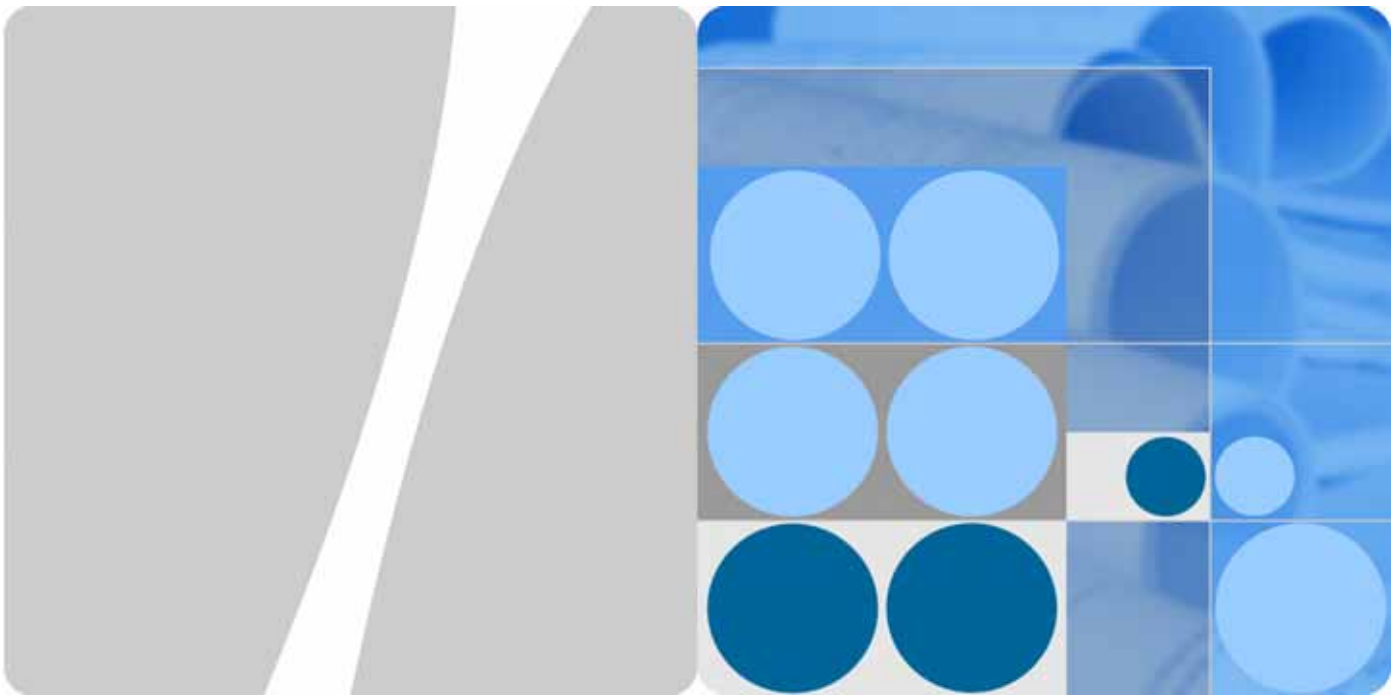


Airbridge DBS3900 CDMA Base Station V400R006C08

Product Description

Issue 11

Date 2010-06-18

HUAWEI TECHNOLOGIES CO., LTD.

Trademarks and Permissions

 and other Huawei trademarks are trademarks of Huawei Technologies Co., Ltd.

All other trademarks and trade names mentioned in this document are the property of their respective holders.

Notice

The purchased products, services and features are stipulated by the contract made between Huawei and the customer. All or part of the products, services and features described in this document may not be within the purchase scope or the usage scope. Unless otherwise specified in the contract, all statements, information, and recommendations in this document are provided "AS IS" without warranties, guarantees or representations of any kind, either express or implied.

The information in this document is subject to change without notice. Every effort has been made in the preparation of this document to ensure accuracy of the contents, but all statements, information, and recommendations in this document do not constitute the warranty of any kind, express or implied.

Huawei Technologies Co., Ltd.

Address: Huawei Industrial Base
Bantian, Longgang
Shenzhen 518129
People's Republic of China

Website: http://www.huawei.com

Email: support@huawei.com

About This Document

Purpose

This document describes the overall structure, logical structure, auxiliary devices, configuration principles, and networking modes of the DBS3900. In addition, this document describes the transmit and receive performance, physical and electrical specifications, lightning protection performance, and environmental requirements of the DBS3900. You can obtain a comprehensive understanding of the DBS3900 by reading this document.

Product Version

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

Product Name	Product Version
DBS3900 CDMA	V400R006C08

Intended Audience

This document is intended for:

- Field engineers
- System engineers

Change History

Version	Change History
11 (2010-06-18)	The modifications in this version are as follows: • Product version update.
10 (2010-03-18)	The modifications in this version are as follows: • Product version update.

Version	Change History
09 (2009-12-25)	Ninth release of the DBS3900 V400R006.
08 (2009-09-15)	The modifications in this version are as follows: • The contents related to the AWS band classes supported by the AC RRU3606 are added.
07 (2009-08-30)	Seventh release of the DBS3900 V400R006.
06 (2009-08-15)	Sixth release of the DBS3900 V400R006.
05 (2009-07-07)	Fifty release of the DBS3900 V400R006.
04 (2009-05-30)	The modifications in this version are as follows: • The descriptions of the UBRI and UEIU are added.
03 (2009-04-01)	The modifications in this version are as follows: • The contents related to the AC RRU3606 are added. • The contents related to the CMPT (8 E1) are added. • The contents related to the 450 MHz band classes supported by the DC RRU3606 are added.
02 (2008-08-10)	The modifications in this version are as follows: • The networking of the DBS3900 is deleted, and the transmission and networking of the BTS are added. • The contents related to the operation and maintenance of the BTS are modified. • The performance measurement items of the DBS3900 are modified.
01(2008-06-25)	Initial release of the DBS3900 V400R006.

Organization

1 Overall Structure of the DBS3900

This describes the overall structure of the DBS3900, which consists of the BBU3900, RRU3606, cables, antenna system, and auxiliary equipment.

2 Solutions for the Auxiliary Devices of the DBS3900

This describes the solutions for the auxiliary devices of the DBS3900. The DBS3900 uses a modular structure. The basic modules of the DBS3900 are the BBU3900 and RRU3606. The auxiliary devices of the DBS3900 include the indoor centralized installation rack, L-shaped support, APM, storage battery cabinet, DCDU, EMUA, SLPU, ODF, DDF, DC power system, and AC power system. The basic modules and auxiliary devices can be flexibly configured to form integrated site solutions.

3 Configuration Principles of the DBS3900

This describes the configuration principles of the DBS3900, covering the configurations of the BBU3900, RRU3606, power supply, and satellite synchronization antenna.

4 Transmission and Networking of the BTS

This describes the transmission and networking of the BTS. The networking modes supported by the BTS are the star networking mode, chain networking mode, and tree networking mode.

5 Operation and Maintenance of the BTS

This section describes the operation and maintenance of the BTS. The operation and maintenance of the BTS refers to the management, monitoring, and maintenance of the BTS. The BTS provides various methods and platforms for operation and maintenance to cater to different scenarios.

6 Technical Specifications of the DBS3900

This describes the technical specifications of the DBS3900.

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 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 time.
 NOTE	Provides additional information to emphasize or supplement important points of the main text.

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`.

Command Conventions

Convention	Description
Boldface	The keywords of a command line are in **boldface**.
Italic	Command arguments are in *italics*.
[ ]	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.

GUI Conventions

Convention	Description
Boldface	Buttons, menus, parameters, tabs, windows, 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 Operation

Format	Description
Key	Press the key. For example, press **Enter** and press **Tab**.

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

Contents

Figures

Tables

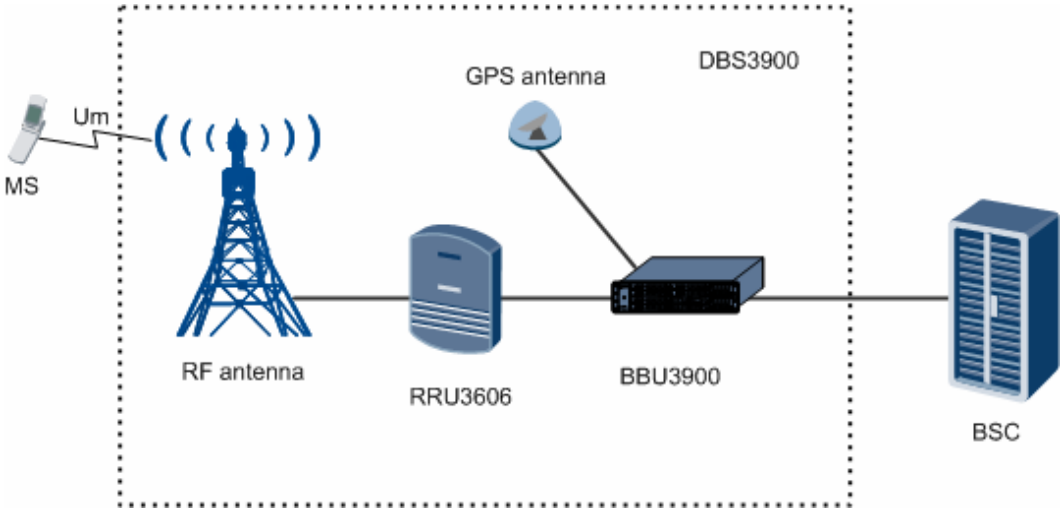
1 Overall Structure of the DBS3900

About This Chapter

This describes the overall structure of the DBS3900, which consists of the BBU3900, RRU3606, cables, antenna system, and auxiliary equipment.

Figure 1-1 shows the hardware structure of the DBS3900.

Figure 1-1 Hardware structure of the DBS3900



Functional Modules of the DBS3900

Functional Module	Description
BBU3900	Being the baseband unit of the DBS3900, this component is responsible for resource management, operation and maintenance, and environment monitoring of the system.
RRU3606	Being the remote RF module unit of the DBS3900, this component is responsible for transmitting and receiving radio signals to achieve communications between the wireless network system and the MSs.

NOTE

There are two types of RRU3606s. One type uses DC power supply whereas the other type uses AC power supply.

The band classes that the DC RRU3606 and AC RRU3606 support are as follows:

- The DC RRU3606 supports the 450 MHz, 800 MHz, 1900 MHz, and AWS band classes.
- The AC RRU3606 supports the 800 MHz A and AWS band classes.

Composition of the DBS3900

Device	Description
APM30	The APM30 is an integrated power system for outdoor use and has the following features: • Supporting -48 V DC and 110/220 V AC power supply • Providing at most 12 U space for user equipment when not configured with additional devices • Supporting internal storage batteries in the case of AC input • Supporting piled installation with the storage battery cabinet (under the APM30 cabinet), which is optional
DCDU	The DCDU is a power distribution box and supports one DC input and nine DC outputs.
EMUA	The EMUA is an environment monitoring unit and implements monitoring for the site environment and user equipment. For details on the functions of the EMUA, see the *EMUA User Guide*.
SLPU	The SLPU is a lightning protection unit, which is used to configure the UELP and UFLP. It implements lightning protection for E1/T1 and FE/GE signals.
DDF	DDFs are classified into two types, which are used for coaxial cables and twisted-pair cables respectively. A DDF is required when the transmission equipment and BBU3900 are configured in the same cabinet.
DC power system	Made up of $PSU_{DC/DC}$ modules, the DC power system converts +24 V DC input to -48 V DC output.
AC power system	Made up of $PSU_{AC/DC}$ modules and PMU modules, the AC power system converts 220/110 V AC input to -48 V DC output.

1.1 Physical Structure of the DBS3900

This describes the physical structure of the DBS3900, which consists of the BBU3900, RRU3606, and auxiliary equipment.

1.2 Physical Ports of the DBS3900

This describes the physical ports of the DBS3900.

1.3 Logical Structure of the DBS3900

This describes the logical structure of the DBS3900.

1.4 Software Structure of the BTS

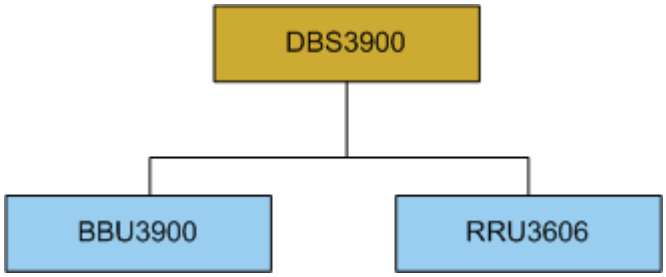
This section describes the software structure of the BTS. The BTS software consists of the platform software, signaling protocol software, operation and maintenance software, and data center.

1.1 Physical Structure of the DBS3900

This describes the physical structure of the DBS3900, which consists of the BBU3900, RRU3606, and auxiliary equipment.

Figure 1-2 shows the major functional modules of the DBS3900.

Figure 1-2 Major functional modules of the DBS3900



Physical Structure of the BBU3900

Figure 1-4 shows the configuration of the BBU3900.

Figure 1-3 Configuration of the BBU3900

FAN	HCPM/HECM 0		HCPM/HECM/UTRP/UELP/UFLP 4	UPEU/UEIU 0
	HCPM/HECM/USCU 1		HCPM/HECM/UTRP/UELP/UFLP/USCU 5	
	HCPM/HECM/USCU/LBBP 2		CMPT/USCU/LMPT 6	UPEU 1
	HCPM/HECM/UBRI 3		CMPT 7	

Table 1-1 Boards in the BBU3900

Module	Expansion	Description	Function
CMPT	CDMA Main Processing&Transmission Unit	It is the main processing and transmission module.	It processes and transmits data between the BTS and the BSC, controls and manages the entire BTS, and provides clock signals for the BTS system.
HCPM	HERT Channel Processing Module	It is the 1X channel processing module.	It processes the 1X service data on forward and reverse channels.
HECM	HERT Enhance Channel Processing Module	It is the EV-DO channel processing module.	It processes the EV-DO service data on forward and reverse channels.
LMPT	LTE Main Processing & Transmission Unit	It is LTE main control and transmission unit.	It manages the entire eNodeB in terms of OM and signaling processing and provides clock signals for the BBU3900.
LBBP	LTE BaseBand Processing unit	It is LTE BaseBand Processing unit.	It processes the baseband signals and Common Public Radio Interface (CPRI) signals.
UTRP	Universal Extension Transmission Processing Unit	It is the universal extension transmission processing unit.	It provides connection between the BBU3900 and the BSC, and supports IP transmission over E1/T1 links.
UBRI	Universal Baseband Radio Interface Unit	It is the universal extension radio interface unit.	It implements the functions of PN sharing, 1X resource pool, and convergence and distribution of baseband data.
UEIU	Universal Environment Interface Unit	It is the universal environment interface unit.	It provides the environment monitoring signal port for the BBU3900.
UELP	Universal E1/T1 Lightning Protection Unit	It is the universal E1/T1 surge protection unit.	It provides surge protection for E1/T1 signals.
UFLP	Universal FE/GE Lightning Protection Unit	It is the FE/GE surge protection unit.	It provides surge protection for FE signals.
FAN	FAN Unit	It is the FAN unit of the BBU3900.	It implements heat dissipation for the BBU3900.

Module	Expansion	Description	Function
UPEU	Universal Power and Environment Interface Unit	It is the universal power and environment interface unit.	It converts -48 V DC or +24 V DC to +12 V DC and provides environment monitoring signal ports for the BBU3900.
USCU	Universal Satellite Card and Clock Unit	It is the universal satellite card and clock unit.	It provides the input port for external signals (including satellite clock signals), and provides synchronization clock signals for the BBU3900 and for the RF modules connected to the BBU3900.

Physical Structure of the RRU3606

The RRU3606 is of two types, that is, the DC RRU3606 and the AC RRU3606, as shown in Figure 1-5 and Figure 1-6.

Figure 1-4 DC RRU3606

Figure 1-5 AC RRU3606

1.2 Physical Ports of the DBS3900

This describes the physical ports of the DBS3900.

The ports of the BBU3900 consist of the power ports, transmission ports, alarm ports, reserved ports, and ports connected to other equipment.

The physical ports of the RRU3606 include power ports, transmission ports, alarm ports, grounding ports, and RF ports. The physical ports of the DC RRU3606 slightly different from those of the AC RRU3606.

1.2.1 Ports on the BBU3900

The ports of the BBU3900 consist of the power ports, transmission ports, alarm ports, reserved ports, and ports connected to other equipment.

Ports on Mandatory Boards

Board	Port	Quantity	Connector Type	Function
CMPT (4 E1)	E1/T1	1	DB26	It is a transmission port, which is connected to the BSC and provides four E1/T1 links.

Board	Port	Quantity	Connector Type	Function
	FE0	1	RJ45	It is the transmission port, which is connected to the BSC and provides one FE link. FE electrical port, supporting cable connection
	FE1	1	SFP	It is the transmission port, which is connected to the BSC and provides one FE link. FE optical port, supporting optical cables (a removable optical module is required)
	USB	1	USB	It is reserved.
	TST	1	USB	It is a clock test port.
	ETH	1	RJ45	It is a commissioning port for local maintenance.
	GPS	1	SMA	It is used for GPS signal input.
CMPT (8 E1)	E1/T1	1	DB44	It is a transmission port, which is connected to the BSC and provides eight E1/T1 links.
	FE0	1	RJ45	It is a transmission port, which is connected to the BSC and provides one FE link. It is an FE electrical port supporting cable connection.
	USB	1	USB	It is reserved.
	TST	1	USB	It is a clock test port.
	ETH	1	RJ45	It is a commissioning port for local maintenance.
	GPS	1	SMA	It is used for GPS signal input.

Board	Port	Quantity	Connector Type	Function
HCPM/HECM	SFP	3	SFP	They are connected to the RF module.
LMPT	SFP 0 and SFP 1	2	LC	Indicate Ethernet optical ports, which are used to connect to the transmission device or gateway
	USB	1	USB	Loads software to the board
	TST	1	USB	Test
	ETH	1	RJ-45	Debug
	FE/GE0 and FE/GE	2	RJ-45	Indicate Ethernet electrical ports, which are used for connection to the transmission device or gateway
	GPS	1	SMA	Receives GPS signals
	RST	1	-	Resets the BBU3900
LBBP	CPRI0 to CPRI5	6	SFP connector	Connecting to the LRRU, LRFU, RRU3606 or CRFU for transmitting service data, clock signals, and synchronization information
UPEU	Power port	1	3V3	It is used for DC input.
	MON0	1	RJ45	Each port provides monitoring function for one RS485 link. There are totally two RS485 links.
	MON1	1	RJ45	
	EXT-ALM0	1	RJ45	Each port provides four links for dry contact alarm signal input. There are totally eight links of dry contact alarm signals.
	EXT-ALM1	1	RJ45	

Ports on Optional Boards

Board	Port	Quantity	Connector Type	Function
UELP	INSIDE	1	DB25	It provides four links for E1/T1 signal input and is connected to the BBU.
	OUTSIDE	1	DB26	It provides four links for E1/T1 signal output, and connects the transmission equipment and the BSC.
UFLP	FE0 and FE1 (INSIDE)	2	RJ45	Each port provides one link for FE signal input and is connected to the BBU.
	FE0 and FE1 (OUTSIDE)	2	RJ45	Each port provides four links for E1/T1 signal output and connects the transmission equipment and the BSC.
USCU0	GPS port	1	SMA	It is used for receiving GPS signals.
	RGPS port	3	8-pin terminal block	They are used for receiving RGPS signals.
	BITS port	1	SMA	It is connected to the BITS clock.
	TEST port	1	SMA	It is used as the output end for the clock test.
USCUb0	GPS port	1	SMA	It is used for receiving GPS signals.
	RGPS port	2	8-pin terminal block	They are used for receiving RGPS signals.
	TOD port	2	RJ45	They are used for receiving or transmitting 1PPS and TOD signals.
	BITS port	1	SMA	It is connected to the BITS clock and supports the adaptive input of 2.048 MHz clock signals and 10 MHz clock signals.
	M-1PPS port	1	SMA	It is used for receiving M1000 1PPS signals.

Board	Port	Quantity	Connector Type	Function
UTRP	E1/T1 port	2	DB26	Each port provides four E1/T1 links. There are totally eight E1/T1 links provided.
UBRI	CPRI	6	SFP	They are connected to the RF module.
UEIU	MON0	1	RJ45	Each port provides monitoring function for one RS485 link. There are totally two RS485 links.
	MON1	1	RJ45	
	EXT-ALM0	1	RJ45	Each port provides four links for dry contact alarm signal input. There are totally eight links of dry contact alarm signals.
	EXT-ALM1	1	RJ45	

1.2.2 Physical Ports of the RRU3606

The physical ports of the RRU3606 include power ports, transmission ports, alarm ports, grounding ports, and RF ports. The physical ports of the DC RRU3606 slightly different from those of the AC RRU3606.

Table 1-2 lists the physical ports of the DC RRU3606.

Table 1-2 Ports on the RRU3606 (DC type)

Port Type	Port	Description	Quantity	Connector
Power port	RTN (+) or RTN (+) 0	Port for -48 V DC power supply	1	Screw
	NEG (-) or NEG (-) 0			
Transmission port	CPRI_E	Connecting the lower-level CPRI port	1	SFP port
	CPRI_W	Connecting the BBU or the upper-level CPRI port	1	SFP port

Port Type	Port	Description	Quantity	Connector
Alarm port	RS485/EXT_ALM	Port for receiving one link of RS485 signals	1	DB15 connector
Ground port	-	Ground screw	4	Screw
RF port	ANT_TX/RXA	Port for TX/main RX signals	1	Cylindrical waterproof DIN connector
	ANT_RXB	Port for diversity RX signals	1	Cylindrical waterproof DIN connector
	RX_IN/OUT	Sharing main RX signals with other RRU3606s	1	2W2 connector
Communication port for the RET antenna	RET/PWR_SRXU	Communication port for the RET antenna	1	DB9 connector

NOTE

The short-circuit impedance of the alarm port is less than 0.2 kilohm, and the open-circuit impedance of the alarm port is more than 51 kilohms.

Table 1-3 lists the physical ports of the AC RRU3606.

Table 1-3 Ports on the RRU3606 (AC type)

Type	Name	Description	Quantity	Connector Type
Power port	AC-in	Port for 220 V AC/110 V AC power input	1	3-pin round waterproof connector
	DC-out	Port for DC power output	1	-
Transmission port	CPRI_E	CPRI port	1	SFP socket
	CPRI_W	CPRI port	1	SFP socket
Alarm port	RS485/EXT_ALM	Port for reporting AC power failure alarms	1	DB15 connector
Ground port	-	-	4	-
RF port	ANT_TX/RXA	Port for TX/main RX signals	1	DIN round waterproof connector

Type	Name	Description	Quantity	Connector Type
	ANT_RXB	Port for diversity RX signals	1	DIN round waterproof connector
	RX_IN/OUT	Sharing main RX signals with other RRU3606s	-	2W2 connector
Communication port for the RET antenna	RET/PWR_SRXU	Communication port for the RET antenna	-	DB9 connector

1.3 Logical Structure of the DBS3900

This describes the logical structure of the DBS3900.

The BBU3900 implements system resource management, operation and maintenance, environment monitoring, and service processing.

This describes the logical structure of the RRU3606, which is used for up-conversion and down-conversion of signals and for power amplification.

1.3.1 Functional Structure of the BBU3900

The BBU3900 implements system resource management, operation and maintenance, environment monitoring, and service processing.

The BBU3900 performs the following functions:

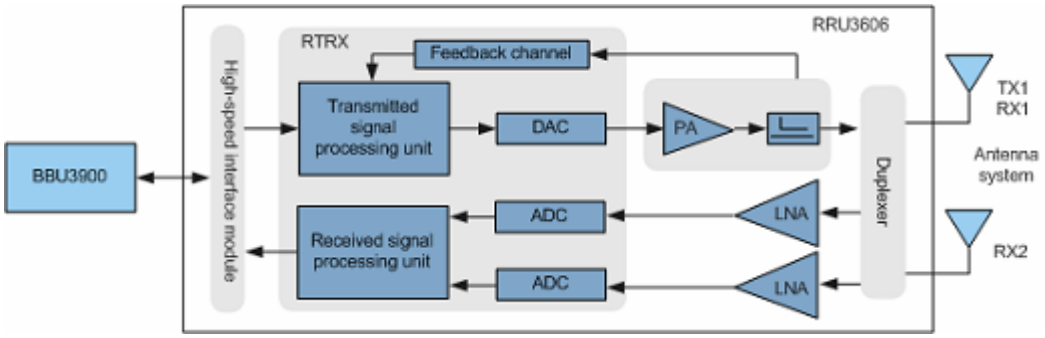
- Providing external ports
  - Providing the Abis interface and processing Abis interface protocols
  - Interfacing with the RF subsystem and processing the Um physical layer and common channel MAC layer protocols
  - Interfacing with the transmission system through the E1/T1/FE ports on the transmission board for connection to the BSC equipment, and providing connection to the RF module through SFP ports on the channel processing board
- Modulating and demodulating baseband data, coding and decoding CDMA channels
- Providing clock signals for system synchronization
- Implementing resource management, operation and maintenance, and environment monitoring for the system

1.3.2 Logical Structure of the RRU3606

This describes the logical structure of the RRU3606, which is used for up-conversion and down-conversion of signals and for power amplification.

Figure 1-7 shows the logical structure of the RRU3606.

Figure 1-6 Logical structure of the RRU3606



The RRU3606 performs the following functions:

- On the forward link, implementing up-conversion and power amplification for modulated transmitted signals and filtering the transmitted signals to make them meet the requirements of the air interface protocol
- On the reverse link, filtering the signals received by the antenna to suppress out-band interference and then performing low noise amplification, down-conversion, and channel-selective filtering.

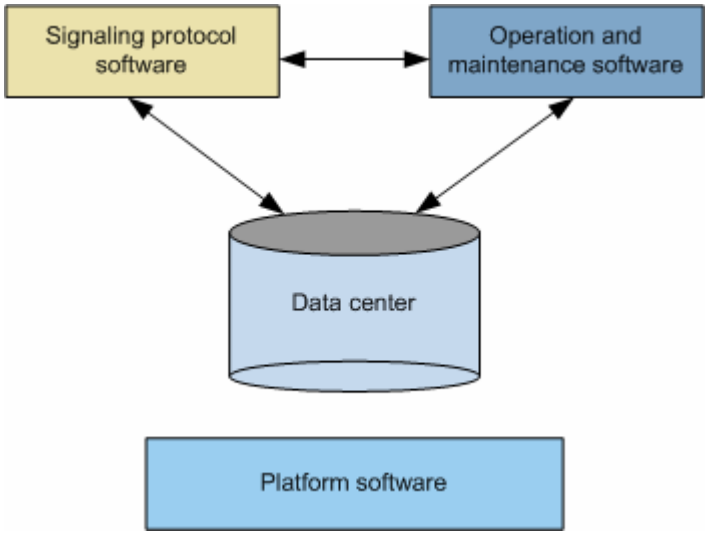
1.4 Software Structure of the BTS

This section describes the software structure of the BTS. The BTS software consists of the platform software, signaling protocol software, operation and maintenance software, and data center.

The signaling protocol software, operation and maintenance software, and data center are applications, whereas the platform software is supporting software.

Figure 1-8 shows the software structure of the BTS.

Figure 1-7 Software structure of the BTS



Platform Software

The major functions of the platform software are as follows:

- Timing management
- Task management
- Memory management

Data Center

The data center stores the configuration data of each module.

Signaling Protocol Software

The major functions of the signaling protocol software are as follows:

- Radio network layer protocol processing
- Transport network layer protocol processing
- Managing the internal logical resources of the BTS, for example, cells and channels, and implementing mapping between physical resources and logical resources

Operation and Maintenance Software

The operation and maintenance software works with the maintenance terminal, for example, the LMT or M2000, to perform the operation and maintenance of the BTS.

The major functions of the operation and maintenance software are as follows:

- Equipment management
- Data configuration
- Performance management
- Commissioning management

- Alarm management
- Software management
- Tracing management
- Security management
- Backup management
- Log management

2 Solutions for the Auxiliary Devices of the DBS3900

About This Chapter

This describes the solutions for the auxiliary devices of the DBS3900. The DBS3900 uses a modular structure. The basic modules of the DBS3900 are the BBU3900 and RRU3606. The auxiliary devices of the DBS3900 include the indoor centralized installation rack, L-shaped support, APM, storage battery cabinet, DCDU, EMUA, SLPU, ODF, DDF, DC power system, and AC power system. The basic modules and auxiliary devices can be flexibly configured to form integrated site solutions.

This describes the outdoor distributed installation of the DBS3900. In this mode, the major modules are the BBU3900 and RRU3606. The BBU3900 supports 220/110 V AC input and -48 V DC input. The DC RRU3606 supports -48 V DC input. The AC RRU3606 supports 220/110 V AC input. The BBU3900 can be installed in the APM30, and the RRU3606 can be installed on a wall or pole close to the RF antenna. In this way, the cost of network construction is reduced.

2.1 Indoor Centralized Installation of the DBS3900

This describes the indoor centralized installation of the DBS3900. In this mode, the major modules are the BBU3900 and RRU3606. The BBU3900 supports -48 V DC input. The DC RRU3606 supports -48 V DC input. The AC RRU3606 supports 220/110 V AC input. Installing the DBS3900 on the indoor centralized installation rack or L-shaped support as a macro base station makes it convenient for the operator to manage the spare components and versions in a centralized manner and to perform maintenance and upgrade in future.

Installation Scenarios

Figure 2-1 shows the indoor centralized installation of the DBS3900.

Figure 2-1 Indoor Centralized Installation of the DBS3900

Indoor centralized installation, -48 V power supply

Auxiliary Device

Table 2-1 lists the auxiliary devices used in the indoor centralized installation of the DBS3900.

Table 2-1 Auxiliary devices used in the door distributed installation of the DBS3900

Component	Description
Indoor centralized installation rack/L-shaped support	The indoor centralized installation rack or L-shaped support is used for the BBU3900 and RRU3606 respectively. The indoor centralized installation rack can be installed on the ground, on a wall, or in a piled way. The L-shaped support can be installed on the ground.
DCDU	The DCDU is a DC power distribution box and supports one -48 V power input and multiple -48 V outputs.

NOTE

- If the DC RRU3606 works in 800 MHz, the 800 MHz band class is categorized in to bands A and AB based on the type of the duplexer. The DC RRU3606 that works in 800 MHz AB and 450 MHz and the AC RRU3606 cannot be installed on a rack in centralized mode.
- If the cabinet in the equipment room has enough free space, the BBU3900 can be installed in the cabinet, and the RRU3606 can be installed on a wall. In this case, the indoor centralized installation rack is not required, and therefore the space in the equipment room is saved.
- The auxiliary devices should be configured according to the actual situation in the equipment room.

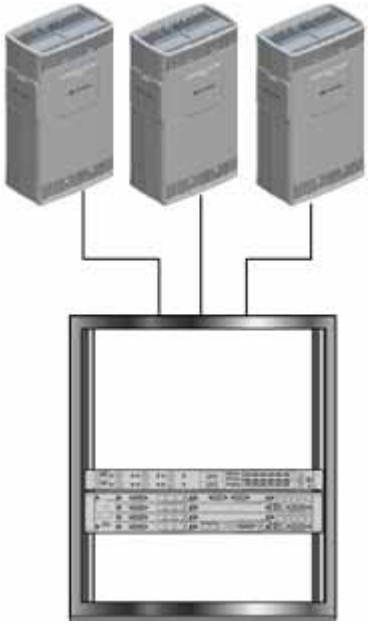
2.2 Indoor Distributed Installation of the DBS3900

This describes the indoor distributed installation of the DBS3900. In this mode, the major modules are the BBU3900 and RRU3606. The BBU3900 supports -48 V DC input. The DC RRU3606 supports -48 V DC input. The AC RRU3606 supports 220/110 V AC input. The BBU3900 can be installed in the free space in an indoor 19" cabinet and uses the transmission and power supply equipment that is already available in the equipment room. The RRU3606 can be installed on a wall, close to the RF antenna. In this way, the cost on the feeder is cut, the loss on the line is reduced, and the coverage is improved.

Installation Scenarios

Figure 2-2 shows the indoor distributed installation of the DBS3900.

Figure 2-2 Indoor distributed installation



Auxiliary Device

Table 2-2 lists the auxiliary devices used in the indoor distributed installation of the DBS3900.

Table 2-2 Auxiliary devices used in the door distributed installation of the DBS3900

Component	Description
Indoor centralized installation rack or L-shaped support	The indoor centralized installation rack or L-shaped support is used for the BBU3900 and RRU3606 respectively. The indoor centralized installation rack can be installed on the ground, on a wall, or in a piled way. The L-shaped support can be installed on the ground.
DCDU	The DCDU is a DC power distribution box and supports one -48 V power input and multiple -48 V outputs.

NOTE

- If the distance between the RRU3606 and the BBU3900 exceeds 70 m [229.66 ft], independent power supply equipment needs to be configured for the RRU3606.
- The auxiliary devices should be configured according to the actual situation in the equipment room.

2.3 Outdoor Centralized Installation of the DBS3900

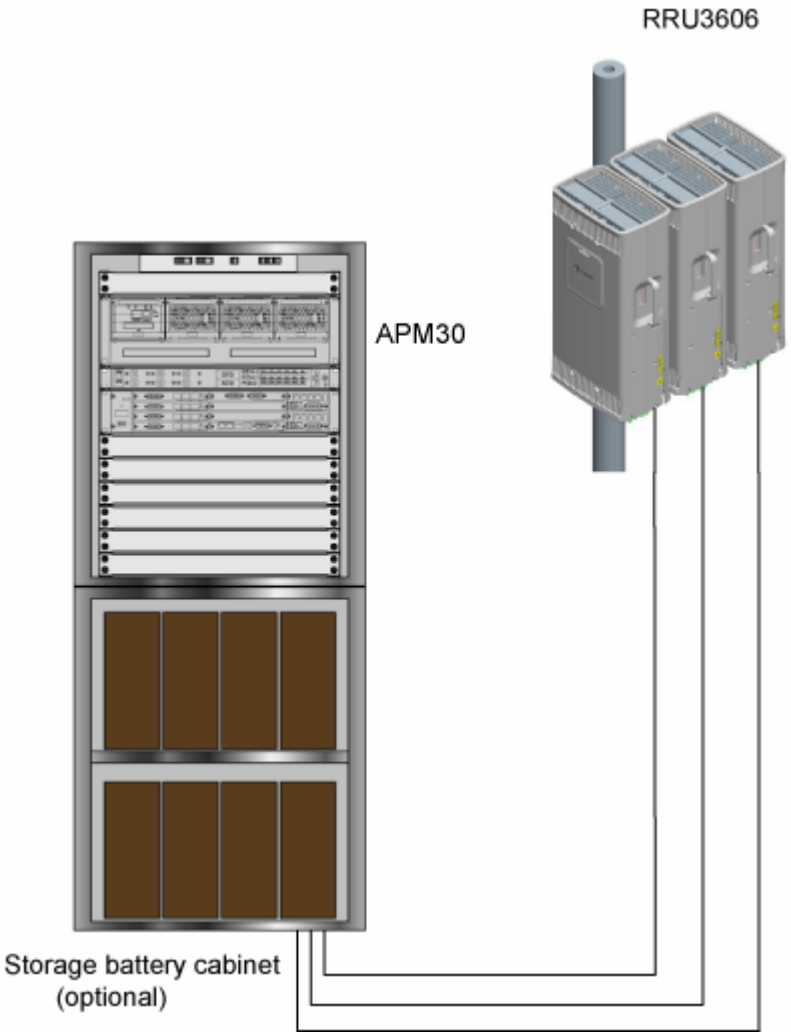
This describes the outdoor centralized installation of the DBS3900. In this mode, the major modules are the BBU3900 and RRU3606. The BBU3900 supports 220/110 V AC and -48 V DC power input. The DC RRU3606 supports -48 V DC power input. The AC RRU3606

supports 220/110 V AC power input. The BBU3900 can be installed in the APM30, and the RRU3606 can be installed on a wall or pole close to the RF antenna. In this way, the cost of network construction are reduced.

Installation Scenarios

Figure 2-3 shows the outdoor centralized installation of the DBS3900.

Figure 2-3 Outdoor centralized installation of the DBS3900



Auxiliary Device

Table 2-3 lists the auxiliary devices used in the outdoor centralized installation of the DBS3900.

Table 2-3 Auxiliary devices used in the outdoor distributed installation of the DBS3900

Component	Description
APM30 (220/110 V AC type)	The APM30 of the 220/110 V AC type is an integrated power system that is used for outdoor applications and supports 220/110 V AC power input.
APM30 (-48 V DC type)	The APM30 of the -48 V DC type is an integrated power backup system that is used for outdoor applications and supports -48 V DC power input.
Storage battery cabinet	This component is optional and used for power backup. When the mains supply fails, the storage battery cabinet powers the equipment.

NOTE

- If the distance between the RRU3606 and the BBU3900 exceeds 70 m [229.66 ft], independent power supply equipment needs to be configured for the RRU3606.
- The auxiliary devices should be configured according to the actual situation and power input mode.
- The DC RRU3606 that works in 800 MHz AB and 450 MHz and the AC RRU3606 cannot be installed in centralized mode.

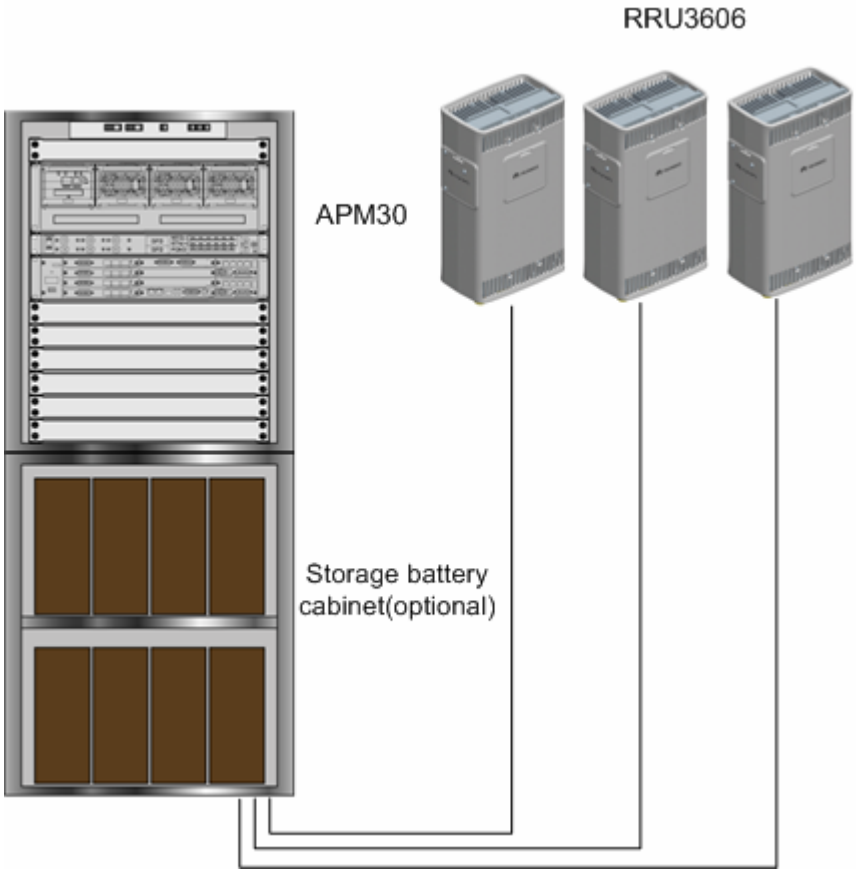
2.4 Outdoor Distributed Installation of the DBS3900

This describes the outdoor distributed installation of the DBS3900. In this mode, the major modules are the BBU3900 and RRU3606. The BBU3900 supports 220/110 V AC input and -48 V DC input. The DC RRU3606 supports -48 V DC input. The AC RRU3606 supports 220/110 V AC input. The BBU3900 can be installed in the APM30, and the RRU3606 can be installed on a wall or pole close to the RF antenna. In this way, the cost of network construction is reduced.

Installation Scenarios

Figure 2-4 shows the outdoor distributed installation of the DBS3900.

Figure 2-4 Outdoor distributed installation of the DBS3900



Auxiliary Device

Table 2-4 lists the auxiliary devices used in the indoor distributed installation of the DBS3900.

Table 2-4 Auxiliary devices used in the door distributed installation of the DBS3900

Component	Description
APM30 (220/110 V AC type)	The APM30 of the 220/110 V AC type is an integrated power system that is used for outdoor applications and supports 220/110 V AC power input.
APM30 (-48 V DC type)	The APM30 of the -48 V DC type is an integrated power backup system that is used for outdoor applications and supports -48 V DC power input.
Storage battery cabinet	This component is optional and used for power backup. When the mains supply fails, the storage battery cabinet powers the equipment.

NOTE

- If the distance between the RRU3606 and the BBU3900 exceeds 70 m [229.66 ft], independent power supply equipment needs to be configured for the RRU3606.
- The auxiliary devices should be configured according to the actual situation and power input mode.

3 Configuration Principles of the DBS3900

About This Chapter

This describes the configuration principles of the DBS3900, covering the configurations of the BBU3900, RRU3606, power supply, and satellite synchronization antenna.

3.1 Configuration Principles of the BBU3900

This describes the configuration principles of the BBU3900.

The BBU3900 is the baseband processing core of the DBS3900.Generally, one BBU3900 is configured for each DBS3900.

Configuration Principles

The mandatory modules are the CMPT, HCPM/HECM, UPEU, and FAN.

- CMPT configuration
  - You can configure a maximum of two CMPTs, which work in 1+1 backup mode. Two CMPTs cannot work at the same time.(when the BTS operates in the CDMA&LTE Dual-Mode, the CMPT can only configure in slot 6.CL 双模配置模式下仅配置在 7 号槽位)
  - There are two types of CMPTs: CMPT (4-E1) and CMPT (8-E1). The CMPT (4-E1) provides one port for 4-E1/T1 links and two FE ports. The CMPT (8-E1) provides one port for 8-E1/T1 links and one FE port. Configure the CMPT depending on capacity demands and service types.
- LBBP configuration
  - You can configure a maximum of one LBBP in slot 2.
- HCPM configuration
  - You can configure a maximum of six HCPMs.
  - Three SFP ports on the HCPM are reserved for connecting hot-swappable optical modules.
  - The HCPM is configured with only one baseband processing chip CSM6700, which can process 285 forward channels and 256 reverse channels.
- HECM configuration
  - You can configure a maximum of six HECMs.
  - Three SFP ports on the HECM are reserved for connecting hot-swappable optical modules.
  - The QCU1HECM is configured with only one baseband processing chip CSM6800, which supports 192 subscribers.
  - The QCU4HECM is configured with one or two baseband processing chips CSM6850, each of which supports 284 subscribers.
- FAN configuration

  You can configure a maximum of one FAN.
- UPEU configuration
  - It is configured preferentially in slot 1 at the right lower corner of the BBU rack.
  - You can configure a maximum of two UPEUs, which work in 1+1 backup mode.

The other modules are the following: the UTRP, UELP/UFLP, USCU, UEIU, and UBRI.

- UTRP configuration
  - You can configure a maximum of two UTRPs, which work in load sharing mode or 1+1 backup mode.
  - Each UTRP provides 8-E1/T1 links.
- USCU configuration

  You can configure a maximum of one USCU, which supports single-mode or dual-mode satellite cards, RGPS signals, and TOD and 1PPS signal sources.
- UELP configuration

  Each UELP supports surge protection for 4-E1/T1 links
- UFLP configuration

  Each UFLP supports surge protection for 2-FE links.
- UEIU configuration

  - You can configure a maximum of one UEIU in slot 0 at the right upper corner of the BBU rack.
  - Each UEIU provides two links for RS485 signals and provides eight links for dry contact signals.
- UBRI configuration
  - You can configure a maximum of one UBRI in slot 3 in the BBU rack.
  - Each UBRI provides six CPRI ports.
  - The UBRI supports a maximum of 48 sector carriers (24 PN-sharing + 24 non-PN-sharing).

NOTE
The BBU3900 supports the hybrid configuration of HCPMs and HECMs so that it can support both 1X services and EV-DO services.

3.2 Configuration Principles of the RRU3606

This describes the configuration principles of the RRU3606.

The RRU3606 is the remote RF unit of the DBS3900. A single RRU3606 supports a maximum of eight carriers.

Configuration Principles

- One RRU3606 supports one sector.
- The DC RRU3606 supports the 450 MHz, 800 MHz, 1900 MHz, and AWS band classes.
- The AC RRU3606 support the 800 MHz A band classes.
- Generally, three to six RRU3606s are configured for each DBS3900.

3.3 Configuration Principles of the Power Supply

This describes the configuration principles of the power supply to the DBS3900.

The DBS3900 can be installed indoors or outdoors. Different installation modes require different power supply configurations.

Indoor Installation of the DBS3900

When installed indoors, the DBS3900 can be installed in indoor centralized mode or indoor distributed mode. The configuration principles of the power supply in these two modes are the same, as listed in Table 3-1.

Table 3-1 Power supply configuration in indoor installation

Power Input Method	Power Supply Configuration
-48 V DC	DCDU

Outdoor Installation of the DBS3900

When installed outdoors, the DBS3900 can be installed in outdoor centralized mode or outdoor distributed mode. The configuration principles of the power supply in these two modes are the same, as listed in Table 3-2.

Table 3-2 Power supply configuration in outdoor installation

Power Input Method	Power Supply Configuration
220/110 V AC	APM30 (220 V AC type), storage battery cabinet (optional)
-48 V DC	APM30 (-48 V DC type), storage battery cabinet (optional)

3.4 Configuration Requirements of the RF Antennas

This section describes the general requirements for the configuration of RF antennas. In practice, choose antennas according to the actual network planning solution.

The general guideline is as follows:

- For omni-directional cells, use omni-directional antennas.
- For directional cells, use directional bi-polarization antennas or directional uni-polarization antennas according to the actual situation.
- For a large coverage area, use antennas with a great amount of gain (for omni-directional cells or directional cells).
- For sector antenna configuration, use directional antennas or omni-directional antennas according to the sector design in the network planning solution.
- For omni-directional cells, use two omni-directional uni-polarization antennas that work in duplex mode.

3.5 Configuration Principles of the Satellite Synchronization Antenna

This describes the configuration principles of the satellite synchronization antenna.

The DBS3900 supports GPS/GLONASS satellite cards. The configuration principles of the satellite synchronization antenna in general situations and situations where system reliability needs to be enhanced are as follows:

- Generally, one DBS3900 requires only one set of satellite synchronization antenna equipment.
- When the DBS3900 is configured with only the CMPT, the system can receive only GPS signals.

- When the DBS3900 is configured with the USCU, the system supports GPS satellite cards, GLONASS cards and mainstream cards. In such cases, the system supports the RGPS signal port.
- The USCU supports GPS/GLONASS satellite cards. When the USCU is configured, the CMPT does not support satellite cards.

3.6 Typical Configurations of the DBS3900

This describes several typical configurations of the DBS3900, which supports the 450 MHz, 800 MHz, 1900 MHz, and AWS band classes.

NOTE

- The following configuration examples apply when the band class is 800 MHz, the power supply is 220 V AC, and the equipment is installed outdoors in distributed mode.

O (1) Configuration

In the O (1) configuration, the following components are configured:

- One BBU3900
- AMP30
- Storage battery cabinet (optional)
- Two omni-directional antennas
- One RRU3606

S (4/4/4) Configuration

In the S (4/4/4) configuration (three sectors, four carriers per sector), the following components are configured:

- One BBU3900
- AMP30
- Storage battery cabinet (optional)
- For each sector, two directional uni-polarization antennas or one directional bi-polarization antenna
- Three RRU3606s

4 Transmission and Networking of the BTS

About This Chapter

This describes the transmission and networking of the BTS. The networking modes supported by the BTS are the star networking mode, chain networking mode, and tree networking mode.

NOTE

The BBU3900 and RRU3606 form a BTS. For convenience and clarification, the BBU3900 and RRU3606 are collectively referred to as the BTS.

4.1 Star Networking Mode

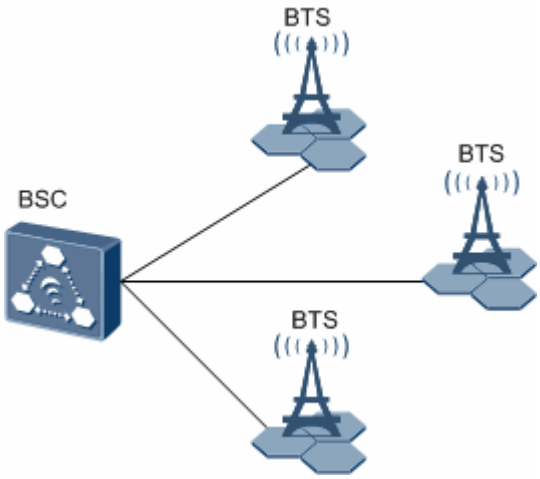
This section describes the application scenarios, advantages, and disadvantages of the star networking mode.

Application Scenarios

As the most commonly used networking mode, the star networking mode is especially applicable to densely populated areas.

Figure 4-1 shows the star networking mode.

Figure 4-1 Star networking mode



Advantages

- The BTS is directly connected to the BSC, thus guaranteeing simplicity in networking and convenience in engineering, maintenance, and capacity expansion.
- Data transmission is implemented directly between the BTS and the BSC, and therefore signals do not have to go through many nodes. In this way, the reliability of the line is high.

Disadvantages

The star networking modes require more transmission resources than other networking modes.

4.2 Chain Networking Mode

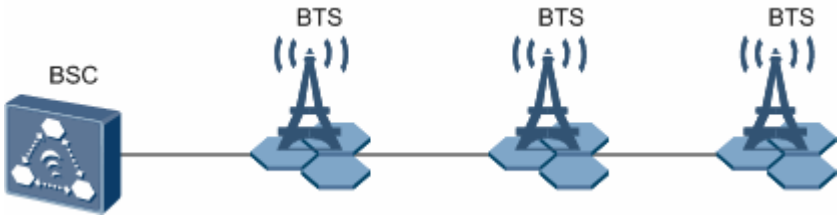
This section describes the application scenarios, advantages, and disadvantages of the chain networking mode.

Application Scenarios

The chain networking mode is applicable to sparsely populated strip areas, for example, areas along superhighways and railways.

Figure 4-2 shows the chain networking mode.

Figure 4-2 Chain networking mode



Advantages

The chain networking mode helps reduce the costs of transmission equipment, of engineering construction, and of transmission link rental.

Disadvantages

- Signals go through a large number of nodes, and therefore the line reliability is low.
- Faults in upper-level BTSs may affect the normal operation of lower-level BTSs.
- The number of chain levels cannot exceed three.

4.3 Tree Networking Mode

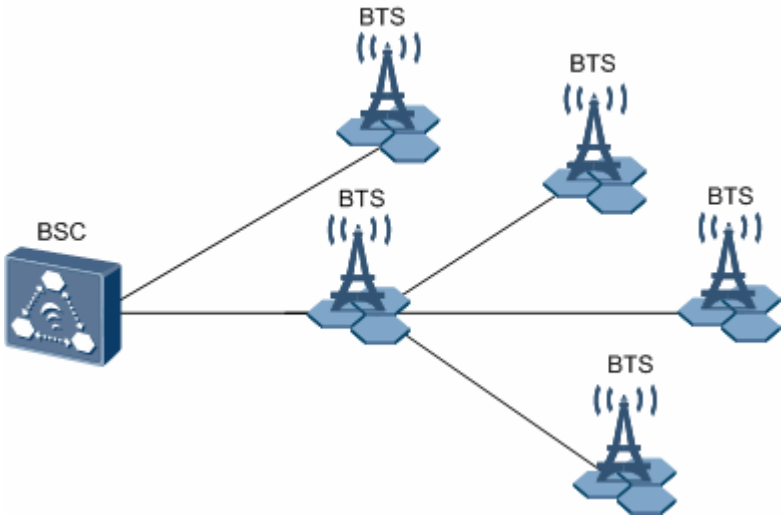
This section describes the application scenarios, advantages, and disadvantages of the tree networking mode.

Application Scenarios

The tree networking mode is applicable to areas where network structures, site distribution, and subscriber distribution are complicated, for example, areas where subscribers are widely distributed and hot spots gather.

Figure 4-3 shows the tree networking mode.

Figure 4-3 Tree networking mode



Advantages

The advantage of the tree networking mode over the star networking mode is that the former lowers the costs of the transmission equipment, the costs of engineering projects, and the rental of transmission links.

Disadvantages

- Signals travel through many nodes, which cause low transmission reliability and construction and maintenance difficulties.
- Faults in upper-level BTSs may affect the normal operation of lower-level BTSs.
- Capacity expansion is difficult because it may require extensive network reconstruction.
- The number of tree levels cannot exceed three.

5 Operation and Maintenance of the BTS

About This Chapter

This section describes the operation and maintenance of the BTS. The operation and maintenance of the BTS refers to the management, monitoring, and maintenance of the BTS. The BTS provides various methods and platforms for operation and maintenance to cater to different scenarios.

This section describes the operation and maintenance modes of the BTS. The BTS can be maintained through the LMT, through the centralized network management system, or locally.

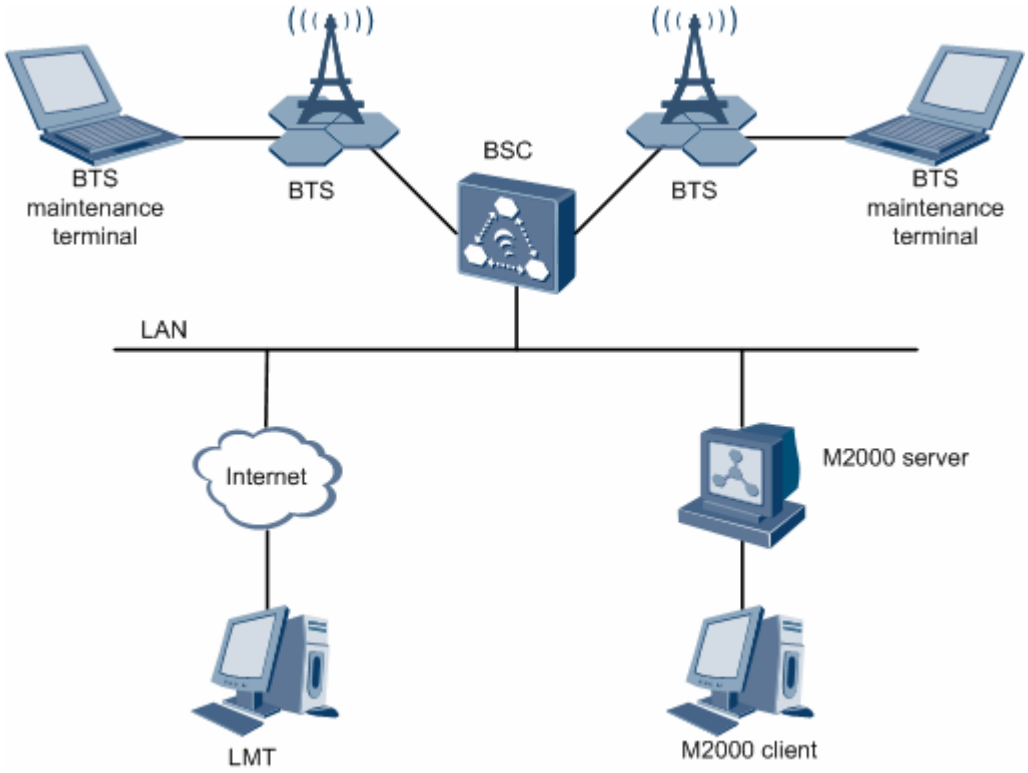
The OM system of the BTS supports equipment management, software management, configuration management, service management, performance management, security management, alarm management, and environment monitoring.

5.1 Operation and Maintenance Modes of the BTS

This section describes the operation and maintenance modes of the BTS. The BTS can be maintained through the LMT, through the centralized network management system, or locally.

Figure 5-1 shows the networking of the operation and maintenance system.

Figure 5-1 Networking of the operation and maintenance system



The BTS supports the following operation and maintenance modes:

- Maintenance through the centralized network management system: The M2000, Huawei's centralized management system for wireless networks, can be used to maintain BTSs through the operation and maintenance network. The M2000 supports the operation and maintenance of sites, cells, carriers, channels, and boards. Centralized network management is used for the maintenance of multiple BTSs.
- Maintenance through the LMT: The LMT can be used to maintain the BTS through the operation and maintenance link provided by the Abis interface between the BSC and the BTS. The LMT communicates with the BSC through a LAN. Through the LMT, you can perform operation and maintenance for the sites, cells, carriers, channels, and boards. The LMT is used to configure and adjust the data of the BSC and BTS.
- Local maintenance: The maintenance terminal of the BTS is used to maintain the BTS locally through Ethernet. Through the maintenance terminal of the BTS, you can perform operation and maintenance for the sites, cells, carriers, baseband, channels, and boards. The maintenance terminal is used to maintain single BTS.

5.2 Operation and Maintenance Functions of the BTS

The OM system of the BTS supports equipment management, software management, configuration management, service management, performance management, security management, alarm management, and environment monitoring.

Equipment Management

Equipment management refers to equipment maintenance and data configuration. The detailed functions are as follows:

- Equipment maintenance refers to maintenance of the equipment or boards, for example, board resetting, management of equipment status, equipment self-testing, active/standby switchovers, and time calibration.
- Data configuration refers to configuration, querying, and backing up of equipment parameters, for example, configuration of the BTS hardware, configuration of clock parameters, configuration of algorithm parameters, and configuration of RF parameters.

Software Management

The functions involved in software management are as follows:

- Software activation
- Checks of compatibility between software and hardware versions
- Version management, for example, querying of hardware and software versions
- Upgrades of software versions

Configuration Management

The functions involved in configuration management are as follows:

- Consistency checks for added, deleted, and Changed data of the BTS
- Automatic data backup
- Dynamic and static modes for data configuration. In dynamic mode, changes made to data take effect immediately. In static mode, changes made to data take effect after the BTS is reset.

Service Management

The functions involved in service management are as follows:

- The BTS provides the boards and environment monitoring device with OM functions such as parameter configuration and alarm querying.
- The BTS supports comprehensive hardware installation and self-testing functions.

Performance Management

The functions involved in performance management are as follows:

- The system monitors the performance of the internal and external communication network. Alarms are generated when the performance becomes poor.
- The system monitors traffic on each port and collects technical data of each port.
- The system supports the monitoring of the usage of key components such as the CPU.

Security Management

Security management involves functions such as connection management between the BTS software and the OMC, subscriber authentication, and bi-directional resolution of encryption and interface messages.

Alarm Management

Alarm management involves equipment alarm management and environment alarm management.

- Equipment alarm management

  The system detects and reports faults or exceptions in the equipment in real time. Through the alarm management function of the LMT or M2000, the alarm information is displayed, and suggestions on handling the alarms are given.

  The alarm management system of the M2000 can be connected to an alarm box through a serial port and supports audible or visual alarms. The alarms can be subscribed to and forwarded to the mobile phones or pagers of maintenance personnel so that the maintenance personnel can handle the faults in time.

- Environment alarm management

  The BTS equipment rooms are generally unmanned and distributed across wide areas. The equipment works in adverse environments and is subject to emergencies. The BTS has a powerful environment monitoring system, which guarantees the normal running of the equipment and helps you deal with emergencies.

The functions involved in alarm management are as follows:

- Alarm detection
- Alarm reporting
- Alarm masking
- Alarm acknowledgement
- Alarm pre-processing
- Alarm correlation processing
- Help information on alarm handling

Environment Monitoring

The BTS supports comprehensive environment monitoring functions.

6 Technical Specifications of the DBS3900

About This Chapter

This describes the technical specifications of the DBS3900.

6.1 Performance Specifications of the DBS3900

This describes the performance specifications of the DBS3900.

6.2 Physical and Electrical Specifications of the DBS3900

This describes the physical and electrical specifications of the DBS3900.

6.3 Reliability Specifications of the DBS3900

This describes the reliability specifications of the DBS3900.

6.4 Lightning Protection Specifications of the DBS3900

This describes the lightning protection specifications of the DBS3900 in terms of lightning specifications of the power input port, E1/T1 input port, GPS RF signal input port, dry contact port, and RF antenna port.

6.5 Safety Specifications of the DBS3900

This describes the safety specifications of the DBS3900.

6.6 EMC Specifications of the DBS3900

This describes the EMC specifications of the DBS3900.

6.7 Environmental Specifications of the DBS3900

This describes the requirements for the storage environment, transportation environment, and running environment of the DBS3900.

6.1 Performance Specifications of the DBS3900

This describes the performance specifications of the DBS3900.

NOTE

- The transmit power is the maximum value measured at the RF port of the cabinet.
- The multi-carrier transmit power refers to the total power instead of the power of each carrier.
- The signal receive sensitivity is the main and diversity receive sensitivity at RC3.
- The DC RRU3606 supports the 450 MHz, 800 MHz, 1900 MHz, and AWS band classes.
- The AC RRU3606 supports the 800 MHz A and 2100 MHz band classes.

Transmit and Receive Specifications

The transmit and receive specifications refer to the technical parameters of the transceiver of the DBS3900. The transmit and receive specifications of the DBS3900 in different band classes are as follows:

- Transmit and receive specifications in band class 0

  Table 6-1 and Table 6-2 list the performance specifications in band class 0 (800 MHz).

Table 6-1 Transmit specifications in band class 0 (800 MHz)

Item	Specification
Operating band class	869 MHz to 894 MHz
Channel bandwidth	1.2288 MHz
Channel precision	30 kHz
Frequency tolerance	≤ ± 0.05 ppm
Transmit power	≤ 80 W

Table 6-2 Receive specifications in band class 0 (800 MHz)

Item	Specification
Operating band class	824 MHz to 849 MHz
Channel bandwidth	1.2288 MHz
Channel precision	30 kHz
Signal receiving sensitivity	Better than -130 dBm (main and diversity receiving at RC3)

- Transmit and receive specifications in band class 1

  Table 6-3 and Table 6-4 list the performance specifications in band class 1 (1900 MHz).

Table 6-3 Transmit specifications in band class 1 (1900 MHz)

Item	Specification
Operating band class	1930 MHz to 1990 MHz

Item	Specification
Channel bandwidth	1.2288 MHz
Channel precision	50 kHz
Frequency tolerance	≤ ± 0.05 ppm
Transmit power	≤ 60 W

Table 6-4 Receive specifications in band class 1 (1900 MHz)

Item	Specification
Operating band class	1850 MHz to 1910 MHz
Channel bandwidth	1.2288 MHz
Channel precision	50 kHz
Signal receiving sensitivity	Better than -127 dBm (main and diversity receiving at RC3)

- Transmit and receive specifications in band class 5

  Table 6-5 and Table 6-6 list the performance specifications in band class 5 (450 MHz).

Table 6-5 Transmit specifications in band class 5 (450 MHz)

Item	Specification
Operating band class	460 MHz to 470 MHz
Channel bandwidth	1.2288 MHz
Channel precision	25 kHz, 20 kHz
Frequency tolerance	≤ ± 0.05 ppm
Transmit power	≤ 60 W

Table 6-6 Receive specifications in band class 5 (450 MHz)

Item	Specification
Operating band class	450 MHz to 460 MHz
Channel bandwidth	1.2288 MHz
Channel precision	25 kHz, 20 kHz
Signal receiving sensitivity	Better than -127 dBm (main and diversity receiving at RC3)

- Transmit and receive specifications in band class 14

  Table 6-7 and Table 6-8 list the performance specifications in band class 14 (1900 MHz).

Table 6-7 Transmit specifications in band class 14 (1900 MHz)

Item	Specification
Operating band class	1930 MHz to 1995 MHz
Channel bandwidth	1.2288 MHz
Channel precision	50 kHz
Frequency tolerance	≤ ± 0.05 ppm
Transmit power	≤ 60 W

Table 6-8 Receive specifications in band class 14 (1900 MHz)

Item	Specification
Operating band class	1850 MHz to 1915 MHz
Channel bandwidth	1.2288 MHz
Channel precision	50 kHz
Signal receiving sensitivity	Better than -127 dBm (main and diversity receiving at RC3)

- Receive and transmit specifications in band class 15 (AWS)

  Table 6-9 and Table 6-10 list the performance specifications in band class 15 (AWS) of CDMA

Table 6-9 Transmit specifications in band class 15 (AWS) of CDMA

Item	Specification
Operating band class	2110 MHz to 2155 MHz
Channel bandwidth	1.2288 MHz
Channel precision	50 kHz
Frequency tolerance	≤ ± 0.05 ppm
Transmit power	≤ 60 W

Table 6-10 Receive specifications in band class 15 (AWS) of CDMA

Item	Specification
Operating band class	1710 MHz to 1755 MHz
Channel bandwidth	1.2288 MHz
Channel precision	50 kHz
Signal receiving sensitivity	Better than -127 dBm (main and diversity receiving at RC3)

Table 6-11 and Table 6-12 list the performance specifications in band class 15 (AWS) of LTE

Table 6-11 Transmit specifications in band class 15 (AWS) of LTE

Item	Specification
Operating band class	2110 MHz to 2155 MHz
Channel bandwidth	5 MHz
Channel precision	100 kHz
Frequency tolerance	≤ ± 0.05 ppm
Transmit power	≤ 60 W

Table 6-12 Receive specifications in band class 15 (AWS) of LTE

Item	Specification
Operating band class	1710 MHz to 1755 MHz
Channel bandwidth	5 MHz
Channel precision	100 kHz
Signal receiving sensitivity	Better than -104 dBm

RRU3606 Cascading Specifications

Table 6-11 lists the RRU3606 cascading specifications of the DBS3900.

Table 6-13 RRU3606 cascading specifications of the DBS3900

Item	Specification
Maximum distance of single-level cascading	70 km [43.50 mi]

Item	Specification
Maximum number of cascading levels	Three
Maximum total cascading distance	90 km [55.93 mi]

BER Threshold Specifications of BTS Transmission Links

The bit error rates (BERs) of transmission links has the same impact on the UNI and IMA modes. Table 6-12 shows the BER threshold specifications of BTS transmission links.

Table 6-14 BER threshold specifications of BTS transmission links

Type	Maximum BER Threshold
CDMA2000 1X voice services	2 x $10e^{-5}$
Packet services	2 x $10e^{-6}$
Maintenance function	5 x $10e^{-5}$

6.2 Physical and Electrical Specifications of the DBS3900

This describes the physical and electrical specifications of the DBS3900.

6.2.1 Technical Specifications of the BBU3900

This section describes the technical specifications of the BBU3900 in terms of the working voltage, power consumption, weight, dimensions, and temperature and humidity in the running environment.

6.2.2 Technical Specifications of the RRU3606

This describes the technical specifications of the RRU3606 in terms of the working voltage, power consumption, weight, dimensions, and temperature and humidity in the running environment.

6.2.1 Technical Specifications of the BBU3900

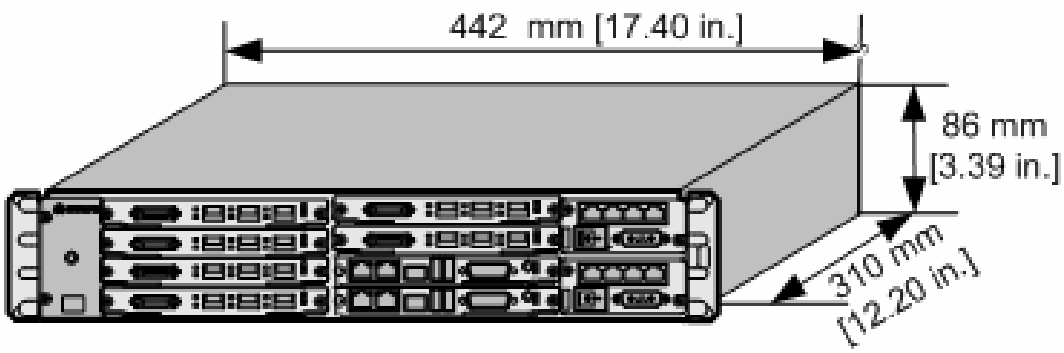
This section describes the technical specifications of the BBU3900 in terms of the working voltage, power consumption, weight, dimensions, and temperature and humidity in the running environment.

Table 6-13 lists the technical specifications of the BBU3900.

Table 6-15 Technical specifications of the BBU3900

Item	Specification
Voltage	• +24 V DC (+21.6 V DC to +29 V DC) • -48 V DC (-57 V DC to -38.4 V DC) **NOTE** There are two types of UPEU, respectively supporting -48 V DC and +24 V DC power input.
Power consumption	full configuration: ≤ 250 W
Weight	• Empty cabinet (including the FAN and UPEU) ≤ 8 kg (17.64 lb) • Full configuration: ≤ 12 kg (26.46 lb)
Cabinet dimensions (height x width x depth)	86 mm (3.39 in.) x 442 mm (17.40 in.) x 310 mm (12.20 in.), as shown in Figure 6-1.
Temperature	-10°C(14°F) to +55°C(131°F)
Relative humidity	5%RH to 95%RH

Figure 6-1 Dimensions of the BBU3900



6.2.2 Technical Specifications of the RRU3606

This describes the technical specifications of the RRU3606 in terms of the working voltage, power consumption, weight, dimensions, and temperature and humidity in the running environment.

Table 6-14 lists the technical specifications of the DC RRU3606.

Table 6-16 Technical specifications of the RRU3606 (DC type)

Item	Specification
Voltage	-48 V DC (-36 V DC to -57 V DC)

Item	Specification
Power consumption	≤ 295 W **NOTE** The power consumption is measured when the RRU3606 works at the 800 MHz band. ≤ 272 W **NOTE** The power consumption is measured when the RRU3606 works at the AWS band.
Weight	• Weights of the RRU that works in the 800 MHz AB and 450 MHz band classes: ≤ 19 kg (41.90 lb) (module + shell) • Weights of the RRU that works in other band classes: ≤ 17 kg (37.49 lb) (with the shell)
Cabinet dimensions (height x width x depth)	Dimensions of the RRU that works in the 800 MHz AB and 450 MHz band classes: • 485 mm (19.09 in.) x 285 mm (11.22 in.) x 170 mm (6.69 in.) (with the shell) • 480 mm (18.90 in.) x 270 mm (10.63 in.) x 140 mm (5.51 in.) (without the shell) Dimensions of the RRU that works in other band classes: • 485 mm (19.09 in.) x 285 mm (11.22 in.) x 170 mm (6.69 in.) (with the shell) • 480 mm (18.90 in.) x 270 mm (10.63 in.) x 140 mm (5.51 in.) (without the shell)
Ambient temperature for operation	-40°C (-40°F) to +52°C (125.6°F) (solar radiation not considered)
Relative humidity for operation	5% RH to 100% RH

Table 6-15 lists the technical specifications of the AC RRU3606.

Table 6-17 Technical specifications of the RRU3606 (AC type)

Item	Specification
Voltage	single-phase 220 V AC (90 V AC to 290 V AC) single-phase 110 V AC (90 V AC to 290 V AC)
Power consumption	333 W
Weight	≤ 22.5 kg [49.6 lb] (with a shell)
Cabinet dimensions (height x width x depth)	485 mm [19.21 in.] x 285 mm [11.02 in.] x 250 mm [9.84 in.] (with a shell)

Item	Specification
Ambient temperature for running	-40°C [-40°F] to +52°C [125.6°F] (solar radiation not considered)
Relative humidity for running	5% RH to 100% RH

6.3 Reliability Specifications of the DBS3900

This describes the reliability specifications of the DBS3900.

Table 6-16 lists the reliability specifications of the DBS3900.

Table 6-18 Reliability specifications of the DBS3900

Item	Specification
Availability	≥ 99.999%
Mean Time Between Failures (MTBF)	BBU3900: ≥ 280000 hours RRU3606: ≥ 260000 hours
Mean Time To Repair (MTTR)	≤ 1 hour (excluding the time needed for the engineers to arrive at the site) ≤ 3 hours (including the time needed for the engineers to arrive at the site)

6.4 Lightning Protection Specifications of the DBS3900

This describes the lightning protection specifications of the DBS3900 in terms of lightning specifications of the power input port, E1/T1 input port, GPS RF signal input port, dry contact port, and RF antenna port.

Table 6-17 lists the lightning protection specifications of the DBS3900.

Table 6-19 Lightning protection specifications of the DBS3900

Item	Specification
AC power input port	Differential mode: ±60 kA, 8/20 us Common mode: ±60 kA, 8/20 us
DC power input port	Differential mode: ±2kA, 1.2/50 us Common mode: ±4kA, 1.2/50 us

Item	Specification
BBU: FE port (with UELP)	Differential mode: ±1kA, 8/20 us Common mode: ±2kA, 8/20 us
BBU: T1/E1 input port (with UELP)	Differential mode: ±3 kA, 8/20 us Common mode: ±5 kA, 8/20 us
GPS RF signal input port	Differential mode: ±8 kA, 8/20 us Common mode: ±40 kA, 8/20 us
Dry contact port	Differential mode: ±250 A, 8/20 us Common mode: ±250 A, 8/20 us
DC power input port of the RRU3606	Differential mode: ±10 kA, 8/20 us Common mode: ±15 kA, 8/20 us
AC power input port of the RRU3606	Differential mode: ±3 kA, 8/20 us Common mode: ±5 kA, 8/20 us
	NOTE If the external lightning protection box is configured, the lightning protection level can reach 60 KA (8/20 us).
RF antenna port	Differential mode: ±8 kA, 8/20 us Common mode: ±40 kA, 8/20 us

6.5 Safety Specifications of the DBS3900

This describes the safety specifications of the DBS3900.

The DBS3900 complies with the following safety standards:

- GB4943-2000: Safety of information technology equipment.
- IEC60950 Safety of information technology equipment Including Electrical Business Equipment.
- IEC60215 Safety requirement for radio transmitting equipment.
- CAN/CSA-C22.2 No 1-M94 Audio, Video and Similar Electronic Equipment.
- CAN/CSA-C22.2 No 950-95 Safety of Information Technology Equipment Including Electrical Business Equipment.
- UL 1419 Standard for Professional Video and Audio Equipment.
- 73/23/EEC Low Voltage Directive.
- UL 1950 Safety of information technology equipment Including Electrical Business Equipment.
- IEC60529 Classification of degrees of protection provided by enclosure. (IP Code).
- GOST 30631-99. General Requirements to machines, instruments and other industrial articles on stability to external mechanical impacts while operating.

- GOST R 50829-95. Safety of radio stations, radio electronic equipment using transceivers and their components. The general requirements and test methods.
- GOST 12.2.007.0-75. Electrotechnical devices. The general safety requirements.

6.6 EMC Specifications of the DBS3900

This describes the EMC specifications of the DBS3900.

The DBS3900 complies with the following EMC standards:

- Council Directive 1999/5/EC: Commission communication in the framework of the implementation of Council Directive 1999/5/EC.
- Council directive 2004/108/EC: DIRECTIVE 2004/108/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 December 2004.
- CISPR 22: "Limits and methods of measurement of radio disturbance characteristics of information technology equipment".
- IEC 61000-6-1: "Electromagnetic compatibility (EMC) Part 6: Generic standards Section 1: Immunity for residential, commercial and light-industrial environments".
- IEC 61000-6-3: "Electromagnetic compatibility (EMC) Part 6: Generic standards Section 3: mission standard for residential, commercial and light industrial environments".
- IEC 61000-3-2: "Electromagnetic compatibility (EMC) - Part 3: Limits Section 2: Limits for harmonic current emissions (equipment input current = 16 A) ".
- IEC 61000-3-3: "Electromagnetic compatibility (EMC) - Part 3: Limits Section 3: Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current = 16 A".
- IEC 61000-4-2: " Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques Section 2: Electrostatic discharge immunity test".
- IEC 61000-4-3: " Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques Section 3: Radiated, radio-frequency electromagnetic field immunity test".
- IEC 61000-4-4: " Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques Section 4: Electrical fast transient/burst immunity test".
- IEC 61000-4-5: " Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques Section 5: Surge immunity test".
- IEC 61000-4-6: " Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques Section 6: Immunity to contacted disturbances, induced by radio frequency fields".
- IEC 61000-4-11: " Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques Section 11: Voltage dips, short interruptions and voltage variations. Immunity tests".
- IEC61000-3-2: Electromagnetic compatibility: Part3: limits Section2: limits for harmonic current emissions(equipment input current less than or equal to 16A per phase).
- IEC61000-3-3: Electromagnetic compatibility: Part3: limits Section3: limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current less than or equal to 16A.

- ETSI 301 489-1: Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements.
- ETSI 301 489-26: ElectroMagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 26: Specific conditions for IMT-2000 CDMA Multi-carrier Base Stations and ancillary equipment.
- CFR 47, FCC Part 15-Radio Frequency Device.
- ITU-R Rec. SM.329-10: "Spurious emissions".
- IEC 61024-1: Protection of structures against lightning.
- IEC 61312-1: Protection Against Lightning Electromagnetic Impulse Part I: General Principles.
- ITU-T K.27(1996): Bonding Configurations and Earthing Inside a Telecommunication Building.
- ITU-T K.44 (2003): SERIES K: PROTECTION AGAINST INTERFERENCE Resistibility test for telecommunication equipment exposed to overvoltages and overcurrents - Basic recommendation.
- ETS 300 253(1995) Equipment Engineering; Earthing and bonding of telecommunication equipment in telecommunication centres.
- YD/T5098-2005: Design specifications about the overvoltage protection engineering of the telecommunications office.

6.7 Environmental Specifications of the DBS3900

This describes the requirements for the storage environment, transportation environment, and running environment of the DBS3900.

The DBS3900 complies with the following environmental standards:

- ETSI EN 300 019-1-1 Class1.2
- ETSI EN 300 019-1-2 Class2.3
- ETSI EN 300 019-1-4 Class4.1

6.7.1 Storage Environment

This describes the requirements for the storage environment of the DBS3900.

6.7.2 Transportation Environment

This describes the requirements for the transportation environment of the DBS3900.

6.7.3 Requirements for the Running Environment of the DBS3900

This describes the requirements for the running environment of the equipment in terms of climatic requirements, waterproofing requirements, biological requirements, and requirements for air purity and mechanical stress.

6.7.1 Storage Environment

This describes the requirements for the storage environment of the DBS3900.

Climatic Requirements

Table 6-18 lists the climatic requirements for the storage environment of the equipment.

Table 6-20 Climatic requirements for the storage environment of the equipment

Item	Range
Temperature	-40°C [-40°F] to +70°C [+158°F]
Temperature change rate	≤ 1°C/min
Relative humidity	BBU: 5%RH to 95%RH RRU: 5%RH to 100%RH
Air pressure	70 kPa to 106 kPa
Solar radiation	≤ 1120 W/m^2
Thermal radiation	≤ 600 W/m^2
Wind speed	BBU: ≤ 30 m/s RRU: ≤ 50 m/s

Waterproofing Requirements

The waterproofing requirements for the storage environment of the equipment are as follows:

- If possible, store the equipment indoors and ensure that:
  - No water accumulates on the ground or may drop onto the package of the equipment.
  - The equipment is kept away from devices that may leak water, for example, automatic fire-fighting devices and heating devices.
- If the equipment has to be stored outdoors, ensure that:
  - The package is intact.
  - Appropriate waterproofing measures are taken to prevent rainwater from entering the package.
  - No water accumulates on the ground or may drop onto the package of the equipment.
  - The package is not exposed directly to sunlight.

Biological Requirements

The biological requirements for the storage environment of the equipment are as follows:

- The environment is not conducive to the growth of microorganisms, such as fungi.
- The equipment is protected from rodents, such as mice.

Air Purity Requirements

The air purity requirements for the storage environment of the equipment are as follows:

- The air is free from explosive, electroconductive, magnetoconductive, and corrosive dust.

- The concentration of mechanically active substances complies with the requirements listed in Table 6-19.

Table 6-21 Requirements for the concentration of mechanically active substances in the storage environment of the equipment

Mechanically Active Substance	Unit	Concentration	
		BBU	RRU
Suspended dust	mg/m^3	≤ 5	≤ 5
Precipitable dust	$mg/m^2 \cdot h$	≤ 20	≤ 500
Grit	mg/m^3	≤ 300	≤ 300

NOTE
- The diameter of a suspended dust particle is not greater than 75 μm.
- The diameter of a precipitable dust particle is not smaller than 75 μm and not greater than 150 μm.
- The diameter of a piece of grit is not smaller than 150 μm and not greater than 1000 μm.

- The concentration of chemically active substances complies with the requirements listed in Table 6-20.

Table 6-22 Requirements for the concentration of chemically active substances in the storage environment of the equipment

Chemically Active Substance	Unit	Concentration
SO_2	mg/m^3	≤ 0.30
H_2S	mg/m^3	≤ 0.10
NO_2	mg/m^3	BBU: ≤ 0.50 RRU: ≤ 0.05
NH_3	mg/m^3	≤ 1.00
Cl_2	mg/m^3	≤ 0.10
HCl	mg/m^3	≤ 0.10
HF	mg/m^3	≤ 0.01
O_3	mg/m^3	≤ 0.05

Mechanical Stress Requirements

Table 6-21 and Table 6-22 list the requirements for the mechanical stress in the storage environment of the equipment.

Table 6-23 Requirements for the mechanical stress in the storage environment of the BBU

Item	Sub-item	Range	
Sinusoidal vibration	Offset	≤ 7.0 mm [0.28 in.]	-
	Acceleration	-	≤ 20 m/s^2
	Frequency range	2 Hz to 9 Hz	9 Hz to 200 Hz
Unsteady impact	Impact response spectrum II	≤ 250 m/s^2	
	Static payload	≤ 5 kPa	
NOTE • The impact response spectrum refers to the maximum acceleration response curve generated by the equipment under specified impact excitation. Impact response spectrum II means that the duration of semi-sine impact response spectrum is 6 ms. • The static payload refers to the capability of the packed equipment to bear the weight from above in the stipulated stack method.			

Table 6-24 Requirements for the mechanical stress in the storage environment of the RRU

Item	Sub-item	Range	
Sinusoidal vibration	Offset	≤ 1.5 mm [0.06 in.]	-
	Acceleration	-	≤ 5 m/s^2
	Frequency range	2 Hz to 9 Hz	9 Hz to 200 Hz
Unsteady impact	Impact response spectrum II	≤ 250 m/s^2	
	Static payload	≤ 5 kPa	
NOTE • The impact response spectrum refers to the maximum acceleration response curve generated by the equipment under specified impact excitation. Impact response spectrum II means that the duration of semi-sine impact response spectrum is 6 ms. • The static payload refers to the capability of the packed equipment to bear the weight from above in the stipulated stack method.			

6.7.2 Transportation Environment

This describes the requirements for the transportation environment of the DBS3900.

Climatic Requirements

Table 6-23 lists the climatic requirements for the transportation environment of the equipment.

Table 6-25 Climatic requirements for the transportation environment of the equipment

Item	Range
Temperature	-40°C [-40°F] to +70°C [+158°F]
Temperature change rate	≤ 3°C/min
Relative humidity	5% RH to 95% RH
Air pressure	70 kPa to 106 kPa
Solar radiation	≤ 1120 W/m^2
Thermal radiation	≤ 600 W/m^2
Wind speed	BBU: ≤ 30 m/s RRU: ≤ 50 m/s

Waterproofing Requirements

The waterproofing requirements for the transportation environment of the equipment are as follows:

- The package is intact.
- Appropriate waterproofing measures are taken to prevent rainwater from entering the package.
- No water accumulates in the vehicle.

Biological Requirements

The biological requirements for the transportation environment of the equipment are as follows:

- The environment is not conducive to the growth of microorganisms, such as fungi.
- The equipment is protected from rodents, such as mice.

Air Purity Requirements

The requirements for the air purity in the transportation environment of the equipment are as follows:

- The air is free from explosive, electroconductive, magnetoconductive, and corrosive dust.
- The concentration of mechanically active substances complies with the requirements listed in Table 6-24.

Table 6-26 Requirements for the concentration of mechanically active substances in the transportation environment of the equipment

Mechanically Active Substance	Unit	Concentration	
		BBU	RRU
Suspended dust	mg/m^3	No requirement	≤ 35
Precipitable dust	$mg/m^2 \cdot h$	≤ 3.0	≤ 0.2
Grit	mg/m^3	≤ 100	≤ 30

NOTE
- The diameter of a suspended dust particle is not greater than 75 μm.
- The diameter of a precipitable dust particle is not smaller than 75 μm and not greater than 150 μm.
- The diameter of a piece of grit is not smaller than 150 μm and not greater than 1000 μm.

- The concentration of chemically active substances complies with the requirements listed in Table 6-25.

Table 6-27 Requirements for the concentration of chemically active substances in the transportation environment of the equipment

Chemically Active Substance	Unit	Concentration
SO_2	mg/m^3	≤ 0.30
H_2S	mg/m^3	≤ 0.10
NO_2	mg/m^3	BBU: ≤ 0.50 RRU: ≤ 0.05
NH_3	mg/m^3	≤ 1.00
Cl_2	mg/m^3	≤ 0.10
HCl	mg/m^3	≤ 0.10
HF	mg/m^3	≤ 0.01
O_3	mg/m^3	≤ 0.05

Mechanical Stress Requirements

Table 6-26 and Table 6-27 list the requirements for the mechanical stress in the transportation environment of the equipment.

Table 6-28 Requirements for the mechanical stress in the transportation environment of the BBU

Item	Sub-item	Range		
Sinusoidal vibration	Offset	≤ 7.5 mm [0.30 in.]	-	-
	Acceleration	-	≤ 20.0 m/s^2	≤ 40. 0 m/s^2
	Frequency range	2 Hz to 9 Hz	9 Hz to 200 Hz	200 Hz to 500 Hz
Random vibration	Acceleration spectral density	10 m^2/s^3	3 m^2/s^3	1 m^2/s^3
	Frequency range	2 Hz to 9 Hz	9 Hz to 200 Hz	200 Hz to 500 Hz
Unsteady impact	Impact response spectrum II	≤ 300 m/s^2		
	Static payload	≤ 10 kPa		

NOTE

- The impact response spectrum refers to the maximum acceleration response curve generated by the equipment under specified impact excitation. Impact response spectrum II means that the duration of semi-sine impact response spectrum is 6 ms.
- The static payload refers to the capability of the packed equipment to bear the weight from above in the stipulated stack method.

Table 6-29 Requirements for the mechanical stress in the transportation environment of the RRU

Item	Sub-item	Range		
Sinusoidal vibration	Offset	≤ 3.5 mm [0.14 in.]	-	-
	Acceleration	-	≤ 10 m/s^2	≤ 15 m/s^2
	Frequency range	2 Hz to 9 Hz	9 Hz to 200 Hz	200 Hz to 500 Hz
Random vibration	Acceleration spectral density	30 m^2/s^3	3 m^2/s^3	1 m^2/s^3
	Frequency range	2 Hz to 10 Hz	10 Hz to 200 Hz	200 Hz to 500 Hz
Unsteady impact	Impact response spectrum II	≤ 250 m/s^2		
	Static payload	≤ 10 kPa		

Item	Sub-item	Range
NOTE • The impact response spectrum refers to the maximum acceleration response curve generated by the equipment under specified impact excitation. Impact response spectrum II means that the duration of semi-sine impact response spectrum is 6 ms. • The static payload refers to the capability of the packed equipment to bear the weight from above in the stipulated stack method.		

6.7.3 Requirements for the Running Environment of the DBS3900

This describes the requirements for the running environment of the equipment in terms of climatic requirements, waterproofing requirements, biological requirements, and requirements for air purity and mechanical stress.

Climatic Requirements

Table 6-28 lists the climatic requirements for the running environment of the equipment.

Table 6-30 Climatic requirements for the running environment of the equipment

Item	Range
Temperature	BBU: -10°C [+14°F] to +55°C [+131°F] RRU: -40°C [-40°F] to +52°C [+125.6°F] (solar radiation not considered)
Temperature change rate	≤ 3°C/min
Relative humidity	BBU: 5% RH to 95% RH RRU: 5% RH to 100% RH
Air pressure	70 kPa to 106 kPa
Solar radiation	BBU: ≤ 700 W/m^2 RRU: ≤ 1120 W/m^2
Thermal radiation	≤ 600 W/m^2
Wind speed	BBU: ≤ 1 m/s RRU: ≤ 67 m/s
NOTE The temperature and humidity should be measured 1.5 m [4.92 ft] above the ground and 0.4 m [1.31 ft] away from the front of the cabinet when no protective board is installed at the front and rear of the cabinet.	

Biological Requirements

The biological requirements for the running environment of the equipment are as follows:

- The environment is not conducive to the growth of fungus.

- The equipment is protected from rodents, such as mice.

Requirements for Air Purity

The requirements for air purity in the running environment of the equipment are as follows:

- The air is free from explosive, electroconductive, magnetoconductive, and corrosive dust.
- For the BBU, the concentration of mechanically active substances complies with the requirements listed in Table 6-29.

Table 6-31 Requirements for the concentration of mechanically active substances in the running environment of the equipment

Mechanically Active Substance	Unit	Concentration
Dust particles	Particles/m^3	$\leq 3 \times 10^4$ (no visible dust accumulated on desktops within three days)
The diameter of a dust particle is not smaller than 5 μm.		

- The concentration of chemically active substances complies with the requirements listed in Table 6-30 and Table 6-31.

Table 6-32 Requirements for the concentration of chemically active substances in the running environment of the BBU

Chemically Active Substance	Unit	Concentration
SO_2	mg/m^3	≤ 0.20
H_2S	mg/m^3	≤ 0.006
NH_3	mg/m^3	≤ 0.05
Cl_2	mg/m^3	≤ 0.01

Table 6-33 Requirements for the concentration of chemically active substances in the running environment of the RRU

Chemically Active Substance	Unit	Concentration
SO_2	mg/m^3	≤ 0.30
H_2S	mg/m^3	≤ 0.10
NH_3	mg/m^3	≤ 1.00

Chemically Active Substance	Unit	Concentration
Cl_2	mg/m^3	≤ 0.10
HCl	mg/m^3	≤ 0.10
HF	mg/m^3	≤ 0.01
O_3	mg/m^3	≤ 0.05
NO_X	mg/m^3	≤ 0.05

Requirements for Mechanical Stress

Table 6-32 and Table 6-33 list the requirements for the mechanical stress in the running environment of the equipment.

Table 6-34 Requirements for the mechanical stress in the running environment of the BBU

Item	Sub-Item	Range	
Sinusoidal vibration	Offset	≤ 3.5 mm [0.14 in.]	-
	Acceleration	-	≤ 10.0 m/s^2
	Frequency range	2 Hz to 9 Hz	9 Hz to 200 Hz
Unsteady impact	Impact response spectrum II	≤ 100 m/s^2	
	Static payload	0	

NOTE

- The impact response spectrum refers to the maximum acceleration response curve generated by the equipment under specified impact excitation. Impact response spectrum II means that the duration of semi-sine impact response spectrum is 6 ms.
- The static payload refers to the capability of the packed equipment to bear the weight from above in the stipulated stack method.

Table 6-35 Requirements for the mechanical stress in the running environment of the RRU

Item	Sub-Item	Range	
Sinusoidal vibration	Offset	≤ 3 mm [0.12 in.]	-
	Acceleration	-	≤ 10.0 m/s^2
	Frequency range	2 Hz to 9 Hz	9 Hz to 200 Hz
Unsteady impact	Impact response spectrum II	≤ 250 m/s^2	
	Static payload	0	

Item	Sub-Item	Range
NOTE ● The impact response spectrum refers to the maximum acceleration response curve generated by the equipment under specified impact excitation. Impact response spectrum II means that the duration of semi-sine impact response spectrum is 6 ms. ● The static payload refers to the capability of the packed equipment to bear the weight from above in the stipulated stack method.		