BTS3900 GSM

V300R008

Hardware Description

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About This Document

Purpose

This document provides an overview of the BTS3900 GSM hardware for the planning and deployment of the BTS3900 GSM. It describes the configurations, functions, and specifications of the components in the BTS3900 GSM cabinet. This document also describes the classification, connector specification, and installation positions of the cables.

Product Version

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

Product Name	Product Version
BTS3900 GSM (hereinafter referred to as BTS3900)	V300R008

Intended Audience

This document is intended for:

- BTS installers
- Site maintainers

Change History

For changes in the document, refer to **Changes in BTS3900 GSM Hardware Description**.

Organization

1 System Architecture of the BTS3900

The BTS3900 consists of the BBU3900, the DRFUs, and the indoor macro cabinet. The BBU3900 and the DRFUs are installed in the indoor macro cabinet.

2 BTS3900 Cabinet

The BTS3900 cabinet is designed in compliance with the IEC297 standard and features a modular structure. It processes the baseband signals and the RF signals.

3 Cable Connections of the BTS3900

The cable connections of the BTS3900 involve the connections of the power cables, signal cables, transmission cables, and RF cables.

4 BTS3900 Components

The BTS3900 components are the BBU, DRFU, DCDU-01, GATM, PMU, PSU, and FAN unit.

5 BTS3900 Cables

The BTS3900 cables consist of the power cables, signal cables, transmission cables, and RF cables.

Conventions

1. Symbol Conventions

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

Symbol	Description
 DANGER	Indicates a hazard with a high level of risk that, if not avoided, will result in death or serious injury.
 WARNING	Indicates a hazard with a medium or 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 cause equipment damage, data loss, and performance degradation, or unexpected results.
 TIP	Indicates a tip that may help you solve a problem or save your time.
 NOTE	Provides additional information to emphasize or supplement important points of the main text.

2. General Conventions

Convention	Description
Times New Roman	Normal paragraphs are in Times New Roman.
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`	Terminal display is in Courier New.

3. Command Conventions

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

4. GUI Conventions

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** .

5. Keyboard Operation

Convention	Description
Key	Press the key.For example,press **Enter** and press **Tab**.
Key1+Key2	Press the keys concurrently.For example,pressing **Ctrl+Alt+A** means the three keys should be pressed concurrently.
Key1,Key2	Press the keys in turn.For example,pressing Alt,A means the two keys should be pressed in turn.

6. Mouse Operation

Action	Description
Click	Select and release the primary mouse button without moving the pointer.
Double-click	Press the primary mouse button twice continuously and quickly without moving the pointer.

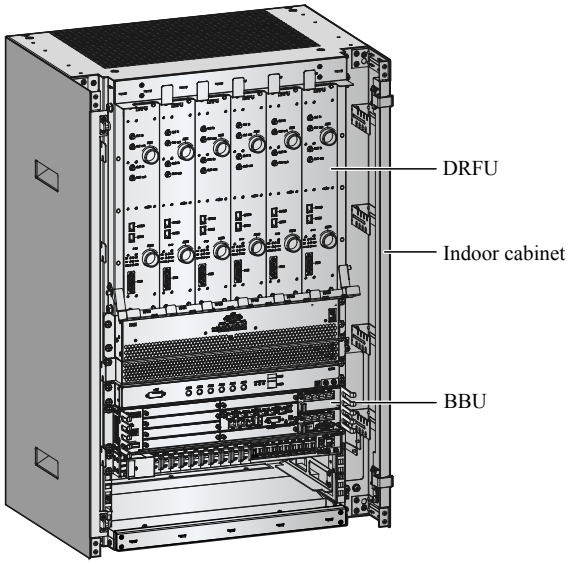
Action	Description
Drag	Press and hold the primary mouse button and move the pointer to a certain position.

1 System Architecture of the BTS3900

The BTS3900 consists of the BBU3900, the DRFUs, and the indoor macro cabinet. The BBU3900 and the DRFUs are installed in the indoor macro cabinet.

Figure 1-1 shows the BTS3900 system.

Figure 1-1 BTS3900 system



The BTS3900 mainly consists of the following components:

- The BBU3900 is used for baseband processing and enables interaction between the BTS and the BSC.
- The DRFU is a double radio filter unit that processes two carriers. The DRFU performs modulation and demodulation between baseband signals and RF signals, processes data, and combines and divides signals.
- The indoor macro cabinet houses the BBU3900 and DRFUs. In addition, the indoor macro cabinet provides the functions such as power distribution, heat dissipation, and surge protection.

2 BTS3900 Cabinet

About This Chapter

The BTS3900 cabinet is designed in compliance with the IEC297 standard and features a modular structure. It processes the baseband signals and the RF signals.

Based on the types of external power input, the BTS3900 cabinets can be classified as follows:

- The BTS3900 -48 V cabinet: contains the DRFU, BBU, GATM, DCDU-01, and FAN unit.
- The BTS3900 +24 V cabinet: contains the DRFU, BBU, DCDU-01, FAN unit, and power subrack (DC/DC).
- The BTS3900 220 V cabinet: contains the DRFU, BBU, DCDU-01, FAN unit, and power subrack (AC/DC).

2.1 Appearance of the BTS3900 Cabinet

The BTS3900 cabinet is designed in compliance with the IEC297 standard. It is purple gray in color and vertical in appearance.

Figure 2-1 shows the BTS3900 cabinet.

Figure 2-1 Appearance of the BTS3900 cabinet

2.2 Structure of the BTS3900 Cabinet

The BTS3900 cabinet supports three types of power input: -48 V DC, +24 V DC, and 220 V AC. The cabinets that support different types of input power are different in structure, mainly in power distribution unit.

2.2.1 Structure of the BTS3900 -48 V Cabinet

The external power input to the BTS3900 -48 V cabinet is -48 V DC. The DC power is directly led into the DCDU-01 and the DCDU-01 distributes the DC power to each component in the cabinet. The BTS3900 -48 V cabinet can be installed alone or stacked on top of another BTS3900 -48 V cabinet.

2.2.2 Structure of the BTS3900 +24 V Cabinet

The external power input to the BTS3900 +24 V cabinet is +24 V DC. After the PSU (DC/DC) transforms +24 V DC into -48 V DC, the DCDU-01 distributes the -48 V DC power to each component in the cabinet. The BTS3900 +24 V cabinet can be installed alone or stacked with a BTS3900 -48 V cabinet.

2.2.3 Structure of the BTS3900 220 V Cabinet

The external power input to the BTS3900 220 V cabinet is 220 V AC. After the PSU (AC/DC) transforms 220 V AC into -48 V DC, the DCDU-01 distributes the -48 V DC power to each

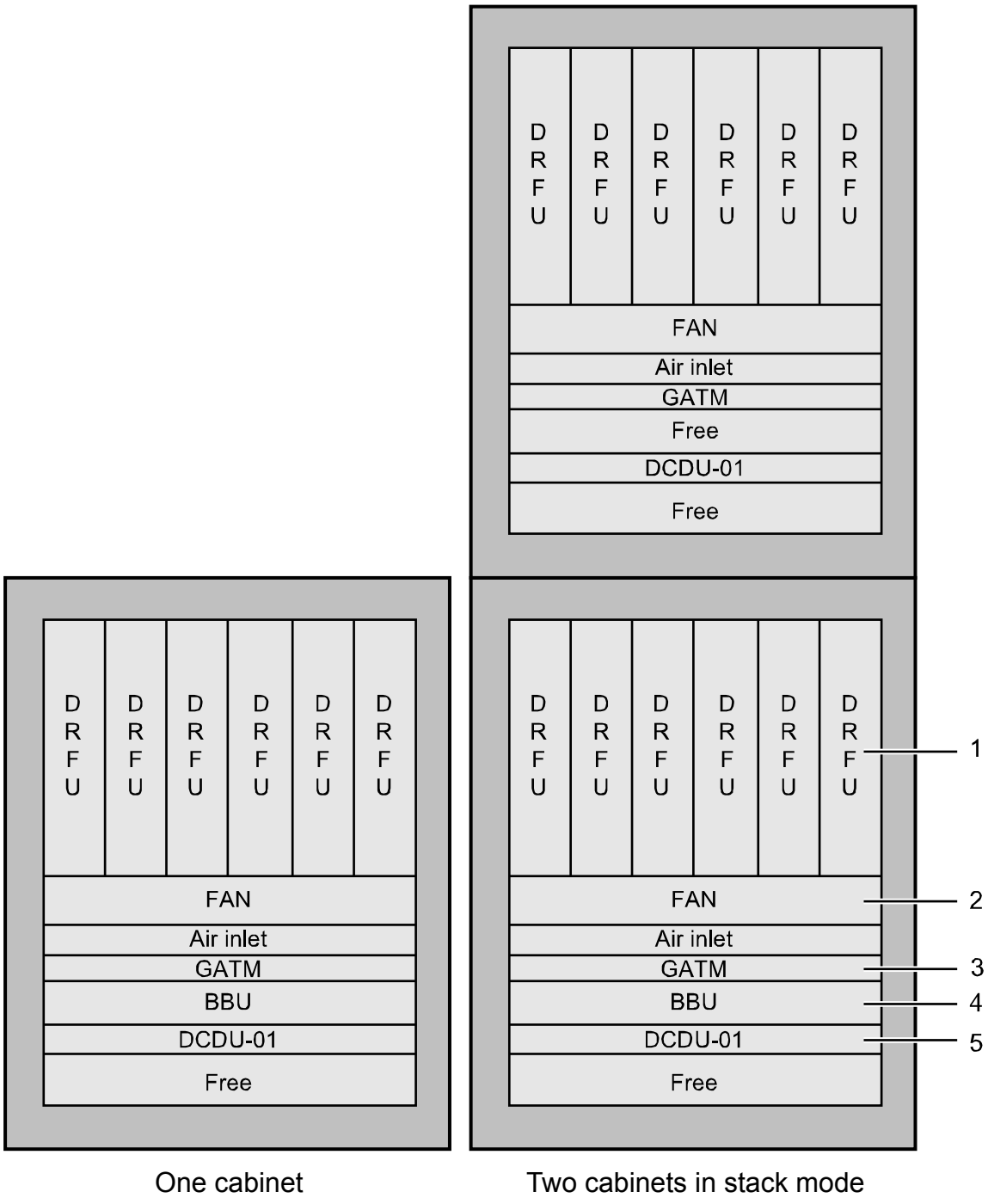
component in the cabinet. The BTS3900 220 V cabinet can be installed alone or stacked with a BTS3900 -48 V cabinet.

2.2.1 Structure of the BTS3900 -48 V Cabinet

The external power input to the BTS3900 -48 V cabinet is -48 V DC. The DC power is directly led into the DCDU-01 and the DCDU-01 distributes the DC power to each component in the cabinet. The BTS3900 -48 V cabinet can be installed alone or stacked on top of another BTS3900 -48 V cabinet.

The BTS3900 -48 V cabinet contains the following components: the DRFU, BBU, GATM, DCDU-01, and FAN unit, among which the GATM is optional. **Figure 2-2** shows the typical configurations when the cabinet is installed alone and when one cabinet is stacked on another.

Figure 2-2 Typical configurations of the BTS3900 -48 V cabinet



(1) DRFU

(2) FAN unit

(3) GATM

(4) BBU

(5) DCDU-01

-

NOTE

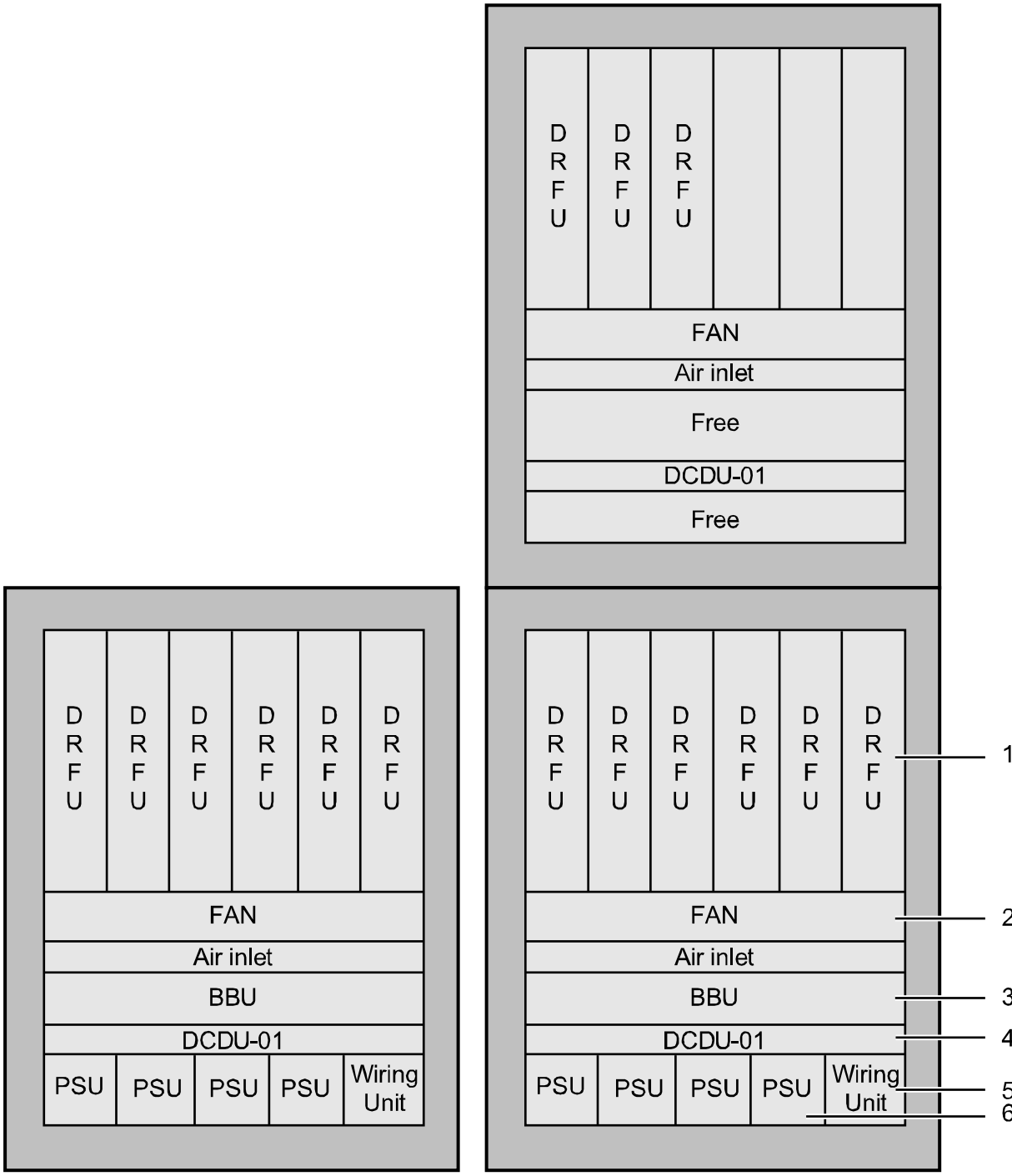
When two BTS3900 -48 V cabinets are installed in stack mode, the BBU is installed only in the lower cabinet and serves as the baseband control unit for the two cabinets.

2.2.2 Structure of the BTS3900 +24 V Cabinet

The external power input to the BTS3900 +24 V cabinet is +24 V DC. After the PSU (DC/DC) transforms +24 V DC into -48 V DC, the DCDU-01 distributes the -48 V DC power to each component in the cabinet. The BTS3900 +24 V cabinet can be installed alone or stacked with a BTS3900 -48 V cabinet.

The BTS3900 +24 V cabinet contains the following components: the DRFU, BBU, DCDU-01, PSU (DC/DC), and FAN unit. **Figure 2-3** shows the typical configurations when the cabinet is installed alone and when one cabinet is stacked on another.

Figure 2-3 Typical configurations of the BTS3900 +24 V cabinet



(1) DRFU (2) FAN unit (3) BBU

(4) DCDU-01 (5) Wiring unit (6) PSU (DC/DC)

NOTE

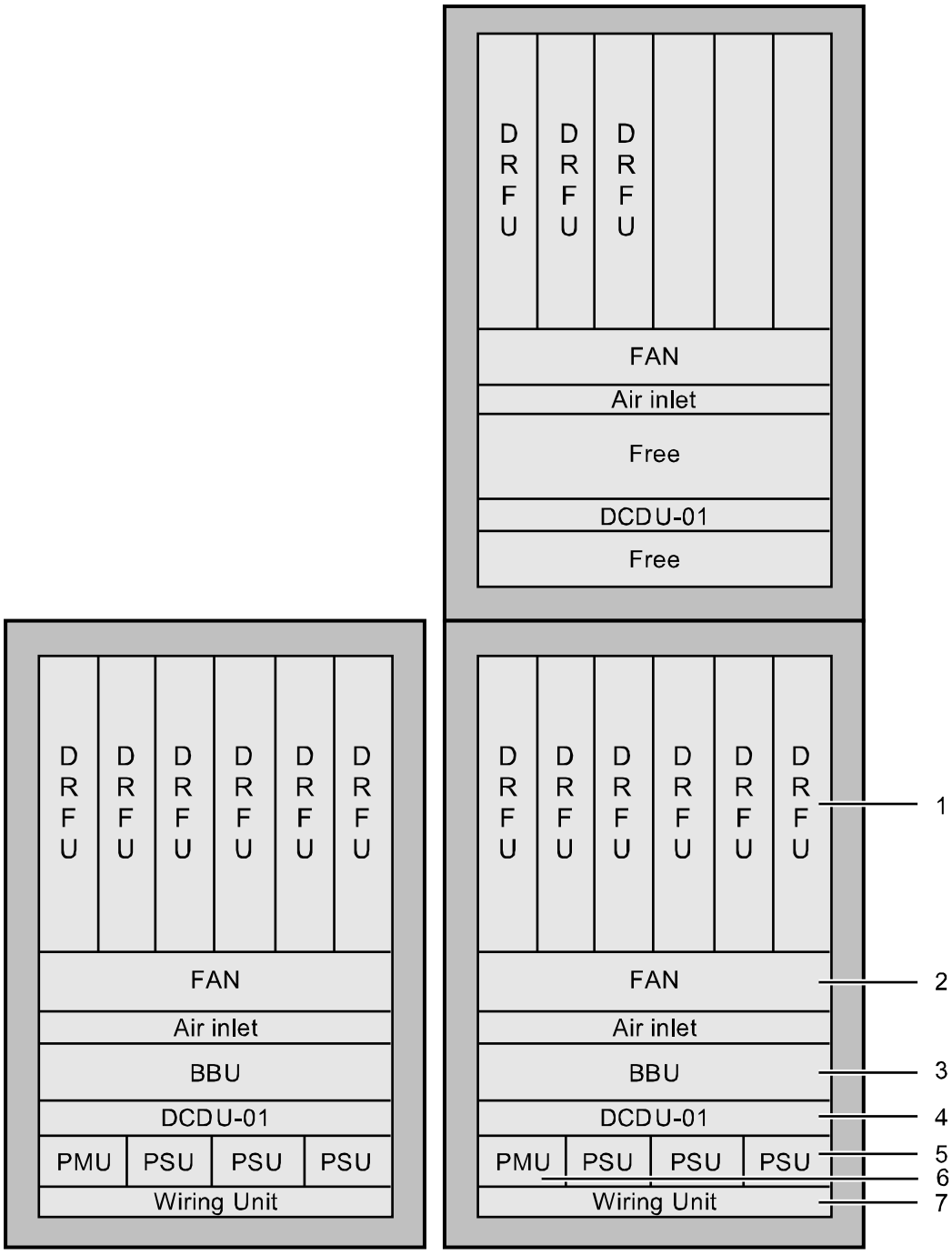
- When the two cabinets are stacked, the BTS3900 -48 V cabinet should be stacked on top of the +24 V cabinet.
- When the -48 V cabinet is stacked on the +24 V cabinet, a maximum of nine DRFUs can be configured.
- When two cabinets are stacked, the BBU is installed only in the lower cabinet and serves as the baseband control unit for the two cabinets.

2.2.3 Structure of the BTS3900 220 V Cabinet

The external power input to the BTS3900 220 V cabinet is 220 V AC. After the PSU (AC/DC) transforms 220 V AC into -48 V DC, the DCDU-01 distributes the -48 V DC power to each component in the cabinet. The BTS3900 220 V cabinet can be installed alone or stacked with a BTS3900 -48 V cabinet.

The BTS3900 220 V cabinet contains the following components: the DRFU, BBU, DCDU-01, PMU, PSU (AC/DC), and FAN unit. **Figure 2-4** shows the typical configurations when the cabinet is installed alone and when one cabinet is stacked on another.

Figure 2-4 Typical configurations of the BTS3900 220 V cabinet



(1) DRFU (2) FAN unit (3) BBU

(3) DCDU-01 (5) PSU (AC/DC) (6) PMU

(7) Wiring unit - -

NOTE

- When the two cabinets are stacked, the BTS3900 -48 V cabinet should be stacked on top of the +24 V cabinet.
- When the -48 V cabinet is stacked on the 220 V cabinet, a maximum of nine DRFUs can be configured.
- When two cabinets are stacked, the BBU is installed only in the lower cabinet and serves as the baseband control unit for the two cabinets.

3 Cable Connections of the BTS3900

About This Chapter

The cable connections of the BTS3900 involve the connections of the power cables, signal cables, transmission cables, and RF cables.

3.1 Power Cable Connections of the BTS3900

The BTS3900 cabinet supports three types of external power input: -48 V DC, +24 V DC, and 220 V AC. Therefore, the BTS3900 involves three types of power cable connections.

3.1.1 Power Cable Connections of the BTS3900 -48 V Cabinet
The power cables for the BTS3900 -48 V cabinet are classified into two types: the external input power cable and the internal power cable.

3.1.2 Power Cable Connections of the BTS3900 +24 V Cabinet
The power cables for the BTS3900 +24 V cabinet are classified into two types: the external input power cable and the internal power cable.

3.1.3 Power Cable Connections of the BTS3900 220 V Cabinet
The power cables for the BTS3900 220 V cabinet are classified into two types: the external input power cable and the internal power cable.

3.1.1 Power Cable Connections of the BTS3900 -48 V Cabinet

The power cables for the BTS3900 -48 V cabinet are classified into two types: the external input power cable and the internal power cable.

Power Cable Connections of a Single Cabinet

Figure 3-1 shows the power cable connections of a single -48 V cabinet.

Figure 3-1 Power cable connections of a single -48 V cabinet

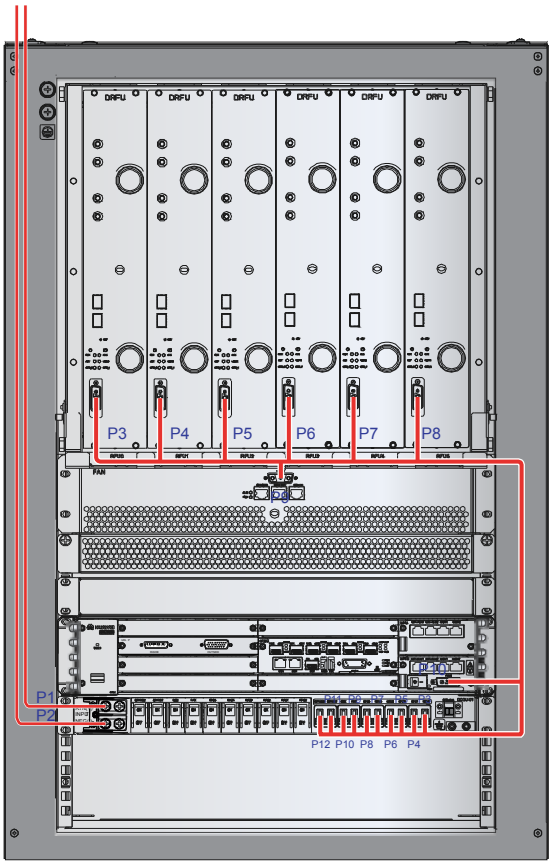


Table 3-1 describes the power cable connections of a single cabinet.

Table 3-1 Power cable connections of a single -48 V cabinet

Category	Cable Number	Cable Name	Quantity
External input power cable	P1-P2	**5.2.3 BTS3900 -48 V Input Power Cable**	2
Internal power cables	P3-P8	**5.2.8 Power Cable Between the DCDU and the DRFU**	6
	P9	**5.2.10 Power Cable Between the DCDU and the FAN Unit**	1
	P10	**5.2.11 Power Cable Between the DCDU and the BBU**	1
	P11-P12	Reserved	2

Power Cable Connections of Two Stacked Cabinets

Figure 3-2 shows the power cable connections of two stacked -48 V cabinets.

Figure 3-2 Power cable connections of two stacked cabinets

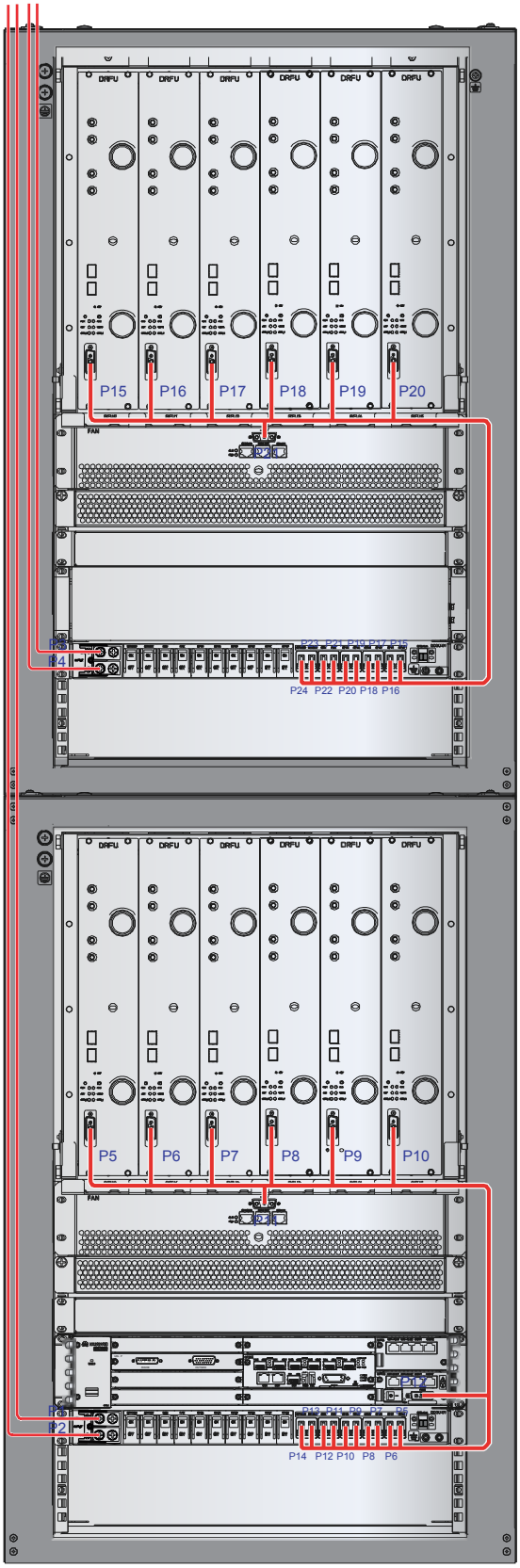


Table 3-2 shows the power cable connections of two stacked -48 V cabinets.

Table 3-2 Power cable connections of two stacked cabinets

Category	Cable Number	Cable Name	Quantity
External input power cable	P1-P2, P3-P4	**5.2.3 BTS3900 -48 V Input Power Cable**	4
Internal power cables	P5-P10, P15-P20	**5.2.8 Power Cable Between the DCDU and the DRFU**	12
	P11，P21	**5.2.10 Power Cable Between the DCDU and the FAN Unit**	2
	P12	**5.2.11 Power Cable Between the DCDU and the BBU**	1
	P13-P14, P22-P24	Reserved	5

3.1.2 Power Cable Connections of the BTS3900 +24 V Cabinet

The power cables for the BTS3900 +24 V cabinet are classified into two types: the external input power cable and the internal power cable.

Power Cable Connections of a Single Cabinet

Figure 3-3 shows the power cable connections of a single +24 V cabinet.

Figure 3-3 Power cable connections of a single +24 V cabinet

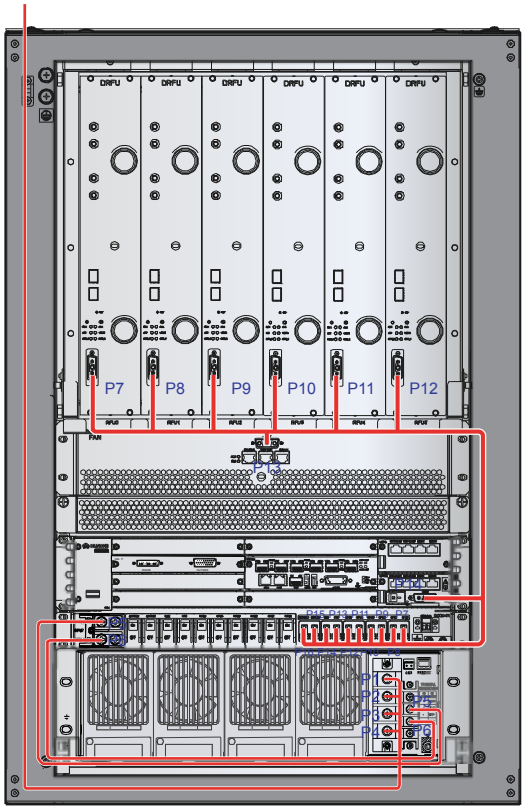


Table 3-3 describes the power cable connections of a single cabinet.

Table 3-3 Power cable connections of a single +24 V cabinet

Category	Cable Number	Cable Name	Quantity
External input power cables	P1-P4	**5.2.4 BTS3900 +24 V Input Power Cable**	4
Internal power cables	P5-P6	**5.2.7 Power Cable Between the PSU (DC/DC) and the DCDU**	2
	P7-P12	**5.2.8 Power Cable Between the DCDU and the DRFU**	6
	P13	**5.2.10 Power Cable Between the DCDU and the FAN Unit**	1
	P14	**5.2.11 Power Cable Between the DCDU and the BBU**	1
	P15-P16	Reserved	2

NOTE

One pair of external +24 V power cables cannot provide sufficient power for the components in the cabinet; therefore, two pairs of external +24 V power cables are used.

Power Cable Connections of Two Stacked Cabinets

Figure 3-4 shows the power cable connections when a -48 V cabinet is stacked on a +24 V cabinet.

Figure 3-4 Power cable connections of two stacked cabinets

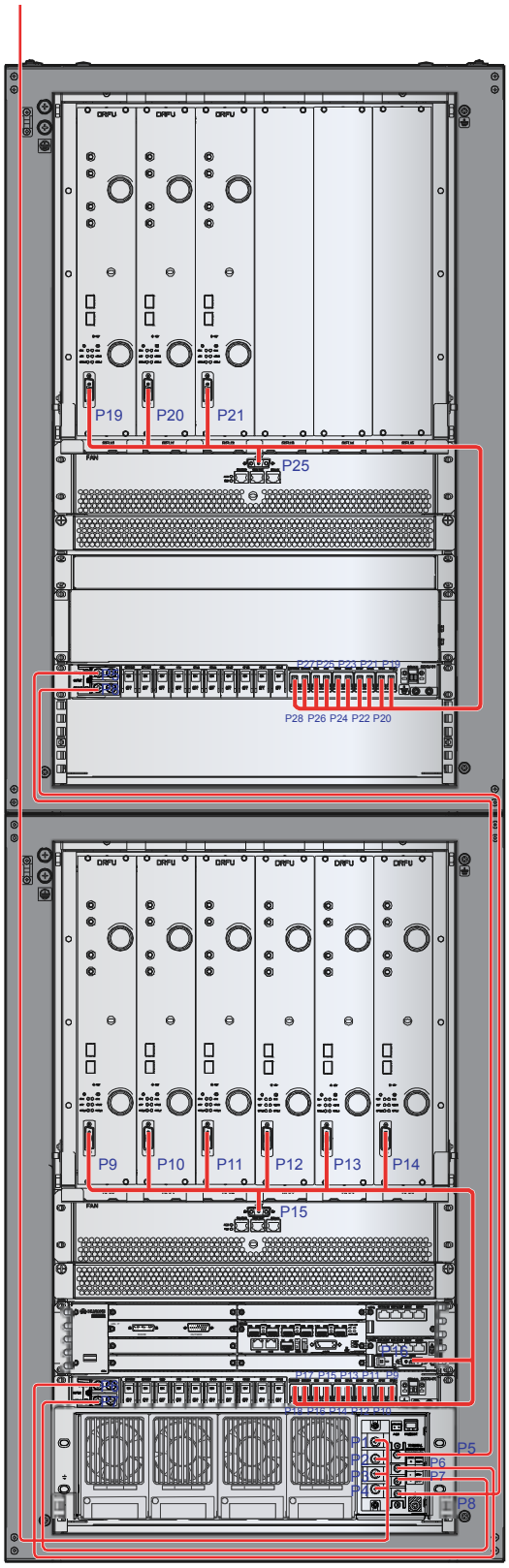


Table 3-4 describes the power cable connections of two stacked cabinets.

Table 3-4 Power cable connections of two stacked cabinets

Category	Cable Number	Cable Name	Quantity
External input power cables	P1-P4	**5.2.4 BTS3900 +24 V Input Power Cable**	4
Internal power cables	P5-P8	**5.2.7 Power Cable Between the PSU (DC/DC) and the DCDU**	4
	P9-P14, P19-P21	**5.2.8 Power Cable Between the DCDU and the DRFU**	9
	P15, P25	**5.2.10 Power Cable Between the DCDU and the FAN Unit**	2
	P16	**5.2.11 Power Cable Between the DCDU and the BBU**	1
	P17-P18, P22-P24, P26-P28	Reserved	8

NOTE

One pair of external +24 V power cables cannot provide sufficient power for the components in the cabinet; therefore, two pairs of external +24 V power cables are used.

3.1.3 Power Cable Connections of the BTS3900 220 V Cabinet

The power cables for the BTS3900 220 V cabinet are classified into two types: the external input power cable and the internal power cable.

Power Cable Connections of a Single Cabinet

Figure 3-5 shows the power cable connections of a single 220 V cabinet.

Figure 3-5 Power cable connections of a single 220 V cabinet

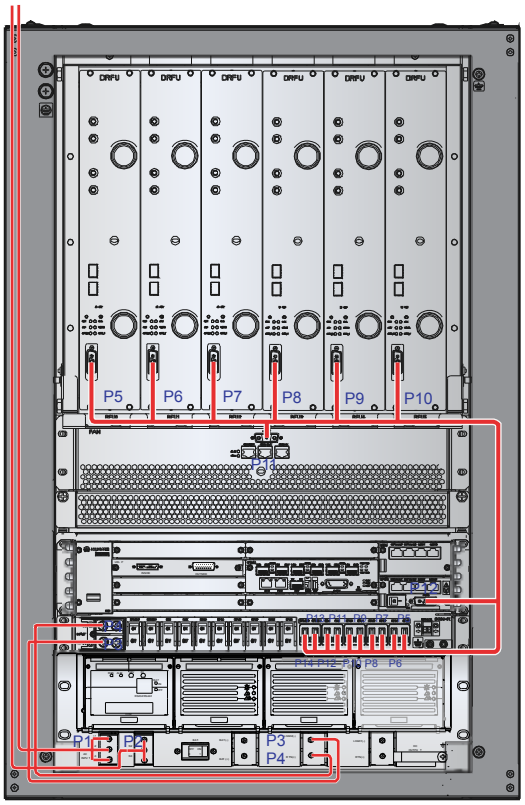


Table 3-5 describes the power cable connections of a single cabinet.

Table 3-5 Power cable connections of a single 220 V cabinet

Category	Cable Number	Cable Name	Quantity
External input power cable	P1-P2	**5.2.5 BTS3900 220 V Input Power Cable**	2
Internal power cables	P3-P4	**5.2.6 Power Cable Between the PSU (AC/DC) and the DCDU**	2
	P5-P10	**5.2.8 Power Cable Between the DCDU and the DRFU**	6
	P11	**5.2.10 Power Cable Between the DCDU and the FAN Unit**	1
	P12	**5.2.11 Power Cable Between the DCDU and the BBU**	1
	P13-P14	Reserved	2

Power Cable Connections of Two Stacked Cabinets

Figure 3-6 shows the power cable connections when the -48 V cabinet is stacked on the 220 V cabinet.

Figure 3-6 Power cable connections of two stacked cabinets

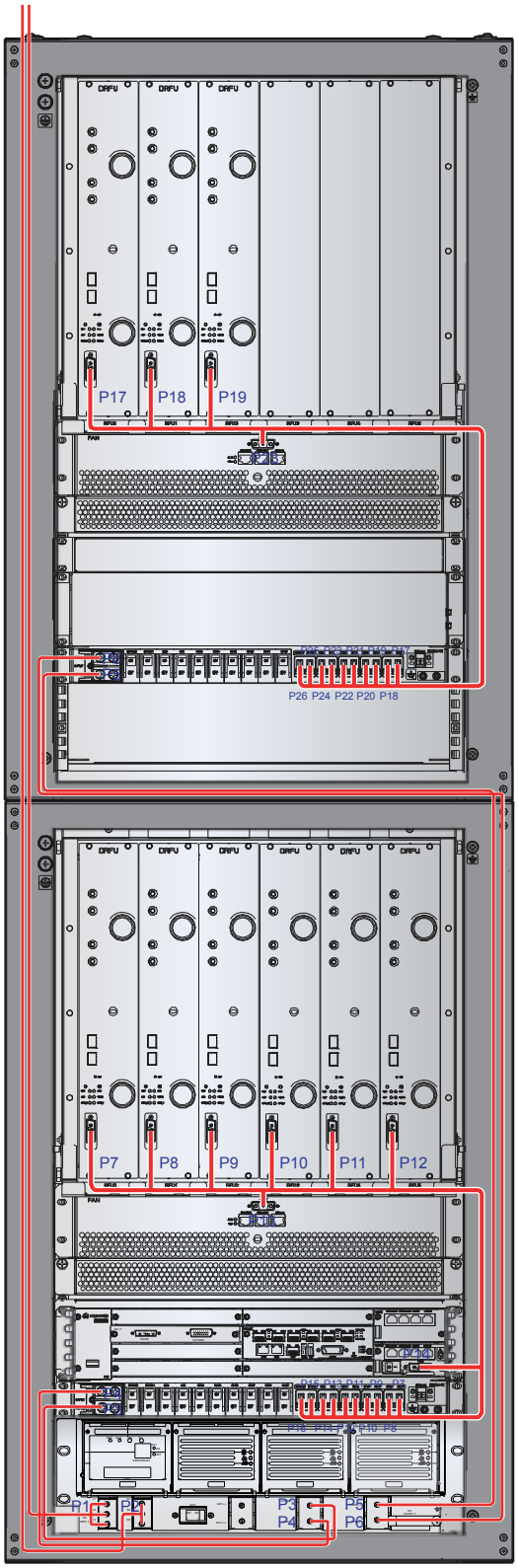


Table 3-6 describes the power cable connections of two stacked cabinets.

Table 3-6 Power cable connections of two stacked cabinets

Category	Cable Number	Cable Name	Quantity
External input power cable	P1-P2	**5.2.5 BTS3900 220 V Input Power Cable**	2
Internal power cables	P3-P6	**5.2.6 Power Cable Between the PSU (AC/DC) and the DCDU**	4
	P7-P12, P17-P19	**5.2.8 Power Cable Between the DCDU and the DRFU**	9
	P13, P23	**5.2.10 Power Cable Between the DCDU and the FAN Unit**	2
	P14	**5.2.11 Power Cable Between the DCDU and the BBU**	1
	P15-P16, P20-P22, P24-P26	Reserved	8

3.2 Signal Cable Connections of the BTS3900

The signal cable connections of the BTS3900 involve the connections of the signal cables for a single cabinet and for two stacked cabinets.

3.2.1 Signal Cable Connections of a Single BTS3900 Cabinet
The signal cable connections of a single BTS3900 cabinet involve signal cable connections in a -48 V cabinet, in a +24 V cabinet, and in a 220 V cabinet.

3.2.2 Signal Cable Connections of Stacked BTS3900 Cabinets
The signal cable connections of stacked BTS3900 cabinets involve the signal cable connections when a -48 V cabinet, a +24 V cabinet, or a 220 V cabinet is stacked with another -48 V cabinet.

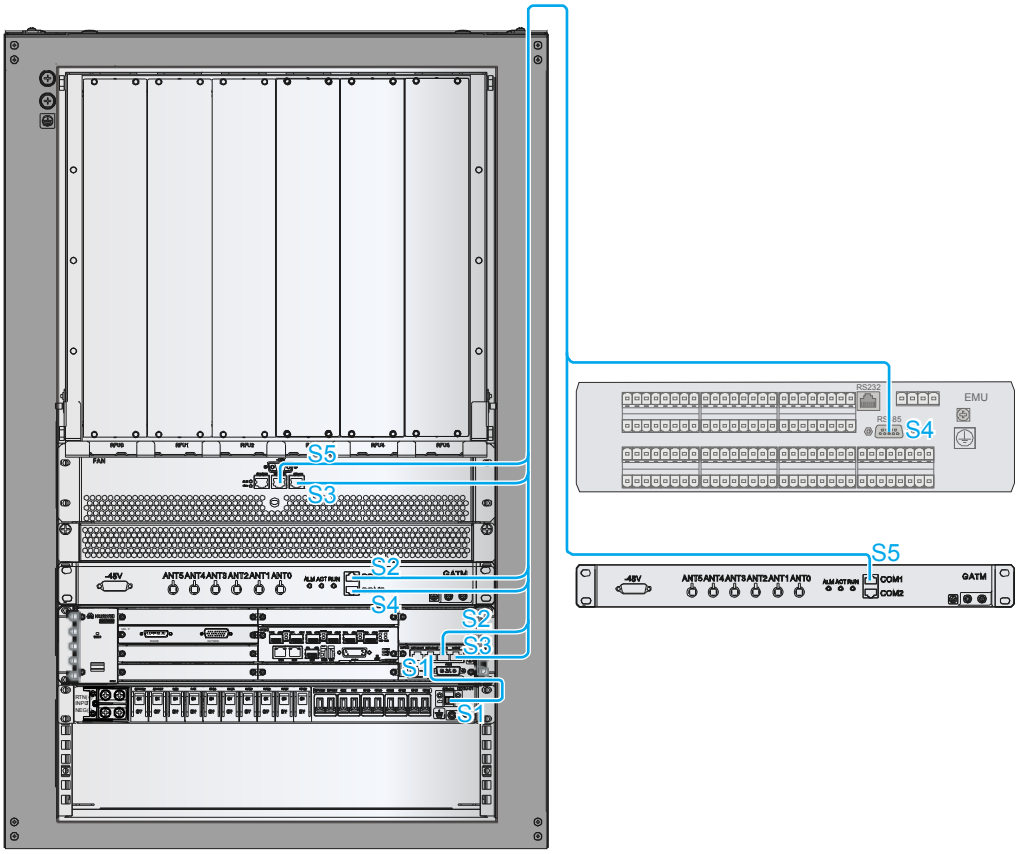
3.2.1 Signal Cable Connections of a Single BTS3900 Cabinet

The signal cable connections of a single BTS3900 cabinet involve signal cable connections in a -48 V cabinet, in a +24 V cabinet, and in a 220 V cabinet.

Signal Cable Connections in a -48 V Cabinet

Figure 3-7 shows the signal cable connections in a -48 V cabinet when only one UPEU is configured.

Figure 3-7 Signal Cable Connections in a -48 V Cabinet (1)



NOTE

The GATM and EMU in **Figure 3-7**, **Figure 3-8**, **Figure 3-9**, **Figure 3-10**, **Figure 3-11**, and **Figure 3-12** are optional. The GATM can be installed in the cabinet. If there is no enough space in the cabinet, the GATM can be installed in spare space of other equipment. The EMU can be installed on a wall.

Table 3-7 describes the signal cables in a -48 V cabinet.

Table 3-7 Signal cable connections in a -48 V cabinet (1)

Cable Number	Cable Name	Quantity
S1	**5.4.1 Monitoring Signal Cables for the DCDU-01**	1
S2, S5	**5.4.5 Monitoring Signal Cable for the GATM**	2
S3	**5.4.8 Monitoring Signal Cable for the FAN Unit**	1
S4	**5.4.4 Monitoring Signal Cable for the EMU**	1

Figure 3-8 shows the signal cable connections in a -48 V cabinet when two UPEUs or one UPEU plus one UEIU are configured.

Figure 3-8 Signal cable connections in a -48 V cabinet (2)

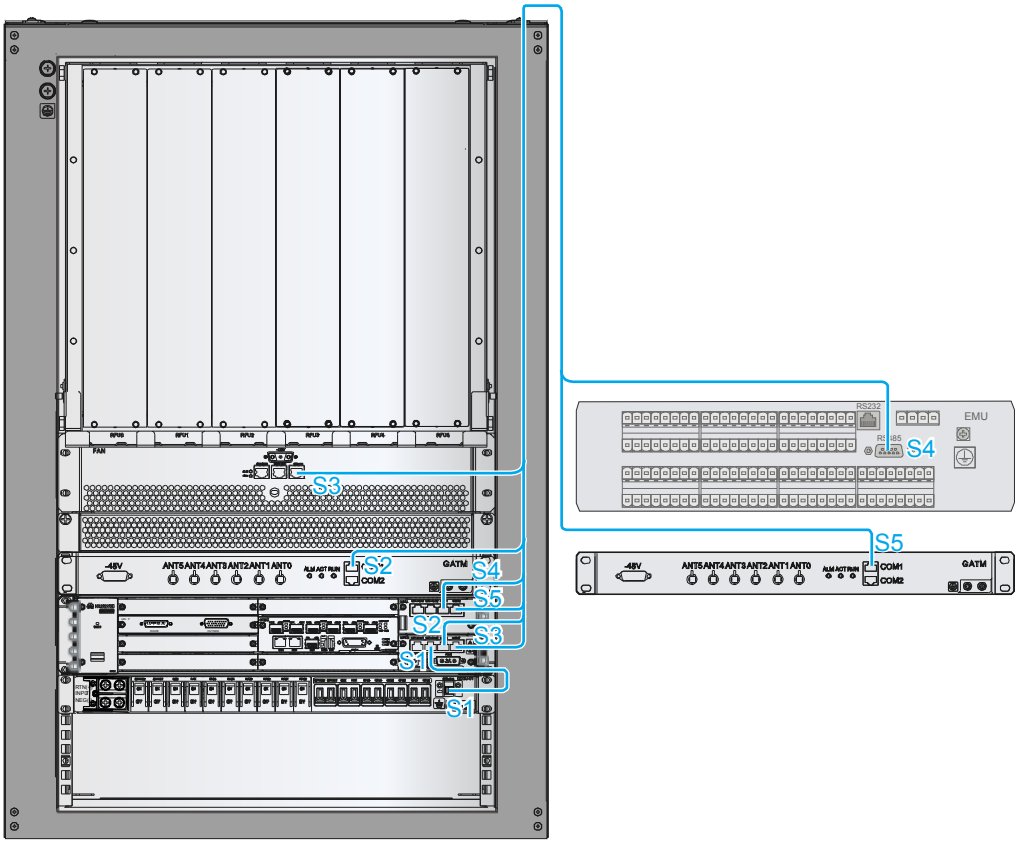


Table 3-8 describes the signal cable connections in a -48 V cabinet.

Table 3-8 Signal cable connections in a -48 V cabinet (2)

Cable Number	Cable Name	Quantity
S1	5.4.1 Monitoring Signal Cables for the DCDU-01	1
S2, S5	5.4.5 Monitoring Signal Cable for the GATM	2
S3	5.4.8 Monitoring Signal Cable for the FAN Unit	1
S4	5.4.4 Monitoring Signal Cable for the EMU	1

Signal Cable Connections in a +24 V Cabinet

Figure 3-9 shows the signal cable connections in a +24 V cabinet when only one UPEU is configured.

Figure 3-9 Signal cable connections in a +24 V cabinet (1)

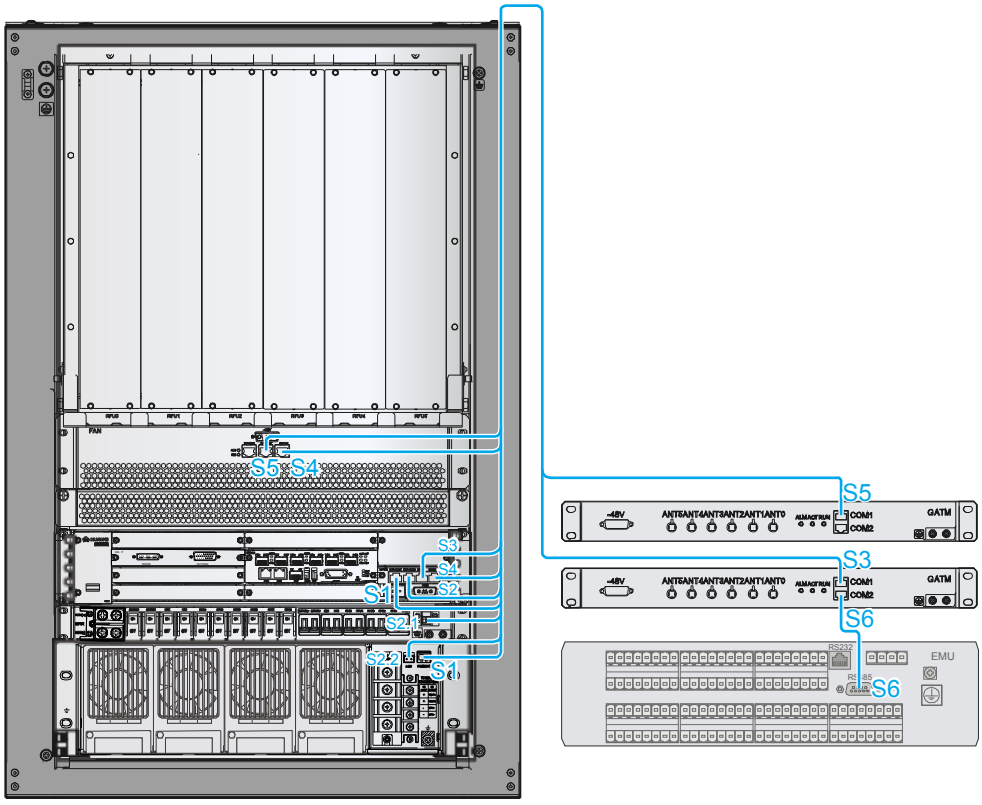


Table 3-9 describes the signal cable connections in a +24 V cabinet.

Table 3-9 Signal cable connections in a +24 V cabinet (1)

Cable Number	Cable Name	Quantity
S1	**5.4.2 In-Position Signal Cable for the PSU (DC/DC)**	1
S2	**5.4.1 Monitoring Signal Cables for the DCDU-01**	1
S3, S5	**5.4.5 Monitoring Signal Cable for the GATM**	2
S4	**5.4.8 Monitoring Signal Cable for the FAN Unit**	1
S6	**5.4.4 Monitoring Signal Cable for the EMU**	1

Figure 3-10 shows the signal cable connections in a +24 V cabinet when two UPEUs or one UPEU plus one UEIU are configured.

Figure 3-10 Signal cable connections in a +24 V cabinet (2)

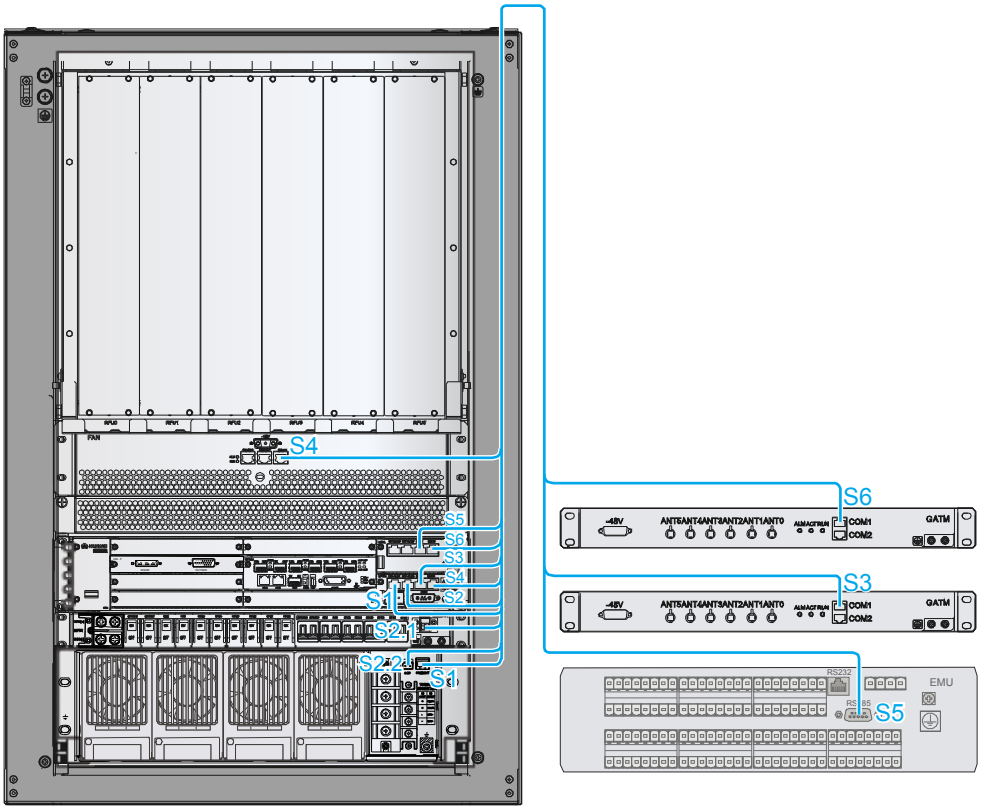


Table 3-10 describes the signal cable connections in a +24 V cabinet.

Table 3-10 Signal cable connections in a +24 V cabinet (2)

Cable Number	Cable Name	Quantity
S1	5.4.2 In-Position Signal Cable for the PSU (DC/DC)	1
S2	5.4.1 Monitoring Signal Cables for the DCDU-01	1
S3, S6	5.4.5 Monitoring Signal Cable for the GATM	2
S4	5.4.8 Monitoring Signal Cable for the FAN Unit	1
S5	5.4.4 Monitoring Signal Cable for the EMU	1

Signal Cable Connections in a 220 V Cabinet

Figure 3-11 shows the signal cable connections in a 220 V cabinet when only one UPEU is configured.

Figure 3-11 Signal cable connections in a 220 V cabinet (1)

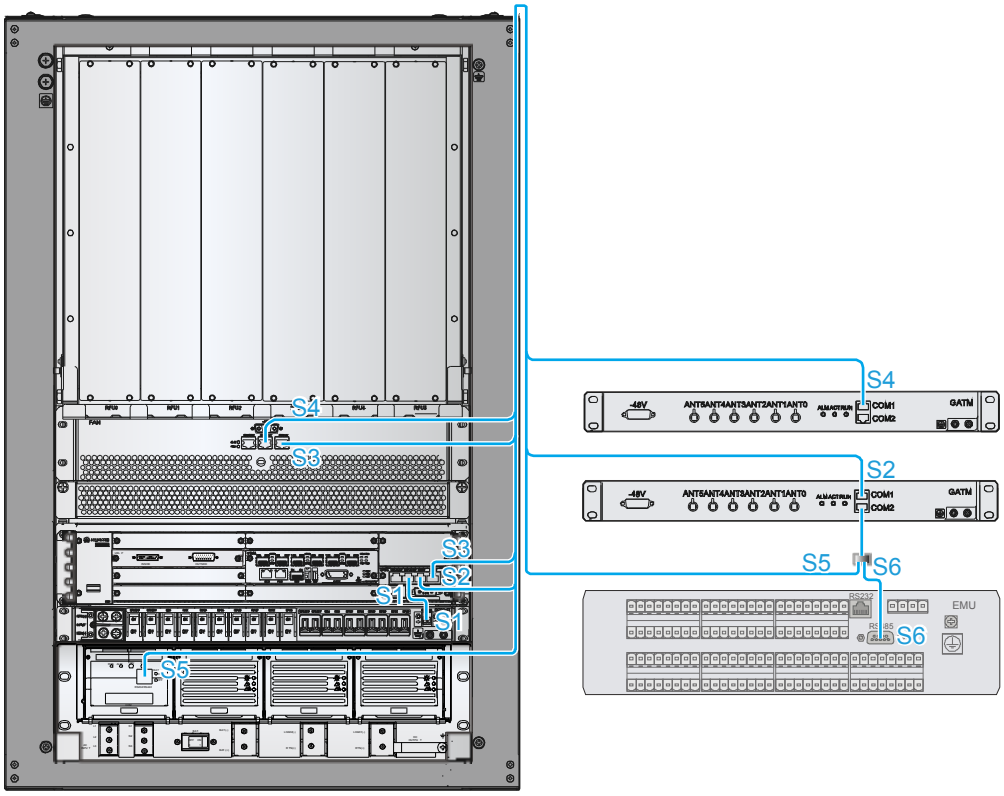


Table 3-11 describes the signal cable connections in a 220 V cabinet.

Table 3-11 Signal cable connections in a 220 V cabinet (1)

Cable Number	Cable Name	Quantity
S1	**5.4.1 Monitoring Signal Cables for the DCDU-01**	1
S2, S4	**5.4.5 Monitoring Signal Cable for the GATM**	2
S3	**5.4.8 Monitoring Signal Cable for the FAN Unit**	1
S5	**5.4.3 Monitoring Signal Cable for the PMU**	1
S6	**5.4.4 Monitoring Signal Cable for the EMU**	1

Figure 3-12 shows the signal cable connections in a 220 V cabinet when two UPEUs or one UPEU plus one UEIU are configured.

Figure 3-12 Signal cable connections in a 220 V cabinet (2)

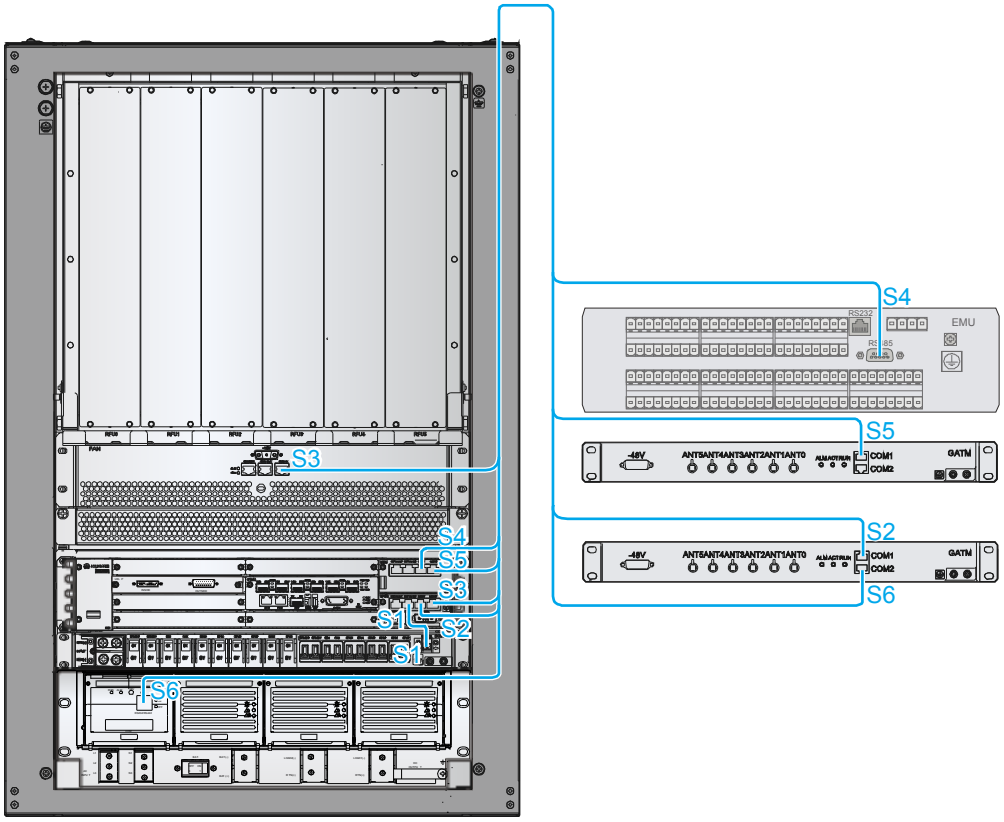


Table 3-12 describes the signal cable connections in a 220 V cabinet.

Table 3-12 Signal cable connections in a 220 V cabinet (2)

Cable Number	Cable Name	Quantity
S1	5.4.1 Monitoring Signal Cables for the DCDU-01	1
S2, S5	5.4.5 Monitoring Signal Cable for the GATM	2
S3	5.4.8 Monitoring Signal Cable for the FAN Unit	1
S4	5.4.4 Monitoring Signal Cable for the EMU	1
S6	5.4.3 Monitoring Signal Cable for the PMU	1

3.2.2 Signal Cable Connections of Stacked BTS3900 Cabinets

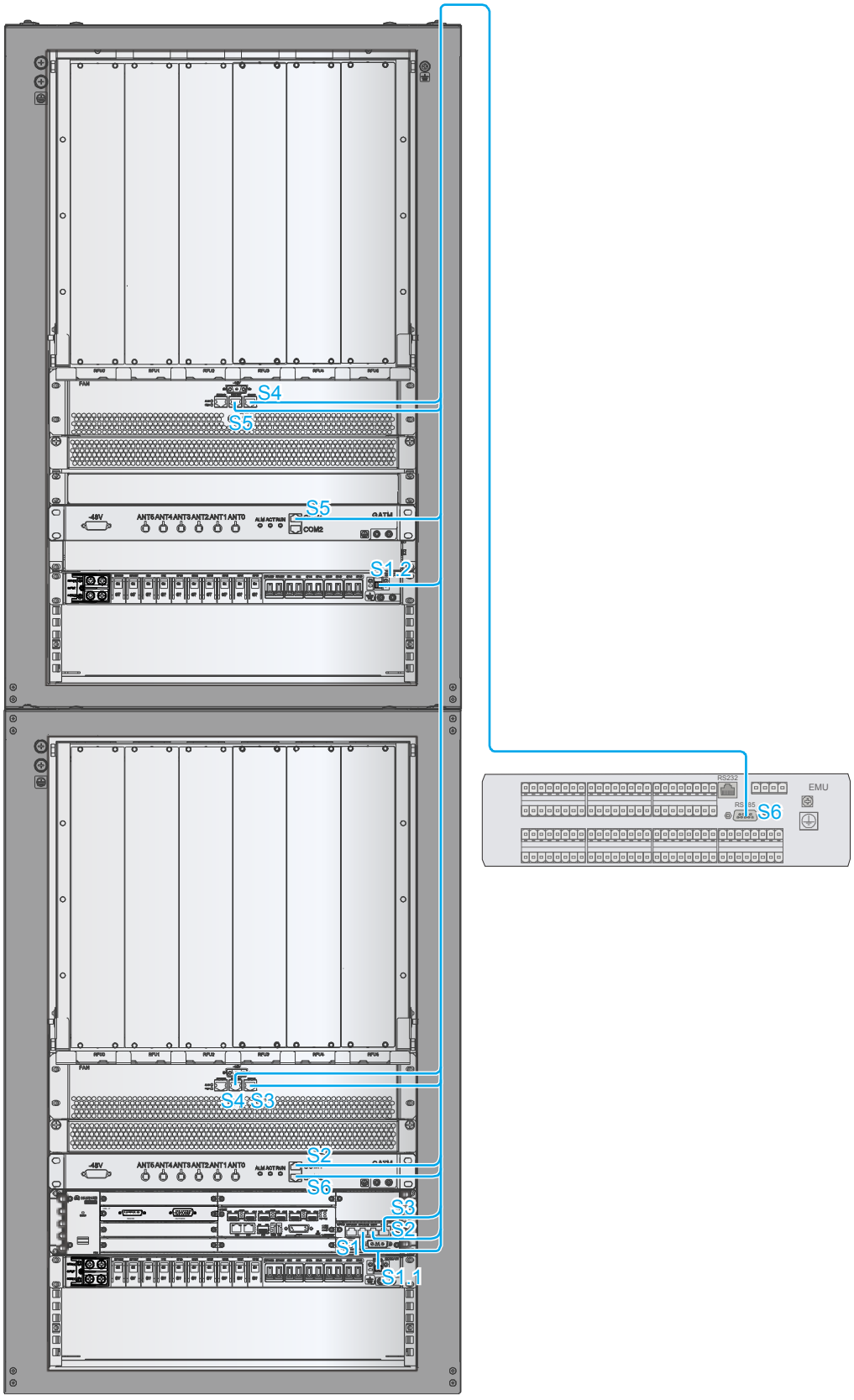
The signal cable connections of stacked BTS3900 cabinets involve the signal cable connections when a -48 V cabinet, a +24 V cabinet, or a 220 V cabinet is stacked with another -48 V cabinet.

Signal Cable Connections of Stacked Cabinets (-48 V)

In this situation, two -48 V cabinets are installed in stack mode.

Figure 3-13 shows the signal cable connections in stacked cabinets when only one UPEU is configured.

Figure 3-13 Signal cable connections of stacked cabinets (1)



NOTE

The GATM and EMU in **Figure 3-13**, **Figure 3-14**, **Figure 3-15**, **Figure 3-16**, **Figure 3-17**, and **Figure 3-18** are optional. The GATM can be installed in the cabinet. If there is no enough space in the cabinet, the GATM can be installed in spare space of other equipment. The EMU can be installed on a wall.

Table 3-13 describes the signal cable connections of stacked cabinets.

Table 3-13 Signal cable connections of stacked cabinets (1)

Cable Number	Cable Name	Quantity
S1	**5.4.1 Monitoring Signal Cables for the DCDU-01**	1
S2, S5	**5.4.5 Monitoring Signal Cable for the GATM**	2
S3	**5.4.8 Monitoring Signal Cable for the FAN Unit**	1
S4	**5.4.9 Signal Cable Between the Cascaded FAN Units**	1
S6	**5.4.4 Monitoring Signal Cable for the EMU**	1

Figure 3-14 shows the signal cable connections when two UPEUs or one UPEU plus one UEIU are configured.

Figure 3-14 Signal cable connections of stacked cabinets (2)

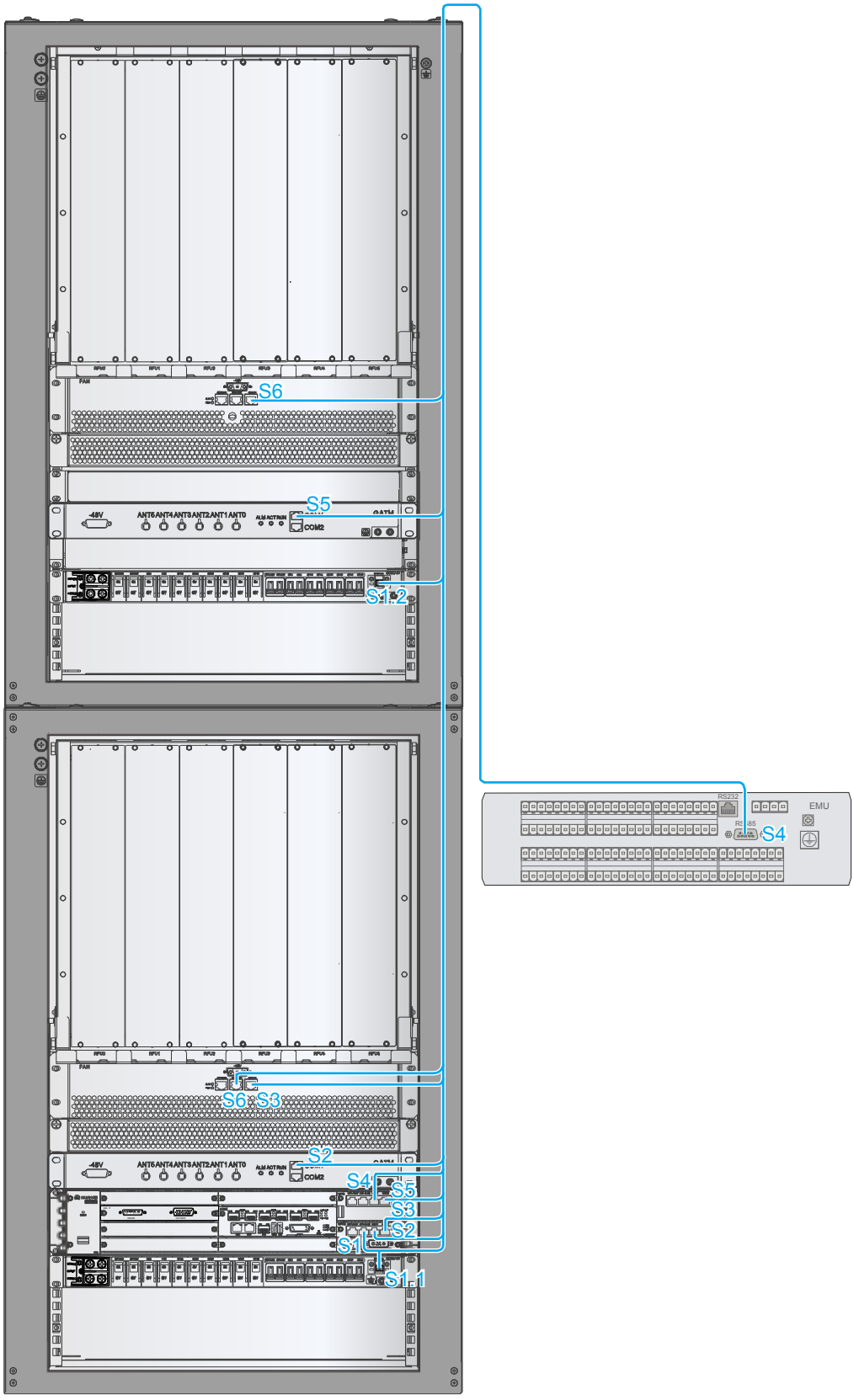


Table 3-14 describes the signal cable connections of stacked cabinets.

Table 3-14 Signal cable connections of stacked cabinets (2)

Cable Number	Cable Name	Quantity
S1	**5.4.1 Monitoring Signal Cables for the DCDU-01**	1
S2, S5	**5.4.5 Monitoring Signal Cable for the GATM**	2
S3	**5.4.8 Monitoring Signal Cable for the FAN Unit**	1
S4	**5.4.4 Monitoring Signal Cable for the EMU**	1
S6	**5.4.9 Signal Cable Between the Cascaded FAN Units**	1

Signal Cable Connections of Stacked Cabinets (+24 V)

In this situation, one +24 V cabinet and one -48 V cabinet are installed in stack mode.

Figure 3-15 shows the signal cable connections in stacked cabinets when only one UPEU is configured.

Figure 3-15 Signal cable connections of stacked cabinets (3)

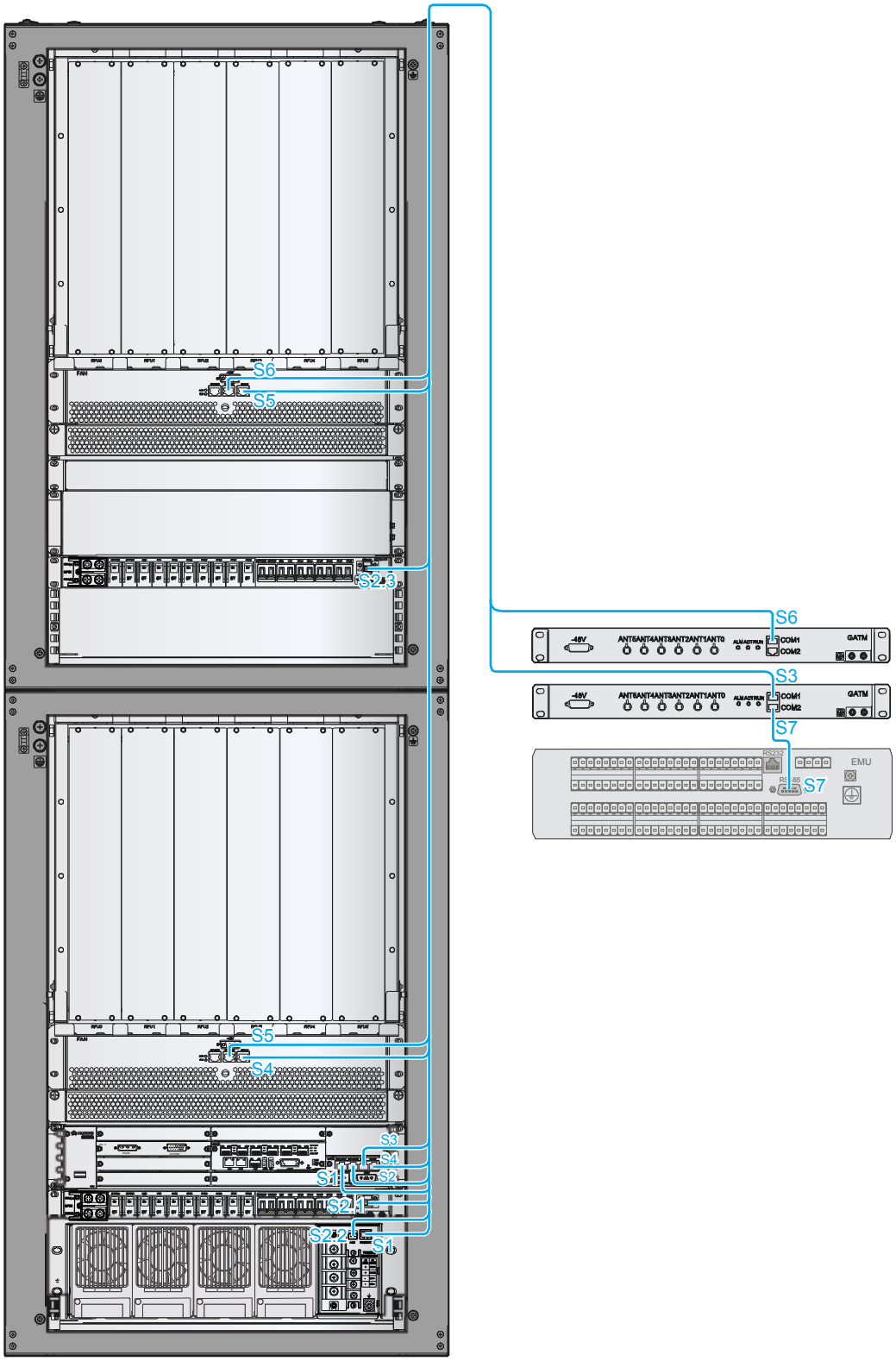


Table 3-15 describes the signal cable connections of stacked cabinets.

Table 3-15 Signal cable connections of stacked cabinets (3)

Cable Number	Cable Name	Quantity
S1	**5.4.2 In-Position Signal Cable for the PSU (DC/DC)**	1
S2	**5.4.1 Monitoring Signal Cables for the DCDU-01**	1
S3, S6	**5.4.5 Monitoring Signal Cable for the GATM**	2
S4	**5.4.8 Monitoring Signal Cable for the FAN Unit**	1
S5	**5.4.9 Signal Cable Between the Cascaded FAN Units**	1
S7	**5.4.4 Monitoring Signal Cable for the EMU**	1

Figure 3-16 shows the signal cable connections when two UPEUs or one UPEU plus one UEIU are configured.

Figure 3-16 Signal cable connections of stacked cabinets (4)

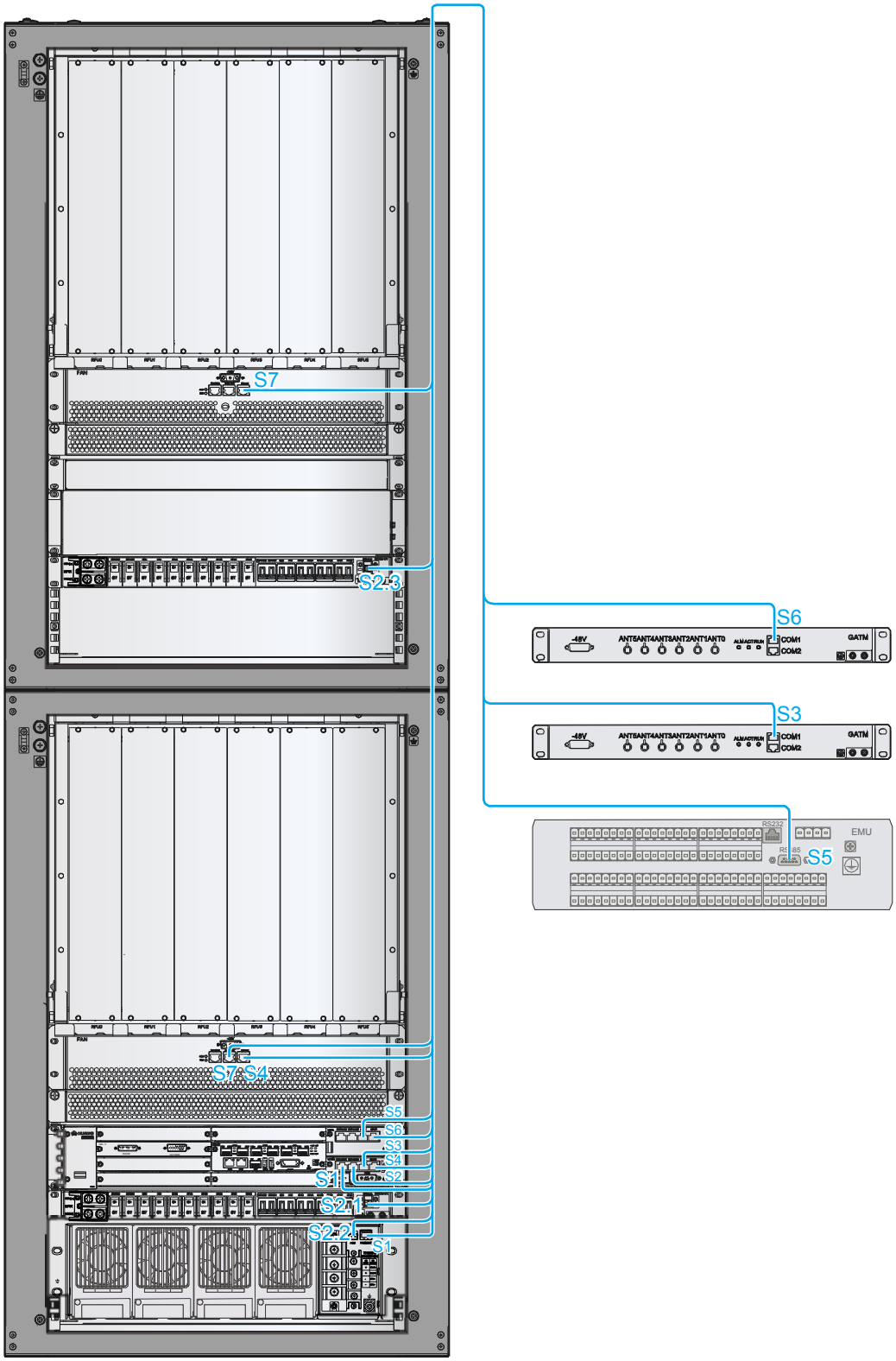


Table 3-16 describes the signal cable connections of stacked cabinets.

Table 3-16 Signal cable connections of stacked cabinets (4)

Cable Number	Cable Name	Quantity
S1	**5.4.2 In-Position Signal Cable for the PSU (DC/DC)**	1
S2	**5.4.1 Monitoring Signal Cables for the DCDU-01**	1
S3, S6	**5.4.5 Monitoring Signal Cable for the GATM**	2
S4	**5.4.8 Monitoring Signal Cable for the FAN Unit**	1
S5	**5.4.4 Monitoring Signal Cable for the EMU**	1
S7	**5.4.9 Signal Cable Between the Cascaded FAN Units**	1

Signal Cable Connections of Stacked Cabinets (220 V)

In this situation, one 220 V cabinet and one -48 V cabinet are installed in stack mode.

Figure 3-17 shows the signal cable connections in stacked cabinets when only one UPEU is configured.

Figure 3-17 Signal cable connections of stacked cabinets (5)

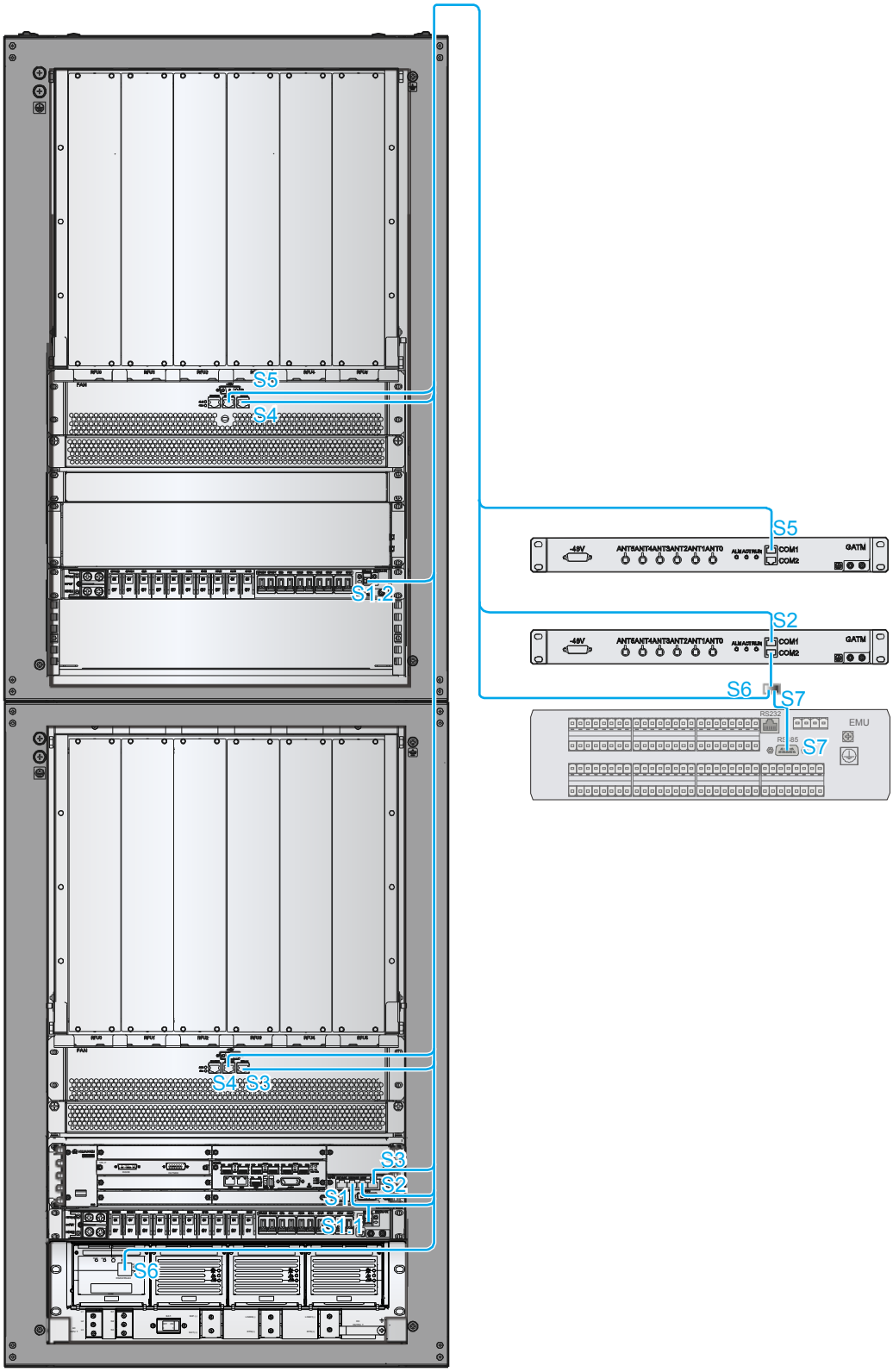


Table 3-17 describes the signal cable connections of stacked cabinets.

Table 3-17 Signal cable connections of stacked cabinets (5)

Cable Number	Cable Name	Quantity
S1	**5.4.1 Monitoring Signal Cables for the DCDU-01**	1
S2, S5	**5.4.5 Monitoring Signal Cable for the GATM**	2
S3	**5.4.8 Monitoring Signal Cable for the FAN Unit**	1
S4	**5.4.9 Signal Cable Between the Cascaded FAN Units**	1
S6	**5.4.3 Monitoring Signal Cable for the PMU**	1
S7	**5.4.4 Monitoring Signal Cable for the EMU**	1

Figure 3-18 shows the signal cable connections when two UPEUs or one UPEU plus one UEIU are configured.

Figure 3-18 Signal cable connections of stacked cabinets (6)

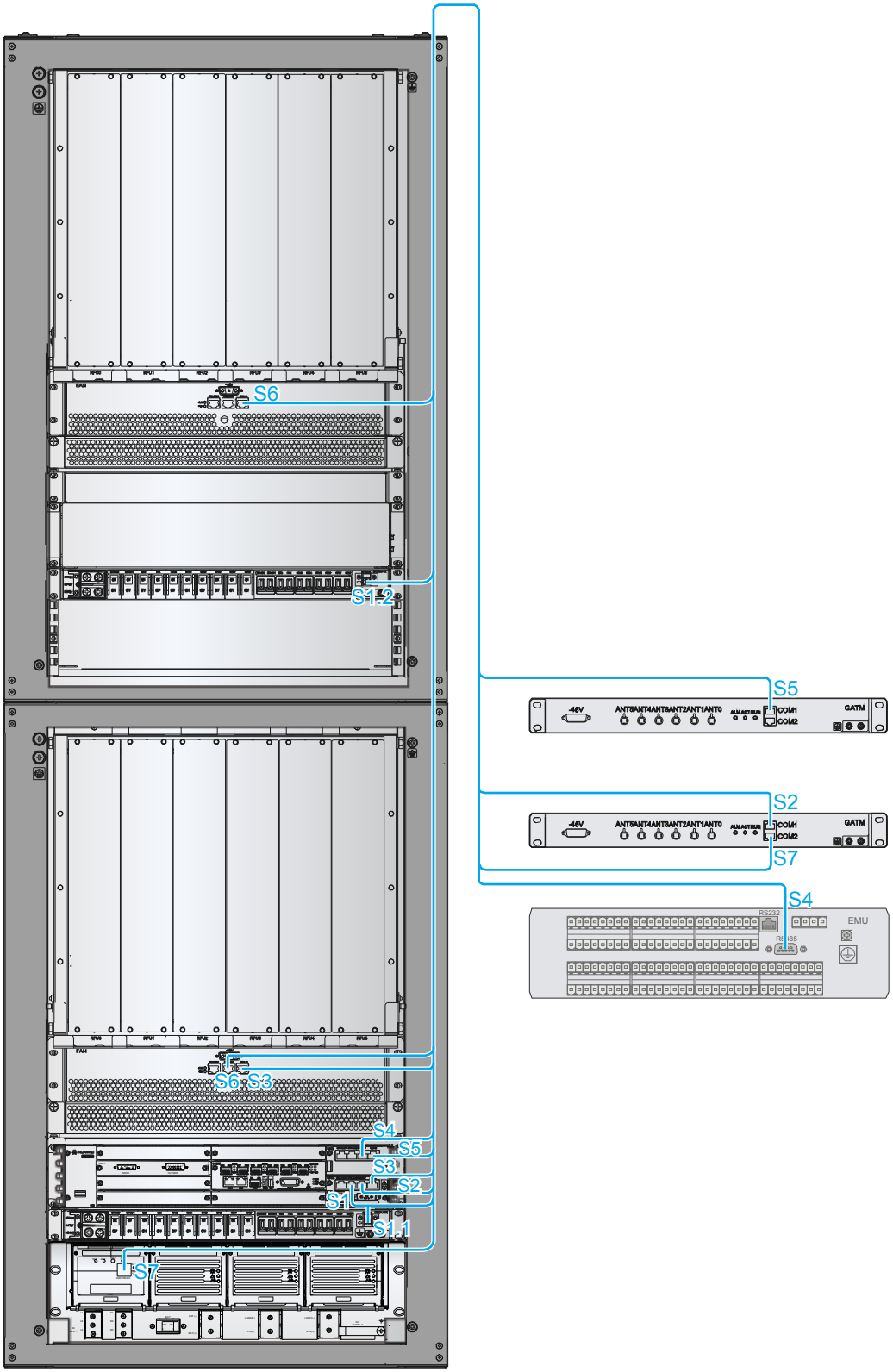


Table 3-18 describes the signal cable connections of stacked cabinets.

Table 3-18 Signal cable connections of stacked cabinets (6)

Cable Number	Cable Name	Quantity
S1	**5.4.1 Monitoring Signal Cables for the DCDU-01**	1
S2, S5	**5.4.5 Monitoring Signal Cable for the GATM**	2
S3	**5.4.8 Monitoring Signal Cable for the FAN Unit**	1
S4	**5.4.4 Monitoring Signal Cable for the EMU**	1
S6	**5.4.9 Signal Cable Between the Cascaded FAN Units**	1
S7	**5.4.3 Monitoring Signal Cable for the PMU**	1

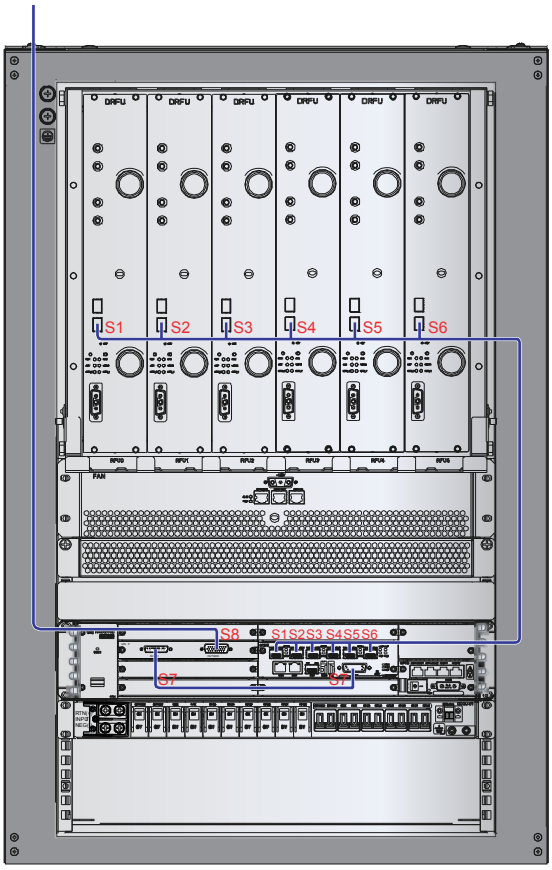
3.3 Transmission Cable Connections of the BTS3900

The transmission cable connections of the BTS3900 involve the connections of the E1 cable, E1 surge protection transfer cable, CPRI cable, and signal cable between cascaded DRFUs. The E1 surge protection transfer cable is required only when the UELP is configured.

Transmission Cable Connections of a Single Cabinet

Figure 3-19 shows the typical cable connections of a single cabinet when the UELP is configured.

Figure 3-19 Transmission cable connections of a single cabinet (1)



NOTE

The transmission cables installed in **Figure 3-19** are based on the star topology, in which the UELP is configured.

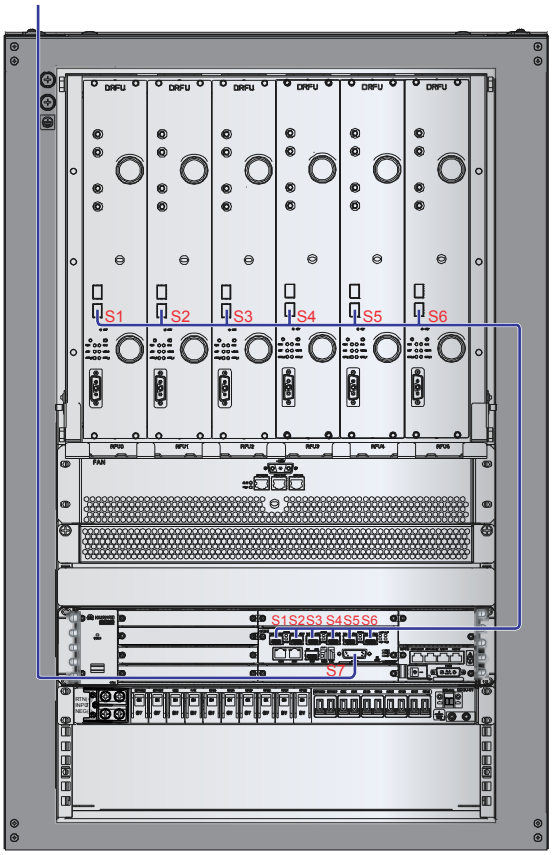
Table 3-19 describes the transmission cable connections of a single cabinet.

Table 3-19 Transmission cable connections of a single cabinet (1)

Cable Number	Cable Name	Quantity
S1-S6	**5.3.3 CPRI Cable**	6
S7	**5.3.2 E1 Surge Protection Transfer Cable**	1
S8	**5.3.1 E1 Cable**	1

Figure 3-20 shows the typical cable connections of a single cabinet when the UELP is not configured.

Figure 3-20 Transmission cable connections of a single cabinet (2)



NOTE

The transmission cables installed in **Figure 3-20** are based on the star topology, in which the UELP is not configured.

Table 3-20 describes the transmission cable connections of a single cabinet.

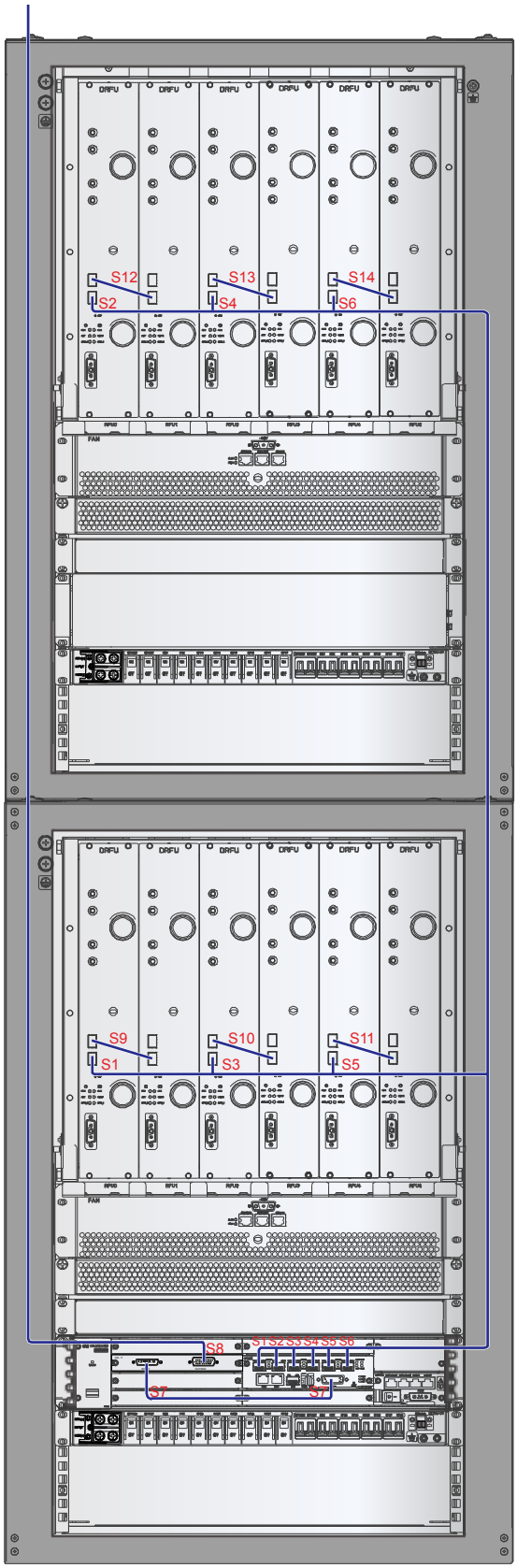
Table 3-20 Transmission cable connections of a single cabinet (2)

Cable Number	Cable Name	Quantity
S1-S6	**5.3.3 CPRI Cable**	6
S7	**5.3.1 E1 Cable**	1

Transmission Cable Connections of Two Stacked Cabinets

Figure 3-21 shows the typical transmission cable connections of two stacked cabinets.

Figure 3-21 Transmission cable Connections of two stacked cabinets



NOTE

The transmission cables installed in **Figure 3-21** are based on the chain topology, in which the UELP is configured.

Table 3-21 describes the transmission cable connections of two stacked cabinets.

Table 3-21 Transmission cable Connections of two stacked cabinets

Cable Number	Cable Name	Quantity
S1-S6	**5.3.3 CPRI Cable**	6
S7	**5.3.2 E1 Surge Protection Transfer Cable**	1
S8	**5.3.1 E1 Cable**	1
S9-S14	**5.3.4 Signal Cable Between the Cascaded DRFUs**	6

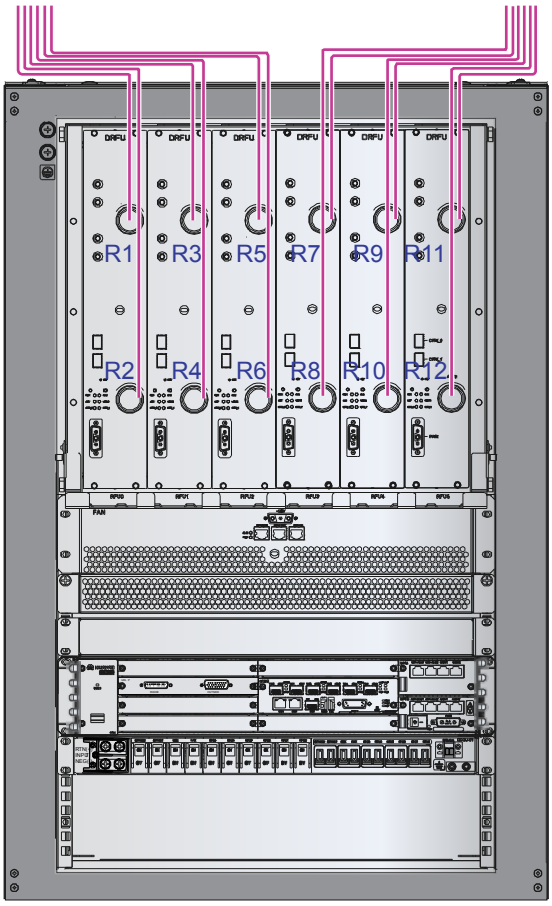
3.4 RF Cable Connections of the BTS3900

The RF cable connections of the BTS3900 involve the connections of the RF cables of a single cabinet and the RF cables of stacked cabinets.

RF Cable Connections

Figure 3-22 shows the typical RF cable connections of a single BTS3900 cabinet.

Figure 3-22 RF cable connections of a single cabinet



NOTE

In **Figure 3-22**, the connections of the RF cables are based on the -48 V cabinet in non-combination mode. For detailed information about the RF cables, refer to **RF Signal Cable Connections of the DRFU**.

Table 3-22 describes the RF cable connections of a single cabinet.

Table 3-22 RF cable connections of a single cabinet

Cable Number	Cable Name	Quantity
R1-R12	**5.5.1 RF Jumper**	12

Figure 3-23 shows the typical RF cables of two stacked cabinets.

Figure 3-23 RF cable connections of two stacked cabinets

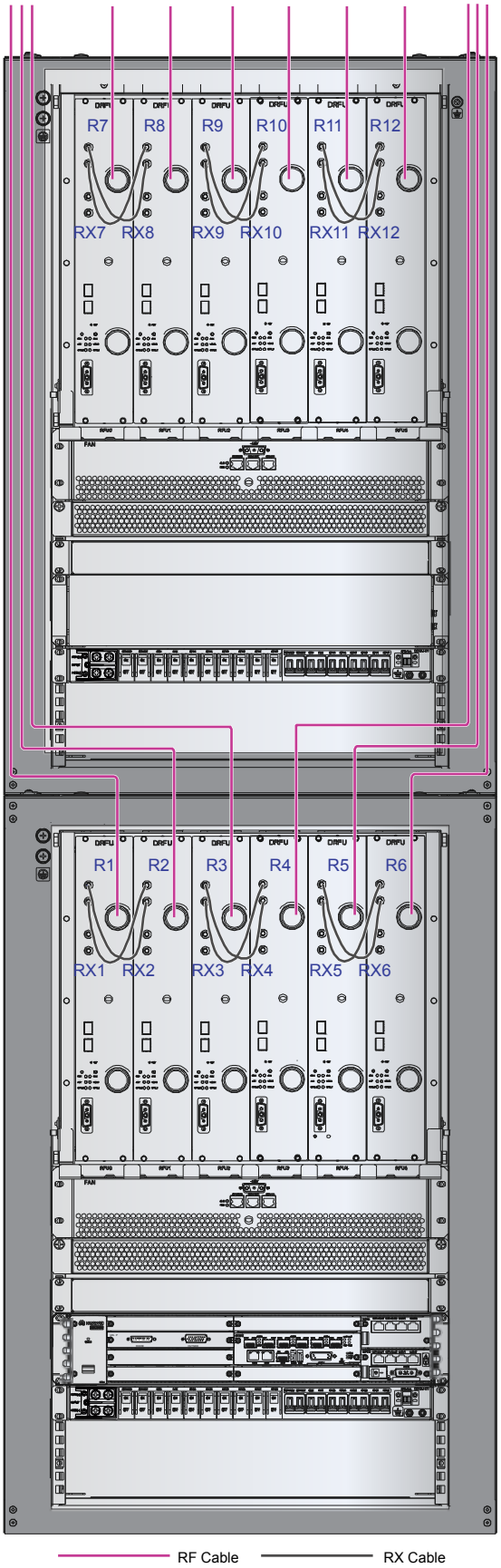


Table 3-23 describes the RF cable connections of two stacked cabinets.

Table 3-23 RF cable connections of two stacked cabinets

Cable Number	Cable Name	Quantity
R1-R12	**5.5.1 RF Jumper**	12
RX1-RX12	**5.5.2 Inter-DRFU RF Signal Cable**	12

NOTE

In **Figure 3-23**, the connections of the RF cables are based on two stacked -48 V cabinets in non-combination mode.

4 BTS3900 Components

About This Chapter

The BTS3900 components are the BBU, DRFU, DCDU-01, GATM, PMU, PSU, and FAN unit.

The power subrack (DC/DC) receives the external +24 V DC power. In the power subrack, the PSU (DC/DC) converts the +24 V DC power into the -48 V DC power and then leads the -48 V DC power to the DCDU-01 through the power cable from the wiring unit.

4.1 List of BTS3900 Components

The BTS3900 components are the BBU, DRFU, DCDU-01, GATM, PMU, PSU, and FAN unit. The BBU consists of the UEIU, GTMU, UELP, UBFA, and UPEU.

Table 4-1 lists the BTS3900 components.

Table 4-1 Component List

Board/ Module	Full Name	Number of Boards or Modules Configured in a Single Cabinet	
		In Full	In Minimum
UEIU	Universal Environment Interface Unit	1	0
GTMU	GSM Transmission & Management Unit for BBU	1	1
UELP	Universal E1/T1 Lightning Protection unit	1	0
UBFA	Universal BBU Fan unit type A(2U)	1	1
UPEU	Universal Power and Environment interface Unit	2	1
DRFU	Double Radio Filter Unit	6	1
DCDU-01	Direct Current Distribution Unit	1	1
GATM	GSM Antenna and TMA Control module	2	0
PMU	Power and Environment Monitoring Unit	1	0
PSU (AC/ DC)	Power Supply Unit(AC/DC)	3	0
PSU (DC/ DC)	Power Supply Unit(DC/DC)	4	0
FAN	FAN unit	1	1

4.2 BBU3900 Equipment

The BBU3900 is the baseband control unit that enables the communication between the BTS and the BSC.

The BBU3900 has the following functions:

- Providing physical ports for the communication between the BTS and the BSC
- Providing the CPRI ports for communication with the DRFU

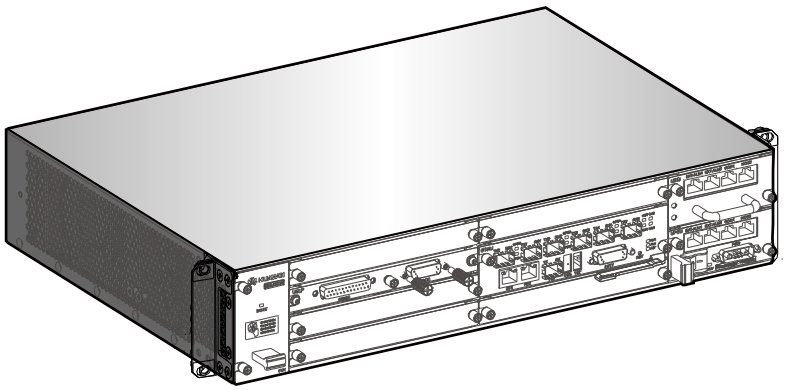
- Providing the USB port for downloading the BTS software
- Providing the OM channel connected to the LMT or M2000
- Processing the UL and DL data
- Providing centralized management on the entire BTS system, such as OM and signaling processing
- Providing the reference clock for the system

4.2.1 Appearance of the BBU3900

The BBU3900 is a small box with all the external ports on the front panel.

Figure 4-1 shows the BBU3900.

Figure 4-1 BBU3900



4.2.2 Engineering Specifications of the BBU

This describes the engineering specifications of the BBU.

Mechanical Dimensions

The BBU can be installed in a standard 19-inch cabinet. **Table 4-2** lists the mechanical dimensions of the BBU.

Table 4-2 Mechanical dimensions of the BBU

Item	Width (mm)	Depth (mm)	Height (mm)
BBU	442	310	86 (2 U)

Weight

Table 4-3 lists the weight of the BBU.

Table 4-3 Weight of the BBU

Item	Weight (kg)
BBU in typical configuration	7
BBU in maximum configuration	12

Power Input

Table 4-4 lists the power input of the BBU.

Table 4-4 Power input of the BBU

Power Type	Typical Value	Allowed Range
-48 V DC	-48 V DC	-38.4 V DC to -57 V DC
+24 V DC	+24 V DC	+19 V DC to +29 V DC

NOTE

- The BBU3900 supports two types of power input, namely, -48 V DC and +24 V DC.
- With an auxiliary power conversion system, 220 V AC power can be converted into -48 V DC power for the BBU3900.

Power Consumption

The typical power consumption of the BBU is 50 W.

4.2.3 Boards and Modules of the BBU3900

The BBU3900 boards consist of the UEIU, GTMU, and UELP. The BBU3900 modules consist of the UBFA and the UPEU.

4.2.3.1 UEIU Board

This describes the Universal Environment Interface Unit (UEIU) board. It transmits monitoring signals and alarm signals from external devices to the main control board.

4.2.3.2 GTMU Board

The GSM Transmission, Timing, and Management Unit for BBU (GTMU) controls and manages the entire BTS. It provides interfaces related to the reference clock, power supply, OM, and external alarm collection.

4.2.3.3 UELP Board

This describes the Universal E1/T1 Lightning Protection Unit (UELP) board. It is an optional board which is installed in the SLPU or the BBU. The UELP provides lightning protection for four E1/T1 signals.

4.2.3.4 UBFA Module

This describes the Universal BBU Fan Unit Type A (UBFA) module. It is a mandatory module of the BBU3900 that controls the fan speed and detects the temperature of the fan board.

4.2.3.5 UPEU Board

This describes the Universal Power and Environment Interface Unit (UPEU) board. It converts -48 V or +24 V DC to +12 V DC.

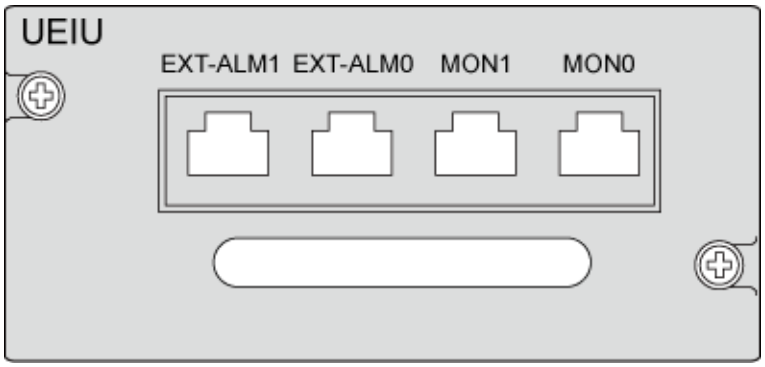
UEIU Board

This describes the Universal Environment Interface Unit (UEIU) board. It transmits monitoring signals and alarm signals from external devices to the main control board.

Panel

Figure 4-2 shows the UEIU panel.

Figure 4-2 Panel of the UEIU



Function

The UEIU performs the following functions:

- Providing two RS485 signal ports
- Providing eight dry contact alarm ports

Port

Table 4-5 describes the ports on the UEIU.

Table 4-5 Ports on the UEIU

Label	Connector
MON0	RJ45
MON1	RJ45
EXT-ALM0	RJ45
EXT-ALM1	RJ45

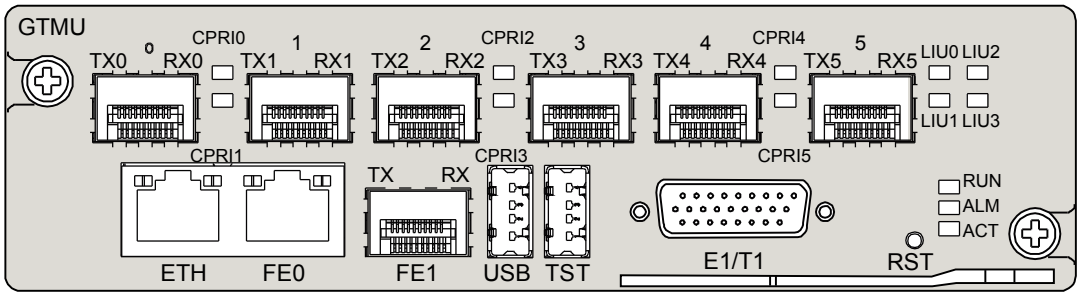
GTMU Board

The GSM Transmission, Timing, and Management Unit for BBU (GTMU) controls and manages the entire BTS. It provides interfaces related to the reference clock, power supply, OM, and external alarm collection.

Panel

Figure 4-3 shows the GTMU panel.

Figure 4-3 GTMU panel



Function

The GTMU performs the following functions:

- Controls, maintains, and operates the BTS
- Provides fault management, configuration management, performance management, and security management
- Monitors the fan module and the power supply module
- Distributes and manages BTS clock signals
- Provides clock input for testing
- Provides the Ethernet port for local maintenance
- Provides four E1 inputs
- Provides CPRI ports for the communication with the RF modules

LED

Table 4-6 describes the LEDs on the GTMU panel.

Table 4-6 LEDs on the GTMU

LED	Color	Status	Description
RUN	Green	On	The board is faulty.
		Off	There is no power supply or the board is faulty.
		On for 1s and off for 1s	The board is running properly.

LED	Color	Status	Description
		On for 2s and off for 2s	The OML link is abnormal.
		On for 0.125s and off for 0.125s	The board is loading software.
ALM	Red	On	A fault occurs in the running board.
		Off	No alarm is generated.
ACT	Green	On	The board is operational.
		Off	Board Fault
LIU0-LIU3	Green	On	A local E1/T1 alarm is generated.
		On for 0.125s and off for 0.125s	A remote E1/T1 alarm is generated.
		Off	This link is not used or the alarm is cleared.
CPRI0-CPRI5	Green	On	The CPRI link is functional.
	Red	On	The reception of the optical module is abnormal and an alarm is generated.

Port

Table 4-7 describes the ports on the GTMU panel.

Table 4-7 Ports on the GTMU panel

Port	Type	Description
CPRI0-CPRI5	SFP connector	Provides the input and output of optical and electrical transmission signals.
ETH	RJ45 connector	Used for local maintenance and commissioning.
FE0	RJ45 connector	A reserved port that performs the following function: Connects the BBU to a routing device in the equipment room through the Ethernet cable to transmit network information.

Port	Type	Description
FE1	DLC connector	A reserved port that performs the following function: Connects the BBU to a routing device in the equipment room through the optical cable to transmit network information.
USB	USB connector	A reserved port that performs the following function: Enables the automatic software upgrade from a USB disk.
TST	USB connector	Tests the output clock signals using a tester.
E1/T1	DB26 male connector	Provides the input and output of the four E1/T1 signals between the GTMU and the UELP or between the GTMU and the BSC.

The **RESET** button on the GTMU is used to reset the GTMU.

DIP Switch

The GTMU has five DIP switches. Each DIP switch has four DIP bits. The DIP switches **S1** and **S2** should be set in pairs.

- If the 75-ohm E1 cable is used, the **S1** and **S2** should be set as follows: The E1 impedance is set to 75 ohms and the E1/T1 is grounded.
- If the 120-ohm E1 cable is used, the **S1** and **S2** should be set as follows: The E1 impedance is set to 120 ohms and the E1/T1 is not grounded.
- If the 100-ohm T1 cable is used, the **S1** and **S2** should be set as follows: The T1 impedance is set to 100 ohms and the E1/T1 is not grounded.

NOTE

The 75-ohm E1 cable, 120-ohm E1 cable, and 100-ohm T1 cable should use the balanced mode.

The functions of the DIP switches are as follows:

- **S1** is used to set E1 impedance. **Table 4-8** describes the settings of the DIP switch.
- **S2** is used to set the grounding of E1/T1 transmission. **Table 4-9** describes the settings of the DIP switch.
- **S3** is reserved.
- **S4** is used for the selection of E1 bypass. **Table 4-10** describes the settings of the DIP switch.
- **S5** is used to set the timeslots when the E1 link is bypassed. **Table 4-11** describes the settings of the DIP switch.

Table 4-8 Settings of **S1**

DIP Switch	Setting of DIP Bit		Description
	1	2	
S1	ON	ON	The E1 impedance is set to 75 ohms.
	OFF	ON	The E1 impedance is set to 120 ohms.
	ON	OFF	The T1 impedance is set to 100 ohms.

NOTE

The DIP bits 3 and 4 of **S1** should retain the default settings. The default settings are OFF. If they are ON, you should change them to OFF.

Table 4-9 Settings of **S2**

DIP Switch	Setting of DIP Bit				Description
	1	2	3	4	
S2	ON	ON	ON	ON	E1/T1 grounded (unbalanced mode)
	OFF	OFF	OFF	OFF	E1/T1 not grounded (balanced mode)
	Miscellaneous				Not available

NOTE

In 75-ohm E1 mode, all bits of S2 are set to OFF by default (balanced mode). Only when the four E1s for receiving links become faulty, all bits of S2 are set to ON (unbalanced mode) to clear the link errors.

In 120-ohm E1 mode, all bits of S2 keep OFF without additional settings.

Table 4-10 Settings of **S4**

DIP Switch	Setting of DIP Bit				Description
	1	2	3	4	
S4	ON	ON	ON	ON	The E1 link can be bypassed.
	OFF	OFF	OFF	OFF	The E1 link cannot be bypassed.
	Miscellaneous				Not available

Table 4-11 Settings of **S5**

DIP Switch	Setting of DIP Bit				Description
	1	2	3	4	
S5	ON	ON	ON	ON	The E1 link cannot be bypassed.
	OFF	ON	ON	OFF	The E1 link of the Level 1 cascaded BTS can be bypassed.
	ON	OFF	ON	OFF	The E1 link of the Level 2 cascaded BTS can be bypassed.
	OFF	OFF	ON	OFF	The E1 link of the Level 3 cascaded BTS can be bypassed.
	ON	ON	OFF	OFF	The E1 link of the Level 4 cascaded BTS can be bypassed.
	OFF	ON	OFF	OFF	The E1 link of the Level 5 cascaded BTS can be bypassed.

UELP Board

This describes the Universal E1/T1 Lightning Protection Unit (UELP) board. It is an optional board which is installed in the SLPU or the BBU. The UELP provides lightning protection for four E1/T1 signals.

Panel

Figure 4-4 shows the UELP panel.

Figure 4-4 Panel of the UELP

Port

Table 4-12 lists the port on the UELP panel.

Table 4-12 Ports on the UELP

Silkscreen	Connector	Quantity	Connector
INSIDE	DB25	1	DB25 connector
OUTSIDE	DB26	1	DB26 connector

DIP Switch

The DIP switch on the UELP defines the grounding status of the RX end. The DIP switch has four DIP bits. **Figure 4-5** shows the DIP switch on the UELP.

Figure 4-5 DIP switch on the UELP

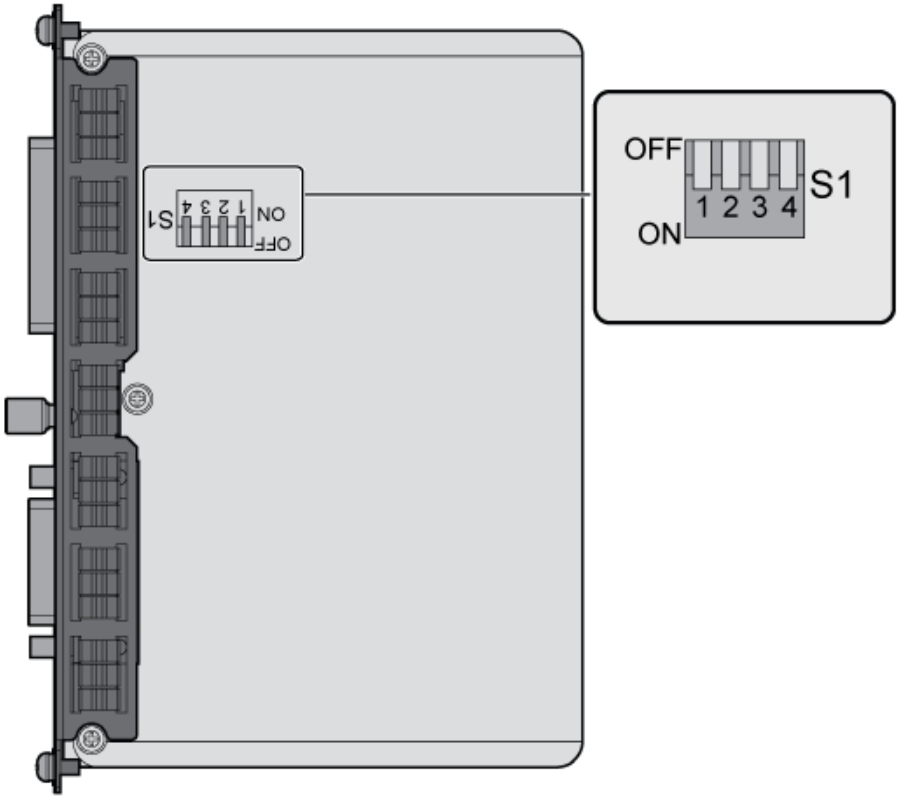


Table 4-13 describes the DIP switch on the UELP.

Table 4-13 DIP switch on the UELP

DIP Switch	Setting of DIP Bit				Description
	1	2	3	4	
S1	ON	ON	ON	ON	Applied to 75-ohm E1 cables in unbalanced mode

DIP Switch	Setting of DIP Bit				Description
	1	2	3	4	
	OFF	OFF	OFF	OFF	Applied to other cases instead of 75-ohm E1 cables in unbalanced mode

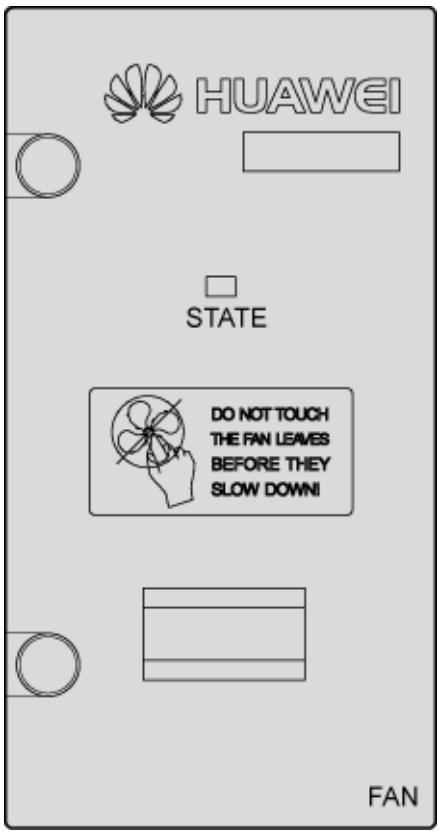
UBFA Module

This describes the Universal BBU Fan Unit Type A (UBFA) module. It is a mandatory module of the BBU3900 that controls the fan speed and detects the temperature of the fan board.

Panel

Figure 4-6 shows the UBFA panel.

Figure 4-6 Panel of the UBFA



Function

The UBFA performs the following functions:

- Controlling the fan speed
- Reporting the fan status to the main control board
- Detecting the temperature at the air inlets

LED

The UBFA has only one LED, indicating the running status of the module. **Table 4-14** describes the LED and its status.

Table 4-14 LED on the UBFA

Label	Color	Status	Description
STATE	Green	0.125s ON, 0.125s OFF	The module is not registered, and no alarm is reported.
		1s ON, 1s OFF	The module is running properly.
	Red	ON	The module is reporting an alarm.

UPEU Board

This describes the Universal Power and Environment Interface Unit (UPEU) board. It converts -48 V or +24 V DC to +12 V DC.

Panel

The UPEU is classified into the UPEA and the UPEB. The UPEA converts -48 V DC to +12 V DC and the UPEB converts +24 V DC to +12 V DC. **Figure 4-7** shows the UPEA panel and **Figure 4-8** shows the UPEB panel.

Figure 4-7 Panel of the UPEA

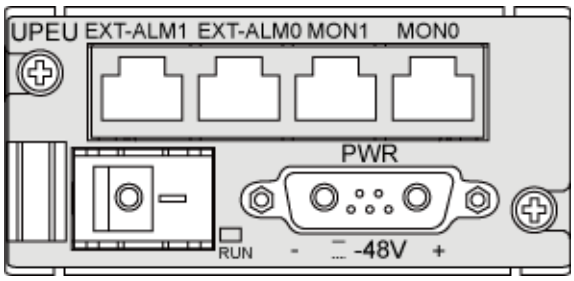
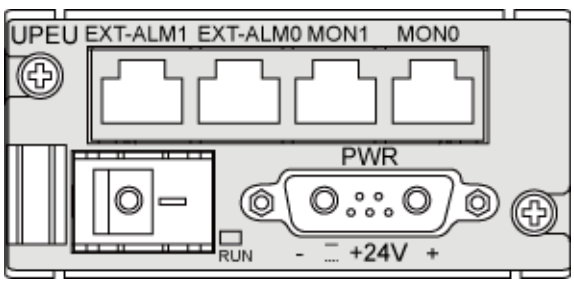


Figure 4-8 Panel of the UPEB



Function

The UPEU performs the following functions:

- Converting -48 V or +24 V DC to +12 V DC that is applicable to the boards
- Providing two RS485 signals and eight dry contact alarms
- Providing reverse connection protection for power cable connectors.

LED

The UPEU has only one LED, indicating the running status of the board. **Table 4-15** describes the LED and its status.

Table 4-15 LED on the UPEU

Label	Color	Status	Description
RUN	Green	ON	The board is running properly.
		OFF	The board has no power input, or the board is faulty.

Port

Table 4-16 describes the ports on the UPEU.

Table 4-16 Ports on the UPEU

Label	Connector	Description
PWR	3V3	+24 V/-48 V DC power input
EXT-ALM1	RJ45	Transmitting eight dry contact alarms
EXT-ALM0	RJ45	
MON1	RJ45	Transmitting two RS485 environment monitoring signals
MON0	RJ45	

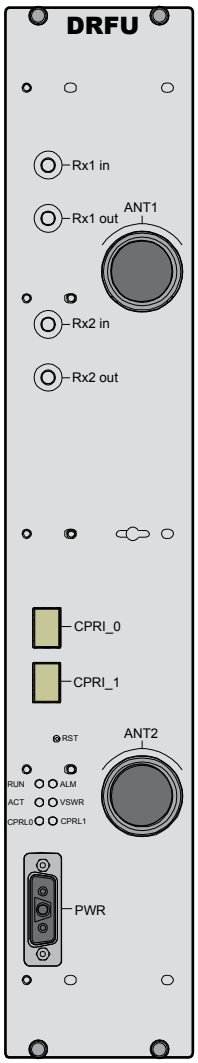
4.3 DRFU

One double radio filter unit (DRFU) provides two TRXs.

Panel

Figure 4-9 shows the DRFU panel.

Figure 4-9 DRFU panel



Function

The DRFU handles modulation and demodulation between baseband signals and RF signals, data processing, and combining-distribution.

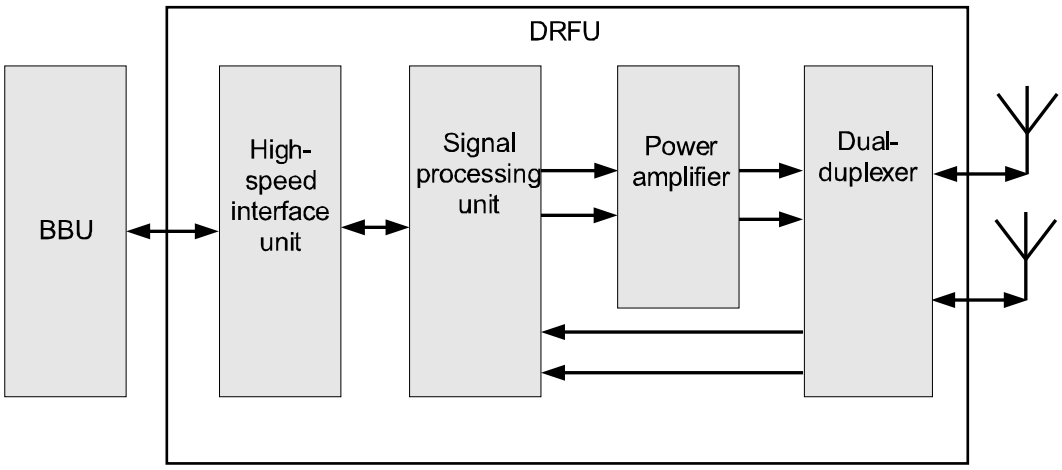
The DRFU performs the following functions:

- It modulates baseband signals to GSM RF signals by using direct frequency conversion in the transmit channel. After amplifying or combining the RF signals, the DRFU sends the signals to the antenna for transmission.
- It receives RF signals from the antenna and down-converts the RF signals to IF signals. After amplifying, analog-to-digital converting, digital down-converting, matched filtering, and performing Automatic Gain Control (AGC), the DRFU sends the signals to the BBU for further processing.
- It performs power control and standing wave detection.
- It performs reverse power detection.
- It supports frequency synthesis and loop testing.

- It generates the CPRI clock, recovers the CPRI clock of lost synchronization, and detects alarms.

The DRFU consists of the following components: high-speed interface unit, signal processing unit, power amplifier, and dual-duplexer. **Figure 4-10** shows the functional structure of the DRFU.

Figure 4-10 Functional structure of the DRFU



- The functions of the high-speed interface unit are as follows:
  - Adapting the signals from the BBU for the signal processing unit
  - Adapting the signals from the signal processing unit for the BBU

The signal processing unit consists of two uplink RX channels and two downlink TX channels.

- The functions of the uplink RX channels are as follows:
  - Down-converting the RF signals to IF signals
  - Amplifying the IF signals and performing IQ demodulation
  - Performing analog-to-digital conversion
  - Sampling digital signals
  - Performing matched filtering
  - Performing Digital Automatic Gain Control (DAGC)
  - Encapsulating data
- The functions of the downlink TX channels are as follows:
  - Decapsulating the clock signals, control signals, and data signals from the BBU and sending them to associated units
  - Shaping and filtering downlink signals
  - Performing digital-to-analog conversion through the DAC and performing IQ modulation
  - Performing up-conversion of RF signals to the transmit band

The power amplifier amplifies the low-power RF signals from the signal processing unit.

- The functions of the dual-duplexer are as follows:

- Multiplexing the RX signals and TX signals
- Combining the RX signals and TX signals so that they share the same antenna channel
- Filtering the received signals and the transmitted signals

LED

The six LEDs on the DRFU panel indicate the operating status of the DRFU. **Table 4-17** describes the LEDs on the DRFU panel.

Table 4-17 LEDs on the DRFU panel

LED	Color	Status	Description
RUN	Green	On	The power input is normal, but the BBU is faulty.
		Off	No power input is available, or the module is faulty.
		On for 1s and off for 1s	The module is functional.
		On for 0.2s and off for 0.2s	The module is loading data.
ALM	Red	On for 1s and off for 1s	A fault alarm is generated.
		Off	No alarm is generated.
ACT	Green	On	The module is functional and is correctly connected to the BBU.
		Off	The connection with the BBU is not established.
VSWR	Red	Off	No VSWR alarm is detected.
		On for 1s and off for 1s	The VSWR alarm is generated only on the ANT2 port.
		On for 0.125s and off for 0.125s	The VSWR alarms are generated on the ANT1 and ANT2 ports.
		On	The VSWR alarm is generated only on the ANT1 port.
CPRI0	Red and green	On (green)	The CPRI link is functional.
		On (red)	The interface module fails to receive signals.
		On for 1s and off for 1s (red)	The CPRI link has a loss-of-lock error.
CPRI1	Red and green	On (green)	The CPRI link is functional.
		On (red)	The interface module fails to receive signals.

LED	Color	Status	Description
		On for 1s and off for 1s (red)	The CPRI link has a loss-of-lock error.

Port

Nine ports are available on the DRFU. two ports for transceiving RF signals, two CPRI ports, four ports for transmitting RX signals between DRFUs, and one power port. **Table 4-18** describes the ports on the DRFU panel.

Table 4-18 Ports on the DRFU panel

Connector	Connector	Port	Description
Port for transceiving RF signals	DIN female connector	ANT1	Used to connected to the antenna system
		ANT2	
CPRI port	SFP female connector	CPRI0	Connects to the lower-level cascaded DRFU
		CPRI1	Connects to the BBU, or upper-level cascaded DRFU
Port for transmitting RX signals between DRFUs	QMA female connector	RX1 in	Input port for diversity signals in antenna channel 1
		RX1 out	Output port of diversity signals in antenna channel 1
		RX2 in	Input port for diversity signals in antenna channel 2
		RX2 out	Output port of diversity signals in antenna channel 2
Power port	3V3 power connector	PWR	Used for power input

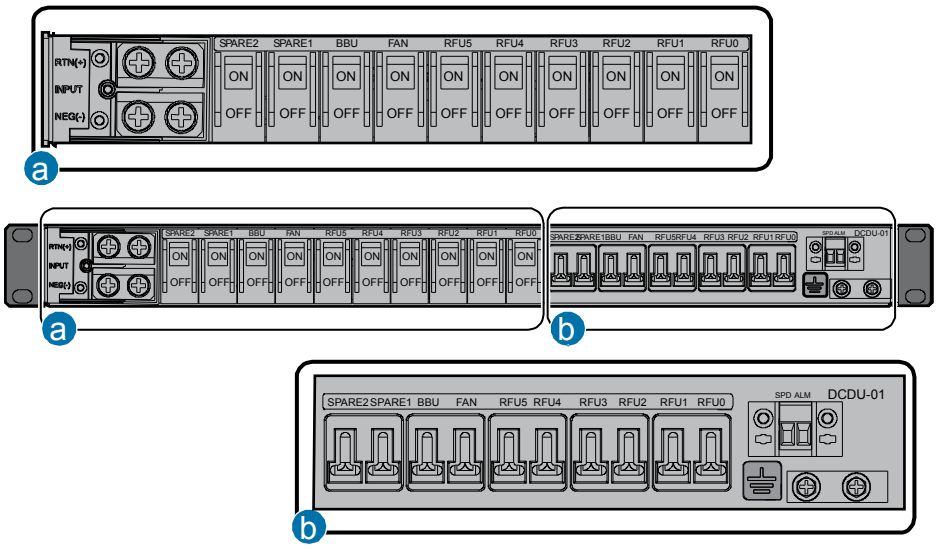
4.4 DCDU-01

The direction current distribution unit (DCDU-01) provides ten -48 V DC power outputs.

Panel

Figure 4-11 shows the DCDU-01.

Figure 4-11 Appearance of the DCDU-01



Function

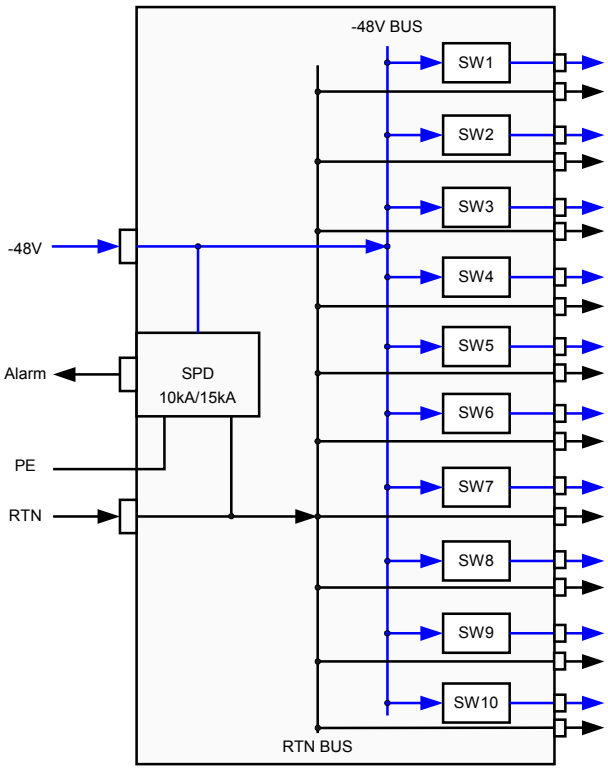
The DCDU-01 has the following functions:

- Receiving -48 V DC input
- Providing ten -48 V DC outputs for other boards and modules in the cabinet
- Providing surge protection of 10 kA in differential mode and 15 kA in common mode, and providing dry contact for surge protection failure

Principles

The DCDU-01 receives one external -48 V DC input and provides ten -48 V DC outputs. In addition, the built-in surge protection unit provides surge protection of 10 kA in differential mode and 15 kA in common mode. **Figure 4-12** shows the working principles of the DCDU-01.

Figure 4-12 Working principles of the DCDU-01



Port

Table 4-19 describes the ports on the DCDU-01 panel.

Table 4-19 Ports on the DCDU-01 panel

Name	Label	Description
Power input terminal	NEG(-)	DCDU-01 low level input terminal
	RTN(+)	DCDU-01 high level input terminal
Power output port	SPARE2, SPARE1, BBU, FAN, and RFU5-RFU0	Supplying the 10 outputs of power to components such as the BBU, DRFU, GATM, and FAN unit
Power switch	SPARE2, SPARE1, BBU, FAN, and RFU5-RFU0	Switches of the ten outputs, controlling power on/off of the BBU, DRFU, GATM, and FAN unit
Alarm output port	SPD ALM	Dry contact alarm output port

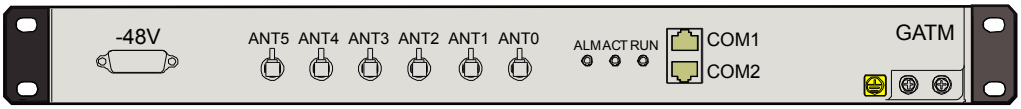
4.5 GATM

The GSM antenna and TMA control module (GATM) is a module that controls the antenna and TMA. The GATM is optional.

Panel

Figure 4-13 shows the GATM panel.

Figure 4-13 GATM panel



Function

The GATM has the following functions:

- Controlling the RET antenna
- Supplying power to the TMA
- Reporting the RET control alarm signals
- Monitoring the current from the feeder

LED

The three LEDs on the DATM panel indicate the operating status of the GATM. Table 4-20 describes the LEDs on the GATM panel.

Table 4-20 LEDs on the GATM panel

LED	Color	Function	Status	Description
RUN	Green	Indicator of the board running status	On for 2s and off for 2s	The power supply is normal but the communication with the BBU is abnormal.
			On for 1s and off for 1s	The board is running normally and the communication with the BBU is normal.
			Off	No power input is available, or the module is faulty.
ACT	Green	Indicator of the service running status	On	The AISG link is normal.
			Off	The AISG link is abnormal.
			Blinking frequently and irregularly	The AISG link is transmitting data.
ALM	Red	Alarm indicator	On	An alarm is generated, such as an overcurrent alarm.
			Off	The module runs normally.

Port

Eight ports are available on the GATM: three ports lead power to the TMA, three ports lead power to the TMA and transmit the RET control signals, one port connects the GATM to the BBU, and one port is used as an extended RS485 port. **Table 4-21** describes the ports on the GATM.

Table 4-21 Ports on the GATM

Port	Connector	Function
ANT0	SMA female connector	Providing power for the RET antenna and transmitting control signals for the RET antenna
ANT1	SMA female connector	Providing power for the antenna
ANT2	SMA female connector	Providing power for the RET antenna and transmitting control signals for the RET antenna
ANT3	SMA female connector	Providing power for the antenna
ANT4	SMA female connector	Providing power for the RET antenna and transmitting control signals for the RET antenna
ANT5	SMA female connector	Providing power for the antenna
COM1	RJ45 connector	Connecting to the BBU
COM2	RJ45 connector	Providing the extended RS485 port to be cascaded with other devices
-48 V	3V3 power connector	Receiving the -48 V power input

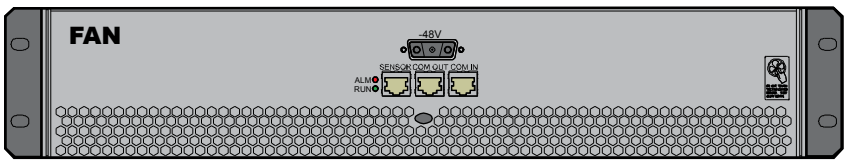
4.6 FAN Unit

The FAN unit, also called the fan module, is used to dissipate the heat in the cabinet. One FAN unit has four fans.

Panel

Figure 4-14 shows the panel of the FAN unit.

Figure 4-14 Panel of the FAN unit



Function

The FAN unit has the following functions:

- Providing forced ventilation and dissipation for the cabinet
- Detecting the temperature

The FAN unit has the following capabilities:

- Supporting two modes of adjusting the rotation speed of the fans, such as adjustment based on the temperature and adjustment controlled by the central processing unit
- Controlling the fan rotation, and stopping the rotation of the fans when the ambient temperature is low

LED

Table 4-22 describes the LEDs on the panel of the FAN unit.

Table 4-22 LEDs on the panel of the FAN unit

LED	Color	Status	Description
RUN	Green	On for 0.125s and off for 0.125s	The communication between the module and the BBU is not established but the module runs normally.
		On for 1s and off for 1s	The communication between the module and the BBU is established and the module runs normally.
		Off	No power input is available, or the module is faulty.
ALM	Red	On for 1s and off for 1s	An alarm is generated.
		Off	No alarm is generated.

Port

Table 4-23 describes the ports on the panel of the FAN unit.

Table 4-23 Ports on the panel of the FAN unit

Connector	Silkscreen	Connector	Description
Power port	**-48 V**	3V3 power connector	Used for receiving the -48 V DC power
Temperature sensor port	**SENSOR**	RJ45 connector	Connects the external temperature sensor

Connector	Silkscreen	Connector	Description
Communication port	**COM OUT**	RJ45 connector	Connects the lower-level cascaded FAN unit
	COM IN	RJ45 connector	Used for communication with the upper-level board or module

4.7 EMU

Environment Monitoring Unit (EMU) is an environmental monitoring device that monitors environmental conditions of the equipment room.

EMU connects to main equipment and performs monitoring functions through the alarm cables. The EMU has the following functions:

- Providing monitoring ports. The EMU provides monitoring ports for the temperature, humidity, water, infrared, and door control sensors. Additionally, it provides monitoring ports for Boolean value, analog, and output control.
- Providing communication ports. The EMU provides two kinds of communication ports, RS485 and RS232, for communication with the BTS.

For details on the structure of the EMU, see *EMU User Guide*.

4.8 Power Subrack (AC/DC)

The power subrack (AC/DC) receives the external 220 V AC power. In the power subrack, the PSU (AC/DC) converts the 220 V AC power into the -48 V DC power and then outputs the -48 V DC power.

This describes the power and environment monitoring unit (PMU). The PMU manages the power supply and batteries. It also collects, processes, and reports environment variables and alarms. The PMU is the core of the power monitoring system.

The power supply unit (PSU) converts the 220 V AC into the -48 V DC that is led to the direct current distribution unit.

The wiring unit of the power subrack in the 220 V cabinet receives the external 220 V AC power. After the PSU (AC/DC) converts the 220 V AC power to -48 V DC power, the wiring unit leads the DC power to the DCDU-01 through the power cable.

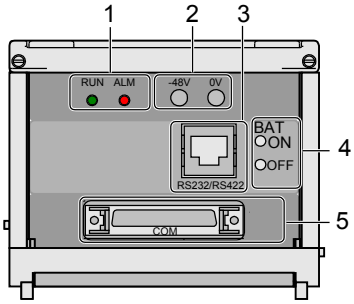
4.8.1 PMU

This describes the power and environment monitoring unit (PMU). The PMU manages the power supply and batteries. It also collects, processes, and reports environment variables and alarms. The PMU is the core of the power monitoring system.

Panel

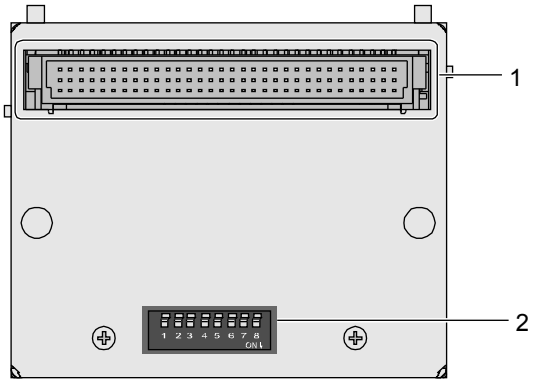
Figure 4-15 shows the ports on the front panel of the PMU. Figure 4-16 shows the ports on the rear panel of the PMU.

Figure 4-15 Ports on the front panel of the PMU



(1) LEDs
(2) Power supply test ports
(3) RS232/RS422 ports
(4) Battery control switch
(5) COM port
-

Figure 4-16 Ports on the rear panel of the PMU



(1) Backplane port
(2) DIP switch

Function

The PMU has the following functions:

- Communicating with the central processing unit through the RS232/RS422 serial port
- Managing the power system and the charging and discharging of the batteries
- Detecting and reporting alarms involved water immersion, smoke, door status, and standby Boolean value, and also reporting ambient humidity and temperature, battery temperature, and standby analog values
- Detecting power distribution and reports related alarms, and also reports dry contact alarms

Port

Table 4-24 describes the ports on the PMU.

CAUTION

- Do not operate the battery control switch on the front panel of the PMU unless necessary. Maloperation of the battery control switch may affect the ongoing services.
- To operate the battery control switch on the front panel of the PMU, put a small pole into the hole.
- When you hear a crack, you can infer that the battery is switched off or switched on.

Table 4-24 Ports on the PMU

Port	Function
RS232/RS422 port	Used to communicate with the central processing unit.
Battery control switch	The battery switch has two control ports **ON** and **OFF**, which are used for switching on and switching off the battery. ● Press and hold the port **ON** for 5-10 seconds to switch on the battery. ● Press and hold the port **OFF** for 5-10 seconds to switch off the battery.
Power supply test port	Two power supply test holes **-48V** and **0V** are available for measurement through an ordinary multimeter.
COM port	Used to connect to the external signal transfer board.
Backplane port	Used to connect to the backplane.

NOTE

The PMU supports only the –48 V system.

LED

The PMU has two LEDs that indicate the running status of the PMU. **Table 4-25** describes the LEDs on the PMU.

Table 4-25 LEDs on the PMU

LED	Color	Status	Description
RUN	Green	On for 1s and off for 1s	The module is functional, and the communication with the central processing unit is normal.
		On for 0.125s and off for 0.125s	The module is functional, but the communication with the central processing unit fails.

LED	Color	Status	Description
		On steady or off steady	The module is faulty if it is not in the power-on self-check state.
ALM	Red	On	The following alarms are generated: ● Mains overvoltage or undervoltage alarm ● Busbar overvoltage or undervoltage alarm ● Overcurrent alarm during charging ● Battery power-off alarm ● Battery circle circuit broken alarm ● Ambient temperature alarm ● Ambient humidity alarm ● Water immersion alarm ● Smoke alarm ● Power module alarm ● Load power-off alarm
		Off	No alarm is generated.

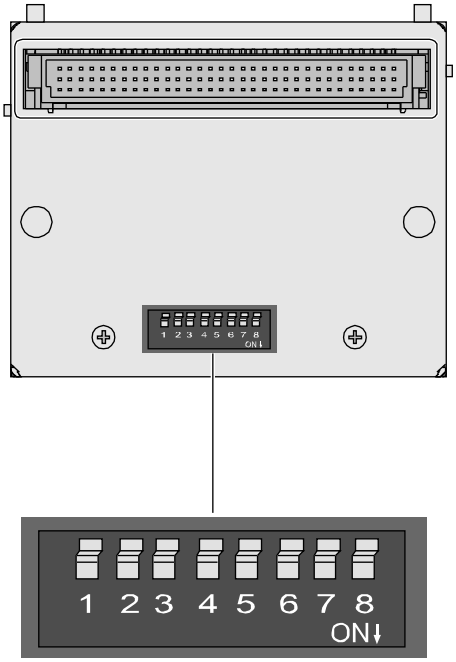
NOTE

- If the PMU does not communicate with the central processing unit for one minute, the **RUN** LED blinks four times every second, indicating that the communication fails.
- After the module is powered on for three to five seconds, the **ALM** and the **RUN** LEDs blink for about 3 seconds at the same time.

DIP Switch

Figure 4-17 shows the DIP switch on the PMU.

Figure 4-17 DIP switch on the PMU



The four least significant bits (1, 2, 3, and 4) of the DIP switch define the secondary node address of the PMU. The four most significant bits (5, 6, 7, and 8) are not defined, and they are reserved for future use.

The communication using the primary/secondary node protocol succeeds only when the secondary node address (monitoring address) of the PMU is consistent with the address defined in the protocol.

You can set the monitoring address by setting the four least significant bits of the DIP switch. The first bit through the fourth bit corresponds to bits 0-3 respectively.

NOTE

- The monitoring address of the PMU can be set to 3 (0011) or 4 (0100). The value 3 is recommended.
- The setting **ON** represents the binary 1, and the setting **OFF** represents the binary 0.

Table 4-26 lists the settings of the DIP switch.

Table 4-26 Settings of the DIP switch

Bit 3	Bit 2	Bit 1	Bit 0	Monitoring Address
0	0	0	0	0000
0	0	0	1	0001
0	0	1	0	0010
0	0	1	1	0011
0	1	0	0	0100

Bit 3	Bit 2	Bit 1	Bit 0	Monitoring Address
0	1	0	1	0101
0	1	1	0	0110
0	1	1	1	0111
1	0	0	0	1000
1	0	0	1	1001
1	0	1	0	1010
1	0	1	1	1011
1	1	0	0	1100
1	1	0	1	1101
1	1	1	0	1110
1	1	1	1	1111

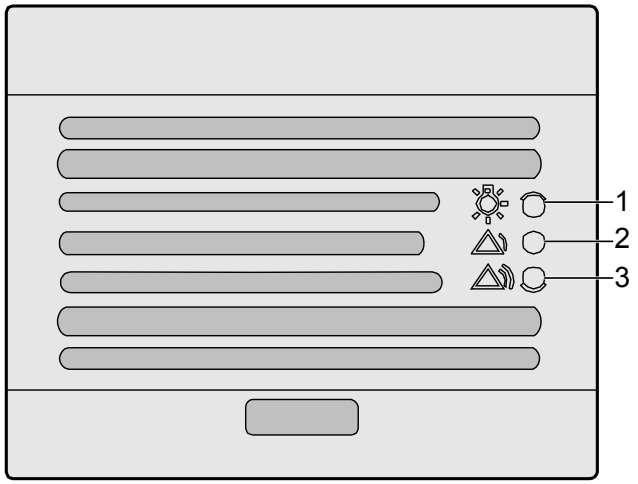
4.8.2 PSU (AC/DC)

The power supply unit (PSU) converts the 220 V AC into the -48 V DC that is led to the direct current distribution unit.

Panel

Figure 4-18 shows the PSU (AC/DC) panel.

Figure 4-18 Panel



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

Function

The PSU (AC/DC) has the following functions:

- Converting the 220 V AC into the -48 V DC
- Monitoring module fault (overvoltage output, no output, and fan fault) alarms, module protection (overtemperature protection, and overvoltage and undervoltage protection) alarms, and AC power failure alarms
- Monitoring the charging and discharging of the batteries

LED

Table 4-27 describes the LEDs on the PSU (AC/DC) panel.

Table 4-27 Meaning

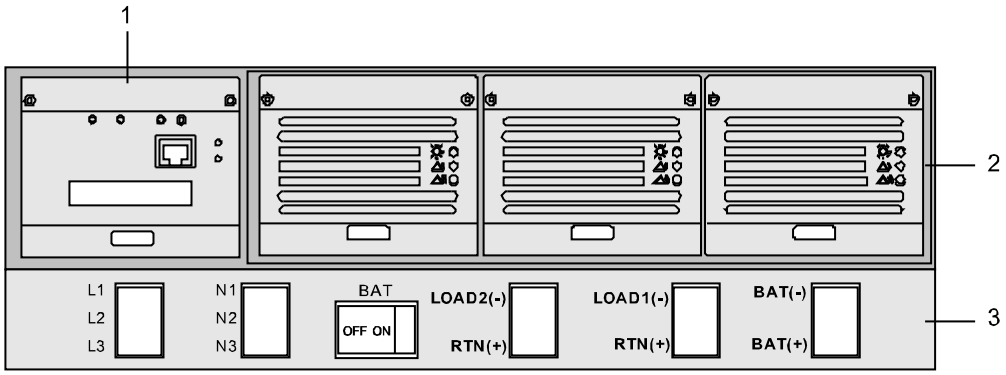
LED	Color	Status	Description
Power input indicator	Green	On	Normal.
		Off	No AC power input is available, or the fuse for power input is damaged.
Protection indicator	Yellow	Off	Normal.
		On	Power protection for the PSU is triggered, for example, upon input undervoltage/ overvoltage or overtemperature.
Fault indicator	Red	Off	Normal.
		On	Irrecoverable fault, such as output overvoltage, no outputs, or fan fault occurs inside the PSU.

4.8.3 Wiring Unit of the Power Subrack (220 V)

The wiring unit of the power subrack in the 220 V cabinet receives the external 220 V AC power. After the PSU (AC/DC) converts the 220 V AC power to -48 V DC power, the wiring unit leads the DC power to the DCDU-01 through the power cable.

Figure 4-19 shows the power subrack (AC/DC).

Figure 4-19 Power subrack (AC/DC)



(1) PMU (2) PSU (AC/DC) (3) Wiring unit

The operating mechanism of the power subrack (AC/DC) is as follows:

- The wiring unit receives the external power supply through the L and N wiring terminals, and leads the power to the PSUs (AC/DC) through the backplane.
- The PSUs (AC/DC) convert the input AC power into the -48 V DC power.
- The PMU monitors the operating status of the PSU (AC/DC).
- The wiring unit outputs the -48 V DC power through the terminals: **LOAD1(-)**, **LOAD2(-)**, and **RTN(+)**.

4.9 Power Subrack (DC/DC)

The power subrack (DC/DC) receives the external +24 V DC power. In the power subrack, the PSU (DC/DC) converts the +24 V DC power into the -48 V DC power and then leads the -48 V DC power to the DCDU-01 through the power cable from the wiring unit.

The power supply unit (PSU) converts the +24 V DC into the -48 V DC that is led into the direct current distribution unit.

The wiring unit of the power subrack in the +24 V cabinet receives the external +24 V DC power. After the PSU (DC/DC) converts the +24 V DC power to -48 V DC power, the wiring unit leads the DC power to the DCDU-01 through the power cable.

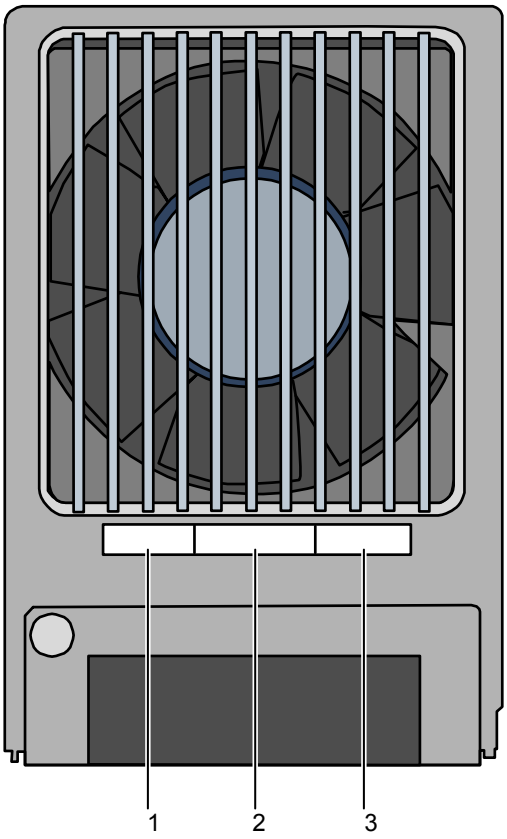
4.9.1 PSU (DC/DC)

The power supply unit (PSU) converts the +24 V DC into the -48 V DC that is led into the direct current distribution unit.

Panel

Figure 4-20 shows the panel of the PSU (DC/DC).

Figure 4-20 Panel



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

Function

The PSU (DC/DC) has the following functions:

- Converting the +24 V DC into the -48 V DC
- Monitoring module fault (overvoltage output, no output, and fan fault) alarms, module protection (overtemperature protection, and overvoltage and undervoltage protection) alarms, and AC power failure alarms

LED

Table 4-28 describes the LEDs on the panel of the PSU (DC/DC).

Table 4-28 LEDs

LED	Color	Status	Description
Power input indicator	Green	On	Normal.
		Off	No power input is available, or the fuse for power input is damaged.
Protection indicator	Yellow	Off	Normal.

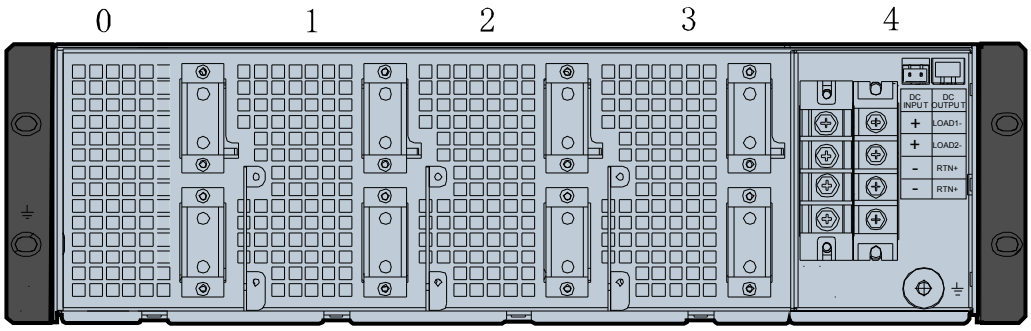
LED	Color	Status	Description
		On	The input or output voltage is abnormal, or the rectifier is overheated or loosely connected.
Fault indicator	Red	Off	Normal.
		Blinking	Irrecoverable fault, such as output overvoltage, no outputs, or fan fault occurs inside the PSU.

4.9.2 Wiring Unit of the Power Subrack (+24 V)

The wiring unit of the power subrack in the +24 V cabinet receives the external +24 V DC power. After the PSU (DC/DC) converts the +24 V DC power to -48 V DC power, the wiring unit leads the DC power to the DCDU-01 through the power cable.

Figure 4-21 shows the power subrack (DC/DC). The positions marked 0, 1, 2, and 3 are used for housing the PSUs (DC/DC) and the position marked 4 is the wiring unit.

Figure 4-21 Power subrack (DC/DC)



The operating mechanism of the power subrack (DC/DC) is as follows:

- The wiring unit receives two external +24 V DC inputs through the wiring terminals marked + and - and leads the +24 V DC power inputs to the PSUs (DC/DC) through the backplane.
- The PSUs (DC/DC) convert the +24 V DC power into the -48 V DC power.
- The wiring unit outputs the -48 V DC power to the DCDU-01 through the terminals: **LOAD1-**, **LOAD2-**, and **RTN+**.

5 BTS3900 Cables

About This Chapter

The BTS3900 cables consist of the power cables, signal cables, transmission cables, and RF cables.

5.1 List of the BTS3900 Cables

The BTS3900 cables include power cables, PGND cables, transmission cables, signal cables, and RF cables.

Table 5-1 lists the BTS3900 cables.

Table 5-1 Cable list

Item	Sub-Item	Factory Settings	Installation Position
Power cable	**BTS3900 -48 V Input Power Cable**	Both ends of the cable should be connected on site.	One end is connected to the external power supply device. The other end is connected to the **NEG(-)** and **RTN(+)** terminals on the power input terminal block on the DCDU-01.
	BTS3900 +24 V Input Power Cable		One end is connected to the external power supply device. The other end is connected to the + and - terminals of the wiring unit on the PSU (DC/DC).
	BTS3900 220 V Input Power Cable		One end is connected to the external power supply device. The other end is connected to the L and N wiring posts of the wiring unit on the PSU (AC/DC).
	Power Cable Between the DCDU and the DRFU	Before delivery, the cable is routed and one end is connected to the DCDU-01. The other end of the cable should be connected on site.	One end is connected to the **RFU** socket on the DCDU-01 panel. The other end is connected to the **PWR** port on the DRFU panel.
	Power Cable Between the DCDU and the GATM		One end is connected to the **SPARE1** socket on the DCDU-01 panel. The other end is connected to the **-48V** port on the GATM panel.
	Power Cable Between the DCDU and the FAN Unit		One end is connected to the **FAN** socket on the DCDU-01 panel. The other end is connected to the **-48V** port on the FAN unit.
	Power Cable Between the DCDU and the BBU		One end is connected to the **BBU** socket on the DCDU-01 panel. The other end is connected to the **PWR** port on the UPEU panel in the BBU.

Item	Sub-Item	Factory Settings	Installation Position
	Power Cable Between the PSU (AC/DC) and the DCDU	Both ends of the cable should be connected on site.	One end is connected to the **NEG(-)** and **RTN (+)** terminals on the DCDU-01 panel. The other end is connected to the **LOAD1(-)** and **RTN(+)** terminals of the wiring unit on the PSU (AC/DC).
	Power Cable Between the PSU (DC/DC) and the DCDU		One end is connected to the **NEG(-)** and **RTN (+)** terminals on the DCDU-01 panel. The other end is connected to the **Load** and **RTN** terminals of the wiring unit on the PSU (DC/DC).
PGND cable	**BTS3900 PGND Cable**		For the cabinet PGND cable, one end of the cable is connected to the PGND terminal inside the cabinet while the other end is connected to the external grounding bar. For the PGND cable for the components inside the cabinet, one end of the cable is connected to the PGND terminal of the component while the other end is connected to the PGND terminal inside the cabinet.
Equipotential cable	**BTS3900 Equipotential Cable**		One end is connected to the PGND terminal on the upper left corner of the lower cabinet. The other end is connected to the PGND terminal on the lower left corner of the upper cabinet.
Transmission cable	**E1 Cable**		One end is connected to the **OUTSIDE** port on the UELP or the **E1/T1** port on the GTMU. The other end is connected to the corresponding auxiliary equipment.
	E1 Surge Protection Transfer Cable		One end is connected to the **INSIDE** port on the UELP. The other end is connected to the **E1/T1** port on the GTMU.
	CPRI Cable		One end is connected to one of the ports **CPRI0** to **CPRI5** on the GTMU in the BBU. The other end is connected to the **CPRI1** port on the DRFU.
	Signal Cable Between the Cascaded DRFUs		One end is connected to the **CPRI0** port on the panel of the upper-level DRFU. The other end is connected to the **CPRI1** port on panel of the lower-level DRFU.

Item	Sub-Item	Factory Settings	Installation Position
Signal cable	**Monitoring Signal Cables for the DCDU-01**		One end is connected to the **EXT-ALM0** port on the UPEU in the BBU. The other end is connected to the following positions under different circumstances: ● As for a single cabinet, pins 1 and 2 are connected to the **SPD ALM** port on the panel of the DCDU-01. ● As for the +24 V cabinet, pins 3 and 6 are connected to the wiring unit of the PSU (DC/DC). ● As for two stacked cabinet, pins 7 and 8 are connected to the **SPD ALM** port on the DCDU-01 of the upper cabinet.
	In-Position Signal Cable for the PSU (DC/DC)		One end is connected to the **EXT-ALM1** port on the UPEU in the BBU. The other end is connected to the RJ45 port on the wiring unit of the power subrack in the +24 V cabinet.
	Monitoring Signal Cable for the PMU		One end is connected to the MON port on the UEIU or UPEU in the BBU. The other end is connected to the following positions under different circumstances: ● The end is cut and the exposed wires are connected to the interconnection terminal ● The end is connected to the **COM2** port on the GATM1 ● The end is connected to the **MON1** port on the UPEU
	Monitoring Signal Cable for the EMU		The RJ45 connector is connected to either of the following positions: the **MON1** port on the UEIU or UPEU, the **COM2** port on the GATM1, or the interconnection terminal after the end is cut and the wires are exposed. The DB9 connector is connected to the **RS485** connector on the EMU.
	Monitoring Signal Cable for the GATM		One end is connected to the **MON1** port on the UPEU or the **COM OUT** port on the FAN unit. The other end is connected to the **COM1** port on the GATM panel.

Item	Sub-Item	Factory Settings	Installation Position
	BBU Alarm Cable		One end is connected to the EXT-ALM port on the UEIU or on the UPEU. The other end is connected to the corresponding external device.
	RET Control Signal Cable		One end is connected to the SMA port on the Bias-Tee. The other end is connected to the ANT port on the GATM panel.
	Monitoring Signal Cable for the FAN Unit		One end is connected to the **COM IN** port on the panel of the FAN unit. The other end is connected to the MON port on the UEIU or UPEU in the BBU.
	Signal Cable Between the Cascaded FAN Units		One end is connected to the **COM OUT** port on the panel of the upper-level FAN unit. The other end is connected to the **COM IN** port on the panel of the lower-level FAN unit.
RF cable	**RF Jumper**		One end (DIN elbow male connector) is connected to the ANT port on the DRFU panel. The other end (DIN straight male connector) is connected to the feeder of the antenna subsystem.
	Inter-DRFU RF Signal Cable		One end is connected to the RX OUT port on one DRFU panel. The other end is connected to the RX IN port on the other DRFU panel.

5.2 BTS3900 Power Cables and PGND Cables

The BTS3900 power cables are classified into the external input power cable, internal power cable, PGND cable, and equipotential cable.

- The PGND cable ensures that the cabinet is grounded properly.
- The equipotential cables ensure that the potential of all the cabinets is the same.
- The external input power cables has three types: -48 V DC power cable, +24 V DC power cable, and 220 V AC power cable. These cables, different in color, lead the external power into the cabinet.
- The internal power cable leads the -48 V DC from the DCDU-01 to each board or module in the cabinet. The +24 V cabinet also has the power cable between the PSU (DC/DC) and the DCDU, which leads the -48 V DC from the PSU (DC/DC) to the DCDU-01. The 220 V cabinet also has the power cable between the PSU (AC/DC) and the DCDU, which leads the -48 V DC from the PSU (AC/DC) to the DCDU-01.

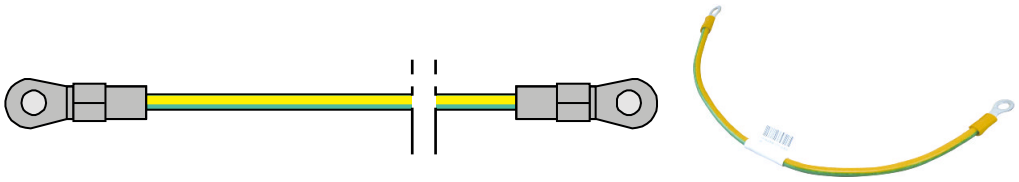
5.2.1 BTS3900 PGND Cable

The BTS3900 PGND cables are classified into the cabinet PGND cable and internal PGND cable. The internal PGND cables are the PGND cable for the DCDU-01, PGND cable for the GATM, and PGND cable for the front door. The internal PGND cables are used to keep equipotentiality between the components in the cabinet and the cabinet. In this way, the components can be properly grounded with the help of the cabinet PGND cable.

Appearance

The BTS3900 PGND cables are yellow and green. Both ends of each cable are OT terminals. The cabinet PGND cable has a cross-sectional area of 25 mm^2 while the internal PGND cable has a cross-sectional area of 6 mm^2. The PGND cables have the same structure, as shown in **Figure 5-1**.

Figure 5-1 PGND cable



Installation Position

Table 5-2 describes the installation positions of the cabinet PGND cable.

Table 5-2 Installation positions of the cabinet PGND cable

One End	The Other End
Connected to the PGND terminal in the cabinet	Connected to the grounding bar outside the cabinet

Table 5-3 describes the installation positions of the internal PGND cables.

Table 5-3 Installation positions of the internal PGND cables

Cable Name	One End	The Other End
PGND cable for the DCDU-01	Connected to the PGND terminal on the right of the DCDU-01 panel	Connected to the PGND terminal on the right side of the cabinet
PGND cable for the GATM	Connected to the PGND terminal on the right of the GATM panel	Connected to the PGND terminal on the right side of the cabinet
PGND cable for the front door	Connected to the PGND terminal on the front door of the cabinet	Connected to the PGND terminal inside the cabinet

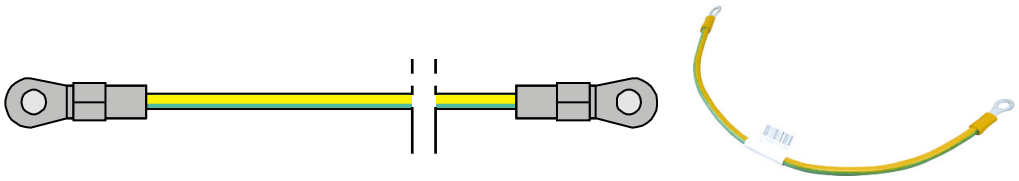
5.2.2 BTS3900 Equipotential Cable

The BTS3900 equipotential cable is used to connect the PGND terminals of any two cabinets, so that all the cabinets are equipotential and the BTS runs safely. When two cabinets are stacked, the equipotential cable is required to connect the two cabinets.

Appearance

The equipotential cable is a yellow and green cable with a cross-sectional area of 16 mm^2. Both ends of the equipotential cable are OT terminals. **Figure 5-2** shows the equipotential cable.

Figure 5-2 Equipotential cable



Installation Position

Table 5-4 shows the installation positions of the equipotential cable.

Table 5-4 Installation positions of the equipotential cable

Name	One End	The Other End
Equipotential cable	Connected to the PGND terminal on the upper left corner of the lower cabinet	Connected to the PGND terminal on the lower left corner of the upper cabinet

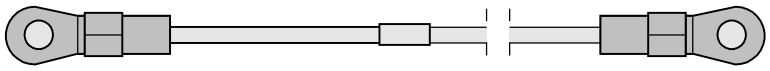
5.2.3 BTS3900 -48 V Input Power Cable

The BTS3900 -48 V input power cable receives the external -48 V DC power supply. This cable is required for the BTS3900 -48 V cabinet.

Appearance

The -48 V input power cable comprises a blue wire and a black wire, each having a cross-sectional area of 16 mm^2. The two wires should be made on site. The two wires are similar in structure, and both ends of each cable are OT terminals, as shown in **Figure 5-3**.

Figure 5-3 -48 V input power cable



Installation Position

Table 5-5 describes the installation positions of the -48 V input power cable.

Table 5-5 Installation positions of the -48 V input power cable

Name	One End	The Other End
-48 V DC wire (blue)	Connected to the relevant wiring terminal on an external DC power distribution device	Connected to the **NEG(-)** terminal on the DCDU-01 power input terminal block
GND wire (black)	Connected to the relevant wiring terminal on an external DC power distribution device	Connected to the **RTN(+)** terminal on the DCDU-01 power input terminal block

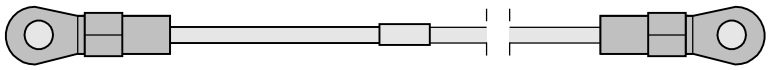
5.2.4 BTS3900 +24 V Input Power Cable

The BTS3900 +24 V input power cable receives the external +24 V DC power supply. This cable is required for the BTS3900 +24 V cabinet.

Appearance

The +24 V input power cables are in two pairs. Each pair of the +24 V input power cables comprises a red wire and a black wire, each having a cross-sectional area of 25 mm^2. The wires are similar in structure, and both ends of each cable are OT terminals, as shown in **Figure 5-4**.

Figure 5-4 +24 V Input power cable



Installation Position

Two pairs of wiring terminals labeled + and - are available on the wiring unit of the power subrack in the +24 V cabinet. **Table 5-6** describes the installation positions of the +24 V input power cable.

Table 5-6 Installation positions of the +24 V input power cable

Name	One End	The Other End
+24 V DC power wire (red)	Connected to the relevant wiring terminal on an external DC power distribution device	Connected to the + terminal on the wiring unit of the power subrack in the +24 V cabinet
GND wire (black)	Connected to the relevant wiring terminal on an external DC power distribution device	Connected to the - terminal on the wiring unit of the power subrack in the +24 V cabinet

5.2.5 BTS3900 220 V Input Power Cable

The BTS3900 220 V input power cable receives the external 220 V AC power supply. The BTS3900 220 V cabinet supports 220 V AC three-phase and 220 V AC single-phase power inputs. This cable is required for the BTS3900 220 V cabinet.

Appearance

The 220 V input power cable consists of the L and N wires, the color of which should be subject to local laws and regulations. The L wire and the N wire are similar in structure, and both ends of each wire are OT terminals, as shown in **Figure 5-5**.

Figure 5-5 220 V Input power cable

Table 5-7 describes the specifications of the 220 V input power cable.

Table 5-7 Specifications of the 220 V input power cable

Power Cable	Wire	Quantity	Cross-Sectional Area
220 V AC three-phase power cable	L	3	2.5 mm^2
	N	1	
220 V AC single-phase single-wire power cable	L	1	6 mm^2
	N	1	
220 V AC single-phase three-wire power cable	L	3	6 mm^2
	N	1	

Installation Position

Table 5-8 describes the installation positions of the 220 V input power cable.

Table 5-8 Installation positions of the 220 V input power cable

Power Cable	Wire	One End	The Other End
220 V AC three-phase power cable	L1	Connected to the **L1** terminal on the wiring unit of the power subrack in the 220 V cabinet	Connected to the corresponding wiring post on an external AC power supply equipment
	L2	Connected to the **L2** terminal on the wiring unit of the power subrack in the 220 V cabinet	
	L3	Connected to the **L3** terminal on the wiring unit of the power subrack in the 220 V cabinet	

Power Cable	Wire	One End	The Other End
	N	Connected to any of the **N1**, **N2**, and **N3** terminals (that are short-circuited in this case) on the wiring unit of the power subrack in the 220 V cabinet	
220 V AC single-phase single-wire power cable	L	Connected to any of the **L1**, **L2**, and **L3** terminals (that are short-circuited in this case) on the wiring unit of the power subrack in the 220 V cabinet	Connected to the corresponding wiring post on an external AC power supply equipment
	N	Connected to any of the **N1**, **N2**, and **N3** terminals (that are short-circuited in this case) on the wiring unit of the power subrack in the 220 V cabinet	
220 V AC single-phase three-wire power cable	L1	Connected to the **L1** terminal on the wiring unit of the power subrack in the 220 V cabinet	Connected to the corresponding wiring post on an external AC power supply equipment
	L2	Connected to the **L2** terminal on the wiring unit of the power subrack in the 220 V cabinet	
	L3	Connected to the **L3** terminal on the wiring unit of the power subrack in the 220 V cabinet	
	N	Connected to any of the **N1**, **N2**, and **N3** terminals (that are short-circuited in this case) on the wiring unit of the power subrack in the 220 V cabinet	

5.2.6 Power Cable Between the PSU (AC/DC) and the DCDU

The power cable between the PSU (AC/DC) and the DCDU is used to lead the -48 V DC power converted by the PSU (AC/DC) to the DCDU-01. This cable is required for the 220 V cabinet.

Appearance

The power cable between the PSU (AC/DC) and the DCDU comprises a blue wire and a black wire, each having a cross-sectional area of 16 mm^2. The two cables are similar in structure, and both ends of each cable are OT terminals, as shown in **Figure 5-6**.

Figure 5-6 Power cable between the PSU (AC/DC) and the DCDU

Installation Position

Table 5-9 describes the installation positions of the power cable between the PSU (AC/DC) and the DCDU in the 220 V cabinet.

Table 5-9 Installation positions of the power cable between the PSU (AC/DC) and the DCDU in the 220 V cabinet

Wire Type	One End	The Other End
-48 V power wire	Connected to the **NEG(-)** terminal on the DCDU-01 panel	Connected to the **LOAD2(-)** terminal on the wiring unit of the power subrack in the 220 V cabinet
Grounding wire	Connected to the **RTN(+)** terminal on the DCDU-01 panel	Connected to the **RTN(+)** terminal (below the **LOAD2(-)** terminal) on the wiring unit of the power subrack in the 220 V cabinet

Table 5-10 describes the installation positions of the power cable between the PSU (AC/DC) and the DCDU in a -48 V cabinet that is stacked on a 220 V cabinet.

Table 5-10 Installation positions of the power cable between the PSU (AC/DC) and the DCDU in the -48 V cabinet

Wire Type	One End	The Other End
-48 V power wire	Connected to the **NEG(-)** terminal on the DCDU-01 panel	Connected to the **LOAD1(-)** terminal on the wiring unit of the power subrack in the 220 V cabinet
Grounding wire	Connected to the **RTN(+)** terminal on the DCDU-01 panel	Connected to the **RTN(+)** terminal (below the **LOAD1(-)** terminal) on the wiring unit of the power subrack in the 220 V cabinet

5.2.7 Power Cable Between the PSU (DC/DC) and the DCDU

The power cable between the PSU (DC/DC) and the DCDU is used to lead the -48 V DC power converted by the PSU (DC/DC) to the DCDU-01. This cable is required for the +24 V cabinet.

Appearance

The power cable between the PSU (DC/DC) and the DCDU comprises a blue wire and a black wire, each having a cross-sectional area of 16 mm^2. The two cables are similar in structure, and both ends of each cable are OT terminals, as shown in Figure 5-7.

Figure 5-7 Power cable between the PSU (DC/DC) and the DCDU

Installation Position

Table 5-11 describes the installation positions of the power cable between the PSU (DC/DC) and the DCDU in the +24 V cabinet.

Table 5-11 Installation positions of the power cable between the PSU (DC/DC) and the DCDU in the +24 V cabinet

Wire Type	One End (OT Terminal)	The Other End (OT Terminal)
-48 V power wire	Connected to the **NEG(-)** terminal on the DCDU-01 panel	Connected to one of the two **Load** terminals on the wiring unit of the power subrack in the+24 V cabinet
Grounding wire	Connected to the **RTN(+)** terminal on the DCDU-01 panel	Connected to one of the two **RTN** terminals on the wiring unit of the power subrack in the+24 V cabinet

Table 5-12 describes the installation positions of the power cable between the PSU (DC/DC) and the DCDU in a -48 V cabinet that is stacked on a +24 V cabinet.

Table 5-12 Installation positions of the power cable between the PSU (DC/DC) and the DCDU in the -48 V cabinet

Wire Type	One End (OT Terminal)	The Other End (OT Terminal)
-48 V power wire	Connected to the **NEG(-)** terminal on the DCDU-01 panel	Connected to the other **Load** terminal on the wiring unit of the power subrack in the +24 V cabinet
Grounding wire	Connected to the **RTN(+)** terminal on the DCDU-01 panel	Connected to the other **RTN** terminal on the wiring unit of the power subrack in the +24 V cabinet

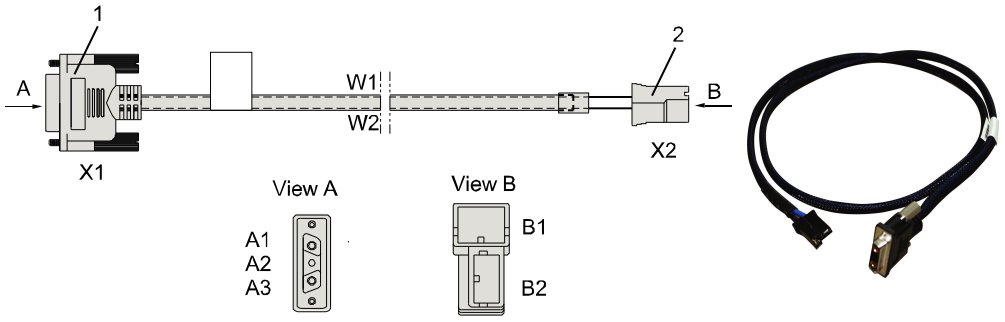
5.2.8 Power Cable Between the DCDU and the DRFU

The power cable between the DCDU and the DRFU leads the -48 V DC power from the DCDU to the DRFU.

Appearance

One end of the power cable is a parallel terminal and the other end is a 3V3 power connector. Figure 5-8 shows the power cable between the DCDU and the DRFU.

Figure 5-8 Power cable between the DCDU and the DRFU



(1) 3V3 power connector (2) Parallel terminal

Pin Assignment

Table 5-13 describes the pin assignment of the power cable between the DCDU and the DRFU.

Table 5-13 Pin assignment of the power cable between the DCDU and the DRFU

Wire	X1 End	X2 End	Color
W1	X1.A1	X2.B1	Black
W2	X1.A3	X2.B2	Blue

Installation Position

Table 5-14 describes the installation positions of the power cables between the DCDU and the DRFUs.

NOTE

The DRFUs are named DRFU0 to DRFU5 from left to right.

Table 5-14 Installation positions of the power cable between the DCDU and the DRFU

Cable Name	The End with the Parallel Terminal	The Other End with the 3V3 Power Connector
Power cable between the DCDU and the DRFU0	Connected to the **RFU0** socket on the DCDU-01 panel	Connected to the **PWR** port on the DRFU0 panel
Power cable between the DCDU and the DRFU1	Connected to the **RFU1** socket on the DCDU-01 panel	Connected to the **PWR** port on the DRFU1 panel

Cable Name	The End with the Parallel Terminal	The Other End with the 3V3 Power Connector
Power cable between the DCDU and the DRFU2	Connected to the **RFU2** socket on the DCDU-01 panel	Connected to the **PWR** port on the DRFU2 panel
Power cable between the DCDU and the DRFU3	Connected to the **RFU3** socket on the DCDU-01 panel	Connected to the **PWR** port on the DRFU3 panel
Power cable between the DCDU and the DRFU4	Connected to the **RFU4** socket on the DCDU-01 panel	Connected to the **PWR** port on the DRFU4 panel
Power cable between the DCDU and the DRFU5	Connected to the **RFU5** socket on the DCDU-01 panel	Connected to the **PWR** port on the DRFU5 panel

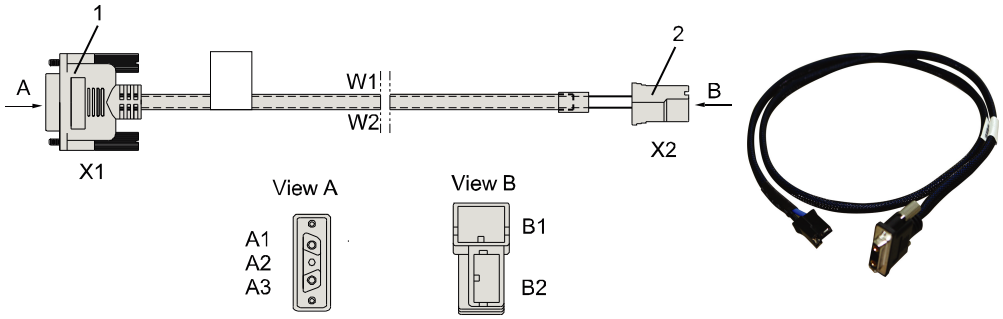
5.2.9 Power Cable Between the DCDU and the GATM

The power cable between the DCDU and the GATM leads the -48 V DC power from the DCDU to the GATM.

Appearance

Figure 5-9 shows the power cable between the DCDU and the GATM.

Figure 5-9 Power cable between the DCDU and the GATM



(1) 3V3 power connector (2) Parallel terminal

Pin Assignment

Table 5-15 describes the pin assignment of the power cable between the DCDU and the GATM.

Table 5-15 Pin assignment of the power cable between the DCDU and the GATM

Wire	X1 End	X2 End	Color
W1	X1.A1	X2.B1	Black
W2	X1.A3	X2.B2	Blue

Installation Position

Table 5-16 describes the installation positions of the power cable between the DCDU and the GATM.

Table 5-16 Installation positions of the power cable between the DCDU and the GATM

The End with the Parallel Terminal	The Other End with the 3V3 Power Connector
Connected to the **SPARE1** socket on the DCDU-01 panel	Connected to the **-48V** port on the GATM panel

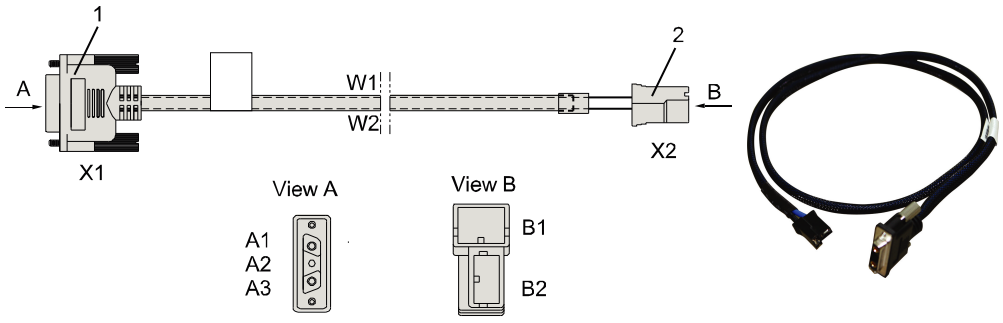
5.2.10 Power Cable Between the DCDU and the FAN Unit

The power cable between the DCDU and the FAN unit leads the -48 V DC power from the DCDU to the FAN unit, enabling the power to be supplied to the fans in the FAN unit.

Appearance

Figure 5-10 shows the power cable between the DCDU and the FAN unit.

Figure 5-10 Power cable between the DCDU and the FAN unit



(1) 3V3 power connector (2) Parallel terminal

Pin Assignment

Table 5-17 describes the pin assignment of the power cable between the DCDU and the FAN unit.

Table 5-17 Pin assignment of the power cable between the DCDU and the FAN unit

Wire	X1 End	X2 End	Color
W1	X1.A1	X2.B1	Black
W2	X1.A3	X2.B2	Blue

Installation Position

Table 5-18 describes the installation positions of the power cable between the DCDU and the FAN unit.

Table 5-18 Installation positions of the power cable between the DCDU and the FAN unit

The End with the Parallel Terminal	The Other End with the 3V3 Power Connector
Connected to the **FAN** socket on the DCDU-01 panel	Connected to the **-48V** port on the FAN unit

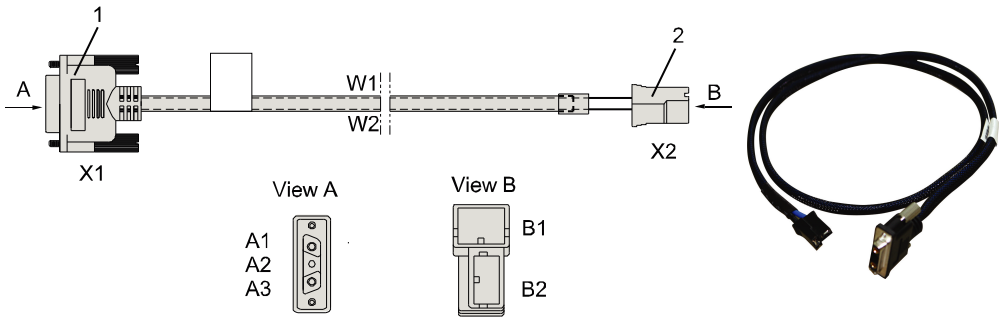
5.2.11 Power Cable Between the DCDU and the BBU

The power cable between the DCDU and the BBU leads the -48 V DC power to the BBU from the DCDU, enabling the power to be supplied to the modules in the BBU.

Appearance

Figure 5-11 shows the power cable between the DCDU and the BBU.

Figure 5-11 Power cable between the DCDU and the BBU



(1) 3V3 power connector (2) Parallel terminal

Pin Assignment

Table 5-19 describes the pin assignment of the power cable between the DCDU and the BBU.

Table 5-19 Pin assignment of the power cable between the DCDU and the BBU

Wire	X1 End	X2 End	Wire Color
W1	X1.A1	X2.B1	Black
W2	X1.A3	X2.B2	Blue

Installation Position

Table 5-20 describes the installation positions of the power cable between the DCDU and the BBU.

Table 5-20 Installation positions of the power cable between the DCDU and the BBU

The End with the Parallel Terminal	The Other End with the 3V3 Power Connector
Connected to the **BBU** socket on the DCDU-01 panel	Connected to the **PWR** port on the UPEU in the BBU

5.3 BTS3900 Transmission Cables

The BTS3900 transmission cables consist of the E1 cables, E1 surge protection transfer cables, CPRI cables, and signal cables between the cascaded DRFUs.

5.3.1 E1 Cable

This describes the E1 cable. It connects the BBU3900 to the RNC and transmits baseband signals.

5.3.1 E1 Cable

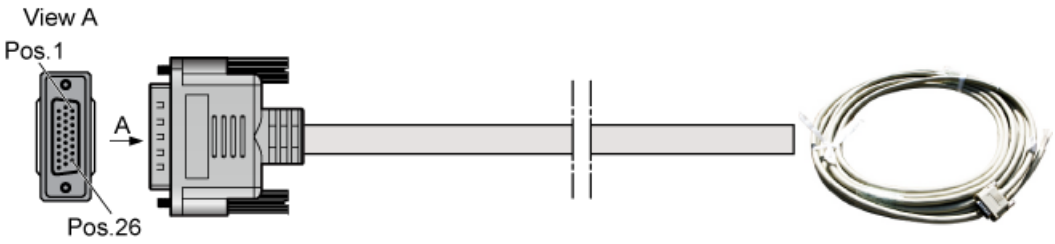
This describes the E1 cable. It connects the BBU3900 to the RNC and transmits baseband signals.

Appearance

The E1 cables are of two types: 75-ohm E1 coaxial cable and 120-ohm E1 twisted pair cable.

One end of the E1 cable is a DB26 male connector. The connector at the other end of the cable should be made on site according to site requirements. **Figure 5-12** shows an E1 cable.

Figure 5-12 E1 cable



Pin Assignment

Table 5-21 and **Table 5-22** describe the pin assignment for the wires of an E1 cable.

NOTE

In **Table 5-21**, "Tip" refers to a wire in the E1 coaxial cable, and "Ring" refers to an external conductor of the cable.

Table 5-21 Pin assignment for the wires of the 75-ohm E1 coaxial cable

Pin on the DB26 Male Connector	Wire Type	Coax. Series No.	Cable Label
X1.1	Tip	1	RX1+
X1.2	Ring		RX1-
X1.3	Tip	2	RX2+
X1.4	Ring		RX2-
X1.5	Tip	3	RX3+

Pin on the DB26 Male Connector	Wire Type	Coax. Series No.	Cable Label
X1.6	Ring		RX3-
X1.7	Tip	4	RX4+
X1.8	Ring		RX4-
X1.19	Tip	5	TX1+
X1.20	Ring		TX1-
X1.21	Tip	6	TX2+
X1.22	Ring		TX2-
X1.23	Tip	7	TX3+
X1.24	Ring		TX3-
X1.25	Tip	8	TX4+
X1.26	Ring		TX4-

Table 5-22 Pin assignment for the wires of the 120-ohm E1 twisted pairs

Pin on the DB26 Male Connector	Wire Color	Wire Type	Cable 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+
X.22	Red		TX2-
X.23	Orange	Twisted pair	TX3+
X.24	Red		TX3-

Pin on the DB26 Male Connector	Wire Color	Wire Type	Cable Label
X.25	Green	Twisted pair	TX4+
X.26	Red		TX4-

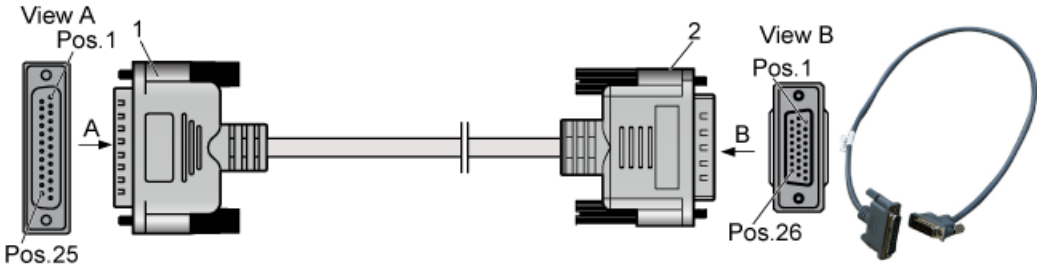
5.3.2 E1 Surge Protection Transfer Cable

This describes the E1 surge protection transfer cable. It is used when the E1 cable requires surge protection.

Appearance

One end of the E1 surge protection transfer cable is a DB26 male connector and the other end is a DB25 male connector, as shown in **Figure 5-13**.

Figure 5-13 E1 surge protection transfer cable



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

Pin Assignment

Table 5-23 describes the pin assignment for wires of the E1 surge protection transfer cable.

Table 5-23 Pin assignment for wires of the E1 surge protection transfer cable

Pin on the DB26 Male Connector	Wire Type	Pin on the DB25 Male Connector
X1.20	Twisted pair	X2.2
X1.19		X2.3
X1.4	Twisted pair	X2.4
X1.3		X2.5
X1.22	Twisted pair	X2.6
X1.21		X2.7
X1.6	Twisted pair	X2.8

Pin on the DB26 Male Connector	Wire Type	Pin on the DB25 Male Connector
X1.5		X2.9
X1.24	Twisted pair	X2.10
X1.23		X2.11
X1.8	Twisted pair	X2.12
X1.7		X2.13
X1.1	Twisted pair	X2.14
X1.2		X2.15
X1.25	Twisted pair	X2.24
X1.26		X2.25

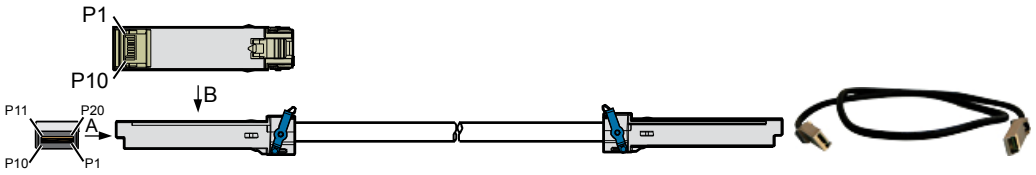
5.3.3 CPRI Cable

The CPRI cable enables the high-speed communication between the BBU and the DRFU.

Appearance

Both ends of the CPRI cable are SFP male connectors. **Figure 5-14** shows the CPRI cable.

Figure 5-14 CPRI cable



Pin Assignment

None.

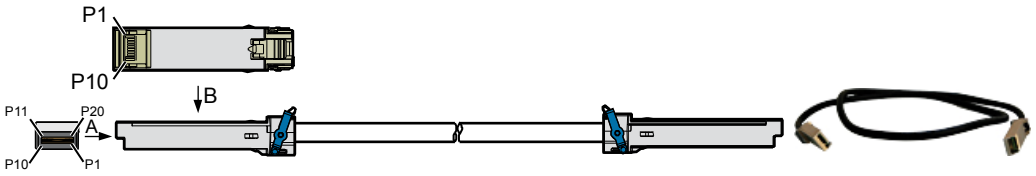
5.3.4 Signal Cable Between the Cascaded DRFUs

The signal cable between cascaded DRFUs is used to connect the DRFUs so that a lower-level DRFU can communicate with the BBU through an upper-level DRFU.

Appearance

Both ends of the signal cable between cascaded DRFUs are SFP male connectors, as shown in **Figure 5-15**.

Figure 5-15 Signal cable between cascaded DRFUs



Pin Assignment

None.

5.4 BTS3900 Signal Cables

The BTS3900 signal cables consist of the monitoring signal cables, cascading signal cables, and control signal cables.

5.4.1 Monitoring Signal Cables for the DCDU-01

The monitoring signal cables for the DCDU-01 connect the DCDU-01 and the BBU so that the surge protection information of the DCDU-01 can be reported to the BBU. In the +24 V cabinet, the monitoring signal cables for the DCDU-01 also transmit the alarm information related to the PSU.

5.4.2 In-Position Signal Cable for the PSU (DC/DC)

The in-position signal cable for the PSU (DC/DC) enables the BBU to monitor the in-position status of the PSU (DC/DC). This cable is required when the +24 V cabinet is used.

5.4.3 Monitoring Signal Cable for the PMU

The monitoring signal cable for the PMU transmits the environment alarm information collected by the PMU to the BBU.

5.4.4 Monitoring Signal Cable for the EMU

The monitoring signal cable for the EMU is used to transmit the Boolean signals from the EMU to the BBU.

5.4.5 Monitoring Signal Cable for the GATM

The monitoring signal cable for the GATM is used to connect the BBU and the GATM. Through this monitoring signal cable, the BBU transmits control signals to the GATM and the GATM reports alarm information to the BBU.

5.4.6 BBU Alarm Cable

This describes the BBU alarm cable. The BBU alarm cable transmits alarm signals from external devices to the BBU.

5.4.7 RET Control Signal Cable

The RET control signal cable is used to connect the GATM and the Bias-Tee, enabling the GATM to supply power to the TMA and to control the RET antenna.

5.4.8 Monitoring Signal Cable for the FAN Unit

The monitoring signal cable for the FAN unit connects the BBU and the FAN unit so that the BBU can monitor the operating status of the FAN unit.

5.4.9 Signal Cable Between the Cascaded FAN Units

The signal cable between the cascaded FAN units enables the lower-level FAN unit to report its alarm information to the BBU through the upper-level FAN unit.

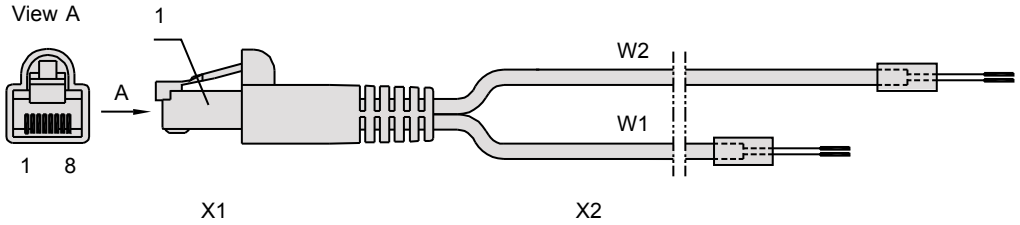
5.4.1 Monitoring Signal Cables for the DCDU-01

The monitoring signal cables for the DCDU-01 connect the DCDU-01 and the BBU so that the surge protection information of the DCDU-01 can be reported to the BBU. In the +24 V cabinet, the monitoring signal cables for the DCDU-01 also transmit the alarm information related to the PSU.

Appearance

Figure 5-16 shows the monitoring signal cable 1 for the DCDU-01.

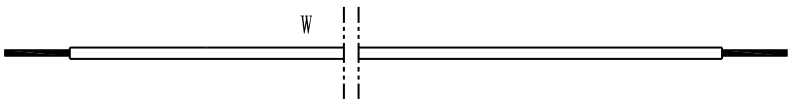
Figure 5-16 Monitoring signal cable 1 for the DCDU-01



(1) RJ45 connector

When two cabinets are stacked for capacity expansion or a +24 V cabinet is used, an interconnection terminal is required to connect the monitoring signal cable 1 for the DCDU-01 and the bare wire, enabling the transmission of the surge protection information of the DCDU-01 in the extension cabinet or the alarm information related to the PSU in the +24 V cabinet. **Figure 5-17** shows a bare wire.

Figure 5-17 Monitoring signal cable 2 for the DCDU-01



Pin Assignment

Table 5-24 describes the pin assignment of the monitoring signal cable 1 for the DCDU-01.

Table 5-24 Pin assignment of the monitoring signal cable 1 for the DCDU-01

X1 End	X2 End	Color	Wire Type	Description
X1.1	X2.1	White	Twisted pair	Used to report the surge protection alarm information from the DCDU-01 in the lower cabinet to the BBU.
X1.2	X2.2	Blue		
X1.3	X2.3	White	Twisted pair	Reserved and used to transmit the extension alarm information. When a

X1 End	X2 End	Color	Wire Type	Description
X1.6	X2.6	Orange		+24 V cabinet is used, this pair of wires should be connected to the ALM port on the PSU (DC/DC). The wires transmit the alarms related to the PSU to the BBU.
X1.4	X2.4	White	Twisted pair	Reserved and used to transmit the extension alarm information.
X1.5	X2.5	Blue		
X1.7	X2.7	White	Twisted pair	Reserved and used to transmit the extension alarm information. When two cabinets are stacked, this pair of wires should be connected to the SPD ALM port on the DCDU-01 in the upper cabinet through an interconnection terminal and a bare wire. The wires transmit the alarms related to the DCDU-01 in the upper cabinet to the BBU.
X1.8	X2.8	Orange		

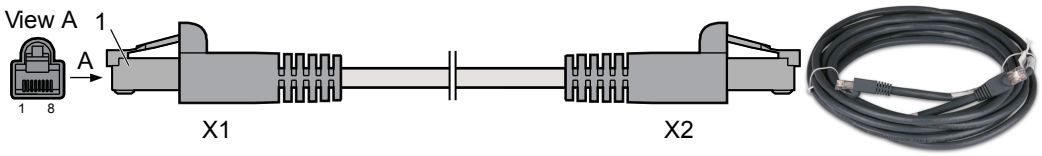
5.4.2 In-Position Signal Cable for the PSU (DC/DC)

The in-position signal cable for the PSU (DC/DC) enables the BBU to monitor the in-position status of the PSU (DC/DC). This cable is required when the +24 V cabinet is used.

Appearance

Figure 5-18 shows the in-position signal cable for the PSU (DC/DC)

Figure 5-18 In-position signal cable for the PSU (DC/DC)



(1) RJ45 connector

Pin Assignment

Table 5-25 describes the pin assignment of the in-position signal cable for the PSU (DC/DC).

Table 5-25 Pin assignment of the in-position signal cable for the PSU (DC/DC)

X1 End	X2 End	Color	Wire Type
X1.1	X2.1	White	Twisted pair

X1 End	X2 End	Color	Wire Type
X1.2	X2.2	Orange and white	
X1.3	X2.3	Green and white	Twisted pair
X1.6	X2.6	Green	
X1.4	X2.4	Blue	Twisted pair
X1.5	X2.5	Blue and white	
X1.7	X2.7	Brown and white	Twisted pair
X1.8	X2.8	Brown	

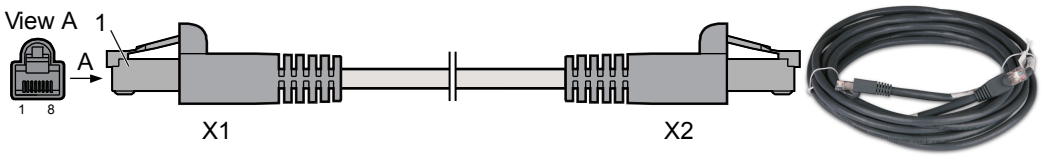
5.4.3 Monitoring Signal Cable for the PMU

The monitoring signal cable for the PMU transmits the environment alarm information collected by the PMU to the BBU.

Appearance

Figure 5-19 shows the monitoring signal cable for the PMU.

Figure 5-19 Monitoring signal cable for the PMU



(1) RJ45 connector

Pin Assignment

Table 5-26 describes the pin assignment of the monitoring signal cable for the PMU.

Table 5-26 Pin assignment of the monitoring signal cable for the PMU

X1 End	X2 End	Wire Type
X1.1	X2.1	Twisted pair
X1.2	X2.2	
X1.3	X2.3	Twisted pair
X1.6	X2.6	
X1.4	X2.4	Twisted pair

X1 End	X2 End	Wire Type
X1.5	X2.5	
X1.7	X2.7	Twisted pair
X1.8	X2.8	

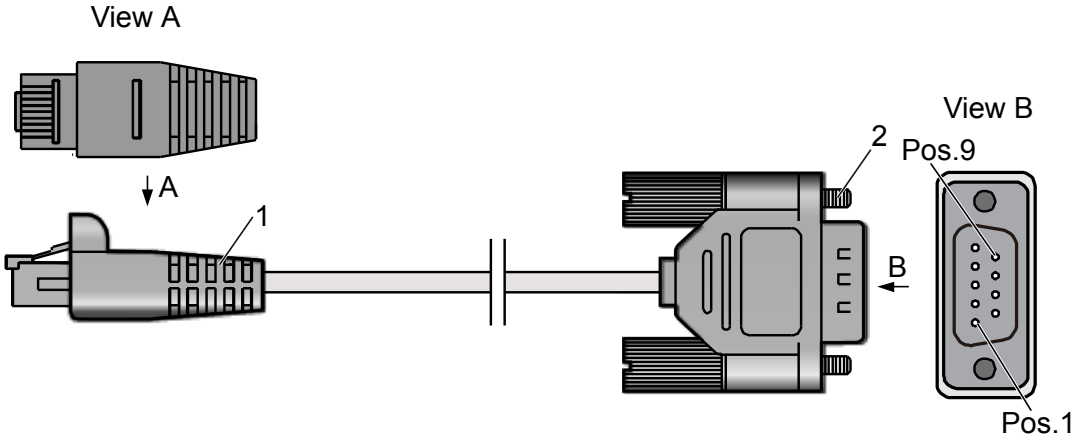
5.4.4 Monitoring Signal Cable for the EMU

The monitoring signal cable for the EMU is used to transmit the Boolean signals from the EMU to the BBU.

Appearance

Figure 5-20 shows the monitoring signal cable for the EMU.

Figure 5-20 Monitoring signal cable for the EMU



(1) RJ45 connector (2) DB9 male connector

Pin Assignment

Table 5-27 describes the pin assignment of the monitoring signal cable for the EMU.

Table 5-27 Pin assignment of the monitoring signal cable for the EMU

Pin of RJ45 Connector	DB9 male connector	Color	Wire Type	Remarks
X1.1	X2.3	White and blue	Twisted pair	TX+
X1.2	X2.7	Blue		TX-
X1.4	X2.2	White and orange	Twisted pair	RX+

Pin of RJ45 Connector	DB9 male connector	Color	Wire Type	Remarks
X1.5	X2.6	Orange		RX-

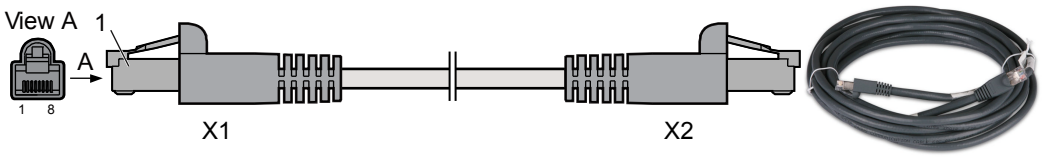
5.4.5 Monitoring Signal Cable for the GATM

The monitoring signal cable for the GATM is used to connect the BBU and the GATM. Through this monitoring signal cable, the BBU transmits control signals to the GATM and the GATM reports alarm information to the BBU.

Appearance

Figure 5-21 shows the monitoring signal cable for the GATM.

Figure 5-21 Monitoring signal cable for the GATM



(1) RJ45 connector

Pin Assignment

Table 5-28 describes the pin assignment of the monitoring signal cable for the GATM.

Table 5-28 Pin assignment of the monitoring signal cable for the GATM

X1 End	X2 End	Color	Description
X1.1	X2.1	Orange and white	Twisted pair
X1.2	X2.2	Orange	
X1.3	X2.3	Green and white	Twisted pair
X1.6	X2.6	Green	
X1.4	X2.4	Blue	Twisted pair
X1.5	X2.5	Blue and white	
X1.7	X2.7	Brown and white	Twisted pair
X1.8	X2.8	Brown	

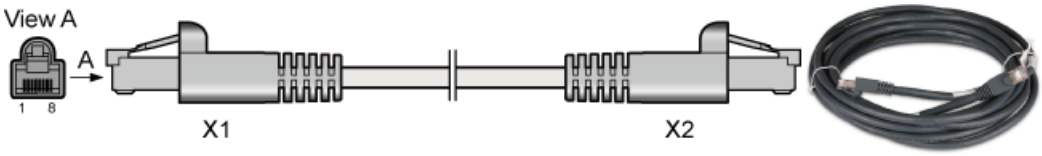
5.4.6 BBU Alarm Cable

This describes the BBU alarm cable. The BBU alarm cable transmits alarm signals from external devices to the BBU.

Appearance

The BBU alarm cable has an RJ45 connector at each end, as shown in **Figure 5-22**. One RJ45 connector at one end, however, may be replaced with an appropriate terminal according to the field requirements.

Figure 5-22 BBU alarm cable



(1) RJ45 connector

Pin Assignment

Table 5-29 describes the pin assignment for the wires of the BBU alarm cable.

Table 5-29 Pin assignment for the wires of the BBU alarm cable

Pin on RJ45 Connector	Pin on RJ45 Connector (the Other End)	Wire Color	Wire Type
X1.1	X2.1	White/orange	Twisted pair
X1.2	X2.2	Orange	
X1.3	X2.3	White/green	Twisted pair
X1.6	X2.6	Green	
X1.5	X2.5	White/blue	Twisted pair
X1.4	X2.4	Blue	
X1.7	X2.7	White/brown	Twisted pair
X1.8	X2.8	Brown	

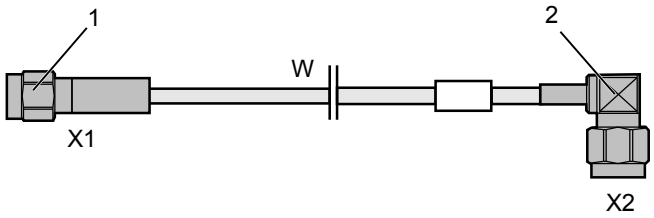
5.4.7 RET Control Signal Cable

The RET control signal cable is used to connect the GATM and the Bias-Tee, enabling the GATM to supply power to the TMA and to control the RET antenna.

Appearance

Figure 5-23 shows the RET control signal cable.

Figure 5-23 RET control signal cable



(1) SMA straight male connector (2) SMA elbow male connector

Pin Assignment

None.

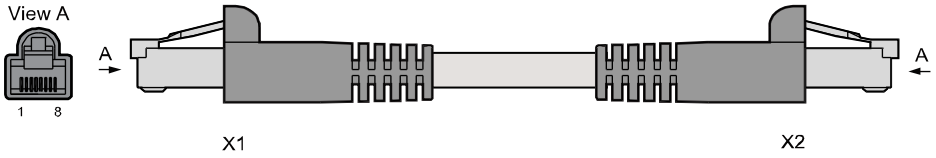
5.4.8 Monitoring Signal Cable for the FAN Unit

The monitoring signal cable for the FAN unit connects the BBU and the FAN unit so that the BBU can monitor the operating status of the FAN unit.

Appearance

The monitoring signal cable for the FAN unit has RJ45 connectors on both ends, as shown in Figure 5-24.

Figure 5-24 Monitoring signal cable for the FAN unit



Pin Assignment

Table 5-30 describes the pin assignment of the monitoring signal cable for the FAN unit.

Table 5-30 Pin assignment of the monitoring signal cable for the FAN unit

X1 End	X2 End	Wire Type
X1.1	X2.1	Twisted pair
X1.2	X2.2	
X1.3	X2.3	Twisted pair
X1.6	X2.6	
X1.4	X2.4	Twisted pair

X1 End	X2 End	Wire Type
X1.5	X2.5	
X1.7	X2.7	Twisted pair
X1.8	X2.8	

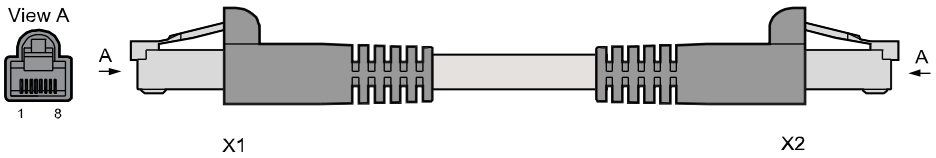
5.4.9 Signal Cable Between the Cascaded FAN Units

The signal cable between the cascaded FAN units enables the lower-level FAN unit to report its alarm information to the BBU through the upper-level FAN unit.

Appearance

Figure 5-25 shows the signal cable between the cascaded FAN units.

Figure 5-25 Signal cable between the cascaded FAN units



Pin Assignment

Table 5-31 describes the pin assignment of the signal cable between the cascaded FAN units.

Table 5-31 Pin assignment of the signal cable between the cascaded FAN units

X1 End	X2 End	Wire Type
X1.1	X2.1	Twisted pair
X1.2	X2.2	
X1.3	X2.3	Twisted pair
X1.4	X2.4	
X1.5	X2.5	Twisted pair
X1.6	X2.6	
X1.7	X2.7	Twisted pair
X1.8	X2.8	

5.5 BTS3900 RF Cables

The BTS3900 RF cables consist of the RF jumpers and the inter-DRFU RF signal cables.

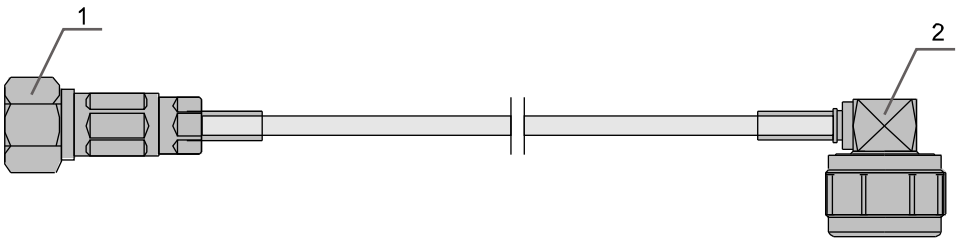
5.5.1 RF Jumper

The RF jumper connects the ANT port on the DRFU to the feeder so that the signals can be transmitted between the BTS and the antenna subsystem.

Appearance

One end of the RF jumper is a DIN elbow male connector and the other end is a DIN straight male connector. **Figure 5-26** shows the jumper.

Figure 5-26 RF jumper



(1) DIN straight male connector (2) DIN elbow male connector

Pin Assignment

None.

5.5.2 Inter-DRFU RF Signal Cable

The inter-DRFU RF signal cable connects the RX IN port on one DRFU and the RX OUT port on the other DRFU for transmitting the diversity receive signals. The received signals of one DRFU can serve as the diversity receive signals of the other DRFUs so that the DRFU can obtain the diversity gain.

Appearance

The connectors on both ends of the inter-DRFU RF signal cable are QMA elbow male connectors. **Figure 5-27** shows the inter-DRFU RF signal cable.

Figure 5-27 Inter-DRFU RF signal cable

(1) QMA elbow male connector

Pin Assignment

None.