

RRU5909&RRU5309&RRU5309w&RRU3959a Hardware Description

Contents

- 6.3.5.2 [RRU5909&RRU5309&RRU5309w&RRU3959a Hardware Description](#)
- 6.3.5.2.1 [Changes in RRU5909&RRU5309&RRU5309w&RRU3959a Hardware Description](#)
- 6.3.5.2.2 [RRU Introduction](#)
- 6.3.5.2.2.1 [RRU Exterior](#)
- 6.3.5.2.2.2 [RRU Functions](#)
- 6.3.5.2.2.3 [RRU Technical Specifications](#)
- 6.3.5.2.2.4 [RRU Ports](#)
- 6.3.5.2.2.5 [RRU Indicators](#)
- 6.3.5.2.2.6 [Optical Modules](#)
- 6.3.5.2.3 [RRU Cables](#)
- 6.3.5.2.3.1 [RRU Cable List](#)
- 6.3.5.2.3.2 [RRU PGND Cable](#)
- 6.3.5.2.3.3 [RRU Power Cable](#)
- 6.3.5.2.3.4 [CPRI Fiber Optic Cable](#)
- 6.3.5.2.3.5 [RRU RF Jumper](#)
- 6.3.5.2.3.6 [RRU AISG Multi-Wire Cable](#)
- 6.3.5.2.3.7 [RRU AISG Extension Cable](#)
- 6.3.5.2.4 [RF Cable Connections for the RRU5909&RRU5309&RRU5309w&RRU3959a](#)
- 6.3.5.2.5 [RRU Auxiliary Devices](#)

6.3.5.2 RRU5909&RRU5309&RRU5309w&RRU3959a Hardware Description

Purpose

This document provides reference for planning and deploying a DC blade RRU5909, RRU5309, RRU5309w and RRU3959a (referred to as RRU in this document). RRU is short for remote radio unit. It presents the exterior and describes the ports, functions, cable types, connector specifications, and cable connections of the RRU.

Product Versions

The following table lists the product versions related to the RRU.

Product Name	Solution Version	Product Version
RRU5909 RRU3959a	<ul style="list-style-type: none"> • SRAN10.1 and later versions • GBSS17.1 and later versions • eRAN8.1 and later versions 	V100R010C10 and later versions For details about the software versions of RF modules, see <i>Software and Hardware Compatibility Description</i> .
RRU5309 RRU5309w	<ul style="list-style-type: none"> • SRAN11.1 and later versions • eRAN11.1 and later versions 	V100R011C10 and later versions For details about the software versions of RF modules, see <i>Software and Hardware Compatibility Description</i> .

Intended Audience

This document is intended for:

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

Organization

[Changes in RRU5909&RRU5309&RRU5309w&RRU3959a Hardware Description](#)

This section describes the changes in RRU5909&RRU5309&RRU5309w&RRU3959a Hardware Description.

[RRU Introduction](#)

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

[RRU Cables](#)

This chapter describes RRU cables.

[RF Cable Connections for the RRU5909&RRU5309&RRU5309w&RRU3959a](#)

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

[RRU Auxiliary Devices](#)

This chapter describes RRU auxiliary devices.

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6.3.5.2.1 Changes in RRU5909&RRU5309&RRU5309w&RRU3959 a Hardware Description

This section describes the changes in RRU5909&RRU5309&RRU5309w&RRU3959a Hardware Description.

05 (2018-01-20)

This is the fifth official release.

Compared with Issue 04 (2017-09-30), this issue does not include any new information.

Compared with Issue 04 (2017-09-30), this issue includes the following changes.

Topic	Change Description
The whole document	Added information about the RRU3959a.

Compared with Issue 04 (2017-09-30), no information is deleted from this issue.

04 (2017-09-30)

This is the fourth official release.

Compared with Issue 03 (2017-08-30), this issue does not include any new information.

Compared with Issue 03 (2017-08-30), this issue includes the following changes.

Topic	Change Description
About This Document	Updated the required product versions and added support of the RRU by the DBS5900.

Compared with Issue 03 (2017-08-30), no information is deleted from this issue.

03 (2017-08-30)

This is the third official release.

Compared with Issue 02 (2017-06-15), this issue does not include any new information.

Compared with Issue 02 (2017-06-15), this issue includes the following changes.

Topic	Change Description
The whole document	Added information about the RRU5309 and RRU5309w.

Compared with Issue 02 (2017-06-15), no information is deleted from this issue.

02 (2017-06-15)

This is the second official release.

Compared with Issue 01 (2017-05-20), this issue does not include any new information.

Compared with Issue 01 (2017-05-20), this issue includes the following changes.

Topic	Change Description
RRU Functions	Added descriptions of the OPM50M(Ver.B).
RRU Auxiliary Devices	

Compared with Issue 01 (2017-05-20), no information is deleted from this issue.

01 (2017-05-20)

This is the first official release.

Compared with Draft C (2017-03-30), this issue does not include any new information.

Compared with Draft C (2017-03-30), this issue does not include any changes.

Compared with Draft C (2017-03-30), no information is deleted from this issue.

Draft C (2017-03-30)

This is a draft.

Compared with Draft B (2017-03-10), this issue does not include any new information.

Compared with Draft B (2017-03-10), this issue includes the following changes.

Topic	Change Description
RRU Power Cable	Updated the specifications of an RRU power cable.

Compared with Draft B (2017-03-10), no information is deleted from this issue.

Draft B (2017-03-10)

This is a draft.

Compared with Draft A (2017-01-20), this issue does not include any new information.

Compared with Draft A (2017-01-20), this issue includes the following changes.

Topic	Change Description
RRU Functions	Optimized the contents in this document. No technical change is involved.

Compared with Draft A (2017-01-20), no information is deleted from this issue.

Draft A (2017-01-20)

This is a draft.

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6.3.5.2.2 RRU Introduction

This chapter describes the exterior and function of the [RRU](#) as well as the ports and indicators on the RRU.

[RRU Exterior](#)

This section describes the exterior and dimensions of an RRU.

[RRU Functions](#)

This section describes main functions of an RRU.

[RRU Technical Specifications](#)

This section describes technical specifications of an RRU, including supported modes, frequency bands, [RF](#) specifications, engineering specifications, and antenna capabilities.

[RRU Ports](#)

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

[RRU Indicators](#)

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

[Optical Modules](#)

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

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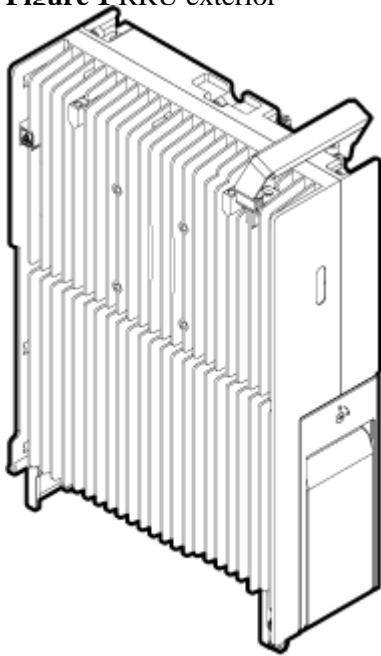
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6.3.5.2.2.1 RRU Exterior

This section describes the exterior and dimensions of an [RRU](#).

[Figure 1](#) shows the exterior of an RRU.

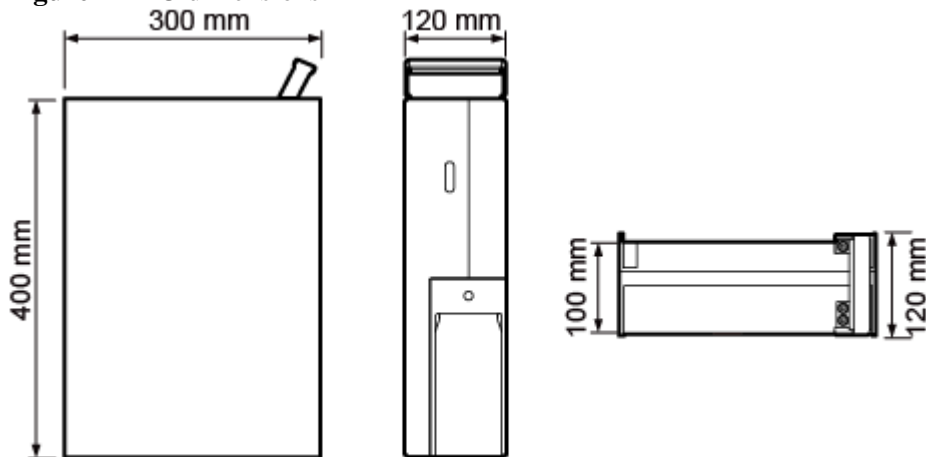
Figure 1 RRU exterior



PARA1C0001

[Figure 2](#) shows RRU dimensions.

Figure 2 RRU dimensions



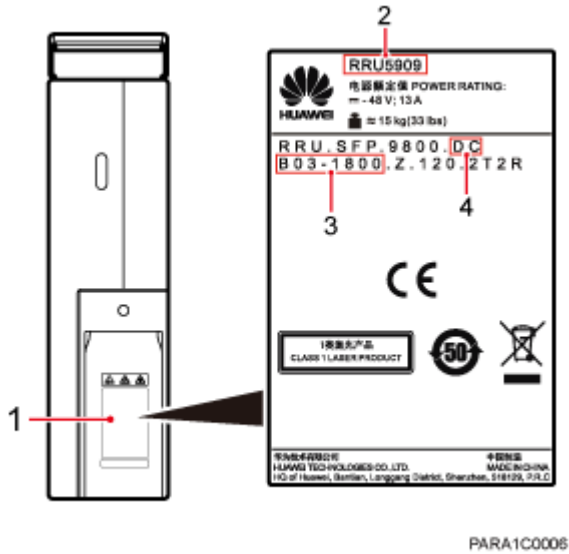
PAR96C0005

You can obtain the RRU name, RRU frequency band and power supply information from the nameplate on the cover plate. [Figure 3](#) shows the positions of the nameplate on the RRU.

 **NOTE:**

The actual nameplate may differ from what is shown in the figure.

Figure 3 Positions of the nameplate



- (1) Nameplate (2) Module name (3) Frequency band (4) Power supply type

Parent Topic: [RRU Introduction](#)

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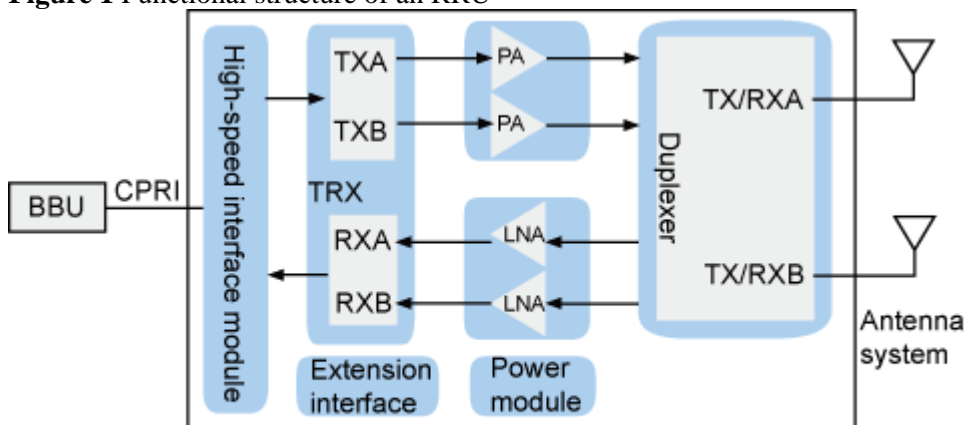
6.3.5.2.2 RRU Functions

This section describes main functions of an [RRU](#).

The [Remote Radio Unit](#) (RRU) consists of the high-speed interface unit, signal processing unit, power amplifier, duplexer, extension ports, and power module.

[Figure 1](#) shows the functional structure of the RRU.

Figure 1 Functional structure of an RRU



**NOTE:**

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

The RRU 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, performs analog-to-digital conversion, and up-converts RF signals to the transmit (TX) band.
- Multiplexes receive (RX) and [TX](#) signals on the RF channel so that these signals can share the same antenna channel, and 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 RRU can work with the Monitoring Extension Box (MEB). The MEB can transmit external RS-485 communication signals and dry node monitoring signals into the RRU, implementing information monitoring and reporting. For details about the MEB, see *MEB06D User Guide*.
- When an RRU is equipped with an AC/DC power module, the RRU and the power module together are called an AC RRU. For details about the AC/DC power module, see *OPM15M(Ver.B) User Guide* or *OPM50M(Ver.B) User Guide*.

Parent Topic: [RRU Introduction](#)

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6.3.5.2.2.3 RRU Technical Specifications

This section describes technical specifications of an [RRU](#), including supported modes, frequency bands, [RF](#) specifications, engineering specifications, and antenna capabilities.

For details about technical specifications of an RRU, see section [Technical Specifications of RRUs](#) in the *Base Station Technical Description*.

Parent Topic: [RRU Introduction](#)

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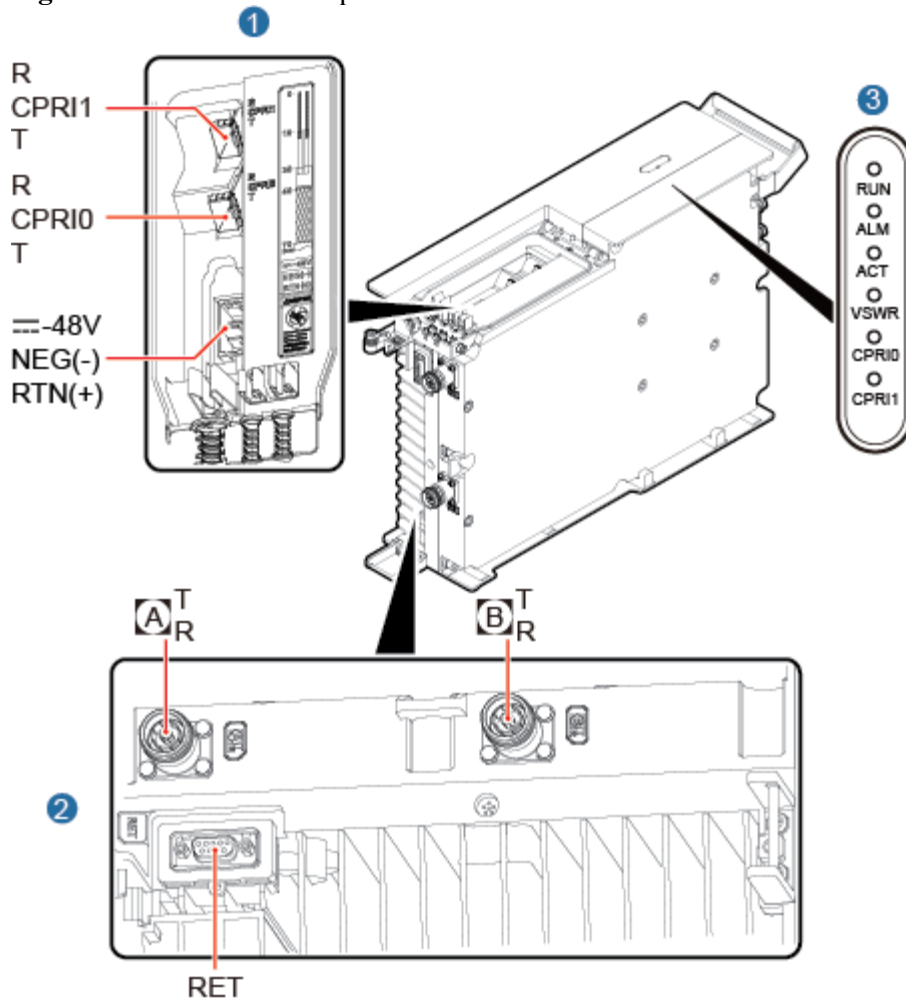
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6.3.5.2.2.4 RRU Ports

This section describes ports on the [RRU](#) panels. An RRU has a bottom panel, cabling cavity panel, and indicator panel.

Figure 1 shows the ports on the RRU panels.

Figure 1 Ports on the RRU panels



PARA1C0002

Table 1 Ports and indicators on the RRU panels

Item	Silkscreen	Remarks
(1) Ports in the cabling cavity	RTN(+)	Power supply socket, For details about RRU power cable appearance and specifications, see RRU Power Cable .
	NEG(-)	
	CPRI0	Optical/electrical port 0, connected to the BBU or an upper-level RRU
	CPRI1	Optical/electrical port 1, connected to a lower-level RRU or the BBU
(2) Bottom ports	A T/R	TX/RX port A (4.3-10 female connector), supporting RET signal transmission

Table 1 Ports and indicators on the RRU panels

Item	Silkscreen	Remarks
	B T/R	TX/RX port B (4.3-10 female connector)
	RET	Communication port for the RET antenna, supporting RET signal transmission
(3) Indicator	RUN	For details, see RRU Indicators .
	ALM	
	ACT	
	VSWR	
	CPRI0	
	CPRI1	

**NOTE:**

- The port for transmitting RET signals is determined by the software.
- Connect the **CPRI0** port to the BBU by default in the single-mode scenario.

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6.3.5.2.2.5 RRU Indicators

This section describes six indicators on an [RRU](#). They indicate the running status of the RRU.

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

[Table 1](#) describes RRU indicators.

Table 1 RRU Indicators

Indicator	Color	Status	Meaning
RUN	Green	Steady on	The power input is available, but the board is faulty.
		Steady off	No power input is available, or the board is faulty.

Table 1 RRU Indicators

Indicator	Color	Status	Meaning
		Blinking (on for 1s and off for 1s)	The board is running properly.
		Blinking (on for 0.125s and off for 0.125s)	The board software is being loaded, or the board is not working.
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 faults on the related board or ports. Therefore, you need to locate the fault before deciding whether to replace the module.
		Steady off	No alarms are generated.
ACT	Green	Steady on	The board is working properly when TX channels are enabled or software is being loaded to a board that is not started.
		Blinking (on for 1s and off for 1s)	The board is running 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 B T/R port.
		Steady on	VSWR alarms are generated on the A T/R port.
		Blinking (on for 0.125s and off for 0.125s)	VSWR alarms are generated on the A T/R and B T/R ports.
CPRI0	Red and green	Steady green	The CPRI link is running properly.
		Steady red	An optical module fails to receive or transmit signals possibly because the optical module is faulty or the optical fiber is broken.
		Blinking red (on for 1s and off for 1s)	The CPRI link is out of lock because of faults on the mutual lock of dual-mode clock sources or mismatched data rates on CPRI ports.
		Steady off	The optical module cannot be detected or is powered off.

Table 1 RRU Indicators

Indicator	Color	Status	Meaning
CPRI1	Red and green	Steady green	The CPRI link is running properly.
		Steady red	An optical module fails to receive or transmit signals possibly because the optical module is faulty or the optical fiber is broken.
		Blinking red (on for 1s and off for 1s)	The CPRI link is out of lock because of faults on the mutual lock of dual-mode clock sources or mismatched data rates on CPRI ports.
		Steady off	The optical module cannot be detected or is powered off.

 **NOTE:**

VSWR indicators on RRUs providing one or more than two TX channels have two types of status:

- Steady off: No VSWR alarm is generated.
 - Steady on: VSWR alarms are generated on one or more ports.
-

Parent Topic: [RRU Introduction](#)

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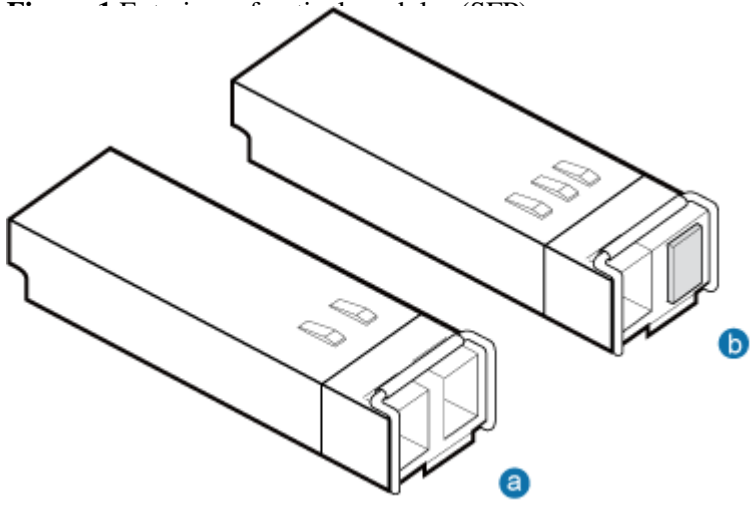
6.3.5.2.2.6 Optical Modules

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.
 - Boards or RF modules supporting only the 1.25 Gbit/s CPRI port rate, for example, a GTMU or RRU3908 V1, cannot use 10 Gbit/s optical modules.
 - A fiber optic cable must use the same type of optical modules on its two ends. If different types of optical modules are used by a fiber optic cable, performance risks may arise, for example, alarms, bit errors, and interrupted links.
 - Only Huawei-certified optical modules meeting the following requirements can be used for Huawei wireless devices:
 - Requirements of devices on which optical modules are to be installed
 - Laser safety in the IEC 60825-1 standard
 - General safety in the IEC 60950-1 standard
 - For SFP or QSFP optical modules certified and provided by Huawei, see *Spare Parts Catalog*.
-

The following figures show the exteriors of optical modules.

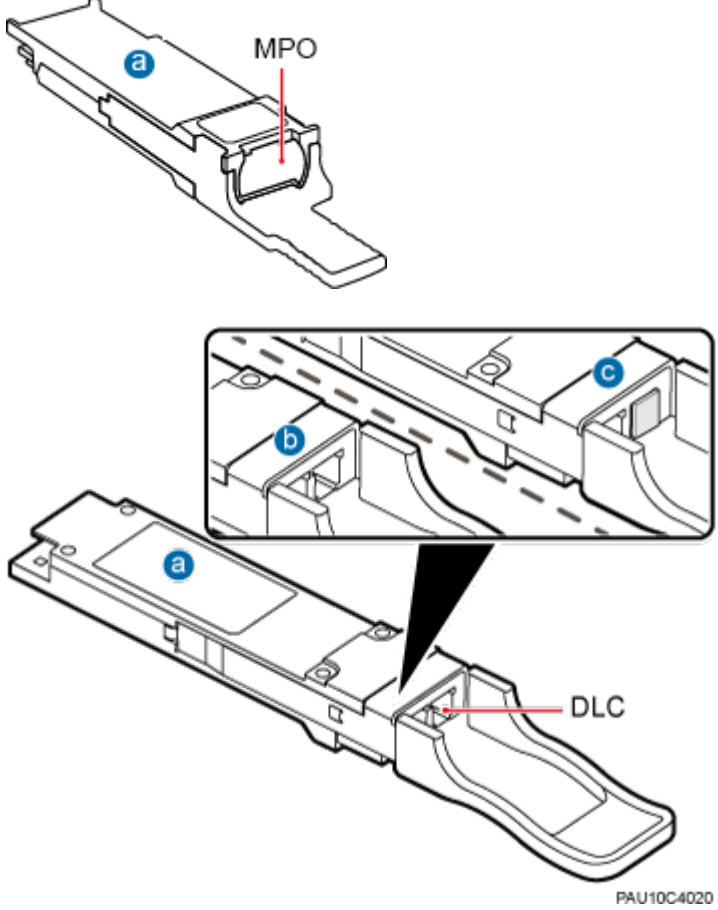


PAA02C0033

a: Two-fiber bidirectional optical module

b: Single-fiber bidirectional optical module

Figure 2 Exteriors of optical modules (QSFP)

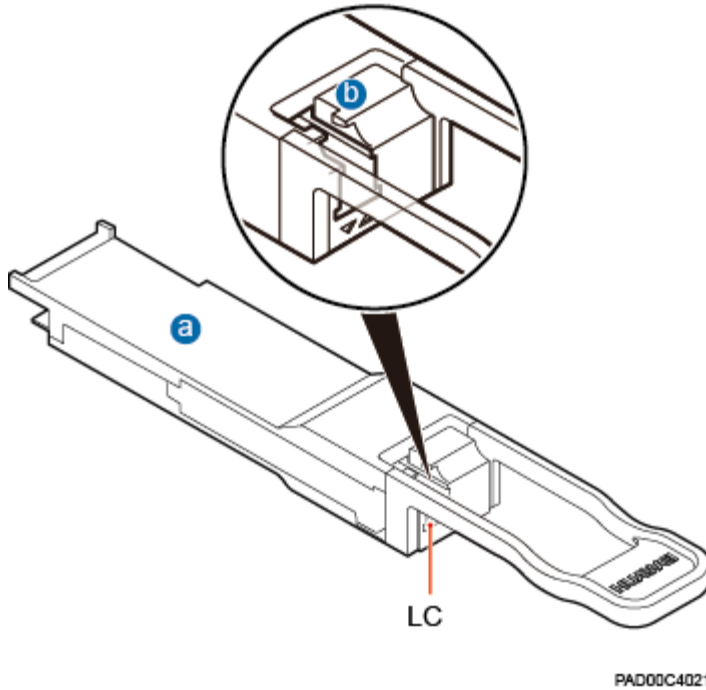


PAU10C4020

a: 100G SR4 optical module

b: Two-fiber bidirectional optical module

c: Single-fiber bidirectional optical module



a: 100G BIDI optical module

b: Single-fiber bidirectional optical module

NOTE:

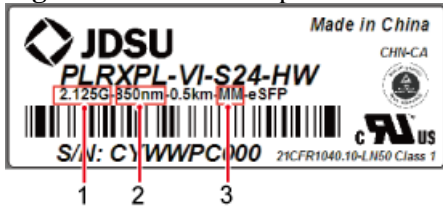
QSFP optical modules are applicable only to BBUs, massive MIMO devices, and radio multiplex units (RMUs), but not to RRUs. In addition, only QSFP optical modules with a data rate of 40 Gbit/s are applicable to the RMUs.

- [Label on an Optical Module](#)
- [Optical Module Type](#)

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.

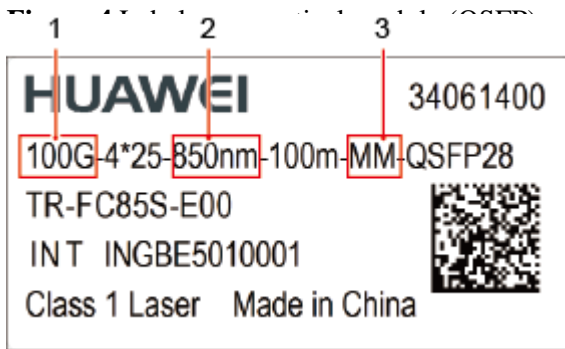
Figure 3 Label on an optical module (SFP)



(1) Rate

(2) Wavelength

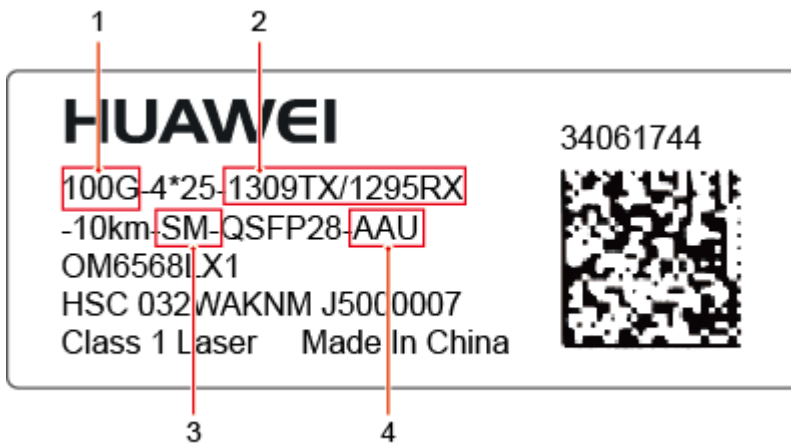
(3) Transmission mode



(1) Rate

(2) Wavelength

(3) Transmission mode



PAD00C0131

(1) Rate

(2) Wavelength

(3) Transmission mode

(4) Connected module

There are different types of optical modules which are configured depending on the actual application scenarios, see **CPRI Fiber Optic Cable** in *3900 Series Base Station Cables*.

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.

Parent Topic: [BBU3900 and BBU3910 Boards](#)

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6.3.5.2.3 RRU Cables

This chapter describes [RRU](#) cables.

[RRU Cable List](#)

This section describes RRU cable connections.

[RRU PGND Cable](#)

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

[RRU Power Cable](#)

The RRU power cable is a -48 V [DC](#) shielded cable. It feeds -48 V DC power to an RRU. The maximum length of power supply that an RRU power cable supports is 100 m (328.08 ft).

[CPRI Fiber Optic Cable](#)

[CPRI](#) fiber optic cables are classified into multimode fiber optic cables and single-mode fiber optic cables. They transfer CPRI signals.

[RRU RF Jumper](#)

The 1/2" RRU [RF](#) jumper transmits and receives RF signals between an RRU and an antenna. A fixed-length RF jumper used by an RRU 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 RRU has a maximum length of 10 m (32.81 ft).

[RRU AISG Multi-Wire Cable](#)

An RRU [AISG](#) multi-wire cable connects an RRU and an [RCU](#) to transmit control signals from a base station to an [RET](#) antenna. When the RRU 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).

[RRU AISG Extension Cable](#)

When the distance between an RRU and an RCU is longer than 5 m (16.4 ft), an AISG multi-wire cable is not long enough to connect the RRU 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).

6.3.5.2.3.1 RRU Cable List

This section describes [RRU](#) cable connections.

[Table 1](#) lists RRU cables.

Table 1 RRU cables				
Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
RRU PGND Cable	OT terminal (M6, 16 mm ² or 0.025 in. ²)	Ground terminal on the RRU	OT terminal (M8, 16 mm ² or 0.025 in. ²)	Ground terminal on the ground bar
RRU Power Cable	Female fast connector (pressfit type)	NEG(-) and RTN(+) ports on the RRU	Depending on the power supply equipment	External power equipment
CPRI Fiber Optic Cable	DLC connector	CPRI0 port on the RRU	DLC connector	CPRI port on a board in the BBU or CPRI1 port on the upper-level RRU
		CPRI1 port on the RRU		CPRI0 port on the lower-level RRU or CPRI port on a board in the BBU
RRU RF Jumper	4.3-10 male connector	RF ports on the RRU	4.3-10 male connector or DIN male connector NOTICE: Select cables based on the type of the connector at the other end of the cable on live networks.	Antenna system
RRU AISG Multi-Wire Cable	DB9 waterproof male connector	RET port on the RRU	Standard AISG female connector	Standard AISG male connector on the RCU or on the AISG extension cable
RRU 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

Parent Topic: [RRU Cables](#)

6.3.5.2.3.2 RRU PGND Cable

An **RRU** PGND cable connects an RRU and a ground bar, ensuring the proper grounding of the RRU. The maximum length of an RRU 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 mm² (0.025 in.²). An OT terminal is installed at each end of the cable. [Figure 1](#) shows a PGND cable.

Figure 1 PGND cable



(1) OT terminal (M6, 16 mm² or 0.025 in.²)

(2) OT terminal (M8, 16 mm² or 0.025 in.²)

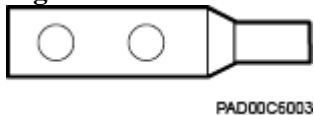


NOTE:

- If the customer prepares the PGND cable, a copper-core cable with a cross-sectional area of 16 mm² (0.025 in.²) 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 2](#) shows a two-hole OT terminal.

Figure 2 Two-hole OT terminal



Parent Topic: [RRU Cables](#)

6.3.5.2.3.3 RRU Power Cable

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

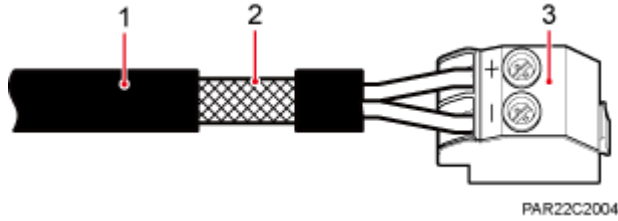
NOTE:

If a power device provided by the customer is used, the recommended specification of the circuit breaker on this power device is 20 A to 30 A.

Exterior

A female fast connector (pressfit type) needs to be added to one end of the RRU 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 1](#).

Figure 1 RRU power cable



(1) -48 V DC power cable

(2) Shield layer

(3) Female fast connector (pressfit type)

The outer diameter of RRU power cables ranges from 9.9 mm to 14.4 mm, and [Table 1](#) lists the specifications of an RRU power cable.

RRU Type	National Standard	Remote Distance	Cross-Sectional Area of the Cable	OCB Quantity
RRU5909, RRU5309, RRU5309w, RRU3959a	European standard	0 m to 70 m	4 mm ²	0
		71 m to 100 m	6 mm ²	0
	American standard	0 m to 70 m	3.3 mm ²	0
		71 m to 100 m	5.3 mm ²	0

[Table 2](#) lists the wire colors of an RRU power cable.

Cable	Wire	Wire Color in Most Regions		Wire Color in Other Regions	
		North American Standard	European Standard	UK	China
	RTN(+)	Black	Brown	Blue	Red

Table 2 Wire Colors of an RRU power cable

Cable	Wire	Wire Color in Most Regions		Wire Color in Other Regions	
		North American Standard	European Standard	UK	China
RRU power cable	NEG(-)	Blue	Blue	Gray	Blue

Parent Topic: [RRU Cables](#)

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6.3.5.2.3.4 CPRI Fiber Optic Cable

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

A multimode fiber optic cable connects a BBU to an RRU or connect two RRUs. The maximum length of a multimode fiber optic cable connecting a BBU and an RRU is 150 m (492.12 ft). The default length of a multimode fiber optic cable connecting two RRUs is 10 m (32.81 ft). If the distance between two RRUs exceeds 10 m (32.81 ft), contact Huawei engineers.

The single-mode fiber optic cable can be divided into two types: single-mode fiber optic cable directly connecting a BBU to an RRU or connects two RRUs (shortened to directly connected single-mode fiber optic cable) and single-mode fiber optic cable connecting an ODF to a BBU or RRU (shortened to single-mode pigtail). The length of each single-mode fiber optic cable between the BBU and RRU or between RRUs cannot exceed the maximum allowed remote distance between the BBU and RRUs. The maximum length of the single-mode pigtail between an ODF and a BBU is 20 m (65.62 ft). The maximum length of the single-mode pigtail between an ODF and an RRU is 70 m (229.66 ft).



NOTE:

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

Selection Principle

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

Table 1 Principles for selecting CPRI fiber optic cables

Remote Distance ^a	CPRI Data Rate of the Optical Module (Gbit/s)	Selection Principle	Connects...to...	Remarks
≤ 100 m (328.08 ft)	2.5 or 4.9	Multimode fiber optic cable	Connects a BBU to an RRU or connect two RRUs.	When multiple RRUs are cascaded, multimode fiber optic cables and single-mode fiber optic cables can be used together.
	9.8	Directly connected single-mode fiber optic cable		
100 m (328.08 ft) < Remote distance ≤ 150 m (492.12 ft)	All	Recommended: single-mode fiber optic cable (single-mode pigtail and trunk single-mode fiber optic cable)	Connects a BBU to an RRU.	The single-mode pigtail at the RRU or BBU side is connected to the trunk single-mode fiber optic cable by using an ODF.
	2.5 or 4.9	Multimode fiber optic cable	Connects a BBU to an RRU or connect two RRUs.	When multiple RRUs are cascaded, multimode fiber optic cables and single-mode fiber optic cables can be used together.
	9.8	Directly connected single-mode fiber optic cable		
> 150 m (492.12 ft)	-	Single-mode fiber optic cable (single-mode pigtail and trunk single-mode fiber optic cable)	Connects a BBU to an RRU.	The single-mode pigtail at the RRU or BBU side is connected to the trunk single-mode fiber optic cable by using an ODF.
≤ 70 m (229.66 ft)	40 or 100	OM3 multimode fiber optic cable	Connects a BBU to an AAU.	Short-distance connection between the BBU and RRU
70 m (229.66 ft) < Remote distance ≤ 100 m	40 or 100	OM4 multimode fiber optic cable		

Table 1 Principles for selecting CPRI fiber optic cables

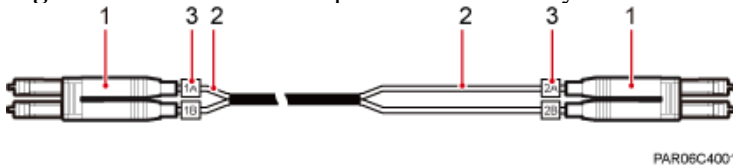
Remote Distance ^a	CPRI Data Rate of the Optical Module (Gbit/s)	Selection Principle	Connects...to...	Remarks
(328.08 ft)				
100 m to 1000 m (328.08 ft to 3280.8 ft)	40 or 100	Directly connected single-mode fiber optic cable	Connects a BBU to an RRU.	-
	40 or 100	Single-mode fiber optic cable (single-mode pigtail and trunk single-mode fiber optic cable)	Connects a BBU to an RRU.	The single-mode pigtail at the RRU or BBU side is connected to the trunk single-mode fiber optic cable by using an ODF.

a: The remote distance between the BBU and RRUs refers to the total length of the cables between the BBU and the RRU that is farthest way from the BBU.

Exterior

Multimode fiber optic cable or directly connected single-mode fiber optic cable: The cable has a DLC connector at each end, as shown in the following figure.

Figure 1 Multimode fiber optic cable or directly connected single-mode fiber optic cable



(1) DLC connector

(2) Breakout cable

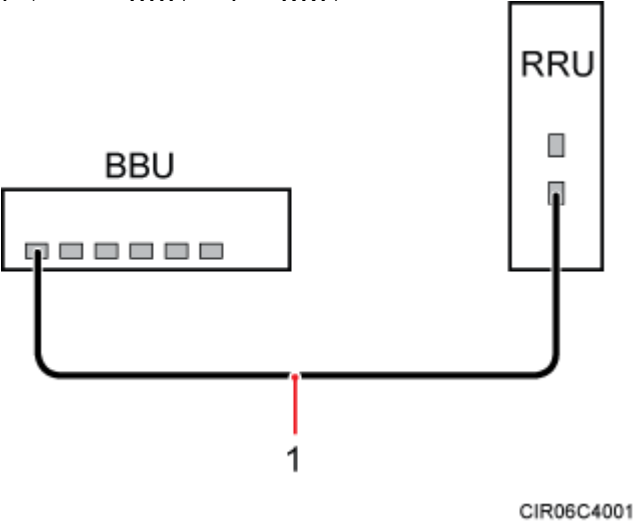
(3) Label on the breakout cable

NOTE:

- When a fiber optic cable connects a BBU3900/BBU3910/BBU5900 to an RRU, the breakout cable on the BBU side is 0.34 m (1.12 ft) and the breakout cable on the RRU side is 0.03 m (0.098 ft).
- When a fiber optic cable connects a BBU3910A/BBU3910C to an RRU, the breakout cables on the BBU side and the RRU side are both 0.03 m (0.098 ft).

The following figure shows the connection of the multimode fiber optic cable or directly connected single-mode fiber optic cable between a BBU and an RRU as an example.

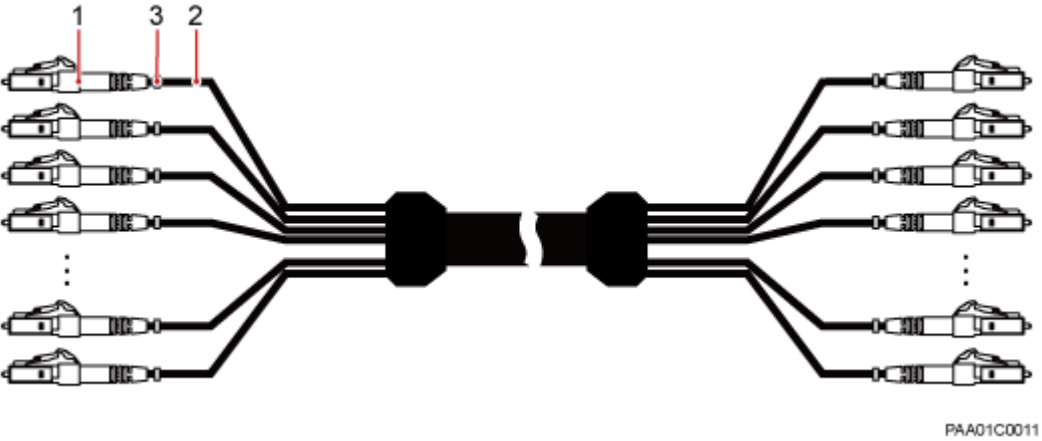
Figure 2 Connection of the multimode fiber optic cable or directly connected single-mode fiber optic cable



(1) Multimode fiber optic cable or directly connected single-mode fiber optic cable between a BBU and an RRU

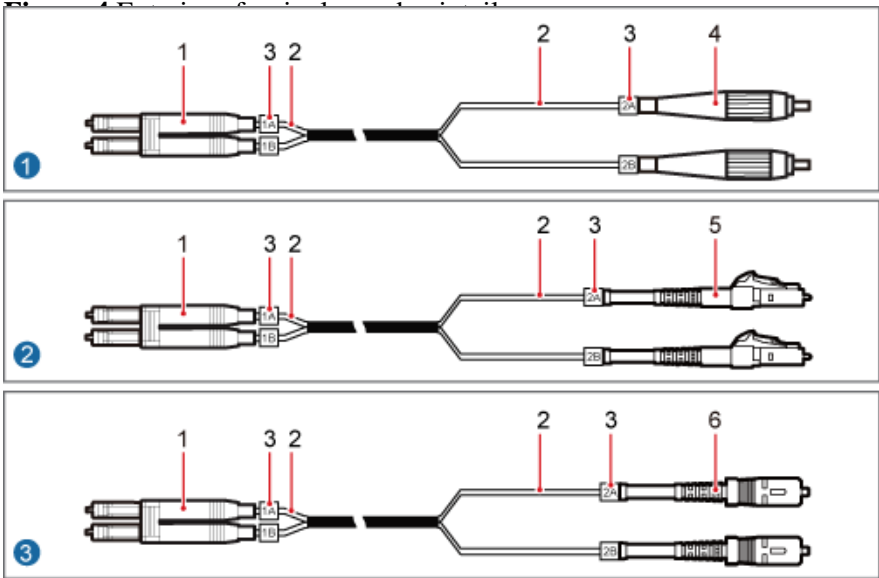
Trunk fiber optic cable for an OFD06: The trunk fiber optic cable for an OFD06 connects a BBU to an OFD06 and has 12 LC connectors at each end, as shown in the following figure.

Figure 3 OFD06 trunk fiber optic cable



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

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 the following figure.



PAR06C4002

(1) DLC connector

(2) Breakout cable

(3) Label on the breakout cable

(4) FC connector

(5) LC connector

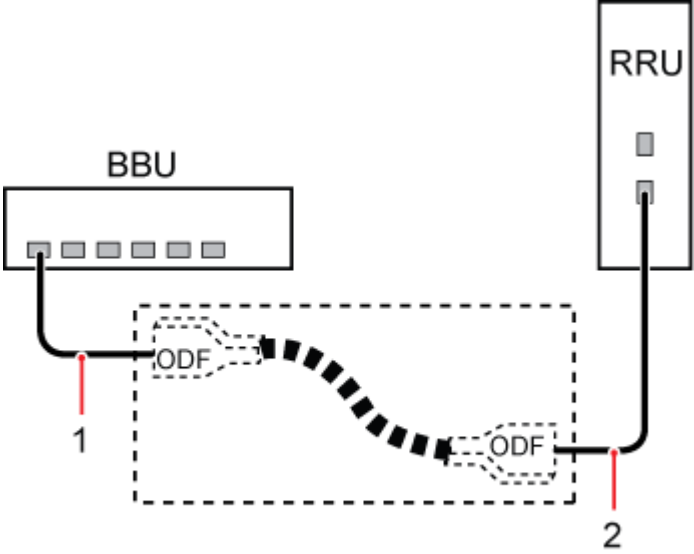
(6) SC connector

NOTE:

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

The following figure shows the connection of the single-mode pigtail.

Figure 5 Connection of the single-mode pigtail



CIR06C4002

- (1) Single-mode pigtail between a BBU and an ODF (2) Single-mode pigtail between an RRU and an ODF

The OM3 and OM4 multimode fiber optic cables have the same exterior, in which each end has an MPO connector. The MPO connector with a strap connects to the BBU and the MPO connector without a strap connects to the RRU, as shown in the following figure.

Figure 6 OM3/OM4 multimode fiber optic cable



(1) MPO connector

(2) Strap

(3) MPO connector

Pin Assignment

The following table describes the labels on the breakout cables of a CPRI fiber optic cable and recommended cable connections.

Table 2 Labels on the breakout cables of a CPRI fiber optic cable and recommended cable connections			
Label on the Breakout Cable	Installation Position		
	Connection Between a BBU and an RRU or Between an OFD06 and an RRU	Connection Between RRUs	Connection Between a BBU or RRU and an ODF
1A	CPRI RX port on the RRU	CPRI RX port on RRU 1	RX port on the BBU or CPRI RX port on the RRU
1B	CPRI TX port on the RRU	CPRI TX port on RRU 1	TX port on the BBU or CPRI TX port on the RRU
2A	OFD06 or TX port on the BBU	CPRI TX port on RRU 0	ODF
2B	OFD06 or RX port on the BBU	CPRI RX port on RRU 0	ODF

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6.3.5.2.3.5 RRU RF Jumper

The 1/2" **RRU RF** jumper transmits and receives RF signals between an RRU and an antenna. A fixed-length RF jumper used by an RRU 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 RRU has a maximum length of 10 m (32.81 ft).

 **NOTE:**

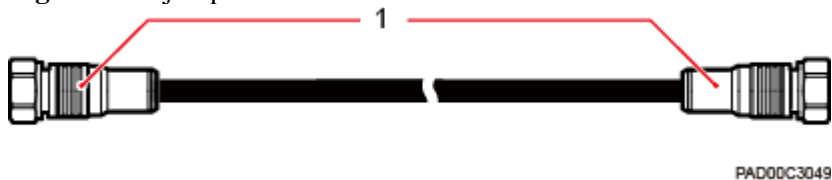
- When the distance between an RRU and an antenna is less than 10 m (32.81 ft), one end of the RF jumper is connected to an RF port at the bottom of the RRU, and the other end is connected to the antenna.
 - When the distance between an RRU and an antenna is greater than 10 m (32.81 ft), it is recommended that one end of the RF jumper be connected to an RF port at the bottom of the RRU, the other end be connected to one end of the feeder, and the other end of the feeder be 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

For an RF jumper, one end is connected to a 4.3-10 male connector, and the other end is connected to a connector based on onsite requirements, which is a 4.3-10 male connector or DIN male connector.

[Figure 1](#) shows an RF jumper with two ends connected to 4.3-10 male connectors.

Figure 1 RF jumper



(1) 4.3-10 male connector

Parent Topic: [RRU Cables](#)

6.3.5.2.3.6 RRU AISG Multi-Wire Cable

An **RRU AISG** multi-wire cable connects an RRU and an **RCU** to transmit control signals from a base station to an **RET** antenna. When the RRU 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).

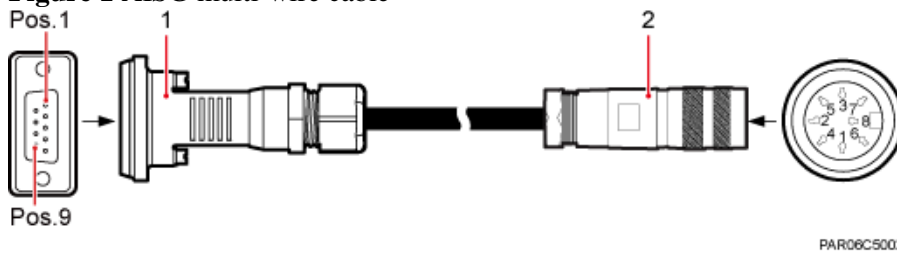
 **NOTE:**

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 waterproof DB9 male connector at one end and a standard AISG female connector at the other end, as shown in [Figure 1](#).

Figure 1 AISG multi-wire cable



(1) Waterproofed DB9 male connector

(2) Standard AISG female connector

Pin Assignment

[Table 1](#) describes the pin assignment for the wires of an AISG multi-wire cable.

Table 1 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
X1.9 and X1.4 are interconnected.	-	-	-	GND

Table 1 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
-	X2.1 and X2.6 are interconnected.	-	-	+12 V
-	X2.4 and X2.7 are interconnected.	-	-	GND

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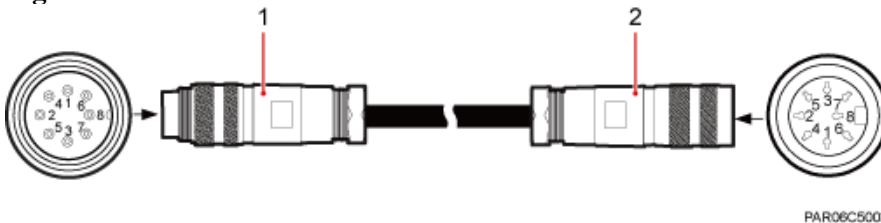
6.3.5.2.3.7 RRU AISG Extension Cable

When the distance between an **RRU** and an **RCU** is longer than 5 m (16.4 ft), an **AISG** multi-wire cable is not long enough to connect the RRU 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 1](#).

Figure 1 AISG extension cable



(1) Standard AISG male connector

(2) Standard AISG female connector

Pin Assignment

[Table 1](#) describes the pin assignment for the wires of an AISG extension cable.

Table 1 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		

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6.3.5.2.4 RF Cable Connections for the RRU5909&RRU5309&RRU5309w&RRU3959a

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

Description of RF Cable Connections

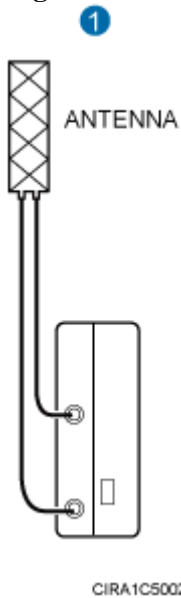
This section describes the RF cable connections for the RRU serving a single sector. The following tables list the RF cable connections for the RRU.

Table 1 RF cable connections for the RRU

RRU Model	Specifications of a Single RRU	Scenario	Illustration of Cable Connections
RRU5909, RRU5309, RRU5309w, RRU3959a	For details, see the typical power configuration of the corresponding RRU in "Technical Specifications of RRUs" of <i>Base Station Technical Description</i> .	<ul style="list-style-type: none">• 1T2R• 2T2R	See illustration 1 in Figure 1 .

Illustration of Cable Connections

Figure 1 RF cable connections for the RRU



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6.3.5.2.5 RRU Auxiliary Devices

This chapter describes [RRU](#) auxiliary devices.

Indoor Floor installation Support

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

For details about the exterior, specifications, and installation of an IFS06, see the *Base Station Hardware Description* and *DBS3900 (ICR) Installation Guide*.

Outdoor Pole Support

OFP06, short for Outdoor Flexible Pole For 6, is an outdoor pole support and provides a solution for extended installation of Huawei products on towers or building tops.

For details about the exterior and installation of an OFP06, see the *OFP06 Installation Guide*.

OCB

An Outdoor Cable Conversion Box (OCB) interconnects cables of different core diameters. Power cables shipped with RRUs 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 RRU power cables.

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

Power Module

Power module is used to convert external AC input power into -48 V DC for the DC RRU, including the following type:

- OPM15M(Ver.B): supported by V100R010C10 and later.
- OPM50M(Ver.B): supported by V100R010C10 and later.

For details about the structure, functions, installation, and maintenance of a Power Module, see the *OPM15M(Ver.B) User Guide* or *OPM50M(Ver.B) User Guide*.

Distribution Equipment

The ODM03D is small distribution equipment, which supports RRU capacity expansion, power cable reuse, and fiber optic cable reuse.

For details about the structure, functions, installation, and maintenance of an ODM03D, see the *ODM03D User Guide*.

RMU

A RMU3900A (Outdoor Distribution Module) is a radio multiplex unit, which converges and deconverges CPRI data and saves CPRI fiber optic cables between a BBU and RRUs.

RMU3900A: supported by V100R012C00 and later.

For details about the structure, functions, installation, and maintenance of a RMU3900A, see the *RMU3900A User Guide*.

MEB

The Monitoring Extension Box (MEB) can convert external RS-485 communication signals and dry node alarm signals into power return circuit signals, implementing power supply monitoring.

MEB: supported by V100R010C10 and later.

For details about the structure, functions, installation, and maintenance of a MEB, see the *MEB06D User Guide*.

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