DBS3900 GSM

V300R008

Technical Description

Issue 06

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About This Document

Purpose

This document describes the composition, orientation, software and hardware structure, subsystems, configuration type, signal flow, clock synchronization, topologies of the DBS3900 GSM.

Product Version

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

Product Name	Product Version
DBS3900 GSM (hereinafter referred to as DBS3900)	V300R008

Intended Audience

This document is intended for:

- Network planners
- Field engineers
- System engineers

Organization

1 Changes in DBS3900 GSM Technical Description

This describes the changes in the DBS3900 GSM Technical Description.

2 DBS3900 Product Family

This describes the functional modules and auxiliary equipment in the DBS3900 product family.

3 Logical Structure of the DBS3900

This describes the internal logical units of the BBU and RRU.

4 Software Structure of the BTS

The BTS software consists of the platform software, signaling protocol software, OM software, and data center. The latter three are application software, and the platform software provides support for the application software.

5 DBS3900 Monitoring Schemes

The monitoring system of the DBS3900 monitors the power supply, fans, and environment.

6 Clock Synchronization Modes of the DBS3900

The DBS3900 supports four types of reference clocks: IP clock, line clock, free-run clock, and external clock.

7 Surge Protection Specifications of Ports on the DBS3900

This describes the surge protection specifications of the external ports on the BBU3900 and RRU.

8 Typical Scenarios of the DBS3900 (with the DC RRU)

This describes the typical installation scenarios of the DBS3900 configured with the BBU3900 and DC RRU.

9 Typical Scenarios of the DBS3900 (with the AC RRU)

This describes the typical scenarios of the DBS3900 configured with the BBU3900 and AC RRU.

10 Configuration of the DBS3900

The DBS3900 features flexible configuration and supports multiple receive and transmit modes.

Conventions

Symbol Conventions

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

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

General Conventions

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

Convention	Description
Times New Roman	Normal paragraphs are in Times New Roman.
Boldface	Names of files, directories, folders, and users are in **boldface**. For example, log in as user **root**.
Italic	Book titles are in *italics*.
`Courier New`	Examples of information displayed on the screen are in Courier New.

Command Conventions

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

Convention	Description
Boldface	The keywords of a command line are in **boldface**.
Italic	Command arguments are in *italics*.
[ ]	Items (keywords or arguments) in brackets [ ] are optional.
{ x | y | ... }	Optional items are grouped in braces and separated by vertical bars. One item is selected.
[x | y | ...]	Optional items are grouped in brackets and separated by vertical bars. One item is selected or no item is selected.
{ x | y | ... }*	Optional items are grouped in braces and separated by vertical bars. A minimum of one item or a maximum of all items can be selected.
[x | y | ...]*	Optional items are grouped in brackets and separated by vertical bars. Several items or no item can be selected.

GUI Conventions

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

Convention	Description
Boldface	Buttons, menus, parameters, tabs, window, and dialog titles are in **boldface**. For example, click **OK**.
>	Multi-level menus are in **boldface** and separated by the ">" signs. For example, choose **File** > **Create** > **Folder** .

Keyboard Operations

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

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

Mouse Operations

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

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

1 Changes in DBS3900 GSM Technical Description

This describes the changes in the DBS3900 GSM Technical Description.

06 (2009-04-20)

This is the sixth commercial release.

Compared with issue 05 (2009-01-20) of V300R008, no part is added, modified or removed.

05 (2009-01-20)

This is the fifth commercial release.

Compared with issue 04 (2008-09-05) of V300R008, this issue includes the following changes:

The document name changes from DBS3900 GSM Product Description to DBS3900 GSM Technical Description.

Compared with issue 04 (2008-09-05) of V300R008, this issue includes the following information:

Information related to the AC RRU. For details, see **2 DBS3900 Product Family** and **9 Typical Scenarios of the DBS3900 (with the AC RRU)**.

Compared with issue 04 (2008-09-05) of V300R008, this issue excludes the following information:

- Introduction to the DBS3900
- Network Topologies of the DBS3900
- OM System of the DBS3900
- Technical Specifications of the DBS3900

04 (2008-09-05)

This is the fourth commercial release.

Compared with issue 03 (2008-06-30) of V300R008, this issue includes the following new information:

- DBS3900 monitoring schemes. For details, see **5 DBS3900 Monitoring Schemes**.
- Information related to the RRU3008.

Compared with issue 03 (2008-06-30) of V300R008, this issue incorporates the following changes:

- Changes in the typical scenarios of the DBS3900. For details, see **8 Typical Scenarios of the DBS3900 (with the DC RRU)**.
- Changes in the specifications of the DBS3900.

03 (2008-06-30)

This is the third commercial release.

Compared with issue 02 (2008-04-15) of V300R008, this issue includes the following information:

- The scenario of indoor -48 V power input. For details, see **8.2.1 Scenario 1: -48 V DC Power Input**.
- The scenario of indoor 220 V power input. For details, see **8.2.2 Scenario 2: 220 V AC Power Input**.
- The scenario of outdoor -48 V power input (without the generator). For details, see **8.1.1 Scenario 1: -48 V DC Power Input**.
- The scenario of outdoor 220 V power input (transmission space ≤ 4 U). For details, see **8.1.2 Scenario 2: 220 V AC Power Input**.
- The scenario of outdoor 220 V power input (transmission space > 4 U). For details, see **Scenario 3: 220 V AC Power Input (Transmission Space Greater Than 4 U)**.

02 (2008-04-15)

This is the second commercial release.

This issue provides the same information as issue 01 (2008-01-10) of V300R008.

01 (2008-01-10)

This is the initial commercial release.

2 DBS3900 Product Family

This describes the functional modules and auxiliary equipment in the DBS3900 product family.

Functional Modules of the DBS3900

The functional modules of the DBS3900 consist of the BBU3900 and the RRU. The RRU is categorized into two types: DC RRU and AC RRU. The DC RRU supports DC power inputs and the AC RRU supports AC power inputs. Both the DC RRU and AC RRU have the RRU3004 and RRU3008 models. **Figure 2-1** shows the DBS3900 product family.

Figure 2-1 DBS3900 product family

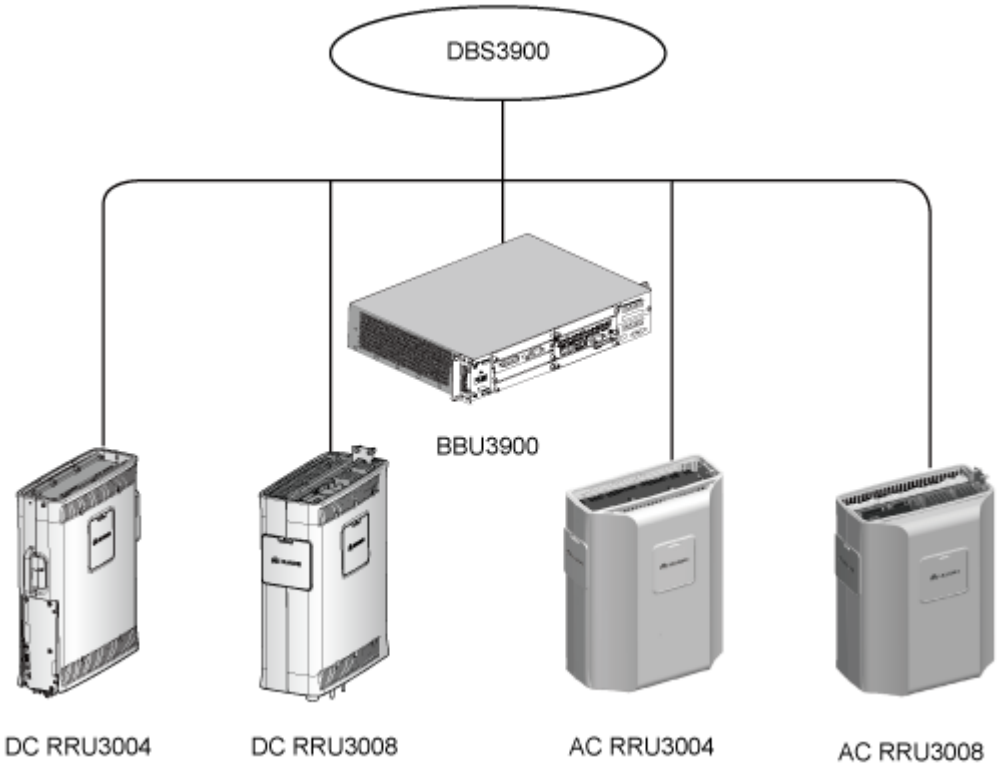


Table 2-1 describes the functions of the functional modules.

Table 2-1 Functional modules of the DBS3900

Functional Module	Description
BBU3900	The BBU3900 is a baseband control unit. It provides ports for connections to the BSC and to the RRU, performs centralized management of the entire DBS3900 in terms of Operation and Maintenance (OM) and signaling processing, and provides the system clock.
RRU3004	The RRU3004 is an outdoor remote radio unit. It processes RF and baseband signals. Each RRU module supports two carriers.
RRU3008	The RRU3008 is an outdoor remote radio unit. It processes RF and baseband signals. Each RRU module supports more than two carriers.

Auxiliary Equipment of the DBS3900

Table 2-2 describes the auxiliary equipment of the DBS3900. The DBS3900 can be configured with one or more types of auxiliary equipment.

Table 2-2 Auxiliary equipment of the DBS3900

Auxiliary Equipment	Description
APM30	The APM30 consists of the power cabinet, battery cabinet, and transmission cabinet. The APM30 provides an auxiliary solution to the outdoor applications of Huawei wireless products. It supplies DC power and backup power to the distributed or separated NodeBs in outdoor scenarios. It can also provide space for installing the BBU and transmission devices outdoors. For detailed functions of the APM30, see the *APM30 User Guide*.
APM30H	The APM30H consists of the APM30H power cabinet, IBBS200T, and TMC11H. The APM30H provides an auxiliary solution to the outdoor applications of Huawei wireless products. It supplies DC power and backup power to the distributed or separated NodeBs in outdoor scenarios. It can also provide space for installing the BBU and transmission devices outdoors. For detailed functions of the APM30H, see the *APM30H User Guide*.
IBBS	The IBBS is a battery cabinet. Its functions are as follows: ● Supplying -48 V DC power output ● Housing batteries of different sizes ● Supporting serial or parallel connection between battery groups For detailed functions of the IBBS, see the *IBBS User Guide*.
DCDU-03B	The DCDU-03B is a DC power distribution box. It provides multiple DC power outputs.

Auxiliary Equipment	Description
PS4890	The PS4890 is an indoor power cabinet. It provides DC power and installation space for customer equipment. When installed with battery groups, the PS4890 can also provide power backup.
EMUA	The EMUA is an environment monitoring device. Its functions are as follows: ● Monitoring environment ● Monitoring entry into the associated equipment ● Monitoring power distribution For detailed functions of the EMUA, see the *EMUA User Guide*.
AC power surge protection box	When the AC RRU is installed outdoors, the AC surge protection box is required to provide surge protection for the AC RRU.

3 Logical Structure of the DBS3900

About This Chapter

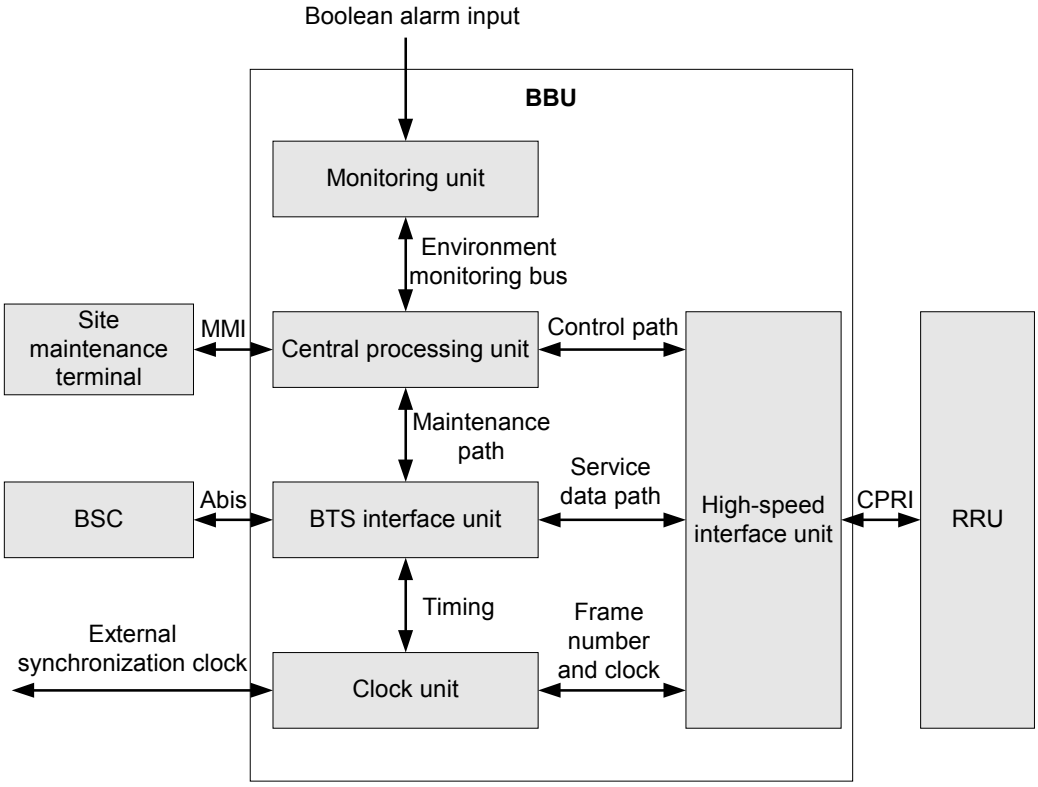
This describes the internal logical units of the BBU and RRU.

3.1 Logical Structure of the BBU

The BBU3900 consists of five units: BTS interface unit, central processing unit, high-speed interface unit, clock unit, and monitoring unit.

Figure 3-1 shows the logical structure of the BBU3900.

Figure 3-1 Logical structure of the BBU3900



BTS Interface Unit

The BTS interface unit performs the following functions:

- Connects the BTS to the BSC.
- Exchanges data between the E1 link and the DBUS.
- Synchronizes the lower-level clock with the upper-level clock.

Central Processing Unit

The central processing unit performs centralized management of the entire distributed base station system in terms of OM and signaling processing, and provides system clocks. The central processing unit performs the following functions:

- Supports the protocols such as UART and HDLC.

- Controls the BTS interface unit to enable the communication between the BBU and the BSC.
- Controls the high-speed interface unit in the BBU to enable the communication between the BBU and the RRU.
- Performs the clock-related functions, that is, provides timing signals, manages BTS clocks, and supports external synchronization clock input.

High-Speed Interface Unit

The high-speed interface unit performs the following functions:

- Receives uplink baseband data from the RRU.
- Transmits downlink baseband data to the RRU.
- Provides up to six SFP optical ports per BBU3900.

Clock Unit

The clock unit performs the following functions:

- Provides the high-accuracy clock source for the BTS and provides the system clock based on this clock source.
- Checks the phase-locking status, provides software phase-locking, adjusts DA values, and generates frame numbers.

Monitoring Unit

The monitoring unit collects the information of Boolean alarms and reports the alarm information to the central processing unit.

3.2 Logical Structure of the RRU

An RRU module consists of the high-speed interface unit, signal processing unit, power amplifier (PA), dual duplexer, and low noise amplifier (LNA).

Figure 3-2 shows the logical structure of the RRU3004.

Figure 3-2 Logical structure of the RRU3004

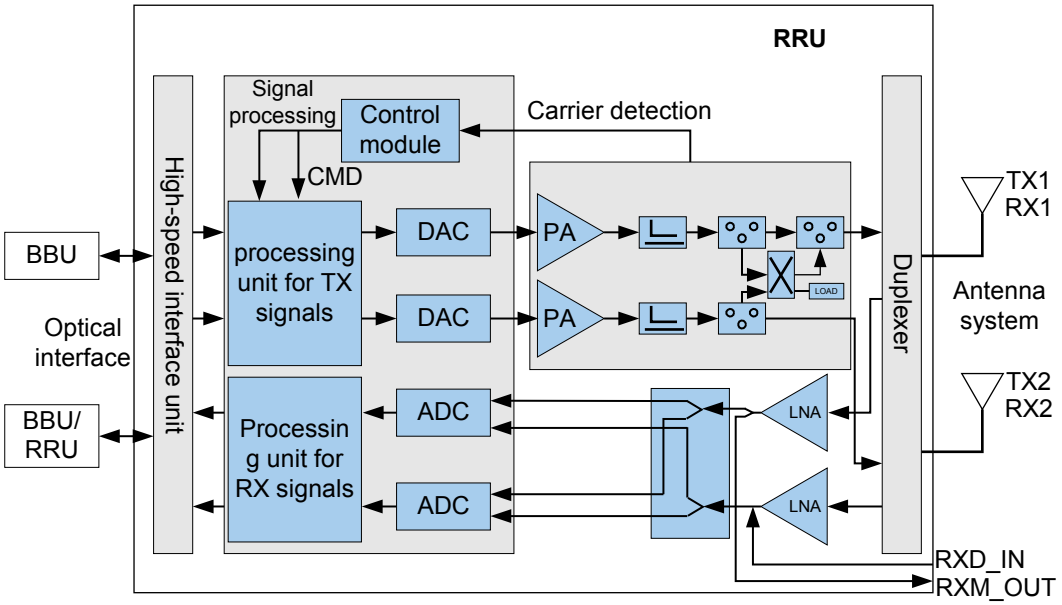
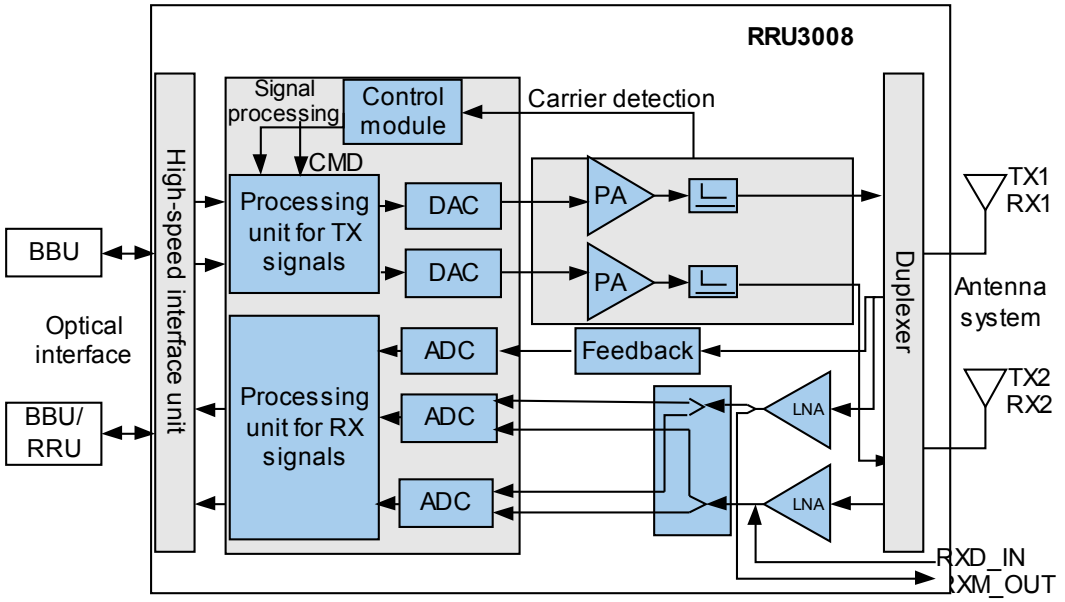


Figure 3-3 shows the logical structure of the RRU3008.

Figure 3-3 Logical structure of the RRU3008



RXM_OUT: RRU RX main output for cascaded RRU modules

RXM_IN: RRU RX diversity input for cascaded RRU modules

High-Speed Interface Unit

The high-speed interface unit performs the following functions:

- Receives downlink data from the upper-level equipment, such as the BBU.
- Transmits uplink data to the upper-level equipment, such as the BBU.
- Transfers data between cascaded RRU modules through the CPRI electrical ports.

Signal Processing Unit

The signal processing unit consists of two uplink RX channels, two downlink TX channels, and a control module. The signal processing unit processes baseband signals and RF signals. The baseband signal processing involves decoding GMSK and 8PSK baseband signals.

The uplink RX channels perform the following functions:

- Down-converts the RX signals into Intermediate Frequency (IF) signals.
- Amplifies the IF signals and performs IQ demodulation.
- Performs analog-to-digital (A/D) conversion through the ADC.
- Performs sampling of digital signals.
- Performs matched filtering.
- Performs Digital Automatic Gain Control (DAGC).
- Processes data and assembles the data into packets.

The downlink TX channels perform the following functions:

- Disassembles the packaged signals (timing signals, control signals, and data signals) from the BBU and sends them to associated units.
- Performs coding, modulation, shaping, and filtering of downlink signals.
- Performs digital-to-analog (D/A) conversion through the DAC and performs IQ modulation.
- Up-converts RF signals to the TX band.

The control module performs the following functions:

- Initializes and loads the RRU.
- Collects alarm information and reports the board status.
- Receives configuration commands from the BBU and performs configuration management of other modules.
- Operates and maintains the RRU.

PA

The PA performs the following functions:

- Combines or divides the signals of the two carriers.
- Amplifies the low-power RF signals sent from the signal processing unit.

Dual Duplexer

The dual duplexer performs the following functions:

- Multiplexes RX signals and TX signals so that they can share an antenna channel.

- Filters the RX signals and TX signals.

LNA

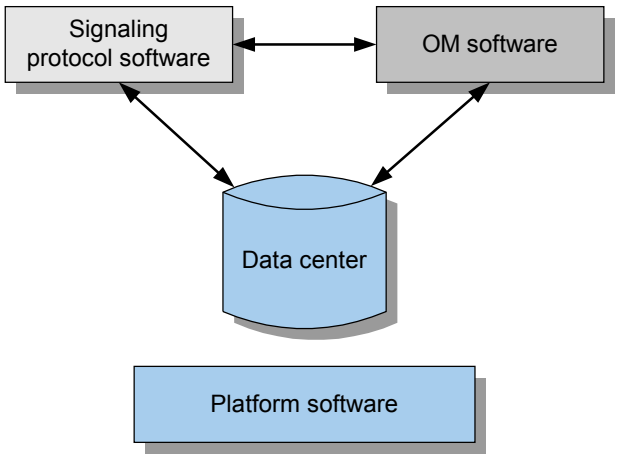
The LNA amplifies the signals received from the antennas.

4 Software Structure of the BTS

The BTS software consists of the platform software, signaling protocol software, OM software, and data center. The latter three are application software, and the platform software provides support for the application software.

Figure 4-1 shows the software structure of the BTS.

Figure 4-1 Software structure of the BTS



Platform Software

The platform software provides support for the signaling protocol software, OM software, and data center. The functions of the platform software are as follows:

- Timing management
- Task management
- Memory management
- Module management
- Managing the loading and running of the application software
- Providing the message forwarding mechanism between modules

- Tracing massages between modules to facilitate troubleshooting

Signaling Protocol Software

The functions of the signaling protocol software are as follows:

- Processing the radio network layer protocol
- Processing the transport network layer protocol, which performs transport data configuration, ALCAP processing, and SAAL processing
- Managing the internal logical resources (such as cells and channels) of the BTS and the mapping between physical resources and logical resources

OM Software

The OM software works together with the maintenance terminals such as the LMT to maintain the BTS. The functions of the OM software are as follows:

- Equipment management
- Data configuration
- Performance management
- Commissioning management
- Alarm management
- Software management
- Tracing management
- Security management
- Backup management
- Log management

Data Center

The data center stores the configuration data of all the modules.

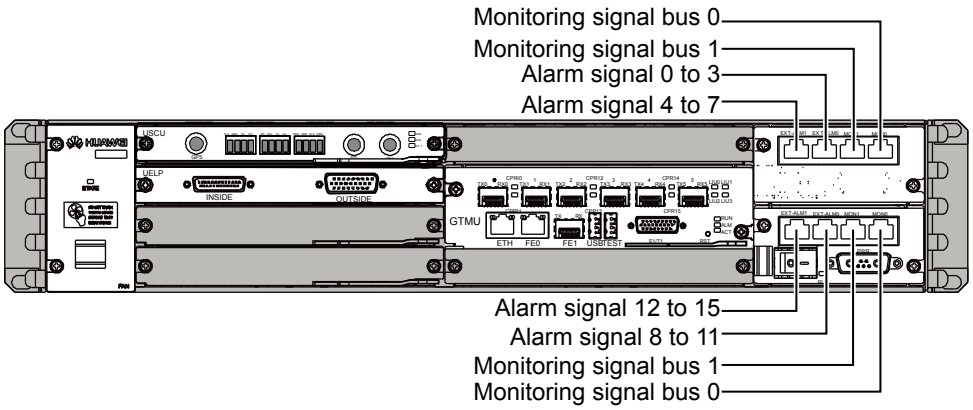
5 DBS3900 Monitoring Schemes

The monitoring system of the DBS3900 monitors the power supply, fans, and environment.

Monitoring Ports on the BBU

Figure 5-1 shows the monitoring ports on the BBU.

Figure 5-1 Monitoring ports on the BBU

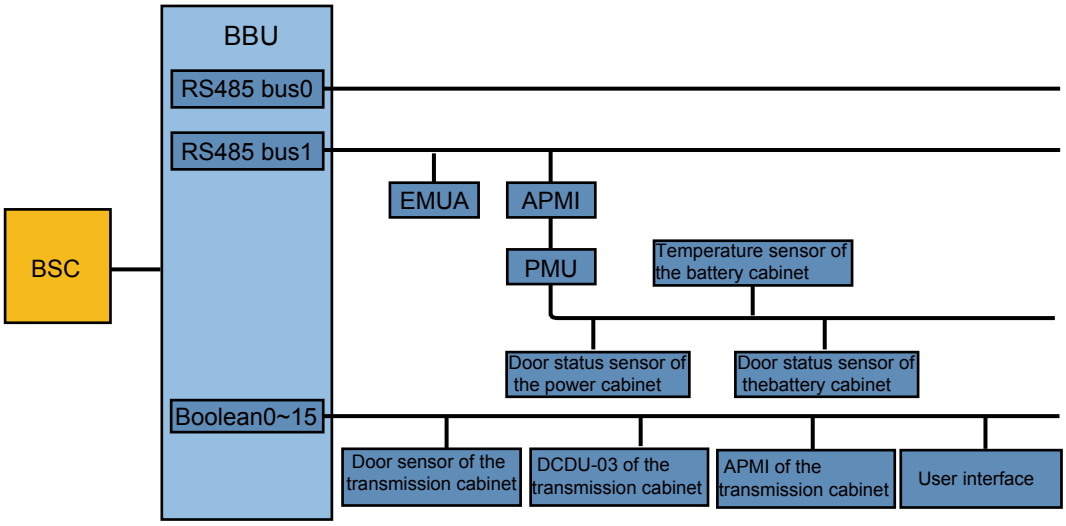


- The BBU can provide a maximum of 2 RS485 buses and 16 Boolean signal inputs.
- The modules connected to RS485 bus 0 cannot change to be connected to RS485 bus 1, and the other way round.

Components of the Monitoring System

Figure 5-2 shows the components of the DBS3900 monitoring system.

Figure 5-2 Components of the monitoring system



Functions of the Monitoring System

Table 5-1 describes the functions of the monitoring system.

Table 5-1 Functions of the monitoring system

Module	Monitoring Function
EMUA	• Communicates with the BBU through the RS485 port, through which two-channel RS485 signals are transmitted. • Detects the input voltage. • Provides ports for connections to the humidity and temperature sensor (12 V DC/24 V DC current type). • Provides ports for detecting the Boolean input signals of dry contact type and of OC type. • Provides ports for controlling six external Boolean outputs of relay node type.

Module	Monitoring Function
PMU in the APM30	● Communicates with the BBU through the RS232/RS422 serial port. ● Manages the power system and the battery recharging and discharging. ● Detects and reports water damage alarms, smoke alarms, door status alarms, and standby Boolean value alarms, and reports ambient humidity and temperature, battery temperature, and standby analog values. ● Detects power distribution and reports alarms.
DCDU-03	Monitors surge protection failure of DC.

6 Clock Synchronization Modes of the DBS3900

The DBS3900 supports four types of reference clocks: IP clock, line clock, free-run clock, and external clock.

IP Clock

The IP clock acts as the clock source of the DBS3900 when the BTS uses the IP over FE transmission mode. The IP clock requires the configuration of the IP clock server in the network. The IP clock server carries the reference clock information in the UDP data packet, and then transmits the clock packets to the BTS. The BTS then resolves the clocks signals from the clock packet and uses these signals as reference clock source.

Line Clock

The BBU3900 directly extracts the clock from the E1/T1 interface. Then, the BBU exports the precise 2 MHz and 8 kHz clocks after frequency dividing, phase locking, and phase adjusting. The 2 MHz and 8 kHz clocks are used for frame synchronization and bit synchronization in the BTS. The line clock consists of the trace BSC clock and trace transmission clock. The BTS extracts the clock signals from the BSC through the E1/T1 interface and uses them as the reference clock source. When the transmission mode of the BTS is upgraded from E1/T1 mode to IP mode, if there is no IP clock, the BTS extracts the clock signals from the transmission network through the E1/T1 interface and use them as the reference clock source.

Free-Run Clock

In the absence of external clocks, the internal free-run clock ensures that the BTS keeps working properly for at least seven days.

External Clock

If the BBU3900 is configured with the USCU, the USCU can receive the external clock signals for the GTMU. The USCU supports clock signals including the GPS clock signal, RGPS clock signal, and BITS clock signal.

7 Surge Protection Specifications of Ports on the DBS3900

This describes the surge protection specifications of the external ports on the BBU3900 and RRU.

Surge Protection Specifications of the External Ports on the BBU3900

Table 7-1 lists the surge protection specifications of the external ports on the BBU3900.

Table 7-1 Surge protection specifications of the external ports on the BBU3900

Port	Surge Protection Mode	Surge Current
Power supply port	Differential mode	2 kV
	Common mode	4 kV
E1 port	Differential mode (UELP not configured)	250 A
	Common mode (UELP not configured)	250 A
	Differential mode (UELP configured)	3 kA
	Common mode (UELP configured)	5 kA
GPS signal input port	Differential mode (GPS surge protector configured)	8 kA
	Common mode (GPS surge protector configured)	20 kA
Dry contact alarm port, RS485 port	Differential mode	250 A
	Common mode	250 A

Surge Protection Specifications of the External Ports on the RRU

Table 7-2 lists the surge protection specifications of the external ports on the RRU.

Table 7-2 Surge protection specifications of the external ports on the RRU

Port	Surge Protection Mode	Surge Current
-48 V DC power port	Differential mode	10 kA
	Common mode	15 kA
AC power port	Differential mode	60 kA
	Common mode	60 kA
RF port	Differential mode	8 kA
	Common mode	40 kA
Dry contact alarm port	Differential mode	250 A
	Common mode	250 A
RET antenna port	Differential mode	3 kA
	Common mode	5 kA

NOTE

- The surge protection specifications of the DBS3900 are based on the surge waveform of 8/20 μs.
- The surge current, unless otherwise specified as the maximum discharge current, refers to a nominal discharge current.

8 Typical Scenarios of the DBS3900 (with the DC RRU)

About This Chapter

This describes the typical installation scenarios of the DBS3900 configured with the BBU3900 and DC RRU.

The full names of common cabinet names whose abbreviations are used in this document are listed as follows:

- BBC: Battery Cabinet
- TMC: Transmission Cabinet
- APM: Advance Power Module

8.1 BBU3900 Outdoors and RRU3004 Outdoors

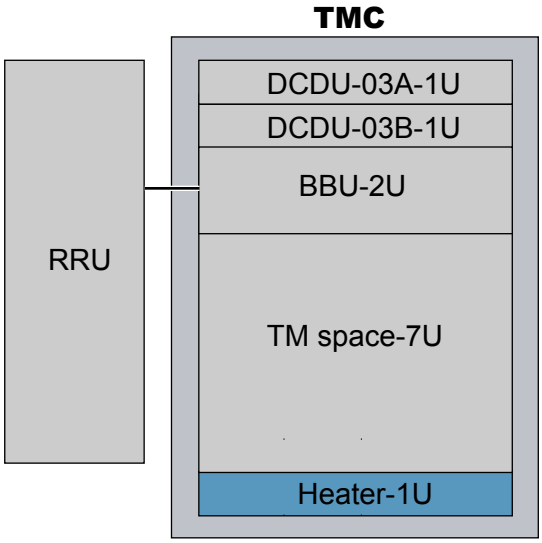
This describes the scenarios that the BBU3900 and RRU3004 of the DBS3900 are installed outdoors.

8.1.1 Scenario 1: -48 V DC Power Input

When -48 V DC power is available on site, the installation scenario of BBU+RRU+TMC is applicable.

Figure 8-1 shows the installation scenario of BBU+RRU+TMC.

Figure 8-1 Installation scenario of BBU+RRU+TMC



In this installation scenario,

- The TMC can be installed on the floor, pole, or wall.
- The TMC provides an installation space no greater than 7 U.
- The BBU can be installed in the TMC, which is equipped with the DCDU-03B to provide power for the BBU and RRU.
- The DCDU-03A configured in the TMC supplies power to transmission units.
- The heater in the TMC is optional.
- The RRU can be installed on a pole or tower.

- The requirement for the switch quantity and capacity of the external power input system is 1 x 63 A.

8.1.2 Scenario 2: 220 V AC Power Input

When 220 V AC power is available on site and the required space for transmission units is not greater than 4 U, the installation scenario of BBU+RRU+APM30+BBC is applicable.

NOTE

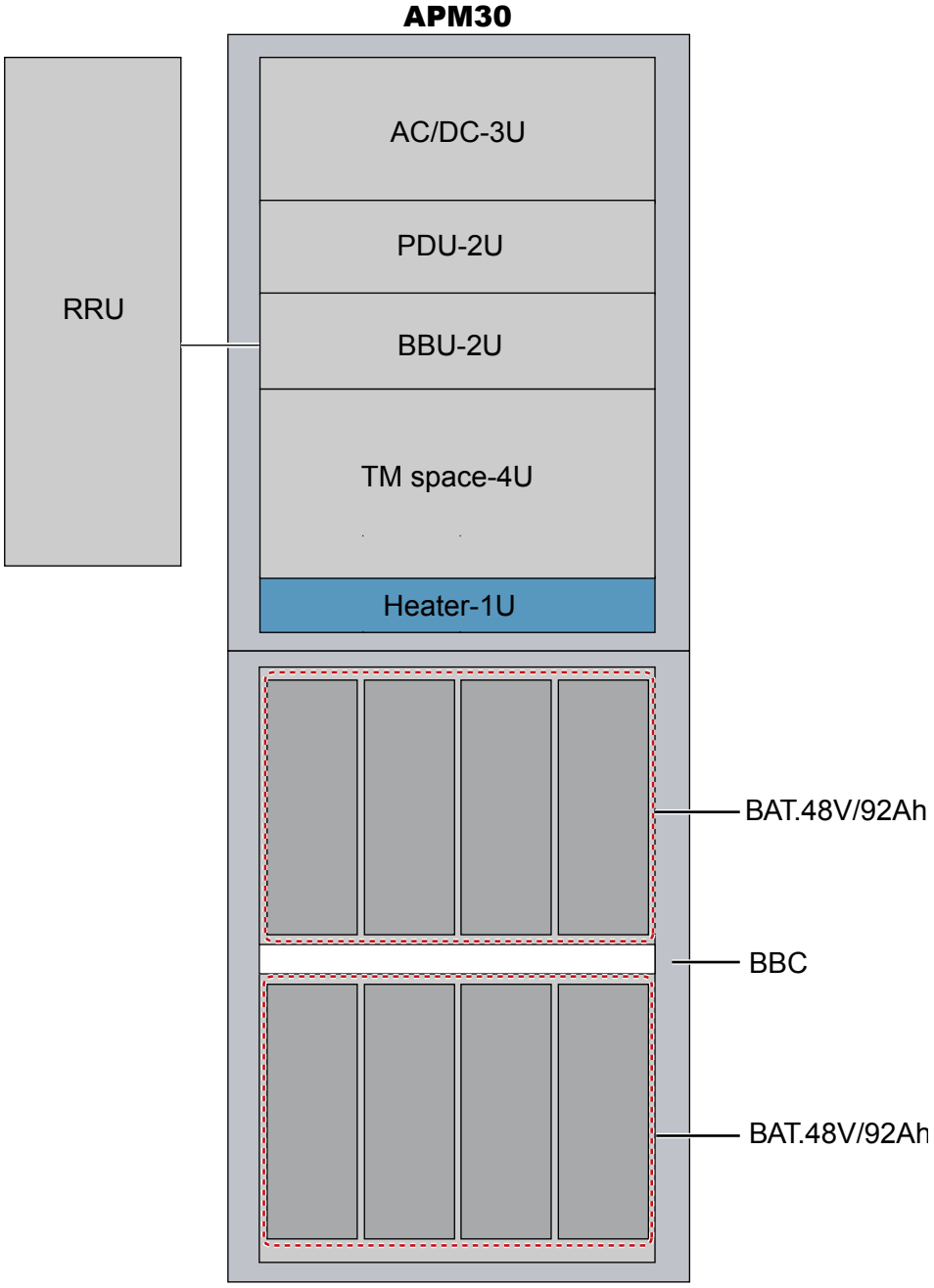
If the required space for transmission units is greater than 4 U, configure a TMC and ensure that the distance between the APM30 and the TMC is not longer than 1 m.

Scenario of Four-Hour Backup Power

If the backup power required at the site is not greater than four hours, installation scenario 1 of BBU+RRU+APM30+BBC is applicable.

Figure 8-2 shows installation scenario 1 of BBU+RRU+APM30+BBC.

Figure 8-2 Installation scenario 1 of BBU+RRU+APM30+BBC



In this installation scenario,

- The BBC is installed on the floor. By default, the APM30 is stacked on the BBC.
- The heater in the APM30 is optional. The APM30 provides a maximum of 4 U space for transmission units.
- The BBU can be installed in the APM30, which supplies -48 V DC power to the BBU and RRU.
- The RRU can be installed on a pole or tower.

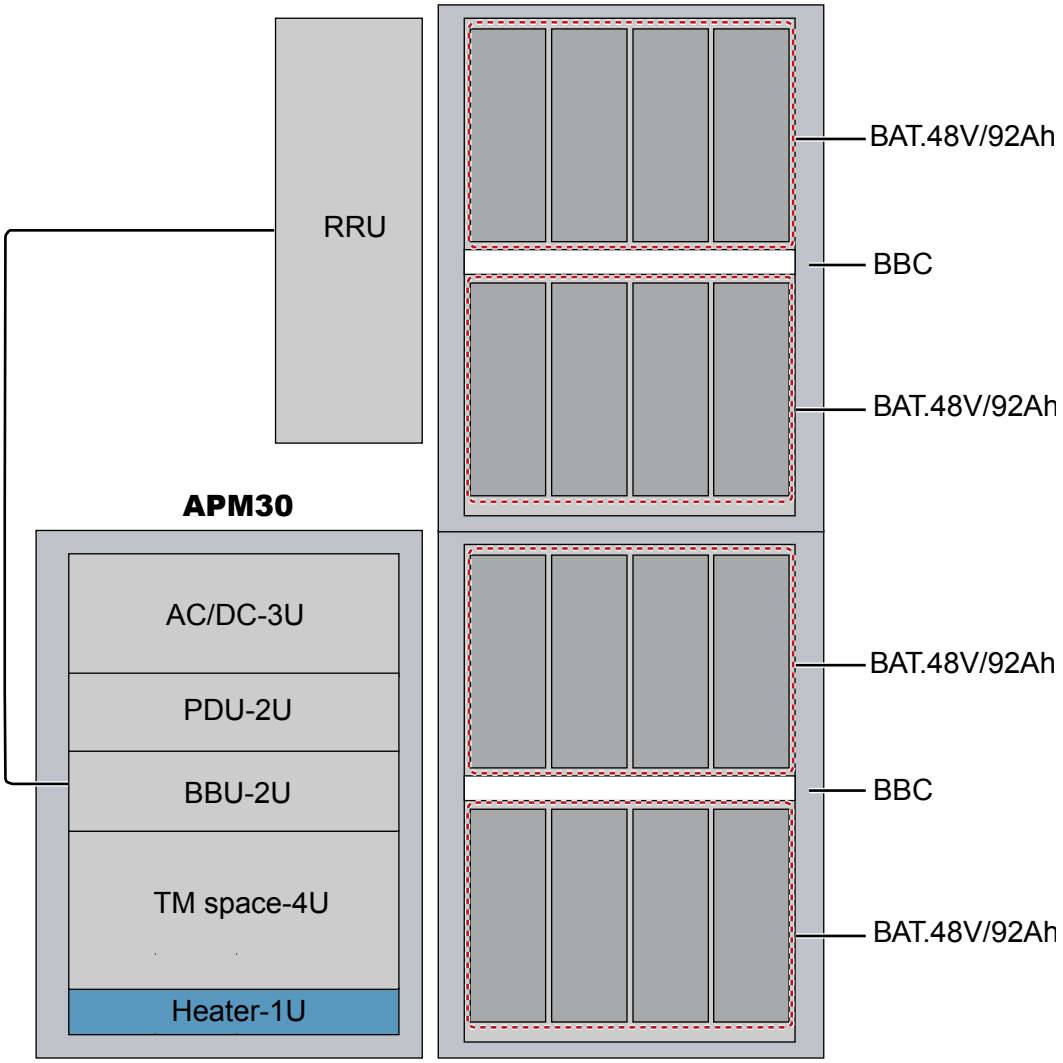
- The heater in the BBC is optional. Without occupying additional internal space, the heater can be placed under the baffle plate at the bottom of each battery layer.
- The requirements for the switch quantity and capacity of the external power input system are as follows:
  - 110 V AC dual-live-wire: 2 x (32 A to 50 A). The 32 A input is recommended.
  - 220 V AC single-phase: 1 x (32 A to 50 A). The 32 A input is recommended.
  - 220 V AC three-phase: 3 x (20 A to 30 A). The 20 A input is recommended.

Scenario of Eight-Hour Backup Power

If eight-hour backup power is required at the site, installation scenario 2 of BBU+RRU+APM30 +BBC is applicable.

Figure 8-3 shows installation scenario 2 of BBU+RRU+APM30+BBC.

Figure 8-3 Installation scenario 2 of BBU+RRU+APM30+BBC



In this installation scenario,

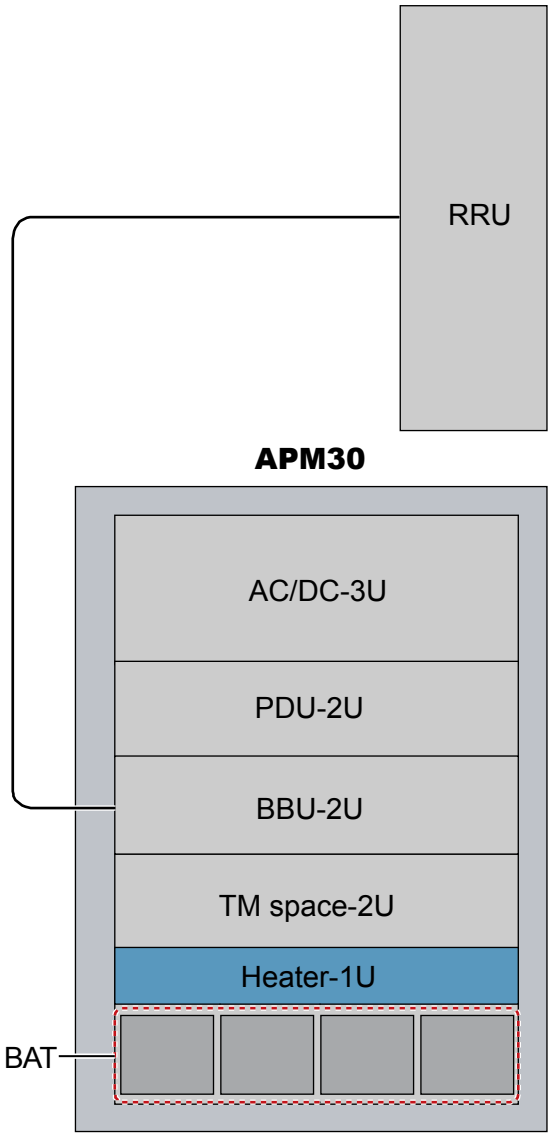
- The APM30 and the BBC can be installed on the floor. By default, the two BBCs are stacked.
- The APM30 provides a maximum of 4 U space for transmission units.
- The BBU can be installed in the APM30, which supplies -48 V DC power to the BBU and RRU.
- The RRU can be installed on a pole or tower.
- The heater in the BBC is optional. Without occupying additional internal space, the heater can be placed under the baffle plate at the bottom of each battery layer.
- The requirements for the switch quantity and capacity of the external power input system are as follows:
  - 110 V AC dual-live-wire: 2 x (32 A to 50 A). The 32 A input is recommended.
  - 220 V AC single-phase: 1 x (32 A to 50 A). The 32 A input is recommended.
  - 220 V AC three-phase: 3 x (20 A to 30 A). The 20 A input is recommended.

Scenario of Half-Hour Backup Power

If half-hour backup power is required at the site, the installation scenario of BBU+RRU+APM30 is applicable.

Figure 8-4 shows the installation scenario of BBU+RRU+APM30.

Figure 8-4 Installation scenario of BBU+RRU+APM30



In this installation scenario,

- The batteries providing 24 Ah backup power can be placed in the APM30. The batteries support a maximum cell configuration of S4/4/4.
- The APM30 provides a maximum of 2 U space for transmission units.
- The BBU can be installed in the APM30, which supplies -48 V DC power to the BBU and RRU.
- The RRU can be installed on a pole or tower.
- The requirements for the switch quantity and capacity of the external power input system are as follows:
  - 110 V AC dual-live-wire: 2 x (32 A to 50 A). The 32 A input is recommended.
  - 220 V AC single-phase: 1 x (32 A to 50 A). The 32 A input is recommended.
  - 220 V AC three-phase: 3 x (20 A to 30 A). The 20 A input is recommended.

8.2 BBU3900 Indoors and RRU3004 Indoors

This describes the scenarios that the BBU3900 and RRU3004 of the DBS3900 are installed indoors.

8.2.1 Scenario 1: -48 V DC Power Input

When -48 V DC power and the equipment room are available on site, the BBU and RRU can be installed indoors.

Centralized Installation Scenarios

Figure 8-5 and **Figure 8-6** show the indoor centralized installation scenarios of the BBU and RRUs.

Figure 8-5 Centralized installation (S2)

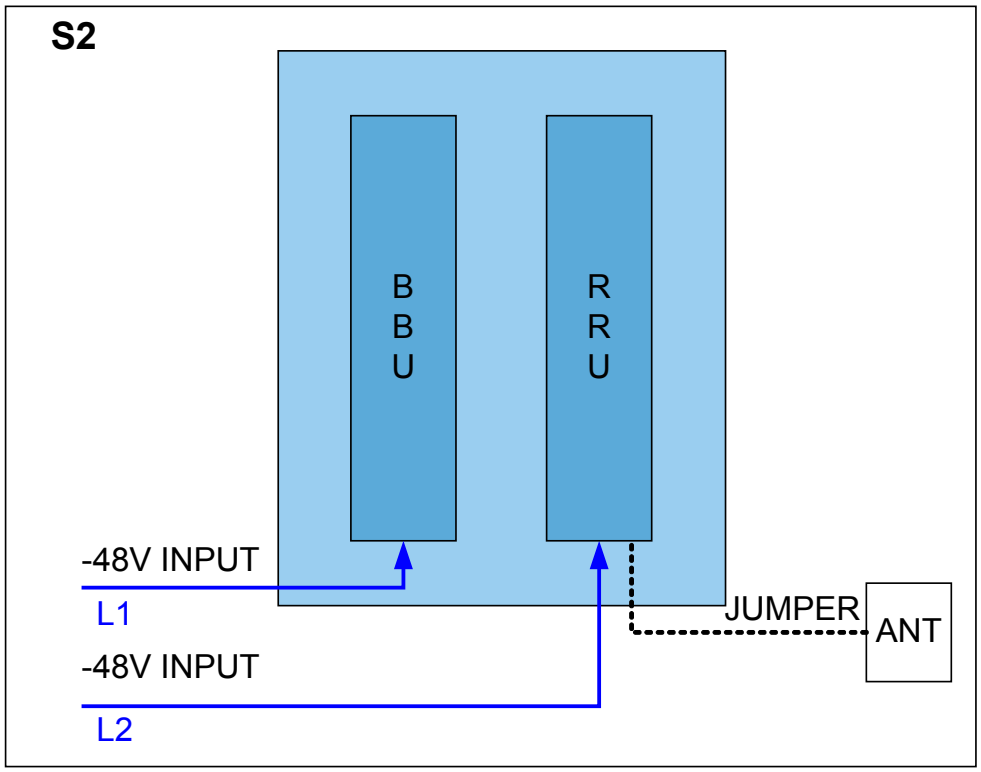
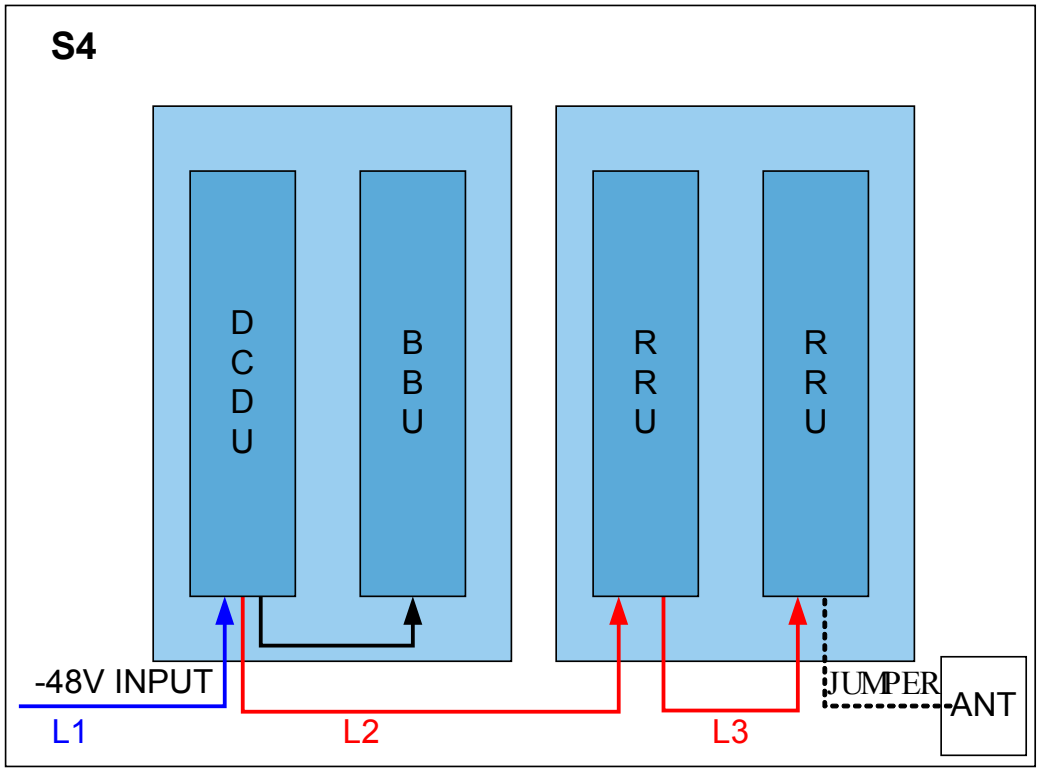


Figure 8-6 Centralized installation (S4)



In this installation scenario,

- The BBU and DCDU-03B are installed in an RRU rack through the 2 U-high adapting pieces.
- The RRU rack can be installed on the wall or stand.
- The requirement for the switch quantity and capacity of the external power input system is 1 x 10 A.
- The RRUs, BBU, and DCDU-03B are equipotentially connected and then grounded through one PGND cable.

Separate Installation Scenarios

Figure 8-7 and **Figure 8-8** show the indoor separate installation scenarios of the BBU and RRUs.

Figure 8-7 Separate installation (S2+S2)

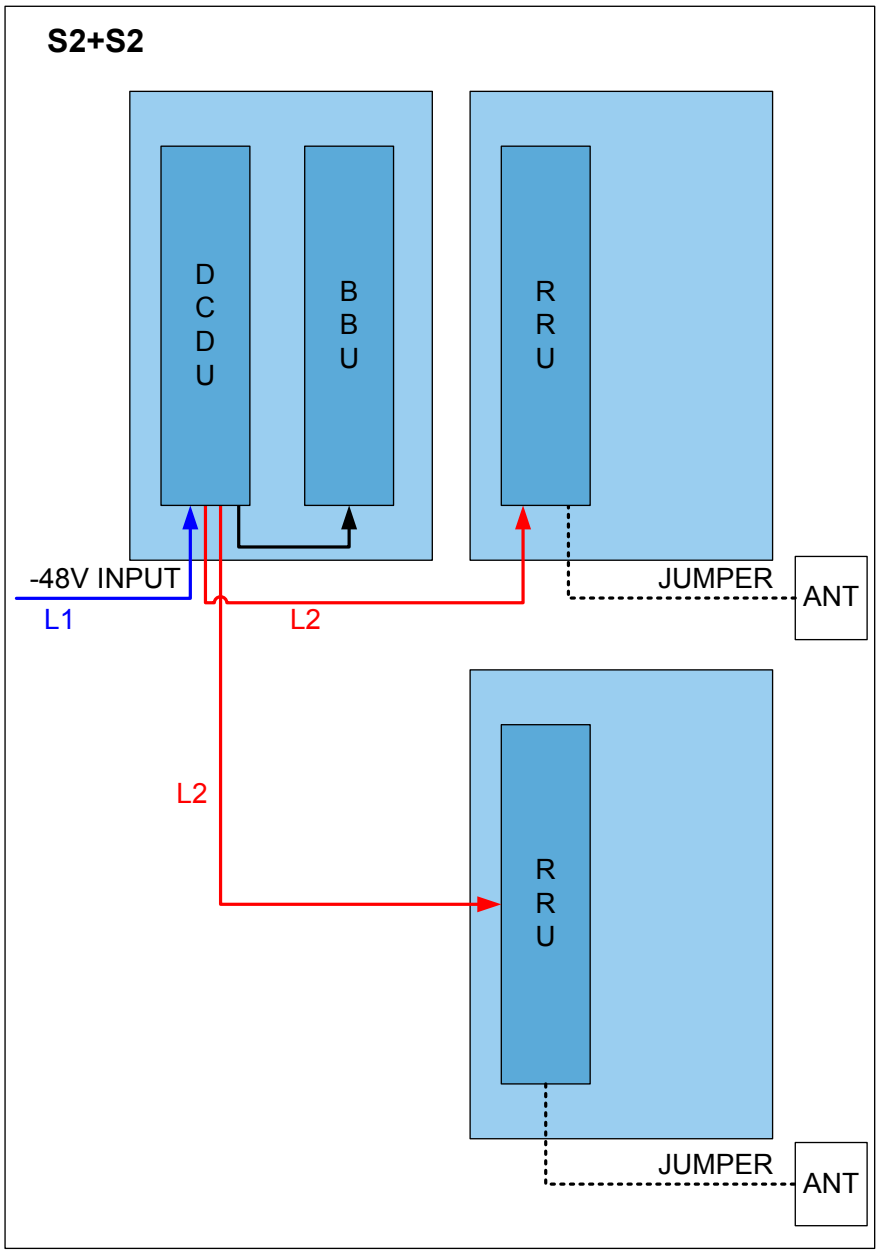
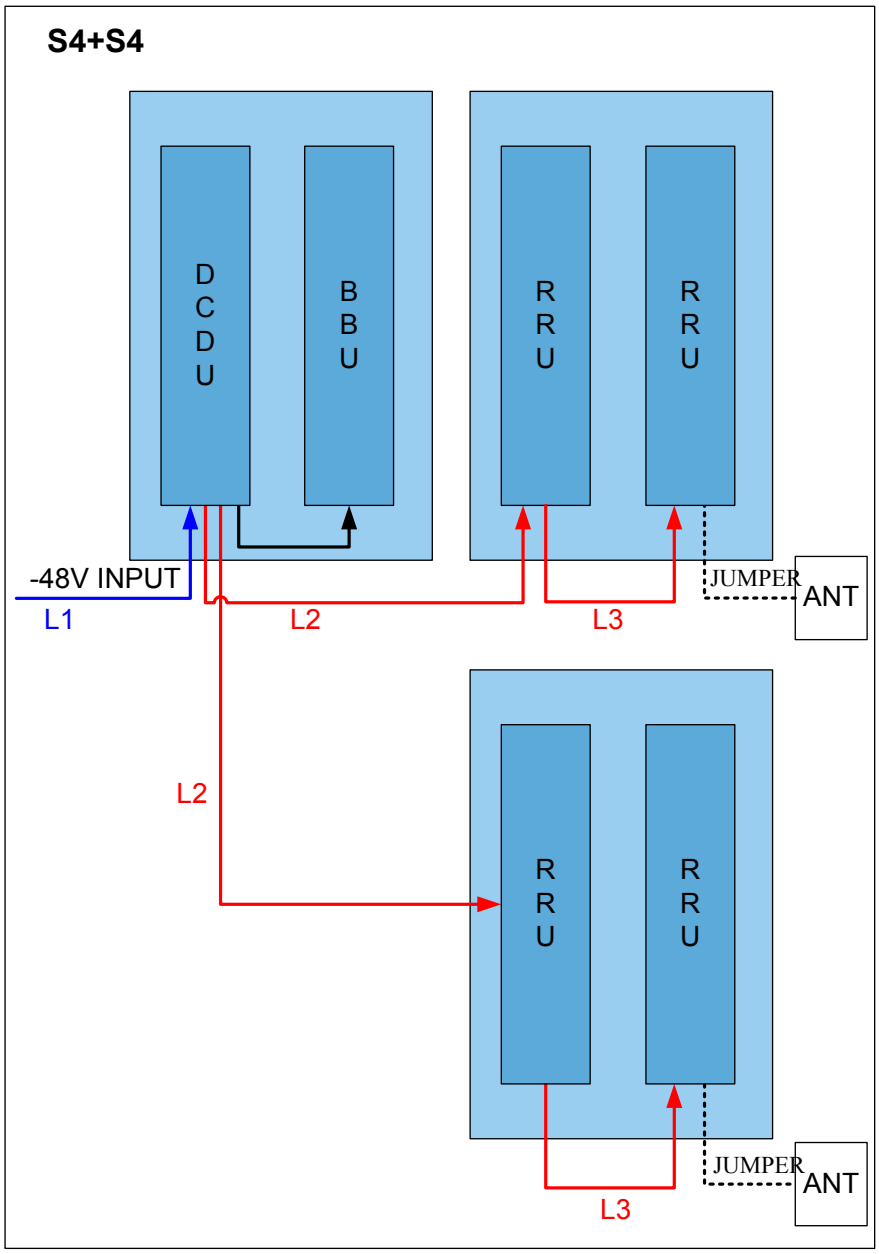


Figure 8-8 Separate installation (S4+S4)



In this installation scenario,

- The BBU and DCDU-03B are installed in an RRU rack through the 2 U-high adapting pieces.
- The RRU rack can be installed on the wall or stand.
- In S2+S2 configuration, the requirement for the switch quantity and capacity of the external power input system is 1 x 10 A. In S4+S4 configuration, the requirement is 1 x 20 A.
- Two cascaded RRUs are equipotentially connected and then grounded through one PGND cable.

8.2.2 Scenario 2: 220 V AC Power Input

When 220 V AC power and the equipment room are available on site, the BBU and RRU can be installed indoors.

Centralized Installation Scenarios

Figure 8-9 and **Figure 8-10** show the indoor centralized installation scenarios of the BBU and RRUs.

Figure 8-9 Centralized installation (S2)

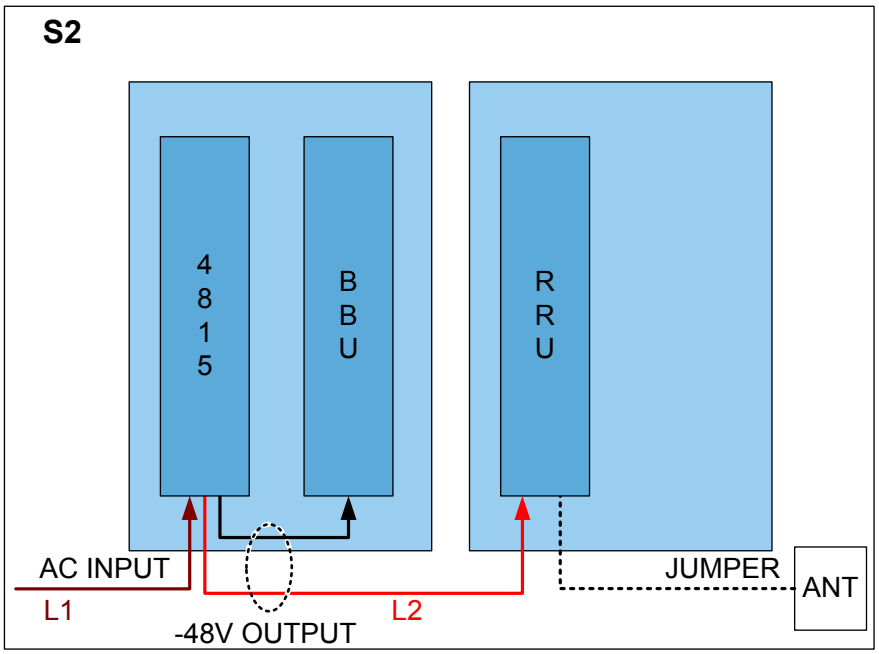
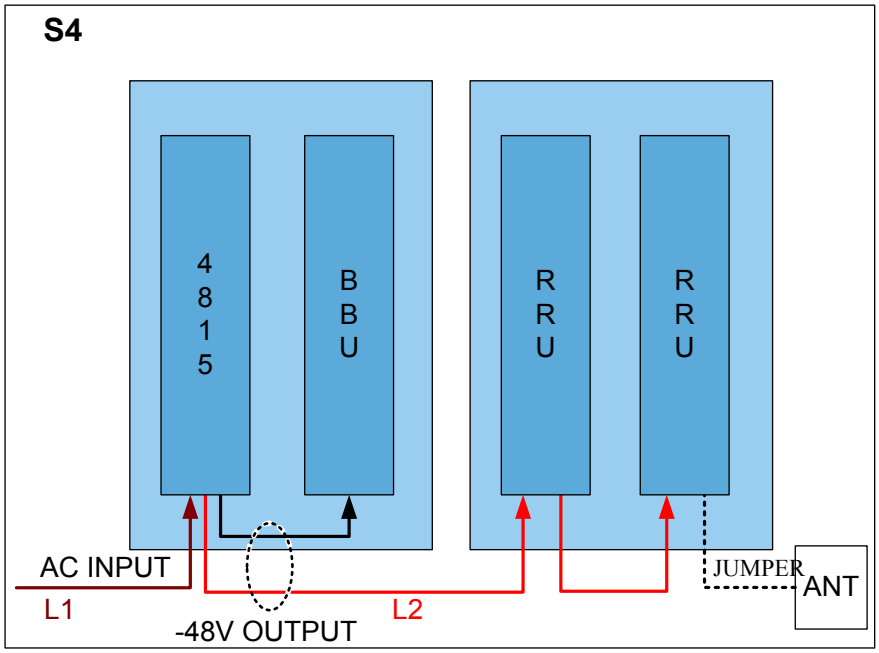


Figure 8-10 Centralized installation (S4)



In this installation scenario,

- The 4815 is an AC/DC conversion unit. It converts the 220 V AC power into the -48 V DC power for the BBU and RRUs.
- The BBU is installed in an RRU rack through a 2 U-high adapting piece. The same is true of the 4815.
- The RRU rack can be installed on the wall or stand.
- The requirement for the switch quantity and capacity of the external power input system is 1 x 5A (AC).
- The RRUs, BBU, and 4815 are equipotentially connected and then grounded through one PGND cable.
- When the 4815 is installed in the same rack as the BBU, the 4815 reports dry contact alarms to the BBU.

Separate Installation Scenarios

Figure 8-11 and **Figure 8-12** show the indoor separate installation scenarios of the BBU and RRUs.

Figure 8-11 Separate installation (S2+S2)

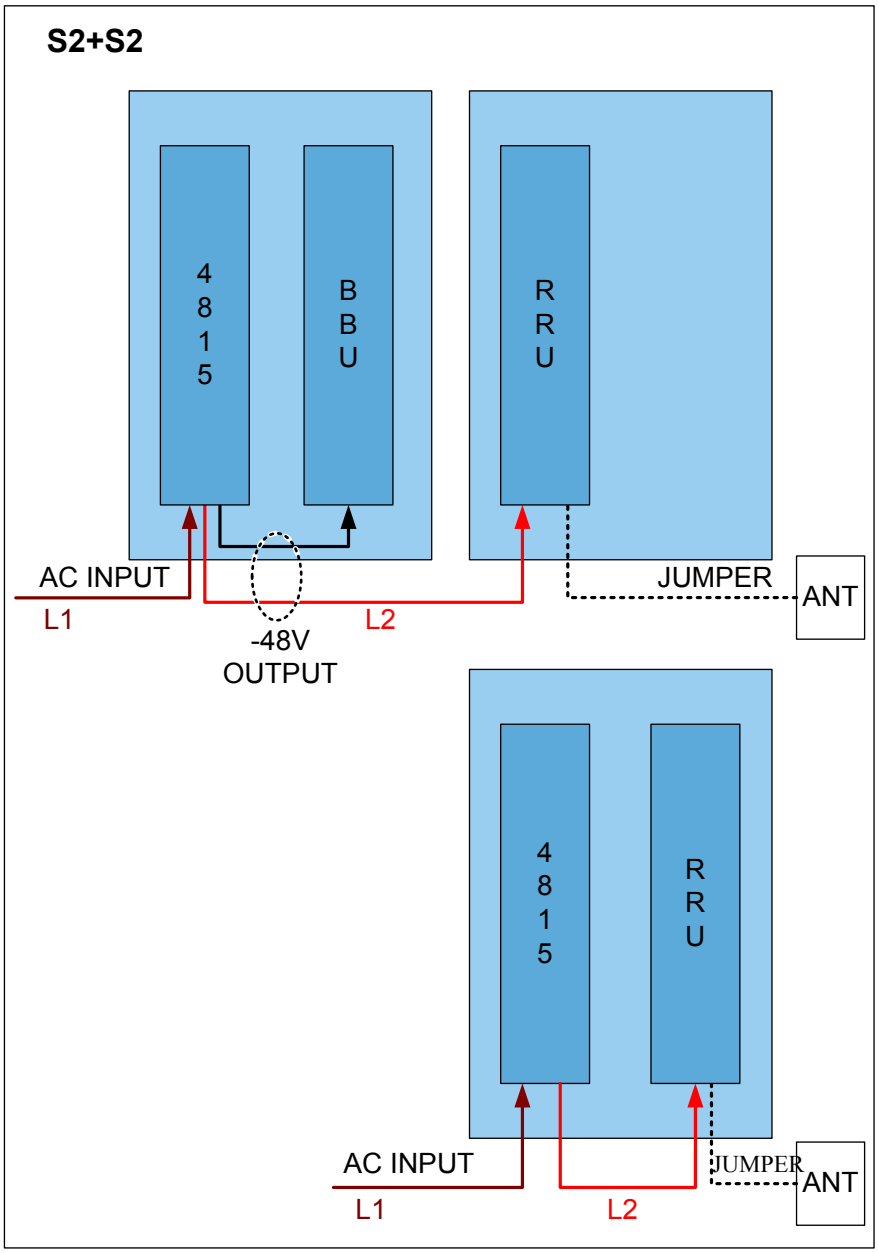
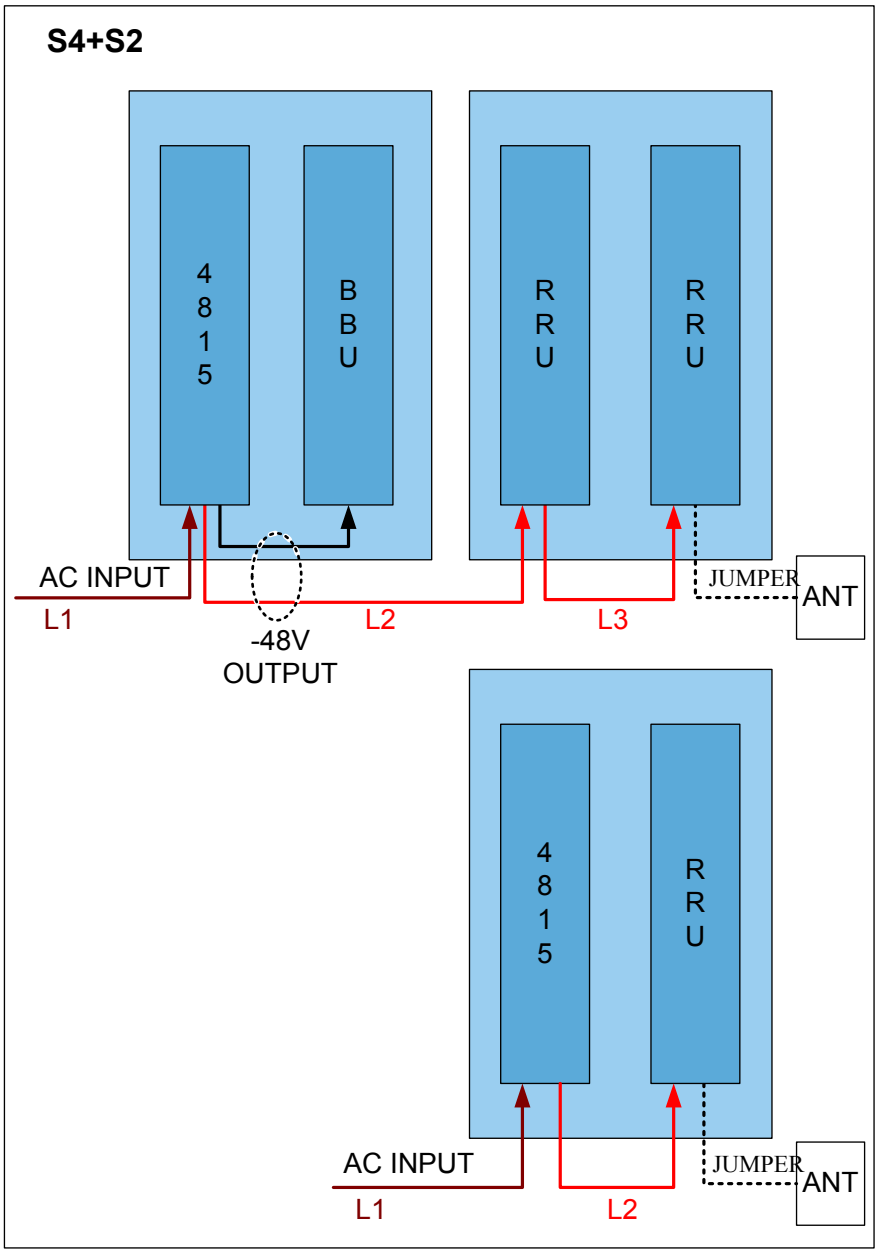


Figure 8-12 Separate installation (S4+S2)



In this installation scenario,

- The 4815 is an AC/DC conversion unit. It converts the 220 V AC power into the -48 V DC power for the BBU and RRUs.
- The BBU is installed in an RRU rack through a 2 U-high adapting piece. The same is true of the 4815.
- The RRU rack can be installed on the wall or stand.
- The requirement for the switch quantity and capacity of the external power input system is 2 x 5A.
- The RRU and 4815 are equipotentially connected and then grounded through one PGND cable.
- When the 4815 is installed in the same rack as the BBU, the 4815 reports dry contact alarms to the BBU.
- When the 4815 is installed in the same rack as the RRU, the RRU does not support detection and monitoring functions. Therefore, monitoring is not performed in this scenario.

8.3 BBU3900 Indoors and RRU3004 Outdoors

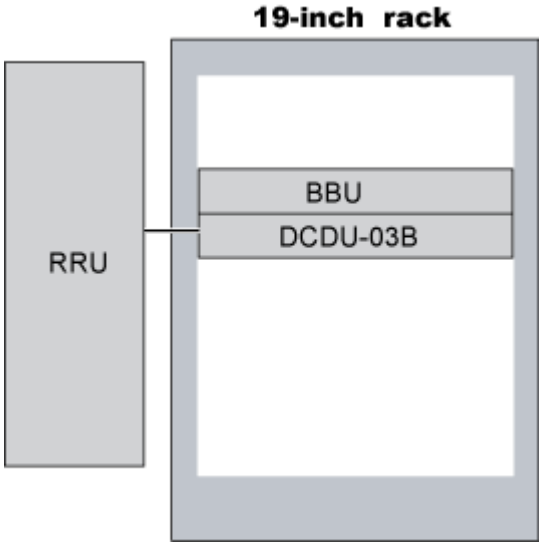
This describes the scenarios that the BBU3900 and RRU3004 of the DBS3900 are installed indoors and outdoors respectively.

8.3.1 Scenario 1: -48 V DC Power Input

When -48 V DC power is available on site, the installation scenario of BBU+RRU+DCDU-03B is applicable.

Figure 8-13 shows the installation scenario of BBU+RRU+DCDU-03B.

Figure 8-13 Installation scenario of BBU+RRU+DCDU-03B



In this installation scenario,

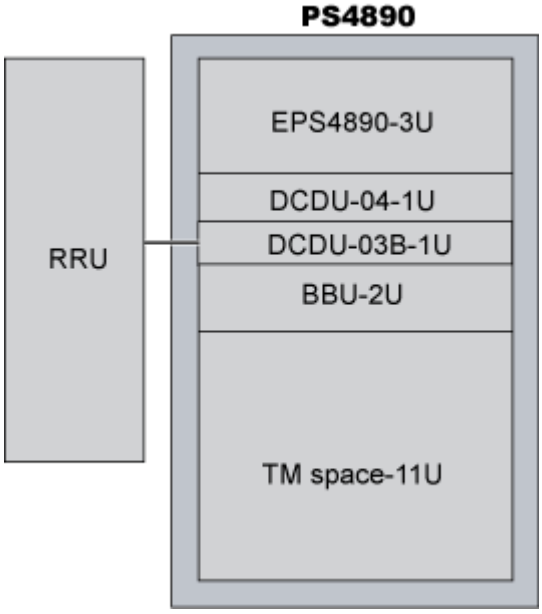
- The BBU and DCDU-03B are installed in an indoor 19-inch rack.
- The RRU can be installed outdoors on a pole.
- The requirement for the switch quantity and capacity of the external power input system is 1 x (63 A to 100 A). The 63 A input is recommended.

8.3.2 Scenario 2: 220 V AC Power Input

When 220 V AC power is available on site, the installation scenario of BBU+RRU+PS4890 +DCDU-03B is applicable.

Figure 8-14 shows the installation scenario of BBU+RRU+PS4890+DCDU-03B.

Figure 8-14 Installation scenario of BBU+RRU+PS4890+DCDU-03B



In this installation scenario,

- The BBU and DCDU-03B are installed in an indoor PS4890.
- The RRU can be installed outdoors on a pole.
- The requirements for the switch quantity and capacity of the external power input system are as follows:
  - 110 V AC dual-live-wire: 2 x (32 A to 50 A). The 32 A input is recommended.
  - 220 V AC single-phase: 1 x (32 A to 50 A). The 32 A input is recommended.
  - 220 V AC three-phase: 3 x (20 A to 30 A). The 20 A input is recommended.

8.4 BBU3900 Outdoors and RRU3008 Outdoors

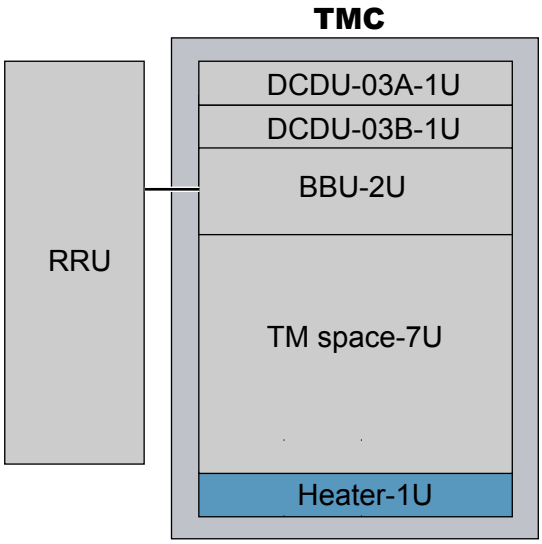
This describes the scenarios that the BBU3900 and RRU3008 of the DBS3900 are installed outdoors.

8.4.1 Scenario 1: -48 V DC Power Input

When -48 V DC power is available on site, the installation scenario of BBU+RRU+TMC is applicable.

Figure 8-15 shows the installation scenario of BBU+RRU+TMC.

Figure 8-15 Installation scenario of BBU+RRU+TMC



In this installation scenario,

- The TMC can be installed on the floor, pole, or wall.
- The TMC provides an installation space no greater than 7 U.
- The BBU can be installed in the TMC, which is equipped with the DCDU-03B to provide power for the BBU and RRU.
- The DCDU-03A configured in the TMC supplies power to transmission units.
- The heater in the TMC is optional.
- The RRU can be installed on a pole or tower.
- The requirement for the switch quantity and capacity of the external power input system is 1 x 63 A.

8.4.2 Scenario 2: 220 V AC Power Input

When 220 V AC power is available on site and the required space for transmission units is not greater than 4 U, the installation scenario of BBU+RRU+APM30+BBC is applicable.

NOTE

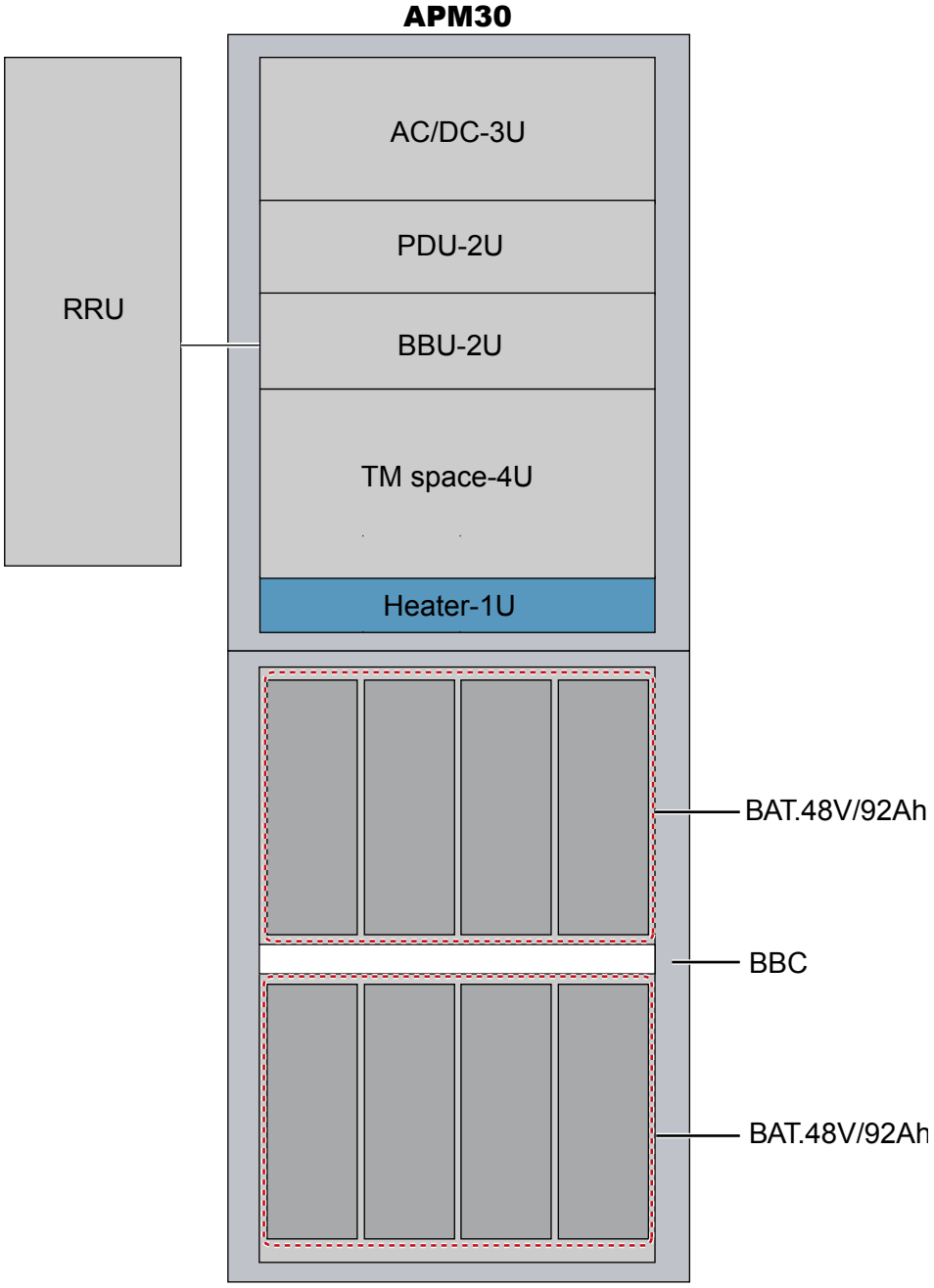
If the required space for transmission units is greater than 4 U, configure a TMC and ensure that the distance between the APM30 and the TMC is not longer than 1 m.

Scenario of Four-Hour Backup Power

If the backup power required at the site is not greater than four hours, installation scenario 1 of BBU+RRU+APM30+BBC is applicable.

Figure 8-16 shows installation scenario 1 of BBU+RRU+APM30+BBC.

Figure 8-16 Installation scenario 1 of BBU+RRU+APM30+BBC



In this installation scenario,

- The BBC is installed on the floor. By default, the APM30 is stacked on the BBC.
- The heater in the APM30 is optional. The APM30 provides a maximum of 4 U space for transmission units.
- The BBU can be installed in the APM30, which supplies -48 V DC power to the BBU and RRU.
- The RRU can be installed on a pole or tower.

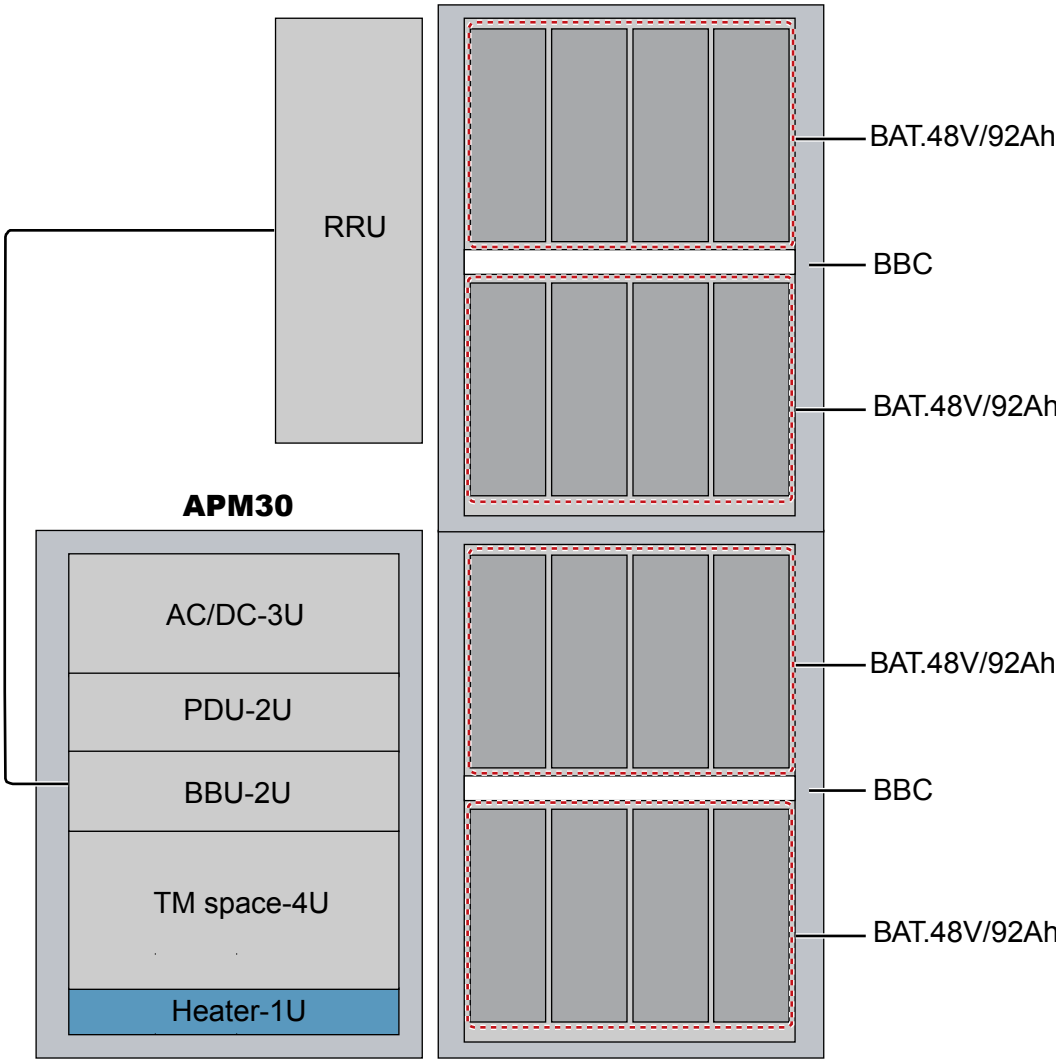
- The heater in the BBC is optional. Without occupying additional internal space, the heater can be placed under the baffle plate at the bottom of each battery layer.
- The requirements for the switch quantity and capacity of the external power input system are as follows:
  - 110 V AC dual-live-wire: 2 x (32 A to 50 A). The 32 A input is recommended.
  - 220 V AC single-phase: 1 x (32 A to 50 A). The 32 A input is recommended.
  - 220 V AC three-phase: 3 x (20 A to 30 A). The 20 A input is recommended.

Scenario of Eight-Hour Backup Power

If eight-hour backup power is required at the site, installation scenario 2 of BBU+RRU+APM30 +BBC is applicable.

Figure 8-17 shows installation scenario 2 of BBU+RRU+APM30+BBC.

Figure 8-17 Installation scenario 2 of BBU+RRU+APM30+BBC



In this installation scenario,

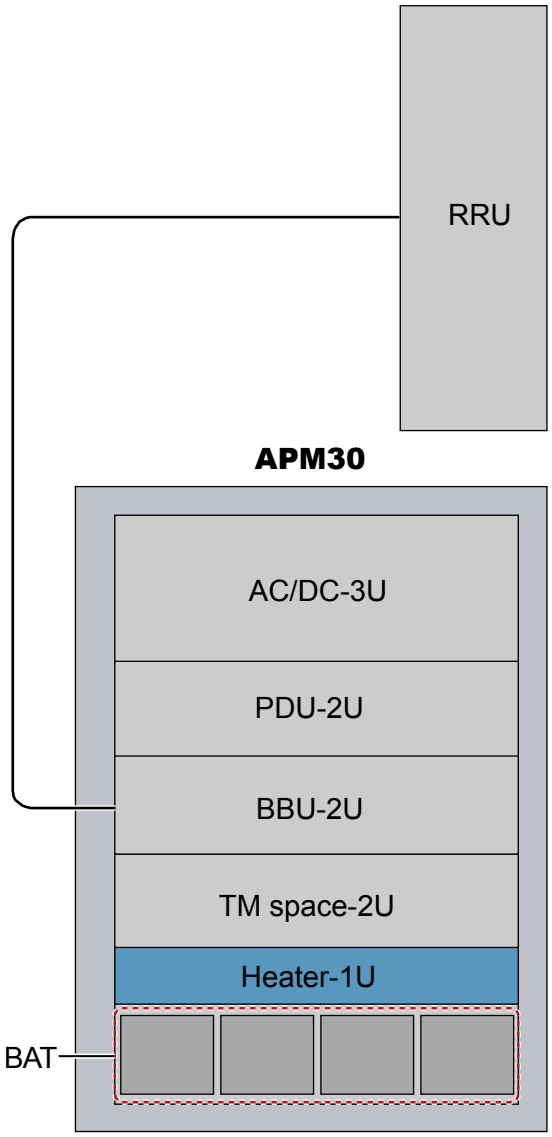
- The APM30 and the BBC can be installed on the floor. By default, the two BBCs are stacked.
- The APM30 provides a maximum of 4 U space for transmission units.
- The BBU can be installed in the APM30, which supplies -48 V DC power to the BBU and RRU.
- The RRU can be installed on a pole or tower.
- The heater in the BBC is optional. Without occupying additional internal space, the heater can be placed under the baffle plate at the bottom of each battery layer.
- The requirements for the switch quantity and capacity of the external power input system are as follows:
  - 110 V AC dual-live-wire: 2 x (32 A to 50 A). The 32 A input is recommended.
  - 220 V AC single-phase: 1 x (32 A to 50 A). The 32 A input is recommended.
  - 220 V AC three-phase: 3 x (20 A to 30 A). The 20 A input is recommended.

Scenario of Half-Hour Backup Power

If half-hour backup power is required at the site, the installation scenario of BBU+RRU+APM30 is applicable.

Figure 8-18 shows the installation scenario of BBU+RRU+APM30.

Figure 8-18 Installation scenario of BBU+RRU+APM30



In this installation scenario,

- The batteries providing 24 Ah backup power can be placed in the APM30. The batteries support a maximum cell configuration of S4/4/4.
- The APM30 provides a maximum of 2 U space for transmission units.
- The BBU can be installed in the APM30, which supplies -48 V DC power to the BBU and RRU.
- The RRU can be installed on a pole or tower.
- The requirements for the switch quantity and capacity of the external power input system are as follows:
  - 110 V AC dual-live-wire: 2 x (32 A to 50 A). The 32 A input is recommended.
  - 220 V AC single-phase: 1 x (32 A to 50 A). The 32 A input is recommended.
  - 220 V AC three-phase: 3 x (20 A to 30 A). The 20 A input is recommended.

8.5 BBU3900 Indoors and RRU3008 Indoors

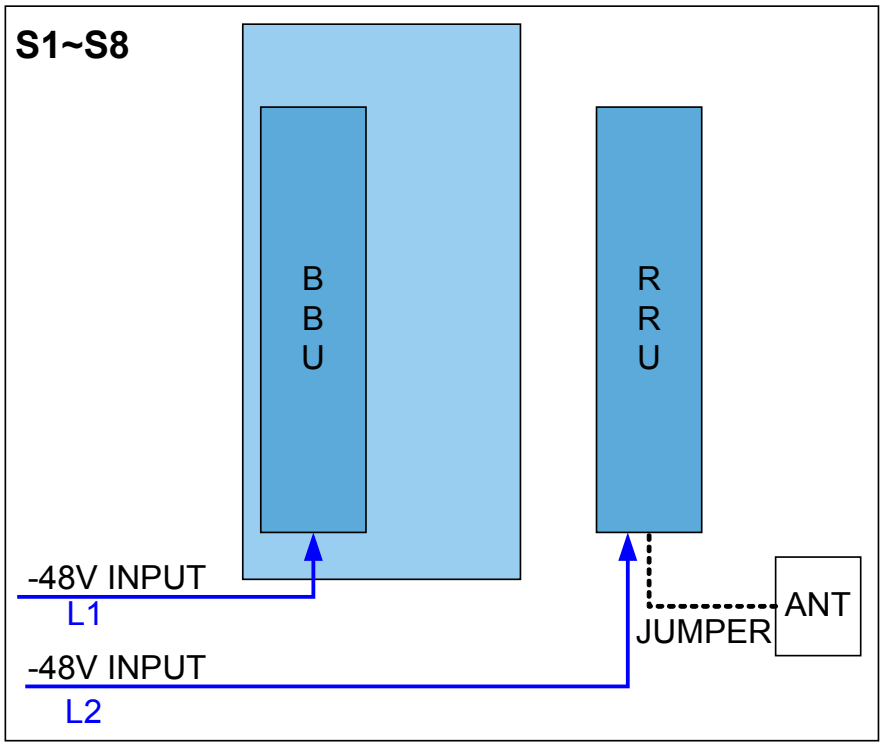
This describes the scenarios that the BBU3900 and RRU3008 of the DBS3900 are installed indoors.

8.5.1 Scenario 1: -48 V DC Power Input

When -48 V DC power and the equipment room are available on site, the BBU and RRU can be installed indoors.

Figure 8-19 shows the indoor centralized installation scenario of the BBU and RRU.

Figure 8-19 Indoor centralized installation



In this installation scenario,

- The BBU is installed in an RRU rack through a 2 U-high adapting piece. The RRU rack can be installed on the wall or stand.
- The RRU can be installed on the wall or stand.

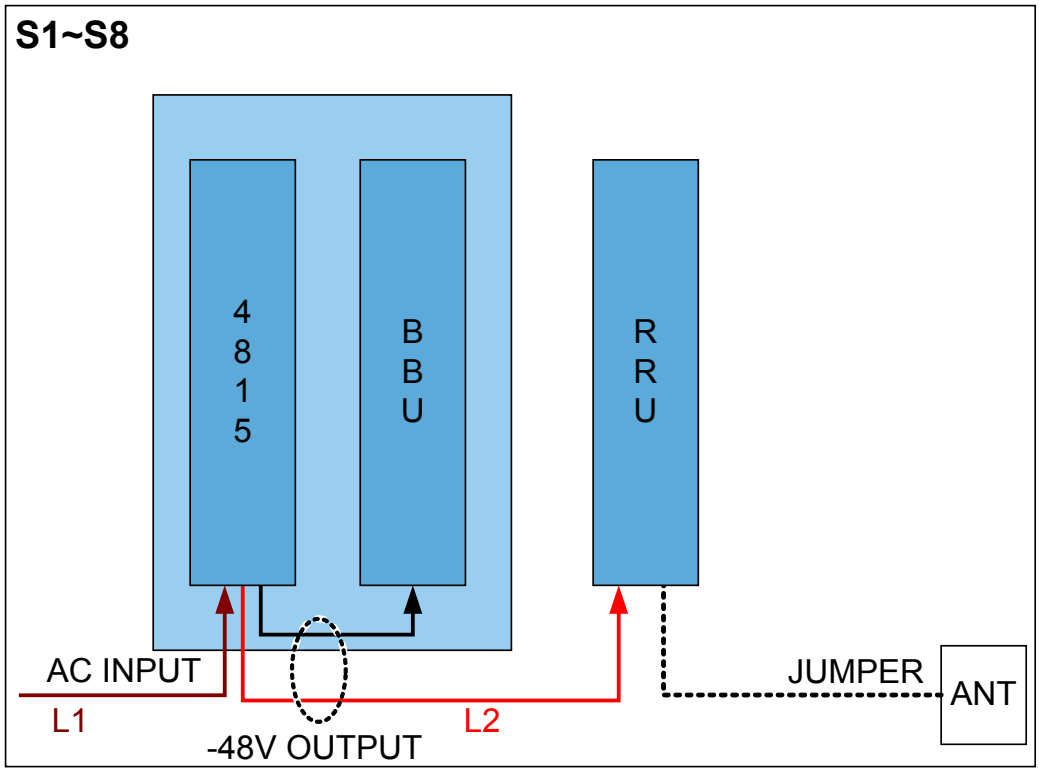
- For the BBU, the requirement for the switch quantity and capacity of the external power input system is 1 x (5 A to 10 A). For the RRU, the requirement is 1 x (10 A to 20 A).

8.5.2 Scenario 2: 220 V AC Power Input

When 220 V AC power and the equipment room are available on site, the BBU and RRU can be installed indoors.

Figure 8-20 shows the indoor centralized installation scenario of the BBU and RRU.

Figure 8-20 Indoor centralized installation



In this installation scenario,

- The 4815 is an AC/DC conversion unit. It converts the 220 V AC power into the -48 V DC power for the BBU and RRUs.
- The BBU and 4815 are installed in an RRU rack through the 2 U-high adapting pieces. The RRU rack can be installed on the wall or stand.
- The RRU can be installed on the wall or stand.
- The requirement for the switch quantity and capacity of the external power input system is 1 x 10 A (AC).

8.6 BBU3900 Indoors and RRU3008 Outdoors

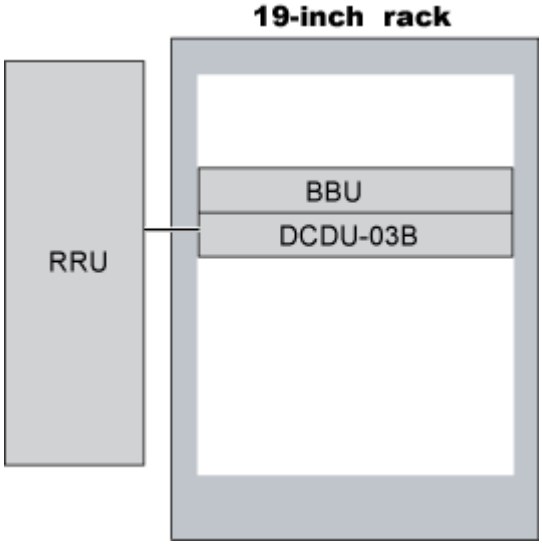
This describes the scenarios that the BBU3900 and RRU3008 of the DBS3900 are installed indoors and outdoors respectively.

8.6.1 Scenario 1: -48 V DC Power Input

When -48 V DC power is available on site, the installation scenario of BBU+RRU+DCDU-03B is applicable.

Figure 8-21 shows the installation scenario of BBU+RRU+DCDU-03B.

Figure 8-21 Installation scenario of BBU+RRU+DCDU-03B



In this installation scenario,

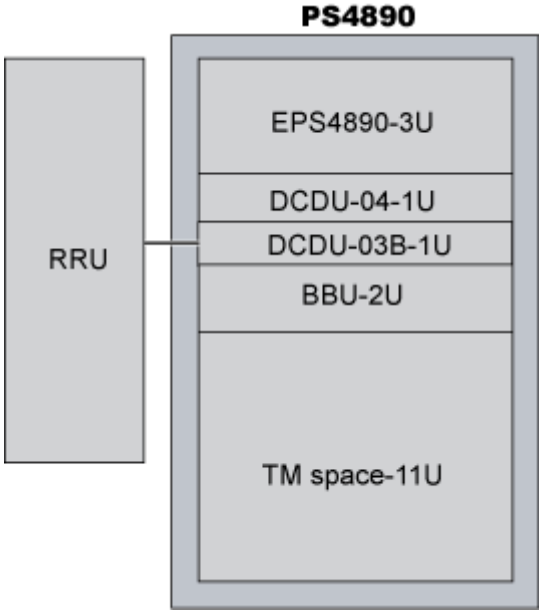
- The BBU and DCDU-03B are installed in an indoor 19-inch rack.
- The RRU can be installed outdoors on a pole.
- The requirement for the switch quantity and capacity of the external power input system is 1 x (63 A to 100 A). The 63 A input is recommended.

8.6.2 Scenario 2: 220 V AC Power Input

When 220 V AC power is available on site, the installation scenario of BBU+RRU+PS4890 +DCDU-03B is applicable.

Figure 8-22 shows the installation scenario of BBU+RRU+PS4890+DCDU-03B.

Figure 8-22 Installation scenario of BBU+RRU+PS4890+DCDU-03B



In this installation scenario,

- The BBU and DCDU-03B are installed in an indoor PS4890.
- The RRU can be installed outdoors on a pole.
- The requirements for the switch quantity and capacity of the external power input system are as follows:
  - 110 V AC dual-live-wire: 2 x (32 A to 50 A). The 32 A input is recommended.
  - 220 V AC single-phase: 1 x (32 A to 50 A). The 32 A input is recommended.
  - 220 V AC three-phase: 3 x (20 A to 30 A). The 20 A input is recommended.

9 Typical Scenarios of the DBS3900 (with the AC RRU)

About This Chapter

This describes the typical scenarios of the DBS3900 configured with the BBU3900 and AC RRU.

9.1 BBU3900 Indoors + RRU Indoors
This describes the scenarios of the BBU3900 and RRU installed indoors. The scenarios are categorized into two types: sites with DC power supply and sites without DC power supply. In such scenarios, the RRU is remotely installed. The RRU3004 has the same power supply mode and installation mode as the RRU3008.

9.2 BBU3900 Indoors + RRU Outdoors
This describes the scenarios of the BBU3900 installed indoors and RRU outdoors. The scenarios are categorized into two types: sites with DC power supply and sites without DC power supply. In such scenarios, the RRU is remotely installed. The RRU3004 has the same power supply mode and installation mode as the RRU3008.

9.1 BBU3900 Indoors + RRU Indoors

This describes the scenarios of the BBU3900 and RRU installed indoors. The scenarios are categorized into two types: sites with DC power supply and sites without DC power supply. In such scenarios, the RRU is remotely installed. The RRU3004 has the same power supply mode and installation mode as the RRU3008.

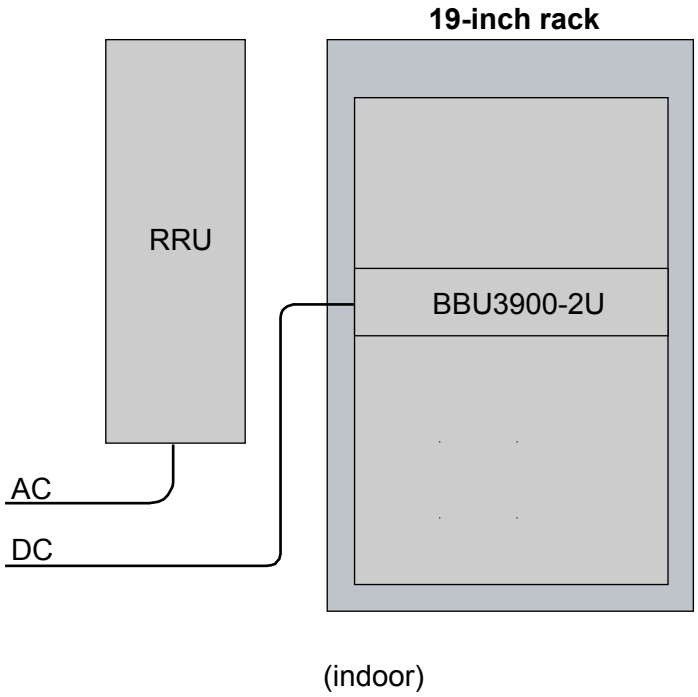
The requirements for the upper-level MCB of the BBU3900 and RRU are as follows:

- The requirements for the DC upper-level MCB of the BBU3900 is 5 A to 10 A.
- The requirements for the AC upper-level MCB of the RRU is 5 A to 10 A.

Sites with DC Power Supply

If a site supplies DC power, the installation scenario of the BBU3900 and RRU is shown in **Figure 9-1**.

Figure 9-1 BBU3900 indoors + RRU indoors (1)



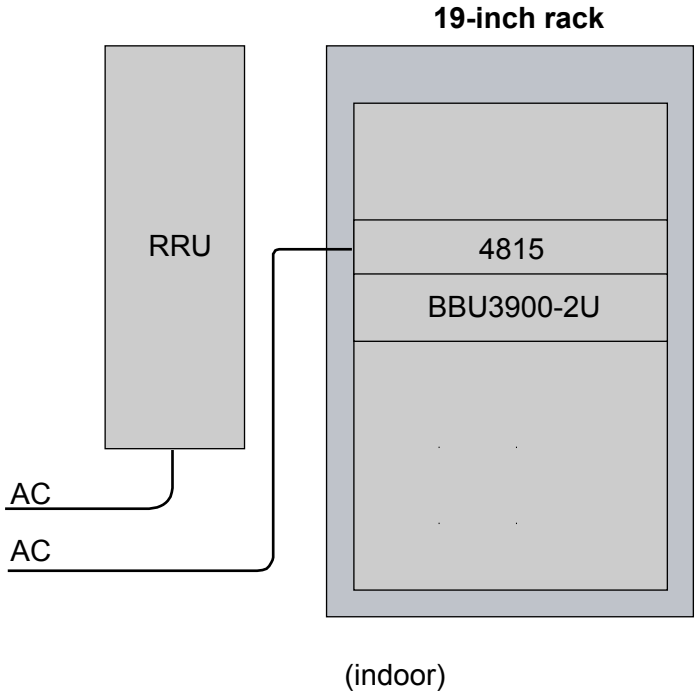
In this scenario,

- The DC power is supplied to the BBU3900 directly by the site.
- The BBU3900 can be installed in a 19-inch rack or in the spare space of the customer equipment.
- The RRU is directly supplied with AC power.
- The RRU can be installed on the wall.

Sites Without DC Power Supply

If a site does not supply DC power and the BBU3900 has no requirements for power backup, the installation scenarios of the BBU3900 and RRU are shown in **Figure 9-2**.

Figure 9-2 BBU3900 indoors + RRU indoors (2)

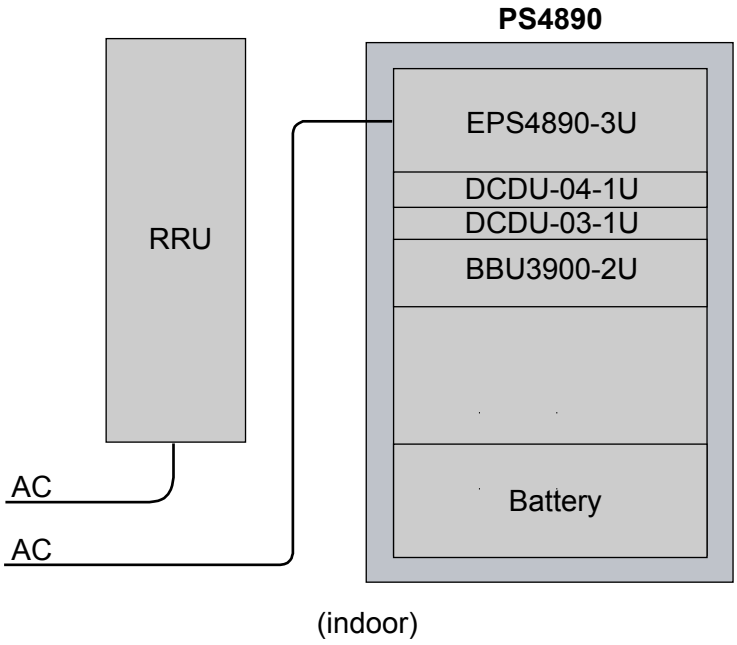


In this scenario,

- The 4815 serves as an AC/DC conversion unit. It converts AC power into DC power for the BBU3900.
- The BBU3900 and 4815 can be installed in the spare space of the customer equipment or in a 19-inch rack.
- The RRU is directly supplied with AC power.
- The RRU can be installed on the wall.

If a site does not supply DC power and the BBU3900 has requirements for power backup, the installation scenarios of the BBU3900 and RRU are shown in **Figure 9-3**.

Figure 9-3 BBU3900 indoors + RRU indoors (3)



In this scenario,

- The PS4890 is used to convert AC power into DC power. It supplies power to and provides installation space for the BBU3900.
- If configured with the 50 Ah batteries, the PS4890 can provide power backup for a minimum of 24 hours for the BBU3900.
- The BBU3900 is installed in the PS4890.
- The RRU is directly supplied with AC power.
- The RRU can be installed on the wall.

9.2 BBU3900 Indoors + RRU Outdoors

This describes the scenarios of the BBU3900 installed indoors and RRU outdoors. The scenarios are categorized into two types: sites with DC power supply and sites without DC power supply. In such scenarios, the RRU is remotely installed. The RRU3004 has the same power supply mode and installation mode as the RRU3008.

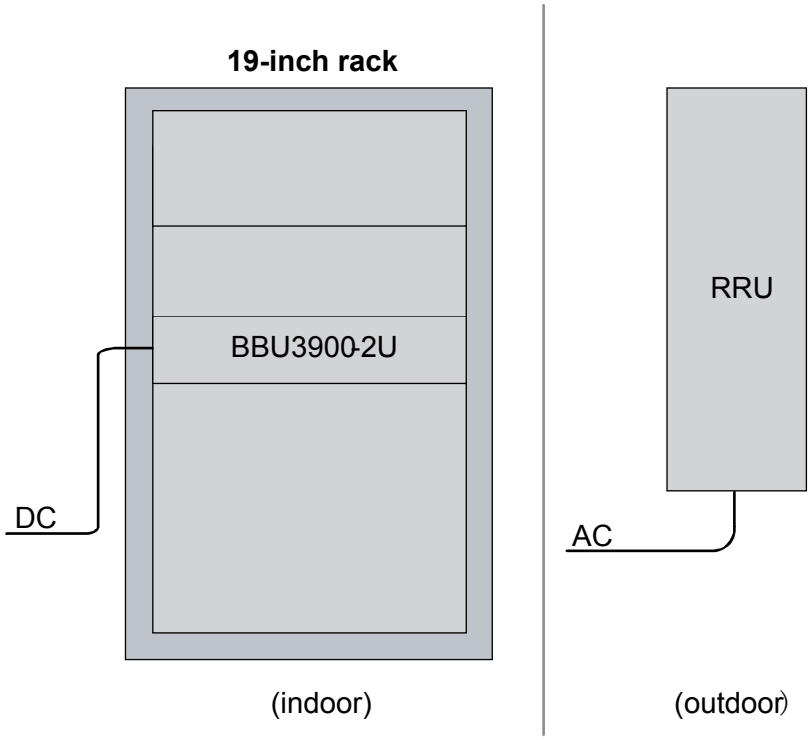
The requirements for the upper-level MCB of the BBU3900 and RRU are as follows:

- The requirements for the DC upper-level MCB of the BBU3900 is 5 A to 10 A.
- The requirements for the AC upper-level MCB of the RRU is 5 A to 10 A.

Sites with DC Power Supply

If a site supplies DC power, the installation scenario of the BBU3900 and RRU is shown in **Figure 9-4**.

Figure 9-4 BBU3900 indoors + RRU outdoors (1)



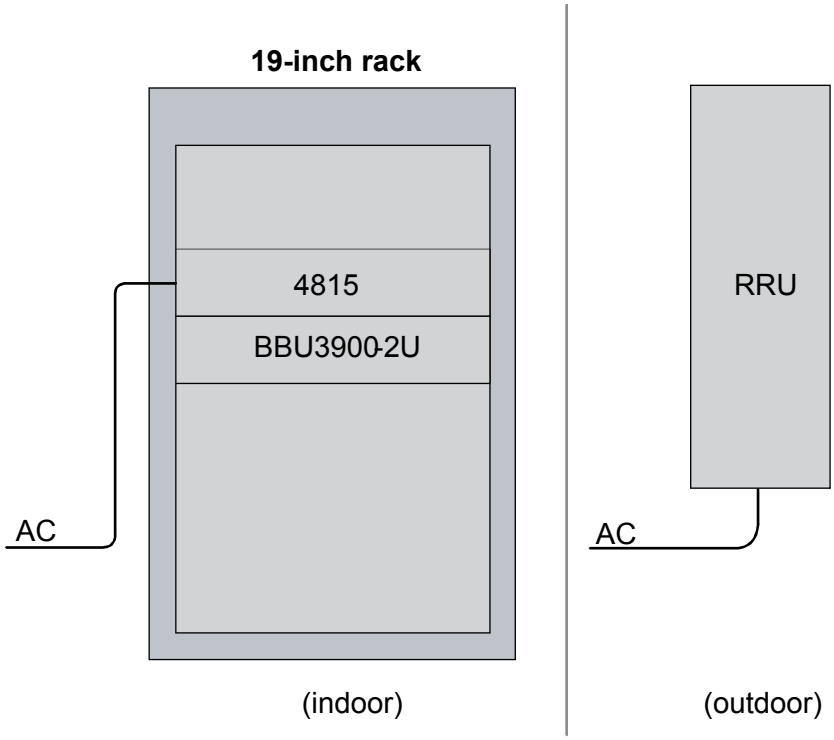
In this scenario,

- The DC power is directly supplied to the BBU3900 by the site.
- The BBU3900 can be installed in a 19-inch rack or in the spare space of the customer equipment.
- The RRU is directly supplied with AC power.
- The RRU can be installed on the pole or wall.

Sites Without DC Power Supply

If a site does not supply DC power and the BBU3900 has no requirements for power backup, the installation scenarios of the BBU3900 and RRU are shown in **Figure 9-5**.

Figure 9-5 BBU3900 indoors + RRU outdoors (2)

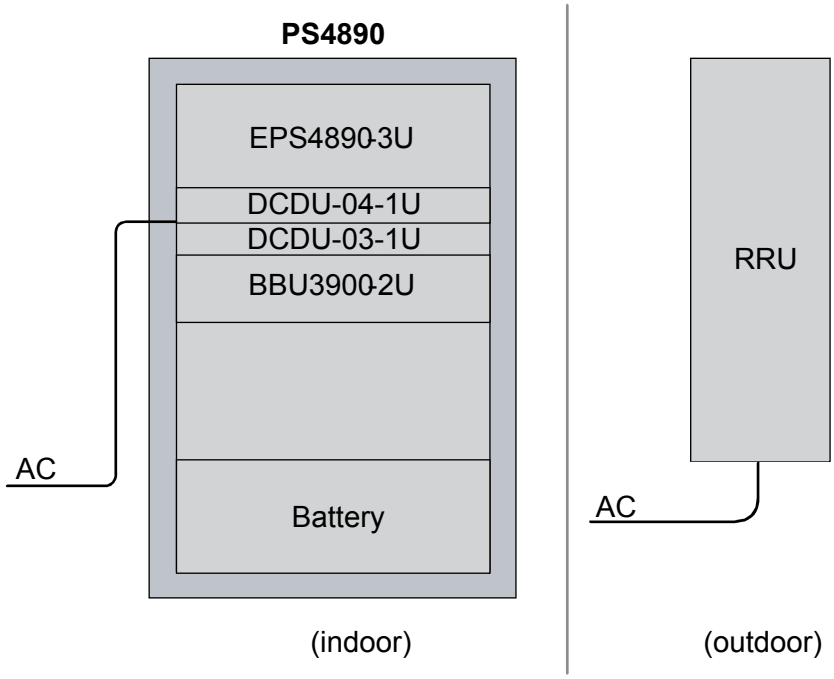


In this scenario,

- The 4815 serves as an AC/DC conversion unit. It converts AC power into DC power for the BBU3900.
- The BBU3900 and 4815 can be installed in the spare space of the customer equipment or in a 19-inch rack.
- The RRU is directly supplied with AC power.
- The RRU can be installed on the pole or wall.

If a site does not supply DC power and the BBU3900 has requirements for power backup, the installation scenarios of the BBU3900 and RRU are shown in **Figure 9-6**.

Figure 9-6 BBU3900 indoors + RRU outdoors (3)



In this scenario,

- The PS4890 is used to convert AC power into DC power. It supplies power to and provides installation space for the BBU3900.
- If configured with the 50 Ah batteries, the PS4890 can provide power backup for a minimum of 24 hours for the BBU3900.
- The BBU3900 is installed in the PS4890.
- The RRU is directly supplied with AC power.
- The RRU can be installed on the pole or wall.

10 Configuration of the DBS3900

About This Chapter

The DBS3900 features flexible configuration and supports multiple receive and transmit modes.

Configuration Features

The DBS3900 has the following features in terms of configuration:

- It supports omni-directional and directional coverage modes.
- The RF modules can be cascaded.
- For the RRU3004, the transmit mode can be transmit independency or combining, PBT, transmit diversity, or dynamic PBT. For the RRU3008, the transmit mode can be transmit independency and transmit diversity.
- The receive mode can be the main and diversity mode.

10.1 Typical Configurations of the DBS3900

The DBS3900 supports the omni-directional, 2-sector, and 3-sector configurations.

Table 10-1 describes the typical configurations of the DBS3900 that uses the RRU3004.

Table 10-1 Typical configurations of the DBS3900 with the RRU3004

Configuration	Number of BBUs	Number of RRU Modules (No Transmit Diversity)
S1/1/1	1	3
S2/2/2	1	3
S3/3/3	1	6
S4/4/4	1	6
S5/5/5	1	9
S6/6/6	1	9
S7/7/7	1	12
S8/8/8	1	12

Table 10-2 describes the typical configurations of the DBS3900 that uses the RRU3008.

Table 10-2 Typical configurations of the DBS3900 with the RRU3008

Configuration	Number of BBUs	Number of RRU Modules (No Transmit Diversity)
S3/3/3	1	3
S4/4/4	1	3
S5/5/5	1	3 to 6
S6/6/6	1	3 to 6
S7/7/7	1	3 to 6
S8/8/8	1	3 to 6
S9/9/9	1	6
S10/10/10	1	6
S11/11/11	1	6
S12/12/12	1	6
S13/13/13	1	6

Configuration	Number of BBUs	Number of RRU Modules (No Transmit Diversity)
S14/14/14	1	6
S15/15/15	1	6
S16/16/16	1	6

10.2 RF Cable Connections of the RRU3004

The RF cables of the RRU are classified into RF jumpers and interconnection jumpers. According to the actual conditions, the RF jumper can be connected to the feeder or can be directly connected to the antenna. The interconnect jumper is used to connect the **RX_IN/OUT** ports of two RRU3004 modules so that RF signals can be transmitted between the two RRU modules. You can determine the appropriate RF cable connections based on the actual networking modes.

Table 10-3 describes the RF cable connections in different networking modes.

NOTE

Table 10-3 takes the star topology between the BBU3900 and the RRU3004 as an example.

The RF cables differ from each other in colors. **Figure 10-1** shows the mapping between the RF signal cables and their colors.

Figure 10-1 Mapping between the RF cables and their colors

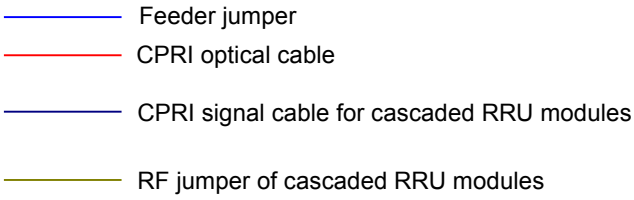
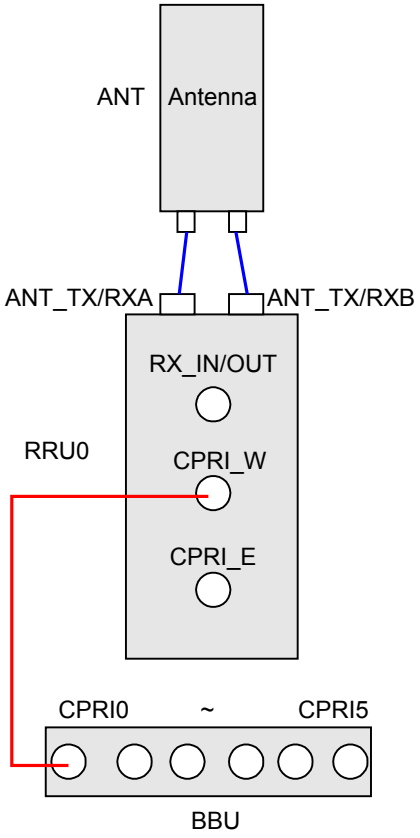
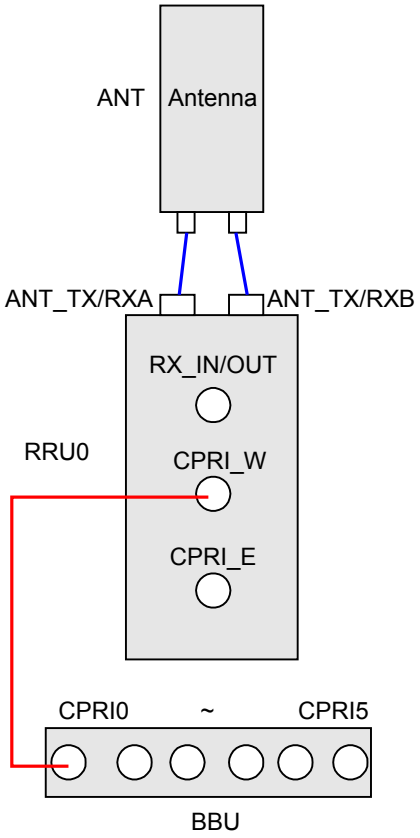
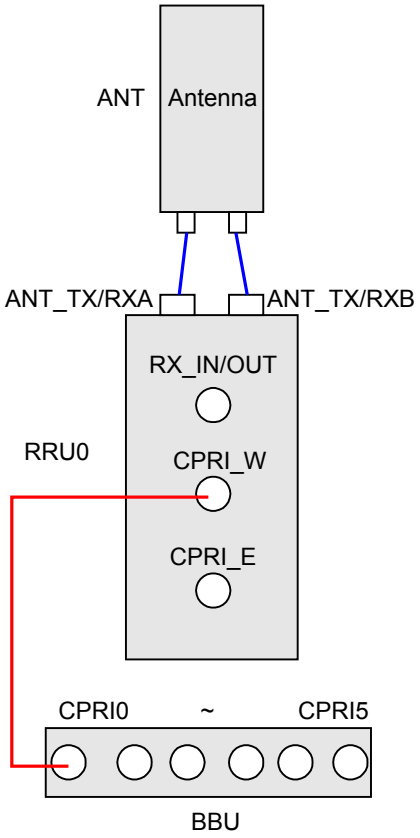
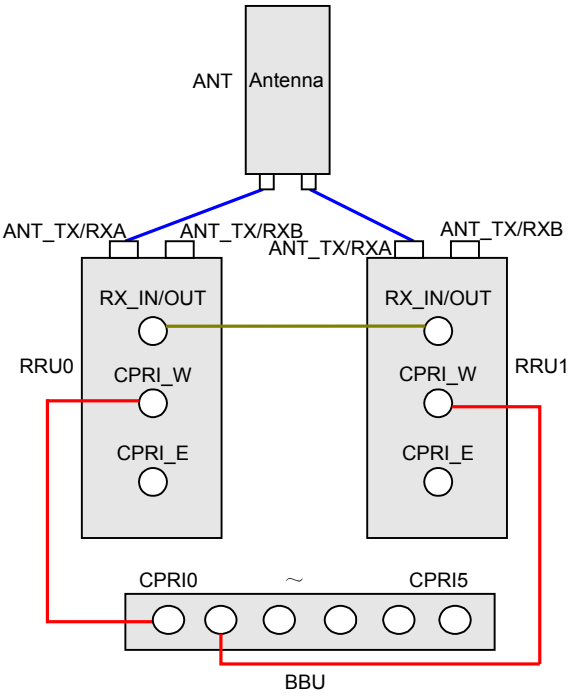


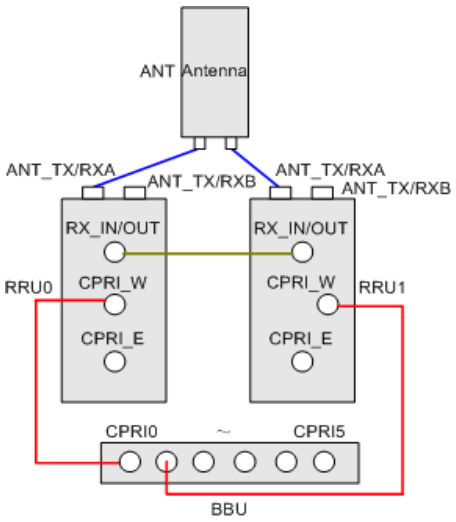
Table 10-3 RF cable connections of the RRU3004 in different configurations

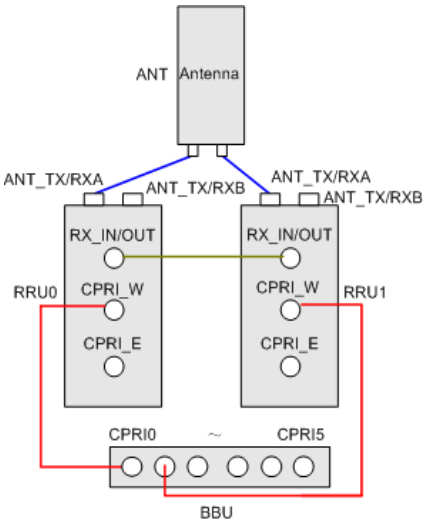
Typical Configuration	Hardware Configuration	Software Configuration
S1	• One RRU3004 module • One dual-polarized antenna **Figure 10-2** shows the related RF cable connections. **Figure 10-2** RF cable connections of S1 (no transmit diversity)  	The settings of TRX attributes and antenna mode on the BSC side are as follows: • Transmit mode: **Transmit Independency** • Receive mode: **Receive Diversity** • Antenna mode: **Double Feeder (2TX + 2RX)**

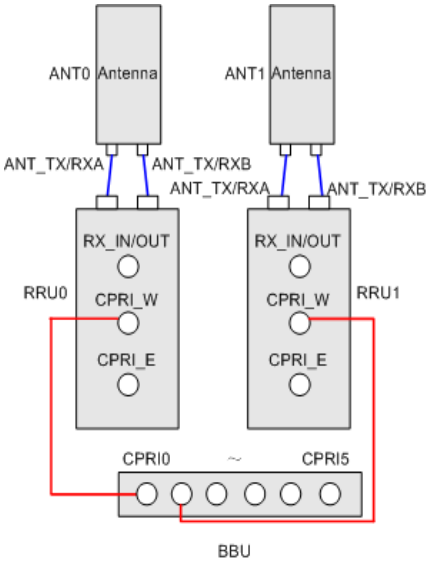
Typical Configuration	Hardware Configuration	Software Configuration
S1	• One RRU3004 module • One dual-polarized antenna **Figure 10-3** shows the related RF cable connections. **Figure 10-3** RF cable connections of S1 (transmit diversity)  	The settings of TRX attributes and antenna mode on the BSC side are as follows: • Transmit mode: **Transmit Diversity** • Receive mode: **Receive Diversity** • Antenna mode: **Double Feeder (2TX + 2RX)**

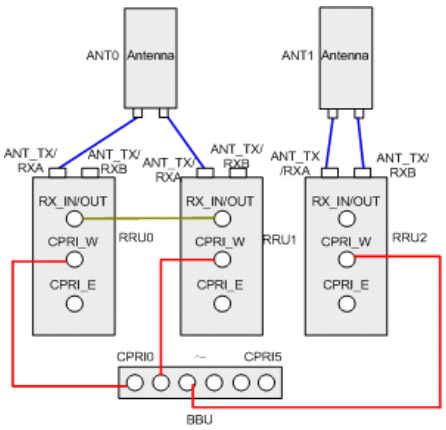
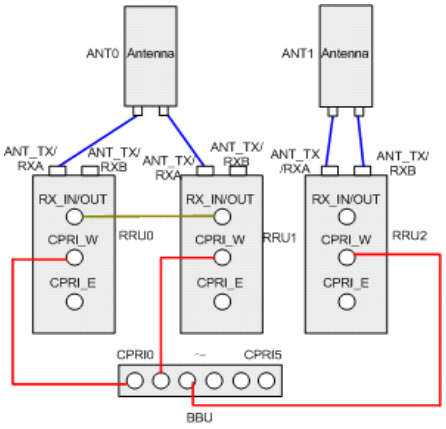
Typical Configuration	Hardware Configuration	Software Configuration
S2	• One RRU3004 module • One dual-polarized antenna **Figure 10-4** shows the related RF cable connections. **Figure 10-4** RF cable connections of S2 (no transmit diversity)  	The settings of TRX attributes and antenna mode on the BSC side are as follows: • Transmit mode: **Transmit Independency or Combining** • Receive mode: **Receive Diversity** • Antenna mode: **Double Feeder (2TX + 2RX)**

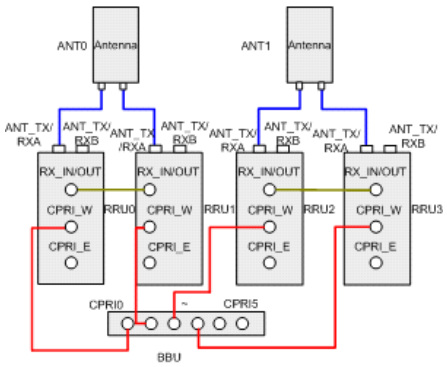
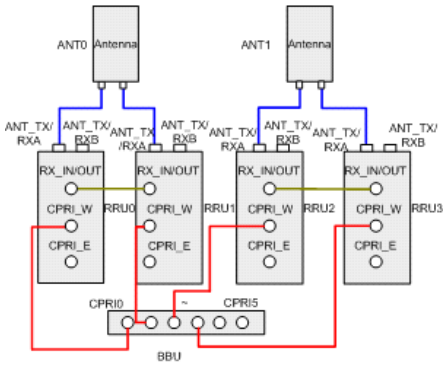
Typical Configuration	Hardware Configuration	Software Configuration
S2	• Two RRU3004 modules • One dual-polarized antenna **Figure 10-5** shows the related RF cable connections. **Figure 10-5** RF cable connections of S2 (PBT)  	The settings of TRX attributes and antenna mode on the BSC side are as follows: • Transmit mode: **PBT** • Receive mode: **Receive Diversity** • Antenna mode: **Single Feeder (1TX + 2RX)**

Typical Configuration	Hardware Configuration	Software Configuration
S3	• Two RRU3004 modules • One dual-polarized antenna **Figure 10-6** shows the related RF cable connections. **Figure 10-6** RF cable connections of S3 (no transmit diversity)  	The settings of TRX attributes and antenna mode on the BSC side are as follows: • Transmit mode: **Transmit Independency or Combining** • Receive mode: **Receive Diversity** • Antenna mode: **Single Feeder (1TX + 2RX)**

Typical Configuration	Hardware Configuration	Software Configuration
S4	• Two RRU3004 modules • One dual-polarized antenna **Figure 10-7** shows the related RF cable connections. **Figure 10-7** RF cable connections of S4 (no transmit diversity)  	The settings of TRX attributes and antenna mode on the BSC side are as follows: • Transmit mode: **Transmit Independency or Combining** • Receive mode: **Receive Diversity** • Antenna mode: **Single Feeder (1TX + 2RX)**

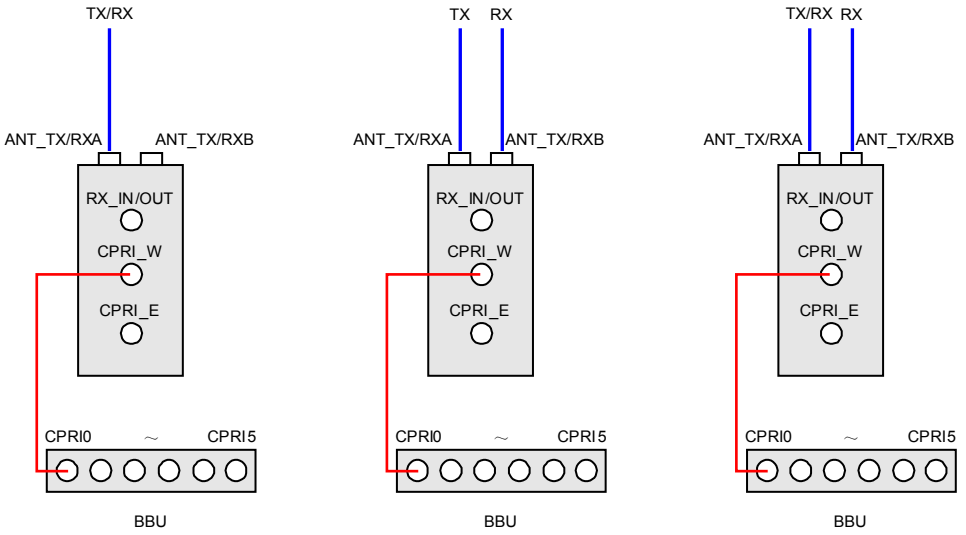
Typical Configuration	Hardware Configuration	Software Configuration
S4	• Two RRU3004 modules • Two dual-polarized antennas **Figure 10-8** shows the related RF cable connections. **Figure 10-8** RF cable connections of S4 (transmit diversity)  	The settings of TRX attributes and antenna mode on the BSC side are as follows: • Transmit mode: **Transmit Independency or Combining** • Receive mode: **Receive Diversity** • Antenna mode: **Double Feeder (2TX + 2RX)**

Typical Configuration	Hardware Configuration	Software Configuration
S5	• Three RRU3004 modules • Two dual-polarized antennas **Figure 10-9** shows the related RF cable connections. **Figure 10-9** RF cable connections of S5 (no transmit diversity)  	The settings of TRX attributes and antenna mode on the BSC side are as follows: • Transmit mode: **Transmit Independency or Combining** • Receive mode: **Receive Diversity** • Antenna mode: **Single Feeder (1TX + 2RX)** for the RRU0 and RRU1, and **Double Feeder (2TX + 2RX)** for the RRU2
S6	• Three RRU3004 modules • Two dual-polarized antennas **Figure 10-10** shows the related RF cable connections. **Figure 10-10** RF cable connections of S6 (no transmit diversity)  	The settings of TRX attributes and antenna mode on the BSC side are as follows: • Transmit mode: **Transmit Independency or Combining** • Receive mode: **Receive Diversity** • Antenna mode: **Single Feeder (1TX + 2RX)** for the RRU0 and RRU1, and **Double Feeder (2TX + 2RX)** for the RRU2

Typical Configuration	Hardware Configuration	Software Configuration
S7	• Four RRU3004 modules • Two dual-polarized antennas **Figure 10-11** shows the related RF cable connections. **Figure 10-11** RF cable connections of S7 (no transmit diversity)  	The settings of TRX attributes and antenna mode on the BSC side are as follows: • Transmit mode: **Transmit Independency or Combining** • Receive mode: **Receive Diversity** • Antenna mode: **Single Feeder (1TX + 2RX)**
S8	• Four RRU3004 modules • Two dual-polarized antennas **Figure 10-12** shows the related RF cable connections. **Figure 10-12** RF cable connections of S8 (no transmit diversity)  	The settings of TRX attributes and antenna mode on the BSC side are as follows: • Transmit mode: **Transmit Independency or Combining** • Receive mode: **Receive Diversity** • Antenna mode: **Single Feeder (1TX + 2RX)**

The other available antenna modes for the RRU3004 are **Single Feeder (1TX + 1RX)**, **Double Feeder (1TX + 1RX)**, and **Double Feeder (1TX + 2RX)**. **Figure 10-13** shows cable connections.

Figure 10-13 RF cable connections of the RRU3004



10.3 RF Cable Connections of the RRU3008

You can determine the appropriate RF cable connections based on the actual networking mode.

Table 10-4 describes the RF cable connections in different networking modes.

NOTE

Table 10-4 takes the star topology between the BBU3900 and the RRU3008 as an example.

The RF cables differ from each other in colors. **Figure 10-14** shows the mapping between the RF signal cables and their colors.

Figure 10-14 Mapping between the RF cables and their colors

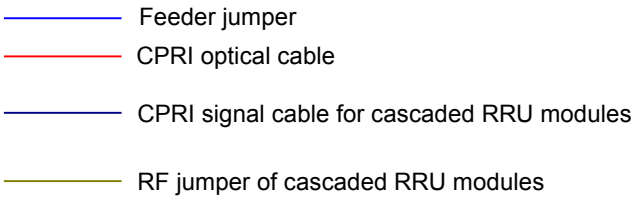
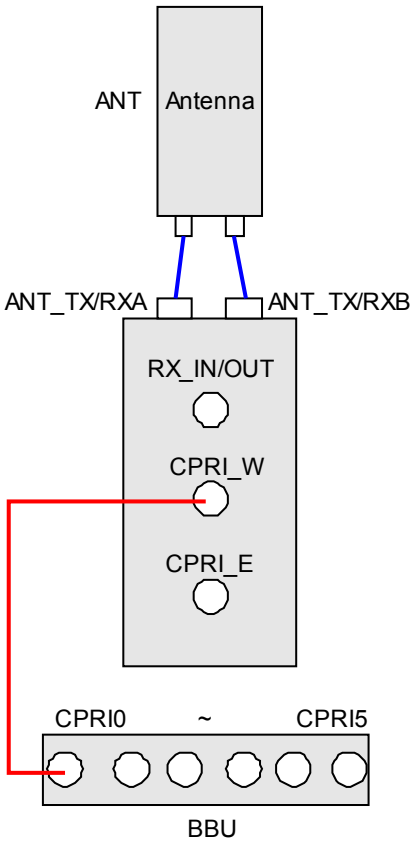
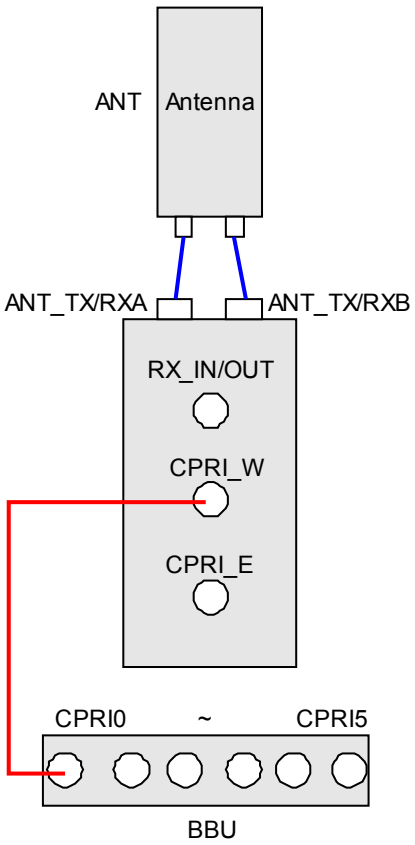
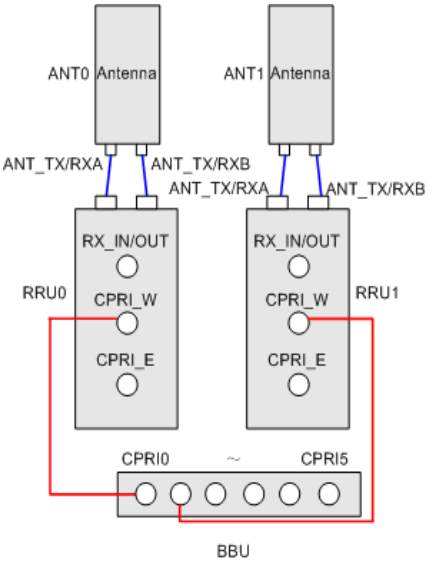
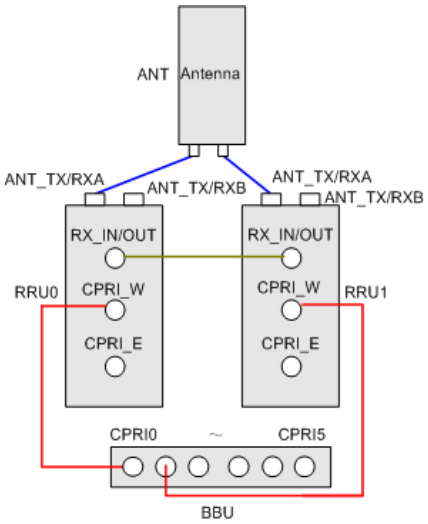


Table 10-4 RF cable connections of the RRU3008 in different configurations

Typical Configuration	Hardware Configuration	Software Configuration
S1-S8	• One RRU3008 module • One dual-polarized antenna **Figure 10-15** shows the related RF cable connections. **Figure 10-15** RF cable connections (1)  	The settings of TRX attributes and antenna mode on the BSC side are as follows: • Transmit mode: **No Combining** • Receive mode: **Main Diversity** • Antenna mode: **Double Feeder (2TX + 2RX)**

Typical Configuration	Hardware Configuration	Software Configuration
S1-S4	• One RRU3008 module • One dual-polarized antenna **Figure 10-16** shows the related RF cable connections. **Figure 10-16** RF cable connections (2)  	The settings of TRX attributes and antenna mode on the BSC side are as follows: • Transmit mode: **Transmit Diversity** • Receive mode: **Main Diversity** • Antenna mode: **Double Feeder (2TX + 2RX)**

Typical Configuration	Hardware Configuration	Software Configuration
S5-S16	• Two RRU3008 modules • Two dual-polarized antennas **Figure 10-17** shows the related RF cable connections. **Figure 10-17** RF cable connections (3)  	The settings of TRX attributes and antenna mode on the BSC side are as follows: • Transmit mode: **No Combining** • Receive mode: **Main Diversity** • Antenna mode: **Double Feeder (2TX + 2RX)**

Typical Configuration	Hardware Configuration	Software Configuration
S5-S16	• Two RRU3008 modules • One dual-polarized antenna **Figure 10-18** shows the related RF cable connections. **Figure 10-18** RF cable connections (4)  	The settings of TRX attributes and antenna mode on the BSC side are as follows: • Transmit mode: **Combining** • Receive mode: **Main Diversity** • Antenna mode: **Single Feeder (1TX + 2RX)**

The other available antenna modes for the RRU3008 are **Single Feeder (1TX + 1RX)**, **Double Feeder (1TX + 1RX)**, and **Double Feeder (1TX + 2RX)**. **Figure 10-19** shows cable connections.

Figure 10-19 RF cable connections of the RRU3008