

**RU3832&RU3632**

# **Hardware Description**

**Issue**        **03**  
**Date**         **2014-01-20**

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# About This Document

## Purpose

This document provides reference for planning and deploying DC blade RRU3832 and RRU3632 (referred to as RU in this document). It presents the exterior and describes the ports, functions, cable types, connector specifications, and cable connections of the RU.

## Product Versions

The following table lists the product versions related to this document for RRU3832.

Product Name	Solution Version	Product Version
DBS3900	SRAN6.0 and later versions	V100R004C00 and later versions
	RAN13.0 and later versions	V200R013C00 and later versions
	eRAN6.0 and later versions	V100R006C00 and later versions

The following table lists the product versions related to this document for RRU3632.

Product Name	Solution Version	Product Version
DBS3900	<ul style="list-style-type: none"><li>SRAN8.0 and later versions</li><li>eRAN6.0 and later versions</li></ul>	V100R008C00 and later versions

## Intended Audience

This document is intended for:

- Base station installation engineers
- System engineers
- Site maintenance engineers

## Organization

### 1 Changes in RRU3832&RRU3632 Hardware Description

This chapter describes the changes in *RRU3832&RRU3632 Hardware Description*.

### 2 RU Introduction

This chapter describes the exterior and function of the RU as well as the ports and indicators on the RU.

### 3 RU Cables

This chapter describes RU cables.

### 4 RF Cable Connections for the RRU3832&RRU3632

RF cable connections for the RU vary depending on the configurations of the RU and antenna.

### 5 RU Auxiliary Devices

This chapter describes RU auxiliary devices.

## Conventions

### Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
 <b>DANGER</b>	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
 <b>WARNING</b>	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 <b>CAUTION</b>	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
 <b>NOTICE</b>	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.
 <b>NOTE</b>	Calls attention to important information, best practices and tips. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

## General Conventions

Convention	Description
Times New Roman	Normal paragraphs are in Times New Roman.
<b>Boldface</b>	Names of files, directories, folders, and users are in <b>boldface</b> . For example, log in as user <b>root</b> .
<i>Italic</i>	Book titles are in <i>italics</i> .
Courier New	Terminal display is in Courier New.

## Command Conventions

Convention	Description
<b>Boldface</b>	The keywords of a command line are in <b>boldface</b> .
<i>Italic</i>	Command arguments are in <i>italics</i> .
[ ]	Items (keywords or arguments) in square brackets [ ] are optional.
{ x   y   ... }	Alternative items are grouped in braces and separated by vertical bars. One is selected.
[ x   y   ... ]	Optional alternative items are grouped in square brackets and separated by vertical bars. One or none is selected.
{ x   y   ... } *	Alternative items are grouped in braces and separated by vertical bars. A minimum of one or a maximum of all can be selected.

## GUI Conventions

Convention	Description
<b>Boldface</b>	Buttons, menus, parameters, tabs, windows, and dialog titles are in <b>boldface</b> . For example, click <b>OK</b> .
>	Multi-level menus are in <b>boldface</b> and separated by the ">" signs. For example, choose <b>File &gt; Create &gt; Folder</b> .

## Keyboard Operation

Format	Description
<b>Key</b>	Press the key. For example, press <b>Enter</b> and press <b>Tab</b> .

Format	Description
<b>Key 1+Key 2</b>	Press the keys concurrently. For example, pressing <b>Ctrl+Alt+A</b> means the three keys should be pressed concurrently.
<b>Key 1, Key 2</b>	Press the keys in turn. For example, pressing <b>Alt, A</b> means the two keys should be pressed in turn.

## Mouse Operation

Action	Description
Click	Select and release the primary mouse button without moving the pointer.
Double-click	Press the primary mouse button twice continuously and quickly without moving the pointer.
Drag	Press and hold the primary mouse button and move the pointer to a certain position.

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# 1 Changes in RU3832&RU3632 Hardware Description

This chapter describes the changes in *RU3832&RU3632 Hardware Description*.

## 03 (2014-01-20)

This is the third official release.

Compared with issue 02 (2013-07-30), this issue includes the following new information:

[4 RF Cable Connections for the RU3832&RU3632](#).

Compared with issue 02 (2013-07-30), this issue does not include any changes.

Compared with issue 02 (2013-07-30), no information is deleted from this issue.

## 02 (2013-07-30)

This is the second official release.

Compared with issue 01 (2013-04-28), this issue does not include any new information.

Compared with issue 01 (2013-04-28), this issue includes the following changes:

Topic	Change Description
<a href="#">2.4 RU Ports</a>	Added a detailed description of the alarm port.

Compared with issue 01 (2013-04-28), no information is deleted from this issue.

## 01 (2013-04-28)

This is the first official release.

# 2 RU Introduction

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## About This Chapter

This chapter describes the exterior and function of the RU as well as the ports and indicators on the RU.

### 2.1 RU Exterior

This section describes the exterior and dimensions of an RU.

### 2.2 RU Functions

This section describes the main functions of the RU.

### 2.3 RU Technical Specifications

This section describes technical specifications of an RU, including supported modes, frequency bands, RF specifications, engineering specifications, and antenna capabilities.

### 2.4 RU Ports

This section describes ports on the RU panels. An RU has a bottom panel, cabling cavity panel, and indicator panel.

### 2.5 RU Indicators

This section describes six indicators on an RU. They indicate the running status.

### 2.6 Optical Modules

An optical module transmits optical signals between an optical port and a fiber optic cable.

## 2.1 RU Exterior

This section describes the exterior and dimensions of an RU.

[Figure 2-1](#) shows an RU.

**Figure 2-1** RU exterior

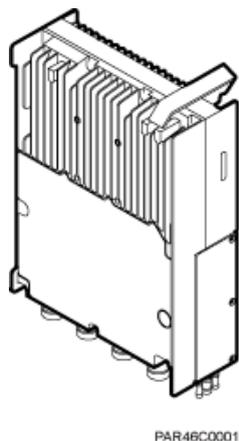
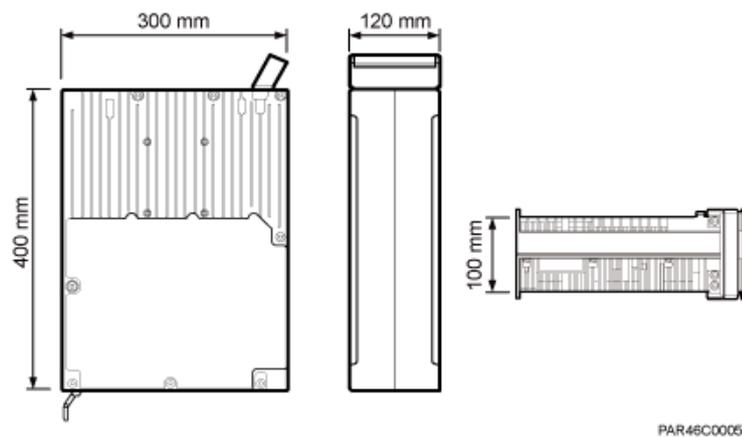


Figure 2-2 shows RU dimensions.

**Figure 2-2** RU dimensions

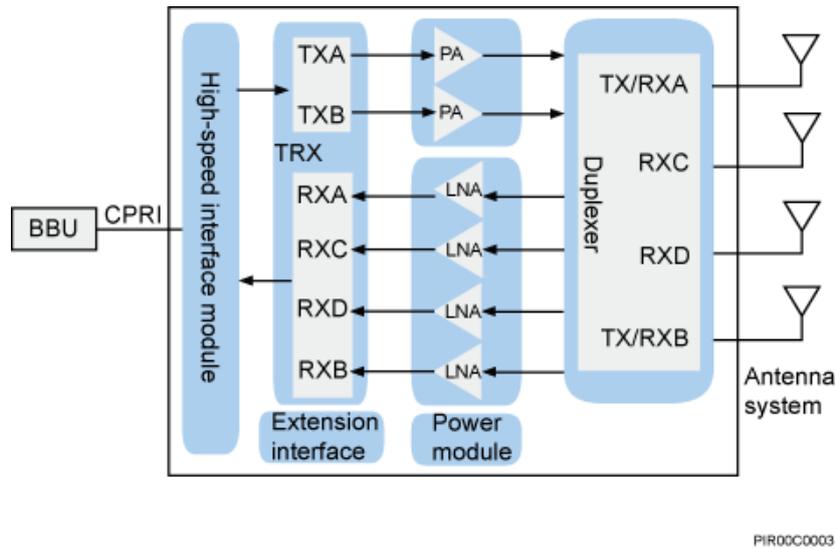


## 2.2 RU Functions

This section describes the main functions of the RU.

The Remote Radio Unit (RU) consists of the high-speed interface unit, signal processing unit, power amplifier, duplexer, extension ports, and power module. Figure 2-3 shows the function structure of the RU.

**Figure 2-3** Function structure of the RU



**NOTE**

For details about the extension ports, see [2.4 RU Ports](#).

The RU performs the following functions:

- Receives downlink baseband data from the BBU and sends uplink baseband data to the BBU.
- Receives RF signals from the antenna system, down-converts the signals to intermediate frequency (IF) signals, amplifies the IF signals, and performs analog-to-digital conversion. The transmit (TX) channel filters downlink signals, performs digital-to-analog conversion, and up-converts RF signals to the TX band.
- Multiplexes receive (RX) and TX signals on the RF channel, which enables these signals to share the same antenna path. It also filters the RX and TX signals.
- Provides a built-in Bias Tee (BT). The built-in BT couples RF signals and OOK signals and transmits them through the TX/RX port A. The built-in BT also supplies power to the tower mounted amplifier (TMA).
- The RU can be powered by the AC/DC power module. In this case, this RU is called AC RU. For details about the AC/DC power module, see the *AC/DC Power Module User Guide* or *OPM15M User Guide*.

## 2.3 RU Technical Specifications

This section describes technical specifications of an RU, including supported modes, frequency bands, RF specifications, engineering specifications, and antenna capabilities.

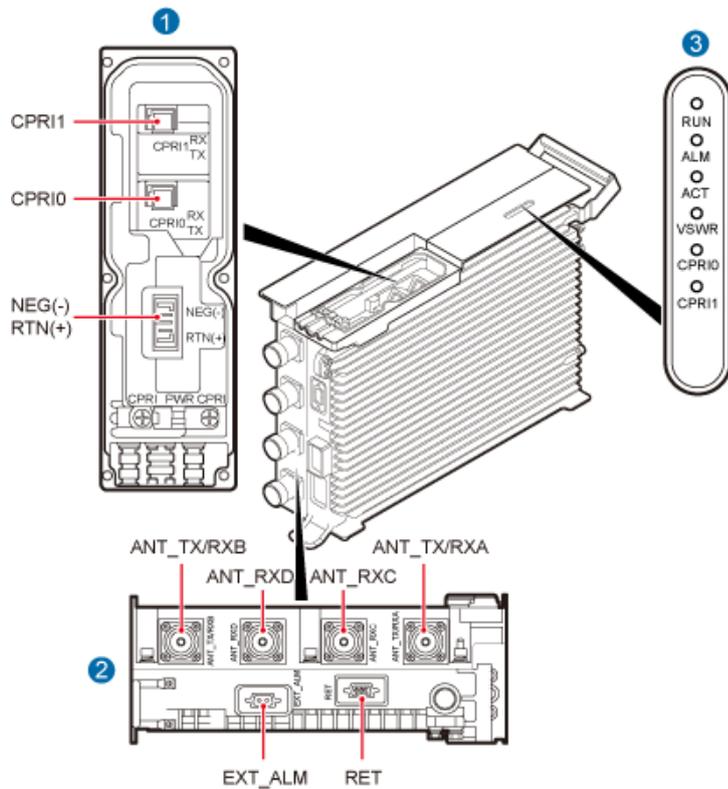
For details about technical specifications of an RU, see section "Technical Specifications of RUs" in the *3900 Series Base Station Technical Description*.

## 2.4 RU Ports

This section describes ports on the RU panels. An RU has a bottom panel, cabling cavity panel, and indicator panel.

Figure 2-4 shows the ports on the RU panels.

Figure 2-4 Ports on the RU panels



PAR46C0002

Table 2-1 describes ports and indicators on the RU panels.

Table 2-1 Ports and indicators on the RU panels

Item	Silkscreen	Remarks
(1) Ports in the cabling cavity	RTN(+)	Power supply socket
	NEG(-)	
	CPRI0	Optical/electrical port 0
	CPRI1	Optical/electrical port 1
(2) Ports at the bottom	ANT_TX/RXA	TX/RX port A, supporting RET signal transmission
	ANT_RXC	RX port C

Item	Silkscreen	Remarks
	ANT_RXD Port	RX port D
	ANT_TX/RXB	TX/RX port B
	EXT_ALM	Alarm monitoring port used for monitoring one RS485 signal and two dry contact signals
	RET	Communication port for the RET antenna, supporting RET signal transmission
(3) Indicators	RUN	See <a href="#">2.5 RU Indicators</a> .
	ALM	
	ACT	
	VSWR	
	CPRI0	
	CPRI1	



**NOTE**

- The port for transmitting RET signals is determined by the software.
- For the RU3832, CPRI0 is connected to the BBU or an upper-level RU and CPRI1 is connected to a lower-level RU.
- For the RU3632, CPRI0 is connected to the BBU and the CPRI1 is reserved.

[Table 2-2](#) describes how to use RF ports for RU3832.

**Table 2-2** Usage of RF ports for RU3832

Product Version	TX/RX Channel	Number of Used RF Ports	Usage	Remarks
DBS3900 WCDMA V200R013C00	1 x 2T2R	2	ANT_TX/RXA and ANT_TX/RXB are used together.	A single sector
DBS3900 WCDMA V200R014C00 and later versions	1 x 1T2R	2	It is recommended that ANT_TX/RXA and ANT_RXC be used together. You can also use ANT_TX/RXB and ANT_RXD together.	A single sector
	1 x 2T2R	2	ANT_TX/RXA and ANT_TX/RXB are used together.	A single sector
	1 x	4	ANT_TX/RXA,	A single

Product Version	TX/RX Channel	Number of Used RF Ports	Usage	Remarks
	2T4R		ANT_TX/RXB, ANT_RXC, and ANT_RXD are used together for one sector, with ANT_TX/RXA and ANT_RXC combined and ANT_TX/RXB and ANT_RXD combined.	sector
	2 x 1T2R	4	ANT_TX/RXA and ANT_RXC are used for one sector; ANT_TX/RXB and ANT_RXD are used for the other sector.	Two sectors
DBS3900 LTE V100R006C00 and later versions	1 x 2T2R	2	ANT_TX/RXA and ANT_TX/RXB are used together.	A single sector
	1 x 2T4R	4	ANT_TX/RXA, ANT_TX/RXB, ANT_RXC, and ANT_RXD are used together for one sector, with ANT_TX/RXA and ANT_RXC combined and ANT_TX/RXB and ANT_RXD combined.	A single sector

Table 2-3 describes how to use RF ports for RU3632.

**Table 2-3** Usage of RF ports for RU3632

Product Version	TX/RX Channel	Number of Used RF Ports	Usage	Remarks
DBS3900 LTE V100R006C00 and later versions	1 x 2T2R	2	ANT_TX/RXA and ANT_TX/RXB are used together.	A single sector
	1 x 2T4R	4	ANT_TX/RXA, ANT_TX/RXB, ANT_RXC, and ANT_RXD are used together for one sector, with ANT_TX/RXA and ANT_RXC combined and ANT_TX/RXB and ANT_RXD combined.	A single sector

Figure 2-5 shows the recommended usage of the RF ports on an RU3832 used for DBS3900 WCDMA V200R013C00.

**Figure 2-5** Recommended usage of the RF ports on an RU3832 used for DBS3900 WCDMA V200R013C00

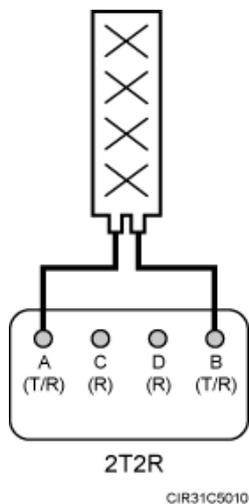


Figure 2-6 shows the recommended usage of the RF ports on an RU3832 used for DBS3900 WCDMA V200R014C00 and later versions.

**Figure 2-6** Recommended usage of the RF ports on an RU3832 used for DBS3900 WCDMA V200R014C00 and later versions

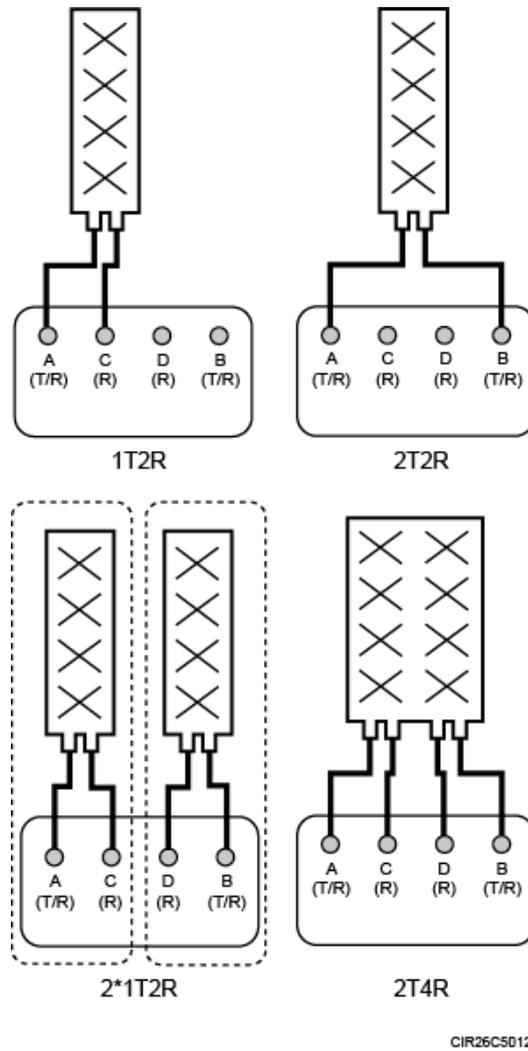
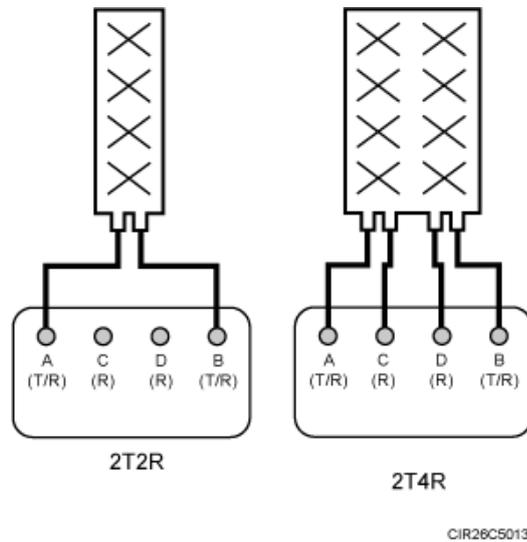


Figure 2-7 shows the recommended usage of the RF ports on RU3832 and RU3632 used for DBS3900 LTE V100R006C00 and later versions.

**Figure 2-7** Recommended usage of the RF ports on RU3832 and RU3632 used for DBS3900 LTE V100R006C00 and later versions



## 2.5 RU Indicators

This section describes six indicators on an RU. They indicate the running status.

For detailed positions of RU indicators, see [2.4 RU Ports](#).

[Table 2-4](#) describes RU indicators.

**Table 2-4** RU indicators

Indicator	Color	Status	Meaning
RUN	Green	Steady on	There is power supply, but the module is faulty.
		Steady off	There is no power supply, or the module is faulty.
		Blinking (on for 1s and off for 1s)	The board is functioning properly.
		Blinking (on for 0.125s and off for 0.125s)	Software is being loaded to the module, or the module is not started.
ALM	Red	Steady on	Alarms are generated, and the module must be replaced.
		Blinking (on for 1s and off for 1s)	Alarms are generated. The alarms may be caused by the faults on the related boards or ports. Therefore, you need to locate the fault before deciding whether to replace the module.

Indicator	Color	Status	Meaning
		Steady off	No alarm is generated.
ACT	Green	Steady on	The module is running properly with TX channels enabled or the software is being loaded without RU running.
		Blinking (on for 1s and off for 1s)	The module is running properly with TX channels disabled.
VSWR	Red	Steady off	No Voltage Standing Wave Ratio (VSWR) alarm is generated.
		Blinking (on for 1s and off for 1s)	VSWR alarms are generated on the ANT_TX/RXB port.
		Steady on	VSWR alarms are generated on the ANT_TX/RXA port.
		Blinking (on for 0.125s and off for 0.125s)	VSWR alarms are generated on the ANT_TX/RXA and ANT_TX/RXB ports.
CPRI0	Red or green	Steady green	The CPRI link is functioning properly.
		Steady red	An optical module fails to transmit or receive signals because the optical module is faulty or the fiber optic cable is broken.
		Blinking red (on for 1s and off for 1s)	The CPRI link is out of lock because of a failure in clock lock between two modes or mismatched data rates over CPRI ports.
		Steady off	The optical module cannot be detected, or the optical module is powered off.
CPRI1	Red or green	Steady green	The CPRI link is functioning properly.
		Steady red	An optical module fails to transmit or receive signals because the optical module is faulty or the fiber optic cable is broken.
		Blinking red (on for 1s and off for 1s)	The CPRI link is out of lock because of a failure in clock lock between two modes or mismatched data rates over CPRI ports.
		Steady off	The optical module cannot be detected, or the optical module is powered off.

## 2.6 Optical Modules

An optical module transmits optical signals between an optical port and a fiber optic cable.



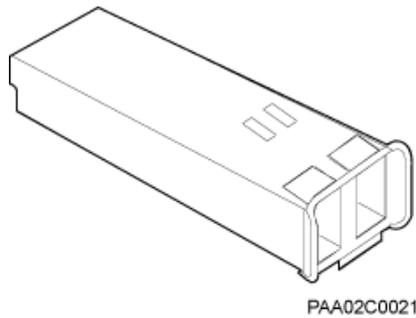
**NOTE**

The exteriors of an optical module and the label on an optical module in this section are for reference only. The actual exteriors may be different.

## Exterior

The following figure shows the exterior of an optical module.

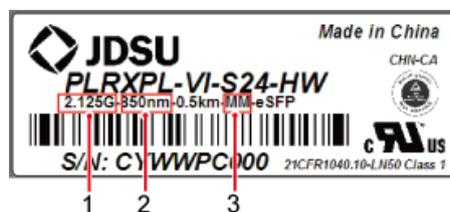
**Figure 2-8** Exterior of an optical module



## Label on an optical module

There is a label on each optical module, which provides information such as the rate, wavelength, and transmission mode, as shown in the following figure.

**Figure 2-9** Label on an optical module



(1) Rate

(2) Wavelength

(3) Transmission mode

## Optical Module Type

Optical modules can be divided into single- and multimode optical modules, which can be distinguished as follows:

- The puller of a single-mode optical module is blue and the puller of a multimode optical module is black or gray.
- The transmission mode is displayed as "SM" on the label of a single-mode optical module and "MM" on the label of a multimode optical module.

# 3 RU Cables

## About This Chapter

This chapter describes RU cables.

### 3.1 RU Cable List

This section describes RU cable connections.

### 3.2 RU PGND Cable

An RU PGND cable connects an RU and a ground bar, ensuring the proper grounding of the RU. The maximum length of an RU PGND cable is 8 m (26.25 ft).

### 3.3 RU Power Cable

The RU power cable is a -48 V DC shielded cable. It feeds -48 V DC power to an RU. The length of power supply that an RU power cable supports is 100 m (328.08 ft) by default.

### 3.4 RU Alarm Cable

The RU alarm cable, a shielded straight-through cable, transmits alarm signals from an external device to an RU so that the base station monitors the operating status of external devices. The RU alarm cable is 5 m (16.4 ft).

### 3.5 CPRI Fiber Optic Cable

CPRI fiber optic cables are classified into multimode fiber optic cables and single-mode fiber optic cables. They transmit CPRI signals.

### 3.6 RU RF Jumper

The 1/2" RU RF jumper transmits and receives RF signals between an RU and an antenna. A fixed-length RF jumper used by an RU is 2 m (6.56 ft), 3 m (9.84 ft), 4 m (13.12 ft), 6 m (19.68 ft), or 10 m (32.81 ft). A variable-length RF jumper used by an RU has a maximum length of 10 m (32.81 ft).

### 3.7 RU AISG Multi-Wire Cable

An RU AISG multi-wire cable connects an RU and an RCU to transmit control signals from a base station to an RET antenna. When the RU is connected to the RET antenna, an AISG multi-wire cable transmits RS485 signals. The length of the AISG multi-wire cable is 5 m (16.40 ft).

### 3.8 RU AISG Extension Cable

When the distance between an RU and an RCU is longer than 5 m (16.4 ft), an AISG multi-wire cable is not long enough to connect the RU and the RCU. In this case, an AISG extension cable is used to extend the AISG multi-wire cable for transmitting RS485 signals. The length of the AISG extension cable is 15 m (49.21 ft).

## 3.1 RU Cable List

This section describes RU cable connections.

Table 3-1 lists RU cables.

**Table 3-1** RU cables

Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
<a href="#">3.2 RU PGND Cable</a>	OT terminal (M6, 16 mm <sup>2</sup> or 0.025 in. <sup>2</sup> )	Ground terminal on the RU	OT terminal (M8, 16 mm <sup>2</sup> or 0.025 in. <sup>2</sup> )	Ground terminal on the ground bar
<a href="#">3.3 RU Power Cable</a>	Tool-less female connector (pressfit type)	NEG(-) and RTN(+) ports on the RU	Depending on the power supply equipment	External power equipment
<a href="#">3.4 RU Alarm Cable</a>	DB15 waterproof male connector	EXT_ALM port on the RU	Cord end terminal	External alarm device
<a href="#">3.5 CPRI Fiber Optic Cable(RU38 32)</a>	DLC connector	CPRI0 port on the RU	DLC connector	CPRI port on a board in the BBU or CPRI1 port on the upper-level RU
		CPRI1 port on the RU		CPRI0 port on the lower-level RU
<a href="#">3.5 CPRI Fiber Optic Cable(RU36 32)</a>	DLC connector	CPRI0 port on the RU	DLC connector	CPRI port on a board in the BBU
<a href="#">3.6 RU RF Jumper</a>	DIN male connector	ANT_TX/RX A, ANT_TX/RX B, ANT_RXC, or ANT_RXD port on the RU	DIN male connector	Antenna system
<a href="#">3.7 RU AISG Multi-Wire</a>	DB9 waterproof male connector	RET port on the RU	Standard AISG female connector	Standard AISG male connector on the RCU or on the AISG

Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
Cable				extension cable
3.8 RU AISG Extension Cable	Standard AISG male connector	Standard AISG female connector on the AISG multi-wire cable	Standard AISG female connector	Standard AISG male connector on the RCU

### 3.2 RU PGND Cable

An RU PGND cable connects an RU and a ground bar, ensuring the proper grounding of the RU. The maximum length of an RU PGND cable is 8 m (26.25 ft).

#### Exterior

A PGND cable is green or green and yellow with a cross-sectional area of 16 mm<sup>2</sup> (0.025 in.<sup>2</sup>). An OT terminal is installed at each end of the cable. Figure 3-1 shows a PGND cable.

Figure 3-1 PGND cable



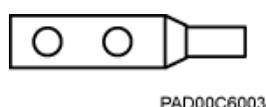
(1) OT terminal (M6, 16 mm<sup>2</sup> or 0.025 in.<sup>2</sup>)    (2) OT terminal (M8, 16 mm<sup>2</sup> or 0.025 in.<sup>2</sup>)

#### NOTE

- If the customer prepares the PGND cable, a copper-core cable with a cross-sectional area of 16 mm<sup>2</sup> (0.025 in.<sup>2</sup>) or larger is recommended.
- One OT terminal must be added to each end of the PGND cable onsite.
- You can determine the color of the cable and whether to use corresponding two-hole OT terminals based on local regulations.

Figure 3-2 shows a two-hole OT terminal.

Figure 3-2 Two-hole OT terminal



### 3.3 RU Power Cable

The RU power cable is a -48 V DC shielded cable. It feeds -48 V DC power to an RU. The length of power supply that an RU power cable supports is 100 m (328.08 ft) by default.

**NOTE**

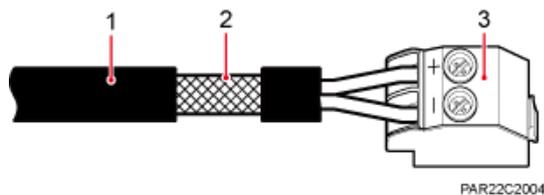
- The maximum length of power supply that an RU power cable supports is 150 m (492.12 ft). Contact Huawei engineers when an RU power cable greater than 50 m (164.04 ft) is required.
- If a power device provided by the customer is used, the recommended specification of the circuit breaker on this power device is 15 A to 30 A.

#### Exterior

There are four types of RU power cables in terms of cross-sectional areas: 3.3 mm<sup>2</sup> (0.005 in.<sup>2</sup>) (12 AWG) and 5.3 mm<sup>2</sup> (0.008 in.<sup>2</sup>) (10 AWG) complying with North American standards, and 4 mm<sup>2</sup> (0.006 in.<sup>2</sup>) and 6 mm<sup>2</sup> (0.009 in.<sup>2</sup>) complying with European standards.

A tool-less female connector (pressfit type) needs to be added to one end of the RU power cable and a corresponding terminal needs to be added to the other end based on the requirements of the connector on the external power device, as shown in [Figure 3-3](#).

**Figure 3-3** RU power cable



- (1) -48 V DC power cable      (2) Shield layer      (3) Tool-less female connector (pressfit type)

[Table 3-2](#) lists the specifications of an RU power cable.

**Table 3-2** Specifications of an RU power cable

Cable	Wire	Wire Color in Most Regions		Wire Color in Other Regions
		North American Standard	European Standard	UK
RU power cable	RTN(+)	Black	Brown	Blue
	NEG(-)	Blue	Blue	Gray

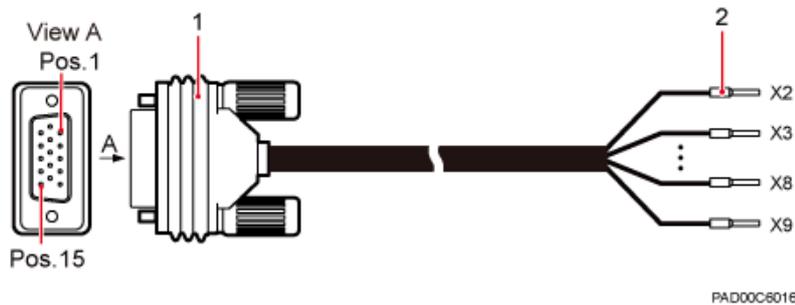
### 3.4 RU Alarm Cable

The RU alarm cable, a shielded straight-through cable, transmits alarm signals from an external device to an RU so that the base station monitors the operating status of external devices. The RU alarm cable is 5 m (16.4 ft).

#### Exterior

An alarm cable has a DB15 waterproof male connector at one end and eight cord end terminals at the other end, as shown in Figure 3-4.

Figure 3-4 Alarm cable



(1) DB15 waterproof male connector

(2) Cord end terminal

#### Pin Assignment

Table 3-3 describes the pin assignment for the wires of an RU alarm cable.

Table 3-3 Pin assignment for the wires of an RU alarm cable

RU Alarm Port	Pin of the Waterproofed DB15 Male Connector	Color	Type	Cord End Terminal	Description
Dry contact	X1.2	White and blue	Twisted pair	X2	SWITCH_INPUT0+
	X1.3	Blue		X3	SWITCH_INPUT0-(GND)
	X1.6	White and orange	Twisted pair	X4	SWITCH_INPUT1+
	X1.7	Orange		X5	SWITCH_INPUT1-(GND)
RS485	X1.10	White and green	Twisted pair	X6	APM RX-

RU Alarm Port	Pin of the Waterproofed DB15 Male Connector	Color	Type	Cord End Terminal	Description
	X1.11	Green		X7	APM RX+
	X1.13	White and brown	Twisted pair	X8	APM TX-
	X1.14	Brown		X9	APM TX+

### 3.5 CPRI Fiber Optic Cable

CPRI fiber optic cables are classified into multimode fiber optic cables and single-mode fiber optic cables. They transmit CPRI signals.

Multimode fiber optic cables connect the BBU and RU or interconnect two RUs. The maximum length of the multimode fiber optic cable between the BBU and RU is 150 m (492.12 ft) and the multimode fiber optic cable between two RUs has a fixed length of 10 m (32.81 ft).

A single-mode fiber optic cable consists of the single-mode pigtail and trunk single-mode fiber optic cable, and the single-mode pigtail and trunk single-mode fiber optic cable are interconnected using the ODF. The maximum length of the single-mode pigtail is 20 m (65.62 ft) on BBU side and 70 m (229.66 ft) on RU side.

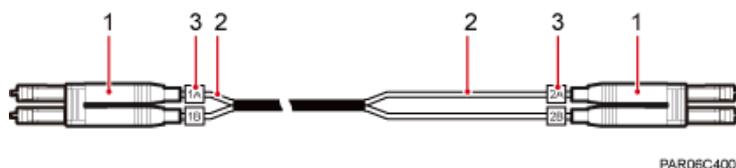
 **NOTE**

- The ODF and trunk single-mode fiber optic cable are provided by the customer and must comply with the ITU-T G.652 standard.
- The ODF is an outdoor transfer box for fiber optic cables, which interconnects the single-mode pigtail and trunk single-mode fiber optic cable.
- A multimode fiber optic cable and a single-mode fiber optic cable are connected to a multimode optical module and a single-mode optical module, respectively.

#### Exterior

Multimode fiber optic cable: The multimode fiber optic cable has a DLC connector at each end, as shown in [Figure 3-5](#).

**Figure 3-5** Multimode fiber optic cable



- (1) DLC connector      (2) Breakout cable      (3) Label on the breakout cable

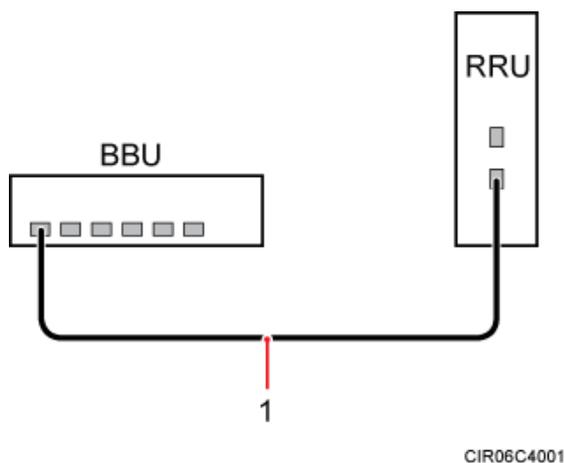


**NOTE**

- When a multimode fiber optic cable connects a BBU and an RU, the breakout cable on the BBU side is 0.34 m (1.12 ft) and the breakout cable on the RU side is 0.03 m (0.098 ft).
- When a multimode fiber optic cable connects two RUs, the breakout cable on both sides is 0.03 m (0.098 ft).

Figure 3-6 shows the connection of the multimode fiber optic cable between a BBU and an RU.

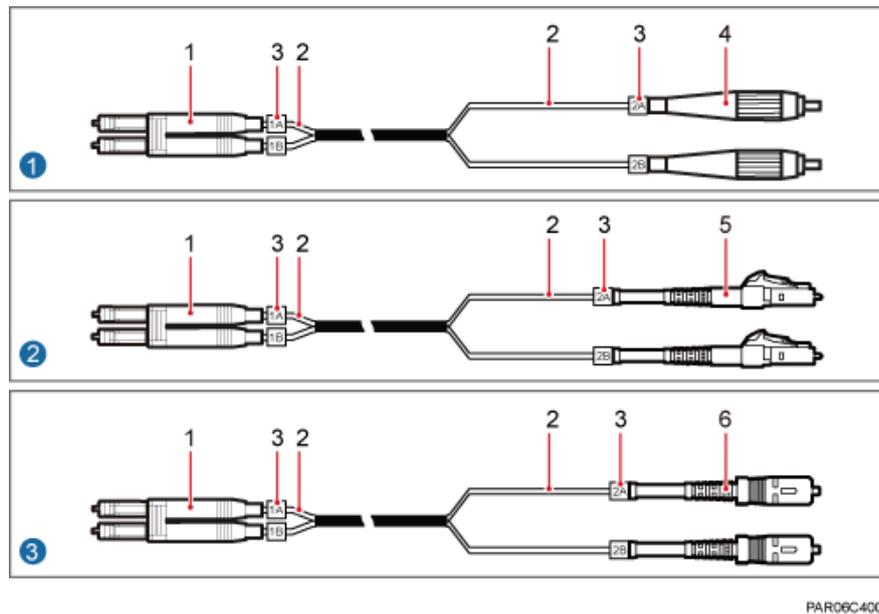
**Figure 3-6** Connection of the multimode fiber optic cable between a BBU and an RU



(1) Multimode fiber optic cable between a BBU and an RU

Single-mode pigtail: The single-mode pigtail has a DLC connector at one end and an FC, LC, or SC connector at the other end, as shown in Figure 3-7.

**Figure 3-7** Single-mode pigtail



PAR06C4002

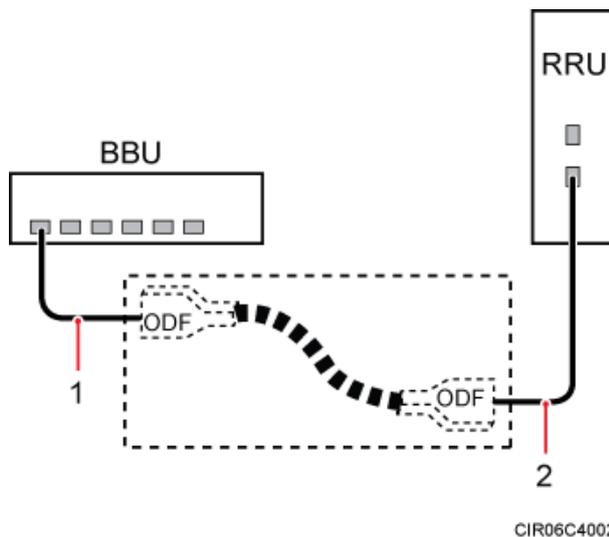
- |                   |                    |                                 |                  |                  |                  |
|-------------------|--------------------|---------------------------------|------------------|------------------|------------------|
| (1) DLC connector | (2) Breakout cable | (3) Label on the breakout cable | (4) FC connector | (5) LC connector | (6) SC connector |
|-------------------|--------------------|---------------------------------|------------------|------------------|------------------|

**NOTE**

- When a single-mode pigtail connects a BBU and an ODF, the breakout cables on the BBU side and ODF side are 0.34 m (1.12 ft) and 0.8 m (2.62 ft), respectively.
- When a single-mode pigtail connects an RU and an ODF, the breakout cables on the RU side and ODF side are 0.03 m (0.098 ft) and 0.8 m (2.62 ft), respectively.

Figure 3-8 shows the connection of the single-mode pigtail.

**Figure 3-8** Connection of the single-mode pigtail



CIR06C4002

- |   |   |
|---|---|
| (1) Single-mode pigtail between a BBU and | (2) Single-mode pigtail between an RU and |
|---|---|

an ODF

an ODF

## Selection Principles

The following table describes the principles for selecting CPRI fiber optic cables.

**Table 3-4** Principles for selecting CPRI fiber optic cables

Remote Distance	Selection Principle	Remarks
Less than or equal to 100 m (328.08 ft)	Multimode fiber optic cable	Connects the BBU and RU When it connects two RUs, the distance between the two RUs must be equal to or less than 10 m (32.81 ft).
Greater than 100 m (328.08 ft) and equal to or less than 150 m (492.12 ft)	Multimode fiber optic cable	Connects the BBU and RU
	Recommended: single-mode fiber optic cable (single-mode pigtail and trunk single-mode fiber optic cable)	The single-mode pigtail at the RU or BBU side is connected to the trunk single-mode fiber optic cable using the ODF.
Greater than 150 m (492.12 ft)	Single-mode fiber optic cable (single-mode pigtail and trunk single-mode fiber optic cable)	

## Pin Assignment

[Table 3-5](#) describes the labels on and recommended connections for the breakout cables of a CPRI fiber optic cable.

**Table 3-5** Labels on and recommended connections for the breakout cables of a CPRI fiber optic cable

Label	Installation Position		
	Multimode Fiber Optic Cable Between a BBU and an RU	Multimode Fiber Optic Cable Between Two RUs	Single-Mode Pigtail
1A	CPRI RX port on the RU	CPRI RX port on RU 1	RX port on the BBU or CPRI RX port on the RU
1B	CPRI TX port on the RU	CPRI TX port on RU 1	TX port on the BBU or CPRI TX port on the RU

Label	Installation Position		
	Multimode Fiber Optic Cable Between a BBU and an RU	Multimode Fiber Optic Cable Between Two RUs	Single-Mode Pigtail
2A	TX port on the BBU	CPRI TX port on RU 0	ODF
2B	RX port on the BBU	CPRI RX port on RU 0	ODF

### 3.6 RU RF Jumper

The 1/2" RU RF jumper transmits and receives RF signals between an RU and an antenna. A fixed-length RF jumper used by an RU is 2 m (6.56 ft), 3 m (9.84 ft), 4 m (13.12 ft), 6 m (19.68 ft), or 10 m (32.81 ft). A variable-length RF jumper used by an RU has a maximum length of 10 m (32.81 ft).

 **NOTE**

- When the distance between an RU and an antenna is less than 10 m (32.81 ft), one end of the RF jumper is connected to the ANT-TX/RXA or ANT-TX/RXB port at the bottom of the RU, and the other end is connected to the antenna.
- When the distance between an RU and an antenna is greater than 10 m (32.81 ft), one end of the RF jumper is connected to a feeder, and the other end is connected to the antenna.
- If the customer prepares the RF jumper, the length of the RF jumper should be as short as possible and not exceed 2 m (6.56 ft.).

### Exterior

An RF jumper has a DIN male connector at one end and a customized connector at the other end.

Figure 3-9 shows an RF jumper with a DIN male connector at each end.

**Figure 3-9** RF jumper



PAR06C5001

(1) DIN male connector

### 3.7 RU AISG Multi-Wire Cable

An RU AISG multi-wire cable connects an RU and an RCU to transmit control signals from a base station to an RET antenna. When the RU is connected to the RET antenna, an AISG multi-wire cable transmits RS485 signals. The length of the AISG multi-wire cable is 5 m (16.40 ft).

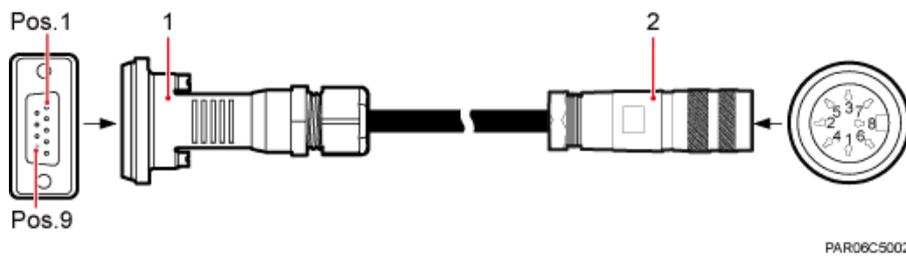
**NOTE**

An RCU is a driving motor used for the phase shifter in the RET antenna. It receives control commands from a base station and runs the commands to drive the stepper motor. Using a gear, the stepper motor drives the adjustable phase shifter in the antenna and changes the downtilt angle.

#### Exterior

An AISG multi-wire cable has a waterproofed DB9 male connector at one end and a standard AISG female connector at the other end, as shown in Figure 3-10.

**Figure 3-10** AISG multi-wire cable



(1) Waterproofed DB9 male connector

(2) Standard AISG female connector

#### Pin Assignment

Table 3-6 describes the pin assignment for the wires of an AISG multi-wire cable.

**Table 3-6** Pin assignment for the wires of an AISG multi-wire cable

X1 End (Pin of the Waterproofed DB9 Male Connector)	X2 End (Pin of the Standard AISG Female Connector)	Color	Type	Description
X1.1	X2.1	White and blue	Twisted pair	+12 V
		Blue		
X1.3	X2.3	White and orange	Twisted pair	RS485 B
X1.5	X2.5	Orange		RS485 A
X1.4	X2.4	White and green	-	GND

X1 End (Pin of the Waterproofed DB9 Male Connector)	X2 End (Pin of the Standard AISG Female Connector)	Color	Type	Description
X1.9 and X1.4 are interconnected.	-	-	-	GND
-	X2.1 and X2.6 are interconnected.	-	-	+12 V
-	X2.4 and X2.7 are interconnected.	-	-	GND

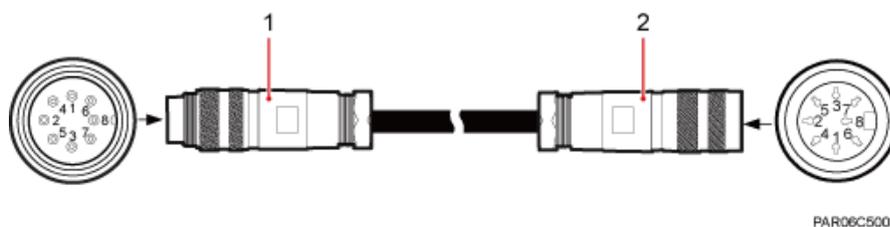
### 3.8 RU AISG Extension Cable

When the distance between an RU and an RCU is longer than 5 m (16.4 ft), an AISG multi-wire cable is not long enough to connect the RU and the RCU. In this case, an AISG extension cable is used to extend the AISG multi-wire cable for transmitting RS485 signals. The length of the AISG extension cable is 15 m (49.21 ft).

#### Exterior

An AISG multi-wire cable has a standard AISG male connector at one end and a standard AISG female connector at the other end, as shown in [Figure 3-11](#).

**Figure 3-11** AISG extension cable



(1) Standard AISG male connector

(2) Standard AISG female connector

#### Pin Assignment

[Table 3-7](#) describes the pin assignment for the wires of an AISG extension cable.

**Table 3-7** Pin assignment for the wires of an AISG extension cable

X1 End (Pin of the Standard AISG Male Connector)	X2 End (Pin of the Standard AISG Female Connector)	Color	Type	Description
X1.1	X2.1	White and blue	Twisted pair	+12 V
		Blue		
X1.7	X2.7	White and orange	Twisted pair	DC Return
		Orange		
X1.3	X2.3	White and green	Twisted pair	RS485 B
X1.5	X2.5	Green		RS485 A
X1.6	X2.6	White and brown	Twisted pair	+24 V
		Brown		

# 4 RF Cable Connections for the RU3832&RU3632

RF cable connections for the RU vary depending on the configurations of the RU and antenna.

## Description of RF Cable Connections

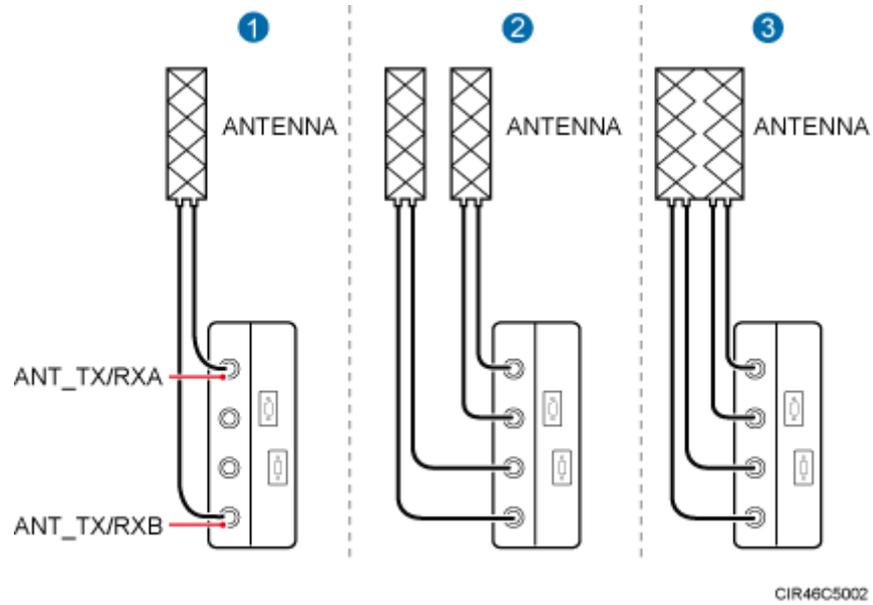
This section describes the RF cable connections for the RU serving a single sector. The following table lists the RF cable connections for the RU.

**Table 4-1** RF cable connections for the RU

RU Model	Specifications of a Single RU	Scenario	Illustration of Cable Connections
RU3832 and RU3632	For details, see section "Typical Power Configuration for RU Modules" in chapter "Configuration Reference" in <i>3900 Series Base Station Initial Configuration Guide</i> .	2T2R	See illustration 1 in <a href="#">Figure 4-1</a> .
		1T2R+1T2R	See illustration 2 in <a href="#">Figure 4-1</a> .
		2T4R	See illustration 3 in <a href="#">Figure 4-1</a> .

## Illustration of Cable Connections

Figure 4-1 RF cable connections for the RU



# 5 RU Auxiliary Devices

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## About This Chapter

This chapter describes RU auxiliary devices.

### 5.1 IFS06

An Indoor Floor installation Support (IFS06) is used for installing indoor RUs.

### 5.2 OCB

An Outdoor Cable Conversion Box (OCB) interconnects cables of different core diameters. Power cables shipped with RUs cannot support long-distance power supply. Therefore, when power supply is far from the equipment, cables with large core diameters are used, and an OCB connects these cables and RU power cables.

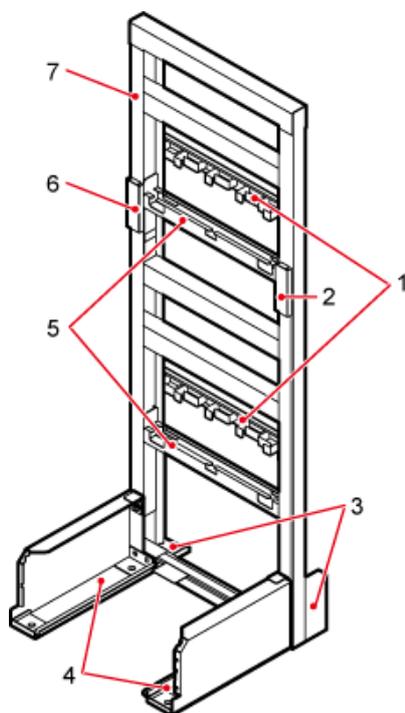
## 5.1 IFS06

An Indoor Floor installation Support (IFS06) is used for installing indoor RUs.

### Exterior

Figure 5-1 shows an IFS06.

**Figure 5-1** IFS06



PAS02C0005

(1) Cable tray	(2) Ground bar 2	(3) Rear foot	(4) Front foot
(5) Adjustable beam	(6) Ground bar 1	(7) Main frame	-

## Function

- It can be installed on the ground.
- The upper and lower adjustable beams on an IFS06 can be moved up and down to fit for heights of RUs.
- RUs can be installed on an IFS06 only when the ambient temperature is higher than or equal to the lowest working temperature of the RU and at least 5 °C (41 °F) lower than the highest working temperature of the RU. In this scenario, the IFS06 supports at least three RUs. When the ambient temperature is higher than or equal to the lowest working temperature of the RU and at least 10 °C (50 °F) lower than the highest working temperature of the RU, the IFS06 supports a maximum of six RUs.



### NOTE

For details about the operating temperature of the RU, see section "Technical Specifications of RUs" in *3900 Series Base Station Technical Description*.

## Specifications

[Table 5-1](#) describes IFS06 specifications.

**Table 5-1** IFS06 specifications

Item	Specification
------	---------------

Item	Specification
Dimensions (H x W x D)	1730 mm (79 in.) x 600 mm (23.62 in.) x 600 mm (23.62 in.)
Weight	45 kg (99.23 lb)

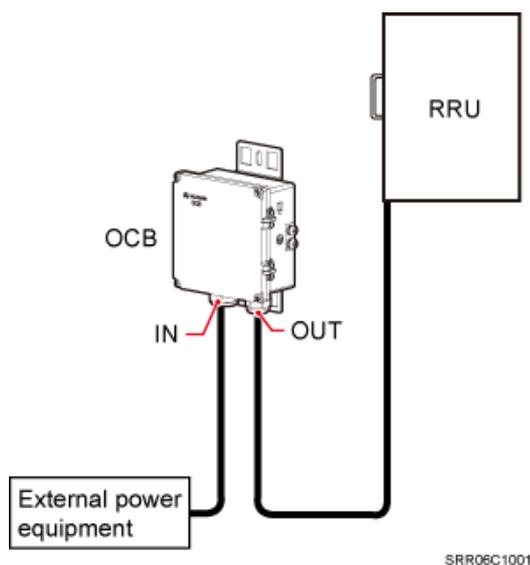
## 5.2 OCB

An Outdoor Cable Conversion Box (OCB) interconnects cables of different core diameters. Power cables shipped with RUs cannot support long-distance power supply. Therefore, when power supply is far from the equipment, cables with large core diameters are used, and an OCB connects these cables and RU power cables.

### Application Scenario of an OCB

Figure 5-2 shows the application scenario of an OCB.

Figure 5-2 Application scenario of an OCB



For details about the structure, functions, installation, and maintenance of an OCB, see the *OCB User Guide* or *OCB-01M User Guide*.