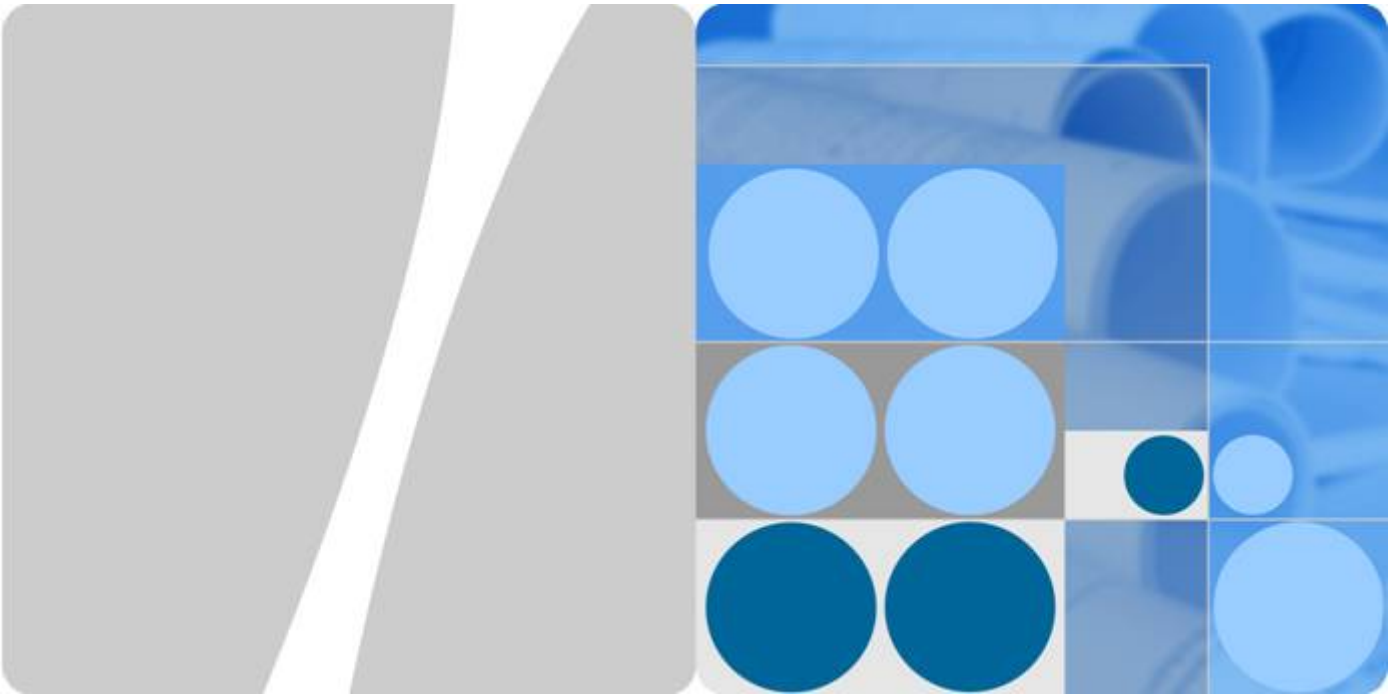

BTS3900C (Ver.C)

Hardware Description

Issue 03

Date 2013-05-27

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About This Document

This document describes the functions, specifications, and configurations of the components in the BTS3900C (Ver.C) cabinet as well as cable types, cable connections, and connector specifications. This document serves as a reference for the BTS3900C (Ver.C) site planning and deployment. BTS3900C (Ver.C) is shortened to BTS3900C in this document.

Product Version

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

Product Name	Product Version
BTS3900C	V100R007C00
BTS3900C WCDMA	V200R014C00

Intended Audience

This document is intended for:

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

Organization

1 Changes In *BTS3900C (Ver.C) Hardware Description*

This chapter describes the changes in the *BTS3900C (Ver.C) Hardware Description*.

2 BTS3900C Cabinet

This chapter describes the exterior, boards, modules, and configurations of the BTS3900C cabinets, providing reference for planning and deploying the BTS3900C.

3 BTS3900C Modules

This chapter describes the modules in the BTS3900C, including the BBU, RRU, and GPS surge protector.

4 BTS3900C Power System

The BTS3900C supports 110 V AC, 220 V AC, and -48 V DC power supply. When AC power is used, the base station converts AC power into -48 V DC power.

5 BTS3900C Monitoring System

The BTS3900C monitoring system monitors all boards and components in a BTS3900C cabinet. If any board or component is faulty, an alarm is automatically reported. The RRU or UPEU and UEIU in the BBU collect monitoring signals from boards and components to monitor the surrounding environment of the BTS3900C.

6 BTS3900C Components

This section describes the components of a BTS3900C cabinet.

7 BTS3900C Cables

The BTS3900C cables are the PGND cables, power cables, transmission cables, CPRI cables, signal cables, and RF cables.

Conventions

Symbol Conventions

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

Symbol	Description
DANGER	Indicates a hazard with a high level or medium level of risk which, if not avoided, could result in death or serious injury.
WARNING	Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
CAUTION	Indicates a potentially hazardous situation that, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results.
TIP	Indicates a tip that may help you solve a problem or save time.
NOTE	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.

Convention	Description
Boldface	Names of files, directories, folders, and users are in **boldface**. For example, log in as user **root**.
Italic	Book titles are in *italics*.
`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
Boldface	The keywords of a command line are in **boldface**.
Italic	Command arguments are in *italics*.
[ ]	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
Boldface	Buttons, menus, parameters, tabs, window, and dialog titles are in **boldface**. For example, click **OK**.
>	Multi-level menus are in **boldface** and separated by the ">" signs. For example, choose **File** > **Create** > **Folder**.

Keyboard Operations

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

Format	Description
Key	Press the key. For example, press **Enter** and press **Tab**.
Key 1+**Key 2**	Press the keys concurrently. For example, pressing **Ctrl**+**Alt**+**A** means the three keys should be pressed concurrently.
Key 1, **Key 2**	Press the keys in turn. For example, pressing **Alt**, **A** 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.

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.

Contents

1 Changes In *BTS3900C (Ver.C) Hardware Description*

This chapter describes the changes in the *BTS3900C (Ver.C) Hardware Description*.

03 (2013-05-27)

This is the third commercial release.

Compared with issue 02 (2012-12-30), no topic is added or deleted.

Compared with issue 02 (2012-12-30), this issue incorporates the following changes:

Topic	Change Description
● 3.1.6 WMPT ● 3.1.5 UMPT ● 3.1.9 LMPT ● 3.1.7 WBBP ● 3.1.10 LBBP	Added specifications of these boards.
7.7 CPRI Fiber Optic Cable	Added information about the classification of CPRI fiber optic cables and the principles for selecting CPRI fiber optic cables.

02 (2012-12-30)

This is the second official release.

Compared with issue 01 (2012-11-10), no information is added from this issue.

Compared with issue 01 (2012-11-10), this issue includes the following changes:

Topic	Change Description
All the sections	Changed the description the connector of DC output terminal of PDU10D-01.

Compared with issue 01 (2012-11-10), no information is deleted from this issue.

01 (2012-11-10)

This is the first official release.

Compared with issue Draft A (2012-09-20), this issue includes the following new information:

3.1.3 BBU3900 Technical Specifications

Compared with issue Draft A (2012-09-20), this issue includes the following changes:

Topic	Change Description
3.1.5 UMPT	Changed the indicator description of the UMPT.

Compared with issue Draft A (2012-09-20), no information is deleted from this issue.

Draft A (2012-09-20)

This is a draft.

2 BTS3900C Cabinet

About This Chapter

This chapter describes the exterior, boards, modules, and configurations of the BTS3900C cabinets, providing reference for planning and deploying the BTS3900C.

2.1 Exterior of the BTS3900C Cabinet
This section describes the exterior of the BTS3900C cabinet.

2.2 Interior of the BTS3900C Cabinet
This section describes the interior and configuration of the BTS3900C AC cabinet and BTS3900C DC cabinet.

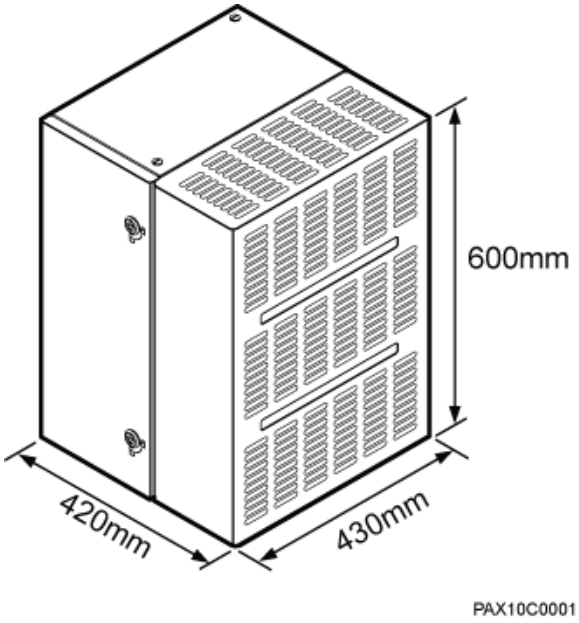
2.3 BTS3900C Engineering Specifications
This section describes the BTS3900C engineering specifications. The BTS3900C engineering specifications include input power specifications and equipment specifications.

2.1 Exterior of the BTS3900C Cabinet

This section describes the exterior of the BTS3900C cabinet.

The BTS3900C cabinet is white and consists of an OMB (Ver.C) cabinet (shortened to OMB (1) in this document) and a remote radio unit (RRU) subrack, as shown in **Figure 2-1**.

Figure 2-1 Exterior of the BTS3900C cabinet



NOTE

(1) OMB: outdoor mini box.

2.2 Interior of the BTS3900C Cabinet

This section describes the interior and configuration of the BTS3900C AC cabinet and BTS3900C DC cabinet.

Interior of the BTS3900C AC Cabinet

Figure 2-2 shows the interior of the BTS3900C AC cabinet, and **Table 2-1** describes the components in the BTS3900C AC cabinet.

Figure 2-2 Interior of the BTS3900C AC cabinet

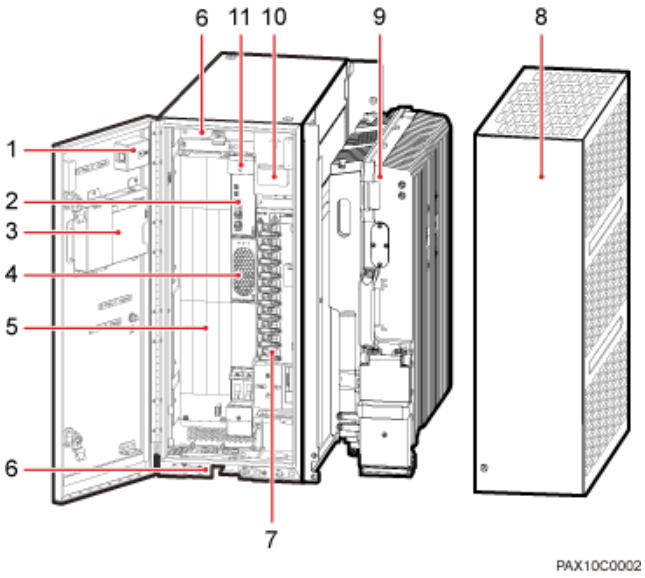


Table 2-1 Components in the BTS3900C AC cabinet

No.	Component	Optional/ Mandatory	Maximum Quantity in a Single Cabinet	Description
1	ELU	Mandatory	1	The electronic label unit (ELU) automatically reports the cabinet type.
2	PMU 11A	Mandatory	1	The power monitoring unit 11A (PMU 11A) manages the power system, monitors power distribution, and reports alarms.

No.	Component	Optional/ Mandatory	Maximum Quantity in a Single Cabinet	Description
3	HEUB	Mandatory	1	The heat exchange unit type B (HEUB) provides power for the fan assembly, monitors the status of the fan assembly, collects the cabinet environment monitoring information and power surge protection alarm information, and reports the collected information to the BBU.
4	PSU (R4850G2)	Mandatory	2	The power supply unit (PSU) converts 110 V AC or 220 V AC power into -48 V DC power.
5	BBU3900	Mandatory	1	The BBU3900 is a baseband processing unit. It processes the baseband signals of the base station.

No.	Component	Optional/ Mandatory	Maximum Quantity in a Single Cabinet	Description
6	Fan assembly	Mandatory	2	The fan assembly dissipates heat from the cabinet, including outer air circulation fan assembly and inner air circulation fan assembly. Two fan assemblies are separately installed at the left bottom and the left top in the OMB.
7	PDU10D-01	Mandatory	1	The power distribution unit 10D-01 (PDU10D-01) provides -48 V DC power for all components in the cabinet.
8	RRU subrack	Mandatory	1	The RRU subrack houses the RRU.
9	RRU	Mandatory	1	The RRU processes and forwards RF signals between the BBU and antenna system.
10	AC surge protection box	Mandatory	1	The AC surge protection box provides surge protection for the input AC power.

No.	Component	Optional/ Mandatory	Maximum Quantity in a Single Cabinet	Description
11	ETP48100-A1	Mandatory	1	The embedded telecommunication power 48100-A1 (ETP48100-A1) system converts AC power into DC power.

Interior of the BTS3900C DC Cabinet

Figure 2-3 shows the interior of the BTS3900C DC cabinet, and **Table 2-2** describes the components in the BTS3900C DC cabinet.

Figure 2-3 Interior of the BTS3900C DC cabinet

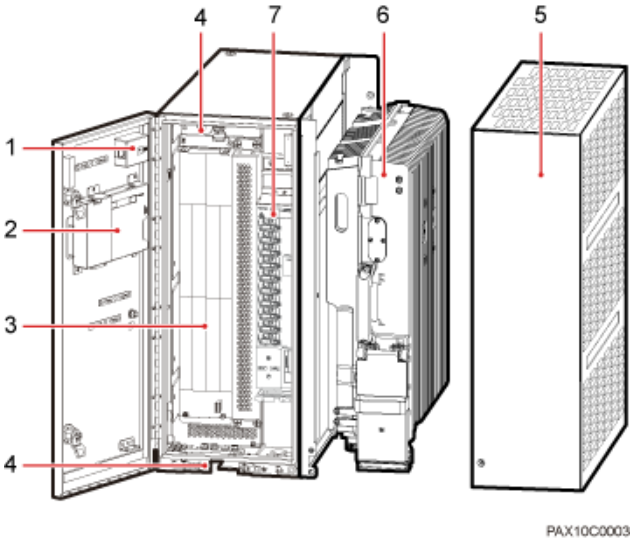


Table 2-2 Components in the BTS3900C DC cabinet

No.	Component	Optional/ Mandatory	Maximum Quantity in a Single Cabinet	Description
1	ELU	Mandatory	1	The ELU automatically reports the cabinet type.

No.	Component	Optional/ Mandatory	Maximum Quantity in a Single Cabinet	Description
2	HEUB	Mandatory	1	The HEUB provides power for the fan assembly, monitors the status of the fan assembly, collects the cabinet environment monitoring information and power surge protection alarm information, and reports the collected information to the BBU.
3	BBU3900	Mandatory	1	The BBU3900 is a baseband processing unit. It processes the baseband signals of the base station.
4	Fan assembly	Mandatory	2	The fan assembly dissipates heat from the cabinet, including outer air circulation fan assembly and inner air circulation fan assembly. Two fan assemblies are separately installed at the left bottom and the left top in the OMB.

No.	Component	Optional/ Mandatory	Maximum Quantity in a Single Cabinet	Description
5	RRU subrack	Mandatory	1	The RRU subrack houses the RRU.
6	RRU	Mandatory	1	The RRU processes and forwards RF signals between the BBU and antenna system.
7	PDU10D-01	Mandatory	1	The PDU10D-01 provides -48 V DC power for all components in the cabinet.

2.3 BTS3900C Engineering Specifications

This section describes the BTS3900C engineering specifications. The BTS3900C engineering specifications include input power specifications and equipment specifications.

Input Power Specifications

The BTS3900C supports 110 V AC, 220 V AC, and -48 V DC power supply. When AC power is used, the base station converts AC power into -48 V DC power.

Table 2-3 and Table 2-4 list the input voltage scopes supported by the BTS3900C.

Table 2-3 AC input voltage range

Input Power	Rated Voltage	Permissible Voltage Range
220 V AC single-phase	200V AC to 240 V AC	176V AC to 290V AC
110 V AC dual-live-wire	100/200 V AC to 120/240 V AC	90/180 V AC to 135/270 V AC

Table 2-4 DC input voltage range

Input Power	Rated Voltage
-48 V DC	-38.4 V DC to -57 V DC

Equipment Specifications

Table 2-5 lists the equipment specifications of a BTS3900C.

Table 2-5 Equipment specifications of a BTS3900C

Item	Specifications
Dimensions (height x width x depth)	600 mm x 420 mm x 430 mm (23.62 in. x 16.54 in. x 16.93 in.)
Weight	BTS3900C AC: ≤ 32 kg (without the BBU and RRU) BTS3900C DC: ≤ 25 kg (without the BBU and RRU) RRU subrack: ≤ 4 kg (without the RRU)

NOTE

For details about other engineering specifications of the BTS3900C, see *3900 Series Base Station Technical Description*.

3 BTS3900C Modules

About This Chapter

This chapter describes the modules in the BTS3900C, including the BBU, RRU, and GPS surge protector.

3.1 BBU3900 Components
This section describes the boards and modules of the BBU3900 in terms of their configuration rules, functions, ports, indicators, and DIP switches.

3.2 RRU
This section describes the types of RRUs supported by the BTS3900C.

3.3 GPS Surge Protector
The Global Positioning System (GPS) surge protector protects the satellite receiver from lightning.

3.1 BBU3900 Components

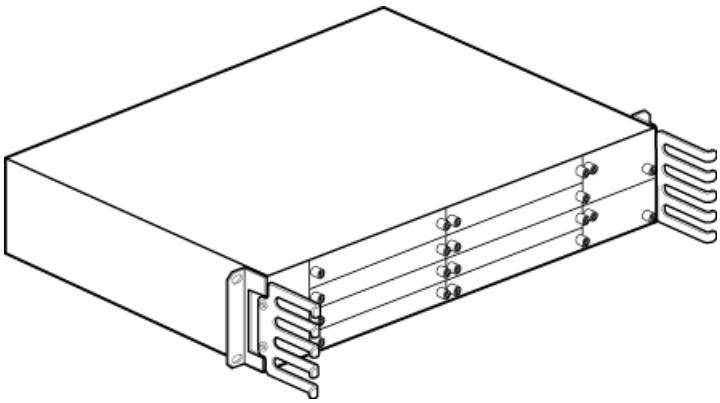
This section describes the boards and modules of the BBU3900 in terms of their configuration rules, functions, ports, indicators, and DIP switches.

3.1.1 BBU3900

The BBU3900, which has a case structure, is 19 inches wide and 2 U high.

The dimensions of the BBU3900 are 86 mm x 442 mm x 310 mm (3.39 in. x 17.4 in. x 12.2 in.) (H x W x D), as shown in **Figure 3-1**.

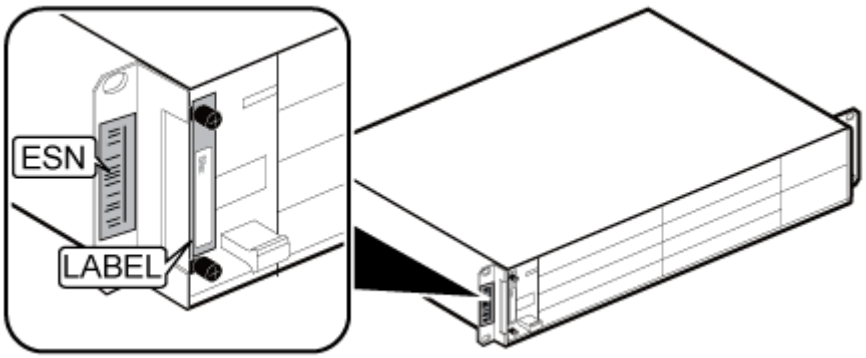
Figure 3-1 BBU3900



The Electronic Serial Number (ESN) is a unique identifier of a Network Element (NE). It is used during base station commissioning.

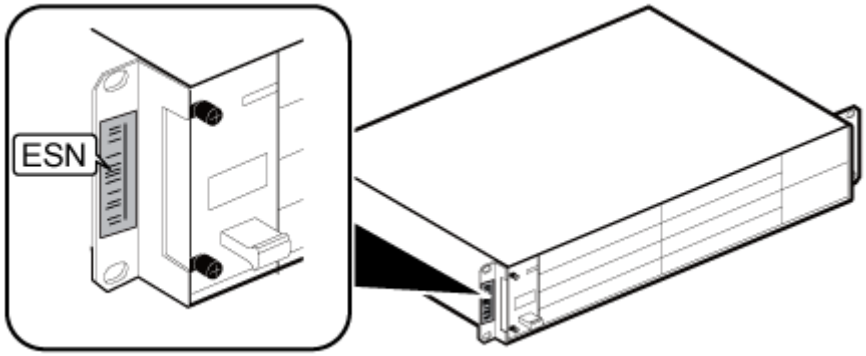
- If there is a label on the FAN unit of the BBU, the ESN is printed on the label and a mounting ear of the BBU, as shown in **Figure 3-2**.

  Figure 3-2 ESN (1)

- If there is no label on the FAN unit of the BBU, the ESN is printed on a mounting ear of the BBU, as shown in **Figure 3-3**.

Figure 3-3 ESN (2)



3.1.2 BBU3900 Functions

The BBU3900 is a baseband processing unit. It processes the baseband signals of the base station.

The BBU3900 performs the following functions:

- Provides ports for communication between the base station and the BSC or RNC.
- Provides CPRI ports for communication between the BBU and the RFUs.
- Provides USB(1) ports. A USB flash drive that stores required software and configuration data can be inserted into the USB port to perform the automatic base station upgrade.
- Provides an OM channel between the base station and the LMT or the M2000 to operate and maintain the base station.
- Processes uplink and downlink data.
- Manages the entire dual-mode system in terms of OM and signaling processing.
- Provides the system clock.

NOTE

(1) The security of the USB port is ensured by encryption. The TST port is used for commissioning the base station rather than importing or exporting the base station configuration.

3.1.3 BBU3900 Technical Specifications

This section describes the technical specifications of the BBU, which include capacity, transmission ports, input power specifications, equipment specifications, environment specifications, and surge protection specifications.

For details about technical specifications of a BBU3900, see section "BBU3900 Technical Specifications" in the *3900 Series Base Station Technical Description*.

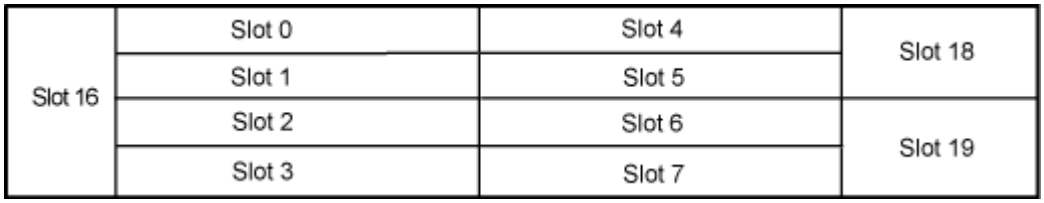
3.1.4 Slot Assignment of the BBU3900

This section describes the slot assignment of the BBU3900 in the following modes: BBU3900 GSM, BBU3900 UMTS, BBU3900 LTE, BBU3900 GSM+UMTS (shortened to GU), BBU3900 GSM+LTE (shortened to GL), and BBU3900 UMTS+LTE (shortened to UL).

Slots in the BBU3900

Slots in the BBU3900 are the same in different scenarios, as shown in **Figure 3-4**.

Figure 3-4 Slots in the BBU3900



BBU3900 Working in GO Mode

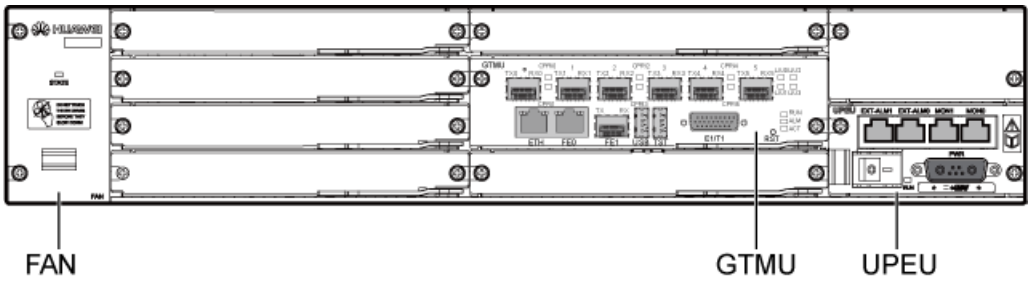
Table 3-1 describes the principles for configuring the boards in the BBU3900 working in GO mode.

Table 3-1 Principles for configuring the boards in the BBU3900 working in GO mode

Board	Optional/ Mandatory	Maximum Quantity	Installation Slot	Remarks
GTMU	Mandatory	1	Slots 5 and 6	It is configured only in slot 6 (with slots 5 and 6 occupied).
FAN	Mandatory	1	Slot 16	It is configured only in slot 16.
UPEU	Mandatory	2	Slot 18 or 19	A single UPEU is preferentially configured in slot 19.
USCU	Optional	1	Slot 0 or 1	It is preferentially configured in slot 1. The 1 U GPS/ GLONASS receiver is configured in slot 1 (with slots 0 and 1 occupied).
UTRP	Optional	1	Slot 0 or 4	It is preferentially configured in slot 4.
UEIU	Optional	1	Slot 18	-
UBRI	Optional	1	Slot 2	-

Figure 3-5 shows the typical configurations of the BBU3900 working in GO mode.

Figure 3-5 Typical configurations of the BBU3900 working in GO mode



NOTE

UTRP is supported in V100R012 and later versions.

BBU3900 UMTS

Table 3-2 describes the slot assignment principles for the boards in the BBU3900 UMTS.

Table 3-2 Slot assignment principles for the boards in the BBU3900 UMTS

Board	Optional/ Mandatory	Maximum Number	Slot	Restriction
WMPT/UMPT	Mandatory	2	Slot 6 or 7	A single UMPT or WMPT is preferentially configured in slot 7. The UMPT and WMPT cannot be configured simultaneously.

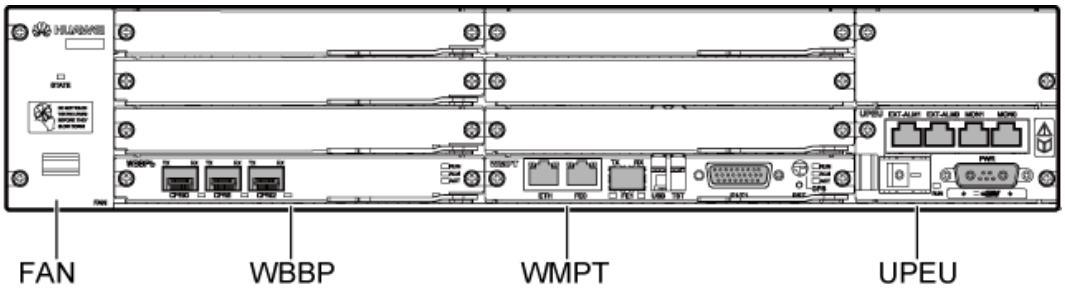
Board	Optional/ Mandatory	Maximum Number	Slot	Restriction
WBBP	Mandatory	6	Slots 0 to 5	It is configured in slot 3 by default. ● If more CPRI ports are required, the WBBP is installed, in descending order of priority, in slot 3 or 2. ● If no more CPRI ports are required, the WBBP is installed, in descending order of priority, in slot 3, 0, 1, 2, 4, or 5. The slot assignment principles for the WBBP boards are as follows: ● The WBBPd or WBBPf is preferentially configured in slot 3 or 2. The WBBPf takes precedence over the WBBPd in slot assignment. ● If five or more WBBPs are required, ensure that a WBBP is installed in each of slots

Board	Optional/ Mandatory	Maximum Number	Slot	Restriction
				2 and 3. At least one of the WBBPs in slots 2 and 3 is WBBPd or WBBPf. ● If both slots 2 and 3 are occupied by the WBBPa or WBBPb boards, exchange boards to ensure that the WBBPd or WBBPf is configured in slot 3 or 2. ● If the WBBPf4 is installed in the same BBU as the WBBPf1, WBBPf2, and WBBPf3, the WBBPf4 is preferentially installed in slots 2 and 3.
FAN	Mandatory	1	Slot 16	It must be configured in slot 16.
UPEU	Mandatory	2	Slot 18 or 19	A single UPEU is preferentially configured in slot 19.
UEIU	Optional	1	Slot 18	-

Board	Optional/ Mandatory	Maximum Number	Slot	Restriction
UTRP	Optional	2	Slot 0, 1, 4, 5, or 6	A single UTRP is preferentially configured in slot 4. If more UTRPs are required, the UTRP is installed, in descending order of priority, in slot 4, 5, 0, 1, or 6. If several UTRPs are configured, the priority of them as following: UTRPc, UTRP6, UTRP9, UTRP2, UTRP3/UTRP4
USCU	Optional	1	Slot 1 or 0	It is preferentially configured in slot 1. When configured with two satellite cards, it is configured in slot 1 (with both slots 0 and 1 occupied).

Figure 3-6 shows the typical configurations of the BBU3900 UMTS.

Figure 3-6 Typical configuration of the BBU3900 UMTS



BBU3900 LTE

Table 3-3 describes the slot assignment principles for the boards in the BBU3900 LTE.

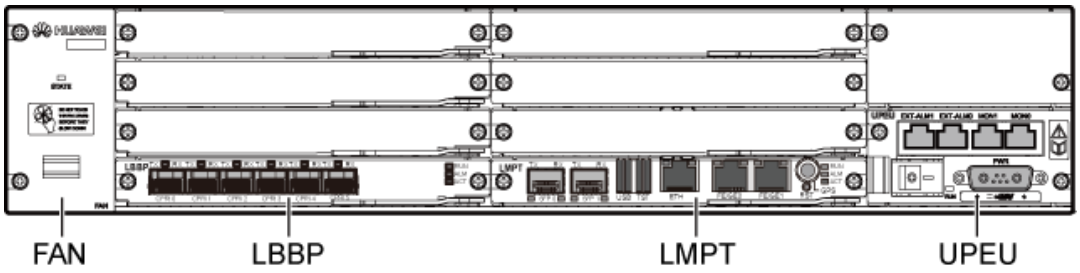
Table 3-3 Slot assignment principles for the boards in the BBU3900 LTE

Board	Optional/ Mandatory	Maximum Number	Slot	Restriction
LMPT/UMPT	Mandatory	2	Slot 6 or 7	A single LMPT or UMPT is preferentially configured in slot 7. The UMPT and WMPT cannot be configured simultaneously.
LBBP	Mandatory	6	Slots 0 to 5	A single LBBP is preferentially configured in slot 3. If more LBBPs are required, the LBBP is installed, in descending order of priority, in slot 3, 1, 2, 0, 4, or 5.
FAN	Mandatory	1	Slot 16	It is configured only in slot 16.
UPEU	Mandatory	2	Slot 18 or 19	A single UPEU is preferentially configured in slot 19.
UEIU	Optional	1	Slot 18	-
UTRP	Optional	1	Slot 4 or 5	It is preferentially configured in slot 4.

Board	Optional/ Mandatory	Maximum Number	Slot	Restriction
USCU	Optional	1	Slot 0, 1, 4, or 5	A single USCU is preferentially configured in slot 5. A USCU that occupies 1 U space is configured in slot 5 (with both slots 5 and 4 occupied). If slots 4 and 5 are occupied, a USCU is preferentially configured in slot 1, or a USCU that uses a dual-satellite card is configured in slot 1, with both slots 1 and 0 occupied.

Figure 3-7 shows the typical configurations of the BBU3900 LTE.

Figure 3-7 Typical configuration of the BBU3900 LTE



BBU3900 GU

Table 3-4 describes the slot assignment principles for the boards in the BBU3900 GU.

Table 3-4 Slot assignment principles for the boards in the BBU3900 GU

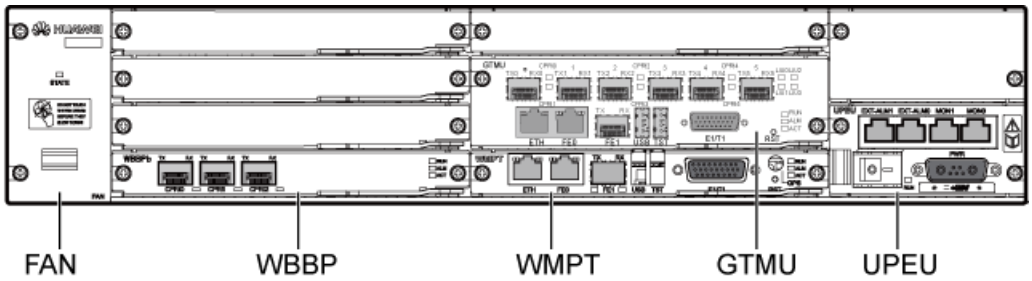
Board	Optional/ Mandatory	Maximum Number	Slot	Restriction
WMPT/UMPT	Mandatory	1	Slot 7	The WMPT or UMPT is configured only in slot 7. The UMPT and WMPT cannot be configured simultaneously.
GTMU	Mandatory	1	Slots 5 and 6	It is configured only in slot 6 (with slots 5 and 6 occupied).

Board	Optional/ Mandatory	Maximum Number	Slot	Restriction
WBBP	Mandatory	5	Slots 0 to 4	It is configured in slot 3 by default. ● If more CPRI ports are required, the WBBP is installed, in descending order of priority, in slot 3 or 2. ● If no more CPRI ports are required, the WBBP is installed, in descending order of priority, in slot 3, 0, 1, 2, or 4. If a WBBPd or WBBPf is required, it is installed, in descending order of priority, in slot 3 or 2. If five or more WBBPs are required, ensure that a WBBP is installed in each of slots 2 and 3. At least one of the WBBPs in slots 2 and 3 is WBBPd or WBBPf. The WBBPf takes precedence over the WBBPd during slot assignment.

Board	Optional/ Mandatory	Maximum Number	Slot	Restriction
FAN	Mandatory	1	Slot 16	It is configured only in slot 16.
UPEU	Mandatory	2	Slot 18 or 19	A single UPEU is preferentially configured in slot 19.
UEIU	Optional	1	Slot 18	-
UTRP	Optional	2	Slot 0 or 4	It is preferentially configured in slot 4. The UTRP in GSM mode takes precedence over the UTRP in UMTS mode during slot assignment.
USCU	Optional	1	Slot 0, 1, or 4	It is preferentially configured in slot 4.
UBRI	Optional	1	Slot 2	-

Figure 3-8 shows the typical configurations of the BBU3900 GU.

Figure 3-8 Typical configuration of the BBU3900 GU



BBU3900 GL

Table 3-5 describes the slot assignment principles for the boards in the BBU3900 GL.

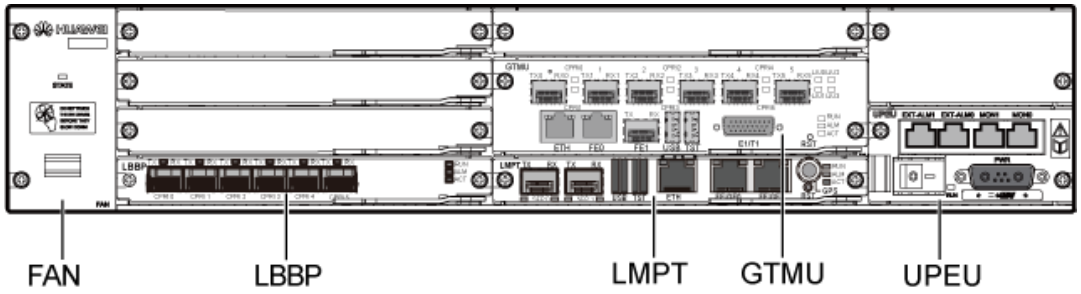
Table 3-5 Slot assignment principles for the boards in the BBU3900 GL

Board	Optional/ Mandatory	Maximum Number	Slot	Restriction
LMPT/UMPT	Mandatory	1	Slot 7	It is configured only in slot 7. The UMPT and WMPT cannot be configured simultaneously.
GTMU	Mandatory	1	Slots 5 and 6	It is configured only in slot 6 (with slots 5 and 6 occupied).
LBBP	Mandatory	5	Slots 0 to 4	A single LBBP is preferentially configured in slot 3. If more LBBPs are required, the LBBP is installed, in descending order of priority, in slot 3, 1, 2, 0, or 4.
FAN	Mandatory	1	Slot 16	It is configured only in slot 16.
UPEU	Mandatory	2	Slot 18 or 19	A single UPEU is preferentially configured in slot 19.
UEIU	Optional	1	Slot 18	-
UTRP	Optional	2	Slot 0 or 4	It is preferentially configured in slot 4. The UTRP in GSM mode takes precedence over the UTRP in LTE mode during slot assignment.

Board	Optional/ Mandatory	Maximum Number	Slot	Restriction
USCU	Optional	1	Slot 0, 1, or 4	It is preferentially configured in slot 4.
UBRI	Optional	1	Slot 2	-

Figure 3-9 shows the typical configurations of the BBU3900 GL.

Figure 3-9 Typical configuration of the BBU3900 GL



BBU3900 UL

Table 3-6 describes the slot assignment principles for the boards in the BBU3900 UL.

Table 3-6 Slot assignment principles for the boards in the BBU3900 UL

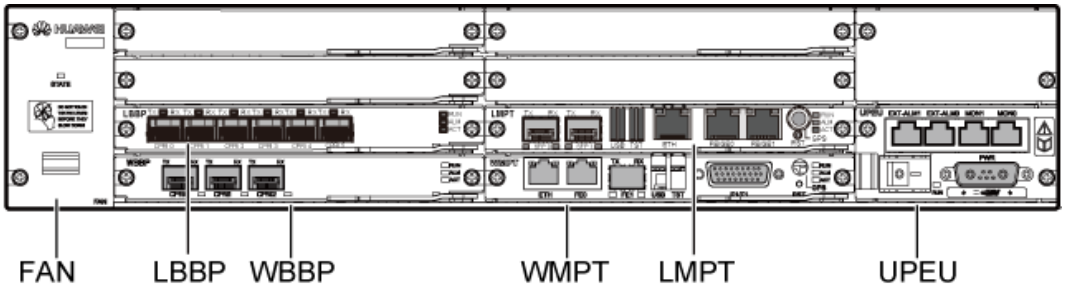
Board	Optional/ Mandatory	Maximum Number	Slot	Restriction
LMPT/UMPT	Mandatory	1	Slot 6	It is configured only in slot 6.
WMPT/UMPT	Mandatory	1	Slot 7	It is configured only in slot 7.
LBBP	Mandatory	5	Slot 0, 1, 2, 4, or 5	A single LBBP is configured only in slot 2. If more LBBPs are required, the LBBP is installed, in descending order of priority, in slot 2, 1, 0, 4, or 5.

Board	Optional/ Mandatory	Maximum Number	Slot	Restriction
WBBP	Mandatory	5	Slot 0, 1, 3, 4, or 5	A single WBBP is configured only in slot 3. If more WBBPs are required, the WBBP is installed, in descending order of priority, in slot 3, 0, 1, 4, or 5. If a WBBPd or WBBPf is required, it is configured only in slot 3. The WBBP, which provides a maximum of six CPRI ports, is configured in either slot 2 or slot 3.
FAN	Mandatory	1	Slot 16	It is configured only in slot 16.
UPEU	Mandatory	2	Slot 18 or 19	A single UPEU is preferentially configured in slot 19.
UEIU	Optional	1	Slot 18	-
UTRP	Optional	2	Slot 4 or 5	It is preferentially configured in slot 4. The UTRP in UMTS mode takes precedence over the UTRP in LTE mode during slot assignment.

Board	Optional/ Mandatory	Maximum Number	Slot	Restriction
USCU	Optional	1	Slot 4 or 5	It is preferentially configured in slot 4.

Figure 3-10 shows the typical configurations of the BBU3900 UL.

Figure 3-10 Typical configuration of the BBU3900 UL



3.1.5 UMPT

The universal main processing and transmission unit (UMPT) processes signals and manages resources on other boards in the BBU3900.

NOTE

UMPTb1 is supported in NodeB V200R014C00SPC370 and later versions.

Specifications of the UMPT

The UMPT is classified into four types: UMPTa1, UMPTb1, UMPTa2, and UMPTa6. Table 3-7 lists the specifications of the UMPTa1, UMPTb1, UMPTa2, and UMPTa6.

Table 3-7 Specifications of the UMPT

Board	Applicable Mode	Transmission Mode	Number of ports	Port Capacity	Full/Half-Duplex
UMPTa1/ UMPTb1	UMTS	ATM over E1/T1 or IP over E1/T1	1	Four channels	-
		Transmission over FE/ GE electrical ports	1	10 Mbit/s, 100 Mbit/s, or 1000 Mbit/s	Full-duplex

Board	Applicable Mode	Transmission Mode	Number of ports	Port Capacity	Full/Half-Duplex
		Transmission over FE/GE optical ports	1	100 Mbit/s or 1000 Mbit/s	Full- or half-duplex
UMPTa2/UMPTa6	LTE	IP over E1/T1	1	Four channels	-
		Transmission over FE/GE electrical ports	1	10 Mbit/s, 100 Mbit/s, or 1000 Mbit/s	Full-duplex
		Transmission over FE/GE optical ports	1	100 Mbit/s or 1000 Mbit/s	Full- or half-duplex

The following table describes the signaling specifications of the UMPTa2, or UMPTa6 working in LTE mode.

Table 3-8 Signaling specifications

Board	Signaling Specifications (CAPS)
UMPTa2/UMPTa6	120

The following table describes the data radio bearer (DRB) specifications and maximum number of users supported by the UMPTa2, or UMPTa6 working in LTE mode.

Table 3-9 Data radio bearer specifications

Board	Maximum Number of Users
UMPTa2/UMPTa6	10800

The maximum of data radio bearers (DRBs) supported by the UMPTa2/UMPTa6 working in LTE mode is three times the maximum number of UEs in RRC_Connected mode.

NOTE

For the signaling specifications of an entire eNodeB or NodeB, see section "Signaling Specifications" in *3900 Series Base Station Technical Description*. For the maximum number of DRBs and UEs in RRC_Connected mode, see section "Baseband Specifications" in *3900 Series Base Station Technical Description*.

Panel

Figure 3-11, **Figure 3-13**, **Figure 3-12** and **Figure 3-14** show the panels of the UMPT boards.

Figure 3-11 UMPTa1 Panel

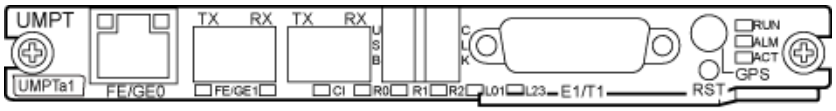


Figure 3-12 UMPTb1 Panel

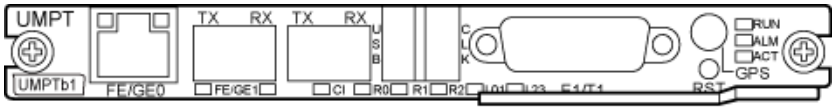


Figure 3-13 UMPTa2 Panel

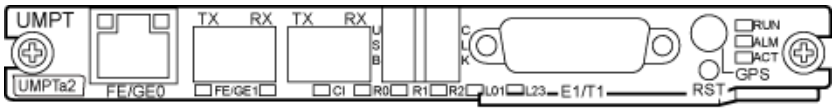
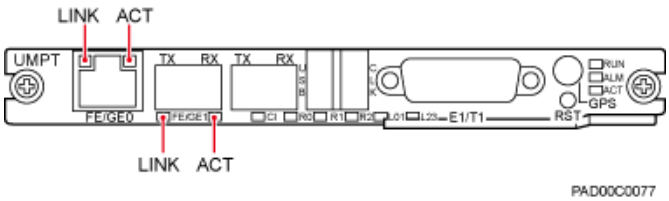


Figure 3-14 UMPTa6 Panel



NOTE

In the lower left of the UMPTa1, UMPTb1, UMPTa2, and UMPTa6, there are silkscreens UMPTa1, UMPTb1, UMPTa2, and UMPTa6, respectively, indicating their board types.

Functions

The UMPT performs the following functions:

- Performs configuration management, device management, performance monitoring, signaling message processing, and active/standby switchover.
- Controls all boards in the system.
- Provides the reference clock for the entire system.
- Implements transmission and provides absolute time and 1 pulse per second (PPS) reference clock source while being equipped with a single satellite card.
- Provides four E1 ports and two FE/GE ports to implement basic transmission in compliance with Asynchronous Transfer Mode (ATM), Internet Protocol (IP), and Point-to-Point Protocol (PPP) during the initial configuration.

Ports

Table 3-10 describes the ports on the UMPT.

Table 3-10 Ports on the UMPT

Silkscreen	Connector	Description
FE/GE1	SFP female connector	A 100 Mbit/s or 1000 Mbit/s adaptive Ethernet optical port is used for transmitting service data and signaling messages.
FE/GE0	RJ45 connector	A 10 Mbit/s, 100 Mbit/s, or 1000 Mbit/s adaptive Ethernet electrical port is used for transmitting service data and signaling messages.
USB(1)	USB connector	The USB port with the USB silkscreen is used for the software upgrade of a base station using a USB flash driver. This port also functions as a commissioning Ethernet port(2). The USB port with the CLK silkscreen functions as the TOD clock or test clock port.
E1/T1	DB26 female connector	The port is used for four E1/T1 signal inputs and outputs between the UMPT and universal E1/T1 lightning protection unit (UELP) or between base station controllers.
GPS	SMA connector	The GPS port on the UMPTa1, UMPTb1, or UMPTa2 is reserved. The GPS port on the UMPTa6 is used for transmitting radio frequency (RF) signals received from the antenna to the satellite card.
CI	SFP female connector	The port is used for BBU interconnection.
RST	-	The port is used to reset the board.

NOTE

(1) The security of the USB port is ensured by encryption.

(2) When the USB port functions as a commissioning Ethernet port, ensure that an OM port has been opened and the user has obtained required authorities for accessing the base station through the OM port before accessing the base station through the USB port.

Indicators

Table 3-11 describes the indicators on the UMPT.

Table 3-11 Indicators on the UMPT

Silkscreen	Color	Status	Description
RUN	Green	Steady on	There is power supply, but the board is faulty.
		Steady off	There is no power supply, or the board is faulty.
		On for 1s and off for 1s	The board is functioning properly.
		On for 0.125s and off for 0.125s	● The board is being loaded or configured. ● The board is not started.
ALM	Red	Steady on	An alarm is generated, and the board needs to be replaced.
		Steady off	The board is running properly.
		On for 1s and off for 1s	An alarm is generated, and you need to locate the fault before deciding whether to replace the board.
ACT	Green	Steady on	The board serves as an active board.

Silkscreen	Color	Status	Description
		Steady off	● The board does not serve as an active board. ● The board has not been activated. ● The board is not providing any services.
		On for 0.125s and off for 0.125s	The operation and maintenance link (OML) is disconnected.
		On for 1s and off for 1s	The board is being tested, such as an RRU Voltage Standing Wave Ratio (VSWR) test through a USB(1) flash drive. **NOTE** Of UMPT boards, only the UMPTa1 has this status.
		In every 4s, the indicator is on for 0.125s and off for 0.125s (eight times) in the first 2s and then off for 2s.	● All cells corresponding to the subrack that houses this board are not activated. ● The S1 link is faulty. **NOTE** Of UMPT boards, only the UMPTa2 and UMPTa6 have this status.

Besides the preceding three indicators, some other indicators indicate the connection status of the FE/GE optical port, FE/GE electrical port, interconnection port, and E1/T1 port. The indicators on the FE/GE optical port, FE/GE electrical port, interconnection port, and E1/T1 port, which have no silkscreen on the boards, are near the corresponding port, as shown in **Figure 3-15**.

Figure 3-15 Indicators for ports

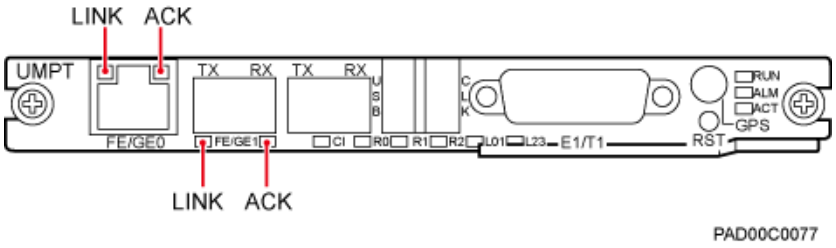


Table 3-12 describes the indicators.

Table 3-12 Indicators for ports

Indicator/ Silkscreen	Color	Status	Definition
LINK (silkscreen for the optical port)	Green	Steady on	The connection is normal.
		Steady off	The connection is abnormal.
ACT (silkscreen for the optical port)	Orange	Blinking	Data is being transmitted.
		Steady off	No data is being transmitted.
LINK (silkscreen for the electrical port)	Green	Steady on	The connection is normal.
		Steady off	The connection is abnormal.
ACT (silkscreen for the electrical port)	Orange	Blinking	Data is being transmitted.
		Steady off	No data is being transmitted.
CI	Red or green	Steady green	The interconnection link is normal.
		Steady red	An optical module fails to receive signals because of one of the following reasons: ● The optical module is faulty. ● The optical cable is broken.

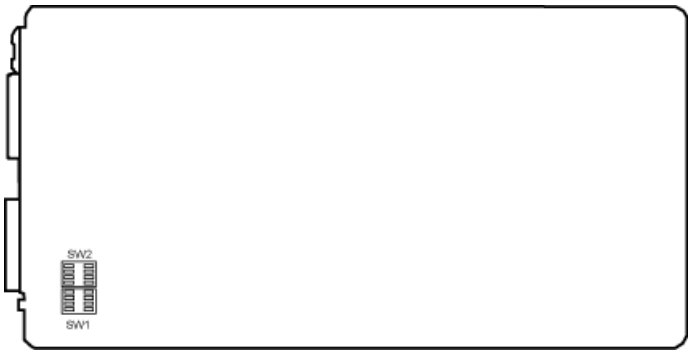
Indicator/ Silkscreen	Color	Status	Definition
		Blinking red (on for 0.125s and off for 0.125s)	Cables are connected in one of following incorrect manners: ● In the UCIU +UMPT scenario, the S0 port on the UCIU is connected to the CI port on the UMPT. Indicators for the S0 and CI ports are blinking. ● The ports are connected in ring topology. Indicators for all incorrectly connected ports are blinking.
		Steady off	The optical module cannot be detected.
R0, R1, R2	Red or green	-	Reserved
L01	Red or green	Steady off	E1/T1 link 0 and 1 is not set up, or an LOS alarm is generated.
		Steady green	E1/T1 links 0 and 1 are working properly.
		Blinking green (on for 1s and off for 1s)	E1/T1 link 0 is working properly, but E1/T1 link 1 is not set up or an LOS alarm is generated.
		Blinking green (on for 0.125s and off for 0.125s)	E1/T1 link 1 is working properly, but E1/T1 link 0 is not set up or an LOS alarm is generated.
		Steady red	Alarms are generated on E1/T1 links 0 and 1.

Indicator/ Silkscreen	Color	Status	Definition
		Blinking red (on for 1s and off for 1s)	An alarm is generated on E1/T1 link 0.
		Blinking red (on for 0.125s and off for 0.125s)	An alarm is generated on E1/T1 link 1.
L23	Red or green	Steady off	E1/T1 link 2 and 3 is not set up, or an LOS alarm is generated.
		Steady green	E1/T1 links 2 and 3 are working properly.
		Blinking green (on for 1s and off for 1s)	E1/T1 link 2 is working properly, but E1/T1 link 3 is not set up or an LOS alarm is generated.
		Blinking green (on for 0.125s and off for 0.125s)	E1/T1 link 3 is working properly, but E1/T1 link 2 is not set up or an LOS alarm is generated.
		Steady red	Alarms are generated on E1/T1 links 2 and 3.
		Blinking red (on for 1s and off for 1s)	An alarm is generated on E1/T1 link 2.
		Blinking red (on for 0.125s and off for 0.125s)	An alarm is generated on E1/T1 link 3.

DIP Switch

Two DIP switches on the UMPT are labeled SW1 and SW2. **Figure 3-16** shows the positions of DIP switches on the UMPT.

Figure 3-16 Positions of DIP switches on the UMPT



Each DIP switch has four bits. The DIP switches have the following functions:

- SW1 is used to select the E1/T1 mode. **Table 3-13** describes the DIP switch.
- SW2 is used to select the grounding mode of E1/T1 transmission. **Table 3-14** describes the DIP switch.

Table 3-13 DIP switch SW1

DIP Switch	DIP Status				Description
	1	2	3	4	
SW1	ON	ON	Reserved	Reserved	The E1 resistance is set to 75 ohms.
	OFF	ON			The E1 resistance is set to 120 ohms.
	ON	OFF			The T1 resistance is set to 100 ohms.

Table 3-14 DIP switch SW2

DIP Switch	DIP Status				Description
	1	2	3	4	
SW2	OFF	OFF	OFF	OFF	Balanced
	ON	ON	ON	ON	Unbalanced

3.1.6 WMPT

The WCDMA main processing and transmission unit (WMPT) processes signals for the BBU3900 and manages resources for other boards in the BBU3900.

Specifications

Table 3-15 lists the WMPT specifications.

Table 3-15 WMPT specifications

Board	Applicable Mode	Transmission Mode	Number of ports	Port Capacity	Full/Half-Duplex
WMPT	UMTS	ATM over E1/T1 or IP over E1/T1	1	Four channels	Full-duplex
		Transmission over FE optical ports	1	10 Mbit/s and 100 Mbit/s	Full-duplex
		Transmission over FE electrical ports	1	10 Mbit/s and 100 Mbit/s	Full-duplex

NOTE

For the combined signaling specifications of the WMPT, see section "Signaling Specifications" in *3900 Series Base Station Technical Description*.

Panel

Figure 3-17 shows the panel of the WMPT.

Figure 3-17 WMPT panel

Functions

The WMPT performs the following functions:

- Performs functions such as configuration management, equipment management, performance monitoring, signaling processing, and active and standby switchover, and provides OM channel to communicate with the LMT or M2000.
- Provides a reference clock for the system.
- Processes signaling and manages resources for other boards in the BBU3900.
- Provides USB ports. A USB flash drive that stores required software and configuration data can be inserted into the USB port to perform the automatic base station upgrade.

- Provides a 4-channel E1/T1 port over ATM or IP.
- Provides an FE electrical port and an FE optical port over IP.

Indicators

Table 3-16 describes the indicators on the WMPT panel.

Table 3-16 Indicators on the WMPT panel

Silkscreen	Color	Status	Description
RUN	Green	Steady on	There is power supply, but the board is faulty.
		Steady off	There is no power supply, or the board is faulty.
		On for 1s and off for 1s	The board is functioning properly.
		On for 0.125s and off for 0.125s	● Data or software is being loaded to the board. ● The board is not started.
ALM	Red	Steady on	An alarm is generated, and the board must be replaced.
		Steady off	The board is running properly.
		On for 1s and off for 1s	An alarm is generated and you need to locate the fault before deciding whether to replace the board.
ACT	Green	Steady on	The board serves as an active board.
		Steady off	● The board does not serve as an active board. ● The board has not been activated. ● The board is not providing any services.

Silkscreen	Color	Status	Description
		On for 0.125s and off for 0.125s	The operation and maintenance link (OML) is disconnected.
		On for 1s and off for 1s	The board is being tested, such as an RRU Voltage Standing Wave Ratio (VSWR) test through a USB(2)(3) flash drive.

In addition to the preceding three indicators, there are six indicators on the board panel, which indicate the connection status of the FE optical port, FE electrical port, and commissioning Ethernet port. The six indicators do not have silkscreen on the WMPT panel, whereas they are at both sides of the corresponding ports, as shown in **Figure 3-18**.

Figure 3-18 Port status indicators on the WMPT panel

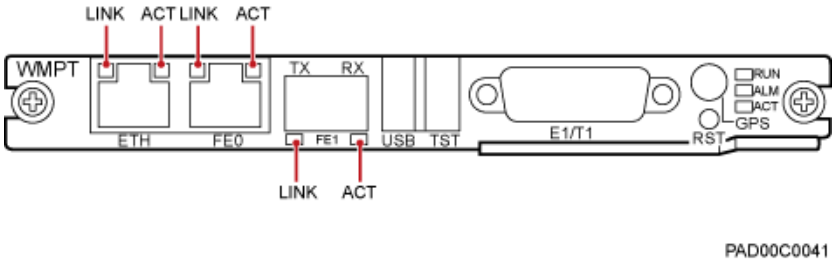


Table 3-17 describes the port status indicators on the WMPT panel.

Table 3-17 Port status indicators

Indicator	Color	Status	Description
FE1 optical port status indicators	Green (LINK on the left side)	Steady on	The connection is set up successfully.
		Steady off	No connection is set up.
	Orange (ACT on the right side)	Blinking	Data is being transmitted or received.
		Steady off	No data is being transmitted or received.

Indicator	Color	Status	Description
FE0 electrical port status indicators	Green (LINK on the left side)	Steady on	The connection is set up successfully.
		Steady off	No connection is set up.
	Orange (ACT on the right side)	Blinking	Data is being transmitted or received.
		Steady off	No data is being transmitted or received.
ETH port indicators	Green (LINK on the left side)	Steady on	The connection is set up successfully.
		Steady off	No connection is set up.
	Orange (ACT on the right side)	Blinking	Data is being transmitted or received.
		Steady off	No data is being transmitted or received.

Ports

Table 3-18 describes the ports on the WMPT panel.

Table 3-18 Ports on the WMPT panel

Silkscreen	Connector	Description
E1/T1 port	DB26 female connector	E1/T1 port
FE0	RJ45 connector	FE electrical port
FE1	SFP female connector	FE optical port
GPS	SMA connector	Reserved
ETH(1)	RJ45 connector	Commissioning
TST(2)	USB connector	USB commissioning port
USB(3)	USB connector	USB loading port
RST	-	Used for resetting the WMPT

NOTE

(1) Before accessing the base station through the ETH port, ensure that an OM port has been opened and the user has obtained required authorities for accessing the base station through the OM port.

(2) The TST port is used for commissioning the base station rather than importing or exporting the base station configuration.

(3) The security of the USB port is ensured by encryption.

DIP Switch

The WMPT has two DIP switches: SW1 and SW2. SW1 is used to set the work mode of the E1/T1 signal cable, and SW2 is used to set the resistance of the four E1/T1 signal cables in different modes. **Figure 3-19** shows the DIP switch settings of the WMPT.

Figure 3-19 DIP switch settings of the WMPT

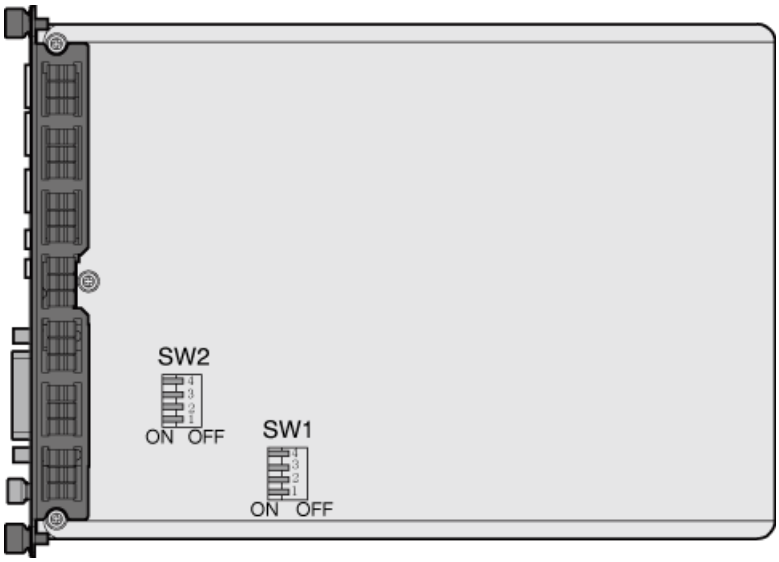


Table 3-19 and **Table 3-20** list the DIP switch settings of the WMPT.

Table 3-19 Settings of the DIP switch SW1 on the WMPT

DIP Switch	DIP Status				Description
	1	2	3	4	
SW1	ON	ON	OFF	OFF	T1
	OFF	OFF	ON	ON	The E1 resistance is set to 120 ohm.
	ON	ON	ON	ON	The E1 resistance is set to 75 ohm.

DIP Switch	DIP Status				Description
	1	2	3	4	
	Others				Unavailable

Table 3-20 Settings of the DIP switch SW2 on the WMPT

DIP Switch	DIP Status				Description
	1	2	3	4	
SW2	OFF	OFF	OFF	OFF	Balanced
	ON	ON	ON	ON	Imbalanced
	Others				Unavailable

3.1.7 WBBP

The WCDMA baseband processing unit (WBBP) in the BBU3900 processes baseband signals.

NOTE

WBBPf is supported in NodeB V200R014C00SPC320 and later versions.

Specifications

The WBBP falls into four types, as listed in **Table 3-21**.

NOTE

The WBBP in slot 2 or slot 3 could transfer the received CPRI data to other boards.

Table 3-21 Specifications of the WBBP

Board	Number of Cells Supported	Number of UL CEs	Number of DL CEs
WBBPa	3	128	256
WBBPb1	3	64	64
WBBPb2	3	128	128
WBBPb3	6	256	256
WBBPb4	6	384	384
WBBPd1	6	192	192
WBBPd2	6	384	384
WBBPd3	6	256	256

Board	Number of Cells Supported	Number of UL CEs	Number of DL CEs
WBBPf1	6	192	256
WBBPf2	6	256	384
WBBPf3	6	384	512
WBBPf4	6	512	768

The following table lists the specifications of the WBBP.

Table 3-22 HSPA specifications

Board	Number of HSDPA Codes	Number of HSDPA UEs	Number of HSUPA UEs
WBBPa	3x15	96	60
WBBPb1	3x15	64	64
WBBPb2	3x15	128	96
WBBPb3	6x15	144	96
WBBPb4	6x15	144	96
WBBPd1	6x15	128	96
WBBPd2	6x15	144	144
WBBPd3	6x15	144	96
WBBPf1	6x15	144	144
WBBPf2	6x15	192	192
WBBPf3	6x15	256	256
WBBPf4	6x15	384	384

NOTE

For the combined signaling specifications of the WBBP, see section "Signaling Specifications" in *3900 Series Base Station Technical Description*.

Panel

The WBBP has four types of panels, as shown in **Figure 3-20**, **Figure 3-21**, **Figure 3-22**, and **Figure 3-23**.

Figure 3-20 Panel of the WBBPa

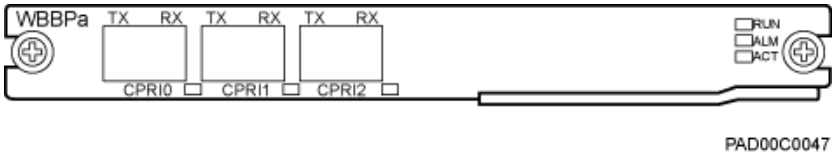
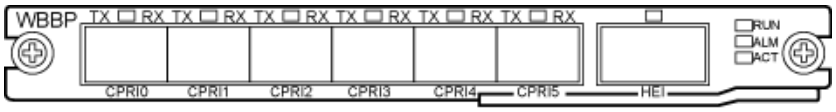


Figure 3-21 Panel of the WBBPb

Figure 3-22 Panel of the WBBPd

Figure 3-23 Panel of the WBBPf



NOTE

- The WBBPb1, WBBPb2, WBBPb3, and WBBPb4 have silkscreens **WBBPb1**, **WBBPb2**, **WBBPb3**, and **WBBPb4** indicating their board types on the lower left corner of the board panel, respectively.
- The WBBPd1, WBBPd2, and WBBPd3 have silkscreens **WBBPd1**, **WBBPd2**, and **WBBPd3** indicating their board types on the lower left corner of the board panel, respectively.
- The WBBPf1, WBBPf2, WBBPf3, and WBBPf4 have silkscreens **WBBPf1**, **WBBPf2**, **WBBPf3**, and **WBBPf4** indicating their board types on the lower left corner of the board panel, respectively.

Functions

The WBBP performs the following functions:

- Provides CPRI ports for communication with RF modules, and supports CPRI ports in 1 +1 backup mode.
- Processes uplink and downlink baseband signals.
- The WBBPd supports interference cancellation (IC) within the board.
- When the WBBPd is installed in slot 2 or 3 and is connected to an RF module, the WBBPd supports the IC of uplink data.
- The WBBPf installed in slot 2 or slot 3 supports the baseband interconnection between BBUs.

Indicators

There are three indicators on the panel of the WBBP. **Table 3-23** describes the indicators on the WBBP and their status.

Table 3-23 Indicators on the panel of the WBBP and their status

Silkscreen	Color	Status	Description
RUN	Green	Steady on	There is power supply, but the board is faulty.
		Steady off	There is no power supply, or the board is faulty.
		On for 1s and off for 1s	The board is functioning properly.
		On for 0.125s and off for 0.125s	● Software or data is being loaded to the board. ● The board is not started.
ALM	Red	Steady on	An alarm is generated, and the board must be replaced.
		Steady off	The board is running properly.
		On for 1s and off for 1s	An alarm is generated and you need to locate the fault before deciding whether to replace the board.
ACT	Green	Steady on	The board serves as an active board.
		Steady off	● The board does not serve as an active board. ● The board has not been activated. ● The board is not providing any services.
		On for 1s and off for 1s	The power supply for the board is insufficient. **NOTE** Of all types of WBBP boards, only the WBBPf has this status.

The WBBPa or WBBPb provides three indicators indicating the status of Small Form-factor Pluggable (SFP) links, and the indicators are below the SFP ports. The WBBPd or WBBPf provides six indicators indicating the status of SFP links, and the indicators are above the SFP ports.

Table 3-24 describes the indicators.

Table 3-24 CPRI port status indicators

Silkscreen	Color	Status	Description
CPRIx	Red or green	Steady green	The CPRI link is functioning properly.
		Steady red	An optical module fails to receive or transmit signals because of the following reasons: ● The optical module is faulty. ● The fiber optic cable is broken.
		Blinking red (on for 0.125s and off for 0.125s)	The RF module connected to the CPRI link has a hardware fault.
		Blinking red (on for 1s and off for 1s)	The CPRI link is out of lock because of following reasons: ● There is no mutual lock between dual-mode clock sources. ● There is mismatched data rate over CPRI ports. ● VSWR alarms are generated on the RF module connected to the CPRI link when the USB(1) flash drive is used for VSWR test.
		Steady off	● The optical module cannot be detected. ● The CPRI cable is not connected.

NOTE

(1) The security of the USB port is ensured by encryption. The TST port is used for commissioning the base station rather than importing or exporting the base station configuration.

The WBBPf provides an indicator indicating the status of the Quad Small Form-factor Pluggable (QSFP) link, and the indicator is above the QSFP port. **Table 3-25** describes this indicator.

Table 3-25 QSFP port status indicators

Silkscreen	Color	Status	Description
HEI	Red or green	Steady green	The inter-BBU transmission link is functional.
		Steady red	An optical module fails to receive or transmit signals because of the following reasons: ● The optical module is faulty. ● The fiber optic cable is broken.
		Blinking red (on for 1s and off for 1s)	The interconnection link is out of lock because of the following reasons: ● There is no mutual lock between two interconnected BBUs. ● There is mismatched data rate over QSFP ports.
		Steady off	The optical module cannot be detected.

Ports

Table 3-26 describes the three CPRI ports on the panel of the WBBPa and WBBPb.

Table 3-26 Ports on the WBBPa and WBBPb panels

Silkscreen	Connector	Description
CPRIx	SFP female connector	Data transmission port interconnected to the RF module. It supports the input and output of optical and electrical transmission signals.

Table 3-27 describes the six CPRI ports on the panel of the WBBPd.

Table 3-27 Ports on the WBBPd panel

Silkscreen	Connector	Description
CPRI0, CPRI1, CPRI2, CPRI3/ EIH0, CPRI4/EIH1, CPRI5/EIH2	SFP female connector	Data transmission port interconnected to the RF module. It supports the input and output of optical and electrical transmission signals.

The WBBPf provides six CPRI ports and one HEI port, as listed in Table 3-28.

Table 3-28 Ports on the WBBPf panel

Silkscreen	Connector	Description
CPRIx	SFP female connector	Data transmission port interconnected to the RF module. It supports the input and output of optical and electrical transmission signals.
HEI	QSFP connector	Port interconnected to other baseband boards to share the baseband resources.

3.1.8 GTMU

The GSM transmission and timing and management unit (GTMU) is the basic transmission and control function entity of the BBU. It provides the reference clock, maintenance port, and external alarm collection port, monitors the power, controls and manages the entire BTS.

Specifications

The GTMU is classified into two types: GTMU and GTMUb. **Table 3-29** lists the transmission specifications of the GTMU and GTMUb.

Table 3-29 Transmission specifications of the GTMU

Board	Supported Mode	Transmission Mode	Number of ports	Port Capacity	Full/Half-Duplex
GTMU/ GTMUb	GSM	TDM over E1/T1	1	Four channels	Full-duplex
		Transmission over FE optical ports	1	10 Mbit/s and 100 Mbit/s	Full-duplex
		Transmission over FE electrical ports	1	10 Mbit/s and 100 Mbit/s	Full-duplex

Table 3-30 lists the TRX specifications of the GTMU and GTMUb.

Table 3-30 TRX specifications of the GTMU

Board	Supported Mode	Transmission Mode	Maximum Carrier Number
GTMU/GTMUb	GSM	TDM	126
		IP over FE	60
		IP over E1	48

Panel

Figure 3-24 and **Figure 3-25** show the panels of the GTMU and GTMUb.

Figure 3-24 GTMU panel

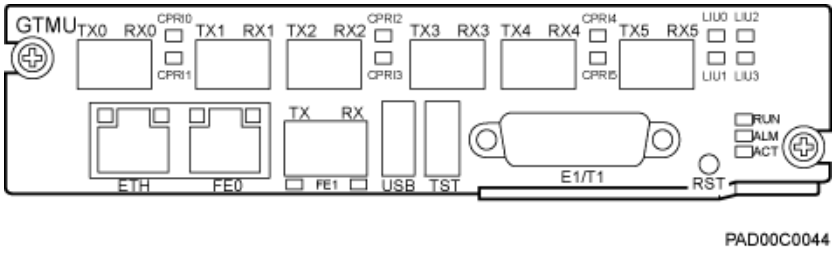
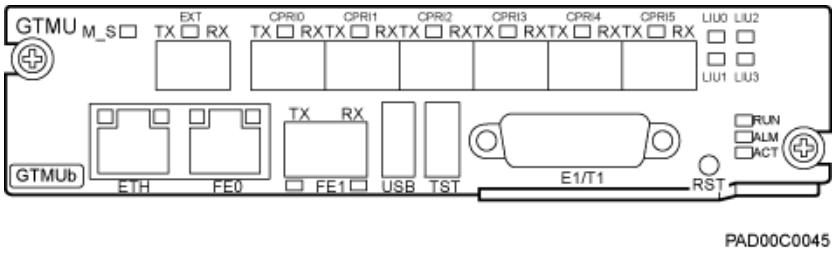


Figure 3-25 GTMUb panel



Functions

The GTMU performs the following functions:

- Controls, maintains, and operates the base station.
- Supports fault management, configuration management, performance management, and security management.
- Monitors the fans and power modules.
- Provides and manages the clock of the base station in centralized mode.
- Provides the clock output for test.
- Provides a port for maintenance on the OM system.
- Supports the transmission of four paths of E1 signals and two paths of FE signals.
- Provides CPRI ports for communication between the BBU and the RFUs.

Indicators

Table 3-31 describes the indicators on the GTMU.

Table 3-31 Indicators on the GTMU

Silkscreen	Color	Status	Description
RUN	Green	Steady on	There is power supply, but the board is faulty.
		Steady off	There is no power supply, or the board is faulty.
		On for 1s and off for 1s	The board is running properly.
		On for 0.125s and off for 0.125s	Software is being loaded to the board.
ALM	Red	Steady on	An alarm is generated, and the board must be replaced.
		Steady off	There is no fault.

Silkscreen	Color	Status	Description
		On for 1s and off for 1s	An alarm is generated and you need to locate the fault before deciding whether to replace the board.
ACT	Green	Steady on	The board serves as an active board.
		On for 0.125s and off for 0.125s	The OML is disconnected.

Besides the preceding three indicators, there are some other indicators on the board, indicating the connection status of the FE optical port, FE electrical port, CPRI port, and commissioning port. They are near the corresponding ports and have no silkscreen. **Table 3-32** describes the indicators.

Table 3-32 Indicators for ports

Indicator	Color	Status	Description
LIU0 to LIU3	Green	Steady on	An E1/T1 local alarm is generated.
		On for 1s and off for 1s	An E1/T1 remote alarm is generated.
		Steady off	The link is functional.
CPRI0 to CPRI5	Red or green	Steady green	The CPRI link is functioning properly.
		Steady red	An optical module fails to receive or transmit signals because of the following reasons: ● The optical module is faulty. ● The fiber optic cable is broken.

Indicator	Color	Status	Description
		Blinking red (on for 1s and off for 1s)	The CPRI link is out of lock because of the following reasons: ● There is no mutual lock between dual-mode clock sources. ● There is mismatched data rate over CPRI ports.
		Steady off	● The optical module cannot be detected. ● The CPRI cable is not connected.
ETH	Green (LINK indicator on the left side)	Steady on	The connection is set up successfully.
		Steady off	No connection is set up.
	Orange (ACT indicator on the right side)	Blinking	Data is being transmitted or received.
		Steady off	No data is being transmitted or received.
FE0	Green (LINK indicator on the left side)	Steady on	The connection is set up successfully.
		Steady off	No connection is set up.
	Orange (ACT indicator on the right side)	Blinking	Data is being transmitted or received.
		Steady off	No data is being transmitted or received.
FE1 (on the GTMUb)	Green (LINK indicator on the left side)	Steady on	The connection is set up successfully.
		Steady off	No connection is set up.

Indicator	Color	Status	Description
	Green (ACT indicator on the right side)	Blinking	Data is being transmitted or received.
		Steady off	No data is being transmitted or received.
M_S (on the GTMUb)	-	-	This is the indicator for the reserved port.
EXT (on the GTMUb)	-	-	This is the indicator for the reserved port.

Ports

Table 3-33 describes the ports on the GTMU.

Table 3-33 Ports on the GTMU

Silkscreen	Connector	Description
CPRI0 to CPRI5	SFP female connector	Data transmission port interconnected to the RF module. It supports the input and output of optical and electrical transmission signals.
EXT (on the GTMUb)	SFP female connector	Reserved
ETH(1)	RJ45 connector	Local maintenance and commissioning port
FE0	RJ45 connector	Connected to the routers in the equipment room through FE cables to transmit network information
FE1	DLC connector	Connected to the routers in the equipment room through fiber optic cables to transmit network information
TST(2)	USB connector	Providing reference clock for the test instruments
USB(3)	USB connector	Used for automatic software upgrade through the USB flash drive
E1/T1	DB26 female connector	Used for four E1/T1 inputs and outputs between the GTMU and the UELP or between BSCs
RST	-	Used for resetting the GTMU

NOTE

(1) Before accessing the base station through the ETH port, ensure that an OM port has been opened and the user has obtained required authorities for accessing the base station through the OM port.

(2) The TST port is used for commissioning the base station rather than importing or exporting the base station configuration.

(3) The security of the USB port is ensured by encryption.

The following table lists the specifications of CPRI ports on the GTMU.

Table 3-34 Specifications of the GTMU ports

Board	Number of CPRI Ports	CPRI Data Rate (Gbit/s)	Topo Type
GTMU	6	1.25	Topologies of star, chain, and ring
GTMUb	6	1.25/2.5	Topologies of star, chain, and ring

DIP Switch

On the GTMU, there are five DIP switches, each of which has four bits. DIP switches **S1** and **S2** need to be set jointly. The functions of the five DIP switches are as follows:

- **S1** is used to select the E1 resistance. **Table 3-35** provides details on the DIP switch.
- **S2** is used to select the grounding mode of E1/T1 transmission cables. **Table 3-36** provides details on the DIP switch.
- **S3** is reserved.
- **S4** is used to select the E1 bypass. **Table 3-37** provides details on the DIP switch.
- **S5** is used for timeslot settings when the E1 bypass is selected. **Table 3-38** provides details on the DIP switch.

Table 3-35 Description on **S1**

DIP Switch	DIP Setting				Description
	1	2	3	4	
S1	ON	ON	OFF	OFF	The E1 resistance is set to 75 ohm.
	OFF	ON	OFF	OFF	The E1 resistance is set to 120 ohm.
	ON	OFF	OFF	OFF	The T1 resistance is set to 100 ohm.
	Others				Unavailable

NOTE

Bits 3 and 4 of **S1** should be kept the factory-delivered configuration, without any manual setting on site. The out-of-factory state should be OFF. If the bits are ON, set them to OFF.

Table 3-36 Description on **S2**

DIP Switch	DIP Setting				Description
	1	2	3	4	
S2	OFF	OFF	OFF	OFF	All the bits are set to OFF by default in all modes.
	ON	ON	ON	ON	When error codes are received over the four E1 RX links in 75 ohm, all the bits of S2 must be set to ON to rectify the faults on the E1 links.
	Others				Unavailable

Table 3-37 Description on **S4**

DIP Switch	DIP Setting				Description
	1	2	3	4	
S4	ON	ON	ON	ON	Supporting E1 bypass
	OFF	OFF	OFF	OFF	Not supporting E1 bypass
	Others				Unavailable

Table 3-38 Description on **S5**

DIP Switch	DIP Setting				Description
	1	2	3	4	
S5	ON	ON	ON	ON	Not supporting E1 bypass
	OFF	ON	ON	OFF	Supporting E1 bypass of level-1 cascaded base stations

DIP Switch	DIP Setting				Description
	1	2	3	4	
	ON	OFF	ON	OFF	Supporting E1 bypass of level-2 cascaded base stations
	OFF	OFF	ON	OFF	Supporting E1 bypass of level-3 cascaded BTSs
	ON	ON	OFF	OFF	Supporting E1 bypass of level-4 cascaded BTSs
	OFF	ON	OFF	OFF	Supporting E1 bypass of level-5 cascaded BTSs

3.1.9 LMPT

The LTE main processing and transmission unit (LMPT) manages the entire eNodeB system in terms of OM and signaling processing and provides system clock for the BBU3900.

Specifications

Table 3-39 lists the specifications of the LMPT.

Table 3-39 Specifications of the LMPT

Board	Mode	Transmission Mode	Number of ports	Port Capacity	Full/Half-Duplex
LMPT	LTE	Transmission over FE/GE optical ports	2	10 Mbit/s, 100 Mbit/s, and 1000 Mbit/s	Full-duplex
		Transmission over FE/GE electrical ports	2	10 Mbit/s, 100 Mbit/s, and 1000 Mbit/s	Full-duplex

The following table lists the signaling specifications of the LMPT.

Table 3-40 Signaling specifications of the LMPT

Board	Signaling Specification (CAPS)
LMPT	30

The following table lists the maximum number of UEs in RRC_Connected mode supported by the LMPT.

Table 3-41 Maximum number of UEs in RRC_Connected mode

Board	Maximum Number of UEs in RRC_Connected Mode
LMPT	5400

The maximum of data radio bearers (DRBs) supported by the LMPT is three times the maximum number of UEs in RRC_Connected mode.

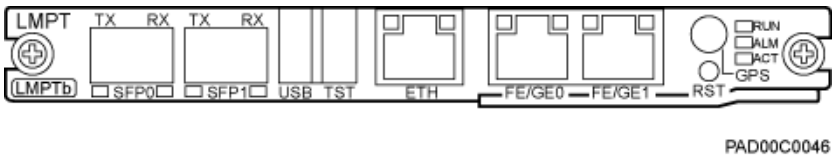
NOTE

For the signaling specifications of an entire eNodeB, see section "Signaling Specifications" in *3900 Series Base Station Technical Description*. For the maximum number of DRBs and UEs in RRC_Connected mode, see section "Baseband Specifications" in *3900 Series Base Station Technical Description*.

Panel

Figure 3-26 shows the LMPT.

Figure 3-26 LMPT



Functions

The LMPT performs the following functions:

- Enables configuration management, device management, performance monitoring, signaling processing, and radio source management
- Controls all boards in the system
- Provides the system clock
- Enables signal exchange between the eNodeB and MME/S-GW

Indicators

There are three indicators on the LMPT panel. **Table 3-42** describes the indicators on the LMPT panel and their status.

Table 3-42 Indicators on the LMPT panel

Silkscreen	Color	Status	Description
RUN	Green	Steady on	There is power supply, but the board is faulty.
		Steady off	There is no power supply, or the board is faulty.
		On for 1s and off for 1s	The board is functioning properly.
		On for 0.125s and off for 0.125s	● Software or data is being loaded to the board. ● The board is not started.
ALM	Red	Steady on	An alarm is generated, and the board needs to be replaced.
		Steady off	The board is running properly.
		On for 1s and off for 1s	An alarm is generated and you need to locate the fault before deciding whether to replace the board.
ACT	Green	Steady on	The board serves as an active board.
		Steady off	● The board does not serve as an active board. ● The board has not been activated. ● The board is not providing any services.
		On for 0.125s and off for 0.125s	The OML is disconnected.
		In every 4s, the indicator is on for 0.125s and off for 0.125s (eight times) in the first 2s and then off for 2s.	● All cells corresponding to the subrack that houses this board are not activated. ● The S1 link is faulty.

Besides the preceding three indicators, some other indicators used for indicating the connection status of the FE optical port, FE electrical port, and commissioning Ethernet port have no silkscreen on the board. They are near the ports. **Table 3-43** describes the indicators.

Table 3-43 Indicators

Silkscreen	Color	Status	Description
SFP0 and SFP1	Green (LINK)	Steady on	The connection is set up successfully.
		Steady off	No connection is set up.
	Orange (ACT)	Blinking	Data is being transmitted or received.
		Steady off	No data is being transmitted or received.
ETH	Orange (ACT)	Blinking	Data is being transmitted or received.
		Steady off	No data is being transmitted or received.
	Green (LINK)	Steady on	The connection is set up successfully.
		Steady off	No connection is set up.
FE/GE0 to FE/GE1	Green (LINK)	Steady on	The connection is set up successfully.
		Steady off	No connection is set up.
	Orange (ACT)	Blinking	Data is being transmitted or received.
		Steady off	No data is being transmitted or received.

Ports

Table 3-44 describes the ports on the panel of the LMPT.

Table 3-44 Ports on the panel of the LMPT

Silkscreen	Connector	Quantity	Description
SFP0 and SFP1	SFP female connector	2	FE/GE optical port connecting to the transmission equipment or gateway equipment
ETH(1)	RJ45 connector	1	Commissioning
TST(2)	USB connector	1	Test port
USB(3)	USB connector	1	Software loading
FE/GE0 to FE/GE1	RJ45 connector	2	FE/GE electrical port connecting to the transmission equipment or gateway equipment
GPS	SMA connector	1	GPS port
RST	-	1	Used for resetting the LMPT

NOTE

(1) Before accessing the base station through the ETH port, ensure that an OM port has been opened and the user has obtained required authorities for accessing the base station through the OM port.

(2) The TST port is used for commissioning the base station rather than importing or exporting the base station configuration.

(3) The security of the USB port is ensured by encryption.

NOTE

SFP0 and FE/GE0 ports on the LMPT are used for one GE input. Therefore, they are not used simultaneously.

SFP1 and FE/GE1 ports on the LMPT are used for another GE input. Therefore, they cannot be used simultaneously.

3.1.10 LBBP

The LTE baseband processing unit (LBBP) in the BBU3900 processes baseband signals.

Specifications

The following table lists the signaling specifications of the LBBP.

Table 3-45 Signaling specifications of the LBBP

Board	Signaling Specification (CAPS)
LBBPc	30

Board	Signaling Specification (CAPS)
LBBPd1/LBBPd2/LBBPd3	60

The following table lists the maximum RRC_connected users supported by the LBBP.

Table 3-46 Maximum RRC_connected users

Board	Cell Bandwidth	Maximum RRC_Connected Users
LBBPc	1.4 MHz	1008
	3 MHz	1800
	5 MHz	1800
	10 MHz	1800
	15 MHz	1800 (2R)/1200 (4R)
	20 MHz	1800 (2R)/1200 (4R)
LBBPd1/LBBPd2	1.4 MHz	504
	3 MHz	1080
	5 MHz	1800
	10 MHz	3600
	15 MHz	3600
	20 MHz	3600
LBBPd3	1.4 MHz	1008
	3 MHz	2160
	5 MHz	3600
	10 MHz	3600
	15 MHz	3600
	20 MHz	3600

The maximum number of data radio bearers (DRBs) supported by the LBBP is three times the maximum RRC_connected users.

NOTE

For the signaling specifications of an entire eNodeB, see section "Signaling Specifications" in *3900 Series Base Station Technical Description*. For the following specifications, see section "Baseband Specifications" in *3900 Series Base Station Technical Description*: the maximum number of data radio bearers, maximum RRC_connected users per cell, maximum RRC_connected users supported by an entire base station, and maximum uplink and downlink throughput per cell or user.

The following table lists the maximum throughput of the LBBP.

Table 3-47 Maximum throughput of the LBBP

Board	Maximum Throughout
LBBPc	● Downlink: 300 Mbit/s ● Uplink: 100 Mbit/s
LBBPd1	● Downlink: 450 Mbit/s ● Uplink: 225 Mbit/s
LBBPd2	● Downlink: 600 Mbit/s ● Uplink: 225 Mbit/s
LBBPd3	● Downlink: 600 Mbit/s ● Uplink: 300 Mbit/s

The following table lists the number of cells, bandwidth, and antenna configurations supported by a single LBBP in LTE FDD scenarios.

Table 3-48 Specifications of the LBBP in LTE FDD scenarios

Board	Number of Cell	Cell Bandwidth	Antenna Configuration
LBBPc	3	1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, and 20 MHz	3x20 MHz 1T1R 3x20 MHz 1T2R 3x10 MHz 4T4R 3x20 MHz 2T2R 1x20 MHz 4T4R
LBBPd1	3	1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, and 20 MHz	3x20 MHz 1T1R 3x20 MHz 1T2R 3x20 MHz 2T2R
LBBPd2	3	1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, and 20 MHz	3x20 MHz 1T1R 3x20 MHz 1T2R 3x20 MHz 2T2R 3x20 MHz 4T4R
LBBPd3	6	1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, and 20 MHz	6x10M 1T1R 6x10M 1T2R 6x10M 2T2R

The following table lists the number of cells, bandwidth, and antenna configurations supported by a single LBBP in LTE TDD scenarios.

Table 3-49 Specifications of the LBBP in LTE TDD scenarios

Board	Number of Cell	Cell Bandwidth	Antenna Configuration
LBBPc	3	5 MHz, 10 MHz, and 20 MHz	3x20 MHz 1T1R 3x20 MHz 1T2R 3x20 MHz 2T2R 3x10 MHz 4T4R 1x20 MHz 8T8R
LBBPd2	3	5 MHz, 10 MHz, and 20 MHz	3x20 MHz 1T1R 3x20 MHz 1T2R 3x20 MHz 2T2R 3x20 MHz 4T4R

NOTE

- The "Antenna Configuration" column lists the maximum configurations supported by various types of LBBP. For example, the LBBPc supports the maximum configuration of 3x10 MHz 4T4R, and therefore supports any of the following configurations: 3x1.4 MHz 4T4R, 3x3 MHz 4T4R, and 3x5 MHz 4T4R.
- Boards with the same antenna configuration support combinations of different bandwidth as long as the total bandwidth does not exceed the maximum bandwidth supported by the board. For example, if an LBBPc supports the 3x20 MHz 2T2R antenna configuration, the three cells connected to the LBBPc can use any of the following antenna configurations: 1.4 MHz 2T2R, 3 MHz 2T2R, 5 MHz 2T2R, 10 MHz 2T2R, 15 MHz 2T2R, and 20 MHz 2T2R.
- The LBBP supports CPRI convergence when the site is configured with any of the following RRUs: RRU3221, RRU3240, RRU3828, RRU3829, RRU3928, RRU3929, LRFUe, MRFUd, RRU3229, RRU3841, RRU3942, RRU3642, RRU3832, RRU3838, and RRU3268. The CPRI convergence of the LBBP must comply with the following principles:
  - In LBBPc+LBBPc CPRI convergence mode, the CPRI convergence is allowed only between two LBBPc boards, and one LBBPc board must be configured in slot 2 or 3.
  - In LBBPc+LBBPc CPRI convergence mode, the CPRI convergence is allowed only from multiple LBBPc boards to one LBBPd board, and only the CPRI ports on the LBBPd in slot 2 or 3 can connect to RF units.

Panel

The LBBP has two types of panels, as shown in **Figure 3-27** and **Figure 3-28**.

Figure 3-27 LBBPc panel

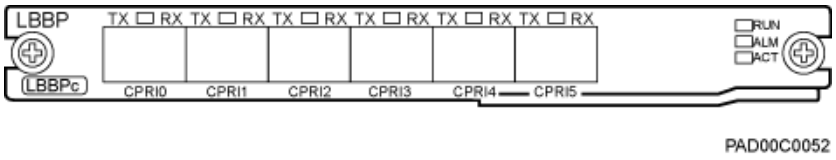
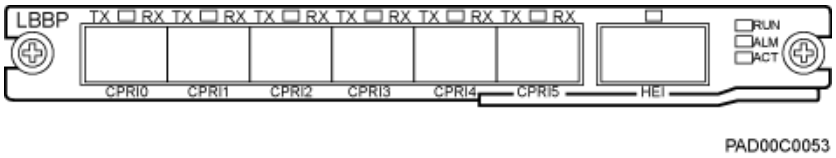


Figure 3-28 LBBPd panel



NOTE

The LBBPd1, LBBPd2, and LBBPd3 have silkscreens **LBBPd1**, **LBBPd2**, and **LBBPd3** indicating their board types on the lower left corner of the board panel, respectively.

Functions

The LBBP performs the following functions:

- Processes uplink and downlink baseband signals.
- Provides CPRI ports for communication with RF modules.

Indicators

On the LBBP panel, there are three indicators, as described in **Table 3-50**.

Table 3-50 Indicators on the LBBP panel

Silkscreen	Color	Status	Description
RUN	Green	Steady on	There is power supply, but the board is faulty.
		Steady off	There is no power supply, or the board is faulty.
		On for 1s and off for 1s	The board is functioning properly.
		On for 0.125s and off for 0.125s	● The board is being loaded or configured. ● The board is not started.
ALM	Red	Steady on	An alarm is generated, and the board must be replaced.
		Steady off	The board is running properly.
		On for 1s and off for 1s	An alarm is generated, and you need to locate the fault before deciding whether to replace the board.
ACT	Green	Steady on	The board serves as an active board.

Silkscreen	Color	Status	Description
		Steady off	● The board does not serve as an active board. ● The board is not activated. ● The board does not provide any services.
		On for 1s and off for 1s	The power supply for the board is insufficient. **NOTE** Of all types of LBBP boards, only the LBBPd has this status.

As listed in **Table 3-51**, the LBBP provides six indicators indicating the Small Form-factor Pluggable (SFP) link status. The indicators are positioned above the SFP ports.

Table 3-51 SFP link status indicators

Silkscreen	Color	Status	Description
CPRIx	Red or green	Steady green	The CPRI link is functioning properly.
		Steady red	An optical module fails to receive or transmit signals because of the following reasons: ● The optical module is faulty. ● The fiber optic cable is broken.
		Blinking red (on for 0.125s and off for 0.125s)	The RF module connected to the CPRI link has a hardware fault.
		Blinking red (on for 1s and off for 1s)	The CPRI link is out of lock because of the following reasons: ● There is no mutual lock between dual-mode clock sources. ● The data rates of the CPRI ports do not match each other.

Silkscreen	Color	Status	Description
		Steady off	● The optical module cannot be detected. ● The CPRI cable is not connected.

The LBBPd provides an indicator that indicates the Quad Small Form-factor Pluggable (QSFP) link status. The indicator is above the QSFP port. **Table 3-52** describes the indicator.

Table 3-52 QSFP link status indicator

Silkscreen	Color	Status	Description
HEI	Red or green	Steady green	The inter-BBU transmission link is functional.
		Steady red	An optical module fails to receive or transmit signals because of the following reasons: ● The optical module is faulty. ● The fiber optic cable is broken.
		Blinking red (on for 1s and off for 1s)	The interconnection link is out of lock because of the following reasons: ● There is no mutual lock between two interconnected BBUs. ● The data rates of the QSFP ports do not match each other.
		Steady off	The optical module cannot be detected.

Ports

Table 3-53 describes the six CPRI ports on the LBBP panel.

Table 3-53 LBBP ports

Silkscreen	Connector	Quantity	Description
CPRI0 to CPRI5	SFP female connector	6	Connected to the RF modules for transmitting service data, clock signals, and synchronization information.

Table 3-54 describes the QSFP port on the LBBPd panel.

Table 3-54 QSFP port on the LBBPd panel

Silkscreen	Connector	Quantity	Description
HEI	QSFP connector	1	Reserved

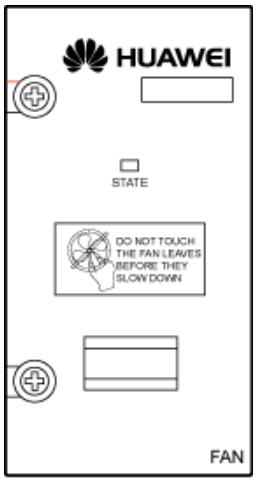
3.1.11 FAN

The FAN unit for the BBU3900 controls the speed of fans and monitors the temperature of the fan unit. It reports the status of the fans and fan unit, and dissipates heat from the BBU.

Panel

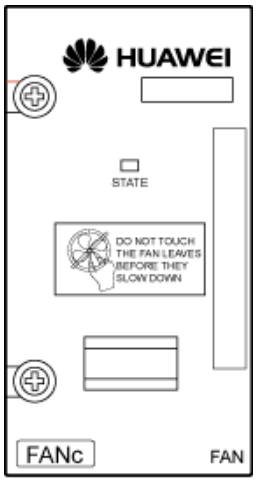
The FAN units fall into two types: FAN and FANc, as shown in Figure 3-29 and Figure 3-30.

Figure 3-29 FAN



PAD00C0055

Figure 3-30 FANc



NOTE

There is a **FANc** silkscreen on the FANc while the FAN has no such silkscreen.

Functions

The FAN unit performs the following functions:

- Controls the fan speed.
- Reports the status, temperature, and in-position signal of the fans to the main control processing unit.
- Monitors the temperature at the air intake vent.
- Dissipates heat.
- The FANc provides a read-write electronic label.

Indicator

There is only one indicator on the panel of the FAN unit, which indicates the operating status of the fans. **Table 3-55** describes the indicator.

Table 3-55 Indicator on the panel of the FAN unit

Silkscreen	Color	Status	Description
STATE	Red or green	Blinking green (on for 0.125s and off for 0.125s)	The module is not registered, and no alarm is reported.
		Blinking green (on for 1s and off for 1s)	The module is working.
		Blinking red (on for 1s and off for 1s)	The module is reporting alarms.

Silkscreen	Color	Status	Description
		Steady off	There is no power supply.

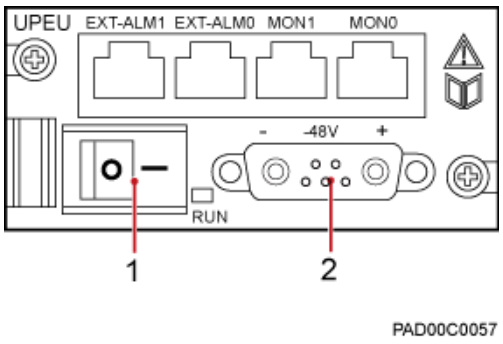
3.1.12 UPEU

The universal power and environment interface unit (UPEU) for the BBU3900 converts -48 V DC or +24 V DC power into +12 V DC power.

Panel

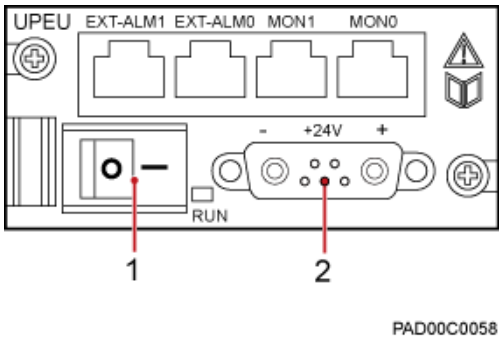
The UPEU is classified into four types: universal power and environment interface unit type a (UPEUa), universal power and environment interface unit type b (UPEUb), universal power and environment interface unit type c (UPEUc), and universal power and environment interface unit type d (UPEUd). The UPEUa, UPEUc, and UPEUd convert -48 V DC power into +12 V DC power, and the UPEUb converts +24 V DC power into +12 V DC power. **Figure 3-31**, **Figure 3-32**, **Figure 3-33**, and **Figure 3-34** show the panels of the UPEUa, UPEUb, UPEUc, and UPEUd, respectively.

Figure 3-31 UPEUa panel



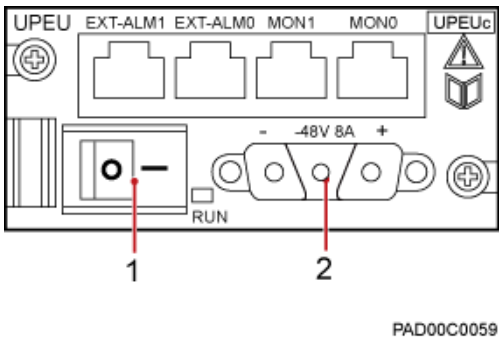
(1) BBU power switch (2) 7W2 connector

Figure 3-32 UPEUb panel



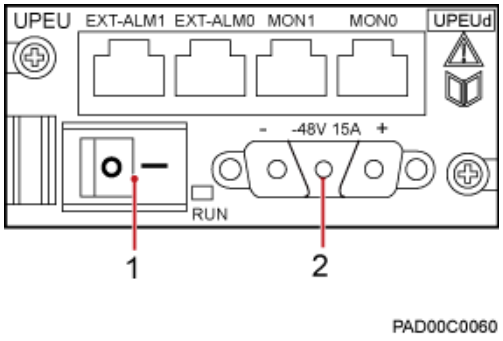
(1) BBU power switch (2) 7W2 connector

Figure 3-33 UPEUc panel



(1) BBU power switch (2) 3V3 connector

Figure 3-34 UPEUd panel



(1) BBU power switch (2) 3V3 connector

NOTE

The UPEUc and UPEUd have silkscreens "UPEUc" and "UPEUd" indicating their board types on them, respectively, whereas the UPEUa and UPEUb do not have such silkscreens indicating their board types. The UPEUa and UPEUb, however, can be distinguished by the silkscreens "-48 V" and "+24 V" on them.

Functions

The UPEU performs the following functions:

- Converts -48 V DC or +24 V DC power into +12 V DC power, which is the operating voltage of the boards.
- Provides two ports with each receiving one RS485 signal and another two ports with each receiving four Boolean signals. The Boolean signals can only be dry contact or Open Collector (OC) signals.

Table 3-56 describes the specifications.

Table 3-56 Specifications

Board	Output Power	Backup Mode
UPEUa	The output power of a UPEUa is 300 W.	1+1 backup
UPEUc	The output power of a UPEUc is 360 W, and the output power of two UPEUc boards is 650 W.	1+1 backup
UPEUd	The output power of a UPEUd is 650 W.	1+1 backup

NOTE

After the UPEUa is replaced by the UPEUc, the UPEU power consumption data monitored by the M2000 will change. The power consumption data does not only depend on the output power but also on the data collection method. The UPEUc and UPEUa use different methods for collecting power consumption data. Therefore, the decrease in the power consumption shown in the M2000 after the UPEUa is replaced by the UPEUc does not necessarily reflect the actual decrease of power consumption.

Indicator

The UPEU has one indicator, which indicates the operating status of the UPEU. **Table 3-57** describes the indicator.

Table 3-57 Indicator on the UPEU panel

Silkscreen	Color	Status	Description
RUN	Green	Steady on	The board is functional.
		Steady off	There is no power supply, or the board is faulty.

Port

The UPEU provides two RS485 signal ports, each receiving one RS485 signal, and two Boolean signal ports, each receiving four Boolean signals. **Figure 3-35** shows the slots in the BBU.

Figure 3-35 Slots in the BBU

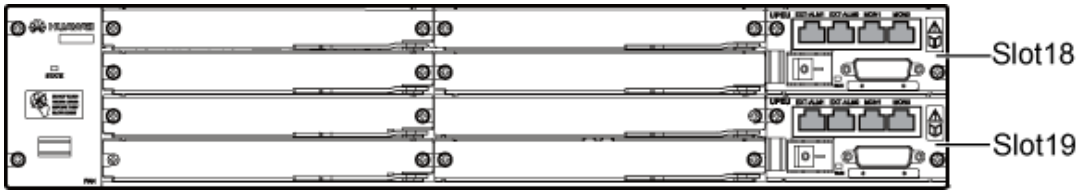


Table 3-58 describes the ports on the UPEU panel.

Table 3-58 Description on the ports

Slot	Silkscreen	Connector	Quantity	Description
Slot 19	+24 V or -48 V	3V3 or 7W2 connector	1	Introducing +24 V or -48 V DC power
	EXT-ALM0	RJ45 connector	1	Port for Boolean inputs 0 to 3
	EXT-ALM1	RJ45 connector	1	Port for Boolean inputs 4 to 7
	MON0	RJ45 connector	1	Port for RS485 input 0
	MON1	RJ45 connector	1	Port for RS485 input 1
Slot 18	+24 V or -48 V	3V3 or 7W2 connector	1	Introducing +24 V or -48 V DC power
	EXT-ALM0	RJ45 connector	1	Port for Boolean inputs 0 to 3
	EXT-ALM1	RJ45 connector	1	Port for Boolean inputs 4 to 7
	MON0	RJ45 connector	1	Port for RS485 input 0
	MON1	RJ45 connector	1	Port for RS485 input 1

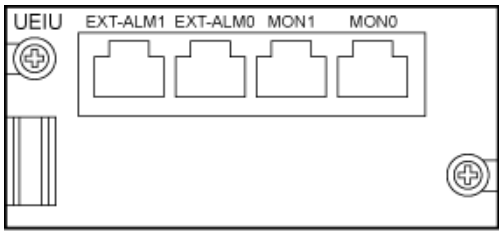
3.1.13 UEIU

The universal environment interface unit (UEIU) of the BBU3900 transmits monitoring signals and alarm signals from external devices to the main control board.

Panel

Figure 3-36 shows the panel of the UEIU.

Figure 3-36 Panel of the UEIU



Functions

The UEIU performs the following functions:

- Provides two ports with each receiving one path of RS485 signal.
- Provides two ports with each receiving four paths of Boolean signals. The Boolean signals can only be dry contact or OC signals.
- Transmits monitoring signals and alarm signals from external devices to the main control board.

Port

The UEIU is configured in slot 18 and provides two RS485 signal ports, each transmitting one path of RS485 signals, and two Boolean signal ports, each transmitting four paths of Boolean signals.

Table 3-59 describes the ports on the panel of the UEIU.

Table 3-59 Ports on the panel of the UEIU

Slot	Silkscreen	Connector	Quantity	Description
Slot 18	EXT-ALM0	RJ45 connector	1	Port for Boolean inputs 0 to 3
	EXT-ALM1	RJ45 connector	1	Port for Boolean inputs 4 to 7
	MON0	RJ45 connector	1	Port for RS485 input 0
	MON1	RJ45 connector	1	Port for RS485 input 1

3.1.14 UTRP

The universal transmission processing unit (UTRP) is an extended transmission board in the BBU3900 and provides ports connecting to transmission equipment.

Specifications

Table 3-60 describes the specifications of the UTRP.

Table 3-60 Specifications of the UTRP

Board	Sub-board/ Board Type	Supported Mode	Transmission Mode	Number of ports	Port Capacity	Full/ Half-Duplex
UTRP2	UEOC	UMTS	Transmission over FE/GE optical ports	2	10 Mbit/s, 100 Mbit/s, and 1000 Mbit/s	Full-duplex
UTRP3	UAEC	UMTS	ATM over E1/T1	2	Eight channels	Full-duplex
UTRP4	UIEC	UMTS	IP over E1/T1	2	Eight channels	Full-duplex
UTRPb4	Without a sub-board	GSM	TDM over E1/T1	2	Eight channels	Full-duplex
UTRP6	UUAS	UMTS	STM-1/ OC-3	1	One channel	Full-duplex
UTRP9	UQEC	UMTS	Transmission over FE/GE electrical ports	4	10 Mbit/s, 100 Mbit/s, and 1000 Mbit/s	Full-duplex
UTRPc	Without a sub-board	GSM UMTS LTE	Transmission over FE/GE electrical ports	4	10 Mbit/s, 100 Mbit/s, and 1000 Mbit/s	Full-duplex
			Transmission over FE/GE optical ports	2	100 Mbit/s and 1000 Mbit/s	Full-duplex

Panel

Figure 3-37 shows the panel of the UTRP2.

Figure 3-37 Panel of the UTRP2 (with two optical ports)

Figure 3-38 shows the panel of the UTRP3 and UTRP4.

Figure 3-38 Panel of the UTRP3 and UTRP4 (with eight E1/T1 channels)

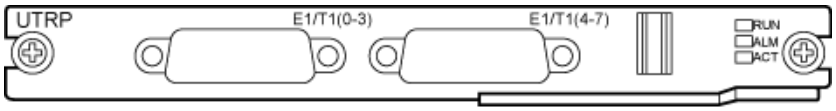


Figure 3-39 shows the panel of the UTRPb4 in GSM mode.

Figure 3-39 Panel of the UTRP4 (with eight E1/T1 channels)

Figure 3-40 shows the panel of the UTRP6.

Figure 3-40 Panel of the UTRP6 (with one STM-1 channel)

Figure 3-41 shows the panel of the UTRP9.

Figure 3-41 Panel of the UTRP9 (with four electrical ports)

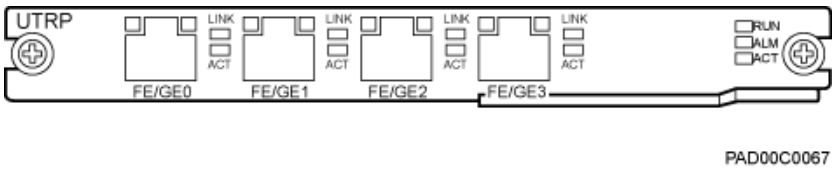
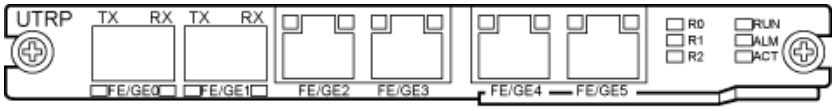


Figure 3-42 shows the panel of the UTRPc.

Figure 3-42 Panel of the UTRPc (with four electrical ports and two optical ports)



Functions

The UTRP performs the following functions:

- Provides extended E1/T1 ports to connect to transmission equipment, supporting ATM, TDM, and IP transmission.
- Provides electrical and optical transmission ports to connect to transmission equipment.
- Supports cold backup.

Restriction

The GTMUa cannot be used together with the UTRPc.

Indicators

Table 3-61 describes the indicators on the UTRP panel.

Table 3-61 Indicators on the UTRP panel

Silkscreen	Color	Status	Description
RUN	Green	Steady on	There is power supply, but the board is faulty.
		Steady off	There is no power supply, or the board is faulty.
		On for 1s and off for 1s	The board is running properly.
		On for 0.125s and off for 0.125s	● The board is being loaded or configured. ● The board is not started.

Silkscreen	Color	Status	Description
ALM	Red	Steady on	An alarm is generated, and the board needs to be replaced.
		Steady off	The board is running properly.
		On for 1s and off for 1s	An alarm is generated and you need to locate the fault before deciding whether to replace the board.
ACT	Green	Steady on	The board serves as an active board.
		Steady off	● The board does not serve as an active board. ● The board has not been activated. ● The board is not providing any services.

The ACT indicator on the UTRP board in GSM mode has different status from the ACT indicator on other boards, as listed in **Table 3-62**.

Table 3-62 Status of the ACT indicator on the UTRP board in GSM mode

Silkscreen	Color	Status	Description
ACT	Green	Steady on	● Before the configuration takes effect, none or both of the two E1 ports in GSM mode are functional. ● The configuration has taken effect.

Silkscreen	Color	Status	Description
		On for 0.125s and off for 0.125s	Before the configuration takes effect, only one E1 port in GSM mode is functional.

Each Ethernet port on the UTRP2, UTRP9, and UTRPc corresponds to two indicators indicating the status of the current link, as listed in **Table 3-63**.

Table 3-63 Status of the indicators for Ethernet ports on the UTRP2, UTRP9, and UTRPc

Silkscreen	Color	Status	Description
LINK	Green	Steady on	The link is connected properly.
		Steady off	The link is not connected properly.
ACT	Orange	Blinking	Data is being transmitted or received on the link.
		Steady off	No data is being transmitted or received on the link.

There are three indicators on the UTRPc: R0, R1, and R2, of which the status is listed in **Table 3-64**.

Table 3-64 Status of indicators on the UTRPc

Silkscreen	Color	Status	Description
R0	Red or green	Steady off	The board is not working in GSM mode.
		Steady green	The board is working in GSM mode.
		Steady red	Reserved
R1	Red or green	Steady off	The board is not working in UMTS mode.
		Steady green	The board is working in UMTS mode.

Silkscreen	Color	Status	Description
		Steady red	Reserved
R2	Red or green	Steady off	The board is not working in LTE mode.
		Steady green	The board is working in LTE mode.
		Steady red	Reserved

NOTE

If multiple indicators are on at the same time, the board works in multiple modes.

Ports

Table 3-65 describes the ports on the UTRP2.

Table 3-65 Ports on the panel of the UTRP2 (with 2 optical ports)

Silkscreen	Port Type	Quantity	Connector
FE/GE0 and FE/GE1	FE/GE optical port	2	SFP female connector

The UTRP3, UTRP4, and UTRPb4 have the same ports, as listed in Table 3-66.

Table 3-66 Ports on the panel of the UTRP3, UTRP4, and UTRPb4 (with 8 E1/T1 ports)

Silkscreen	Port Type	Quantity	Connector
E1/T1	E1/T1 port	2	DB26 female connector

Table 3-67 lists the ports on the UTRP6.

Table 3-67 Ports on the panel of the UTRP6 (with one STM-1 channel)

Silkscreen	Port Type	Quantity	Connector
STM-1/OC-3	STM-1/OC-3	1	SFP female connector

Table 3-68 lists the ports on the UTRP9.

Table 3-68 Ports on the panel of the UTRP9 (with four electrical ports)

Silkscreen	Port Type	Quantity	Connector
FE/GE0 to FE/GE3	FE/GE electrical port	4	RJ45 connector

Table 3-69 describes the ports on the panel of the UTRPc.

Table 3-69 Ports on the panel of the UTRPc (with four electrical ports and two optical ports)

Silkscreen	Port Type	Quantity	Connector
FE/GE0 and FE/GE1	FE/GE optical port	2	SFP female connector
FE/GE2 to FE/GE5	FE/GE electrical port	4	RJ45 connector

DIP Switch

There is no DIP switch on the UTRP2, UTRP6, and UTRP9.

There are three DIP switches on the UTRP3, UTRP4, and UTRPb4. SW1 and SW2 are used to set whether to ground the receiver end of the E1 cable, and SW3 is used to set the resistance of the E1 cable. Figure 3-43 shows the DIP switches on the UTRP3 and UTRP4. Figure 3-44 shows the DIP switches on the UTRPb4.

Figure 3-43 DIP switches on the UTRP3 and UTRP4

Figure 3-44 DIP switches on the UTRPb4

[Table 3-70](), [Table 3-71](), and [Table 3-72]() list the settings of the DIP switches on the UTRP.

Table 3-70 Settings of SW1 on the UTRP

DIP Switch	DIP Setting				Description
	1	2	3	4	
SW1	OFF	OFF	OFF	OFF	Balanced
	ON	ON	ON	ON	Imbalanced
	Others				Unavailable

Table 3-71 Settings of SW2 on the UTRP

DIP Switch	DIP Setting				Description
	1	2	3	4	
SW2	OFF	OFF	OFF	OFF	Balanced
	ON	ON	ON	ON	Imbalanced
	Others				Unavailable

CAUTION

SW1 and SW2 are set to OFF by default. SW1 corresponds to No.4 to No.7 E1 channels. SW2 corresponds to No.0 to No.3 E1 channels.

Table 3-72 Settings of SW3 on the UTRP

DIP Switch	DIP Setting				Description
	1	2	3	4	
SW3	OFF	OFF	ON	ON	T1
	ON	ON	OFF	OFF	The E1 resistance is set to 120 ohm.
	ON	ON	ON	ON	The E1 resistance is set to 75 ohm.
	Others				Unavailable

3.1.15 USCU

This section describes the universal satellite card and clock unit (USCU).

Specifications

The USCU falls into five types, as shown in **Table 3-73**.

Table 3-73 Specifications of the USCU

Board	Supported Mode	Supported Satellite Card
USCUb11	LTE	N/A
USCUb12	GSM UMTS LTE	RT single-satellite card
USCUb14	GSM UMTS LTE	UBLOX single-satellite card
USCUb22	GSM UMTS LTE	Naviors dual-satellite card
USCUb21	GSM UMTS LTE	K161 dual-satellite card

Panel

There are five types of USCU: USCUb11, USCUb12, USCUb14, USCUb22, and USCUb21, as shown in **Figure 3-45** and **Figure 3-46**. The USCUb11, USCUb12, and USCUb14 have the same exterior. The USCUb22 and the USCUb21 have the same exterior.

Figure 3-45 USCUb11, USCUb12, and USCUb14 panel

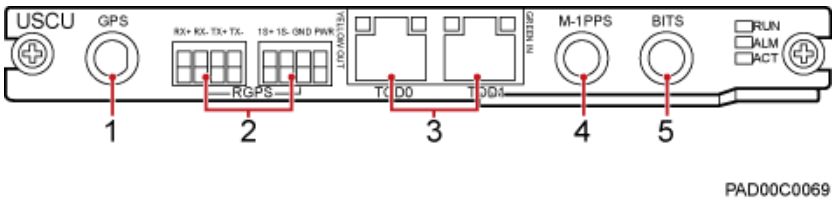
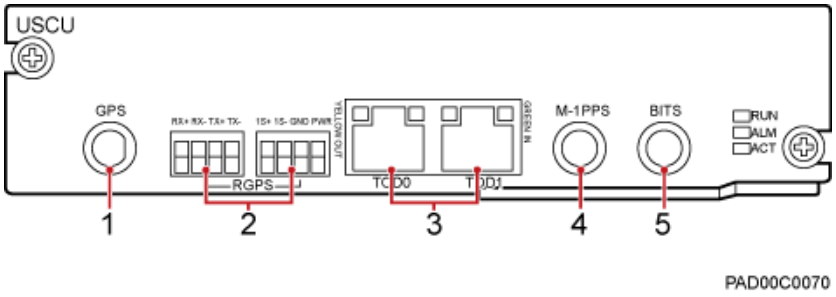


Figure 3-46 USCUb22 and USCUb21 panel



(1) GPS port (2) RGPS port (3) TOD port (4) M-1PPS port (5) BITS port

NOTE

- The USCUb11, USCUb12, and USCUb14 have silkscreens **USCUb11** , **USCUb12** and **USCUb14** indicating their board types on the lower left corner of the board panel, respectively.
- The USCUb22 and USCUb21 have silkscreens **USCUb22** and **USCUb21** indicating their board types on the lower left corner of the board panel, respectively.

Functions

The USCU has the following functions:

- The USCUb11 provides ports to communicate with the RGPS (for example the reused equipment of the customer) and BITS equipment. It does not support GPS signals.
- The USCUb12 contains an RT satelliate card, which does not support RGPS signals.
- The USCUb14 contains a UBLOX satelliate card, which does not support RGPS signals.
- The USCUb22 does not support RGPS signals. It uses a Naviors satellite card, which must be purchased locally and installed onsite.
- The USCUb21 does not support RGPS signals. It uses a K161 satellite card, which must be purchased locally and installed onsite.

Indicators

Table 3-74 and Table 3-75 describe the indicators on the USCU.

Table 3-74 Indicators on the USCU

Silkscreen	Color	Status	Description
RUN	Green	Steady on	There is power supply, but the board is faulty.
		Steady off	There is no power supply, or the board is faulty.
		On for 1s and off for 1s	The board is functioning properly.
		On for 0.125s and off for 0.125s	● The board is being loaded or configured. ● The board is not started.
ALM	Red	Steady on	An alarm is generated, and the board needs to be replaced.
		Steady off	The board is running properly.
		On for 1s and off for 1s	An alarm is generated and you need to locate the fault before deciding whether to replace the board.
ACT	Green	Steady on	The board serves as an active board.
		Steady off	● The board does not serve as an active board. ● The board has not been activated. ● The board is not providing any services.

Table 3-75 Indicators for the TOD ports

Color	Status	Description
Green (on the left)	The green indicator is steady on and the orange indicator is steady off.	The TOD port is configured as an input port.
Orange (on the right)	The orange indicator is steady on and the green indicator is steady off.	The TOD port is configured as an output port.

Ports

Table 3-76 describes the ports on the USCU.

Table 3-76 Ports on the USCU

Silkscreen	Connector	Description
GPS	SMA connector	The GPS ports on the USCUb12, USCUb21, USCUb14 and USCUb22 receive GPS signals. The GPS port on the USCUb11 is reserved and cannot receive GPS signals.
RGPS port	PCB welded wiring terminal	The RGPS port on the USCUb11 receives RGPS signals. The RGPS ports on the USCUb12, USCUb21, USCUb14 and USCUb22 are reserved and cannot receive RGPS signals.
TOD0 port	RJ45 connector	This port receives or transmits 1PPS+TOD signals.
TOD1 port	RJ45 connector	This port receives or transmits 1PPS+TOD signals, and receives TOD signals from the M1000.
BITS port	SMA connector	This port receives BITS clock signals, supports adaptive input of 2.048 MHz and 10 MHz clock reference source.
M-1PPS port	SMA connector	This port receives 1PPS signals from the M1000.

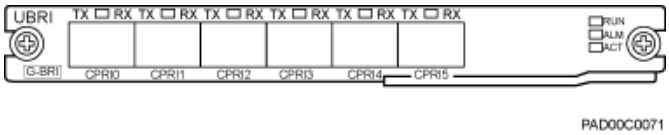
3.1.16 UBRI

The universal baseband radio interface board (UBRI) provides extended CPRI optical or electrical ports to implement convergence, distribution, and multi-mode transmission on the CPRI.

Panel

Figure 3-47 shows the panel of the UBRI.

Figure 3-47 UBRI panel



Functions

The UBRI performs the following functions:

- Provides extended CPRI electrical or optical ports.
- Performs convergence, distribution, and multi-mode transmission on the CPRI.

Indicators

Table 3-77 describes the indicators on the UBRI panel.

Table 3-77 Indicators on the UBRI panel

Silkscreen	Color	Status	Description
RUN	Green	Steady on	There is power supply, but the board is faulty.
		Steady off	There is no power supply, or the board is faulty.
		On for 1s and off for 1s	The board is running properly.
		On for 0.125s and off for 0.125s	Software is being loaded to the board.
ALM	Red	Steady on	An alarm is generated on the board.
		Steady off	The board is running properly.
		On for 1s and off for 1s	An alarm is generated and you need to locate the fault before deciding whether to replace the board.
ACT	Green	Steady on	The board serves as an active board.
		Steady off	● The board does not serve as an active board. ● The board has not been activated. ● The board is not providing any services.

The UBRI provides six indicators indicating the status of the CRRI links. The indicators are above the SFP ports. Table 3-78 describes the indicators.

Table 3-78 CPRI port status indicators

Silkscreen	Color	Status	Description
CPRIx	Red or green	Steady green	The CPRI link is functioning properly.
		Steady red	An optical module fails to receive signals because of the following reasons: ● The optical module is faulty. ● The fiber optic cable is broken.
		Blinking red (on for 1s and off for 1s)	The CPRI link is out of lock because of the following reasons: ● There is no mutual lock between dual-mode clock sources. ● The data rates of the CPRI ports do not match each other.
		Steady off	● The optical module cannot be detected. ● The CPRI cable is not connected.

Ports

Table 3-79 describes the ports on the UBRI panel.

Table 3-79 Ports on the UBRI panel

Silkscreen	Connector	Quantity	Description
CPRI0 to CPRI5	SFP female connector	6	Connecting the BBU and the RF module

The following table lists the specifications of the CPRI ports on the UBRI.

Table 3-80 Specifications of the CPRI ports on the UBRI

Board	CPRI Port Quantity	CPRI Port Data Rate (Gbit/s)	Topology Type
UBRI	6	1.25/2.5	Star, chain, and ring topologies

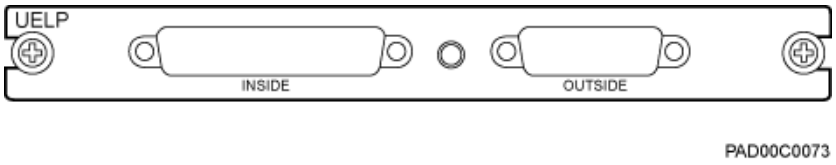
3.1.17 UELP

Each universal E1/T1 lightning protection unit (UELP) provides surge protection for four paths of E1/T1 signals.

Panel

Figure 3-48 shows the panel of the UELP.

Figure 3-48 UELP panel



Ports

Table 3-81 lists the ports on the UELP.

Table 3-81 Ports on the UELP

Silkscreen	Connector	Description
INSIDE	DB25 female connector	Connecting to a transmission board of the base station
OUTSIDE	DB26 female connector	Connecting to an external transmission device

DIP Switch

The UELP has one DIP switch, which is used to determine whether the receiving end is grounded. The DIP switch has four DIP bits. Figure 3-49 shows the DIP switch on the UELP.

Figure 3-49 DIP switch on the UELP

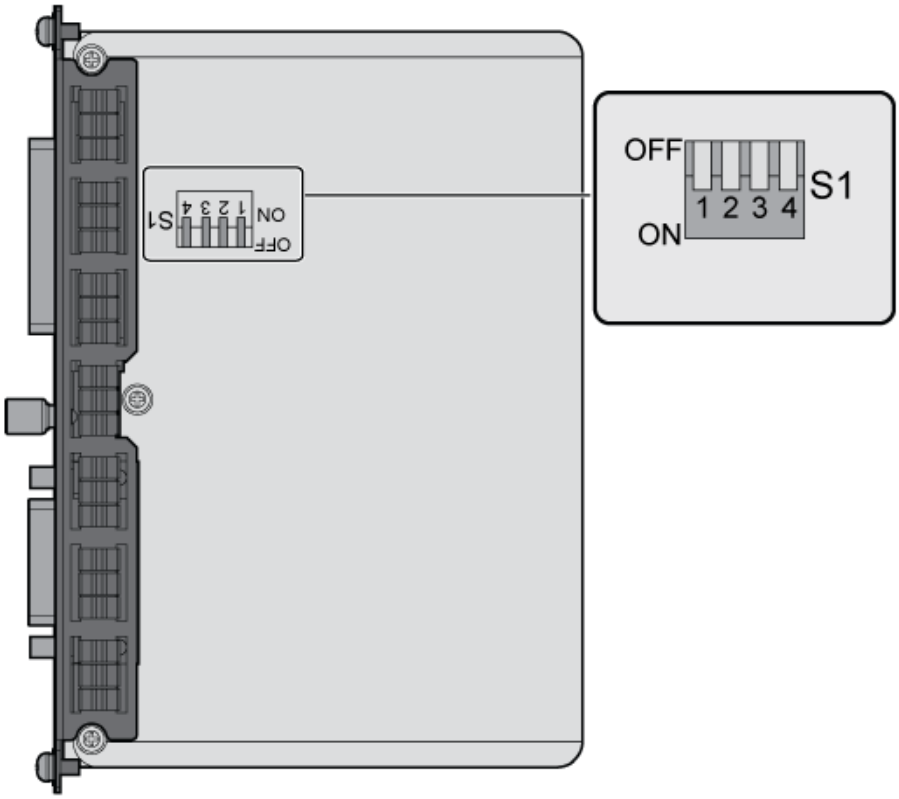


Table 3-82 describes the DIP switch on the UELP.

Table 3-82 DIP switch on the UELP

DIP Switch	DIP Status				Description
	1	2	3	4	
S1	OFF	OFF	OFF	OFF	Not grounded
	Other status				Grounded

NOTE

The E1 cable of 75 ohms can be either grounded or not, whereas the E1 cable of 120 ohms and the T1 cable of 100 ohms cannot be grounded.

3.1.18 UFLP

Each universal FE lightning protection unit (UFLP) provides protection for two channels of FE signals. Each universal FE lightning protection unit type B (UFLPB) provides protection for two channels of FE/GE signals.

NOTE

The UFLPB applies only to the LTE mode.

Panel

Figure 3-50 shows the UELP panel.

Figure 3-50 UELP panel

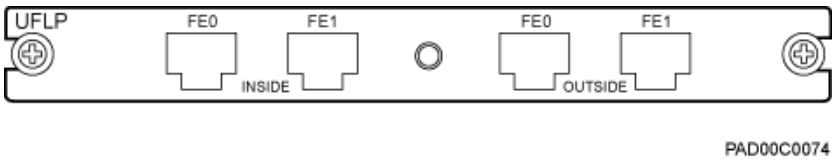
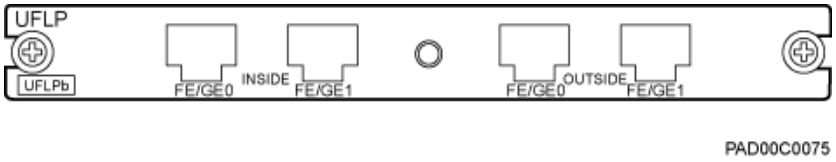


Figure 3-51 shows the UFLPB panel.

Figure 3-51 UFLPB panel



Port

Table 3-83 describes UFLP ports.

Table 3-83 UFLP ports

Port Location	Silkscreen	Connector	Description
INSIDE side	FE0 and FE1	RJ45 connector	Connecting to a transmission board of the base station
OUTSIDE side	FE0 and FE1	RJ45 connector	Connecting to an external transmission device

Table 3-84 describes UFLPB ports.

Table 3-84 UFLPB ports

Port Location	Silkscreen on the Panel	Connector	Description
INSIDE side	FE/GE0 and FE/GE1	RJ45 connector	Connecting to a transmission board of the base station

Port Location	Silkscreen on the Panel	Connector	Description
OUTSIDE side	FE/GE0 and FE/GE1	RJ45 connector	Connecting to an external transmission device

3.2 RRU

This section describes the types of RRUs supported by the BTS3900C.

The RRU performs the following functions:

- Receives downlink baseband data from the BBU and sends uplink baseband data for the communication between the BBU and the RRU.
- Receives RF signals from the antenna system, down-converts the received signals to IF signals, amplifies the IF signals, and performs analog-to-digital conversion. The TX channel filters downlink signals, performs digital-to-analog conversion, and up-converts RF signals to the TX band.
- Multiplexes RX and TX signals, which enables these signals to share the same antenna path. It also filters the RX and TX signals.
- For the RRUs with 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).

Table 3-85 lists the types of RRUs supported by the BTS3900C. For details about these RRUs, see the hardware description of the corresponding RRU.

Table 3-85 Types of RRUs supported by the BTS3900C

RRU Type	
RRU3804	RRU3801E
RRU3908 V1	RRU3908 V2
RRU3928	RRU3808
RRU3929	RRU3942
RRU3828	RRU3829
RRU3806	RRU3926

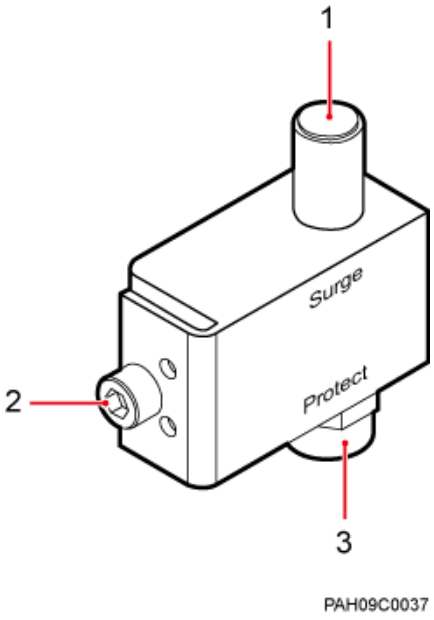
3.3 GPS Surge Protector

The Global Positioning System (GPS) surge protector protects the satellite receiver from lightning.

Exterior

Figure 3-52 shows the GPS surge protector.

Figure 3-52 GPS surge protector



Ports

Table 3-86 describes the ports on the GPS surge protector.

Table 3-86 Ports on the GPS surge protector

SN	Silkscreen	Connector
(1)	Surge	N-type female connector
(2)	-	Ground terminal
(3)	Protect	N-type male connector

4 BTS3900C Power System

About This Chapter

The BTS3900C supports 110 V AC, 220 V AC, and -48 V DC power supply. When AC power is used, the base station converts AC power into -48 V DC power.

4.1 Configurations of Upper-Level Circuit Breakers and Power Cables
This section describes the recommended configurations of upper-level circuit breakers and power cables for the BTS3900C. The recommended configurations are based on a fully configured base station.

4.2 Power Distribution for the BTS3900C
This section describes power distribution schemes for BTS3900C cabinets when 110 V AC, 220 V AC, or -48 V DC power is supplied.

4.3 ETP48100-A1
The embedded telecommunication power 48100-A1(ETP48100-A1) system converts external 220 V or 110 V AC input power into -48 V DC power.

4.4 PDU10D-01
The power distribution unit 10D-01 (PDU10D-01) distributes -48 V DC power to all components in the cabinet.

4.5 AC Surge Protection Box
The AC surge protection box provides surge protection for the input AC power.

4.1 Configurations of Upper-Level Circuit Breakers and Power Cables

This section describes the recommended configurations of upper-level circuit breakers and power cables for the BTS3900C. The recommended configurations are based on a fully configured base station.

Table 4-1 lists the recommended configurations of upper-level circuit breakers and power cables for a BTS3900C AC cabinet.

Table 4-1 Recommended configurations of upper-level circuit breakers and power cables for a BTS3900C AC cabinet

Input Power	Requirement for the Circuit Breakers on Customer Equipment	Cross-sectional Area of an Input Power Cable	Length of an Input Power Cable
220 V AC single-phase	16 A/1 P(1)	4 mm^2 (0.025 $in.^2$)	⩽ 15 m
110 V AC dual-live-wire	20 A/2 P		

NOTE

(1) P is short for Pole, indicating the number of switches simultaneously controlled by a pole.

Table 4-2 lists the recommended configurations of upper-level circuit breakers and power cables for a BTS3900C DC cabinet.

Table 4-2 Recommended configurations of upper-level circuit breakers and power cables for a BTS3900C DC cabinet

Input Power	Requirement for the Circuit Breakers on Customer Equipment	Cross-sectional Area of an Input Power Cable	Length of an Input Power Cable
-48 V DC	32 A/1 P	4 mm^2 (0.025 $in.^2$)	⩽ 10 m

4.2 Power Distribution for the BTS3900C

This section describes power distribution schemes for BTS3900C cabinets when 110 V AC, 220 V AC, or -48 V DC power is supplied.

Power Distribution Scheme in the 110 V AC or 220 V AC Power Supply Scenario

When 110 V AC or 220 V AC power is supplied, the ETP48100-A1 in the OMB converts the one AC input into two DC outputs.

Figure 4-1 shows the power distribution scheme for a cabinet supplied with 110 V AC or 220 V AC power. **Table 4-3** lists the specifications of fuses in the base station.

NOTE

When 220 V AC single-phase power is used, the live wire must be connected to a circuit breaker.

Figure 4-1 Power distribution scheme for a cabinet supplied with 110 V AC or 220 V AC power

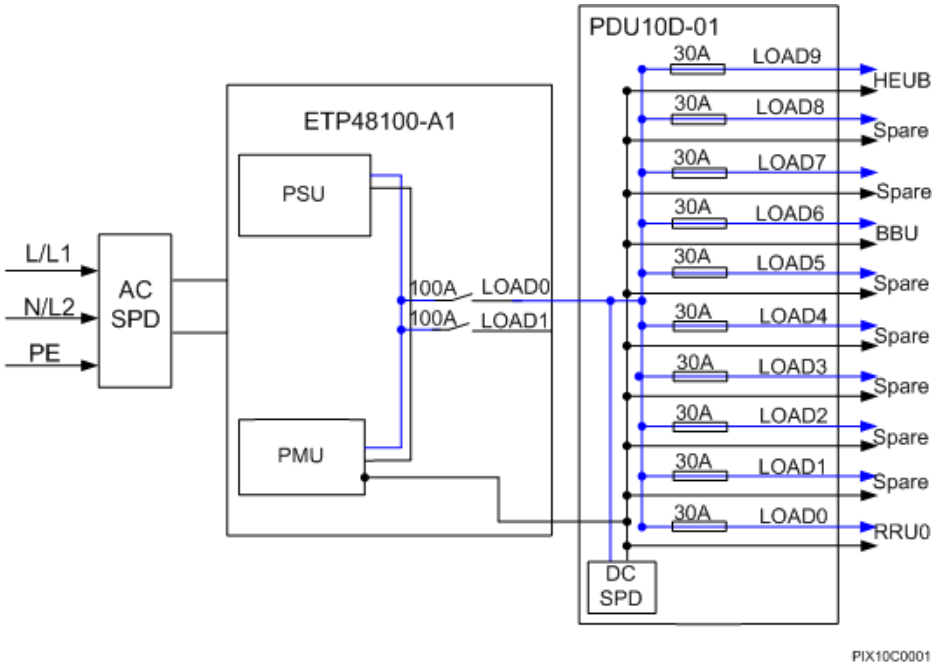


Table 4-3 Specifications of fuses when 110 V AC or 220 V AC power is supplied

Input Power	Specifications of a circuit breaker
220 V AC single-phase	● RRU: 1x30 A ● BBU: 1x30 A ● HEUB: 1x30 A
110 V AC dual-live-wire	

Power Distribution Scheme in the -48 V DC Power Supply Scenario

When -48 V DC power is supplied, the PDU10D in the OMB converts the one DC input into several DC outputs and distributes the DC power to modules such as the BBU, HEUB, and RRUs.

Figure 4-2 shows the power distribution scheme for a cabinet supplied with -48 V DC power. **Table 4-4** lists the specifications of fuses in the base station.

Figure 4-2 Power distribution scheme for a cabinet supplied with -48 V DC power

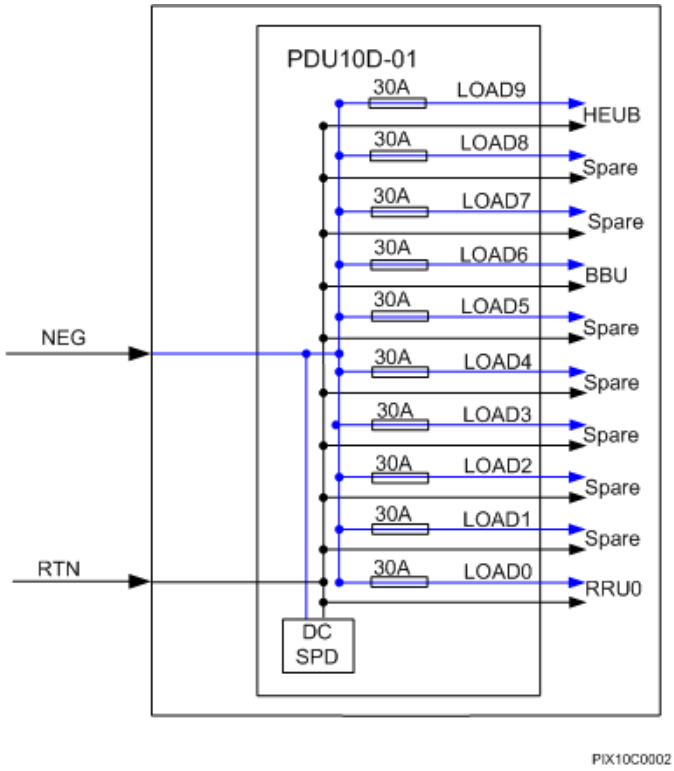


Table 4-4 Specifications of fuses when -48 V DC power is supplied

Input Power	Specifications of a circuit breaker
-48 V DC	● RRU: 1x30 A ● BBU: 1x30 A ● HEUB: 1x30 A

4.3 ETP48100-A1

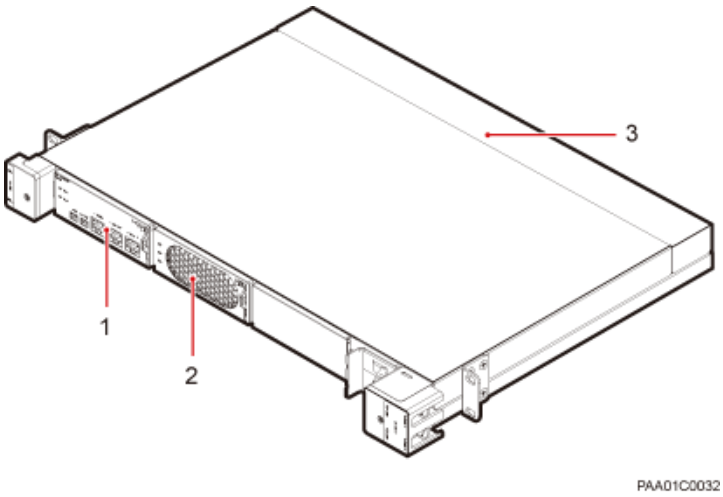
The embedded telecommunication power 48100-A1(ETP48100-A1) system converts external 220 V or 110 V AC input power into -48 V DC power.

4.3.1 ETP48100-A1 Components

The embedded telecommunication power 48100-A1 (ETP48100-A1) system consists of the power monitoring unit 11A (PMU 11A), power supply unit (PSU), and ETP48100-A1 subrack.

Figure 4-3 shows the ETP48100-A1 components.

Figure 4-3 ETP48100-A1 components



(1) **PMU 11A** (2) **PSU** (3) **ETP48100-A1 subrack**

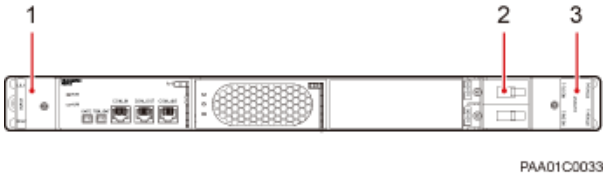
4.3.2 ETP48100-A1 Subrack

The embedded telecommunication power 48100-A1 (ETP48100-A1) subrack houses the PMU 11A and PSU. It also distributes AC input power and DC output power.

Exterior

Figure 4-4 shows an ETP48100-A1 subrack.

Figure 4-4 ETP48100-A1 subrack



(1) AC input terminal (2) Circuit breaker (3) DC output terminal

Table 4-5 describes the ports on an ETP48100-A1 subrack.

Table 4-5 Ports on an ETP48100-A1 subrack

Port	Silkscreen	Connector
AC input terminal	INPUT	OT terminal
Circuit breaker	LOAD0/LOAD1	-
DC output terminal	OUTPUT	OT terminal

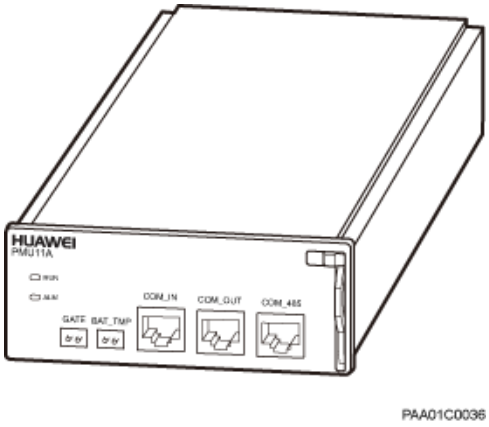
4.3.3 PMU 11A

The power monitoring unit 11A (PMU 11A) manages the power system, monitors power distribution, and reports alarms.

Exterior

Figure 4-5 shows a PMU 11A.

Figure 4-5 PMU 11A



Functions

The PMU 11A performs the following functions:

- Manages the power system.
- Reports the battery temperature.
- Monitors power distribution and reports alarms.

Ports

Figure 4-6 shows the ports on the PMU 11A and **Table 4-6** describes these ports.

Figure 4-6 Ports on the PMU 11A

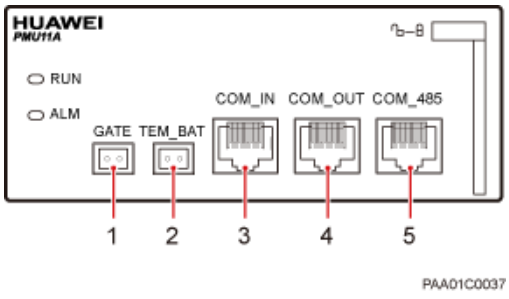


Table 4-6 Ports on the PMU 11A

No.	Silkscreen	Connector	Description
1	GATE	2-pin connector	Connects to a door status sensor
2	TEM_BAT	2-pin connector	Reserved for a battery temperature sensor
3	COM_IN	RJ45 connector	Connects to the BBU or upper-level device and reports alarms to the BBU.
4	COM_OUT	RJ45 connector	Connects to the BBU or lower-level devices and collects alarms from lower-level devices.
5	COM_485	RJ45 connector	Reserved

Indicators

Table 4-7 describes the indicators on the PMU 11A.

Table 4-7 Indicators on the PMU 11A

Silkscreen	Color	Description	Status	Description
RUN	Green	Running status indicator	Steady on	The PMU 11A is performing startup, self-check, loading and activation.
			Blinking (on for 1s and off for 1s)	The PMU 11A is functional and communicating with the BBU properly. (This status does not necessarily mean that the PMU 11A has been configured.)
			Blinking (on for 0.125s and off for 0.125s)	The PMU 11A is functional but unable to communicate properly.
			Steady off	The PMU 11A is faulty or there is no DC power supply.
ALM	Red	Alarm indicator	Steady on	An alarm is generated.
			Steady off	No alarms is generated.

Silkscreen	Color	Description	Status	Description
			Blinking (on for 1s and off for 1s)	An alarm is generated and you need to locate the fault before deciding whether to replace the PMU 11A.

DIP Switches

Figure 4-7 shows the DIP switches on the PMU 11A.

Figure 4-7 DIP switches on the PMU 11A

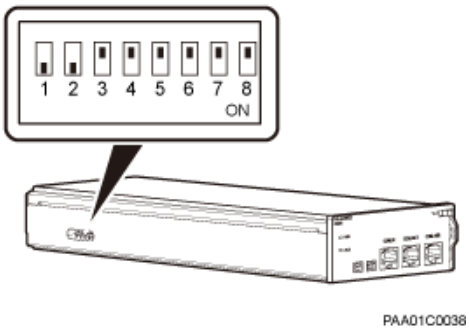


Table 4-8 describes the settings of the DIP switches.

Table 4-8 Settings of the DIP switches

DIP Bit	Function	Setting
Four least significant bits (1, 2, 3, and 4)	Define the monitoring address of the PMU.	The bit 1 indicates ON, and the bit 0 indicates OFF. Bits 1 to 4 are set to 1100 by default before delivery.
Four most significant bits (5, 6, 7, and 8)	Reserved for future use.	The bit 1 indicates ON, and the bit 0 indicates OFF. Bits 5 to 8 are set to 0000 by default before delivery.

4.3.4 PSU

The power supply unit (PSU) converts 110 V or 220 V AC power into -48 V DC power.

Functions

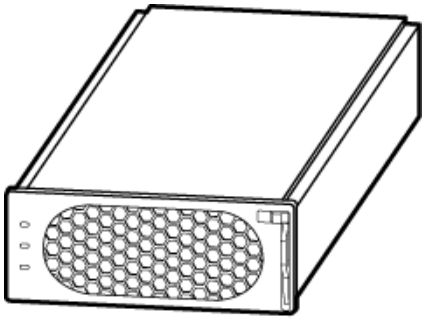
The PSU implements the following functions:

- Converts 110 V or 220 V AC power into -48 V DC power. The power monitoring unit (PMU) adjusts the output voltage.
- Provides protection against overcurrent, overvoltage, and overheat.
- Dissipates heat using built-in fans.

Exterior

Figure 4-8 shows the PSU exterior.

Figure 4-8 PSU exterior



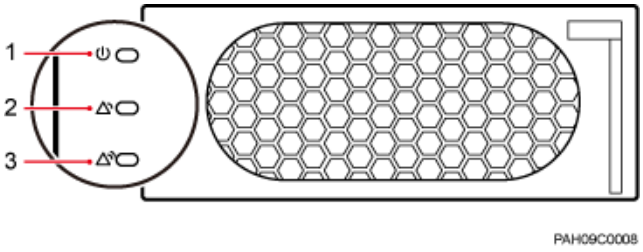
NOTE

A scanner is required for stock management to scan the two-dimensional bar code on the front panel of the PSU.

Indicators

Figure 4-9 shows the indicators on the front panel of the PSU.

Figure 4-9 Indicators on the front panel of the PSU



(1) Power indicator (2) Protection indicator (3) Fault indicator

Table 4-9 describes the indicators on the front panel of the PSU.

Table 4-9 Indicators on the front panel of the PSU

Indicator	Color	Status	Description
Power indicator	Green	Steady on	The PSU is functioning properly.
		Steady off	The PSU is experiencing a mains supply fault, or the PSU is faulty.
Protection indicator	Yellow	Steady off	The PSU is functioning properly.
		Steady on	An alarm triggered by an external factor is generated.
		Blinking (on for 1s and off for 1s)	The communication between the PSU and the PMU is interrupted.
Fault indicator	Red	Steady off	The PSU is functioning properly.
		Steady on	The PSU is faulty or shut down in case of an emergency. Diagnose the fault to determine whether to replace the PSU.

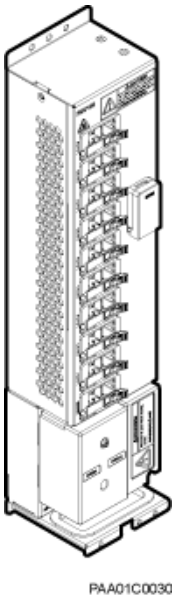
4.4 PDU10D-01

The power distribution unit 10D-01 (PDU10D-01) distributes -48 V DC power to all components in the cabinet.

Exterior

Figure 4-10 shows a PDU10D-01.

Figure 4-10 PDU10D-01



Functions

The PDU10D-01 performs the following functions:

- Supports a maximum of two -48 V DC inputs and a maximum of 160 A input current.
- Provides ten DC outputs with six for the RRUs, one for the BBU, one for the HEUB, and two reserved.

Ports

Figure 4-11 shows ports on the PDU10D-01 and **Table 4-10** describes these ports.

Figure 4-11 Ports on the PDU10D-01

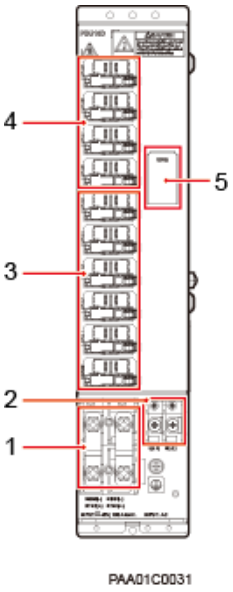
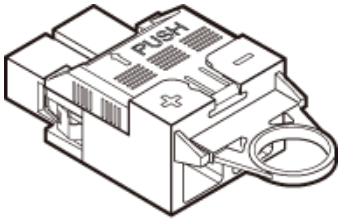


Table 4-10 Ports on the PDU10D-01

No.	Port	Silkscreen	Matched Terminal and Cable	Description
1	DC input terminals	NEG(-)	One-hole OT terminal (M6). The maximum cross-sectional area of the cable supported is 25 mm^2 (0.039 $in.^2$) for one input or 16 mm^2 (0.025 $in.^2$) for two inputs.	Negative power input wiring terminal
		RTN(+)		Positive power input wiring terminal

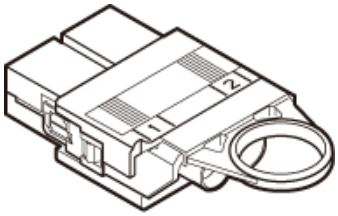
No.	Port	Silkscreen	Matched Terminal and Cable	Description
2	AC input terminals	L, N, PE	One-hole OT terminal (M4). The maximum cross-sectional area of the cable supported is 4 mm^2 (0.0062 ^{2}).	The maximum input current for a single input is 30 A.
3	DC output terminals	LOAD0 to LOAD5	**Figure 4-12** shows the EPC5 connectors for ports LOAD0 to LOAD5. The maximum cross-sectional area of the cable is 10 mm^2 (0.016 $in.^2$).	The output current is 30 A.
4	DC output terminals	LOAD6 to LOAD9	**Figure 4-13** shows an EPC4/EPC6 connector, which applies to any one among ports LOAD6 to LOAD9. The maximum cross-sectional area of the cable is 4 mm^2 (0.006 $in.^2$). **NOTE** **Figure 4-13** shows an EPC4 or EPC6 connector. An EPC4 connector must be connected to a cable onsite, whereas an EPC6 connector has been connected to a cable before delivery. The EPC5 connector must be connected to the cable onsite.	The output current is 30 A.
5	Spare fuse box	-	-	There are three fuses in the spare fuse box: ● Two 5 A spare fuses, each used for transferring power less than 150 W. ● One 30 A spare fuse, used for the 30 A output power ports on the PDU10D-01.

Figure 4-12 Exterior of an EPC5 connector



PAD00C0106

Figure 4-13 Exterior of an EPC4 or EPC6 connector



PAD00C0107

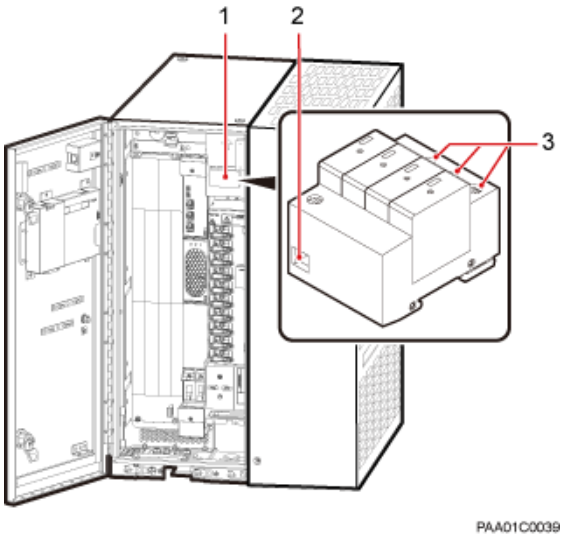
4.5 AC Surge Protection Box

The AC surge protection box provides surge protection for the input AC power.

Exterior

Figure 4-14 shows the panel of an AC surge protection box.

Figure 4-14 Panel of the AC surge protection box



PAA01C0039

(1) AC surge protection box (2) Alarm port (3) AC power supply ports

Ports

Table 4-11 describes the ports on the panel of the AC surge protection box.

Table 4-11 Ports on the panel of the AC surge protection box

Port Type	Silkscreen	Connector	Description
Port for alarm reporting	ALARM	Bare wire	Port for collecting the AC input surge protection alarm
AC power supply port	L	Cord end terminal	AC power supply port
	N		
	PE		

5 BTS3900C Monitoring System

About This Chapter

The BTS3900C monitoring system monitors all boards and components in a BTS3900C cabinet. If any board or component is faulty, an alarm is automatically reported. The RRU or UPEU and UEIU in the BBU collect monitoring signals from boards and components to monitor the surrounding environment of the BTS3900C.

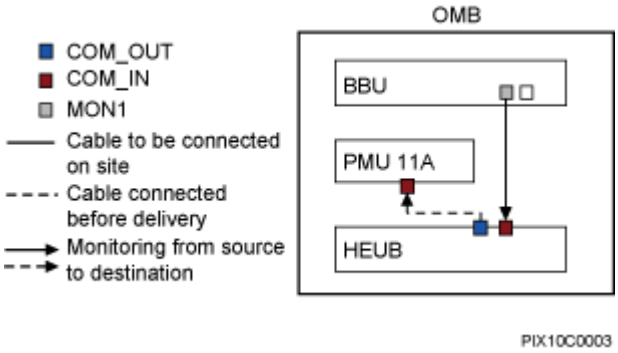
5.1 Principles for Monitoring a BTS3900C Cabinet

A BTS3900 cabinet is monitored by various boards. The boards collect alarms from sensors and fans, and then transmit the alarm signals to the MON port on the BBU through the RS485 serial bus. In this manner, the boards monitor the cabinet.

Principles for Monitoring a BTS3900C Cabinet in the 110 V AC or 220 V AC Power Supply Scenario

Figure 5-1 illustrates the principles for monitoring a BTS3900C cabinet when the BBU is installed in the OMB. For details about modules monitored by the HEUB, see 5.3.1 HEUB.

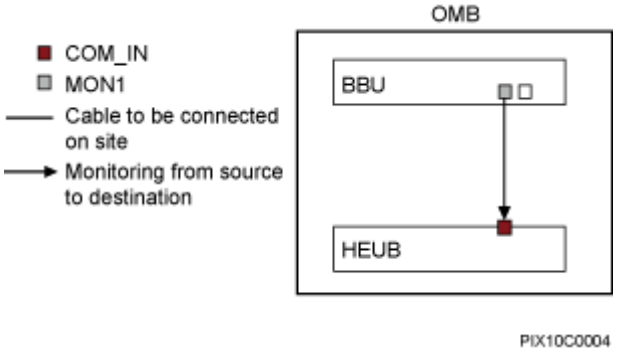
Figure 5-1 Principles for monitoring of a BTS3900C cabinet when the BBU is installed in the OMB



Principles for Monitoring a BTS3900C Cabinet in the -48 V DC Power Supply Scenario

Figure 5-2 illustrates the principles for monitoring a BTS3900C cabinet when the BBU is installed in the OMB. For details about modules monitored by the HEUB, see 5.3.1 HEUB.

Figure 5-2 Principles for monitoring of a BTS3900C cabinet when the BBU is installed in the OMB



5.2 BBU Monitoring Port

The BBU houses the UPEU and UEIU for monitoring. Each board has two Boolean input ports and two RS485 input ports, and each Boolean input port receives four Boolean inputs.

Figure 5-3 shows the slot assignment for the UPEU and UEIU.

Figure 5-3 Slot assignment for the UPEU and UEIU

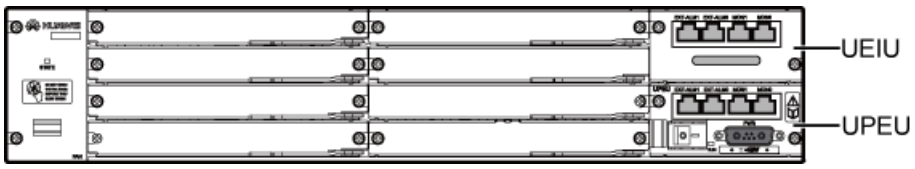


Table 5-1 lists the ports on the UPEU and UEIU.

Table 5-1 Ports on the UPEU and UEIU

Slot	Board	Port	Connector	Quantity	Description
Slot19	UPEU	EXT-ALM0	RJ45 connector	1	Port for Boolean inputs 0 to 3
		EXT-ALM1	RJ45 connector	1	Port for Boolean inputs 4 to 7
		MON0	RJ45 connector	1	Port for RS485 input 0
		MON1	RJ45 connector	1	Port for RS485 input 1
Slot18	UEIU (optional)	EXT-ALM0	RJ45 connector	1	Port for Boolean inputs 0 to 3
		EXT-ALM1	RJ45 connector	1	Port for Boolean inputs 4 to 7
		MON0	RJ45 connector	1	Port for RS485 input 0
		MON1	RJ45 connector	1	Port for RS485 input 1

5.3 Monitoring Boards

This section describes monitoring boards in a BTS3900C cabinet.

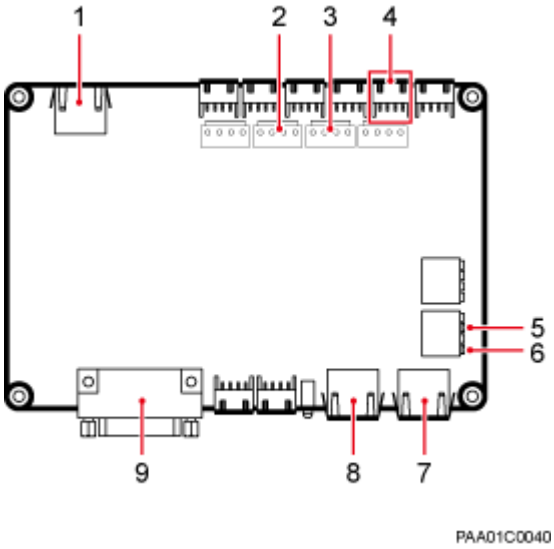
5.3.1 HEUB

The heat exchange unit type B (HEUB) provides power for the fan assembly, monitors the status of the fan assembly, collects the cabinet environment monitoring information and power surge protection alarm information, and reports the collected information to the BBU.

Panel

Figure 5-4 shows the HEUB panel.

Figure 5-4 HEUB panel



(1) ELU	(2) ExtFAN	(3) IntFAN
(4) TEM	(5) AC_SPD	(6) GATE
(7) COM_IN	(8) COM_OUT	(9) PWR

Functions

The HEUB performs the following functions:

- Provides -48 V DC power to the fan assembly.
- Collects the cabinet environment monitoring information.
- Collects the surge protection alarm information of power equipment when AC power is used.
- Monitors the running status of fans and supports fan speed adjustment based on temperature or controlled by the BBU.
- Reports collected information to the BBU.

Ports

Table 5-2 describes the ports on the HEUB.

Table 5-2 Ports on the HEUB

Silkscreen	Connector	Description
ELU	RJ45 connector	Electronic label port
ExtFAN	4-pin connector	Power port for the outer air circulation fan
IntFAN	4-pin connector	Power port for the inner air circulation fan
TEM	4-pin connector	Port connected to the temperature sensor
AC_SPD	Bare wire	Port for collecting the AC input surge protection alarm
GATE	Bare wire	Port for the door status sensor
COM_IN	RJ45 connector	Port for reporting monitoring signals
COM_OUT	RJ45 connector	Port connected to the ETP48100-A1
PWR	3V3 power connector	-48 V DC input port

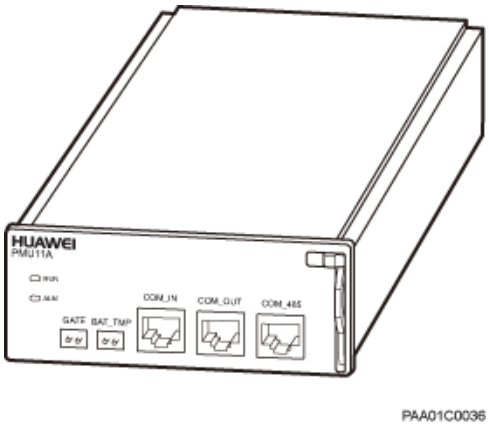
5.3.2 PMU 11A

The power monitoring unit 11A (PMU 11A) manages the power system, monitors power distribution, and reports alarms.

Exterior

Figure 5-5 shows a PMU 11A.

Figure 5-5 PMU 11A



Functions

The PMU 11A performs the following functions:

- Manages the power system.
- Reports the battery temperature.
- Monitors power distribution and reports alarms.

Ports

Figure 5-6 shows the ports on the PMU 11A and Table 5-3 describes these ports.

Figure 5-6 Ports on the PMU 11A

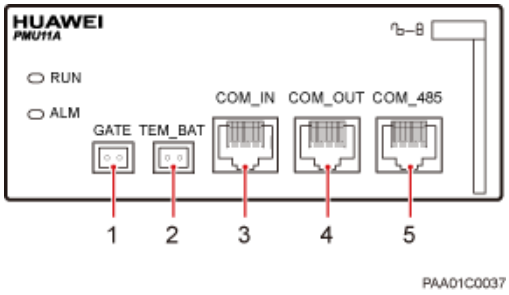


Table 5-3 Ports on the PMU 11A

No.	Silkscreen	Connector	Description
1	GATE	2-pin connector	Connects to a door status sensor
2	TEM_BAT	2-pin connector	Reserved for a battery temperature sensor
3	COM_IN	RJ45 connector	Connects to the BBU or upper-level device and reports alarms to the BBU.
4	COM_OUT	RJ45 connector	Connects to the BBU or lower-level devices and collects alarms from lower-level devices.
5	COM_485	RJ45 connector	Reserved

Indicators

Table 5-4 describes the indicators on the PMU 11A.

Table 5-4 Indicators on the PMU 11A

Silkscreen	Color	Description	Status	Description
RUN	Green	Running status indicator	Steady on	The PMU 11A is performing startup, self-check, loading and activation.
			Blinking (on for 1s and off for 1s)	The PMU 11A is functional and communicating with the BBU properly. (This status does not necessarily mean that the PMU 11A has been configured.)
			Blinking (on for 0.125s and off for 0.125s)	The module is functional but unable to communicate with the PMU properly.
			Steady off	The PMU is faulty or there is no DC power supply.
ALM	Red	Alarm indicator	Steady on	An alarm is generated.
			Steady off	No alarms is generated.
			Blinking (on for 1s and off for 1s)	An alarm is generated and you need to locate the fault before deciding whether to replace the PMU 11A.

DIP Switch

Figure 5-7 shows the DIP switches on the PMU 11A.

Figure 5-7 DIP switches on the PMU 11A

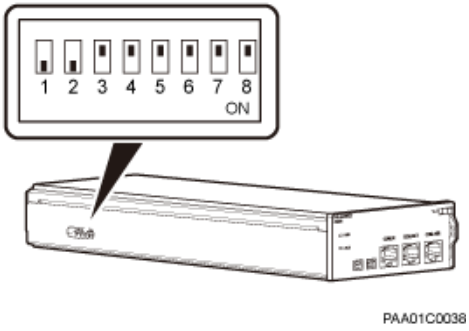


Table 5-5 describes the settings of the DIP switches.

Table 5-5 Settings of the DIP switches

DIP Bit	Functions	Setting
Four least significant bits (1, 2, 3, and 4)	Define the monitoring address of the PMU.	The bit 1 indicates ON, and the bit 0 indicates OFF. Bits 1 to 4 are set to 1100 by default before delivery.
Four most significant bits (5, 6, 7, and 8)	Reserved for future use.	The bit 1 indicates ON, and the bit 0 indicates OFF. Bits 5 to 8 are set to 0000 by default before delivery.

6 BTS3900C Components

About This Chapter

This section describes the components of a BTS3900C cabinet.

6.1 Fan Assembly
The fan assembly dissipates heat from the BTS3900C cabinet.

6.2 ELU
The electronic label unit (ELU) reports the cabinet type automatically to facilitate troubleshooting.

6.3 BTS3900C Sensors
The BTS3900C sensors consist of the door status sensor and temperature sensor.

6.1 Fan Assembly

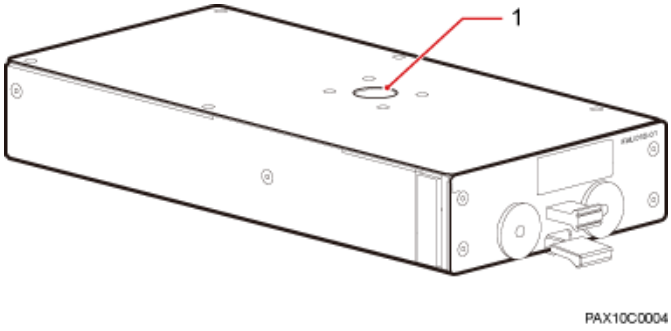
The fan assembly dissipates heat from the BTS3900C cabinet.

A BTS3900C cabinet has two fan assemblies. The one at the left bottom in the OMB is the outer air circulation fan assembly and the one at the left top in the OMB is the inner air circulation fan assembly.

Exterior

The inner air circulation fan assembly has the same exterior as the outer air circulation fan assembly, as shown in **Figure 6-1**.

Figure 6-1 Fan assembly



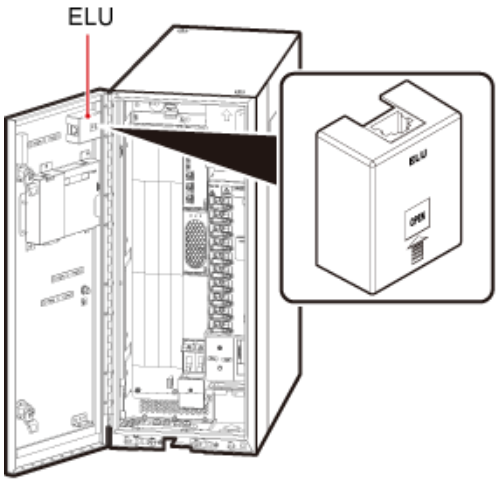
(1) Barcode opening

6.2 ELU

The electronic label unit (ELU) reports the cabinet type automatically to facilitate troubleshooting.

The ELU is on the top right corner of the BTS3900C cabinet door, as shown in **Figure 6-2**.

Figure 6-2 ELU



6.3 BTS3900C Sensors

The BTS3900C sensors consist of the door status sensor and temperature sensor.

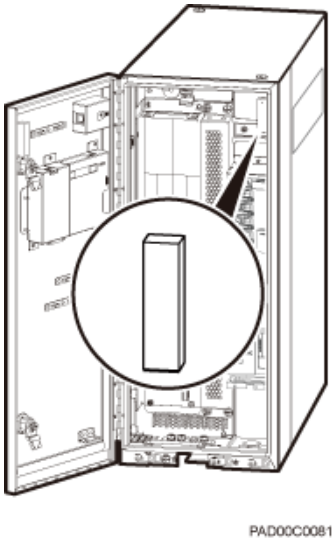
6.3.1 Door Status Sensor

The door status sensor, on the cabinet door, monitors whether the cabinet door is open.

Exterior

Figure 6-3 shows a door status sensor.

Figure 6-3 Door status sensor



6.3.2 Temperature Sensor

The temperature sensor monitors the temperature in different positions in a cabinet and reports the temperature to the HEUB.

Exterior

Figure 6-4 shows a temperature sensor.

Figure 6-4 Temperature sensor

(1) Temperature Sensor (2) 4-pin Connector

Specifications

Table 6-1 shows specifications of a temperature sensor.

Table 6-1 Specifications of a temperature sensor

Parameter	Specifications
Permissible voltage range	3.0 V DC to 5.5 V DC
Temperature measurement range	-55°C to +125°C (-67°F to +257°F)
Temperature measurement error	±0.5°C (±32.9°F)

7 BTS3900C Cables

About This Chapter

The BTS3900C cables are the PGND cables, power cables, transmission cables, CPRI cables, signal cables, and RF cables.

7.1 List of BTS3900C Cables
The BTS3900C cables are the PGND cables, power cables, transmission cables, CPRI cables, signal cables, and RF cables.

7.2 Cable Outlets in a BTS3900C Cabinet
All cables for a BTS3900C cabinet are routed into and out of the cabinet through the cable outlets at the bottom of the cabinet.

7.3 BTS3900C Cable Connections
This chapter describes the cable connections in the BTS3900C. The cable connections vary according to the configurations of the cabinet.

7.4 PGND Cables
A PGND cable ensures that the cabinet and components in the cabinet are properly grounded and that the base station runs properly. The maximum length of a PGND cable is 15 m (49.21 ft.).

7.5 Power Cables
This chapter describes all the power cables used in a BTS3900C.

7.6 BTS3900C Transmission Cables
This chapter describes all the transmission cables used in a BTS3900C, including the exteriors, functions, and pin assignments of the transmission cables.

7.7 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.

7.8 BTS3900C Signal Cables
This chapter describes all the signal cables used in a BTS3900C, including the exteriors, functions, and pin assignments of the signal cables.

7.9 RRU RF Jumper
An RRU RF jumper connects an RRU and the feeder of the antenna system to transmit signals between the base station and antenna system. 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) long. A variable-length RF jumper used by an RRU has a maximum length of 10 m (32.81 ft).

7.10 RRU AISG Multi-Wire Cable

An RRU AISG multi-wire cable is 5 m (16.4 ft.) long. It connects an RRU and a remote control unit (RCU) to transmit control signals from a base station to the RET antenna. When the RRU is connected to the RET antenna, an AISG multi-wire cable transmits RS485 signals.

7.11 RRU AISG Extension Cable

When the distance between an RRU and an RCU is longer than 5 m (16.4 ft.), an AISG multi-core cable cannot connect the RRU and the RCU because it is not long enough. In this case, an AISG extension cable is used to extend the AISG multi-core cable for transmitting RS485 signals.

7.1 List of BTS3900C Cables

The BTS3900C cables are the PGND cables, power cables, transmission cables, CPRI cables, signal cables, and RF cables.

PGND Cables

PGND cables need to be installed onsite. **Table 7-1** lists the cable connections.

Table 7-1 PGND cables

Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
OMB PGND cable	OT terminal	Ground bar at the bottom of the OMB	OT terminal	Ground bar outside the cabinet
RRU PGND Cable	OT terminal	Ground terminal on the RRU	OT terminal	Ground bar outside the cabinet

Power Cables

Table 7-2 and **Table 7-3** list the power cables used in an AC cabinet. **Table 7-4** and **Table 7-5** list the power cables used in a DC cabinet.

Table 7-2 Power cables installed before delivery (in an AC cabinet)

Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
7.5.3 ETP48100-A1 Power Cable	OT terminal	L/L1 and N/L2 on the INPUT side of the ETP48100-A1	Cord end terminal	L/N, N/L, PE on the AC surge protection box
	OT terminal	PDU10D-01		
7.5.6 HEUB Power Cable	EPC4 or EPC6 connector	LOAD9 on the PDU10D-01	3V3 connector	DC INPUT on the HEUB

Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
7.5.4 PDU10D-01 Power Cable	OT terminal	RTN0(+) and NEG0(-) on the OUTPUT side of the ETP48100-A1	OT terminal	RTN(+) and NEG(-) terminals on the INTPUT: -48 V side of the PDU10D-01

Table 7-3 Power cables to be installed onsite (in an AC cabinet)

Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
7.5.2 AC Input Power Cable	OT terminal	INPUT: AC on the PDU10D-01	Depending on the external power equipment	External power equipment
7.5.5 BBU Power Cable	EPC4 or EPC6 connector	LOAD6 on the PDU10D-01	3V3 connector	-48V on the UPEU
7.5.7 RRU Power Cable	EPC4 or EPC6 connector	LOAD0 on the PDU10D-01	Depending on the RRU type	NEG(-) and RTN(+) terminals on the RRU

Table 7-4 Power cables installed before delivery (in a DC cabinet)

Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
7.5.6 HEUB Power Cable	EPC4 or EPC6 connector	LOAD9 on the PDU10D-01	3V3 connector	DC INPUT on the HEUB

Table 7-5 Power cables to be installed onsite (in a DC cabinet)

Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
7.5.1 DC Input Power Cable	OT terminal	RTN(+) and NEG(-) terminals on the INTPUT: -48 V side of the PDU10D-01	Depending on the external power equipment	External power equipment
7.5.5 BBU Power Cable	EPC4 or EPC6 connector	LOAD6 on the PDU10D-01	3V3 connector	-48V on the UPEU
7.5.7 RRU Power Cable	EPC4 or EPC6 connector	LOAD0 on the PDU10D-01	Depending on the RRU type	NEG(-) and RTN(+) terminals on the RRU

Transmission Cables

Table 7-6 lists the transmission cables that have been installed before delivery. Table 7-7 lists the transmission cables and CPRI fiber optic cables that need to be installed onsite.

Table 7-6 Transmission cables installed before delivery

Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
E1/T1 Surge Protection Transfer Cable	DB25 connector	INSIDE port on the UELP in the BBU	DB26 connector	E1/T1 port on the GTMU, WMPT, or UTRP in the BBU
FE Surge Protection Transfer Cable	RJ45 connector	● FE0 port on the GTMU or WMPT in the BBU ● FE0 or FE1 port on the LMPT in the BBU	RJ45 connector	FE0 port in the INSIDE part on the UFLP in the BBU

Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
7.6.5 Interconnection Cable Between the FE Electrical Ports	RJ45 connector	FE0 port on the GTMU in the BBU	RJ45 connector	FE0 port on the WMPT in the BBU
7.6.6 Interconnection Cable Between FE Optical Ports	LC connector	FE1 port on the GTMU in the BBU	LC connector	FE1 port on the WMPT in the BBU

Table 7-7 Transmission cables and CPRI fiber optic cables to be installed onsite

Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
7.6.1 E1/T1 Cable	DB26 male connector	INSIDE port on the UELP in the BBU	Depending on the external transmission equipment	External transmission equipment
7.6.3 FE/GE Ethernet Cable	RJ45 connector	FE0 port in the OUTSIDE part on the UFLP in the BBU	RJ45 connector	Routing device
7.6.7 FE/GE Fiber Optic Cable	LC connector	● FE1 port on the GTMU, WMPT, or UTRP in the BBU ● SFP0 or SFP1 port on the LMPT in the BBU	● FC connector ● SC connector ● LC connector	Routing device

Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
7.7 CPRI Fiber Optic Cable	DLC connector	● CPRI port on the GTMU or UBRI in the BBU ● CPRI port on the WBBP in the BBU ● CPRI port on the LBBP in the BBU	DLC connector	CPRI_W or CPRI0 port on the RRU

Signal Cables

Table 7-8 and Table 7-9 list the signal cables that have been installed before delivery. Table 7-10 lists the signal cables to be installed onsite.

Table 7-8 Signal cables installed before delivery (in an AC cabinet)

Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
7.8.7 Monitoring Signal Cable for the Door Status Sensor	Bare wire	Door status sensor	Bare wire	GATE port on the HEUB
Monitoring signal cable for the inner air circulation fan	4-pin connector	IntFAN port on the HEUB	4-pin connector	Power and monitoring port for the inner air circulation fan
Monitoring signal cable for the outer air circulation fan	4-pin connector	ExtFAN port on the HEUB	4-pin connector	Power and monitoring port for the outer air circulation fan
7.8.3 PMU 11A Monitoring Signal Cable	RJ45 connector	COM_OUT port on the HEUB	RJ45 connector	COM_IN port on the PMU11A in the ETP48100-A1
7.8.6 ELU Signal Cable	RJ45 connector	RJ45 port on the ELU	RJ45 connector	ELU port on the HEUB

Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
7.8.10 Adapter Used for Local Maintenance	USB3.0 connector	BBU/UMPT/ USB	Ethernet connector	Ethernet cable

Table 7-9 Signal cables installed before delivery (in a DC cabinet)

Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
7.8.7 Monitoring Signal Cable for the Door Status Sensor	Bare wire	Door status sensor	Bare wire	GATE port on the HEUB
Monitoring signal cable for the inner air circulation fan	4-pin connector	IntFAN port on the HEUB	4-pin connector	Power and monitoring port for the inner air circulation fan
Monitoring signal cable for the outer air circulation fan	4-pin connector	ExtFAN port on the HEUB	4-pin connector	Power and monitoring port for the outer air circulation fan
7.8.6 ELU Signal Cable	RJ45 connector	RJ45 port on the ELU	RJ45 connector	ELU port on the HEUB
7.8.10 Adapter Used for Local Maintenance	USB3.0 connector	BBU/UMPT/ USB	Ethernet connector	Ethernet cable

Table 7-10 Signal cables to be installed onsite

Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
7.8.9 GPS Clock Signal Cable	SMA male connector	GPS port on the USCU in the BBU	Type N female connector	Protect port on the GPS surge protector
7.8.4 HEUB-BBU Monitoring Signal Cable	RJ45 connector	COM_IN port on the HEUB	RJ45 connector	MON1 port on the UPEU in the BBU

Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
7.8.5 BBU Alarm Cable	RJ45 connector	EXT_ALM0 port on the UPEU or UEIU	RJ45 connector	External alarm equipment

RF Cables

All RF cables need to be installed onsite. Table 7-11 lists the RF cable connections.

Table 7-11 RF cables to be installed onsite

Cable	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
7.9 RRU RF Jumper	DIN male connector	ANT_TX/RXA or ANT_TX/RXB port on the RRU	DIN male connector	Antenna system
7.10 RRU AISG Multi-Wire Cable	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
7.11 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

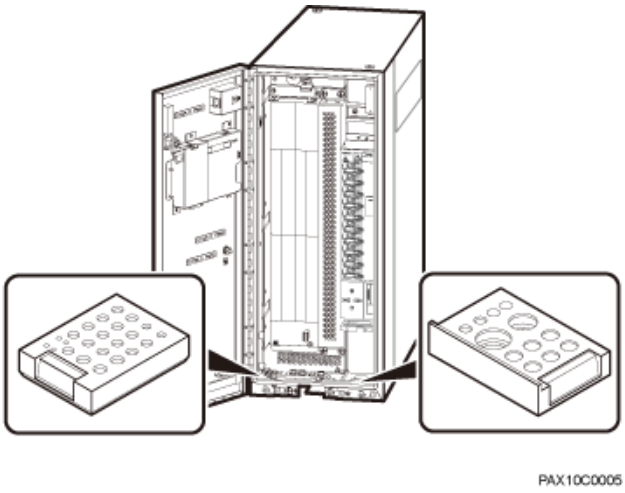
7.2 Cable Outlets in a BTS3900C Cabinet

All cables for a BTS3900C cabinet are routed into and out of the cabinet through the cable outlets at the bottom of the cabinet.

Position of cable outlet modules

Cable outlet modules are on the bottom left and right sides of the OMB, as shown in Figure 7-1.

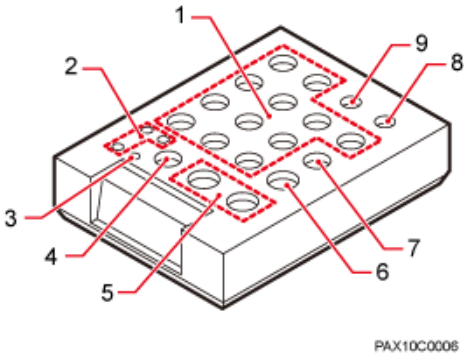
Figure 7-1 Position of cable outlet modules



Cable holes on the left cable outlet module

Figure 7-2 shows cable holes on the left cable outlet module.

Figure 7-2 Cable holes on the left cable outlet module

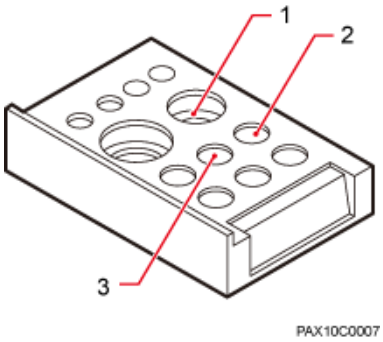


(1) Cable holes for CPRI fiber optic cables	(6) Cable hole for the PGND cable
(2) Reserved	(7) Cable hole for the alarm cable
(3) Cable hole for the GPS clock signal cable	(8) Cable hole for the monitoring signal cable for an outer air circulation fan
(4) Cable hole for the alarm cable	(9) Reserved
(5) Cable hole for the transmission cable	-

Cable holes on the right cable outlet module

Figure 7-3 shows cable holes on the right cable outlet module.

Figure 7-3 Cable holes on the right cable outlet module



(1) Cable hole for an AC input power cable

(2) Cable holes for RRU power cables

(3) Cable hole for a DC input power cable

-

7.3 BTS3900C Cable Connections

This chapter describes the cable connections in the BTS3900C. The cable connections vary according to the configurations of the cabinet.

7.3.1 Power Cable Connections

This section describes the power cable connections for a BTS3900C AC cabinet and a BTS3900C DC cabinet.

Power Cable Connections for a BTS3900C AC Cabinet

Figure 7-4 shows the power cable connections for a BTS3900C AC cabinet. **Table 7-12** describes the power cables in a BTS3900C AC cabinet.

Figure 7-4 Power cable connections for a BTS3900C AC cabinet

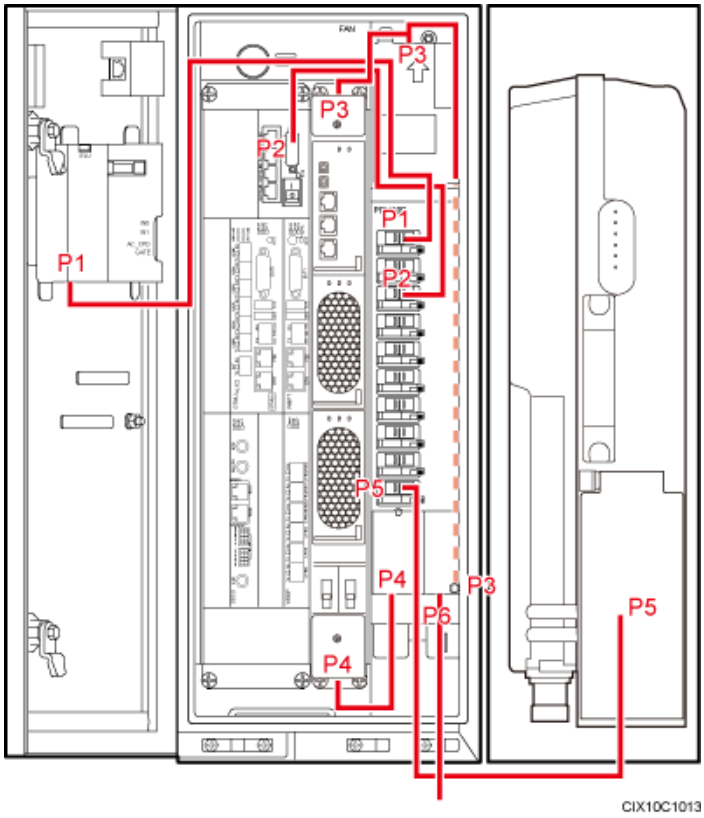


Table 7-12 Power cables in a BTS3900C AC cabinet

Cable No.	Cable Description
P1	**7.5.6 HEUB Power Cable**
P2	**7.5.5 BBU Power Cable**
P3	**7.5.3 ETP48100-A1 Power Cable**
P4	**7.5.4 PDU10D-01 Power Cable**
P5	**7.5.7 RRU Power Cable**
P6	**7.5.2 AC Input Power Cable**

Power Cable Connections for a BTS3900C DC Cabinet

Figure 7-5 shows the power cable connections for a BTS3900C DC cabinet. **Table 7-13** describes the power cables in a BTS3900C DC cabinet.

Figure 7-5 Power cable connections for a BTS3900C DC cabinet

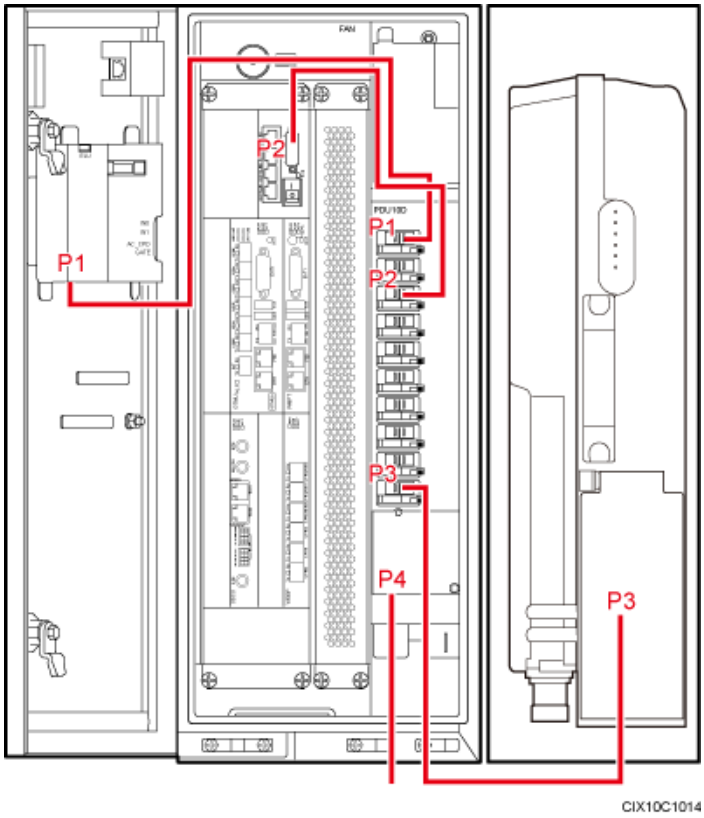


Table 7-13 Power cables in a BTS3900C DC cabinet

Cable No.	Cable Description
P1	**7.5.6 HEUB Power Cable**
P2	**7.5.5 BBU Power Cable**
P3	**7.5.7 RRU Power Cable**
P4	**7.5.1 DC Input Power Cable**

7.3.2 Transmission Cable Connections

This chapter describes the transmission cable connections of the BTS3900C in different modes.

Transmission Cable Connections in a Single-Mode Base Station

In GSM only, UMTS only, or LTE only mode, use the E1/T1 cable, FE/GE cable, or optical cable to transmit data. This section describes transmission cable connections for each mode.

Configuration Principles

- The BTS3900C cannot provide enough space for an SLPU. Therefore, surge protection boards need to be installed in the BBU subrack.
- The surge protection board cannot be positioned in slot 4 in the BBU to avoid interfering with power cables in the BTS3900C cabinet.
- The number of surge protection boards (UELP/UFLP/UFLPB) is based on the number of E1/FE/GE ports that need surge protection in the BBU. The surge protection board is installed, in descending order of priority, in slot 5, 1, or 0. If slots 5, 1, and 0 are occupied, the surge protection board can be installed in a vacant slot in the BBU.
- Either the UFLPB or UFLP, but not both of them, can be installed in the surge protection box. The UFLPB or UFLP is installed in a slot with a higher priority than the UELP.
- The FE/GE fiber optic cables do not need surge protection.

Cable Connections

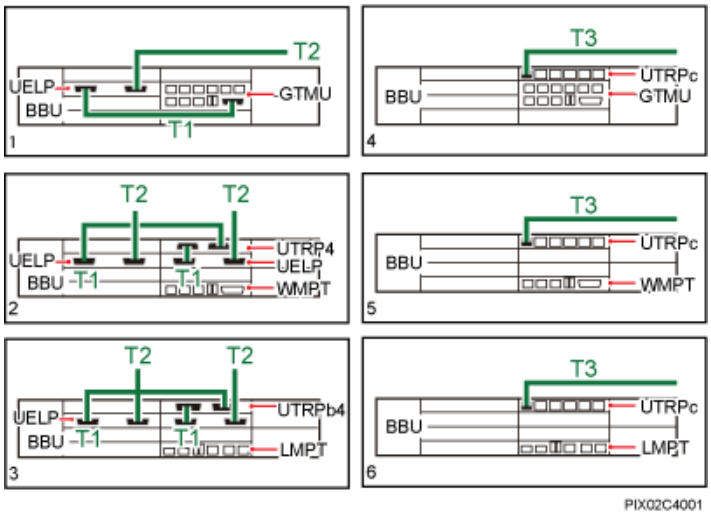
Table 7-14 and **Figure 7-6** show transmission cable connections in a single-mode base station.

Table 7-14 Transmission cable connections for a single-mode base station

Transmission Mode	Mode Supported	Application Scenario	Legend
Transmission over the E1 Cable	GSM only	Scenario 1: The UTRP is not configured. The transmission cable is connected to the E1/T1 port on the GTMU. Scenario 2: The UTRP is configured. The transmission cables are connected to the E1/T1 ports on the GTMU and UTRP.	**"1"** in the **Figure 7-6** shows the cable connections in scenario 1.
	UMTS only	Scenario 1: The UTRP is configured. The transmission cable is connected to the E1/T1 port on the UTRP. Scenario 2: The UTRP is not configured. The transmission cable is connected to the E1/T1 port on the WMPT or UMPT.	**"2"** in the **Figure 7-6** shows the cable connections in scenario 1.
	LTE only	The UTRP is configured. The transmission cable is connected to the E1/T1 port on the UTRP.	**"3"** in **Figure 7-6** shows the cable connections.
Transmission over the FE Cable	GSM only	Scenario 1: The UTRPc is configured. The transmission cable is connected to the FE/GE optical port or electrical port on the UTRPc. Scenario 2: The UTRP is not configured. The transmission cable is connected to the FE/GE optical port on the GTMU. Scenario 3: The UTRP is not configured. The transmission cable is connected to the FE/GE electrical port on the GTMU.	**"4"** in the **Figure 7-6** shows the cable connections in scenario 1.

Transmission Mode	Mode Supported	Application Scenario	Legend
	UMTS only	Scenario 1: The UTRPc is configured. The transmission cable is connected to the FE/GE optical port or electrical port on the UTRPc. Scenario 2: The UTRP2 is configured. The transmission cable is connected to the FE/GE optical port on the UTRP2. Scenario 3: The UTRP9 is configured. The transmission cable is connected to the FE/GE electrical port on the UTRP9. Scenario 4: The UTRP is not configured. The transmission cable is connected to the FE/GE optical port or electrical port on the WMPT or UMPT.	**"5"** in the **Figure 7-6** shows the cable connections in scenario 1.
	LTE only	Scenario 1: The UTRPc is configured. The transmission cable is connected to the FE/GE optical port or electrical port on the UTRPc. Scenario 2: The UTRP is not configured. The transmission cable is connected to the FE/GE optical port or electrical port on the LMPT or UMPT.	**"6"** in the **Figure 7-6** shows the cable connections in scenario 1.

Figure 7-6 Transmission cable connections in a single-mode base station



T1: E1/T1 Surge Protection Transfer Cable T2: **7.6.1 E1/T1 Cable** T3: **7.6.7 FE/GE Fiber Optic Cable**

Transmission Cable Connections in a Dual-Mode Base Station in Common Transmission Mode

In GSM+UMTS, GSM+LTE, or UMTS+LTE mode, common transmission can be used. This section describes transmission cable connections for each mode.

Configuration Principles

- The BTS3900C cannot provide enough space for an SLPU. Therefore, surge protection boards need to be installed in the BBU subrack.
- The surge protection board cannot be positioned in slot 4 in the BBU to avoid interfering with power cables in the BTS3900C cabinet.
- The number of surge protection boards (UELP/UFLP/UFLPB) is based on the number of E1/FE/GE ports that need surge protection in the BBU. The surge protection board is installed, in descending order of priority, in slot 5, 1, or 0. If slots 5, 1, and 0 are occupied, the surge protection board can be installed in a vacant slot in the BBU.
- Either the UFLPB or UFLP, but not both of them, can be installed in the surge protection box. The UFLPB or UFLP is installed in a slot with a higher priority than the UELP.
- In a GU dual-mode base station supporting TDM co-transmission scenario, the transmission cables are connected to ports on the GTMU or UTRP.
- In a GU dual-mode base station supporting IP co-transmission scenario, the transmission cables are connected ports on the WMPT, GTMU or UTRP.
- In a GL dual-mode base station, the transmission cables are connected to ports on the LMPT or UMPT, or ports on the UTRP in the LTE side with a higher priority.
- The FE/GE fiber optic cables do not need surge protection.

Cable Connections

Figure 7-7 shows cable connections in a dual-mode base station in different transmission modes. **Table 7-15** describes cable connections in a dual-mode base station in different transmission modes.

Table 7-15 Transmission cable connections for a dual-mode base station in common transmission mode

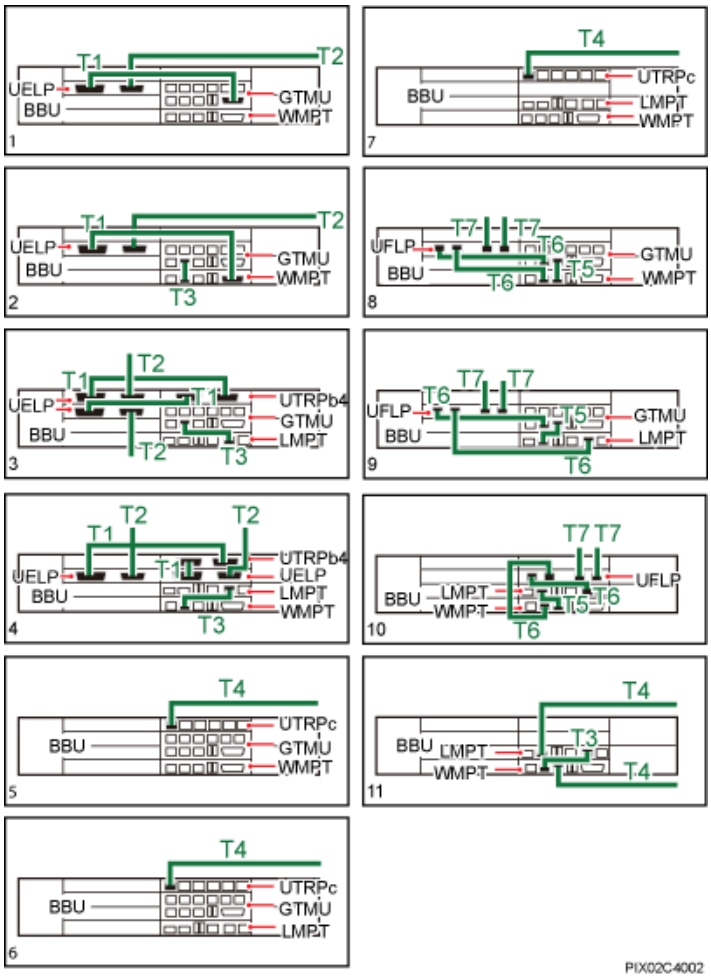
Transmission Mode	Mode Supported	Application Scenario	Legend
TDM Common Transmission	GSM+UMTS	Scenario 1: The UTRP is not configured. The transmission cable is connected to the E1/T1 port on the GTMU. Scenario 2: The UTRP is configured. The transmission cable is connected to the E1/T1 port on the UTRP.	**"1"** in the **Figure 7-7** shows the cable connections in scenario 1.

Transmission Mode	Mode Supported	Application Scenario	Legend
IP Over E1/T1 Common Transmission	GSM +UMTS	Scenario 1: The UTRP is not configured. The transmission cable is connected to the E1/T1 port on the WMPT or UMPT. The WMPT or UMPT is interconnected to the GTMU using the electrical port or optical port. Scenario 2: The UTRP is configured. The transmission cable is connected to the E1/T1 port on the UTRP. The WMPT or UMPTis interconnected to the GTMU using the electrical port or optical port.	**"2"** in the **Figure 7-7** shows the cable connections in scenario 1.
	GSM +LTE	The UTRP is configured. The transmission cable is connected to the E1/T1 port on the UTRP. The LMPT or UMPT is interconnected to the GTMU using the electrical port or optical port.	**"3"** in **Figure 7-7** shows the cable connections.
	UMTS +LTE	The UTRP is configured. The transmission cable is connected to the E1/T1 port on the UTRP. The LMPT or UMPT is interconnected to the WMPT or UMPT using the electrical port or optical port.	**"4"** in the **Figure 7-7** shows the cable connections.
IP over FE/GE Common Transmission	GSM +UMTS	Scenario 1: The UTRPc is configured. The transmission cable is connected to the FE/GE optical port or electrical port on the UTRPc. Scenario 2: The UTRP2 is configured. The transmission cable is connected to the FE/GE optical port on the UTRP2. The GTMU is interconnected to the UTRP using the optical port. Scenario 3: The UTRP is not configured. The transmission cable is connected to the FE/GE optical port on the WMPT or UMPT. The WMPT or UMPT is interconnected to the GTMU using the electrical port. Scenario 4: The UTRP is not configured. The transmission cable is connected to the FE/GE electrical port on the WMPT or UMPT. The WMPT or UMPT is interconnected to the GTMU using the optical port. Scenario 5: The UTRP is not configured. The transmission cable is connected to the FE/GE electrical port or optical port on the WMPT or UMPT. The WMPT or UMPT is interconnected to the GTMU through the backplane.	**"5"** in the **Figure 7-7** shows the cable connections in scenario 1.

Transmission Mode	Mode Supported	Application Scenario	Legend
	GSM +LTE	Scenario 1: The UTRPc is configured. The transmission cable is connected to the FE/GE optical port or electrical port on the UTRPc. Scenario 2: The UTRP is not configured. The transmission cable is connected to the FE/GE optical port on the LMPT or UMPT. The LMPT or UMPT is interconnected to the GTMU using the electrical port. Scenario 3: The UTRP is not configured. The transmission cable is connected to the FE/GE electrical port on the LMPT or UMPT. The LMPT or UMPT is interconnected to the GTMU using the optical port. Scenario 4: The UTRP is not configured. The transmission cable is connected to the FE/GE electrical port or optical port on the LMPT or UMPT. The LMPT or UMPT is interconnected to the GTMU through the backplane.	**"6"** in the **Figure 7-7** shows the cable connections in scenario 1.
	UMTS +LTE	Scenario 1: The UTRPc is configured. The transmission cable is connected to the FE/GE optical port or electrical port on the UTRPc. Scenario 2: The UTRP is not configured. The transmission cable is connected to the FE/GE optical port on the LMPT or UMPT. The LMPT or UMPT is interconnected to the WMPT or UMPT using the electrical port. Scenario 3: The UTRP is not configured. The transmission cable is connected to the FE/GE electrical port on the LMPT or UMPT. The LMPT or UMPT is interconnected to the WMPT or UMPT using the optical port. Scenario 4: The UTRP is not configured. The transmission cable is connected to the FE/GE electrical port or optical port on the LMPT or UMPT. The LMPT or UMPT is interconnected to the WMPT or UMPT through the backplane.	**"7"** in the **Figure 7-7** shows the cable connections in scenario 1.
Route Backup Mode with IP Common Transmission	GSM +UMTS	Scenario 1: The transmission cables are connected to the electrical ports on the WMPT or UMPTand the GTMU. The WMPT or UMPT is interconnected to the GTMU using the optical port. Scenario 2: The transmission cables are connected to the optical ports on the WMPT or UMPT and the GTMU. The WMPT or UMPT is interconnected to the GTMU using the electrical port.	**"8"** in the **Figure 7-7** shows the cable connections in scenario 1.

Transmission Mode	Mode Supported	Application Scenario	Legend
	GSM +LTE	Scenario 1: The transmission cables are connected to the electrical ports on the LMPT or UMPT and the GTMU. The LMPT or UMPT is interconnected to the GTMU using the optical port. Scenario 2: The transmission cables are connected to the optical ports on the LMPT or UMPT and the GTMU. The LMPT or UMPT is interconnected to the GTMU using the electrical port.	**"9"** in the **Figure 7-7** shows the cable connections in scenario 1.
	UMTS +LTE	Scenario 1: The transmission cables are connected to the electrical ports on the LMPT or UMPT and the WMPT or UMPT. The LMPT or UMPT is interconnected to the WMPT or UMPT using the optical port. Scenario 2: The transmission cables are connected to the optical ports on the LMPT or UMPT and the WMPT or UMPT. The LMPT or UMPT is interconnected to the WMPT or UMPT using the optical port.	**"10"** in the **Figure 7-7** shows the cable connections in scenario 1.
Hybrid Transmission	UMTS +LTE	Scenario 1: The transmission cables are connected to the optical ports on the WMPT or UMPT and the LMPT or UMPT. The LMPT or UMPT is interconnected to the WMPT or UMPT using the electrical port. Scenario 2: The transmission cables are connected to the optical ports on the WMPT or UMPT and the LMPT or UMPT. The LMPT or UMPT is interconnected to the WMPT or UMPT using the electrical port.	**"11"** in the **Figure 7-7** shows the cable connections in scenario 1.

Figure 7-7 Transmission cable connections in a dual-mode base station in common transmission mode



T1: E1/T1 Surge Protection Transfer Cable E1/T1 Surge Protection Transfer Cable	T2: **7.6.1 E1/T1 Cable**	T3: **7.6.5 Interconnection Cable Between the FE Electrical Ports**	T4: **7.6.7 FE/GE Fiber Optic Cable**
T5: **7.6.6 Interconnection Cable Between FE Optical Ports**	T6: FE Surge Protection Transfer Cable	T7: **7.6.3 FE/GE Ethernet Cable**	-

Transmission Cable Connections in a Dual-Mode Base Station in Separate Transmission Mode

In GSM+UMTS, GSM+LTE, or UMTS+LTE mode, independent transmission can be used. This section describes transmission cable connections for each mode.

Configuration Principles

- The BTS3900C cannot provide enough space for an SLPU. Therefore, surge protection boards need to be installed in the BBU subrack.

- The surge protection board cannot be positioned in slot 4 in the BBU to avoid interfering with power cables in the BTS3900C cabinet.
- The number of surge protection boards (UELP/UFLP/UFLPB) is based on the number of E1/FE/GE ports that need surge protection in the BBU. The surge protection board is installed, in descending order of priority, in slot 5, 1, or 0. If slots 5, 1, and 0 are occupied, the surge protection board can be installed in a vacant slot in the BBU.
- Either the UFLPB or UFLP, but not both of them, can be installed in the surge protection box. The UFLPB or UFLP is installed in a slot with a higher priority than the UELP.
- The FE/GE fiber optic cables do not need surge protection.

Cable Connections

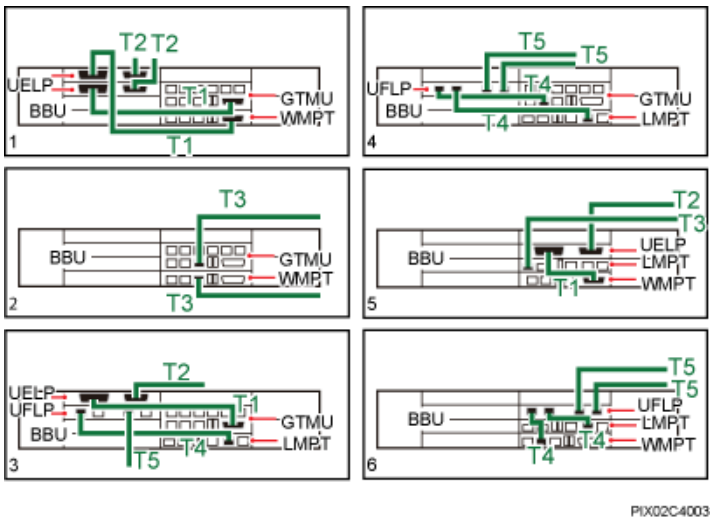
Table 7-16 and **Figure 7-8** show cable connections in a dual-mode base station in different transmission modes.

Table 7-16 Transmission cable connections for a dual-mode base station in independent transmission mode

Transmission Mode	Mode Supported	Application Scenario	Legend
GSM E1/T1 +UMTS E1/T1	GSM +UMTS	The transmission cables are connected to the E1/T1 port on the WMPT or UMPT and the GTMU.	**"1"** in the **Figure 7-8** shows the cable connections.
GSM FE/GE +UMTS FE/GE	GSM +UMTS	Scenario 1: The transmission cables are connected to the FE optical port on the WMPT or UMPT and the GTMU. Scenario 2: The transmission cables are connected to the FE electrical port on the WMPT or UMPT and the GTMU.	**"2"** in the **Figure 7-8** shows the cable connections in scenario 1.
GSM E1/T1 +LTE FE/GE	GSM +LTE	Scenario 1: The UTRP is not configured. The transmission cables are connected to the E1/T1 port on the GTMU and the FE optical or electrical port on the LMPT or UMPT. Scenario 2: The UTRP is configured on the GSM side. The transmission cables are connected to the E1/T1 ports on the GTMU and UTRP and to the FE electrical or optical port on the LMPT or UMPT.	**"3"** in the **Figure 7-8** shows the cable connections in scenario 1.
UMTS FE/GE +LTE FE/GE	GSM +LTE	Scenario 1: The transmission cables are connected to the FE electrical port on the LMPT or UMPT and the GTMU. Scenario 2: The transmission cables are connected to the FE optical port on the LMPT or UMPT and FE electrical port on the GTMU.	**"4"** in the **Figure 7-8** shows the cable connections in scenario 1.

Transmission Mode	Mode Supported	Application Scenario	Legend
UMTS E1/T1 +LTE FE/GE	UMTS +LTE	Scenario 1: The UTRP is not configured. The transmission cables are connected to the E1/T1 port on the WMPT or UMPT and the FE optical or electrical port on the LMPT or UMPT. Scenario 2: The UTRP is configured on the UMTS side. The transmission cable is connected to the E1/T1 port on the UTRP and to the FE electrical or optical port on the LMPT or UMPT.	**"5"** in the **Figure 7-8** shows the cable connections in scenario 1.
UMTS FE/GE +LTE FE/GE	UMTS +LTE	Scenario 1: The transmission cables are connected to the FE electrical port on the LMPT or UMPT and the WMPT or UMPT. Scenario 2: The transmission cables are connected to the FE optical port on the LMPT or UMPT and FE electrical port on the WMPT or UMPT.	**"6"** in the **Figure 7-8** shows the cable connections in scenario 1.

Figure 7-8 Transmission cable connections in a dual-mode base station in separate transmission mode



T1: E1/T1 Surge Protection Transfer Cable	T2: **7.6.1 E1/T1 Cable**	T3: **7.6.7 FE/GE Fiber Optic Cable**	T4: FE Surge Protection Transfer Cable
T5: **7.6.3 FE/GE Ethernet Cable**	-	-	-

7.3.3 Monitoring Signal Cable Connections

This section describes the monitoring signal cable connections for a BTS3900C AC cabinet and a BTS3900C DC cabinet.

Monitoring Signal Cable Connections for a BTS3900C AC Cabinet

Figure 7-9 shows the monitoring signal cable connections for a BTS3900C AC cabinet. **Table 7-17** describes the monitoring signal cables in a BTS3900C AC cabinet.

Figure 7-9 Monitoring signal cable connections for a BTS3900C AC cabinet

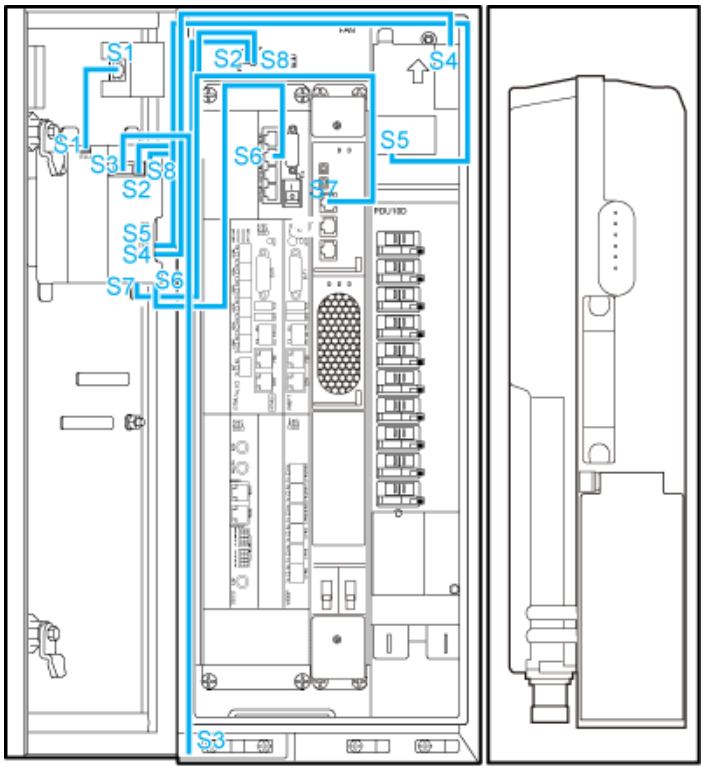


Table 7-17 Monitoring signal cables in a BTS3900C AC cabinet

Cable No.	Cable Description
S1	**ELU signal cable**
S2	**Monitoring signal cable for the outer air circulation fan**
S3	**Monitoring signal cable for the inner air circulation fan**
S4	**Monitoring signal cable for the door status sensor**
S5	**Monitoring signal cable for the surge protection box**
S6	**HEUB-BBU monitoring signal cable**
S7	**PMU 11A monitoring signal cable**
S8	**Temperature monitoring signal cable**

Monitoring Signal Cable Connections for a BTS3900C DC Cabinet

Figure 7-10 shows the monitoring signal cable connections for a BTS3900C DC cabinet. **Table 7-18** describes the monitoring signal cables in a BTS3900C DC cabinet.

Figure 7-10 Monitoring signal cable connections for a BTS3900C DC cabinet

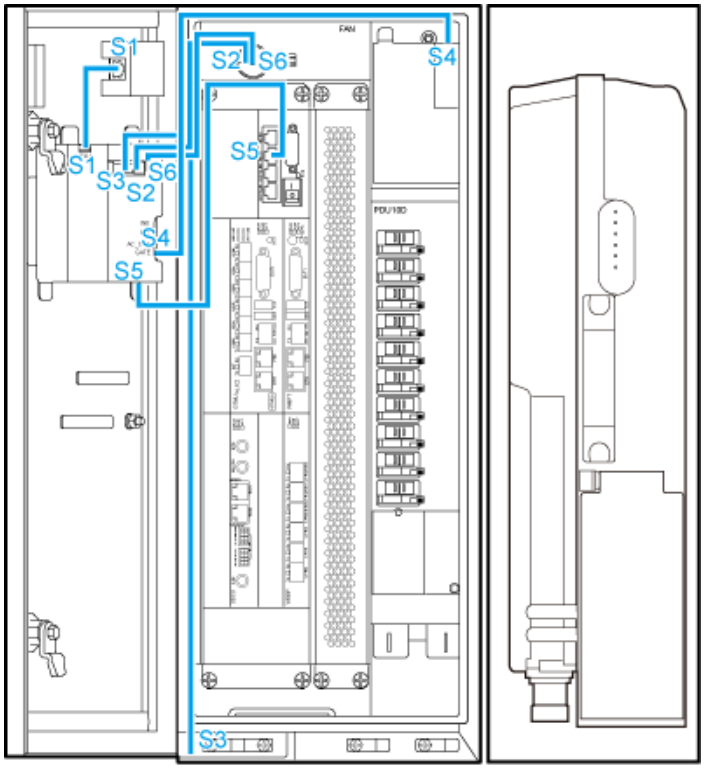


Table 7-18 Monitoring signal cables in a BTS3900C DC cabinet

Cable No.	Cable Description
S1	**ELU signal cable**
S2	**Monitoring signal cable for the outer air circulation fan**
S3	**Monitoring signal cable for the inner air circulation fan**
S4	**Monitoring signal cable for the door status sensor**
S5	**HEUB-BBU monitoring signal cable**
S6	**Temperature monitoring signal cable**

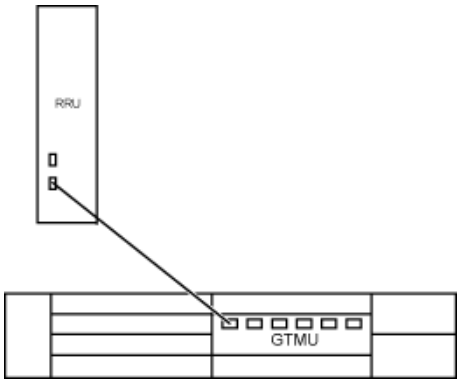
7.3.4 CPRI Cable Connections

CPRI cable connections in the BTS3900C cabinet depend on the mode of the BTS3900C.

CPRI Cable Connections in the GSM Only Base Station

Figure 7-11 shows CPRI cable connections in the GSM only base station.

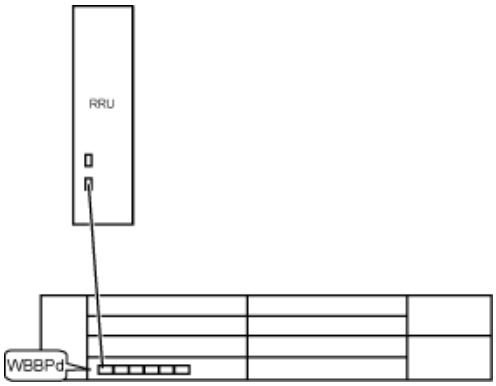
Figure 7-11 CPRI cable connections in the GSM only base station



CPRI Cable Connections in the UMTS Only Base Station

Figure 7-12 shows CPRI cable connections in the UMTS only base station.

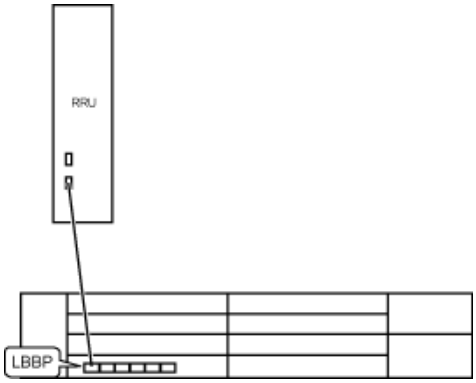
Figure 7-12 CPRI cable connections in the UMTS only base station



CPRI Cable Connections in the LTE Only Base Station

Figure 7-13 shows CPRI cable connections in the LTE only base station.

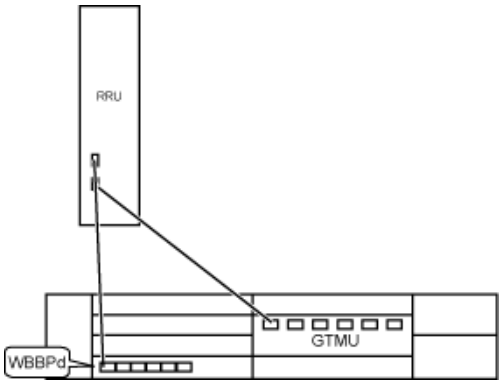
Figure 7-13 CPRI cable connections in the LTE only base station



CPRI Cable Connections in the GSM+UMTS Base Station

Figure 7-14 shows CPRI cable connections in the GSM+UMTS base station.

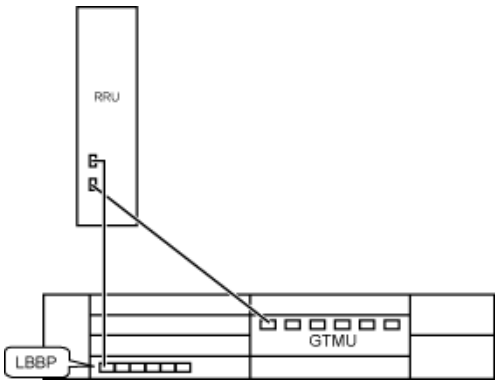
Figure 7-14 CPRI cable connections in the GSM+UMTS base station



CPRI Cable Connections in the GSM+LTE Base Station

Figure 7-15 shows CPRI cable connections in the GSM+LTE base station.

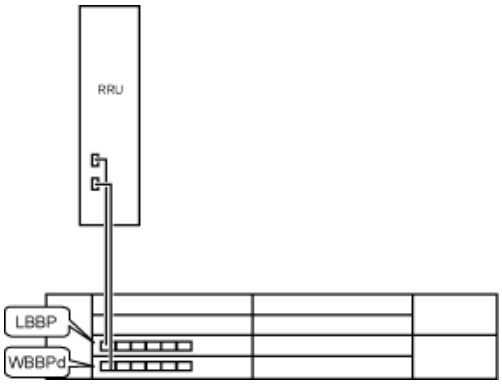
Figure 7-15 CPRI cable connections in the GSM+LTE base station



CPRI Cable Connections in the UMTS+LTE Base Station

Figure 7-16 shows CPRI cable connections in the UMTS+LTE base station.

Figure 7-16 CPRI cable connections in the UMTS+LTE base station



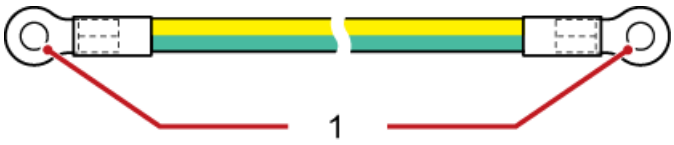
7.4 PGND Cables

A PGND cable ensures that the cabinet and components in the cabinet are properly grounded and that the base station runs properly. The maximum length of a PGND cable is 15 m (49.21 ft.).

Exterior

Figure 7-17 shows a PGND cable.

Figure 7-17 PGND cable



(1) OT terminal

Cable Description

Table 7-19 describes a PGND cable.

Table 7-19 PGND cable

Cable	Color	Size of the OT Terminal and Cross-Sectional Area of the Cable
PGND cable for the cabinet	Green and yellow	M6, 16 mm^2 (0.025 $in.^2$)
PGND cable for components in the cabinet	Green and yellow	M6, 6 mm^2 (0.009 $in.^2$)

7.5 Power Cables

This chapter describes all the power cables used in a BTS3900C.

7.5.1 DC Input Power Cable

A DC input power cable for the BTS3900C feeds DC power into a BTS3900C DC cabinet. The maximum length of a DC input power cable is 6 m (19.68 ft.).

Exterior

Figure 7-18 shows a DC input power cable for the BTS3900C.

Figure 7-18 DC input power cable for the BTS3900C

(1) OT terminal

NOTE

- A DC input power cable for the BTS3900C has two wires with the cross-sectional area of 16 mm^2 (0.025 $in.^2$).
- Colors and structures of cables vary in different region. If cables are purchased at local markets, they must comply with local rules and regulations.

Cable Description

Table 7-20 describes a DC input power cable for the BTS3900C.

Table 7-20 DC input power cable for the BTS3900C

Wire	Color	Size of the OT Terminal and Cross-Sectional Area of the Cable
NEG(-)	Blue	M6, 4 mm^2 (0.025 $in.^2$)
RTN(+)	Black	

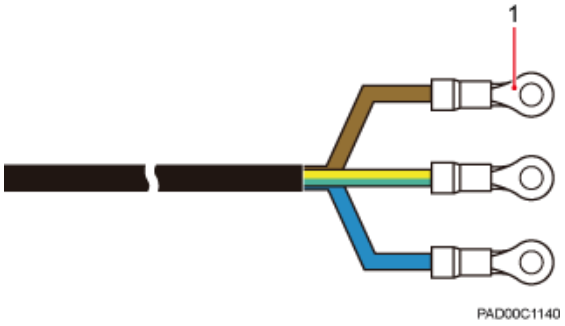
7.5.2 AC Input Power Cable

An AC input power cable for the BTS3900C feeds AC power into a BTS3900C AC cabinet. The maximum length of an AC input power cable is 6 m (19.68 ft.).

Exterior

Figure 7-19 shows an AC input power cable for the BTS3900C.

Figure 7-19 AC input power cable for the BTS3900C



(1) OT terminal

Cable Description

Table 7-21 describes an AC input power cable for the BTS3900C.

NOTE

Colors and structures of cables vary in different region. If cables are purchased at local markets, they must comply with local rules and regulations.

Table 7-21 AC input power cable for the BTS3900C

Cable	Wire	Color	Size of the OT Terminal and Cross-Sectional Area of the Cable
220 V AC single-phase power cable	L wire	Brown	M4, 4 mm^2 (0.0062 $in.^2$)
	N wire	Blue	
	PE wire	Green and yellow	
110 V AC dual-live-wire	L1 wire	Brown	M4, 4 mm^2 (0.0062 $in.^2$)
	L2 wire	Blue	
	PE wire	Green and yellow	

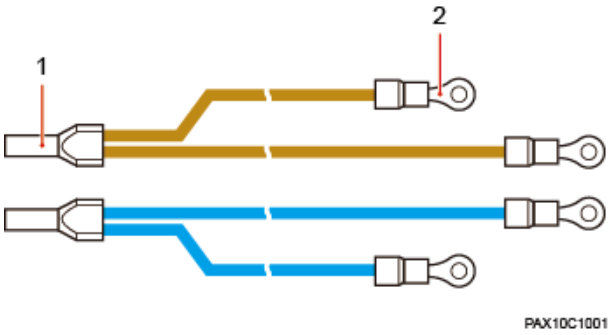
7.5.3 ETP48100-A1 Power Cable

The ETP48100-A1 power cable feeds AC power into the ETP48100-A1.

Exterior

Figure 7-20 shows an ETP48100-A1 power cable.

Figure 7-20 ETP48100-A1 power cable



(1) Cord end terminal (2) OT terminal (M4, 4 mm^2 or 0.0062 $in.^2$)

7.5.4 PDU10D-01 Power Cable

The PDU10D-01 power cable feeds -48 V DC power into the PDU10D-01.

Exterior

Figure 7-21 shows a PDU10D-01 power cable.

Figure 7-21 PDU10D-01 power cable

(1) OT terminal (M6, 16 mm^2 or 0.025 $in.^2$)

Cable Description

Table 7-22 describes a PDU10D-01 power cable.

Table 7-22 PDU10D-01 power cable

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

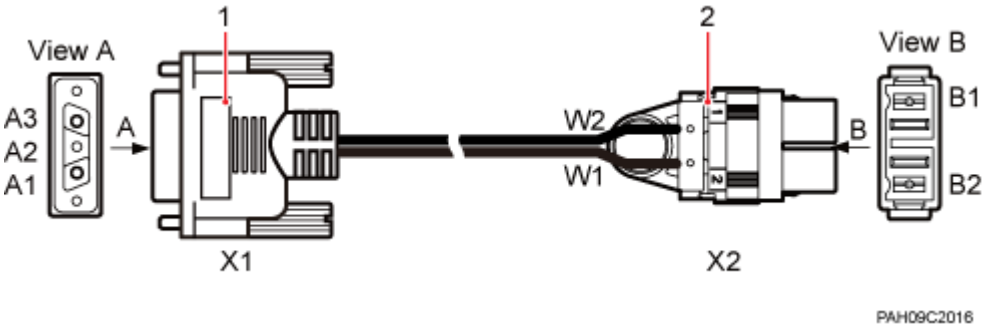
7.5.5 BBU Power Cable

The BBU power cable feeds -48 V DC power into a BBU.

Exterior

Figure 7-22 shows a BBU power cable.

Figure 7-22 BBU power cable



(1) 3V3 connector (2) EPC4 or EPC6 connector

Cable Description

A BBU power cable consists of two wires. Table 7-23 describes the pin assignment for the wires of a BBU power cable.

Table 7-23 Pin assignment for the wires of a BBU power cable

Wire	X1 End	X2 End	Wire Color in Most Regions	Wire Color in Other Regions
W1	X1.A1	X2.2	Blue	Gray
W2	X1.A3	X2.1	Black	Blue

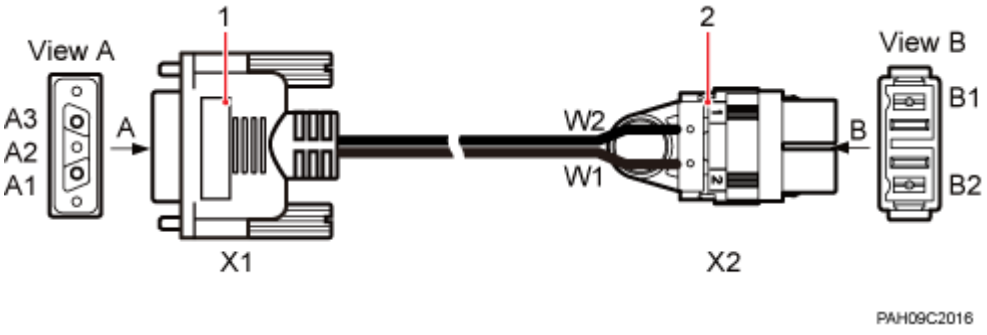
7.5.6 HEUB Power Cable

The HEUB power cable feeds -48 V DC power into an HEUB.

Exterior

Figure 7-23 shows an HEUB power cable.

Figure 7-23 HEUB power cable



(1) 3V3 power connector (2) EPC4 or EPC6 connector

Cable Description

An HEUB power cable consists of two wires. Table 7-24 describes the pin assignment for the wires of an HEUB power cable.

Table 7-24 Pin assignment for the wires of an HEUB power cable

Wire	X1 End	X2 End	Wire Color in Most Regions	Wire Color in Other Regions
W1	X1.A1	X2.2	Blue	Gray
W2	X1.A3	X2.1	Black	Blue

7.5.7 RRU Power Cable

The RRU power cable feeds -48 V DC power into an RRU.

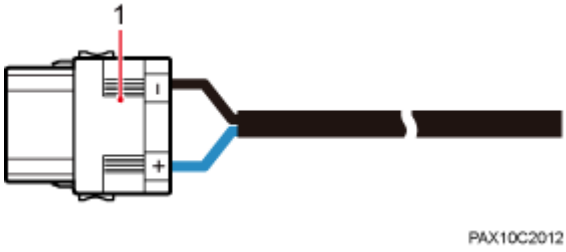
Exterior

Figure 7-24 shows an RRU power cable.

NOTE

The RRU power cable has a tool-less female connector (pressfit type) at one end connected the power equipment, and the tool-less female connector (pressfit type) needs to be added to the power cable onsite. The connector at the other end of the power cable depends on the RRU type.

Figure 7-24 RRU power cable



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

Cable Description

Table 7-25 lists the specifications of an RRU power cable.

Table 7-25 Specifications of an RRU power cable

Wire	Color	
	North American Standard	European Standard
NEG(-)	Blue	Blue
RTN(+)	Black	Brown

7.6 BTS3900C Transmission Cables

This chapter describes all the transmission cables used in a BTS3900C, including the exteriors, functions, and pin assignments of the transmission cables.

7.6.1 E1/T1 Cable

An E1/T1 cable transmits baseband signals from BBU to the external transmission equipment. The maximum length of a E1/T1 cable is 50 m (164.04 ft).

Exterior

The E1/T1 cable is of three types: 75-ohm E1 coaxial cable, 120-ohm E1 twisted pair cable, and 100-ohm T1 twisted pair cable.

One end of the E1 cable is a DB26 male connector. The connector at the other end of the cable is prepared on site based on site requirements. **Figure 7-25** shows an E1/T1 cable.

Figure 7-25 E1/T1 signal cable

(1) DB26 male connector

Table 7-26 lists different types of 75 ohm E1 coaxial cables.

Table 7-26 Different types of 75 ohm E1 coaxial cables

Cable	One End	The Other End
75 ohm E1 coaxial cable	DB26 male connector	L9 male connector
		L9 female connector
		SMB female connector
		BNC male connector
		SMZ male connector
		SMZ female connector

Pin Assignment

Table 7-27, **Table 7-28**, and **Table 7-29** describe the pin assignment for the wires of the E1/T1 cable.

Table 7-27 Pin assignment for the wires of the 75-ohm E1 coaxial cable

Pin on the DB26 Male Connector	Type(1)	Coaxial Unit No.	Wire Label
X1.1	Tip	1	RX1+
X1.2	Ring		RX1-
X1.3	Tip	3	RX2+
X1.4	Ring		RX2-

Pin on the DB26 Male Connector	Type(1)	Coaxial Unit No.	Wire Label
X1.5	Tip	5	RX3+
X1.6	Ring		RX3-
X1.7	Tip	7	RX4+
X1.8	Ring		RX4-
X1.19	Tip	2	TX1+
X1.20	Ring		TX1-
X1.21	Tip	4	TX2+
X1.22	Ring		TX2-
X1.23	Tip	6	TX3+
X1.24	Ring		TX3-
X1.25	Tip	8	TX4+
X1.26	Ring		TX4-

NOTE

(1) "Tip" refers to a wire in the E1 coaxial cable and "Ring" refers to an external conductor of the cable.

Table 7-28 Pin assignment for the wires of the 120-ohm E1 twisted pair cable

Pin on the DB26 Male Connector	Wire Color	Wire Type	Wire Label
X.1	Blue	Twisted pair	RX1+
X.2	White		RX1-
X.3	Orange	Twisted pair	RX2+
X.4	White		RX2-
X.5	Green	Twisted pair	RX3+
X.6	White		RX3-
X.7	Brown	Twisted pair	RX4+
X.8	White		RX4-
X.19	Gray	Twisted pair	TX1+
X.20	White		TX1-
X.21	Blue	Twisted pair	TX2+

Pin on the DB26 Male Connector	Wire Color	Wire Type	Wire Label
X.22	Red		TX2-
X.23	Orange	Twisted pair	TX3+
X.24	Red		TX3-
X.25	Green	Twisted pair	TX4+
X.26	Red		TX4-

Table 7-29 Pin assignment for the wires of the 100-ohm T1 twisted pair cable

Pin on the DB26 Male Connector	Wire Color	Wire Type	Wire Label
X.1	Blue and white	Twisted pair	RX1+
X.2	White and blue		RX1-
X.3	Orange and white	Twisted pair	RX2+
X.4	White and orange		RX2-
X.5	Green and white	Twisted pair	RX3+
X.6	White and green		RX3-
X.7	Brown and white	Twisted pair	RX4+
X.8	White and brown		RX4-
X.19	Gray and white	Twisted pair	TX1+
X.20	White and gray		TX1-
X.21	Blue and red	Twisted pair	TX2+
X.22	Red and blue		TX2-
X.23	Orange and red	Twisted pair	TX3+
X.24	Red and orange		TX3-
X.25	Green and red	Twisted pair	TX4+
X.26	Red and green		TX4-

7.6.2 E1/T1 Surge Protection Transfer Cable

This section describes the E1/T1 surge protection transfer cable connecting the UELP to the transmission board. This cable is optional. The length of an E1/T1 surge protection transfer cable is 0.65 m (2.13 ft).

Exterior

The E1/T1 surge protection transfer cable has a DB26 male connector at one end and a DB25 male connector at the other end, as shown in **Figure 7-26**.

Figure 7-26 E1/T1 surge protection transfer cable

(1) DB25 male connector (2) DB26 male connector

Pin Assignment

Table 7-30 describes the pin assignment for the wires of the E1/T1 surge protection transfer cable.

Table 7-30 Pin assignment for the wires of the E1/T1 surge protection transfer cable

Pin on the DB25 Male Connector	Type	Pin on the DB26 Male Connector
X1.20	Twisted pair cable	X2.2
X1.19		X2.3
X1.4	Twisted pair cable	X2.4
X1.3		X2.5
X1.22	Twisted pair cable	X2.6
X1.21		X2.7
X1.6	Twisted pair cable	X2.8
X1.5		X2.9
X1.24	Twisted pair cable	X2.10
X1.23		X2.11
X1.8	Twisted pair cable	X2.12
X1.7		X2.13
X1.1	Twisted pair cable	X2.14
X1.2		X2.15

Pin on the DB25 Male Connector	Type	Pin on the DB26 Male Connector
X1.25	Twisted pair cable	X2.24
X1.26		X2.25

7.6.3 FE/GE Ethernet Cable

The FE/GE Ethernet cable connects the BBU to the external transmission equipment through routing equipment and transmits baseband signals. The maximum length of an FE/GE Ethernet cable is 50 m (164.04 ft).

Exterior

The FE/GE Ethernet cable is a shielded straight-through cable, which has an RJ45 connector at each end. **Figure 7-27** shows an FE/GE Ethernet cable.

Figure 7-27 FE/GE Ethernet cable

(1) RJ45 connector

Pin Assignment

Table 7-31 describes the pin assignment for the wires of the FE/GE Ethernet cable.

Table 7-31 Pin assignment for the wires of the FE/GE Ethernet cable

Pin on the RJ45 Connector	Wire Color	Wire Type	Pin on the RJ45 Connector
X1.2	Orange	Twisted pair	X2.2
X1.1	White and orange		X2.1
X1.6	Green	Twisted pair	X2.6
X1.3	White and green		X2.3
X1.4	Blue	Twisted pair	X2.4
X1.5	White and blue		X2.5

Pin on the RJ45 Connector	Wire Color	Wire Type	Pin on the RJ45 Connector
X1.8	Brown	Twisted pair	X2.8
X1.7	White and brown		X2.7

7.6.4 FE Surge Protection Transfer Cable

The FE surge protection transfer cable is used to connect the UFLP and the main control board. It is an optional cable. The length of an FE surge protection transfer cable is 0.8 m (2.62 ft).

Exterior

The FE surge protection transfer cable has an RJ45 connector at each end, as shown in **Figure 7-28**.

Figure 7-28 FE surge protection transfer cable

(1) RJ45 connector

Pin Assignment

Table 7-32 describes the pin assignment for the wires of the FE surge protection transfer cable.

Table 7-32 Pin assignment for the wires of the FE surge protection transfer cable

Pin on the RJ45 Connector	Wire Color	Wire Type	Pin on the RJ45 Connector
X1.2	Orange	Twisted pair	X2.2
X1.1	White		X2.1
X1.6	Green	Twisted pair	X2.6
X1.3	White		X2.3
X1.4	Blue	Twisted pair	X2.4
X1.5	White		X2.5
X1.8	Brown	Twisted pair	X2.8

Pin on the RJ45 Connector	Wire Color	Wire Type	Pin on the RJ45 Connector
X1.7	White		X2.7

7.6.5 Interconnection Cable Between the FE Electrical Ports

This cable connects the FE electrical ports on two main control boards to enable IP-based co-transmission.

Exterior

The interconnection cable between the FE electrical ports has an RJ45 connector at each end, as shown in **Figure 7-29**.

Figure 7-29 Interconnection cable between FE electrical ports

(1) RJ45 connector

7.6.6 Interconnection Cable Between FE Optical Ports

This cable connects the FE optical ports on the GTMU and WMPT to achieve co-transmission in IP mode.

Exterior

The interconnection cable between the FE optical ports has an LC connector at each end, as shown in **Figure 7-30**.

Figure 7-30 Interconnection cable between FE optical ports

(1) LC connector

7.6.7 FE/GE Fiber Optic Cable

An FE/GE fiber optic cable transmits optical signals between the BBU3900 and the transmission equipment. This cable is optional. The maximum length of an FE/GE fiber optic cable is 20 m (65.62 ft).

Exterior

The FE/GE fiber optic cable has an LC connector at one end and an FC connector, SC connector, or LC connector at the other end, as shown in **Figure 7-31**, **Figure 7-32**, **Figure 7-33**.

Figure 7-31 FE/GE fiber optic cable (with the FC and LC connectors)

Figure 7-32 FE/GE fiber optic cable (with the SC and LC connectors)

Figure 7-33 FE/GE fiber optic cable (with the LC connectors)

CAUTION

To connect a BBU3900 and a transmission device by using FE/GE optical fiber patch cords, adhere to the following rules:

- The TX port on the BBU3900 must be connected to the RX port on the transmission equipment.
- The RX port on the BBU3900 must be connected to the TX port on the transmission equipment.

7.7 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 RRU or interconnect two RRUs. The maximum length of the multimode fiber optic cable between the BBU and RRU is 150 m (492.12 ft) and the multimode fiber optic cable between two RRUs 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 RRU side.

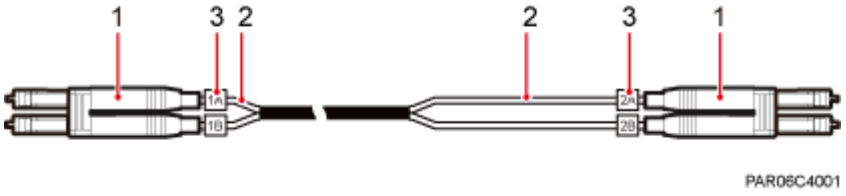
NOTE

- 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 7-34**.

Figure 7-34 Multimode fiber optic cable



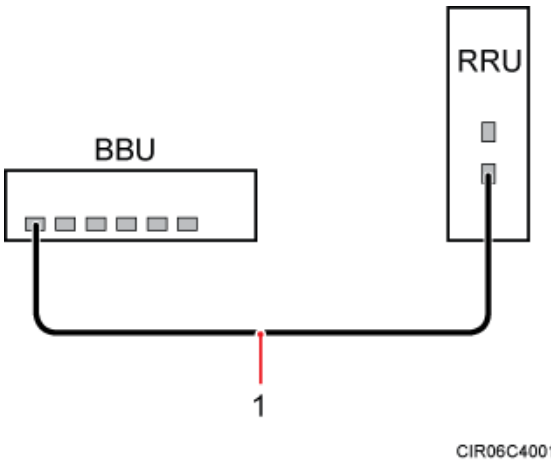
(1) DLC connector (2) Breakout cable (3) Label on the breakout cable

NOTE

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

Figure 7-35 shows the connection of the multimode fiber optic cable between a BBU and an RRU.

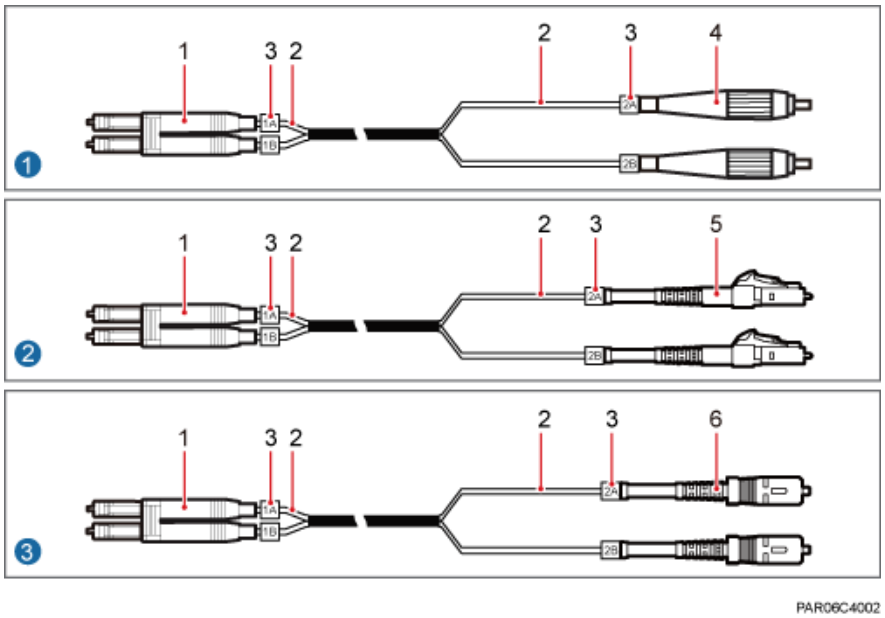
Figure 7-35 Connection of the multimode fiber optic cable between a BBU and an RRU



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

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 7-36**.

Figure 7-36 Single-mode pigtail



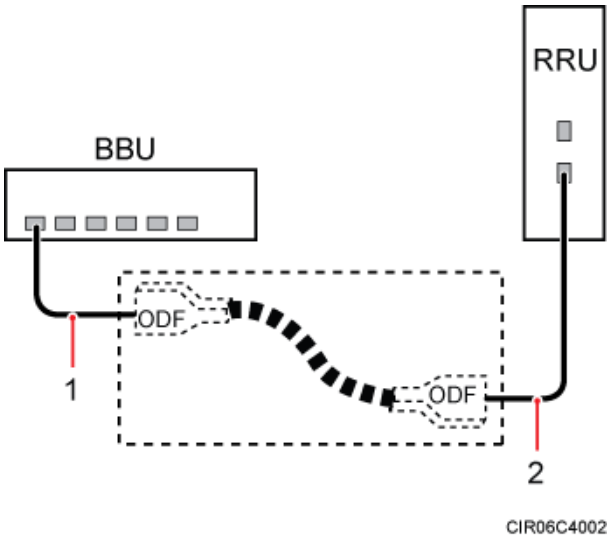
(1) DLC connector (2) Breakout cable (3) Label on the breakout cable (4) FC connector (5) LC connector (6) SC connector

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 RRU and 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.

Figure 7-37 shows the connection of the single-mode pigtail.

Figure 7-37 Connection of the single-mode pigtail



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

Selection Principles

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

Table 7-33 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 RRU When it connects two RRUs, the distance between the two RRUs 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 RRU
	Recommended: single-mode fiber optic cable (single-mode pigtail and trunk single-mode fiber optic cable)	The single-mode pigtail at the RRU 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 7-34 describes the labels on and recommended connections for the breakout cables of a CPRI fiber optic cable.

Table 7-34 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 RRU	Multimode Fiber Optic Cable Between Two RRUs	Single-Mode Pigtail
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	TX port on the BBU	CPRI TX port on RRU 0	ODF
2B	RX port on the BBU	CPRI RX port on RRU 0	ODF

7.8 BTS3900C Signal Cables

This chapter describes all the signal cables used in a BTS3900C, including the exteriors, functions, and pin assignments of the signal cables.

7.8.1 Monitoring Signal Cable for the Fan Assembly

The monitoring signal cable for the fan assembly is used for the HEUB to monitor the operating status of the fan assembly.

Exterior

Figure 7-38 shows a monitoring signal cable for the fan assembly.

Figure 7-38 Monitoring signal cable for the fan assembly

(1) 4-pin connector

7.8.2 Temperature monitoring signal cable

The temperature monitoring signal cable transmits the cabinet temperature information to the HEUB.

Exterior

Figure 7-39 shows a temperature monitoring signal cable.

Figure 7-39 Temperature monitoring signal cable

(1) Temperature sensor (2) 4-pin connector

Cable Description

Table 7-35 describes the pin assignment for the wires of a temperature monitoring signal cable.

Table 7-35 Pin assignment for the wires of a temperature monitoring signal cable

Cable	X1 End	X2 End
W1	X1.1	X2.3
W2	X1.2	X2.2
W3	X1.3	X2.1

7.8.3 PMU 11A Monitoring Signal Cable

The PMU 11A monitoring signal cable is used to connect PMU 11A and HEUB. The cable transmits the monitoring information of the PMU 11A to the BBU.

Exterior

Figure 7-40 shows a PMU 11A monitoring signal cable.

Figure 7-40 PMU 11A monitoring signal cable

(1) RJ45 connector

Cable Description

Table 7-36 describes the pin assignment for the wires of the PMU 11A monitoring signal cable.

Table 7-36 Pin assignment for the wires of the PMU 11A monitoring signal cable

X1 End	X2 End	Color	Type
X1.1	X2.1	White	Twisted pair
X1.2	X2.2	Orange	
X1.3	X2.3	White	Twisted pair
X1.6	X2.6	Green	
X1.5	X2.5	White	Twisted pair
X1.4	X2.4	Blue	
X1.7	X2.7	White	Twisted pair
X1.8	X2.8	Brown	

7.8.4 HEUB-BBU Monitoring Signal Cable

The HEUB-BBU monitoring signal cable transmits the monitoring information collected by the HEUB to the BBU.

Exterior

Figure 7-41 shows an HEUB-BBU monitoring signal cable.

Figure 7-41 HEUB-BBU monitoring signal cable

(1) RJ45 connector

Cable Description

Table 7-37 describes the pin assignment for the wires of the HEUB-BBU monitoring signal cable.

Table 7-37 Pin assignment for the wires of the HEUB-BBU monitoring signal cable

X1 End	X2 End	Color	Type
X1.1	X2.1	White	Twisted pair
X1.2	X2.2	Orange	
X1.3	X2.3	White	Twisted pair
X1.6	X2.6	Green	
X1.5	X2.5	White	Twisted pair
X1.4	X2.4	Blue	
X1.7	X2.7	White	Twisted pair
X1.8	X2.8	Brown	

7.8.5 BBU Alarm Cable

A BBU alarm cable transmits alarm signals from external alarm equipment to a BBU. The maximum length of a BBU alarm cable is 20 m (65.62 ft).

Exterior

The BBU alarm cable has an RJ45 connector at each end, as shown in Figure 7-42. One RJ45 connector at one end, however, may be removed and an appropriate terminal may be added according to the field requirements.

Figure 7-42 BBU alarm cable

(1) RJ45 connector

Pin Assignment

Table 7-38 shows the wire sequence of the BBU alarm cable.

Table 7-38 Pin assignment for the wires of the BBU alarm cable

BBU Alarm Port	Pin on the RJ45 Connector	Wire Color	Wire Type	Pin on the RJ45 Connector	Description
EXT-ALM1	X1.1	White and orange	Twisted pair	X2.1	Boolean input 4+
	X1.2	Orange		X2.2	Boolean input 4- (GND)
	X1.3	White and green	Twisted pair	X2.3	Boolean input 5+
	X1.6	Green		X2.6	Boolean input 5- (GND)
	X1.5	White and blue	Twisted pair	X2.5	Boolean input 6+
	X1.4	Blue		X2.4	Boolean input 6- (GND)
	X1.7	White and brown	Twisted pair	X2.7	Boolean input 7+
	X1.8	Brown		X2.8	Boolean input 7- (GND)
EXT-ALM0	X1.1	White and orange	Twisted pair	X2.1	Boolean input 0+
	X1.2	Orange		X2.2	Boolean input 0+ (GND)
	X1.3	White and green	Twisted pair	X2.3	Boolean input 1+
	X1.6	Green		X2.6	Boolean input 1- (GND)
	X1.5	White and blue	Twisted pair	X2.5	Boolean input 2+

BBU Alarm Port	Pin on the RJ45 Connector	Wire Color	Wire Type	Pin on the RJ45 Connector	Description
	X1.4	Blue		X2.4	Boolean input 2- (GND)
	X1.7	White and brown	Twisted pair	X2.7	Boolean input 3+
	X1.8	Brown		X2.8	Boolean input 3- (GND)

7.8.6 ELU Signal Cable

The ELU signal cable is used by the ELU to report the cabinet type to the HEUB.

Exterior

Figure 7-43 shows an ELU signal cable.

Figure 7-43 ELU signal cable

(1) RJ45 connector

Cable Description

Table 7-39 describes the pin assignment for the wires of an ELU signal cable.

Table 7-39 Pin assignment for the wires of an ELU signal cable

X1 End	X2 End	Color	Type
X1.1	X2.1	White	Twisted pair
X1.2	X2.2	Orange	
X1.3	X2.3	White	Twisted pair
X1.6	X2.6	Green	
X1.5	X2.5	White	Twisted pair
X1.4	X2.4	Blue	
X1.7	X2.7	White	Twisted pair

X1 End	X2 End	Color	Type
X1.8	X2.8	Brown	

7.8.7 Monitoring Signal Cable for the Door Status Sensor

The monitoring signal cable for the door status sensor is used by the door status sensor to report the door status to the HEUB.

Exterior

A monitoring signal cable for the door status sensor consists of two bare wires, as shown in **Figure 7-44**.

Figure 7-44 Monitoring signal cable for the door status sensor

7.8.8 Monitoring Signal Cable for the Surge Protection Box

The monitoring signal cable for the surge protection box transmits information about the AC surge protection box to the HEUB.

Exterior

The monitoring signal cable for the surge protection box consists of two bare wires, as shown in **Figure 7-45**.

Figure 7-45 Monitoring signal cable for the surge protection box

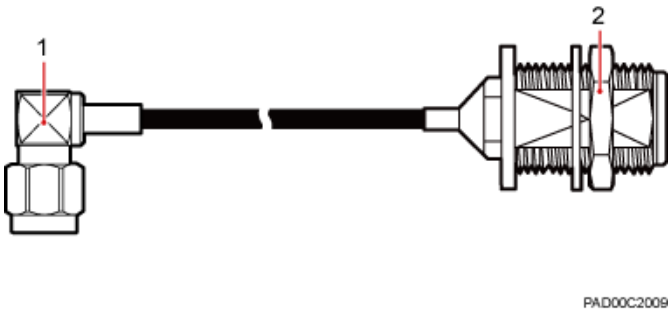
7.8.9 GPS Clock Signal Cable

The GPS clock signal cable is used to transmit GPS clock signals from the GPS antenna system to the BBU. The GPS clock signals serve as the clock reference of the BBU. This cable is optional.

Exterior

The GPS clock signal cable has an SMA male connector at one end and an N-type female connector at the other end, as shown in **Figure 7-46**.

Figure 7-46 GPS clock signal cable



(1) SMA male connector (2) N-type female connector

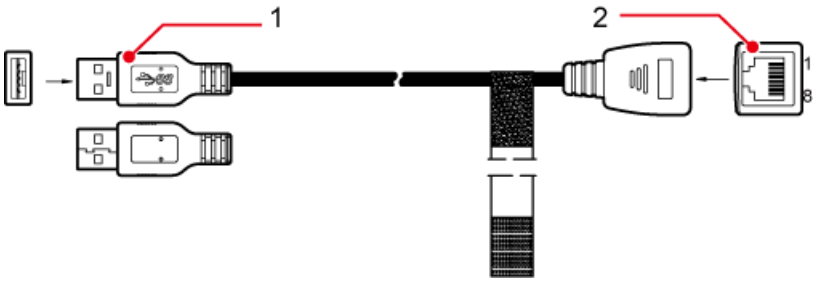
7.8.10 Adapter Used for Local Maintenance

An adapter used for local maintenance connects the USB port on the UMPT to an Ethernet cable during local maintenance.

Exterior

The adapter used for local maintenance has a USB connector at one end and an Ethernet connector at the other end, as shown in **Figure 7-47**.

Figure 7-47 Adapter used for local maintenance



(1) USB connector (2) Ethernet connector

Pin Assignment

Table 7-40 describes the pin assignment for the wires of the adapter used for local maintenance.

Table 7-40 Pin assignment for the wires of the adapter used for local maintenance

Pin of the USB Connector	Wire Color	Wire Type	Pin of the Ethernet Connector
X1.9	Blue	Twisted pair	X2.1
X1.8	White		X2.2

Pin of the USB Connector	Wire Color	Wire Type	Pin of the Ethernet Connector
X1.6	Orange	Twisted pair	X2.3
X1.5	White		X2.6
X1.Shell	-	Shield	X2.Shell

7.9 RRU RF Jumper

An RRU RF jumper connects an RRU and the feeder of the antenna system to transmit signals between the base station and antenna system. 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) long. A variable-length RF jumper used by an RRU has a maximum length of 10 m (32.81 ft).

Exterior

Figure 7-48 shows an RRU RF jumper.

Figure 7-48 RRU RF jumper

(1) DIN straight male connector

Installation Position

Table 7-41 describes the installation position of an RRU RF jumper.

Table 7-41 Installation position of an RRU RF jumper

One End	The Other End
ANT_TX/RXA and ANT_RXB ports on the RRU	Antenna feeder

7.10 RRU AISG Multi-Wire Cable

An RRU AISG multi-wire cable is 5 m (16.4 ft.) long. It connects an RRU and a remote control unit (RCU) to transmit control signals from a base station to the RET antenna. When the RRU is connected to the RET antenna, an AISG multi-wire cable transmits RS485 signals.

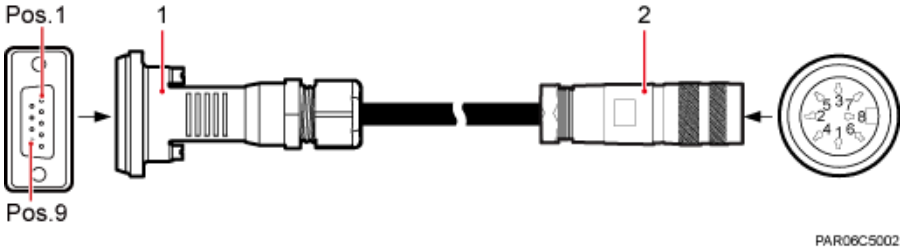
NOTE

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 7-49**.

Figure 7-49 AISG multi-wire cable



(1) Waterproof DB9 male connector (2) Standard AISG female connector

Pin Assignment

Table 7-42 describes the pin assignment for the wires of an AISG multi-wire cable.

Table 7-42 Pin assignment for the wires of an AISG multi-wire cable

X1 End (Pin of the Waterproof 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

X1 End (Pin of the Waterproof DB9 Male Connector)	X2 End (Pin of the Standard AISG Female Connector)	Color	Type	Description
-	X2.4 and X2.7 are interconnected.	-	-	GND

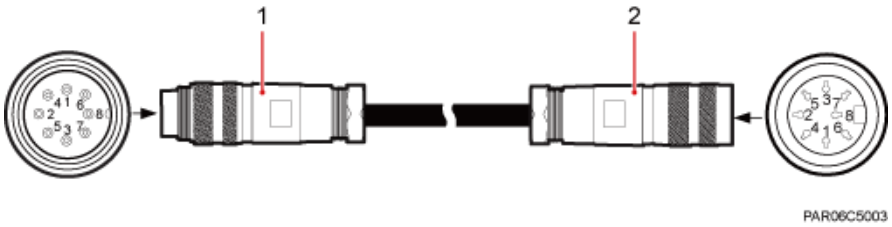
7.11 RRU AISG Extension Cable

When the distance between an RRU and an RCU is longer than 5 m (16.4 ft.), an AISG multi-core cable cannot connect the RRU and the RCU because it is not long enough. In this case, an AISG extension cable is used to extend the AISG multi-core cable for transmitting RS485 signals.

Exterior

An AISG extension cable has a standard AISG male connector at one end and a standard AISG female connector at the other end, as shown in **Figure 7-50**.

Figure 7-50 AISG extension cable



(1) Standard AISG male connector (2) Standard AISG female connector

Pin Assignment

Table 7-43 describes the pin assignment for the wires of an AISG extension cable.

Table 7-43 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

X1 End (Pin of the Standard AISG Male Connector)	X2 End (Pin of the Standard AISG Female Connector)	Color	Type	Description
		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		