extends the distance between the pRRU3907 and RHUB.

9.1.2 Constraints and Limitations

The pRRU3907 can be installed on a wall or pole.Installation scenarios must meet heat-dissipation and waterproofing requirements of the RRU.

Requirements for the Installation Scenarios

Application scenarios:

To ensure proper heat dissipation of the pRRU, the following requirements must be met:

- The pRRU cannot be installed in an enclosed cabinet without a cooling system.
- The pRRU cannot be installed in an enclosed camouflage box.

- The pRRU cannot be installed in an enclosed equipment room without a cooling system.
- When multiple pRRUs are installed in centralized mode, the minimum clearance requirements must be met. For details, see **9.1.3 Installation Clearance and Space Requirements**.

NOTICE

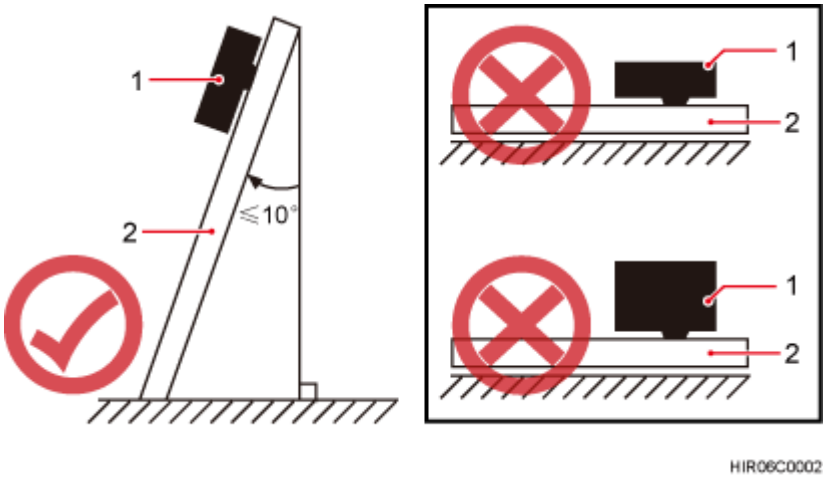
If the pRRU is inappropriately installed, heat dissipation of the pRRU deteriorates and the pRRU may not work properly, as shown in **Figure 9-1**.

Figure 9-1 Inappropriately installed pRRU

Correct installation methods:

To ensure the heat dissipation of the pRRU and waterproofing of the ports at the bottom of the RRU, the vertical deviation angle of a pRRU must be less than or equal to 10°, as shown in **Figure 9-2**.

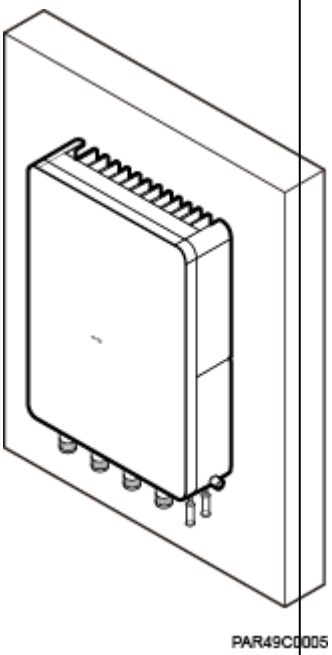
Figure 9-2 Requirements for the vertical deviation angle of a pRRU

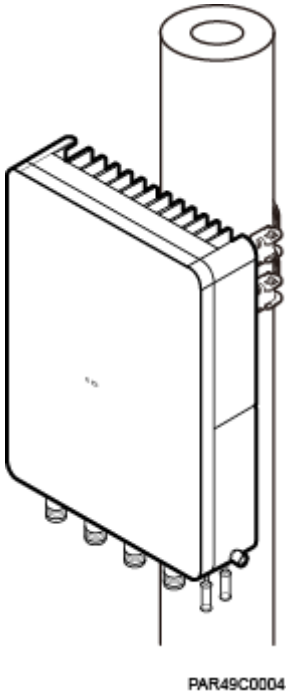


(1) pRRU (2) Installation support (pole or wall)

Table 9-2 lists the mounted suggestions of different installation scenarios.

Table 9-2 mounted suggestion

Installation Mode	Requirements	Mounting Brackets	Installation Diagram
Installing the pRRU3907 on a wall For details, see**9.3.2 Installing a pRRU on a Wall**.	● The wall can bear a load at least four times the weight of a pRRU3907. ● The screws must be tightened with a torque of 30 N·m. This ensures the screws work properly and the wall remains intact without cracks in it.	1. M6x60 bolt 2. Nut 3. Spring washer 4. Flat washer 5. Expansion sleeve	

Installation Mode	Requirements	Mounting Brackets	Installation Diagram
Installing the pRRU3907 on a pole For details, see **9.3.3 Installing a pRRU on a Pole**.	● The diameter of a pole for installing a pRRU ranges from 60 mm (2.36 in.) to 114 mm (4.49 in.). The recommended diameter is 80 mm (3.15 in.). ● The recommended thickness of the pole wall is 3.5 mm (0.14 in.) or above.	1. Mounting kit 2. Steel belt	

9.1.3 Installation Clearance and Space Requirements

This section describes the recommended and minimum clearances for a pRRU.

Clearance for a pRRU

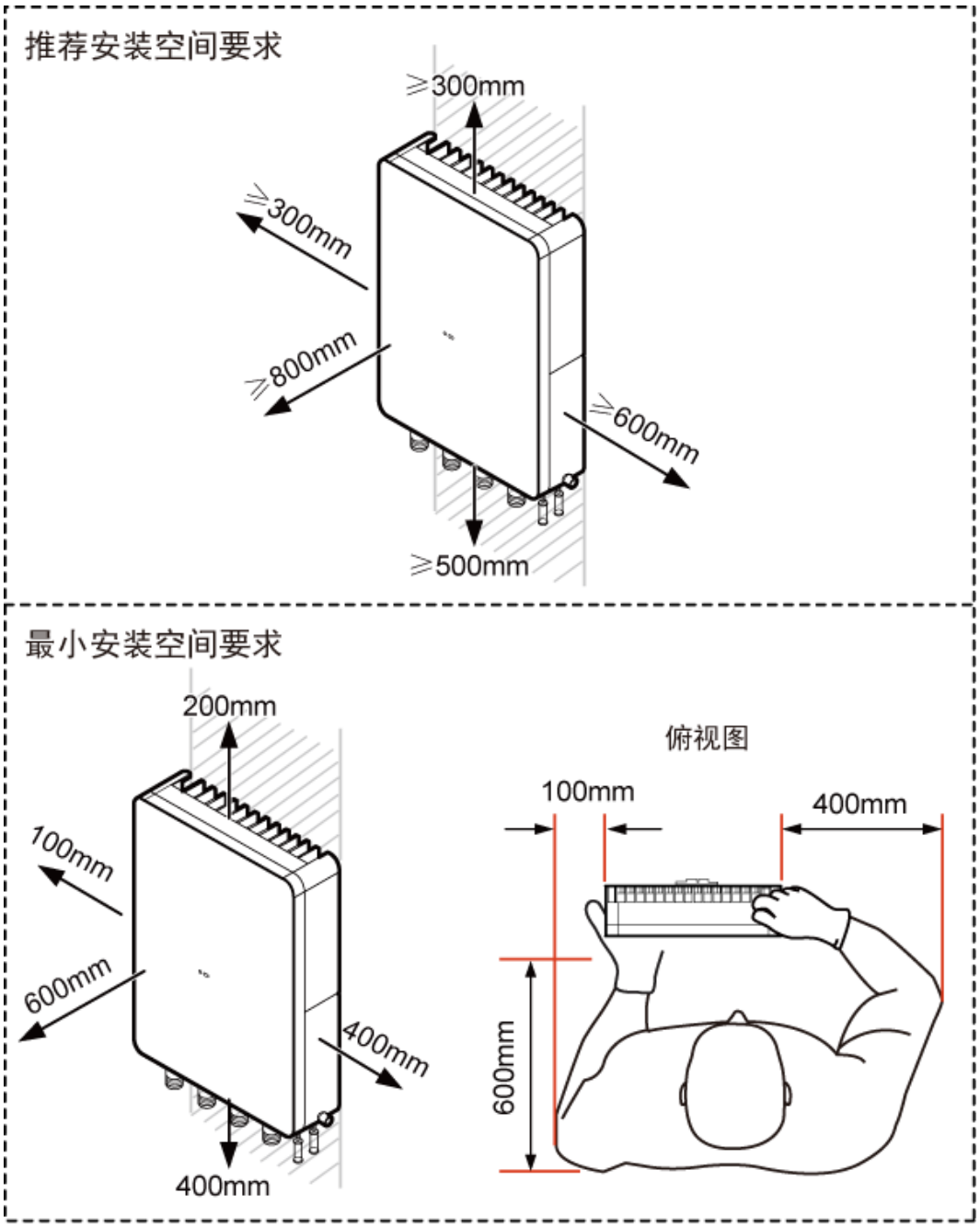
When the pRRU3907 is installed on a wall or pole, the minimum clearance is required for easy cabling and operation and maintenance (O&M). Based on the engineering practice, the recommendation for the installation clearance is provided.

NOTE

- The recommended clearances are for customers, ensuring normal running and providing appropriate space for O&M. If installation space is sufficient, leave the recommended clearances after installing equipment.
- The minimum clearance ensures normal operation and heat dissipation, but O&M activities such as checking indicator status and opening the cover plate of a cabling cavity cannot be properly conducted. If installation space is restricted, leave the minimum clearance after installing equipment.

Figure 9-3 show the clearances for installing a pRRU3907.

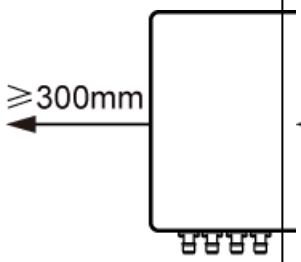
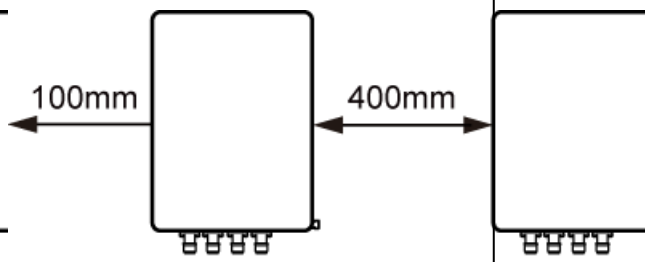
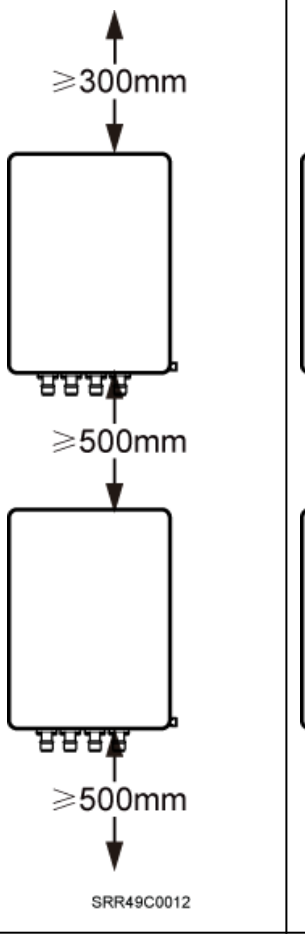
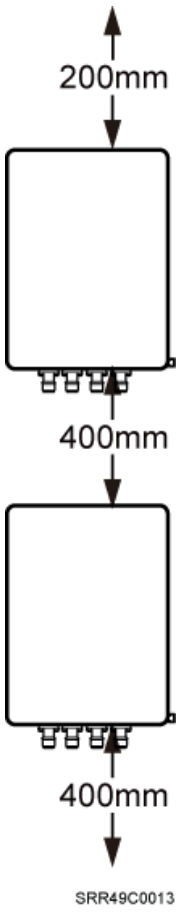
Figure 9-3 Clearances for installing a pRRU3907



Installation Spacing Between pRRUs

Table 9-3 lists the horizontal and vertical spacing between pRRUs.

Table 9-3 spacing between pRRUs

Item	Recommended Spacing	Minimum Spacing
Horizontal		
Vertical		

9.1.4 Installation Environment Requirements

The installation environment of a pRRU3907 involves the running environment specifications for the pRRU3907.

Running Environment Specifications

Table 9-4 shows the environment specifications for the pRRU3907 installed outdoors.

Table 9-4 pRRU3907 environment specifications

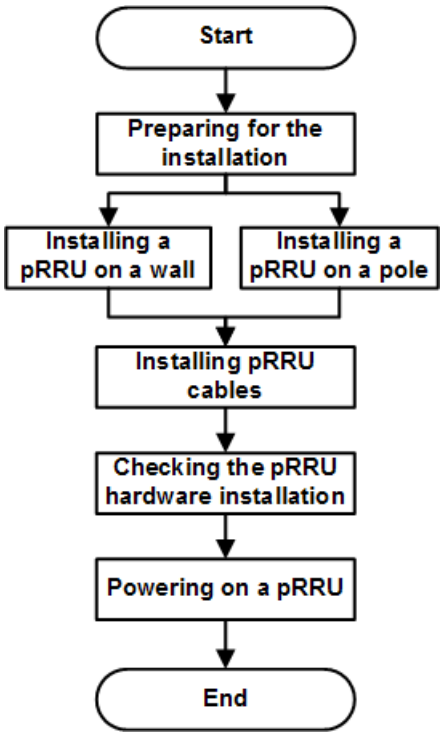
Specifications	Condition	Remarks
Operating temperature	- 40°C to + 50°C	-
Relative humidity	5% RH to 95% RH	-
Altitude	- 60 m to + 1800 m	Works properly.
	1800 m to 4000 m	Above the 1800 m altitude, the maximum operating temperature decreases by 1°C each time the altitude increases by 220 m.

9.2 Installation Process

This section describes the pRRU3907 installation process, which involves installing a pRRU3907, and cables, checking the pRRU3907 hardware installation, and powering on the pRRU3907.

Figure 9-4 shows the pRRU3907 installation process.

Figure 9-4 pRRU3907 installation process



9.3 Installing a pRRU3907

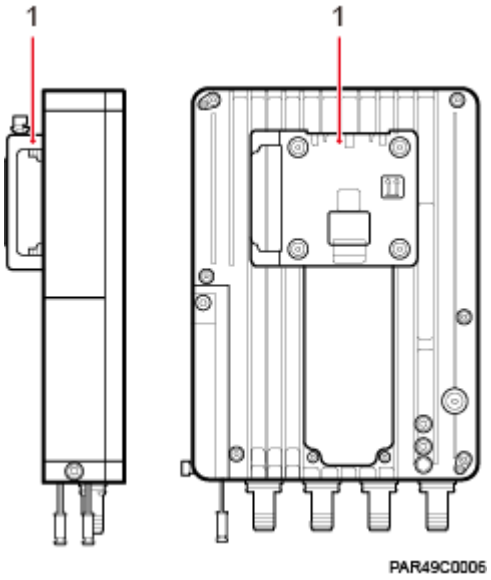
This section describes the pRRU3907 installation process.

9.3.1 pRRU3907 Mounting Kits

This section describes mounting kits and attachment plates for installing pRRUs.

Figure 9-5 shows the exterior of the pRRU3907.

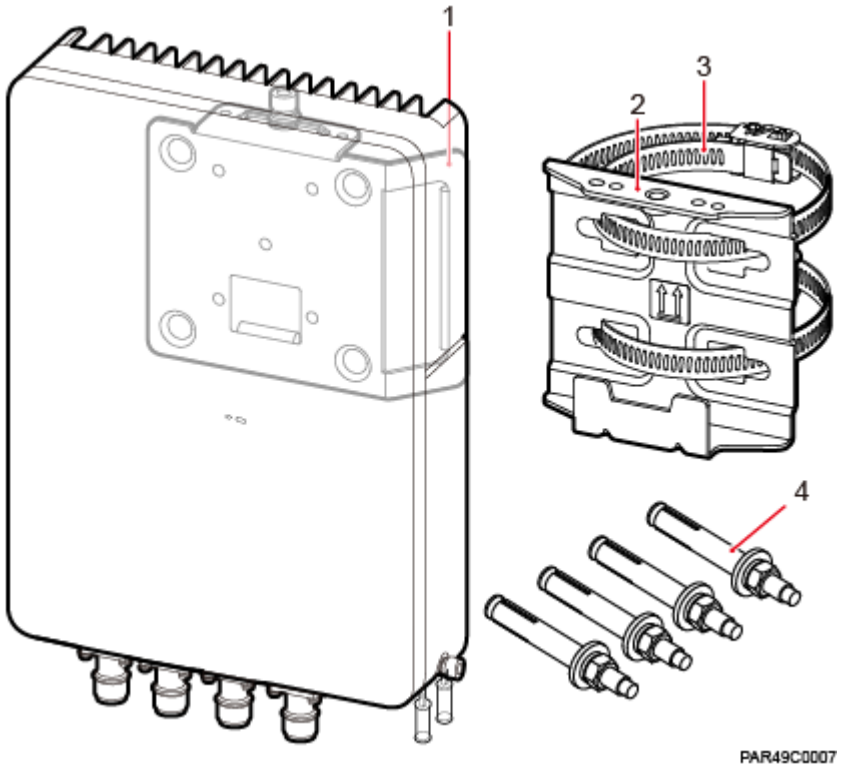
Figure 9-5 Front and side of a pRRU3907



(1) Attachment plate

Figure 9-6 shows a mounting bracket and a attachment plate.

Figure 9-6 Mounting bracket and common attachment plate for installing a pRRU



(1) Attachment plate	(2) Mounting bracket	(3) Steel belt
(4) Expansion bolt	-	-

9.3.2 Installing a pRRU on a Wall

This section describes the procedure and precautions for installing a pRRU on a wall.

Context

The wall for installing pRRUs must meet the following requirements:

- The wall must be able to bear a weight four times heavier than the pRRU's weight.
- Expansion bolts must be tightened to 30 N·m (265.52 lbf·in.) to ensure that the bolt assemblies work properly and the wall remains intact.

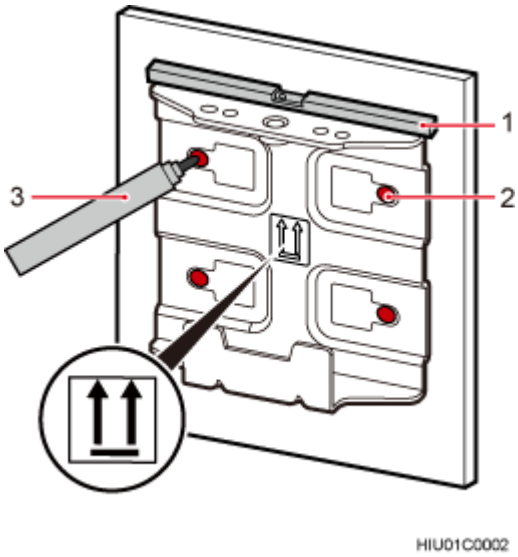
NOTICE

- Do not stand a pRRU upright because the RF ports cannot support the weight of the pRRU.
- Place a foam pad or cardboard under a pRRU to protect the pRRU housing from damage during the installation.

Procedure

Step 1 Determine a position for installing the pRRU on a wall, use a level to verify that the marking-off template is placed horizontally, and then use a marker to mark anchor points, as shown in **Figure 9-7**.

Figure 9-7 Marking anchor points



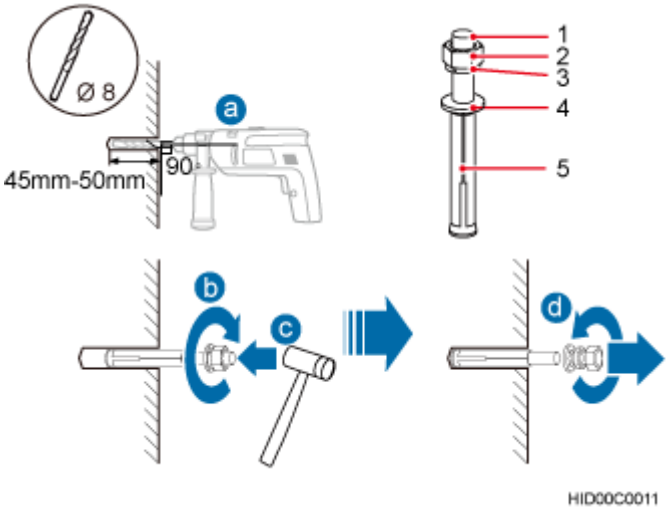
(1) Level (2) Tapped hole (3) Marker

NOTE

It is recommended that the separate mounting kit be 1200 mm (47.24 in.) to 1600 mm (62.99 in.) above the ground.

Step 2 Drill holes at the anchor points and install expansion bolts in the holes, as shown in **Figure 9-8**.

Figure 9-8 Drilling a hole and inserting an expansion bolt assembly



(1) M6x60 bolt (2) Nut (3) Spring washer (4) Flat washer (5) Expansion tube

1. Use a hammer drill with a φ8 bit to drill holes vertically at the marked anchor points. Ensure that the depth of each hole ranges from 45 mm (1.77 in.) to 50 mm (1.97 in.).

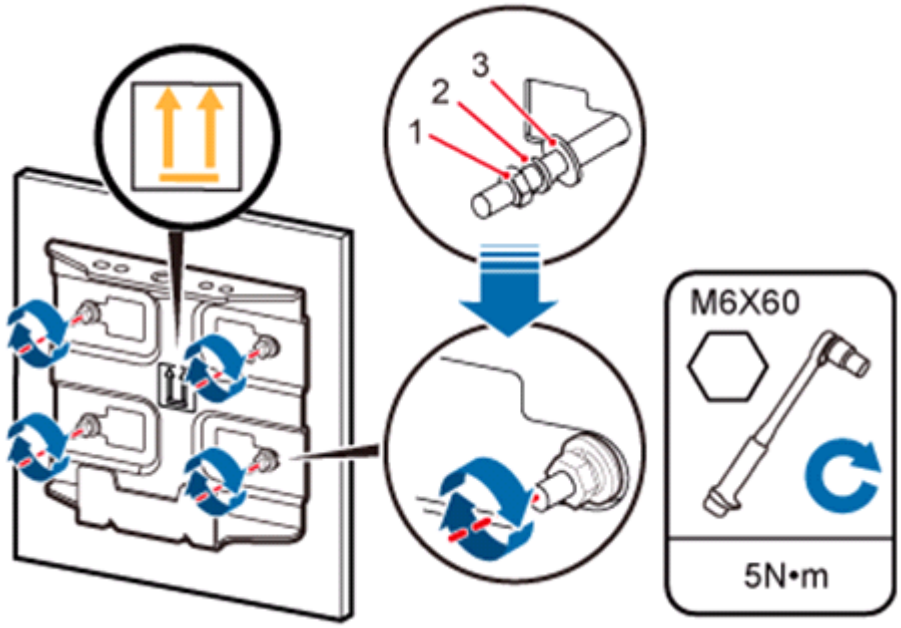
NOTICE

Take proper safety measures to protect your eyes and respiratory tract against the dust before drilling holes.

2. Use a vacuum cleaner to clear the dust out from inside and around the holes, and measure the distances between holes. If any of the holes is beyond the acceptable range, mark a new anchor point and drill a new hole.
3. Tighten the expansion bolts slightly, and place each expansion bolt vertically into each hole.
4. Use a rubber mallet to pound each expansion bolt until the corresponding expansion tube completely enters the hole. Leave 20 mm (0.79 in.) of the expansion bolt outside the wall.
5. Remove the M6x60 bolt, nut, spring washer, and flat washer in sequence.

Step 3 Place the mounting kit onto the wall, insert four M6x60 bolts into the tapped holes on the mounting kit, and tighten each bolt to 5 N·m (44.25 lbf·in.) to secure the mounting kit, as shown in **Figure 9-9**.

Figure 9-9 Securing the separate mounting kit

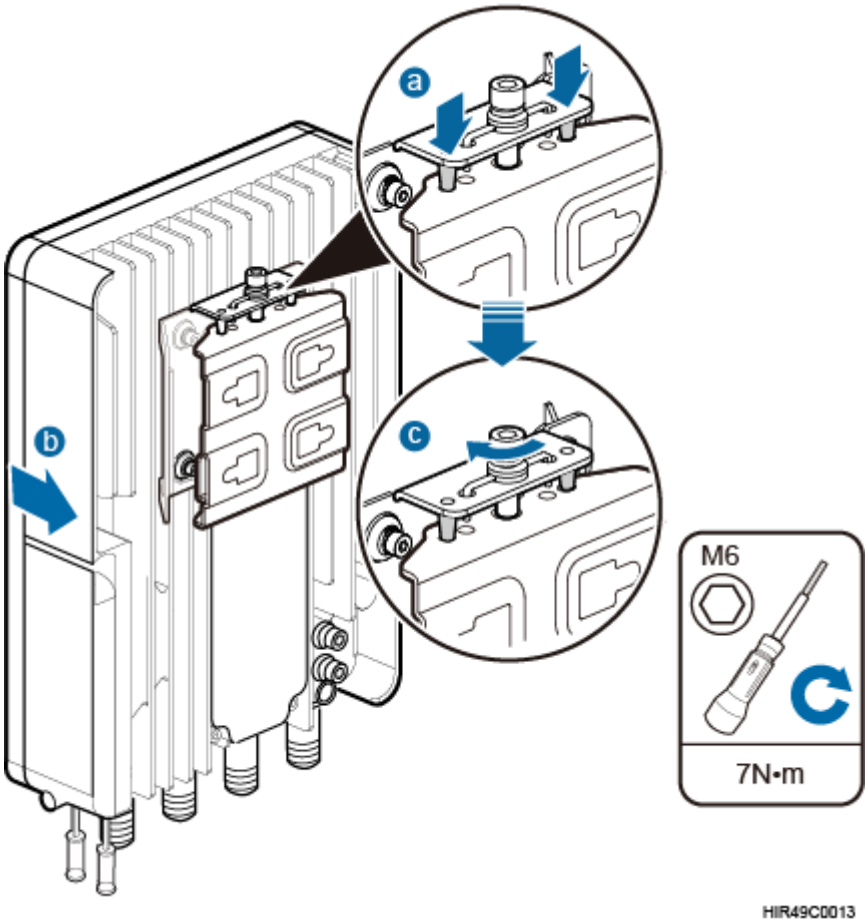


(1) Nut (2) Spring washer (3) Flat washer

Step 4 Hold the pRRU, hang the two dowels on the top of the pRRU attachment plate onto the separate mounting kit, and push the pRRU until it snaps into place, as shown by illustrations a and b in **Figure 9-10**.

Step 5 Use the M6 inner hexagon screwdriver to tighten the screw on the top of the separate attachment plate to 7 N·m (61.96 lbf·in.), as shown by illustration c in **Figure 9-10**.

Figure 9-10 Securing the pRRU onto the mounting kit



----End

9.3.3 Installing a pRRU on a Pole

This section describes the procedure and precautions for installing a pRRU on a pole.

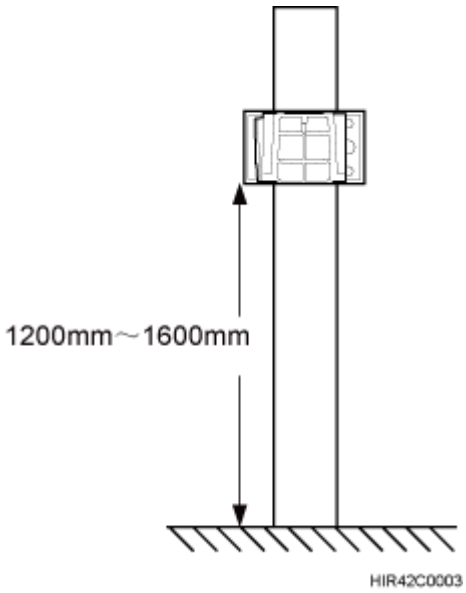
Context

- Do not stand a pRRU upright because the RF ports cannot support the weight of the pRRU.
- Place a foam pad or cardboard under a pRRU to protect the pRRU housing from damage during the installation.

Procedure

Step 1 Determine a position for installing the separate mounting kit, as shown in **Figure 9-11**.

Figure 9-11 Distance between the separate mounting kit and the ground

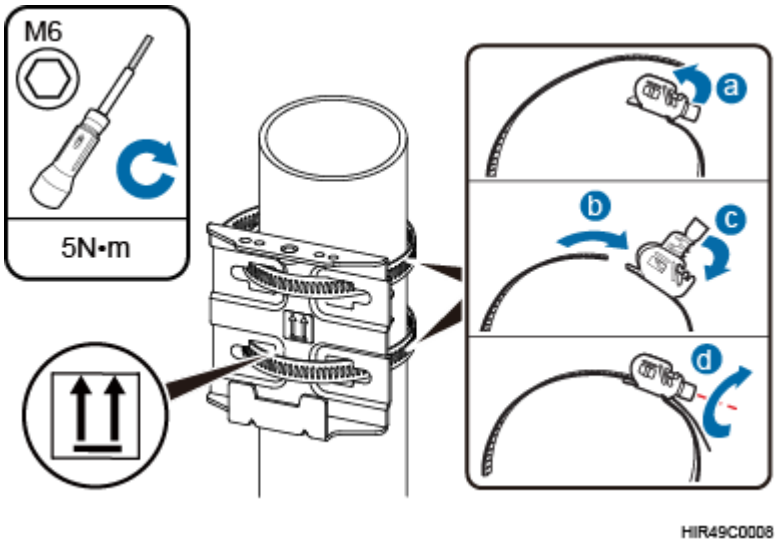


NOTE

It is recommended that the separate mounting kit be 1200 mm (47.24 in.) to 1600 mm (62.99 in.) above the ground.

Step 2 Install the mounting kit, as shown in **Figure 9-12**.

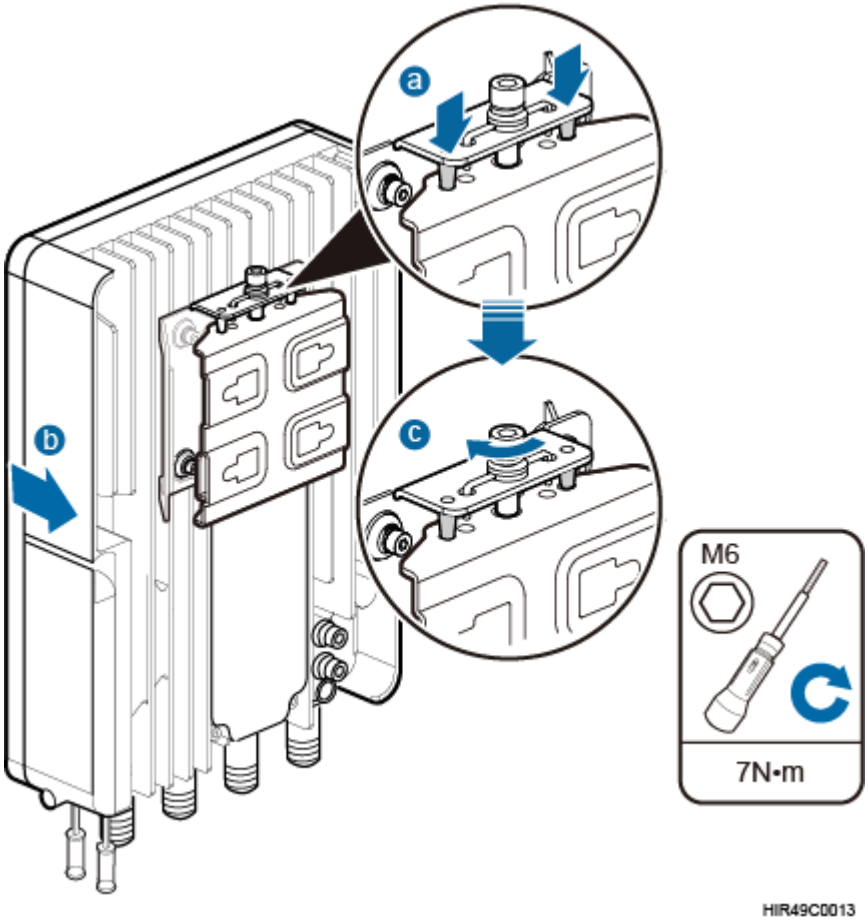
Figure 9-12 Installing a pRRU mounting kit



1. Determine a position for installing the pRRU. Then, place the separate mounting kit onto the pole, thread the steel belt through the mounting kit, and encircle the pole with the steel belt, as shown by illustrations a, b, and c in **Figure 9-12**.
2. Use an M6 inner hexagon screwdriver to tighten the bolt on each steel belt to 5 N·m (44.25 lbf·in.) to secure the mounting kit, as shown by illustration d in **Figure 9-12**.

Step 3 Secure the pRRU onto the separate mounting kit, as shown in **Figure 9-13**.

Figure 9-13 Securing the pRRU onto the mounting kit



1. Hang the two dowels on the top of the pRRU attachment plate onto the mounting kit, and push the pRRU until it snaps into place, as shown by illustrations a and b in **Figure 9-13**.
2. Use the M6 inner hexagon screwdriver to tighten the screw on the top of the attachment plate to 7 N·m (61.96 lbf·in.), as shown by illustration c in **Figure 9-13**.

----End

9.4 Installing pRRU Cables

This chapter describes the procedures for installing pRRU cables.

9.4.1 Cabling Requirements

Cables must be laid out according to the specified cabling requirements to prevent signal interference.

NOTE

If a cable listed below is not required, skip the cabling requirements of the cable.

General Cabling Requirements

Bending radius requirements

- The bending radius of a 7/8" feeder must be greater than 250 mm (9.84 in.), and the bending radius of a 5/4" feeder must be greater than 380 mm (14.96 in.).
- The bending radius of a 1/4" jumper must be greater than 35 mm (1.38 in.). The bending radius of a super-flexible 1/2" jumper must be greater than 50 mm (1.97 in.), and the bending radius of an ordinary 1/2" jumper must be greater than 127 mm (5.00 in.).
- The bending radius of a PGND cable must be at least three times its diameter.
- The bending radius of a signal cable must be at least five times its diameter.

Cable binding requirements

- Cables of the same type must be bound together.
- Different types of cables must be separately laid out and bound, with a minimum distance of 30 mm (1.18 in.) from each other.
- Cables must be bound tightly and neatly. The sheaths of cables must not be damaged.
- Cable ties must face the same direction, and those at the same horizontal line must be in a straight line.
- The excess of indoor cable ties must be cut off. The excess of 5 mm (0.197 in.) of outdoor cable ties should be reserved, and the cut surfaces must be smooth without sharp edges.
- After cables are installed, labels or nameplates must be attached to the cables at their ends, curves, and interconnection positions.

Security requirements

- When laying out cables, avoid sharp objects, for example sharp edges on the wall. If necessary, use tubes to protect the cables.
- When laying out cables, keep cables away from heat sources, or use heat insulation materials to insulate the cables from the heat sources.
- Reserve a proper distance (0.1 m [3.937 in.] is recommended) between equipment and cables especially at the cable curves to protect the cables and equipment.

Indoor cabling requirements

- Route each cable into the room through the feeder window.
- Reserve drip loops for all cables outside the feeder window before routing them into the room. Ensure that the radiuses of the drip loops are greater than or equal to the minimum bending radiuses of the cables.
- When routing a cable into the room, ensure that a person is assisting you in the room.
- Apply waterproof treatment to the feeder window.

Outdoor Cabling Requirements

- Protect outdoor cables against potential damage. For example, thread the cables through tubes.
- Cables to be protected include AC power cables, transmission cables, and cables laid out underground.
- Use cable clips to secure cables outdoors.
- Arrange cables neatly along the routing direction and use cable clips to secure the cables.

- Determine the positions where the clips are installed according to the actual situation. For example, 7/8" feeders are secured with clips at an interval of 1.5 m (4.92 ft) to 2 m (6.56 ft), and CPRI fiber optic cables and power cables are secured with clips at an interval of 1 m (3.28 ft) to 1.5 m (4.92 ft). Ensure that the clips are evenly spaced and in the same direction.
- When fastening cables with a clip, ensure that the cables are aligned neatly and are routed through the holes in the clip. Do not stretch the cables too tightly.
- When using clips to secure cables, tighten the screws on the clips after all cables are arranged and laid out.

Special Cabling Requirements

Cabling of PGND cables

- PGND cables for a base station must be connected to the same ground bar.
- PGND cables must be buried in the ground or routed indoors.
- The external conductor of the coaxial wire and the shield layer of the shielded cable must have proper electrical contact with the metal surface of the equipment which they are connected to.
- PGND cables and signal cables must be installed separately. A certain distance must be reserved between them to prevent interference from each other.
- Switches or fuses must not be installed on the PGND cables.
- Other devices must not be used for electrical connections of the PGND cables.
- All the metal parts in the housing of the equipment must be reliably connected to the ground terminal.

9.4.2 pRRU3907 Cable List

This section describes pRRU cables, connectors added to the pRRU cables, and installation positions for both ends of each cable.

Table 9-5 lists pRRU3907 cables.

Table 9-5 List of pRRU3907 cables

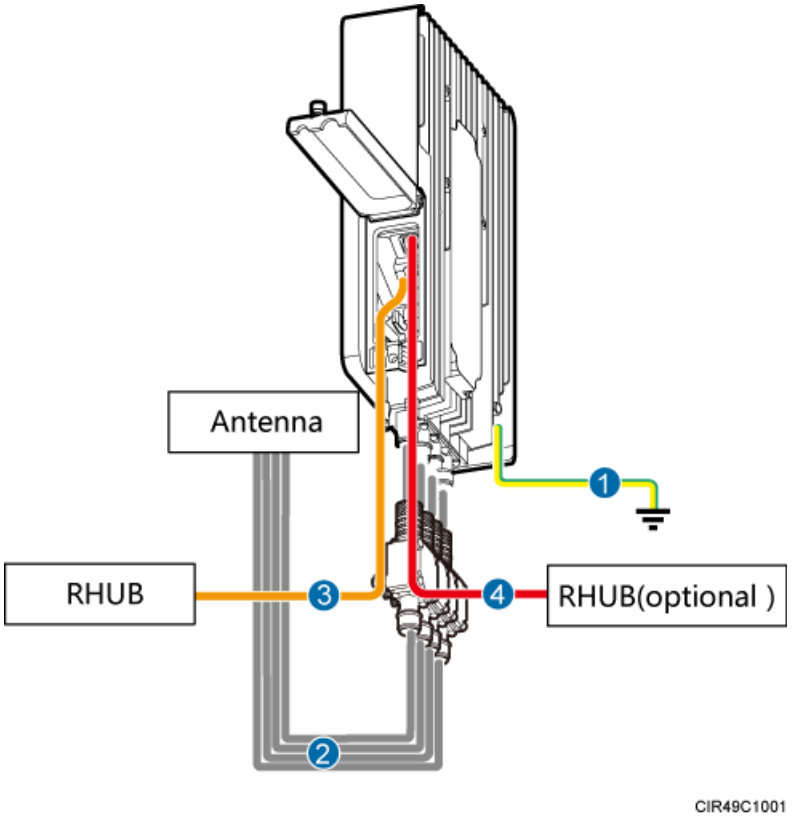
Cable	One End		The Other End	
	Connector	Connected to ...	Connector	Connected to ...
Ethernet Cable	RJ45 connector	RHUB/ CPRI_E0~CPRI_E7 port	RJ45 connector	pRRU3907/ CPRI_E0~CPRI_E1 port
pRRU RF Jumper	Type N male connector	RF port on the pRRU	Depends on the port model of the antenna system	Antenna system

9.4.3 pRRU Cable Connections

This section describes pRRU cable connections.

Figure 9-14 shows the cable connections when a pRRU is installed.

Figure 9-14 Cable connections when a pRRU is installed



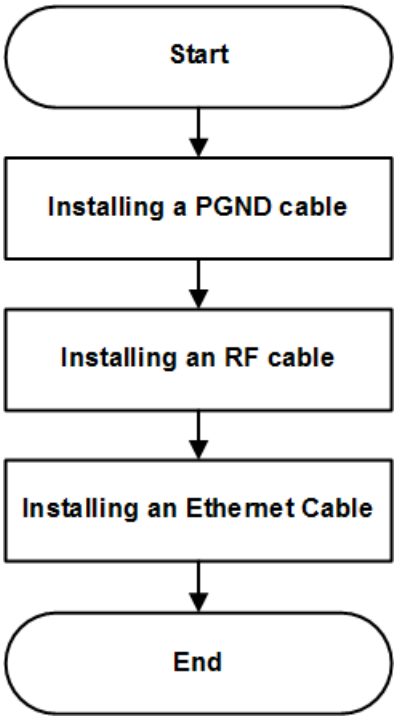
(1) pRRU PGND cable (2) pRRU RF jumper (3) pRRU Ethernet cable (4) pRRU Ethernet cable

9.4.4 pRRU3907 cable installation process

This section describes the process of installing pRRU cables.

Figure 9-15 shows the process of installing pRRU3907 cables.

Figure 9-15 pRRU3907 cable installation process



9.4.5 Installing a PGND Cable

This section describes the procedure for installing a PGND cable.

Procedure

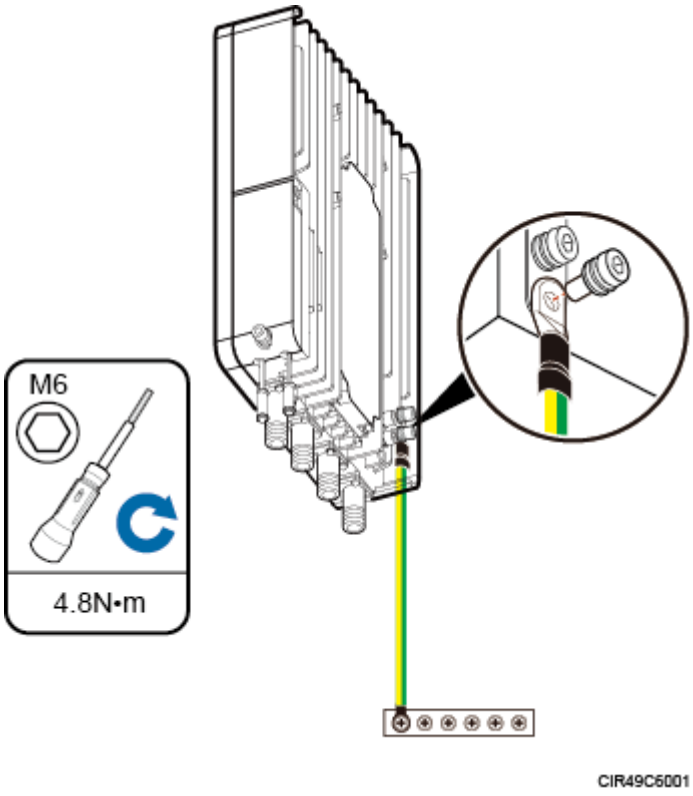
Step 1 Prepare a pRRU PGND cable.

1. Cut the cable to a length suitable for the actual cable route.
2. Add OT terminals to both ends of the cable by following the instructions in Assembling the OT Terminal and the Power Cable.

Step 2 Install the pRRU PGND cable.

Connect one end of the PGND cable with an M6 OT terminal to the ground terminal at the RRU bottom and the other end of the cable with an M8 OT terminal to the external ground bar, as shown in **Figure 9-16**.

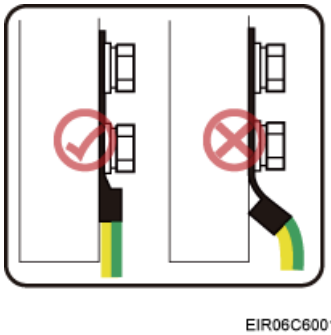
Figure 9-16 Installing a pRRU PGND cable



NOTE

Crimp OT terminals in correct directions, as shown in **Figure 9-17**.

Figure 9-17 Correct direction for crimping an OT terminal



Step 3 Label the installed cable by following the instructions in Attaching a Sign Plate Label.

----End

9.4.6 Installing an RF Jumper

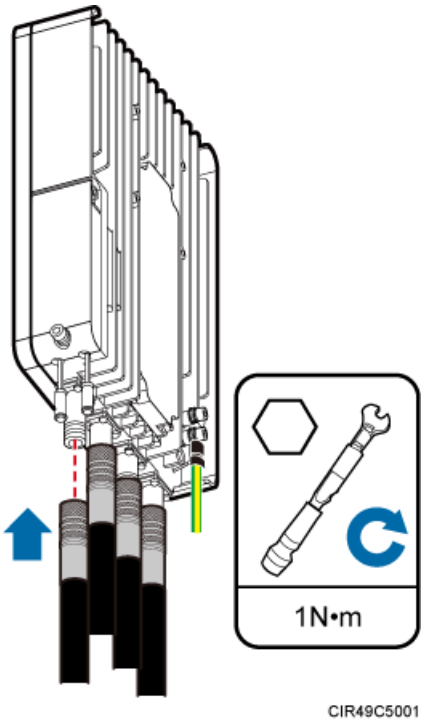
This section describes the procedure for installing an RF jumper.

Procedure

Step 1 Remove the dustproof cap from the ANT port to be used on the pRRU.

Step 2 Connect the type N male connector at one end of the pRRU RF jumper to the ANT port at the bottom of the pRRU in sequence, and use a torque wrench to tighten the connector to 1 N·m (8.85 lbf·in.), as shown in **Figure 9-18**.

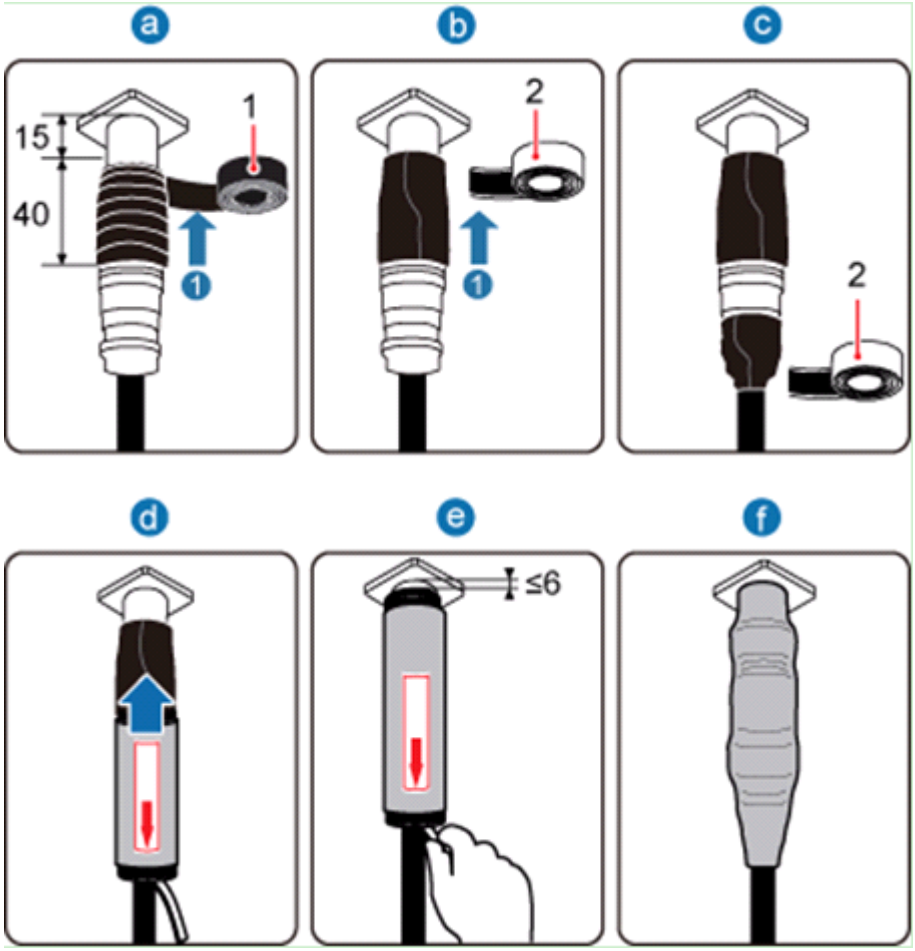
Figure 9-18 Installing an RF jumper



Step 3 Connect the other end of the pRRU RF jumper to the external antenna system.

Step 4 Waterproof the connector of the RF jumper by cold shrink sleeve, as shown in **Figure 9-19**.

Figure 9-19 Waterproofing the connector of the RF jumper



NOTICE

- Wrap cold shrink sleeves around the RF jumpers before installing the connectors.
- Do not rotate the adjacent connectors of a connector that has been wrapped with a cold shrink sleeve. Otherwise, the cold shrink sleeve may be damaged.
- During installation, ensure that no foreign substance, including sand, enters the sleeve.

1. Wrap a PVC insulation tape around the exposed area of the connector. The wrapped area is 15 mm away from the end of the connector, with a total length of 40 mm.
2. Ensure that dimensions (L x W) of the waterproof tape is 50 mm x 50 mm. Stretch the tape horizontally until it is twice of the original length and wrap it around the upper area of the connector.

   Ensure that the upper end of the waterproof tape overlays that of the PVC insulation tape.
3. Push the cold shrink sleeve to the end of the pRRU connector while gently pulling out the support strip along the jumper until the sleeve shrinks and secures the connector.

4. Pull out the support strip along the direction indicated by the arrow.

CAUTION

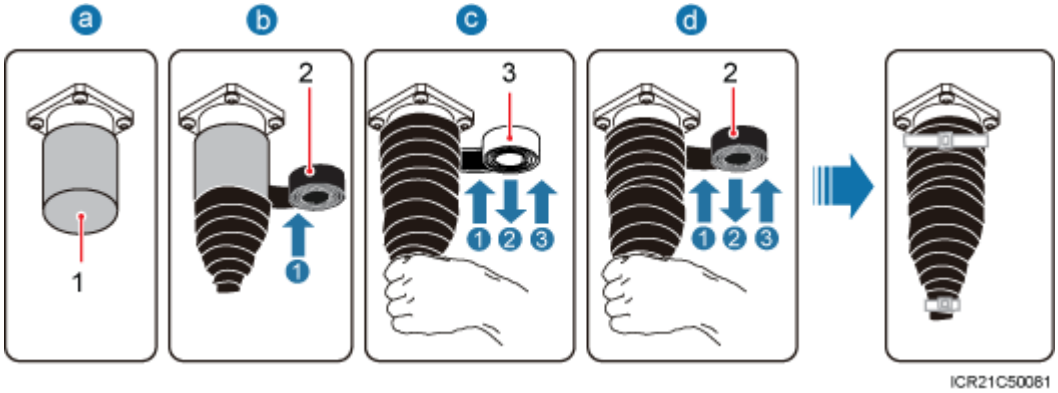
Ensure that the sleeve shrinks around the end of the pRRU connector and that the upper end of the sleeve and the connector end is 6 mm apart or less.

Step 5 Check the dustproof caps on antenna connectors. In outdoor scenarios, dustproof caps must be waterproofed, as shown in **Figure 9-20**.

NOTICE

Do not remove dustproof caps from vacant antenna connectors.

Figure 9-20 Waterproofing a dustproof cap



(1) Dustproof cap (2) PVC insulation tape (3) Waterproof tape

1. Verify that dustproof caps are not removed.
2. Wrap one layer of PVC insulation tape on each connector from bottom up.
3. Wrap three layers of waterproof tape on each connector, first from bottom up, then from top down, and finally from bottom up. Wrap each layer of the tape around the connector tightly.
4. Wrap three layers of PVC insulation tape on each connector, first from bottom up, then from top down, and finally from bottom up. Wrap each layer of the tape around the connector tightly.

NOTE

- When wrapping waterproof tape, stretch the tape evenly until it is twice of the original length. When wrapping PVC insulation tape, do not stretch it.
- Wrap each layer of tape around each connector tightly and neatly, and ensure that the adhesive surface of each layer of tape overlaps more than 50% of the lower layer.
- When cutting off a cable tie, reserve a surplus length of 3 mm (0.12 in.) to 5 mm (0.20 in.).

----End

Follow-up Procedure

1. Route the cable by following the instructions in section **9.4.1 Cabling Requirements** and use cable ties to bind the cable.
2. Label the installed cable. For details, see section Attaching a Sign Plate Label and Attaching the Color Ring.

9.4.7 Opening the Cover Plate of a pRRU Cabling Cavity

This section describes the procedure for opening the cover plate of a pRRU cabling cavity.

Procedure

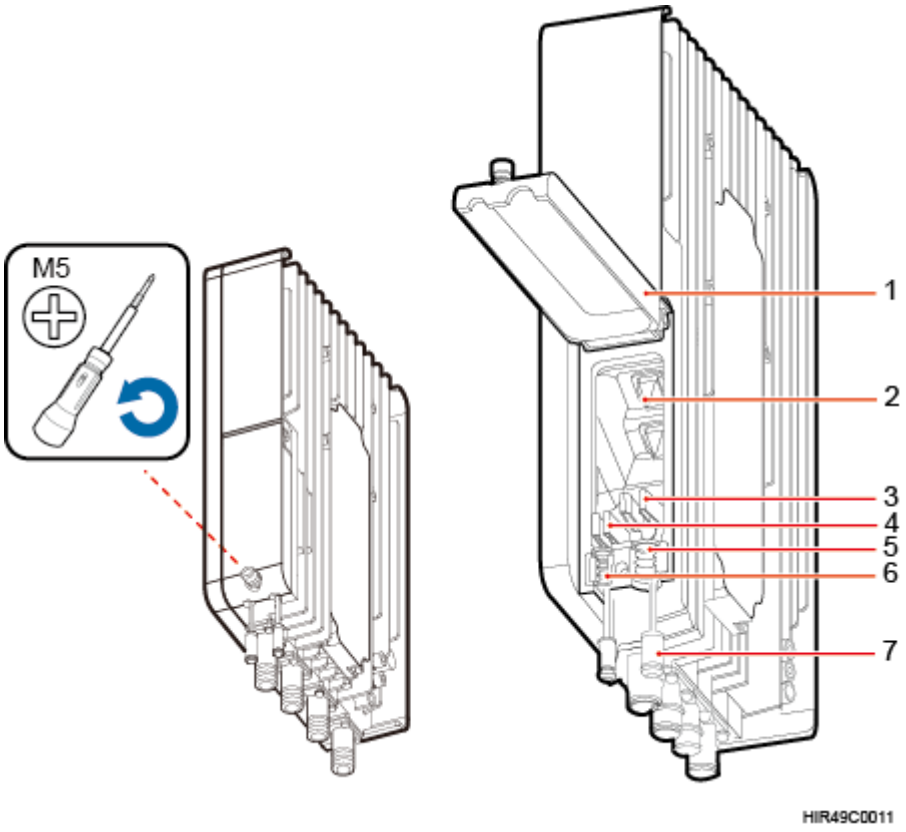
Step 1 Wear ESD gloves.

NOTICE

Take proper ESD protection measures, for example, wear ESD gloves, to prevent electrostatic damage to boards, modules, or electronic components.

Step 2 Use an M6 inner hexagon screwdriver to loosen the screw on the cover plate of the pRRU cabling cavity, and open the cover plate, as shown in **Figure 9-21**.

Figure 9-21 Opening the cover plate of the pRRU cabling cavity



(1) Cover plate	(2) Cabling cavity	(3) Cable clip for Ethernet cables
(4) Cable clip for Ethernet cables	(5) Cable trough for Ethernet cables	(6) Cable trough for Ethernet cables
(7) Waterproof block	-	-

Step 3 Remove the waterproof block.

NOTE

Remove only the waterproof blocks for cables to be installed.

----End

9.4.8 Installing an Ethernet Cable

This section describes how to install an Ethernet cable.

Context

- The Ethernet cable must be of Category 5e (enhanced) or higher.
- With the internal PoE module providing power, the maximum length of an Ethernet cable is 100 m. With the Extender, the distance of the pRRU3907 and RHUB can be extended by the Extender up to a total distance of 200 m.
- Ethernet cables are not delivered, and they must be prepared onsite. You need to use a network cable tester to test the Ethernet cable connection.

- The Ethernet cable has the following functions:
  - Provides power supply for the pRRU3907 when the cable connects the CPRI_E0 port on the pRRU3907 to the RHUB.
  - Transmits CPRI signals between an RHUB and a pRRU3907.

Procedure

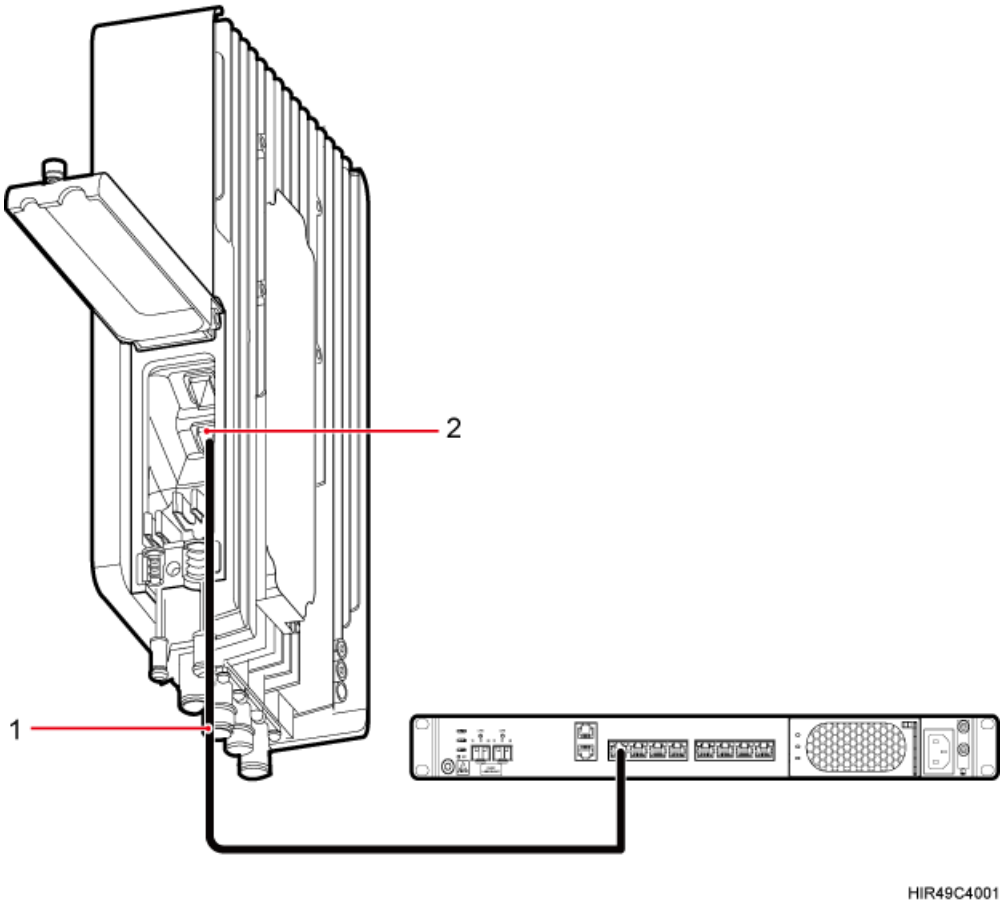
Step 1 Connect the RJ45 connector at one end of the Ethernet cable to the PoE port on the pRRU3902 panel, and push the cables into the cable clips.

Step 2 **Optional:** Connect the RJ45 connector at the other end of the Ethernet cable to the output port of the Extender. Then, connect the RJ45 connector at one end of another Ethernet cable to the input port of the Extender.

In this scenario, the Ethernet cable is divided into two parts, one between the RHUB and the Extender and the other between the Extender and the pRRU3907.

Step 3 Connect the RJ45 connector at the other end of the Ethernet cable to any port ranging from CPRI_E0 to CPRI_E7 on the RHUB panel based on the engineering design, as shown in **Figure 9-22**.

Figure 9-22 Installing an Ethernet cable



(1) Ethernet cable (2) CPRI_E0 port on the pRRU3907

NOTE

The connection mode of CPRI_E0 port is the same to that of CPRI_E1 port on pRRU3907, and this chapter uses CPRI_E0 as an example.

----End

Follow-up Procedure

1. Route the cable by following the instructions in section **9.4.1 Cabling Requirements** and use cable ties to bind the cable.
2. Label the installed cable. For details, see section Attaching a Sign Plate Label.

9.4.9 Closing the Cover Plate of a pRRU Cabling Cavity

This section describes the procedure for closing the cover plate of a pRRU cabling cavity.

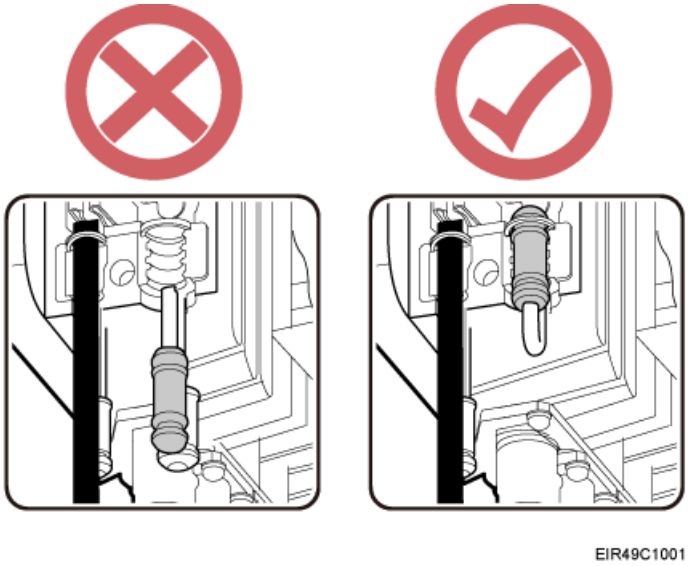
Procedure

Step 1 Insert waterproof blocks into vacant cable troughs in the cabling cavity, as shown in **Figure 9-23**. **Figure 9-23** is for reference only and vacant cable troughs must be blocked based on onsite requirements.

NOTICE

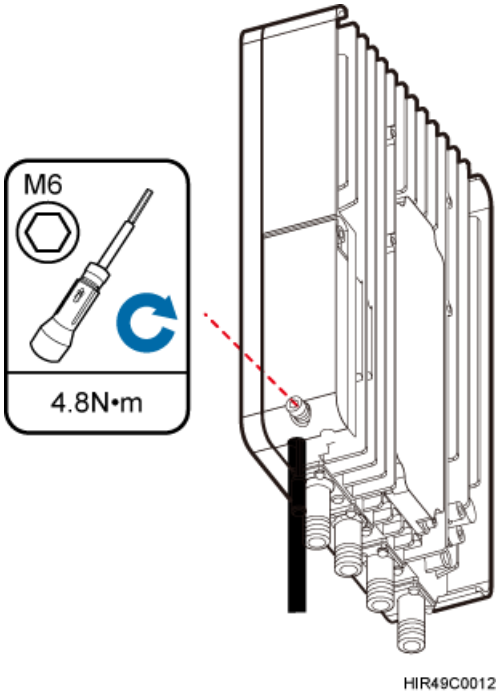
Ensure that cables and waterproof blocks are properly inserted into troughs.

Figure 9-23 Correct placement of waterproof blocks



Step 2 Close the cover plate of the pRRU cabling cavity, and use an M6 inner hexagon screwdriver to tighten the screw on the cover plate to 4.8 N·m (42.48 lbf·in.), as shown in **Figure 9-24**.

Figure 9-24 Closing the cover plate of a pRRU cabling cavity



Step 3 Take off the ESD gloves, and pack up all tools.

----End

9.5 Checking the pRRU3907 Hardware Installation

pRRU3907 hardware installation checking includes hardware and cable installation checking.

Table 9-6 lists the hardware installation checking items.

Table 9-6 Hardware installation checking list

No.	Item
1	The installation position of each device strictly complies with the engineering design and meets clearance requirements. Sufficient space is reserved for equipment maintenance.
2	The pRRU is securely installed.
3	The cover plate is securely installed on the RRU cabling cavity.

No.	Item
4	Waterproof blocks are securely installed in vacant cable troughs of the pRRU cabling cavity, and the cover plate of the cabling cavity is securely installed. In addition, vacant RF ports are covered with dustproof caps and the caps are tightened.
5	Labels are correct, legible, and complete at both ends of each cable, feeder, and jumper.

Table 9-7 lists the check items of the signal cable connection.

Table 9-7 Checklist for the signal cable connection

No.	Item
1	The connectors of the signal cables must securely connected.
2	The connectors of the signal cables are intact.
3	The signal cables are intact.
4	The cable ties are evenly spaced. The signal cables are bound neatly with cable ties to proper tightness, and arranged at even intervals in the same direction.
5	The extra length of the cable ties is cut and removed. The cut surfaces of the indoor cables are smooth and have no sharp edges.
6	The cable layout facilitates maintenance and expansion.
7	Correct and clear labels are attached to both ends of the signal cables.

Table 9-8 lists the checking items for other cable connections.

Table 9-8 Checklist for other cable connections

No.	Item
1	The connectors of the other cables must securely connected.
2	Labels on the cables are legible and bound based on the engineering requirements. The cables must be bound tightly and neatly. The sheaths of the cables must not be damaged.
3	Positions for routing the cables must meet requirements of the engineering design.
4	There are no connectors or joints on each PGND cable. None of PGND cables can be short-circuited or reversely connected. In addition, these cables are not damaged or broken.
5	PGND cables are separately bound from other cables.

No.	Item
6	The protection grounding of the pRRU and the surge protection grounding of the building share one group of ground conductors.

9.6 Powering on the pRRU3907

This section describes the power-on check on the pRRU3907 after the pRRU3907 hardware is installed and checked.

Procedure

Step 1 Power on the pRRU3907. Wait 3 to 5 minutes, check the status of the 3GPP indicator on the pRRU3907.

If the 3GPP Indicator...	Because...	Then...
Blinks white at 4 Hz	The pRRU3907 is loading software, configuring data, or it is not running.	Wait until the software is loaded. If the loading is not completed in five minutes, power off the pRRU3907 and check whether the data configuration file is correct. After the fault is rectified, power on the pRRU3907 again.
Blinks white at 0.5 Hz (on for 1s and off for 1s)	The pRRU3907 is working properly and does not transmit power.	Check whether the services have been configured and power amplification have been enabled on the pRRU3907.
Is steady white	The cell is set up and transmits power properly.	No further action is required.
Is steady orange.	There is power input, but the hardware is faulty.	Power off the pRRU3907, rectify the hardware fault, and then power it on again.
Blinks orange at 0.5 Hz (on for 1s and off for 1s)	A minor alarm (indicating an HDLC link disconnection, for example) is generated.	Troubleshoot based on the alarm information.

If the 3GPP Indicator...	Because...	Then...
Is off	The board is not powered on.	Turn off the power supply switch and check whether the power input is normal. If the power input is normal, check for and rectify board faults, and turn on the power supply switch again.

----End

10 Installing the Extender (Optional)

This section describes the Extender installation process.

Context

When an RHUB and a pRRU need extended install, use extender. With the Extender, the distance of the pRRU and RHUB can be extended by the Extender up to a total distance of 200 m.

The Extender can be installed on a wall or ceiling in the same mode. This section describes wall-mounted installation as an example.

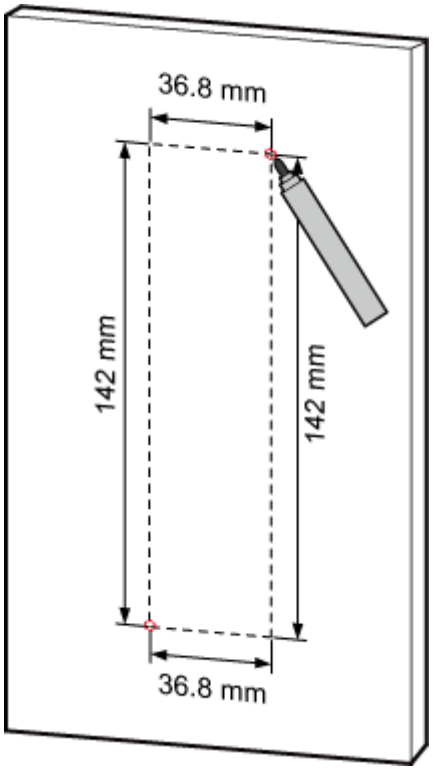
Only space above and under the Extender is required to be reserved when installing the Extender. The recommended space for installing the Extender is described as follows:

- At least 150 mm above the Extender is reserved for cabling.
- At least 150 mm under the Extender is reserved for cabling.

Procedure

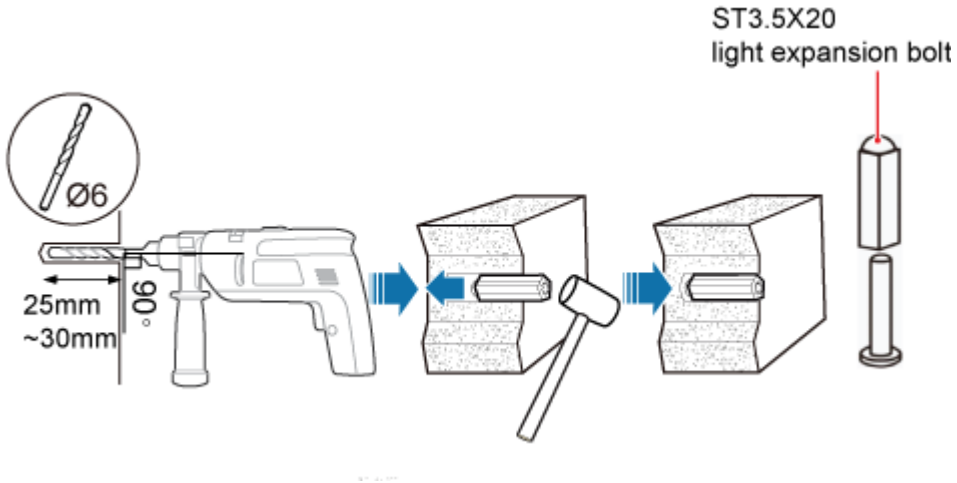
Step 1 Use a marker to mark the two anchor points according to inter-hole spacing, as shown in **Figure 10-1**.

Figure 10-1 Marking anchor points



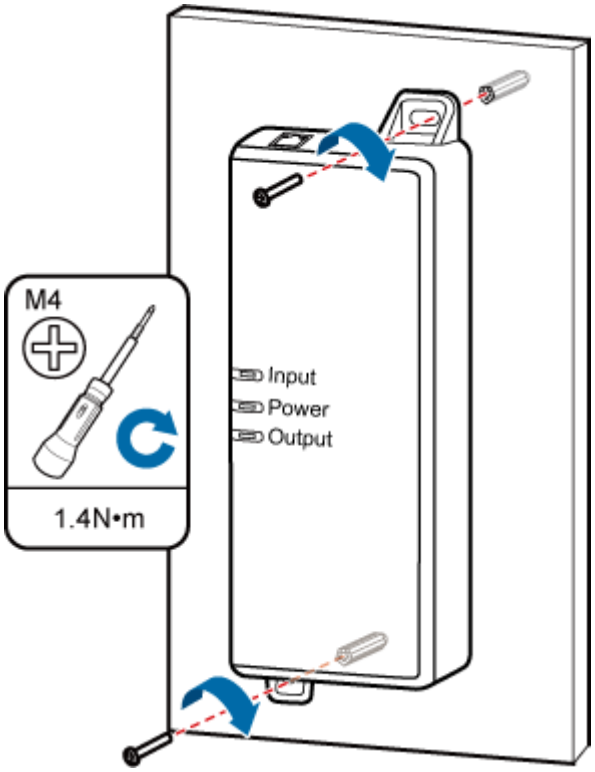
Step 2 Drill holes at the anchor points, and install expansion bolt assemblies, as shown in **Figure 10-2**. The diameter of the hole is 6 mm, and the depth is 25 mm to 30 mm.

Figure 10-2 Drilling holes and installing expansion bolts



Step 3 Place the Extender in the corresponding position and use an M4 Phillips screwdriver to tighten the screws to 1.4 N•m, as shown in **Figure 10-3**.

Figure 10-3 Installing Extender



----End

11 Appendix

About This Chapter

This chapter describes reference information during installation.

11.1 MAC Collection Template
This section describes the MAC collection template for a pRRU3901 with three transmission ports.

11.2 DBS3900 LampSite Engineering Label
This section describes the content and presents the exterior of DBS3900 LampSite engineering labels.

11.3 Attaching an L-Shaped Label
This section describes the procedure and precautions to be taken for attaching an L-shaped label.

11.1 MAC Collection Template

This section describes the MAC collection template for a pRRU3901 with three transmission ports.

The MAC collection template is used to record the installation position, MAC address of the site at the initial installation stage to facilitate subsequent commissioning and maintenance. **Table 11-1** shows the MAC collection template.

Table 11-1 MAC collection template

No.	Site Number	Site Name	WIFI MAC	Location Information
Sample	*01*	*pRRU3901*		*xx floor, xx building, xx mansion*
Note: The MAC collection template is essential to the engineering stage and subsequent maintenance, especially when multiple devices are installed at a short distance. This is because the template defines the radio network to access. Maintain this template with caution.				

11.2 DBS3900 LampSite Engineering Label

This section describes the content and presents the exterior of DBS3900 LampSite engineering labels.

Label Content

The DBS3900 LampSite engineering labels include the RHUB power label, RHUB ground label, RHUB alarm or monitoring label, RHUB optical transmission label, and RHUB network transmission label, the pRRU power label, pRRU network transmission label, pRRU antenna label. The engineering labels are used for DBS3900 LampSite units RHUB and pRRU for indoor scenarios.

By default, blank labels are delivered for DBS3900 LampSite and must be filled in onsite. Table 11-2 describes the content of engineering labels.

Table 11-2 DBS3900 LampSite Engineering Label Content

NE	Label Content		Description	Corresponding port on the base station
RHUB	Power label	RHUBx PWR	Label for the RHUBx power cable. **x** specifies the number of RHUBs and cannot exceed the maximum RHUB number supported by the networking.	**PWR**
	Ground label	RHUBx PGND	Label for the RHUBx ground cable. **x** specifies the number of RHUBs and cannot exceed the maximum RHUB number supported by the networking.	⏚
	Alarm or monitoring label	RHUBx EXT_ALM	Label for the RHUBx alarm cable. **x** specifies the number of RHUBs and cannot exceed the maximum RHUB number supported by the networking.	**EXT-ALM**
	Optical transmission label	RHUBx BBU/ RHUBa/ RHUBb	Label for the RHUBx CPRI cable. ● **x** specifies the number of RHUBs and cannot exceed the maximum RHUB number supported by the networking. ● **a** can be set to **0** or **1**. **0** and **1** respectively correspond to CPRI0 port and CPRI1 port of the upper-level RHUB. ● **b** can be set to **0** or **1**. **0** and **1** respectively correspond to CPRI0 port and CPRI1 port of the lower-level RHUB.	**CPRI0** or **CPRI1**

NE	Label Content		Description	Corresponding port on the base station
	Network transmission label	RHUBx CPRI_Ea	Label for the RHUBx Ethernet cable. ● **x** specifies the number of RHUBs and cannot exceed the maximum RHUB number supported by the networking. ● **a** can be set to **0** or **1**. **0** and **1** respectively correspond to CPRI_E0 port and CPRI_E1 port of the pRRU.	**CPRI_E0** to **CPRI_E7**
pRRU	Power label	pRRUy PWR	Label for the pRRUy power cable. **y** specifies the number of pRRUs and cannot exceed the maximum pRRU number supported by the networking.	**PWR** or **CPRI_E0**
	Network transmission label	pRRUy CPRI_Ea	Label for the pRRUy Ethernet cable. ● **y** specifies the number of pRRUs and cannot exceed the maximum pRRU number supported by the networking. ● **a** can be set to **0** to **7**, which respectively correspond to CPRI_E0 port to CPRI_E7 port of the RHUB.	**CPRI_E0** or **CPRI_E1**

NE	Label Content		Description	Corresponding port on the base station
	Antenna label	pRRUy ANTa	Label for the pRRUy RF Jumper. ● **y** specifies the number of pRRUs and cannot exceed the maximum pRRU number supported by the networking. ● **a** can be set to **0** to **5**, which respectively correspond to **ANT0** port and **ANT5** port of the pRRU.	**ANT0** to **ANT5**

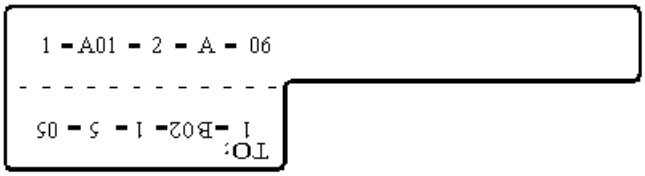
NOTE

- In the label, **RHUB** and **pRRU** identify the specific DBS3900 LampSite NEs.
- If only one RHUB is deployed, mark it as RHUB0 on the label. If multiple RHUBs are deployed, mark them in ascending sequence, beginning with RHUB0.
- If only one pRRU is deployed, mark it as pRRU0 on the label. If multiple pRRUs are deployed, mark them in ascending sequence, beginning with pRRU0.
- For details about the maximum number of RHUBs and pRRUs in the DBS3900 LampSite solution, see *Typical Configurations* in *DBS3900 LampSite Technical Description*.

Label Structure

Using the RHUB power label as an example, **Figure 11-1** shows the structure of a DBS3900 LampSite engineering label.

Figure 11-1 Label structure



11.3 Attaching an L-Shaped Label

This section describes the procedure and precautions to be taken for attaching an L-shaped label.

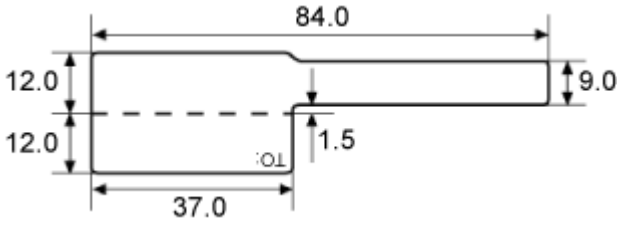
Context

- This section applies to Huawei sign plate labels. If other engineering labels in accordance with local standards are used on site, follow the local standards for attaching sign plate labels.
- In the DBS3900 LampSite solution, blank L-Shaped engineering labels are delivered by default.
- The L-shaped label is usually used for the signal cable, E1/T1 cable, optical cable, and power cable. The description in this section takes the Ethernet cable in a base station as an example.

Procedure

Step 1 Obtain the engineering label to be attached from the whole set of the L-shaped engineering labels, as shown in **Figure 11-2**.

Figure 11-2 Engineering label to be attached



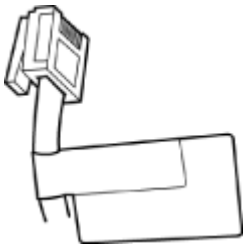
Step 2 Attach the long end of the engineering label to the cable in the position 20 mm away from the connector, and then turn over the long end along the adhesive face. Ensure that the edges of the turned-over engineering label are in a line, as shown in **Figure 11-3**.

NOTE

By default, the label is attached in the position 20 mm away from the connector. If required, you can change the position to make installation faster and more efficient. Consistency and neatness, however, must be maintained.

Step 3 Adhere the long end to the labeling area. Ensure that the spacing between the cable and the labeling area is 2 mm to 3 mm.

Figure 11-3 Adhering the long end to the labeling area



Step 4 Turn over the labeling area along the adhesive face from the bottom, and then finish attaching the engineering label, as shown in **Figure 11-4** and **Figure 11-5**. Ensure that the edges of the turned-over labeling area are in a line.

Figure 11-4 Turning over the labeling area along the adhesive face

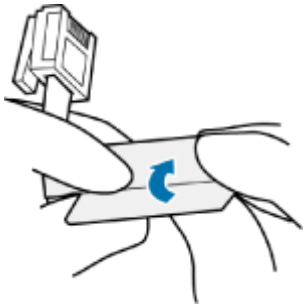
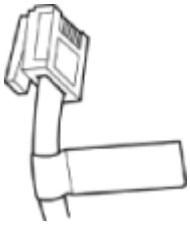
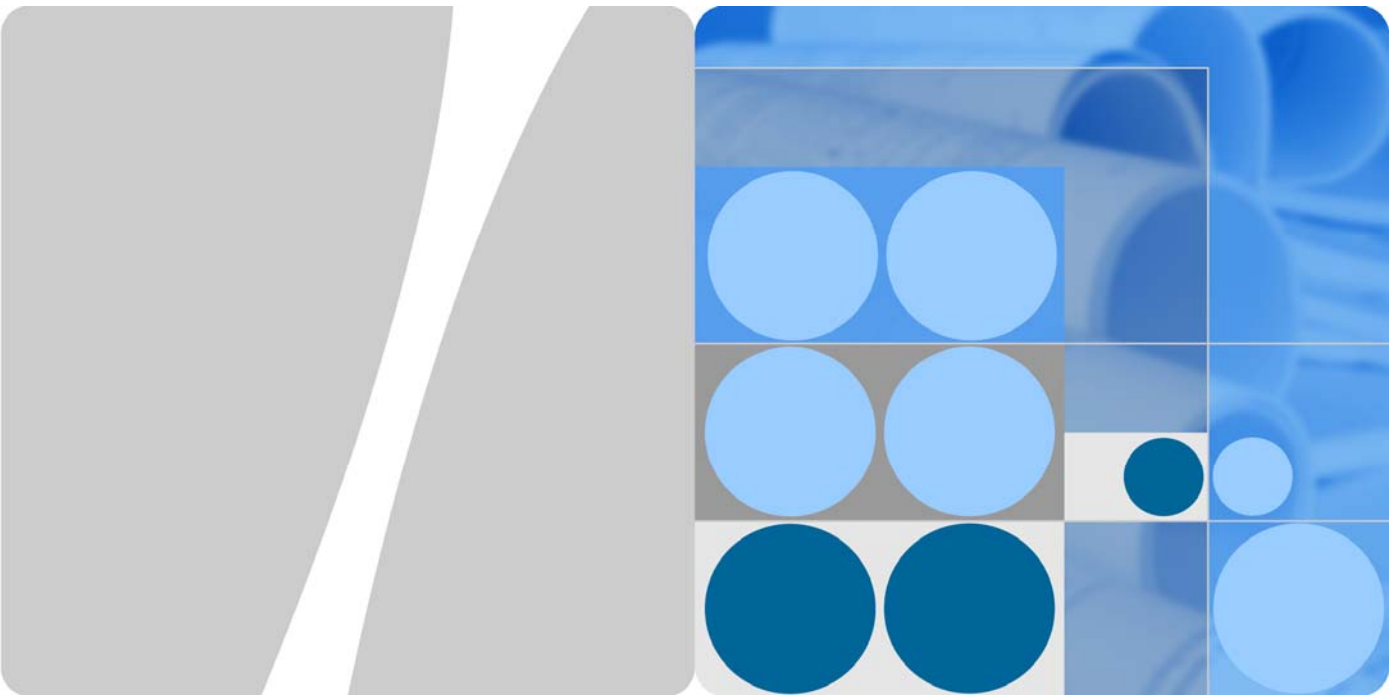


Figure 11-5 Attached engineering label



Step 5 Fill in the attached blank label by referring to LampSite Engineering Label.

----End



Regulatory Compliance Statement
pRRU3901, pRRU3901 AWS+PCS+WIFI

Issue: 02

Date:2014-12-11

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1 Regulatory Compliance Statement

About This Chapter

1.1 Declaration of Conformity to European Directives

Figure 1-1 Declaration of Conformity to European Directives

Doc NO.: CE-01372135

Declaration of Conformity

For EU Directives and Regulations

For the following equipment

Product	:	**pico Remote Radio Unit**
Model/Trademark	:	**pRRU3901 / HUAWEI**
Manufacturer's Name	:	**Huawei Technologies Co., Ltd.**
Manufacturer's Address	:	**Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C**

is herewith confirmed to comply with the requirements which are set out in 1999/5/EC(R&TTE Directive), 2002/95/EC & 2011/65/EU (RoHS Directive), 2002/96/EC&2012/19/EU (WEEE Directive) and 2006/1907/EC(REACH Regulation). For the evaluation of the compliance with these Directives and Regulations, the following standards/requirements were applied:

Safety	**EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013**
EMC	**ETSI EN 301 489-1 V1.9.2 ETSI EN 301 489-17 V2.2.1 ETSI EN 301 489-23 V1.5.1 EN 55022:2010 EN 55024:2010 CISPR 22:2008 CISPR 24:2010**
Radio & Health	**ETSI EN 301 908-1 V6.2.1 ETSI EN 301 908-3 V6.2.1 ETSI EN 301 908-14 V6.2.1 EN 62311:2008 EN 300 328 V1.8.1 EN 301 893 V1.7.1 Council Recommendation 1999/519/EC EN 50385:2002**
RoHS	**2002/95/EC, 2011/65/EU, EN 50581: 2012**
REACH	**EC NO. 1907/2006**
WEEE	**2002/96/EC, 2012/19/EU**

Responsible for making this declaration is the:

☑ Manufacturer ☐ Authorised representative established within the EU

Person responsible for making this declaration

Name/Title: ZhangXingWei **Regulation Compliance Manager**

Place/Date **Shenzhen, China** **June 17, 2014**

2 Regulatory Compliance Information

About This Chapter

2.1 Regulatory Compliance Standards

The Product complies with the standards listed in Table 2-1.

Table 2-1 Regulatory compliance standards

Discipline	Standards
EMC	• CISPR22 Class B • CISPR24 • EN55022 Class B • EN50024 • ETSI EN 301 489 Class B • CFR 47 FCC Part 15 Class B • ICES 003 Class B • AS/NZS CISPR22 Class B • GB9254 Class B • VCCI Class B • CNS 13438 Class B • IEC/EN61000-3-2 • IEC/EN61000-3-3 • IEC/EN61000-6-1 • IEC/EN61000-6-3
RF	• ETSI EN 301 908-1 • ETSI EN 301 908-3 • ETSI EN 301 908-14 • ETSI EN 300 328 • ETSI EN 301 893
Heath	• ICNIRP Guideline • 1999-519-EC • EN 50385 • OET Bulletin 65 • IEEE Std C95.1 • EN 60215 • EN 62311
Safety	• IEC/EN 60950-1 • IEC/EN41003 • EN 60950-1 • UL 60950-1 • CSA C22.2 No 60950-1 • AS/NZS 60950.1 • BS EN 60950-1 • IS 13252 • GB4943

Discipline	Standards
Environmental protection	• 2011/65/EU (RoHS) • EC NO. 1907/2006 (REACH) • 2002/96/EC (WEEE)
Grounding	• ITU-T K.27 • ETSI EN 300 253

NOTE

EMC: electromagnetic compatibility
NEBS: Network Equipment Build Standard
RF: radio frequency
CISPR: International Special Committee on Radio Interference
EN: European Standard
ETSI: European Telecommunications Standards Institute
CFR: Code of Federal Regulations
FCC: Federal Communication Commission
IEC: International Electrotechnical Commission
AS/NZS: Australian/New Zealand Standard
VCCI: Voluntary Control Council for Interference
CNS: Chinese National Standard
UL: Underwriters Laboratories
CSA: Canadian Standards Association
BS: British Standard
IS: Indian Standard
GR: General Requirement
FDA: Food and Drug Administration
BTS: Base Transceiver Station
GSM: Global System for Mobile communications
WLAN: wireless local area network
ICNIRP: International Commission on Non-Ionizing Radiation Protection
OET: Office of Engineering Technology
IEEE: Institute of Electrical and Electronics Engineers
RoHS: restriction of the use of certain hazardous substances

2.2 European Regulatory Compliance

The Product complies with the following European directives and regulations.

- 2004/108/EC (EMC)
- 2006/95/EC (low voltage)
- 1999/5/EC (R&TTE)
- 2011/65/EU (RoHS)
- EC NO. 1907/2006 (REACH)

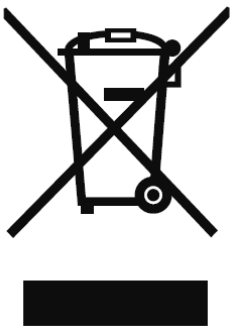
- 2002/96/EC (WEEE)

Product complies with Directive 2002/95/EC, 2011/65/EU and other similar regulations from the countries outside the European Union, on the RoHS in electrical and electronic equipment. The device does not contain lead, mercury, cadmium, and hexavalent chromium and brominated flame retardants (Polybrominated Biphenyls (PBB) or Polybrominated Diphenyl Ethers (PBDE)) except for those exempted applications allowed by RoHS directive for technical reasons.

Product complies with Regulation EC NO. 1907/2006 (REACH) and other similar regulations from the countries outside the European Union. Huawei will notify to the European Chemical Agency (ECHA) or the customer when necessary and regulation requires.

Product complies with Directive 2002/96/EC on waste electrical and electronic equipment (WEEE). Huawei is responsible for recycling its end-of-life devices, and please contact Huawei local service center when recycling is required. Huawei strictly complies with the EU Waste Electrical and Electronic Equipment Directive (WEEE Directive) and electronic waste management regulations enacted by different countries worldwide. In addition, Huawei has established a system for recycling and reuse of electronic wastes, and it can provide service of dismantling and recycling for WEEE. By Huawei recycling system, the waste can be handled environmentally and the resource can be recycled and reused fully, which is also Huawei WEEE stratagem in the word. Most of the materials in product are recyclable, and our packaging is designed to be recycled and should be handled in accordance with your local recycling policies.

In accordance with Article 11(2) in Directive 2002/96/EC (WEEE), products were marked with the following symbol: a cross-out wheeled waste bin with a bar beneath as below:



2.3 U.S.A Regulatory Compliance

2.3.1FCC Part 15

The Product complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device does not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

If this device is modified without authorization from Huawei, the device may no longer comply with FCC requirements for Class B digital devices. In that a case, your right to use the device may be limited by FCC regulations. Moreover, you may be required to correct any interference to radio or television communications at your own expense.

This device 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 device generates, uses and radiates radio frequency energy. If it is not installed and used in accordance with the instructions, it may cause harmful interference to radio communications.

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

- Reorient or relocate the receiving antenna.
- Reinforce the separation between the device and receiver.
- Connect the device into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or TV technician for assistance.

2.3.2 FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 25cm between the radiator& your body.

This transmitter must not be co-located or operating in conjunction with any other antenna o r transmitter.

2.4 Canada Regulatory Compliance

2.4.1 RSS-Gen statement

This device complies with Industry Canada licence-exempt RSS standard(s).

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

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

2.4.2 RSS-102 statement

This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by Industrial Canada and meets the requirements for radiation exposure limits set forth for an uncontrolled environment.

In order to avoid the possibility of exceeding the Industrial Canada radio frequency exposure limits, human proximity to the equipment shall not be less than 0.25m

Cet appareil est conçu et fabriqué pour ne pas dépasser les limites d'émission pour l'exposition à la fréquence radio (RF) de l'énergie fixé par l'Industrielle Canada et répond aux exigences en matière de limites d'exposition aux rayonnements définies pour un environnement non contrôlé.

Afin d'éviter la possibilité de dépasser les limites d'exposition aux fréquences radio industrielle du Canada, la proximité humaine pour l'appareil nedoit pas être inférieure à0.25m

2.5 Japanese Regulatory Compliance

2.4.1VCCI

The Product complies with VCCI Class B by Information Technology Equipment (ITE).

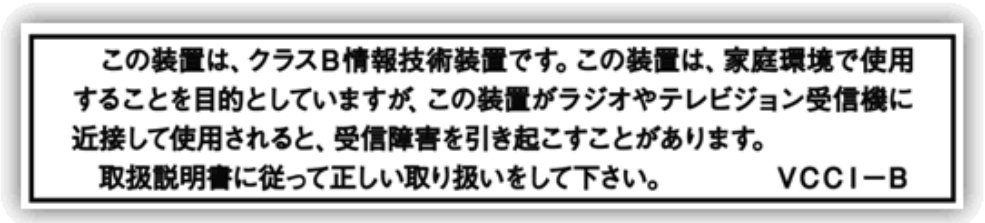
The preceding translates as follows:

This is a Class B product based on the standard of the Voluntary Control Council for

Interference by Information Technology Equipment (VCCI).If this product is used

Near a radio or television receiver in a domestic environment. It may cause radio

Interference.Install and use the equipment according to the instruction manual.



2.6 CISPR 22 Compliance

The Product complies with CISPR 22 for Class B by the ITE.

2.7 China RoHS hazardous substance table

This products described in this guide complies with “the Administration on the Control of Pollution Caused by Electronic Information Products” which is also called China RoHS

部件名称	产品中有害物质或元素的名称及含量					
	镉	铅	汞	六价铬	多溴联苯	多溴联苯醚
Alloy Parts	○	×	○	○	○	○
Metal Fittings	○	○	○	○	○	○
PCBA	○	×	○	○	○	○
Capacitor	○	×	○	○	○	○
Other electronics	○	×	○	○	○	○
Solder	○	×	○	○	○	○
Cable	○	○	○	○	○	○
Plastic and Polymer	○	○	○	○	○	×

○：表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T11363-2006 标准规定的限量要求以下。
×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006 标准规定的限量要求。

2.8 India RoHS hazardous substance table

This products described in this guide complies with the “e-waste (Management and Handling) Rules, 2011”of India which is also called India RoHS.

Part Descriptions	Restricted Substances in Product					
	Cd	Pb	Hg	Cr(VI)	PBBs	PBDEs
Alloy Parts	○	×	○	○	○	○

Metal Fittings	○	○	○	○	○	○
PCBA	○	×	○	○	○	○
Capacitor	○	×	○	○	○	○
Other electronics	○	×	○	○	○	○
Solder	○	×	○	○	○	○
Cable	○	○	○	○	○	○
Plastic and Polymer	○	○	○	○	○	×

○: indicates that the content of the toxic and hazardous substance in all the Homogeneous Materials of the part is below the concentration limit requirement as described in the e-waste (Management and Handling) Rules, 2011.
×: indicates that the content of the toxic and hazardous substance in at least one Homogeneous Material of the part exceeds the concentration limit requirement as described in S in the e-waste (Management and Handling) Rules, 2011.

2.9 Other Markets

For relevant compliance information/documentation for markets not mentioned above,

Please contact Huawei representative