



**RRU3942**

## **Hardware Description**

**Issue**      **02**

**Date**        **2012-06-29**

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# About This Document

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## Purpose

This document provides reference for planning and deploying an RRU3942 (referred to as RRU in this document). It presents the exterior and describes the ports, functions, cable types, connector specifications, and cable connections of the RRU.

## Product Version

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

Product Name	Product Version
DBS3900	V100R004C00 and later versions
DBS3900 GSM	V100R013C00 and later versions
DBS3900 WCDMA	V200R013C00 and later versions
DBS3900 LTE	V100R005C00 and later versions

## Intended Audience

This document is intended for:

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

## Organization

### [1 Changes in the RRU3942 Hardware Description](#)

This chapter describes the changes in the *RRU3942 Hardware Description*.

### [2 RRU Introduction](#)

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

### 3 RRU Cables

This chapter describes RRU cables.






### 4 RRU Auxiliary Devices

This chapter describes RRU auxiliary devices.

## Conventions

### Symbol Conventions

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

Symbol	Description
 <b>DANGER</b>	Indicates a hazard with a high level of risk, which if not avoided, will result in death or serious injury.
 <b>WARNING</b>	Indicates a hazard with a medium or low level of risk, which if not avoided, could result in minor or moderate injury.
 <b>CAUTION</b>	Indicates a potentially hazardous situation, which if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results.
 <b>TIP</b>	Indicates a tip that may help you solve a problem or save time.
 <b>NOTE</b>	Provides additional information to emphasize or supplement important points of the main text.

### General Conventions

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

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	Examples of information displayed on the screen are in Courier New.

### Command Conventions

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

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 brackets [ ] are optional.
{ x   y   ... }	Optional items are grouped in braces and separated by vertical bars. One item is selected.
[ x   y   ... ]	Optional items are grouped in brackets and separated by vertical bars. One item is selected or no item is selected.
{ x   y   ... }*	Optional items are grouped in braces and separated by vertical bars. A minimum of one item or a maximum of all items can be selected.
[ x   y   ... ]*	Optional items are grouped in brackets and separated by vertical bars. Several items or no item can be selected.

### GUI Conventions

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

Convention	Description
<b>Boldface</b>	Buttons, menus, parameters, tabs, window, 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 Operations

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

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

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

<b>Action</b>	<b>Description</b>
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 the RRU3942 Hardware Description

This chapter describes the changes in the *RRU3942 Hardware Description*.

## 02 (2012-06-29)

This is the second official release.

Compared with issue 01 (2012-04-25), this issue does not include any new information.

Compared with issue 01 (2012-04-25), this issue includes the following changes:

Topic	Change Description
<a href="#">3.2 RRU PGND Cable</a>	Added the length information of the cables.
<a href="#">3.3 RRU Power Cable</a>	
<a href="#">3.7 Inter-RRU RF Cable</a>	
<a href="#">3.8 RRU AISG Multi-Wire Cable</a>	
<a href="#">3.9 RRU AISG Extension Cable</a>	
<a href="#">3.1 RRU Cable List</a>	Optimized the contents in this section.

Compared with issue 01 (2012-04-25), no information is deleted from this issue.

## 01 (2012-04-25)

This is the first official release.

Compared with draft A (2012-01-10), this issue does not include any modification.

## Draft A (2012-01-10)

This is a draft.



# 2 RRU Introduction

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## About This Chapter

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

### [2.1 RRU Functions](#)

This section describes the main functions of the RRU.

### [2.2 RRU Exterior](#)

This section describes the exterior and dimensions of an RRU.

### [2.3 RRU Ports](#)

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

### [2.4 RRU Indicators](#)

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

## 2.1 RRU Functions

This section describes the main functions of the RRU.

The Remote Radio Unit (RRU) performs the following functions:

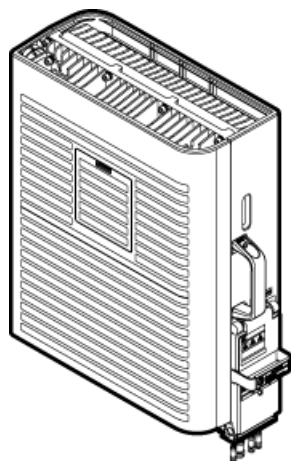
- Receives downlink baseband data from the BBU and sends uplink baseband data to the BBU.
- Receives RF signals from the antenna system, down-converts the signals to intermediate frequency (IF) signals, amplifies the IF signals, and performs analog-to-digital conversion. The transmit (TX) channel filters 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 RRU can be powered by the AC/DC power module. In this case, this RRU is called AC RRU. For details about the AC/DC power module, see the *AC/DC Power Module User Guide*.

## 2.2 RRU Exterior

This section describes the exterior and dimensions of an RRU.

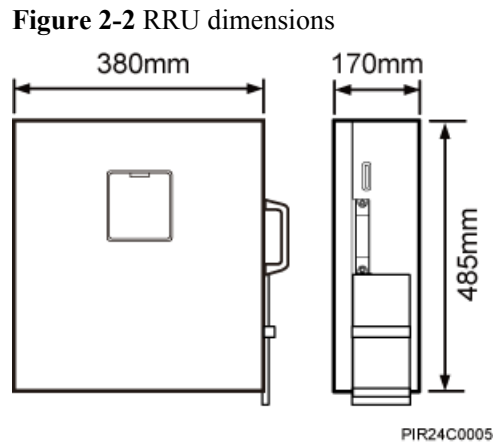
**Figure 2-1** shows an RRU.

**Figure 2-1** RRU exterior



PIR24C0001

**Figure 2-2** shows RRU dimensions.

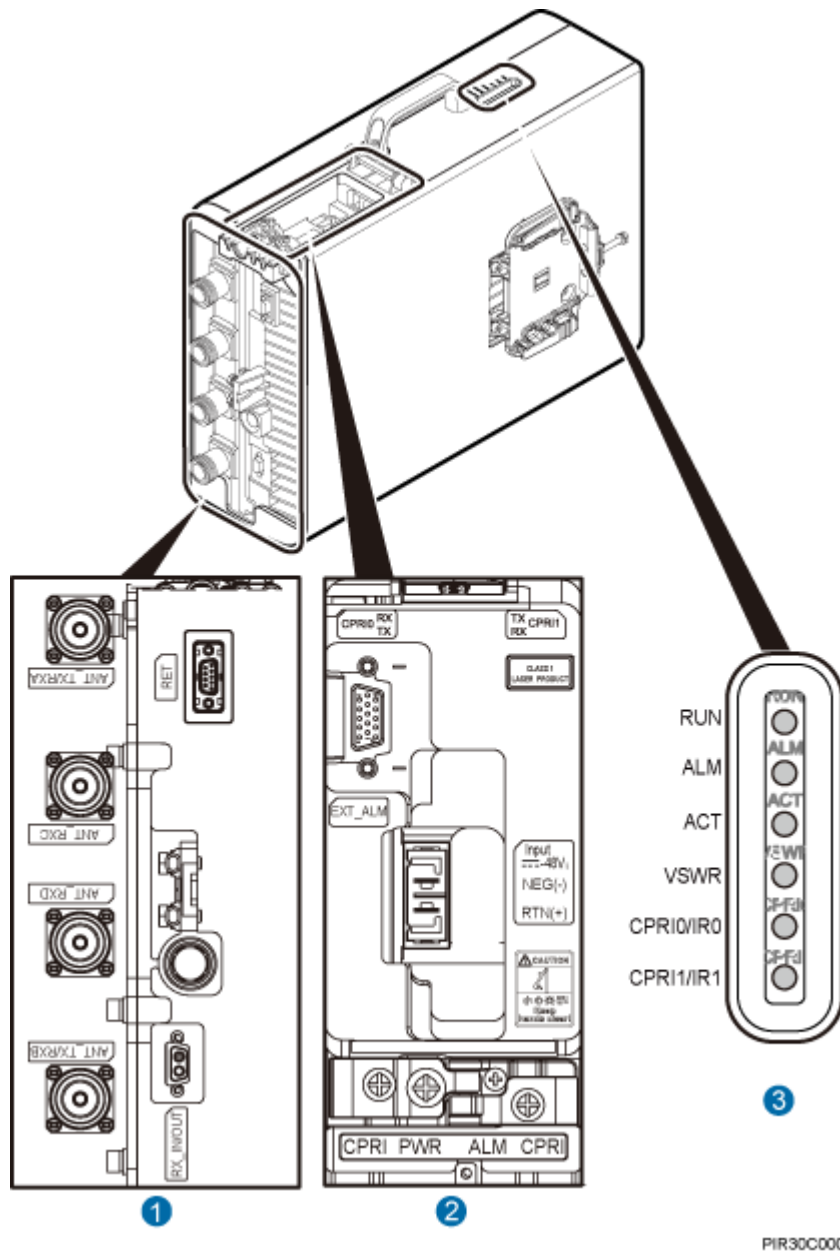


## 2.3 RRU Ports

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

**Figure 2-3** shows the ports on the RRU panels.

**Figure 2-3** Ports on the RRU panels



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

**Table 2-1** Ports and indicators on the RRU panels

Item	Silkscreen	Description
(1) Ports at the bottom	ANT_TX/RXA	TX/RX port A, supporting RET signal transmission
	ANT_RXC	RX port C
	ANT_RXD Port	RX port D

Item	Silkscreen	Description
	ANT_TX/RXB	TX/RX port B
	RX_IN/OUT	Port for the inter-RRU RF cable
	RET	Communication port for the RET antenna, supporting RET signal transmission
(2) Ports in the cabling cavity	RTN(+)	Power supply socket
	NEG(-)	
	CPRI0	Optical/electrical port 0
	CPRI1	Optical/electrical port 1
	EXT_ALM	Port for alarm reporting
(3) Indicators	RUN	For details, see <a href="#">2.4 RRU Indicators</a> .
	ALM	
	ACT	
	VSWR	
	CPRI0/IR0	
	CPRI1/IR1	

 **NOTE**

The RET ports to be used are determined by the software configuration.

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

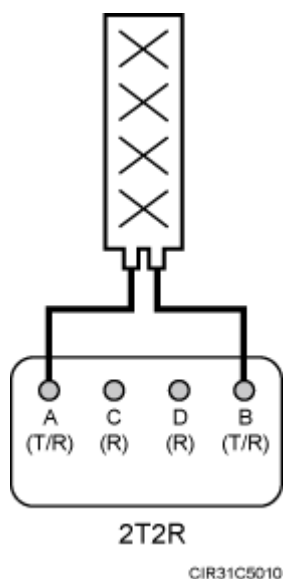
**Table 2-2** Usage

Product Version	TX/RX Channel	Number of Used RF Ports	Usage	Remark
<ul style="list-style-type: none"> <li>● DBS3900 V100R004C00</li> <li>● DBS3900 GSM V100R013C00</li> <li>● DBS3900 WCDMA V200R013C00</li> </ul>	1*2T2R	2	ANT_TX/RXA works with ANT_TX/RXB.	A single sector

Product Version	TX/RX Channel	Number of Used RF Ports	Usage	Remark
<ul style="list-style-type: none"> <li>DBS3900 GSM V100R014C00 and later versions</li> </ul>	1*1T2R	2	It is recommended that ANT_TX/RXA works with ANT_RXC.  You can also use the ports in the following ways: ANT_TX/RXB works with ANT_RXD.	A single sector
	1*2T2R	2	ANT_TX/RXA works with ANT_TX/RXB.	A single sector
	2*1T2R	4	ANT_TX/RXA works with ANT_RXC and ANT_TX/RXB works with ANT_RXD .	Two sectors
<ul style="list-style-type: none"> <li>DBS3900 V100R007C00 and later versions</li> <li>DBS3900 WCDMA V200R014C00 and later versions</li> <li>DBS3900 LTE V100R005C00 and later versions</li> </ul>	1*1T2R	2	It is recommended that ANT_TX/RXA works with ANT_RXC.  You can also use the ports in the following ways: ANT_TX/RXB works with ANT_RXD.	A single sector
	1*2T2R	2	ANT_TX/RXA works with ANT_TX/RXB.	A single sector
	1*2T4R	4	ANT_TX/RXA, ANT_RXC, ANT_TX/RXB, and ANT_RXD work together.	A single sector
	2*1T2R	4	ANT_TX/RXA works with ANT_RXC and ANT_TX/RXB works with ANT_RXD .	Two sectors

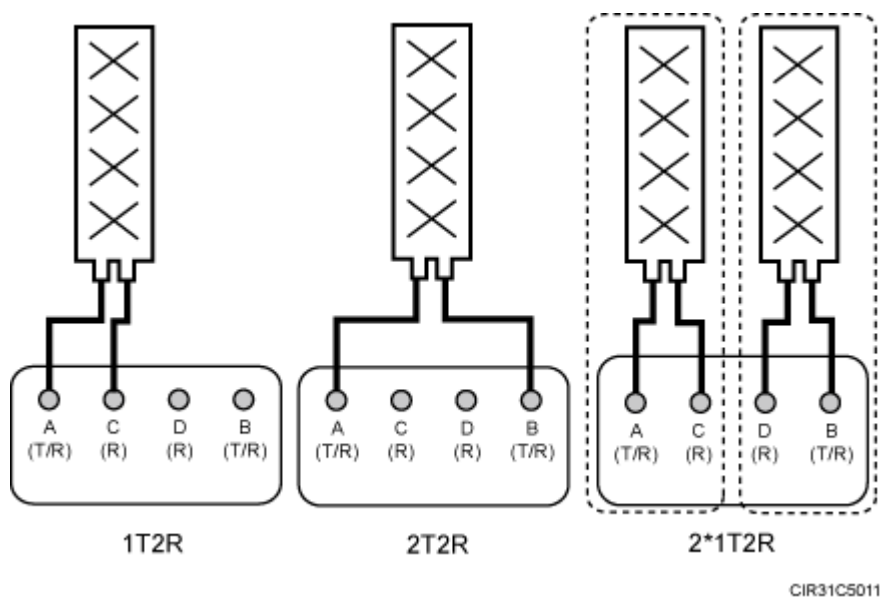
**Figure 2-4** shows the recommended usage of the RF ports on an RRU3942 used for DBS3900 V100R004C00, DBS3900 GSM V100R013C00 and DBS3900 WCDMA V200R013C00.

**Figure 2-4** Recommended usage of the RF ports for DBS3900 V100R004C00, DBS3900 GSM V100R013C00 and DBS3900 WCDMA V200R013C00



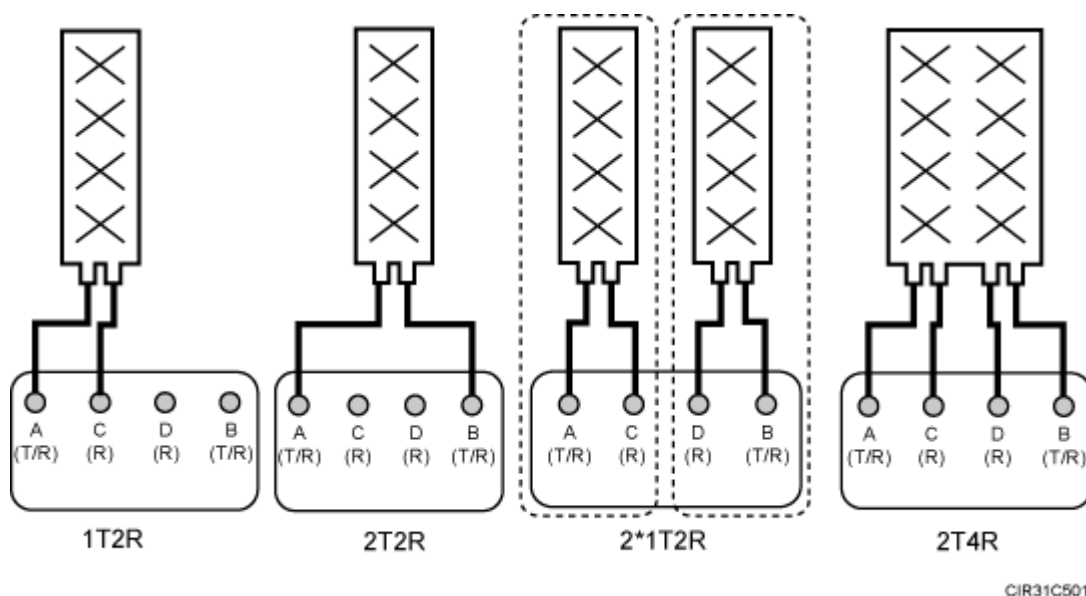
**Figure 2-5** shows the recommended usage of the RF ports on an RRU3942 used for DBS3900 GSM V100R014C00 and later versions.

**Figure 2-5** Recommended usage of the RF ports for DBS3900 GSM V100R014C00 and later versions



**Figure 2-6** shows the recommended usage of the RF ports on an RRU3942 used for DBS3900 V100R007C00 and later versions, DBS3900 WCDMA V200R014C00 and later versions, DBS3900 LTE V100R005C00 and later versions.

**Figure 2-6** Recommended usage of the RF ports for DBS3900 V100R007C00 and later versions, DBS3900 WCDMA V200R014C00 and later versions, DBS3900 LTE V100R005C00 and later versions



## 2.4 RRU Indicators

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

For detailed positions of RRU indicators, see [2.3 RRU Ports](#).

[Table 2-3](#) describes RRU indicators.

**Table 2-3** RRU indicators

Silkscreen	Color	Status	Description
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 running 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	An alarm is generated, and the module must be replaced.



Silkscreen	Color	Status	Description
		Blinking (on for 1s and off for 1s)	An alarm is generated. The alarm may be caused by a fault on a related board or port. Therefore, you need to locate the fault before deciding whether to replace the module.
		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 RRU 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/IR0	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 mutual lock of dual-mode clock sources or mismatched data rates over CPRI ports.
		Steady off	The optical module cannot be detected, or the CPRI cable is not connected properly.
CPRI1/IR1	Red or green	Steady green	The CPRI link is functioning properly.
		Steady red	An optical module fails to 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 mutual lock of dual-mode clock sources or mismatched data rates over CPRI ports.
		Steady off	The optical module cannot be detected, or the CPRI cable is not connected properly.

# 3 RRU Cables

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## About This Chapter

This chapter describes RRU cables.

### [3.1 RRU Cable List](#)

This section describes RRU cable connections.

### [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 the RRU PGND cable is 30 m (98.42 ft.).

### [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 the RRU power cable is 50 m (164.04 ft.).

### [3.4 RRU Alarm Cable](#)

The RRU alarm cable, a shielded straight-through cable, transmits alarm signals from an external device to an RRU so that the base station monitors the operating status of external devices. The maximum length of the RRU alarm cable is 5 m (16.40 ft.).

### [3.5 CPRI Fiber Optic Cable](#)

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

### [3.6 RRU RF Jumper](#)

The 1/2" RRU RF jumper transmits and receives RF signals between an RRU and an antenna.

### [3.7 Inter-RRU RF Cable](#)

An inter-RRU RF cable connects the RX\_IN/OUT ports on two RRUs in the same cell and transmits RF signals between the RRUs. The maximum length of the inter-RRU RF cable is 2 m (6.56 ft.).

### [3.8 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 maximum length of the AISG multi-wire cable is 5 m (16.40 ft.).

### [3.9 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 maximum length of the AISG extension cable is 15 m (49.21 ft.).

## 3.1 RRU Cable List

This section describes RRU cable connections.

**Table 3-1** lists RRU cables.

**Table 3-1** RRU cables

Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
<b>3.2 RRU PGND Cable</b>	OT terminal (M6, 16 mm <sup>2</sup> or 0.025 in. <sup>2</sup> )	Ground terminal on the RRU	OT terminal (M8, 16 mm <sup>2</sup> or 0.025 in. <sup>2</sup> )	Ground terminal on the ground bar
<b>3.3 RRU Power Cable</b>	Tool-less female connector (pressfit type)	NEG(-) and RTN(+) ports on the RRU	Tool-less female connector (pressfit type)	One of RRU0 to RRU5 ports on the EPU One of LOAD0 to LOAD5 ports on the DCDU-11B
<b>3.4 RRU Alarm Cable</b>	DB15 male connector	EXT_ALM port on the RRU	Cord end terminal	External alarm device

Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
<b>3.5 CPRI Fiber Optic Cable</b> (in multi-mode scenarios)	DLC connector	CPRI0 port on the RRU CPRI1 port on the RRU	DLC connector	GSM+UMTS (GU) mode CPRI port on the GTMU in the BBU CPRI port on the WBBP in the BBU GSM+LTE (GL) mode CPRI port on the GTMU in the BBU CPRI port on the LBBP in the BBU UMTS+LTE (UL) mode CPRI port on the WBBP in the BBU CPRI port on the LBBP in the BBU
<b>3.5 CPRI Fiber Optic Cable</b> (in single-mode scenarios)	DLC connector	CPRI0 port on the RRU	DLC connector	GSM only (LO) mode CPRI port on the GTMU in the BBU UMTS only (LO) mode CPRI port on the WBBP in the BBU LTE only (LO) mode CPRI port on the LBBP in the BBU
<b>3.6 RRU RF Jumper</b>	DIN male connector	ANT_TX/RXA or ANT_TX/RXB port on the RRU	DIN male connector	Antenna system

Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
<b>3.7 Inter-RRU RF Cable</b>	DB2W2 connector	RX_IN/OUT port on the RRU	DB2W2 connector	RX_IN/OUT port on the RRU
<b>3.8 RRU AISG Multi-Wire Cable</b>	Waterproofed DB9 male connector	RET port on the RRU	Standard AISG female connector	Standard AISG male connector on the RCU or on the AISG extension cable
<b>3.9 RRU AISG Extension Cable</b>	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 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 the RRU PGND cable is 30 m (98.42 ft.).

### Exterior

An RRU 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>). This cable has an OT terminal at each end. **Figure 3-1** shows an RRU PGND cable.

**Figure 3-1** PGND cable



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

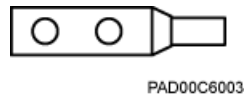
(2) OT terminal (M8, 16 mm<sup>2</sup> or 0.025 in.<sup>2</sup>)

#### 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



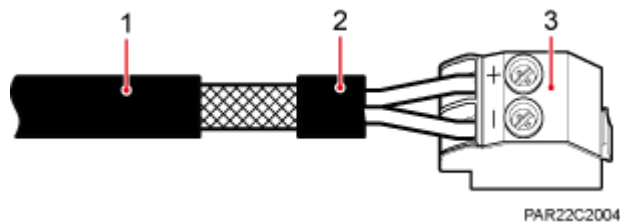
### 3.3 RRU Power Cable

The RRU power cable is a -48 V DC shielded cable. It feeds -48 V DC power to an RRU. The maximum length of the RRU power cable is 50 m (164.04 ft.).

#### Exterior

The cross-sectional areas of the RRU power cable is 6 mm<sup>2</sup> (0.0093 in.<sup>2</sup>). A tool-less female connector (pressfit type) needs to be added to one end of the power cable and a corresponding terminal needs to be added to the other end. The corresponding terminal is added to the bare wire based on the requirements of the connector on the external power device, as shown in Figure 3-3.

Figure 3-3 RRU power cable



(1) -48 V DC power cable

(2) Shield layer

(3) Tool-less female connector  
(pressfit type)

#### Pin Assignment

The DC power input cable is a 2-wire cable. Table 3-2 and Table 3-3 describe the pin assignment for the wires of a DC power input cable.

Table 3-2 Pin assignment for the wires of a DC power input cable (North American Standards)

Wire	Color
NEG(-)	Blue
RTN(+)	Black

**Table 3-3** Pin assignment for the wires of a DC power input cable (European Standards)

Wire	Color
NEG(-)	Blue
RTN(+)	Brown

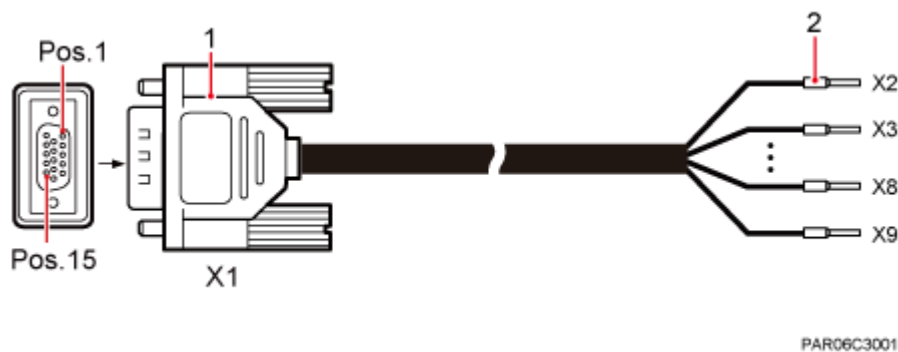
### 3.4 RRU Alarm Cable

The RRU alarm cable, a shielded straight-through cable, transmits alarm signals from an external device to an RRU so that the base station monitors the operating status of external devices. The maximum length of the RRU alarm cable is 5 m (16.40 ft.).

#### Exterior

An alarm cable has a DB15 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 male connector

(2) Cord end terminal

#### Pin Assignment

[Table 3-4](#) describes the pin assignment for the wires of an RRU alarm cable.

**Table 3-4** Pin assignment for the wires of an RRU alarm cable

RRU Alarm Port	Pin of the DB15 Male Connector	Color	Type	Cord End Terminal	Description
Dry contact	X1.2	White and blue	Twisted pair	X2	SWITCH_INPUT0+



RRU Alarm Port	Pin of the DB15 Male Connector	Color	Type	Cord End Terminal	Description
	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-
	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 multi-mode fiber optic cables and single-mode fiber optic cables. They transmit CPRI signals.

 **NOTE**

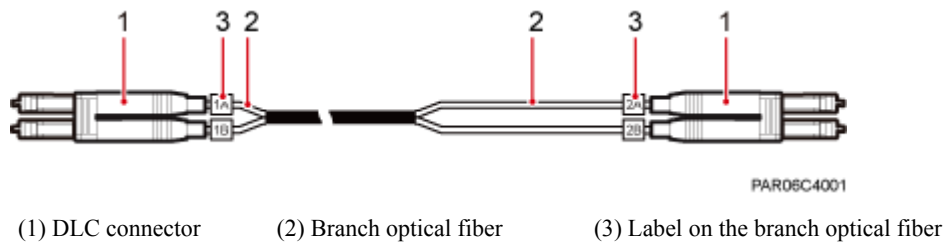
- An ODF can be used when the distance between a BBU and an RRU or the distance between interconnected RRUs is longer than 100 m (328.08 ft).
- A single-mode fiber optic cable connects a BBU to an ODF or connects an ODF to an RRU.

The maximum length of a CPRI fiber optic cable is 150 m (492.12 ft) When the fiber optical cable connects a BBU and an RRU. The length of a CPRI fiber optic cable is 10 m (32.81 ft) when the fiber optical cable connects two RRUs.

#### Exterior

**Figure 3-5** shows a fiber optic cable between a BBU and an RRU or between RRUs, with a DLC connector at each end.

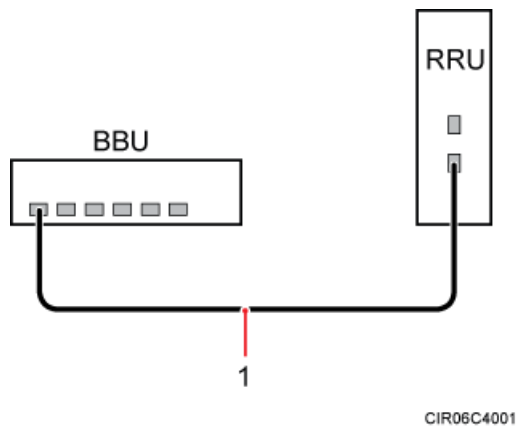
**Figure 3-5** Fiber optical cable between a BBU and an RRU or between RRUs



When a fiber optical cable connects a BBU and an RRU, the optical fibers on the BBU side and RRU side are 0.34 m (0.013 in.) and 0.03 m (0.0012 in.) long, respectively. When a fiber optical cable connects two RRUs, the optical fibers on both RRU sides are 0.03 m (0.0012 in.) long.

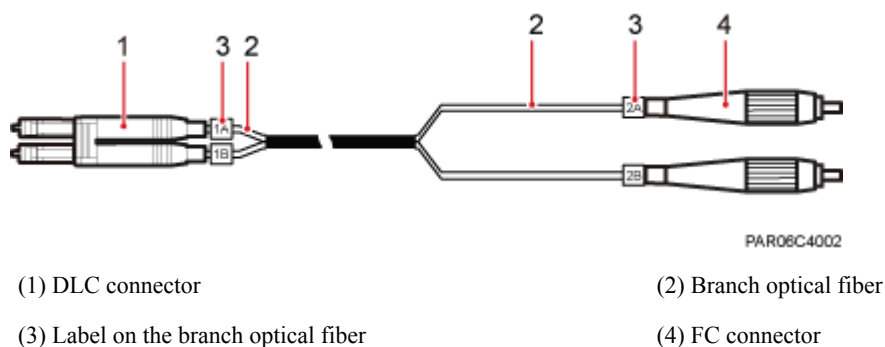
**Figure 3-6** shows the connections for a CPRI fiber optic cable between a BBU and an RRU.

**Figure 3-6** Connections for a CPRI fiber optic cable between a BBU and an RRU



**Figure 3-7** shows a single-mode fiber optic cable between a BBU and an ODF or between an ODF and an RRU, with a DLC connector at one end and an FC connector at the other end.

**Figure 3-7** Single-mode fiber optic cable between a BBU and an ODF or between an ODF and an RRU

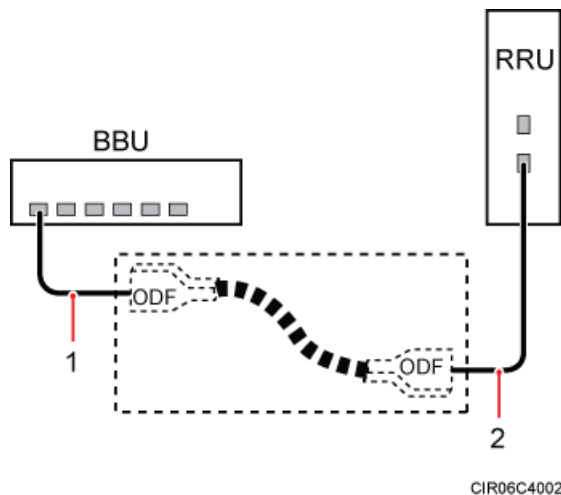


When a single-mode fiber optic cable connects a BBU and an ODF, the optical fibers on the BBU side and ODF side are 0.34 m (0.013 in.) and 0.8 m (0.031 in.) long, respectively.

When a single-mode fiber optic cable connects an ODF and an RRU, the optical fibers on the RRU side and ODF side are 0.03 m (0.013 in.) and 0.8 m (0.031 in.) long, respectively.

**Figure 3-8** shows the connections for a single-mode CPRI fiber optic cable between a BBU and an ODF or between an ODF and an RRU.

**Figure 3-8** Connections for a single-mode fiber optic cable between a BBU and an ODF or between an ODF and an RRU



(1) Single-mode CPRI fiber optic cable between a BBU and an ODF (2) Single-mode CPRI fiber optic cable between an ODF and an RRU

**NOTE**

A CPRI fiber optic cable must be connected to optical modules in the CPRI ports. A multi-mode fiber optic cable and single-mode fiber optic cable are connected to multi-mode optical modules and single-mode optical modules, respectively.

## Pin Assignment

**Table 3-5**, **Table 3-6**, and **Table 3-7** describe the labels on and recommended connections for fiber optic cables of an optical assembly.

**Table 3-5** Labels on and recommended connections for optical fibers of an optical assembly between a BBU and an RRU

Label	Connected To
1A	CPRI RX port on the RRU
1B	CPRI TX port on the RRU
2A	TX port on the BBU
2B	RX port on the BBU

**Table 3-6** Labels on and recommended connections for optical fibers of a fiber optic cable between RRUs

Label	Connected To
1A	CPRI RX port on RRU 1
1B	CPRI TX port on RRU 1
2A	CPRI TX port on RRU 0
2B	CPRI RX port on RRU 0

**Table 3-7** Labels on and recommended connections for optical fibers of a single-mode optical assembly between a BBU and an ODF or between an ODF and an RRU

Label	Connected To
1A	RX port on the BBU or CPRI RX port on the RRU
1B	TX port on the BBU or CPRI TX port on the RRU
2A	ODF
2B	ODF

## 3.6 RRU RF Jumper

The 1/2" RRU RF jumper transmits and receives RF signals between an RRU and an antenna.

 **NOTE**

- When the distance between an RRU and an antenna is within 14 m (45.93 ft.), connect one end of the RF jumper to the ANT-TX/RXA or ANT-TX/RXB port at the RRU bottom, and connect the other end to the antenna.
- When the distance between the RRU and the antenna exceeds 14 m (45.93 ft.), connect one end of the RF jumper to the ANT-TX/RXA or ANT-TX/RXB port at the RRU bottom, and connect the other end to the feeder. Then, connect the other end of the feeder 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



(1) DIN male connector

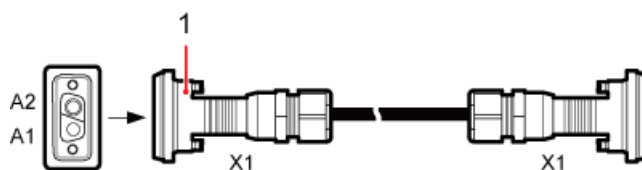
## 3.7 Inter-RRU RF Cable

An inter-RRU RF cable connects the RX\_IN/OUT ports on two RRUs in the same cell and transmits RF signals between the RRUs. The maximum length of the inter-RRU RF cable is 2 m (6.56 ft.).

### Exterior

**Figure 3-10** shows an inter-RRU RF cable with a DB2W2 connector at each end.

**Figure 3-10** Inter-RRU RF cable



(1) DB2W2 connector

## 3.8 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 maximum length of the AISG multi-wire cable is 5 m (16.40 ft.).

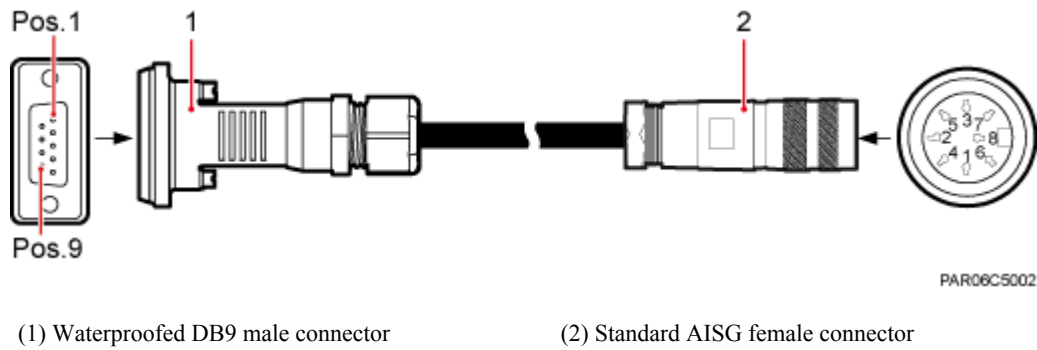
### NOTE

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 3-11**.

**Figure 3-11** AISG multi-wire cable



## Pin Assignment

**Table 3-8** describes the pin assignment for the wires of an AISG multi-wire cable.

**Table 3-8** 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
-	X2.1 and X2.6 are interconnected.	-	-	+12 V
-	X2.4 and X2.7 are interconnected.	-	-	GND

## 3.9 RRU AISG Extension Cable

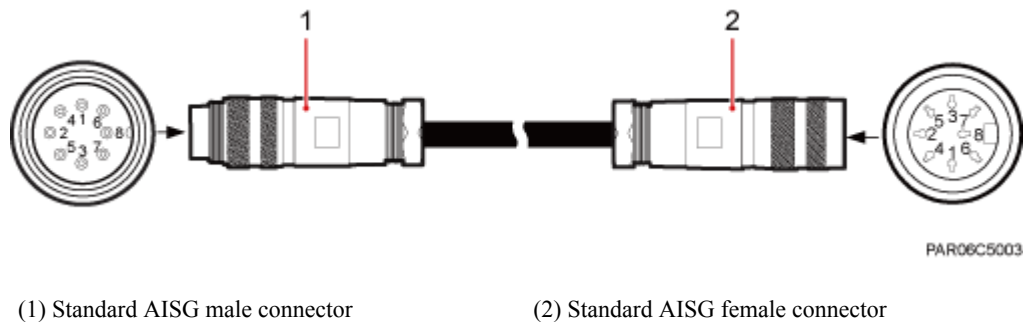
When the distance between an RRU and an RCU is longer than 5 m (16.4 ft.), an AISG multi-wire cable is not long enough to connect the RRU and the RCU. In this case, an AISG extension

cable is used to extend the AISG multi-wire cable for transmitting RS485 signals. The maximum 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 3-12](#).

**Figure 3-12** AISG extension cable



## Pin Assignment

[Table 3-9](#) describes the pin assignment for the wires of an AISG extension cable.

**Table 3-9** 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 A
		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 RRU Auxiliary Devices

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## About This Chapter

This chapter describes RRU auxiliary devices.

### 4.1 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.



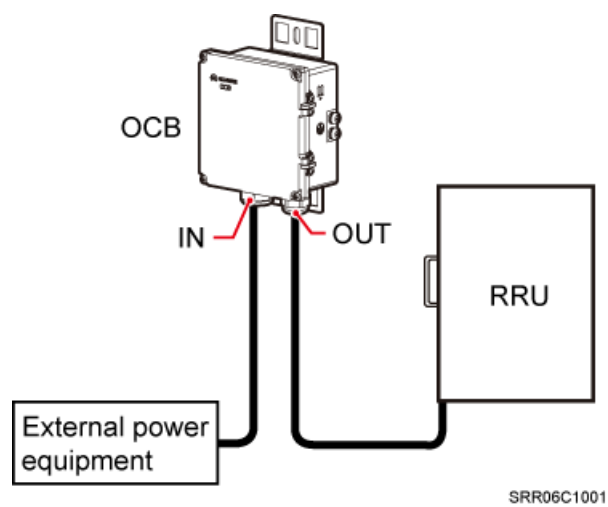
## 4.1 OCB

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.

### Application Scenario of an OCB

Figure 4-1 shows the application scenario of an OCB.

Figure 4-1 Application scenario of an OCB



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