BTS3900E GSM

V300R008&V600R009

User Guide

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About This Document

Purpose

This document provides a reference for you to plan and deploy the BTS3900E. It describes the ports and functions of the BTS3900E, categories of the cables, and specifications and installation positions of the connectors. The methods for maintaining the BTS3900E are also provided.

Product Version

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

Product Name	Product Version
BTS3900E GSM (hereinafter referred to as BTS3900E)	V300R008
	V600R009

Intended Audience

This document is intended for:

- BTS3900E installers
- Site maintainers
- Field engineers

Organization

1 Changes in the BTS3900E GSM User Guide

This describes the changes in the *BTS3900E GSM User Guide*.

2 Typical Installation Scenarios of the BTS3900E (Indoor Coverage)

This describes the typical installation scenarios of the BTS3900E for indoor coverage.

3 Typical Installation Scenarios of the BTS3900E (Outdoor Coverage)

This describes the typical installation scenarios of the BTS3900E for outdoor coverage.

4 Monitoring Scheme of the BTS3900E

This describes the monitoring scheme of the BTS3900E.

5 BTS3900E Hardware

This describes the equipment, cables, and auxiliary devices of the BTS3900E.

6 BTS3900E Maintenance

This describes the items to be regularly maintained after the BTS3900E is put into use in order to ensure its proper operation. The power-on and power-off operations and the method of replacing the BTS3900E and optical modules are also provided.

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 the BTS3900E GSM User Guide

This describes the changes in the *BTS3900E GSM User Guide*.

01 (2010-01-15)

This is the first commercial release.

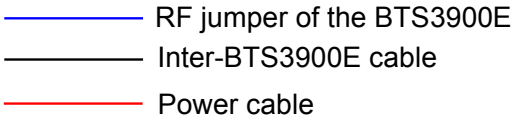
2 Typical Installation Scenarios of the BTS3900E (Indoor Coverage)

About This Chapter

This describes the typical installation scenarios of the BTS3900E for indoor coverage.

In the typical installation scenarios, different cables are identified by different colors. **Figure 2-1** shows the mapping between the RF cables and their colors.

Figure 2-1 Mapping between the cables and their colors



NOTE

- The longest remote distance of the DC power cable for a single BTS3900E is 100 m. The longest remote distance of the DC power cables for cascaded BTS3900Es is 50 m.
- A maximum of three DC BTS3900Es can be cascaded in chain topology.
- In indoor application scenario, the BTS3900E supports distributed installation of combined cabinets. The distance between the combined cabinets is shorter than or equal to 10 km.

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

- BBC: Battery Cabinet
- APM: Advance Power Module
- APM30H: Advance Power Module(with Heat-exchanger Cooling)

This describes the installation scenarios of the BTS3900E in the case that -48 V DC power is available on site but no transmission space is provided.

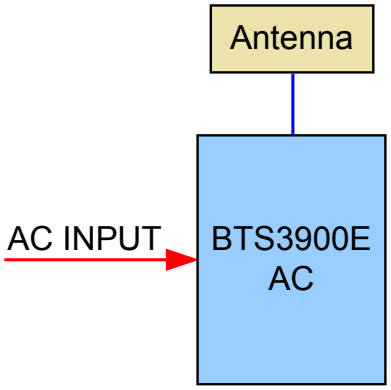
2.1 Scenario 1: AC Power Input

This describes the installation scenarios of the BTS3900E in the case that AC power is available on site and no transmission space is required.

Configuration of Omni-Directional Site (One BTS3900E)

Figure 2-2 shows the installation of the one AC-powered BTS3900E in omni-directional configuration.

Figure 2-2 Installation of one AC-powered BTS3900E in omni-directional configuration



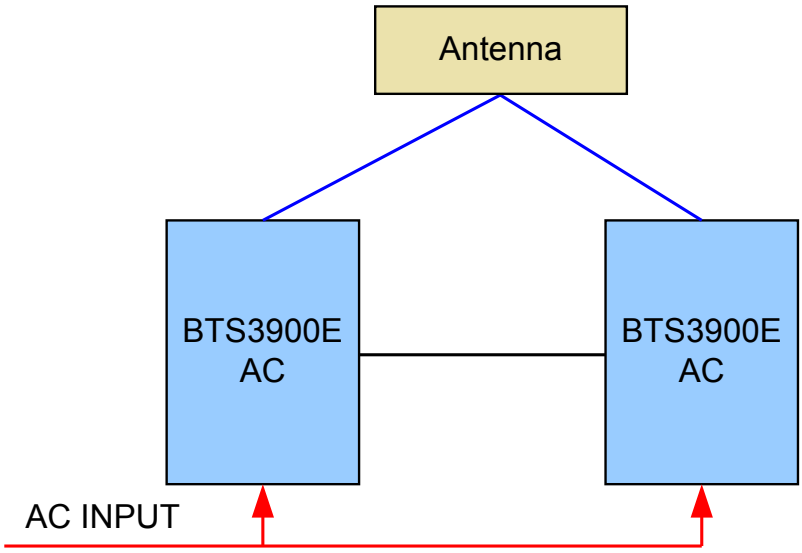
This installation scenario has the following features:

- Requirements for the external power input system:
  - 110 V AC single-phase: 4 A to 6 A
  - 220 V AC single-phase: 4 A to 6 A
- The BTS3900E can be mounted on the wall or H-shaped stand.
- Considering the capacity expansion requirements, the space for mounting one BTS3900E can be left on the wall. In addition, a maximum of two BTS3900Es can be mounted on the H-shaped stand.

Configuration of Omni-Directional Site (Two BTS3900Es)

Figure 2-3 shows the installation of the two AC-powered BTS3900Es in omni-directional configuration.

Figure 2-3 Installation of two AC-powered BTS3900Es in omni-directional configuration



This installation scenario has the following features:

- Requirements for the external power input system:
  - 110 V AC single-phase: 4 A to 6 A
  - 220 V AC single-phase: 4 A to 6 A
- The BTS3900E can be mounted on the wall or H-shaped stand.
- The two AC-powered BTS3900Es are interconnected through the SFP ports.

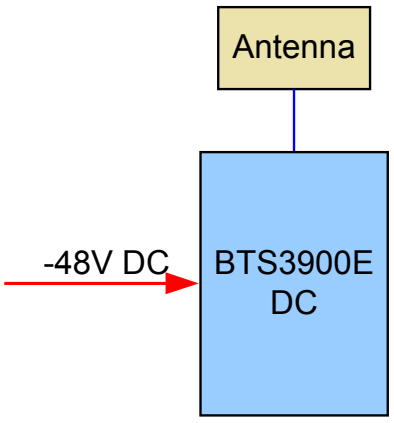
2.2 Scenario 2: -48 V DC Power Input

This describes the installation scenarios of the BTS3900E in the case that -48 V DC power is available on site but no transmission space is provided.

Configuration of Omni-Directional Site (One BTS3900E)

Figure 2-4 shows the installation of one DC-powered BTS3900E in omni-directional configuration.

Figure 2-4 Installation of one DC-powered BTS3900E in omni-directional configuration



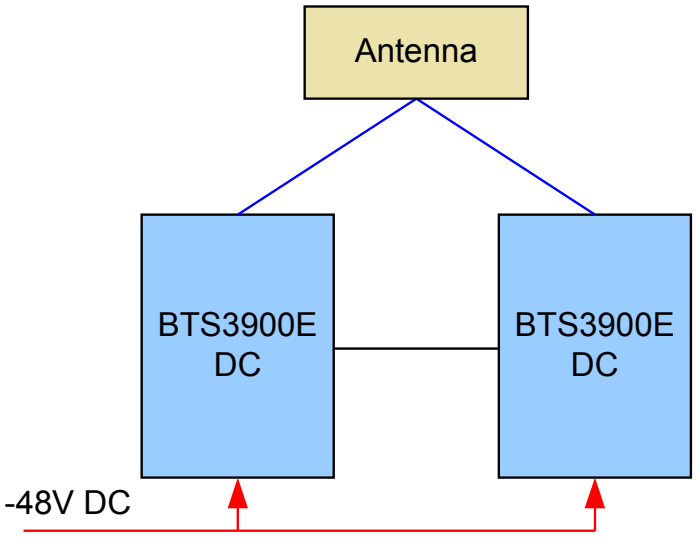
This installation scenario has the following features:

- The BTS3900E can be mounted on the wall or H-shaped stand.
- The capacity of the external power input system should range from 5 A to 8 A.
- Considering the capacity expansion requirements in later phase, the space for mounting one BTS3900E can be left on the wall. In addition, a maximum of two BTS3900Es can be mounted on the H-shaped stand.

Configuration of Omni-Directional Site (Two BTS3900Es)

Figure 2-5 shows the installation of two DC-powered BTS3900Es in omni-directional configuration.

Figure 2-5 Installation of two DC-powered BTS3900Es in omni-directional configuration



This installation scenario has the following features:

- The BTS3900E can be mounted on the wall or H-shaped stand.
- Requirements for the external power input system:
  - If power supply for the BTS3900Es are independent from each other, the capacity of the external power input system should range from 5 A to 8 A.
  - If two BTS3900Es are cascaded, the capacity of the external power input system should range from 10 A to 12 A.
- A maximum of two BTS3900Es can be mounted on the H-shaped stand, which facilitates capacity expansion.
- The two DC-powered BTS3900Es are interconnected through the SFP ports.

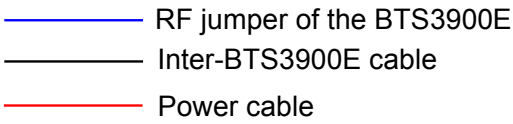
3 Typical Installation Scenarios of the BTS3900E (Outdoor Coverage)

About This Chapter

This describes the typical installation scenarios of the BTS3900E for outdoor coverage.

In the typical installation scenarios, different cables are identified by different colors. **Figure 3-1** shows the mapping between the RF cables and their colors.

Figure 3-1 Mapping between the cables and their colors



NOTE

- The longest remote distance of the DC power cable for a single BTS3900E is 100 m. The longest remote distance of the DC power cables for cascaded BTS3900Es is 50 m.
- A maximum of three DC BTS3900Es can be cascaded in chain topology.
- In outdoor application scenario, the BTS3900E does not support distributed installation of combined cabinets. The distance between the combined cabinets is shorter than or equal to 10 km.

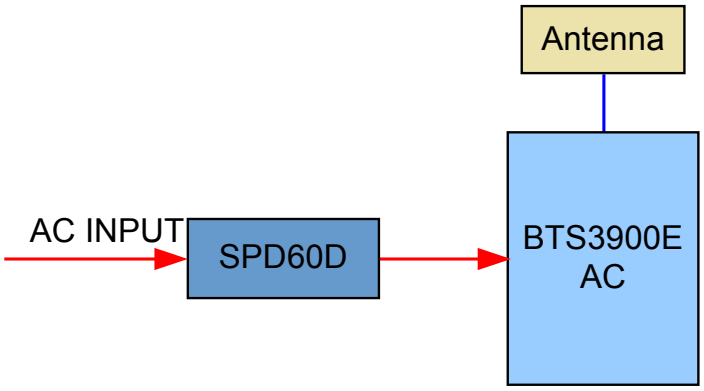
3.1 Scenario 1: AC Power Input (No Backup Power Required)

This describes the installation scenarios of the BTS3900E in the case that AC power is available on site and backup power is not required.

Configuration of Omni-Directional Site (One BTS3900E)

Figure 3-2 shows the installation of one AC-powered BTS3900E in omni-directional configuration.

Figure 3-2 Installation of one AC-powered BTS3900E in omni-directional configuration



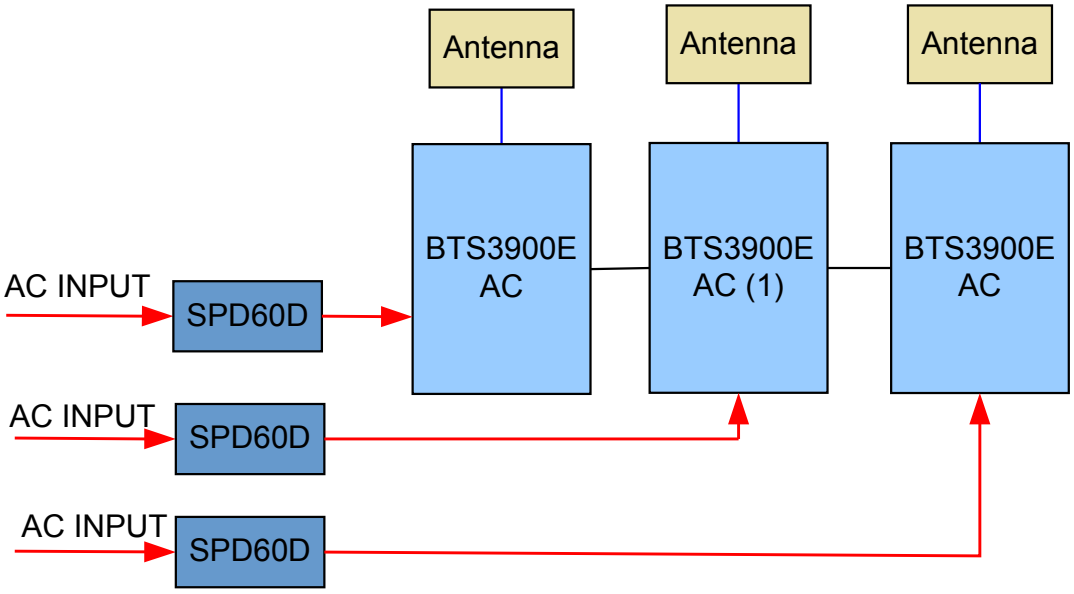
This installation scenario has the following features:

- The BTS3900Es can be mounted on the wall or pole.
- The SPD60D, an AC surge protection box, is used to provide surge protection for AC power. It supports 220 V AC single-phase input.
- The capacity of the external power input system should range from 4 A to 6 A.

Three-Sector Configuration

Figure 3-3 shows the installation of three AC-powered BTS3900Es in three-sector configuration.

Figure 3-3 Installation of AC-powered BTS3900E in three-sector configuration



This installation scenario has the following features:

- The BTS3900Es can be mounted on the wall or pole.
- If power supply of three BTS3900Es are independent from each other, the capacity of the external power input system should range from 4 A to 6 A.
- Each of the three AC-powered BTS3900Es should be configured with an AC surge protection box (SPD60D).
- The BTS3900E AC(1) works as the basic module. It is connected to the two extension BTS3900Es through the SFP ports to form a star topology.

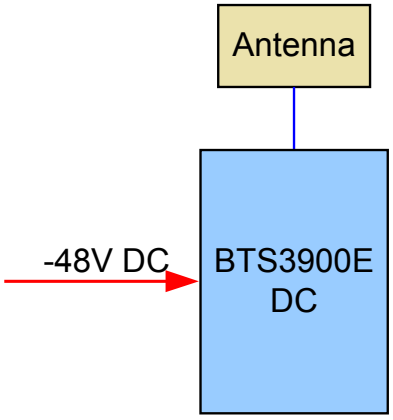
3.2 Scenario 2: -48 V DC Power Input (No Backup Power Required)

This describes the installation scenarios of the BTS3900E in the case that -48 V DC power is available on site and backup power is not required.

Configuration of Omni-Directional Site (One BTS3900E)

Figure 3-4 shows the installation of one DC-powered BTS3900E in omni-directional configuration.

Figure 3-4 Installation of one AC-powered BTS3900E in omni-directional configuration



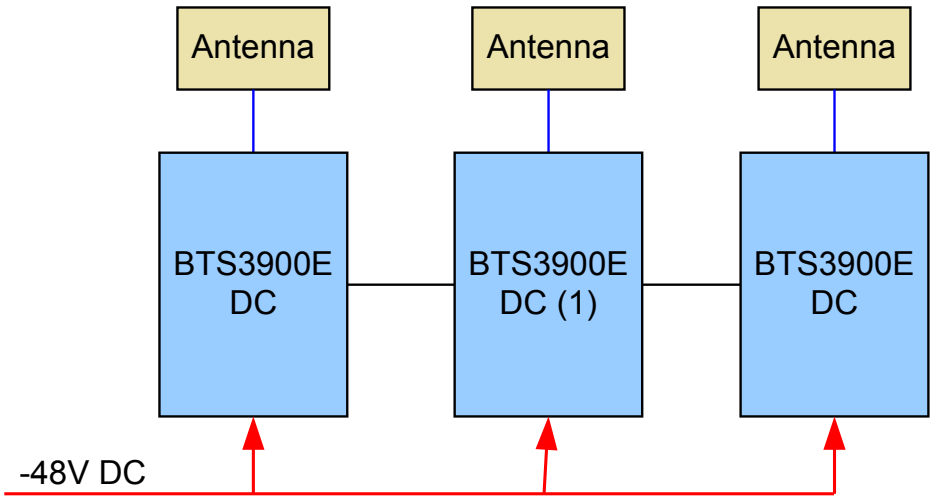
This installation scenario has the following features:

- The BTS3900Es can be mounted on the wall or pole.
- The capacity of the external power input system should range from 5 A to 8 A.

Three-Sector Configuration

Figure 3-5 shows the installation of three DC-powered BTS3900Es in three-sector configuration.

Figure 3-5 Installation of DC-powered BTS3900E in three-sector configuration



This installation scenario has the following features:

- The BTS3900Es can be mounted on the wall or pole.
- Requirements for the external power input system:
  - If power supply for the BTS3900Es are independent from each other, the capacity of the external power input system should range from 5 A to 8 A.
  - If two BTS3900Es are cascaded, the capacity of the external power input system should range from 10 A to 12 A.

- If three BTS3900Es are cascaded, the capacity of the external power input system should range from 15 A to 20 A.

- The BTS3900E DC(1) works as the basic module. It is connected to the two extension BTS3900Es through the SFP ports to form a star topology.

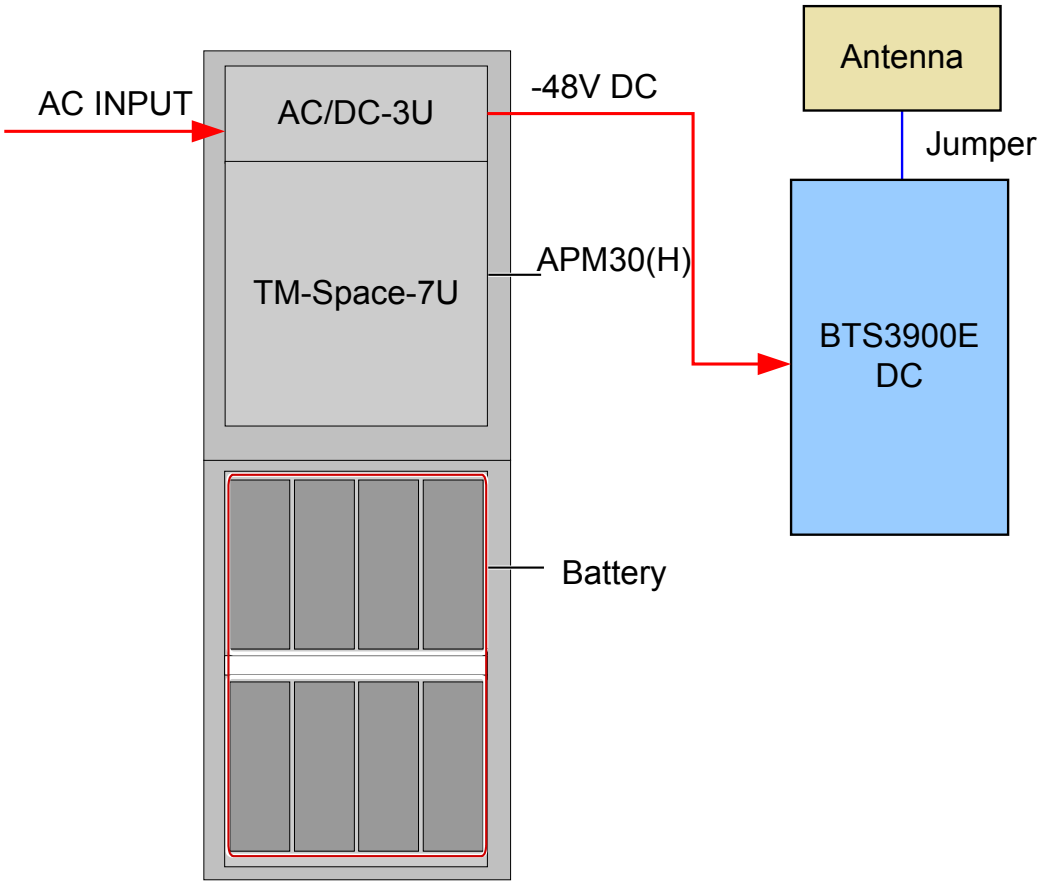
3.3 Scenario 3: AC Power Input (Backup Power Required)

This describes the installation scenarios of the BTS3900E in the case that AC power is available on site and backup power is required.

Configuration of Omni-Directional Site (One BTS3900E)

Figure 3-6 shows the installation of one DC-powered BTS3900E in omni-directional configuration when backup power is required.

Figure 3-6 Installation of one AC-powered BTS3900E in omni-directional configuration



This installation scenario has the following features:

- The power cabinet (APM30 or APM30H) is mandatory. It supplies -48 V DC power and provides a maximum of 7 U installation space.
- The BBC or IBBS200T that is used to install batteries is mandatory.
- Installation options:

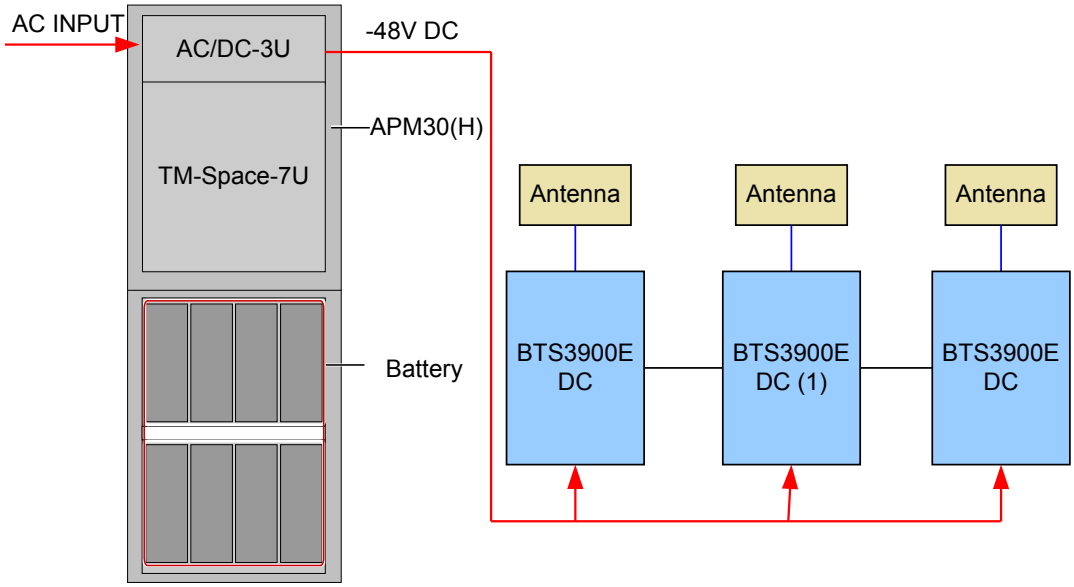
- The BTS3900E can be mounted on the wall or pole.
- The APM30 and the BBC (or IBBS200T) can be installed on the ground in stack mode.
- The APM30H and the IBBS200T can be installed on the ground in stack mode.

- Requirements for the external power input system:
  - 110 V AC dual-live-wire: 32 A/2 Pole
  - 220 V AC single-phase: 32 A/1 Pole
  - 220 V AC three-phase: 16-20 A/3 Pole
- If the backup power is required to last two, four, or six hours, the 50 Ah battery pack should be configured.

Three-Sector Configuration

Figure 3-7 shows the installation of three DC-powered BTS3900Es in three-sector configuration when backup power is required.

Figure 3-7 Installation of DC-powered BTS3900E in three-sector configuration



This installation scenario has the following features:

- The power cabinet (APM30 or APM30H) is mandatory. It supplies -48 V DC power and provides a maximum of 7 U installation space.
- The BBC or IBBS200T that is used to install batteries is mandatory.
- Installation options:
  - The BTS3900E can be mounted on the wall or pole.
  - The APM30 and the BBC or IBBS200T can be installed on the ground in stack mode.
  - The APM30H and the IBBS200T can be installed on the ground in stack mode.
- Requirements for the external power input system:
  - 110 V AC dual-live-wire: 32 A/2 Pole
  - 220 V AC single-phase: 32 A/1 Pole

- 220 V AC three-phase: 16-20 A/3 Pole

- The BTS3900E DC(1) works as the basic module. It is connected to the two extension BTS3900Es through the SFP ports to form a star topology.
- If the backup power is required to last two hours, the 50 Ah battery pack should be configured.
- If the backup power is required to last four or six hours, the 92 Ah battery pack should be configured.

4 Monitoring Scheme of the BTS3900E

This describes the monitoring scheme of the BTS3900E.

Monitoring Port

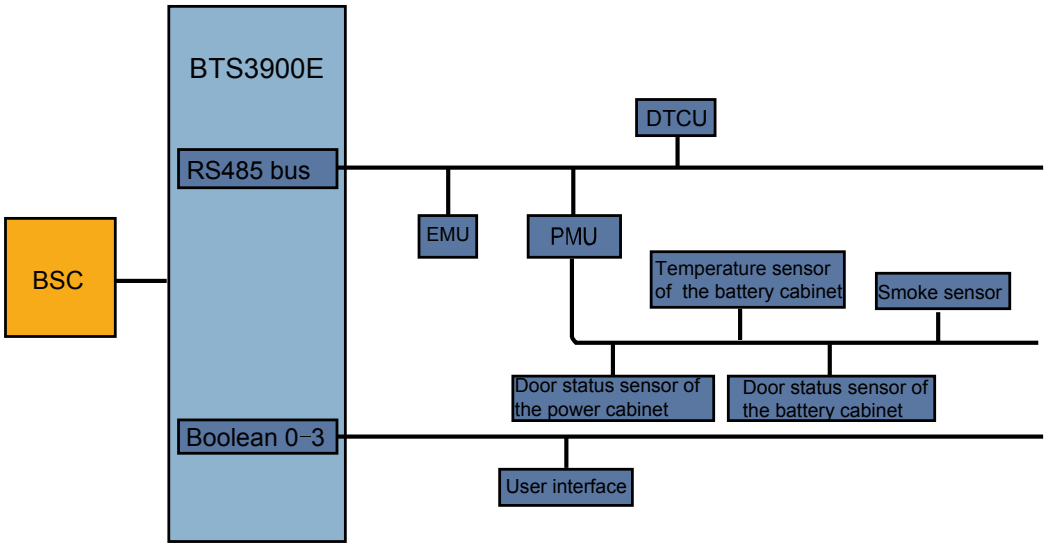
The port labeled MON at the bottom of the BTS3900E is the monitoring port. For the exact position of the monitoring port, see **5.1.2 Panels of the BTS3900E**.

- The BTS3900E provides one RS485 bus and allows four Boolean signal inputs.
- The surge protection capability for four dry contact inputs is 3 kA in differential mode and 5 kA in common mode.

Monitoring System

Figure 4-1 shows the BTS3900E monitoring system.

Figure 4-1 Monitoring system



Functions of the monitoring system

Table 4-1 describes the functions of the BTS3900E monitoring system.

Table 4-1 Functions of the monitoring system

Module	Function
PMU	• Communicating with the BTS3900E through the RS232/RS422 serial port • Managing power system and battery charge/discharge • Detecting and reporting water alarms, smoke alarms, door status alarms, and standby Boolean value alarms, and reporting ambient humidity and temperature, battery temperature, and standby analog values • Detecting power distribution and reporting related alarms
Temperature control unit (DTCU) • APM30: AFMU • APM30H: HEUA	AFMU • Supplying DC power to the APMI/AFMU through the DC power port • Supplying DC power to the two fans at the top of the cabinet and reporting the alarms of the fans • Reporting the alarms of the internal ambient temperature sensor, air inlet temperature sensor, and air outlet temperature sensor • The alarm signals of the AFMU is transmitted to the APMI through the signal transfer cable and then is reported to the main control board. HEUA • Monitoring the fans and reporting the related alarms
EMU	• Communicating with the BTS3900E through the RS485 port, through which two-channel RS485 signals are transmitted • Detecting the input voltage • Providing a port for connecting with the 12 V DC or 24 V DC temperature and humidity sensor • Providing ports for Boolean signal inputs of dry contact type and of OC type • Providing ports for controlling six external Boolean outputs of relay node type

5 BTS3900E Hardware

About This Chapter

This describes the equipment, cables, and auxiliary devices of the BTS3900E.

5.1 BTS3900E Equipment

With a highly integrated structure, the BTS3900E incorporates functions such as transmission, main control, baseband processing, and RF processing into a single module.

5.1.1 BTS3900E Appearance

The BTS3900E is classified into two types, namely AC-powered BTS3900E and DC-powered BTS3900E. The former supports 110 V AC and 220 V AC power and the latter supports -48 V DC power.

Figure 5-1 shows the two types of BTS3900E. The left one is the AC-powered BTS3900E and the right one is the DC-powered BTS3900E.

Figure 5-1 Dimensions of the AC-powered BTS3900E and the DC-powered BTS3900E

BTS3900E（AC）　　BTS3900E （DC）

Table 5-1 lists the dimensions of the AC-powered BTS3900E and the DC-powered BTS3900E.

Table 5-1 Dimensions of the AC-powered BTS3900E and the DC-powered BTS3900E

Type	Height (mm)	Width (mm)	Depth (mm)
AC-powered BTS3900E	485	370	130
DC-powered BTS3900E	485	268	130

5.1.2 Panels of the BTS3900E

The BTS3900E has three panels, namely bottom panel, cabling cavity panel, and LED panel.

The panels of the AC-powered BTS3900E and the DC-powered BTS3900E are at the same positions.

NOTE

The power socket of the DC-powered BTS3900E is located in the cabling cavity whereas that of the AC-powered BTS3900E is at the bottom.

Figure 5-2 takes the DC-powered BTS3900E as an example to show the positions of the BTS3900E panels.

Figure 5-2 Positions of the BTS3900E panels

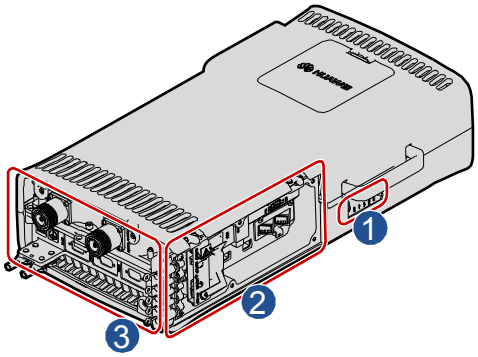


Figure 5-3 shows the panels of the DC-powered BTS3900E.

Figure 5-3 Panels of the DC-powered BTS3900E

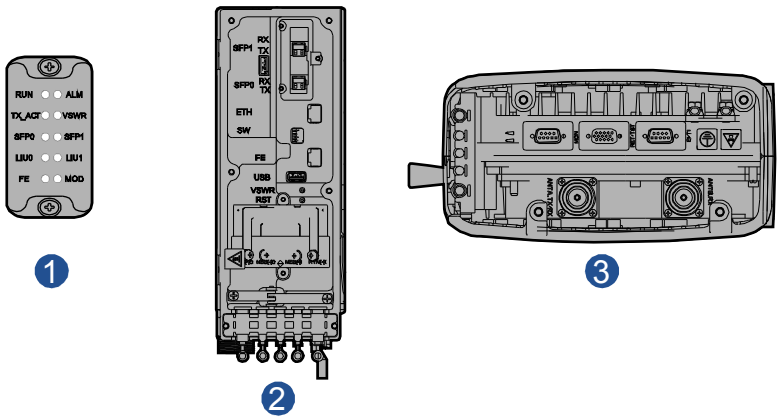


Figure 5-4 shows the panels of the AC-powered BTS3900E.

Figure 5-4 Panels of the AC-powered BTS3900E

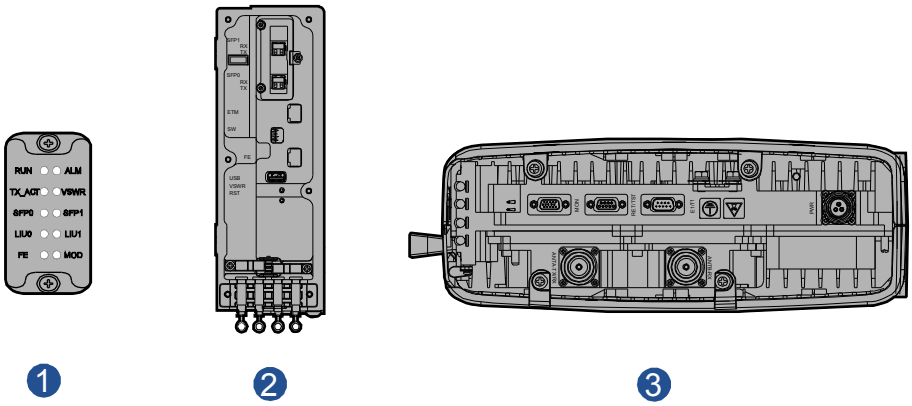


Table 5-2 describes the items such as the LEDs, ports, and button on the panels of the BTS3900E.

Table 5-2 Panels of the BTS3900E

Item	Label	Description
(1) LED panel	For details, see **5.1.3 LEDs on the BTS3900E**.	
(2) Cabling cavity panel	SFP0	High-speed ports for BTS3900E cascading
	SFP1	
	FE	Transmission port, supporting 802.3af compliant Power-over-Ethernet (PoE)

Item	Label	Description
	ETH	Ethernet port for local maintenance
	VSWR	Button for the VSWR test
	SW	DIP switch. For details, see **5.1.4 DIP Switch on the BTS3900E**.
	RST	Button for resetting the BTS3900E
	USB	Reserved port Function to be implemented: Automatic software upgrade through USB disk
	RTN(+)0	DC-powered BTS3900E: Wiring posts for DC power input to the BTS3900E
	NEG(-)0	
	RTN(+)1	DC-powered BTS3900E: Wiring posts for power supply to the cascaded BTS3900E
	NEG(-)1	
(3) Bottom panel	ANTA_TX/RX	Antenna connector for transmitting and receiving RF signals
	ANTB_RX	Antenna connector for receiving RF signals
	RET/TST	Reserved port Functions to be implemented: This port will work as an RET antenna port that is in compliance with AISG2.0 protocol. The BTS3900E will communicate with the RET antenna through this port in order to control the RET antenna.
	E1/T1	Transmission port, providing two E1s/T1s
	MON	Monitoring port, providing one RS485 environment monitoring signal input and four dry contact environment monitoring signal inputs
	PWR	AC-powered BTS3900E: for AC power input

5.1.3 LEDs on the BTS3900E

The BTS3900E has 10 LEDs that are used to indicate its operating status.

For the positions of the LEDs on the BTS3900E, see **5.1.2 Panels of the BTS3900E**.

Table 5-3 lists all the LEDs on the BTS3900E and describes the indications of different LED states.

Table 5-3 LEDs on the BTS3900E

LED	Color	State	Description
RUN	Green	Blinking (ON for 1s and OFF for 1s)	The BTS3900E works properly.
		Blinking (ON for 0.125s and OFF for 0.125s)	Board software is being loaded or the board is not started.
		ON	The power input is normal, but the board is faulty or being started.
		OFF	The BTS3900E has no power input, or alarms are generated.
ALM	Red	ON	Alarms are generated, and the BTS3900E needs to be replaced.
		Blinking (ON for 0.5s and OFF for 0.5s)	An alarm is generated and needs to be cleared according to the handling suggestion.
		OFF	No alarm is generated.
ACT	Green	ON	The power amplifier (PA) works properly.
		Blinking (ON for 1s and OFF for 1s)	The BTS3900E works properly, but the PA does not work.
SFP0/ SFP1	Red and green	ON (green)	The CPRI link is normal.
		ON (red)	Data reception is abnormal.
		Red (ON for 1s and OFF for 1s)	The CPRI link is out of lock.
		OFF	The SFP module is out of position.
VSWR	Red	OFF (red)	No VSWR alarm is generated.
		ON (red)	A VSWR alarm is generated at the ANTA_TX/RX port.
LIU0/ LIU1	Green	ON	A local E1 alarm is generated, or the E1 cable is not connected.
		Blinking (ON for 0.25s and OFF for 0.25s)	A remote E1 alarm is generated.
		OFF	The BTS3900E works properly.
FE	Green	OFF	The FE connection is faulty.

LED	Color	State	Description
		ON	The FE connection is normal.
		Blinking (ON for 0.125s and OFF for 0.125s)	The FE port is receiving or transmitting data.
MOD	Green	ON	The BTS3900E module is a basic module.
		Blinking (ON for 0.5s and OFF for 0.5s)	The BTS3900E module is an extension module.

5.1.4 DIP Switch on the BTS3900E

There is only a 4-bit DIP switch on the BTS3900E.

The 4-bit DIP switch is located in the BTS3900E cabling cavity, as shown in **Figure 5-5**.

Figure 5-5 Position of the BTS3900E DIP switch

Table 5-4 describes the default settings of the 4-bit DIP switch.

Table 5-4 Default settings of the 4-bit DIP switch

Setting				Description
1	2	3	4	
ON	ON	OFF	OFF	Basic module, 75-ohm E1 transmission, RX not grounded

The 4-bit DIP switch performs the following functions:

- Bits 1 and 2 are used to specify whether the BTS3900E is a basic module or an extension module and the transmission mode, as described in **Table 5-5**.

- When bits 1 and 2 are set to ON, bits 3 and 4 can be used to specify the grounding state of the 75-ohm E1 transmission, as described in **Table 5-6**.

NOTE

After setting the DIP switch, you need to reset the BTS3900E to make the settings take effect.

Table 5-5 Settings of the 4-bit DIP switch (1)

Setting		Description
1	2	
ON	ON	Basic module, 75-ohm E1 transmission
OFF	ON	Basic module, 120-ohm E1 transmission
ON	OFF	Basic module, T1 transmission
OFF	OFF	The BTS3900E module is an extension module.

Table 5-6 Settings of the 4-bit DIP switch (2)

Bit	Setting	Description
3	ON	The second E1, RX grounded
	OFF	The second E1, RX not grounded
4	ON	The first E1, RX grounded
	OFF	The first E1, RX not grounded

5.2 BTS3900E Cables

The BTS3900E cables are categorized as the PGND cable, power cable, transmission cable, signal cable, and RF jumper.

5.2.1 List of the BTS3900E Cables

The BTS3900E cables are categorized as the PGND cable, power cable, E1 cable, Ethernet cable, inter-BTS3900E cable, RF jumper, and alarm cable.

5.2.2 PGND Cable of the BTS3900E

The PGND cable is used to connect the BTS3900E and the grounding bar to ensure the proper grounding of the BTS3900E.

5.2.3 Power Cable of the BTS3900E

The power cables of the BTS3900E are categorized as the DC power cable and AC power cable.

5.2.4 Transmission Cable of the BTS3900E

The transmission cables of the BTS3900E are categorized as the Ethernet cable, E1 cable, and inter-BTS3900E signal cable.

5.2.5 Alarm Cable of the BTS3900E

The alarm cables are used to lead alarm signals from external devices to the BTS3900E so that the external signals can be monitored.

5.2.6 RF Cable of the BTS3900E
This describes the RF jumpers and RF cable connections of the BTS3900E.

5.2.1 List of the BTS3900E Cables

The BTS3900E cables are categorized as the PGND cable, power cable, E1 cable, Ethernet cable, inter-BTS3900E cable, RF jumper, and alarm cable.

Table 5-7 lists the BTS3900E cables.

Table 5-7 List of the BTS3900E cables

Cable	Status Before Delivery	Installation Position
5.2.2 PGND Cable of the BTS3900E	Both ends of the cable should be connected on site.	• External PGND cable - One end is connected to the grounding bolt at the bottom of the BTS3900E. - The other end is connected to the wiring terminal of the protection grounding bar. • PGND cable between cascaded BTS3900Es - One end is connected to the grounding bolt at the bottom of one BTS3900E. - The other end is connected to the grounding bolt at the bottom of the other BTS3900E.
DC Power Cable of the BTS3900E	Both ends of the cable should be connected on site.	• Power cable between cascaded BTS3900Es - One end is connected to the NEG(-)1 and RTN (+)1 wiring posts in the cabling cavity of one BTS3900E. - The other end is connected to the NEG(-)0 and RTN(+)0 wiring posts in the cabling cavity of the other BTS3900E. • Input power cable - One end is connected to the NEG(-)0 and RTN (+)0 wiring posts in the cabling cavity of the BTS3900E. - The other end is connected to the wiring posts on the external power supply device.

Cable	Status Before Delivery	Installation Position
AC Power Cable of the BTS3900E	Both ends of the cable should be connected on site.	• Power cable between the BTS3900E and the AC surge protection box - One end is connected to the PWR port at the bottom of the BTS3900E. - The other end is connected to the AC surge protection box. • Power cable between the BTS3900E and the power supply device - One end is connected to the PWR port at the bottom of the BTS3900E. - The other end is connected to the external power supply device. • Power cable between the AC surge protection box and the power supply device - One end is connected to the AC surge protection box. - The other end is connected to the external power supply device.
Ethernet Cable of the BTS3900E	Both ends of the cable should be connected on site.	• Ethernet cable for transmission: One end is connected to the FE port on the cabling cavity of the BTS3900E, and the other end is connected to the transmission device. • Ethernet cable for maintenance: One end is connected to the ETH port on the cabling cavity of the BTS3900E , and the other end is connected to the Ethernet port on the PC where the site maintenance terminal system is installed.
E1 Cable of the BTS3900E	Both ends of the cable should be connected on site.	One end is connected to the E1/T1 port on the BTS3900E. The other end is connected to the BSC or transmission device.
Inter-BTS3900E Signal Cable	Both ends of the cable should be connected on site.	One end is connected to the SFP0 or SFP1 port on the cabling cavity of one BTS3900E. The other end is connected to the SFP0 or SFP1 port on the cabling cavity of the other BTS3900E. **NOTE** The connection between the SFP0 ports on basic and extension BTS3900Es takes precedence over the connections between other pairs of ports.
5.2.5 Alarm Cable of the BTS3900E	Both ends of the cable should be connected on site.	One end is connected to the MON port at the bottom of the BTS3900E. The other end is connected to the ports for alarm signals on the external device.

Cable	Status Before Delivery	Installation Position
RF Jumper of the BTS3900E	Both ends of the cable should be connected on site.	One end is connected to the ANTA_TX/RX or ANTB_RX port at the bottom of the BTS3900E. The other end is connected to the antenna or feeder.

5.2.2 PGND Cable of the BTS3900E

The PGND cable is used to connect the BTS3900E and the grounding bar to ensure the proper grounding of the BTS3900E.

According to the functions and installation positions, the PGND cables of the BTS3900E are categorized as the external PGND cable and the PGND cable between two cascaded BTS3900Es. The two categories of PGND cable have the same appearance and perform different functions, as described below:

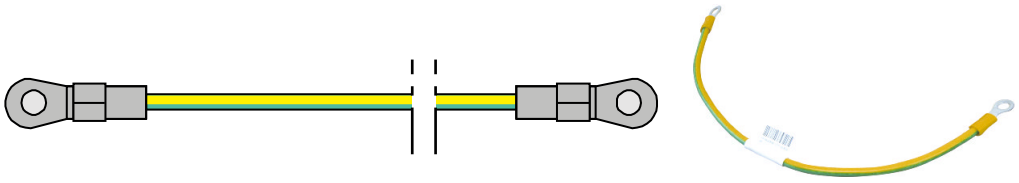
- The external PGND cable is used to connect the BTS3900E and the external grounding bar.
- The PGND cable between two cascaded BTS3900Es is used to ensure the equipotential connection between the cascaded BTS3900Es.

If two BTS3900Es are cascaded, you can connect one of them to the external grounding bar and then connect the two by using the PGND cable between cascaded BTS3900Es. Alternatively, you can use external PGND cables to individually connect the two BTS3900Es to the external grounding bar.

Appearance

The green and yellow PGND cable of the BBU3806 is a single cable with a cross-sectional area of 16 mm^2. The PGND cable has an OT terminal on both ends, as shown in **Figure 5-6**. The OT terminals need to be added on site.

Figure 5-6 PGND cable



NOTE

- When an AC surge protection box is configured, the PGND cable is used to connect the AC surge protection box and the grounding bar to ensure the proper grounding of the AC surge protection box.
- One end of the PGND cable that is connected to the BTS3900E or AC surge protection box has an M6 OT terminal, and the other end needs to be added with an OT terminal of a proper size depending on the external ground bar on site.

Pin Assignment

None.

5.2.3 Power Cable of the BTS3900E

The power cables of the BTS3900E are categorized as the DC power cable and AC power cable.

DC Power Cable of the BTS3900E

The BTS3900E has two types of DC power cables: the external input power cable and the power cable between cascaded BTS3900Es.

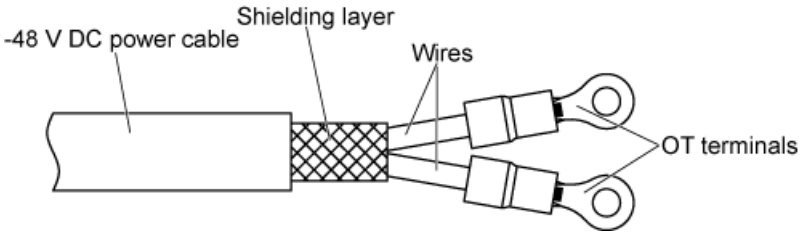
The two types of power cables have the same appearance. The functions of the two types of power cables are as follows:

- The external input power cable is used to lead -48 V DC power from the external equipment to the BTS3900E to supply power to the BTS3900E.
- The power cable between two cascaded BTS3900Es is used to lead power from one BTS3900E to the other.

Appearance

The DC power cable of the BTS3900E has OT terminals at one end and bare wires at the other end, as shown in **Figure 5-7**. Appropriate terminals need to be added to the bare end based on the external power device.

Figure 5-7 DC power cable of the BTS3900E (North American standard)



NOTE

The end that is connected to the BTS3900E is the M4 OT terminal, and the other end needs to be added with OT terminals of a proper size based on the external power device on site.

Pin Assignment

The DC power cable of the BTS3900E is a 2-wire cable. **Table 5-8** and **Table 5-9** describe the pin assignment for the wires of the DC power cables used in different regions.

Table 5-8 Pin assignment for the wires of the DC power cable of the BTS3900E (North American standard)

Wire Type	Color
NEG	Blue
RTN	Black

Table 5-9 Pin assignment for the wires of the DC power cable of the BTS3900E (European standard)

Wire Type	Color
NEG	Blue
RTN	Brown

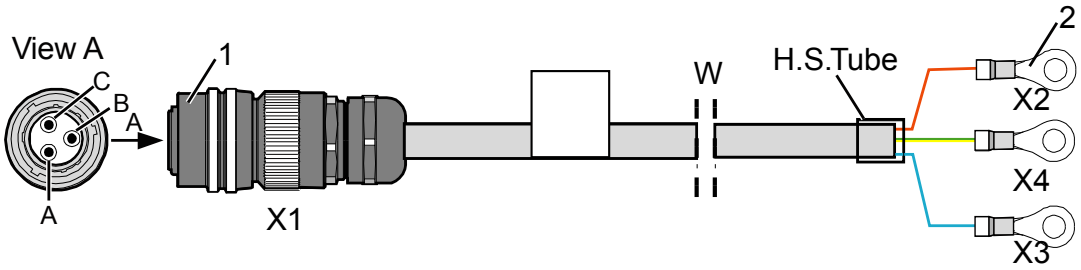
AC Power Cable of the BTS3900E

The AC power cable of the BTS3900E is used to lead AC power from the external equipment to the BTS3900E.

Appearance

Figure 5-8 shows the power cable between the BTS3900E and the AC surge protection box.

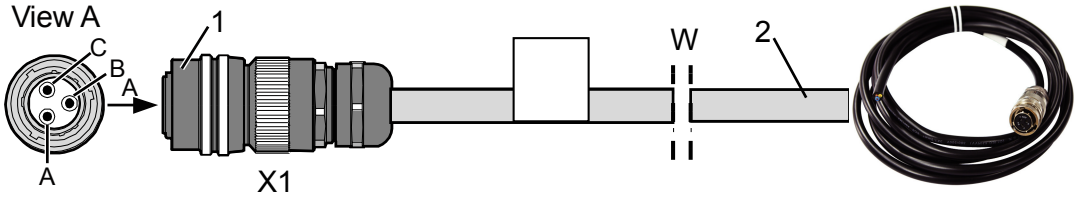
Figure 5-8 Power cable between the BTS3900E and the AC surge protection box



(1) 3-pin round connector (2) OT terminal

Figure 5-9 shows the power cable between the BTS3900E and the power supply device when the AC surge protection box is not configured.

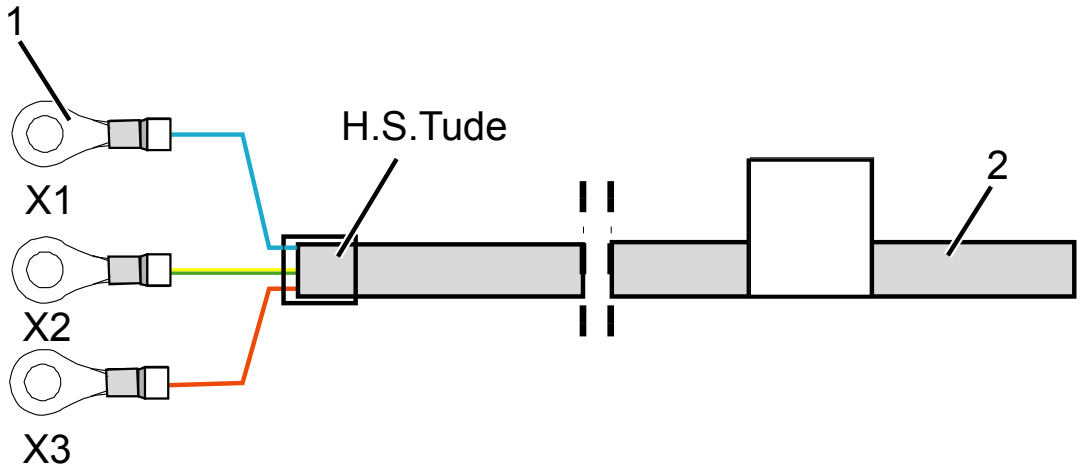
Figure 5-9 Power cable between the BTS3900E and the power supply device



(1) 3-pin round connector (2) Bare wire

Figure 5-10 shows the power cable between the AC surge protection box and the power supply device.

Figure 5-10 Power cable between the AC surge protection box and the power supply device



(1) OT terminal (2) Bare wire

Pin Assignment

Table 5-10 describes the pin assignment for the wires of the power cable between the BTS3900E and the AC surge protection box.

Table 5-10 Pin assignment for the wires of the power cable between the BTS3900E and the AC surge protection box

Pin on the 3-Pin Round Connector	Color	OT Terminal	Description
X1.A	Brown	X2	L
X1.B	Green and yellow	X4	PE

Pin on the 3-Pin Round Connector	Color	OT Terminal	Description
X1.C	Blue	X3	N

Table 5-11 describes the pin assignment for the wires of the power cable between the BTS3900E and the power supply device.

Table 5-11 Pin assignment for the wires of the power cable between the BTS3900E and the power supply device

Pin on the 3-Pin Round Connector	Color	Description
X1.A	Brown	L
X1.B	Green and yellow	PE
X1.C	Blue	N

Table 5-12 describes the pin assignment for the wires of the power cable between the AC surge protection box and the power supply device.

Table 5-12 Pin assignment for the wires of the power cable between the AC surge protection box and the power supply device

OT Terminal	Color	Description
X3	Brown	L
X2	Green and yellow	PE
X1	Blue	N

5.2.4 Transmission Cable of the BTS3900E

The transmission cables of the BTS3900E are categorized as the Ethernet cable, E1 cable, and inter-BTS3900E signal cable.

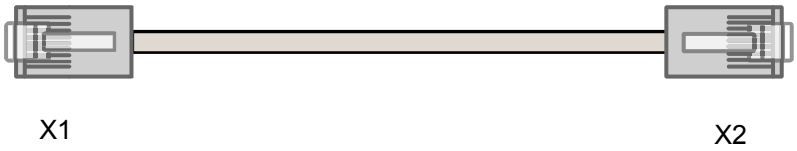
Ethernet Cable of the BTS3900E

The Ethernet cable is used to connect the BTS3900E to a transmission device or a PC where the site maintenance terminal system is installed.

Appearance

The Ethernet cable has RJ45 connectors at both ends, as shown in **Figure 5-11**.

Figure 5-11 Ethernet cable



Pin Assignment

Table 5-13 describes the pin assignment for the wires of the Ethernet cable.

Table 5-13 Pin assignment for the wires of the Ethernet cable

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

Installation Position

Table 5-14 shows the installation position of the Ethernet cable.

Table 5-14 Installation position of the Ethernet cable

Working Mode	One End (RJ-45 Connector)	The Other End (RJ-45 Connector)
Ethernet cable for transmission	**FE** port on the BTS3900E Cabling cavity panel.	Ethernet cable for user equipment connection.
PoE power supply		Connected to microwave transmission equipment.

Working Mode	One End (RJ-45 Connector)	The Other End (RJ-45 Connector)
Local maintenance	**ETH** port on the BTS3900E Cabling cavity panel.	Connected to the Ethernet port of the local maintenance terminal PC.

E1 Cable of the BTS3900E

The E1 cable is used to connect the BTS3900E to the BSC.

Appearance

The E1 cable is classified into 75-ohm E1 coaxial cable and 120-ohm E1 twisted pair cable.

The E1 cable has a DB9 female connector at one end, and the connector at the other end needs to be made according to the field requirements. **Figure 5-12** and **Figure 5-13** show the 75-ohm E1 cable and 120-ohm E1 cable respectively.

Figure 5-12 75-ohm E1 cable

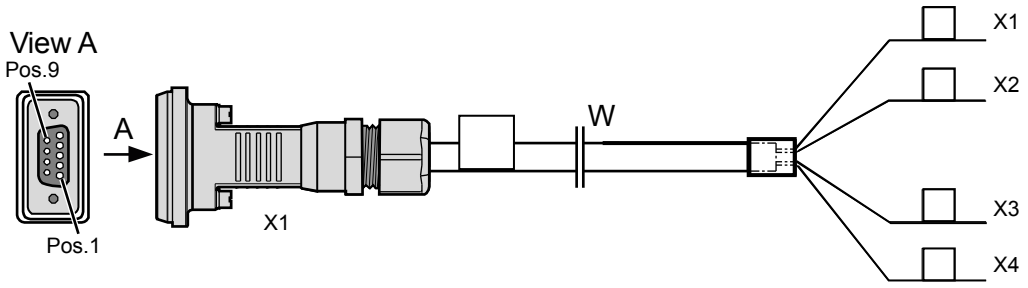
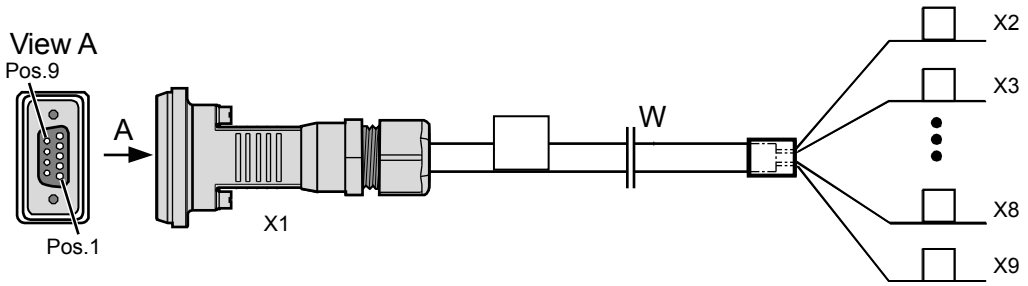


Figure 5-13 120-ohm E1 cable



Pin Assignment

Table 5-15 and **Table 5-16** describe the pin assignment for the wires of the 75-ohm E1 coaxial cable and 120-ohm E1 twisted pair cable.

NOTE

In Table 5-15, "Tip" refers to a wire in the E1 coaxial cable, and "Ring" refers to an external conductor of the cable.

Table 5-15 Pin assignment for the wires of the 75-ohm E1 coaxial cable

Pin on the DB9 Female Connector	Type	SN	Signal	Description
X1.1	Tip	2	R0	-
X1.2	Ring			-
X1.3	Tip	4	R1	-
X1.4	Ring			-
X1.6	Tip	1	T0	-
X1.7	Ring			Start X1.Shell
X1.8	Tip	3	T1	-
X1.9	Ring			Start X1.Shell

Table 5-16 Pin assignment for the wires of the 120-ohm E1 twisted pair cable

Pin on the DB9 Female Connector	Color	Type	Signal	Label
X1.1	White	Twisted pair	R0	R0+
X1.2	Orange			R0–
X1.3	White	Twisted pair	R1	R1+
X1.4	Brown			R1–
X1.6	White	Twisted pair	T0	T0+
X1.7	Blue			T0–
X1.8	White	Twisted pair	T1	T1+
X1.9	Green			T1–

Inter-BTS3900E Signal Cable

The inter-BTS3900E signal cable is used to transmit signals between the basic BTS3900E and the extension BTS3900E.

Appearance

According to different application scenarios, an SFP high-speed cable or an optical cable is used as the inter-BTS3900E signal cable. **Table 5-17** lists the application scenarios of the inter-BTS3900E signal cable.

Table 5-17 Application scenarios of the inter-BTS3900E signal cable

Application Scenario	Distance Between Combined BTS3900Es (L)	Cable Type
Indoor	L ≤ 2 m	SFP high-speed cable
	2 m < L ≤100 m	Multi-mode optical cable
	2 m < L ≤10 km	Single-mode optical cable
Outdoor	L ≤ 2 m	SFP high-speed cable
	2 m < L ≤ 10 m	Multi-mode optical cable

Figure 5-14 shows the appearance of the SFP high-speed cable.

Figure 5-14 Appearance of the SFP high-speed cable

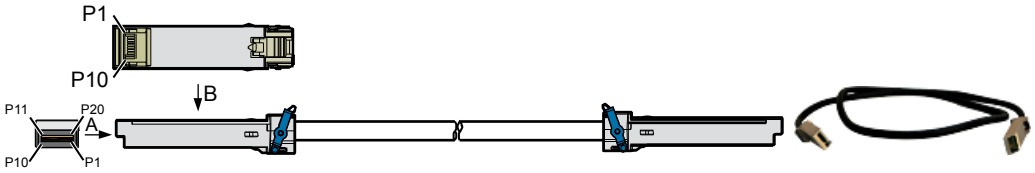
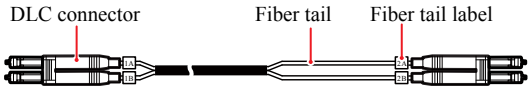


Figure 5-15 shows the appearance of the multi-mode optical cable.

Figure 5-15 Appearance of the multi-mode optical cable



Pin Assignment

None.

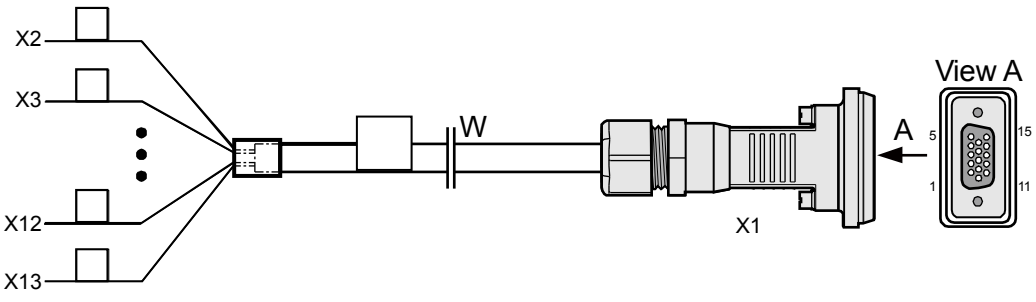
5.2.5 Alarm Cable of the BTS3900E

The alarm cables are used to lead alarm signals from external devices to the BTS3900E so that the external signals can be monitored.

Appearance

The alarm cable has an DB15 male connector at one end and bare wires at the other end, as shown in **Figure 5-16**. A terminal needs to be added to the bare end according to the port on the external device.

Figure 5-16 Alarm cable



(1) DB15 male connector (2) Bare wire

Pin Assignment

Table 5-18 describes the pin assignment for the wires of the alarm cable.

Table 5-18 Pin assignment for the wires of the alarm cable

X1 End (Pin on the DB15 Connector)	Type	Color	Signal
X1.1	Twisted pair	White	SWITCH_H1
X1.6		Blue	GND
X1.2	Twisted pair	White	SWITCH_H2
X1.7		Orange	GND
X1.3	Twisted pair	White	SWITCH_H3
X1.8		Green	GND
X1.4	Twisted pair	White	SWITCH_H4
X1.9		Brown	GND
X1.11	Twisted pair	Red	PSU 485 TX-
X1.12		Blue	PSU 485 TX+
X1.13	Twisted pair	Red	PSU 485 RX-
X1.14		Orange	PSU 485 RX+

5.2.6 RF Cable of the BTS3900E

This describes the RF jumpers and RF cable connections of the BTS3900E.

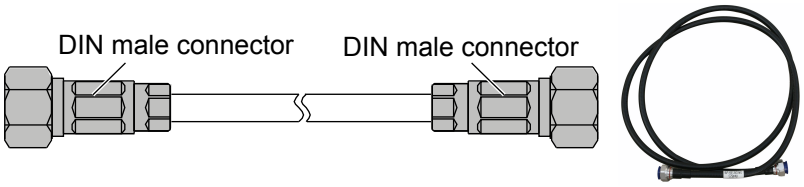
RF Jumper of the BTS3900E

The RF jumpers of the BTS3900E are 1/2-inch jumpers. The RF jumper connects the antenna port at the bottom of the BTS3900E to the feeder or antenna. It transfers the input and output RF signals, and thus facilitates the signal exchange between the BTS and the antenna system.

Appearance

Both ends of the RF jumper use DIN male connectors, as shown in **Figure 5-17**.

Figure 5-17 RF jumper



Pin Assignment

None.

RF Cable Connections of the BTS3900E

This describes the RF cable connections of the BTS3900E. You can determine the proper RF cable connections based on the site configuration.

Table 5-19 describes the RF cable connections in different site configurations.

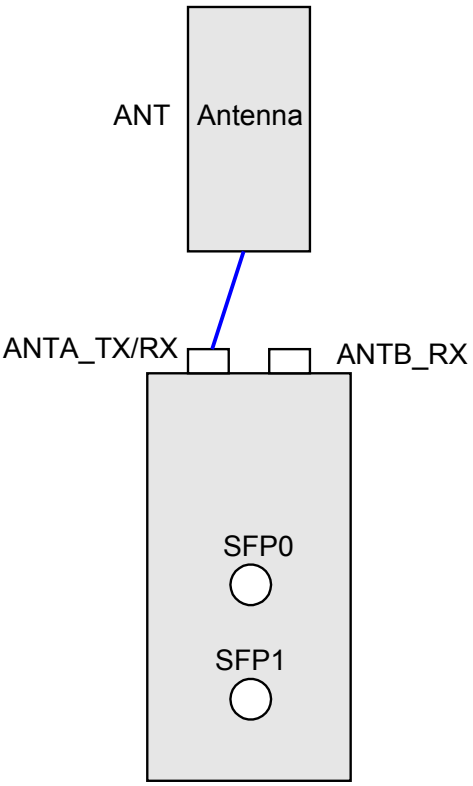
Different RF cables are identified by different colors. **Figure 5-18** shows the mapping between the RF cables and their colors.

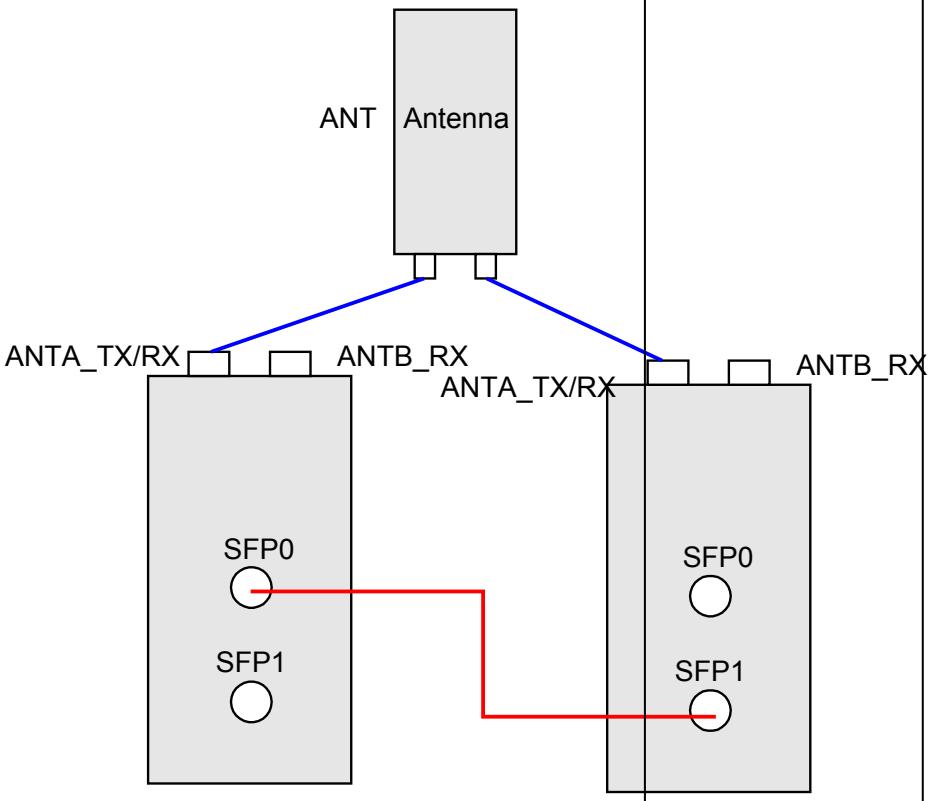
Figure 5-18 Mapping between the RF cables and their colors

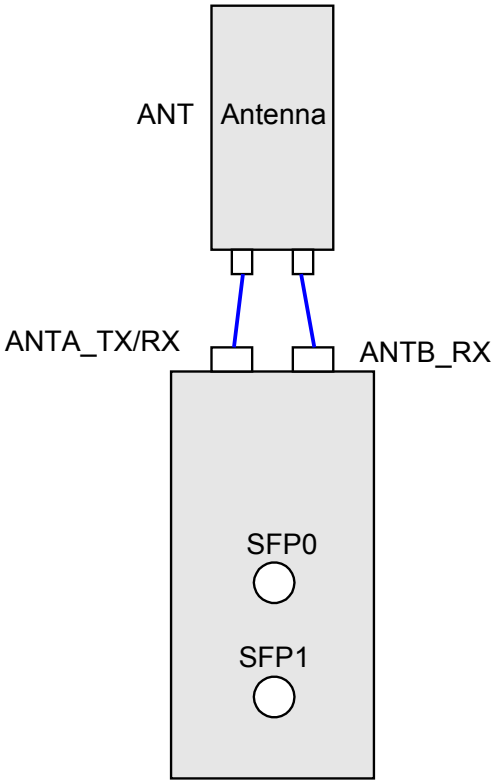
RF jumper of the BTS3900E

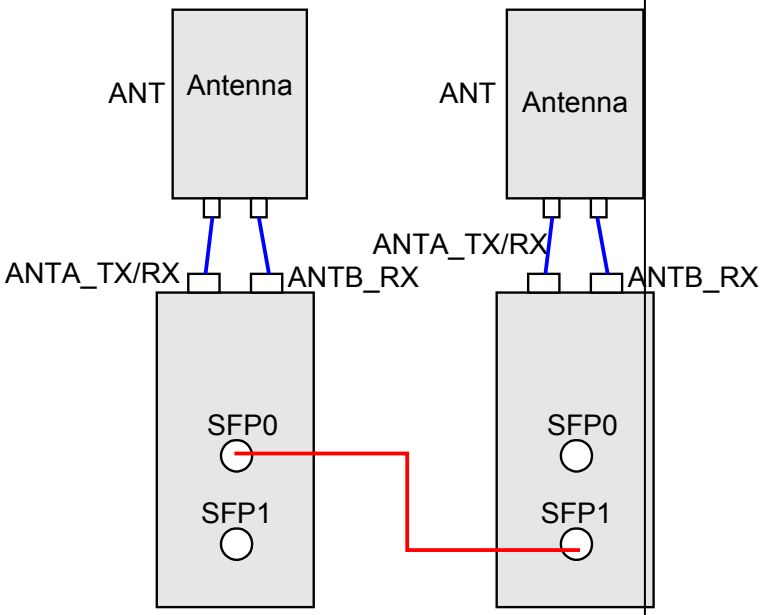
Inter-BTS3900E cable

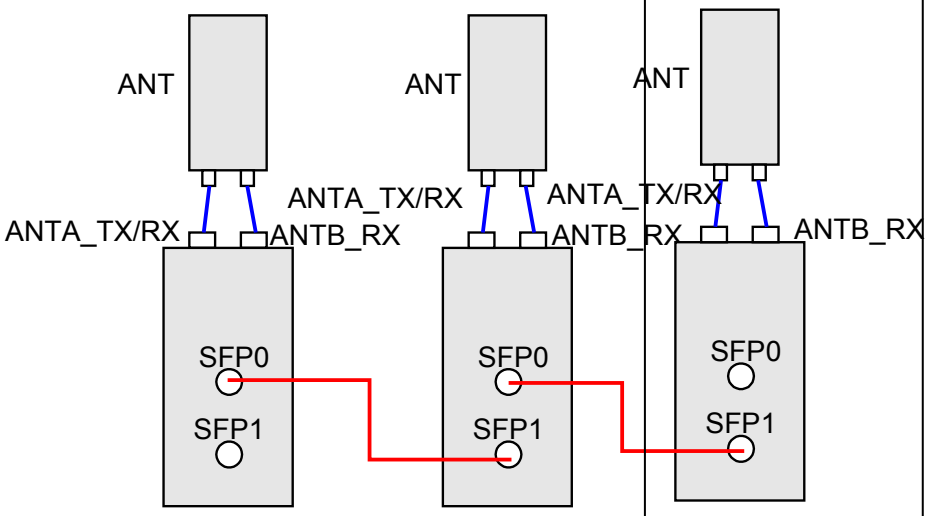
Table 5-19 RF cable connections of the BTS3900E

Site Configuration	Hardware Configuration	Software Configuration
Configuration of the omni-directional site (indoor coverage)	• One BTS3900E • One uni-polarized antenna **Figure 5-19** shows the RF cable connections. **Figure 5-19** RF cable connections (1) 	Configuration on the BSC side: • The **Send Receive Mode** should be set to **Single Feeder (1TX + 1RX)**.

Site Configuration	Hardware Configuration	Software Configuration
	• Two BTS3900Es • One dual-polarized antenna Figure 5-20 shows the RF cable connections. **Figure 5-20** RF cable connections (2)  	Configuration on the BSC side: • The **Send Receive Mode** should be set to **Single Feeder (1TX + 1RX)**.

Site Configuration	Hardware Configuration	Software Configuration
Configuration of the omni-directional site (outdoor coverage)	• One BTS3900E • One dual-polarized antenna **Figure 5-21** shows the RF cable connections. **Figure 5-21** RF cable connections (3)  	Configuration on the BSC side: • The **Send Receive Mode** should be set to **Double Feeder (1TX + 2RX)**.

Site Configuration	Hardware Configuration	Software Configuration
Configuration of the two-sector site (outdoor coverage)	• Two BTS3900Es • Two dual polarization antennas **Figure 5-22** shows the RF cable connections. **Figure 5-22** RF cable connections (4) 	Configuration on the BSC side: • The **Send Receive Mode** should be set to **Double Feeder (1TX + 2RX)**.

Site Configuration	Hardware Configuration	Software Configuration
Configuration of the three-sector site (outdoor coverage)	• Three BTS3900Es • Three dual polarization antennas **Figure 5-23** shows the RF cable connections. **Figure 5-23** RF cable connections (5) 	Configuration on the BSC side: • The **Send Receive Mode** should be set to **Double Feeder (1TX + 2RX)**.

5.3 Auxiliary Devices of the BTS3900E

This describes the auxiliary devices of the BTS3900E, including auxiliary antennas, SLPU, and AC surge protection box (SPD60D).

5.3.1 Integrated Antennas of the BTS3900E
This describes the integrated antennas of the BTS3900E. The integrated antennas of the BTS3900E are optional and can be installed at the back of the BTS3900E to transmit or receive radio waves.

5.3.2 Structure of SLPU
The SLPU has a case structure, which requires a 19 inch-wide and 1 U-high space.

5.3.3 AC Surge Protection Box
The AC surge protection box is used to provide surge protection for AC power, and the surge protection capability is 15 kA in either differentiated mode or common mode.

5.3.1 Integrated Antennas of the BTS3900E

This describes the integrated antennas of the BTS3900E. The integrated antennas of the BTS3900E are optional and can be installed at the back of the BTS3900E to transmit or receive radio waves.

Appearance

The integrated antennas of the BTS3900E consist of omni-directional antennas and directional antennas. **Figure 5-24** and **Figure 5-25** show the appearance of omni-directional antennas and directional antennas.

Figure 5-24 Appearance of omni-directional antennas

Figure 5-25 Appearance of directional antennas

NOTE

- The RF jumpers delivered with the integrated antennas of the BTS3900E can be connected to the ANTA_TX/RX port at bottom of the BTS3900E.
- For details about the installation of the integrated antennas of the BTS3900E, see the *BTS3900E GSM Installation Guide*.

Specifications

Table 5-20 lists the specifications of the integrated antennas of the BTS3900E.

Table 5-20 Specifications of the integrated antennas of the BTS3900E

Item	Omni-Directional Antenna	Directional Antenna
Frequency range	GSM850 PGSM900 EGSM900 GSM1800	GSM850 PGSM900 EGSM900 GSM1800

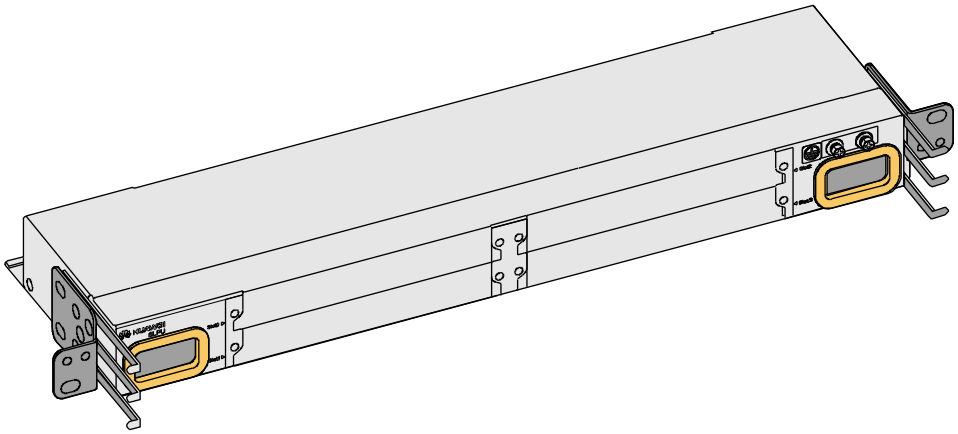
Item	Omni-Directional Antenna	Directional Antenna
Dimensions (mm)	370 x 200 x 50	230 x 200 x 50

5.3.2 Structure of SLPU

The SLPU has a case structure, which requires a 19 inch-wide and 1 U-high space.

Figure 5-26 shows the structure of SLPU.

Figure 5-26 Structure of SLPU



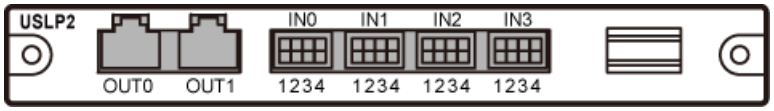
USLP2

The Universal Signal Lightning Protection unit 2 (USLP2) is a RS485, boolean alarm and E1/T1 surge protection unit. It is optional and can be installed in the SLPU. Each USLP2 provides protection for four RS485 signal, four E1s/T1s, or eight Boolean alarm signals.

Panel

Figure 5-27 shows the panel of the USLP2.

Figure 5-27 Panel of the USLP2



Ports

Table 5-21 describes the ports on the panel of the USLP2.

Table 5-21 Ports on the panels of the USLP2

Port	Quantity	Connected Cable
RJ-45	2	Surge protection transfer cable from the main control board in the cabinet
4-pin	4	Transmission cable from an external device

DIP Switch

The USLP2 has two DIP switches, which determine whether the receiving end is grounded. The DIP switch has four DIP bits. **Figure 5-28** shows the DIP switches on the USLP2.

Figure 5-28 DIP switches on the USLP2

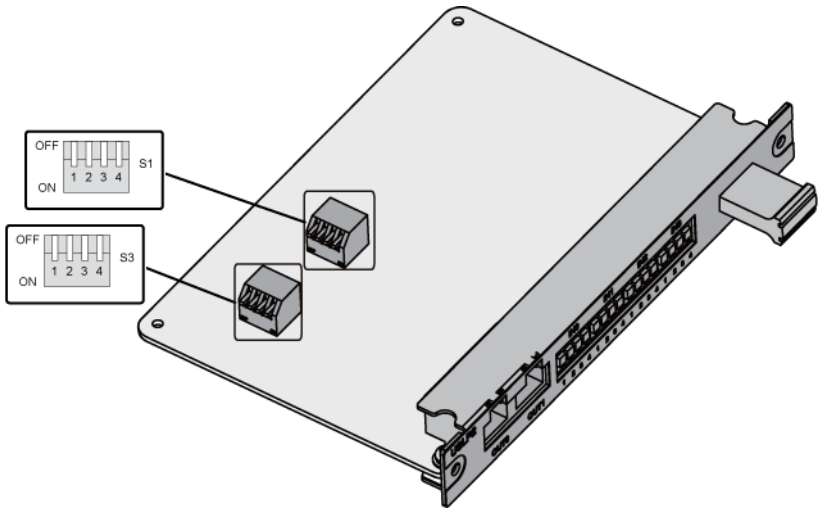


Table 5-22 describes the DIP switches on the USLP2.

Table 5-22 DIP switches on the USLP2

DIP Switch	Bit Status				Description
	1	2	3	4	
S1 and S3	ON	ON	ON	ON	75-ohm E1/T1 (unbalanced) surge protection
	OFF	OFF	OFF	OFF	120-ohm E1/T1 (balanced) surge protection

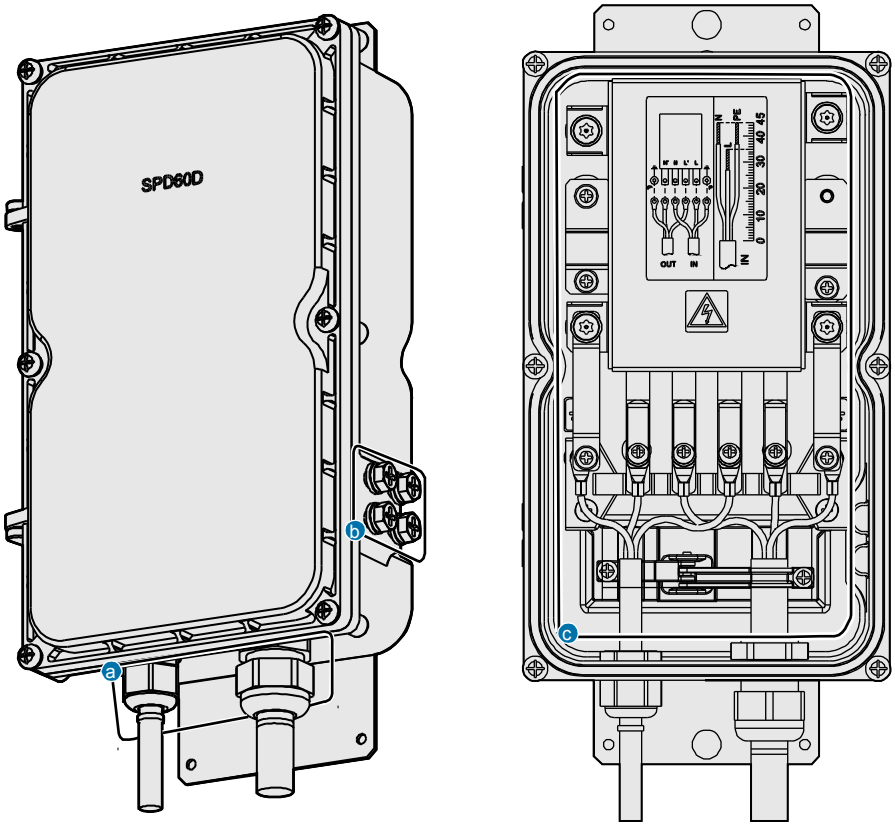
5.3.3 AC Surge Protection Box

The AC surge protection box is used to provide surge protection for AC power, and the surge protection capability is 15 kA in either differentiated mode or common mode.

Appearance

Figure 5-29 shows the AC surge protection box.

Figure 5-29 AC surge protection box



Specifications

Table 5-23 describes the specifications of the AC surge protection box.

Table 5-23 Specifications of the AC surge protection box

Item	Description
Depth (mm) x width (mm) x height (mm)	240 x 140 x 75
Installation option	Pole-mounted or wall-mounted
Surge protection capability	15 kA either in differentiated mode or in common mode (10/350 us)

Wiring Terminal and Wiring Post

Table 5-24 describes the wiring terminals and wiring posts on the AC power surge protection box.

Table 5-24 Wiring terminals and wiring posts on the AC surge protection box

Item	Label	Description
(a) Bottom panel	IN	AC power input
	OUT	Output of protected power
(b) Side panel	-	Wiring terminal for the external PGND cable
	-	Wiring terminal for the PGND cable of the BTS3900E
(c) Cabling cavity panel	L/L'	Wiring posts for the power cable
	N/N'	
	GND	

6 BTS3900E Maintenance

About This Chapter

This describes the items to be regularly maintained after the BTS3900E is put into use in order to ensure its proper operation. The power-on and power-off operations and the method of replacing the BTS3900E and optical modules are also provided.

6.1 Maintenance Items for the BTS3900E

This describes the maintenance items for the BTS3900E. The maintenance items are equipment surface, cleanliness, and LEDs.

Table 6-1 describes the maintenance items for the BTS3900E.

Table 6-1 Maintenance items for the BTS3900E

Item	Checking Frequency	Operation	Reference Standard
Equipment surface	Monthly or quarterly	Check whether the surface of the equipment is damaged and whether the label on the equipment is legible.	None.
Equipment cleanliness	Monthly or quarterly	Check whether the equipment is clean.	The surface of the equipment is not dusty.
LEDs	Monthly or quarterly	Check whether the LEDs on the equipment are functional.	For details on the indications of the LED states, see **5.1.3 LEDs on the BTS3900E**.

6.2 Powering On and Powering Off the BTS3900E

When powering on the BTS3900E, you should check the input voltage and the LED states. As for power-off, you should perform normal power-off or emergency power-off based on the actual situation.

6.2.1 Powering On the BTS3900E

To power on the BTS3900E, set the corresponding MCB on the auxiliary power device to **ON**, and then check the operating status of the BTS3900E based on the LED states.

Prerequisite

- The hardware and cables of the BTS3900E are installed.
- The input voltage stays within the normal range.

Context

CAUTION

After the BTS3900E is unpacked, it must be powered on in 24 hours. If the BTS3900E should be powered off for maintenance, the duration of the power-off state cannot exceed 24 hours.

Procedure

Step 1 Set the corresponding MCB on the auxiliary power device of the BTS3900E to **ON**.

DANGER

Do not look into the optical module after the BTS3900E is powered on.

Step 2 Wait three to five minutes, and then check the states of the LEDs on the BTS3900E. For the indications of different LED states, see **5.1.3 LEDs on the BTS3900E**.

NOTE

If BTS3900Es are cascaded, check the state of the LEDs on each BTS3900E.

Step 3 Take corresponding actions based on the LED state.

If...	Then…
The BTS3900E operates normally	End the power-on operation.
The BTS3900E is faulty	Rectify the fault, and then go to **Step 1**.

----End

6.2.2 Powering Off the BTS3900E

This describes how to power off the BTS3900E in a normal situation or in an emergency.

Procedure

Step 1 Choose normal power-off or emergency power-off according to the field conditions.

If...	Then…
You need to power off the BTS3900E before an equipment swap or a foreseeable regional blackout	Go to **Step 2** to perform a normal power-off.
You need to power off the BTS3900E in an emergency, such as fire, smoke, or water immersion	Go to **Step 3** to perform an emergency power-off.

Step 2 Set the corresponding MCB on the auxiliary power supply device of the BTS3900E to **OFF**.

NOTE

Before powering off any of the cascaded BTS3900Es,assess the possible impacts on the lower-level BTS3900E. This helps prevent the ongoing services from being disrupted.

Step 3 Preferentially, cut off the external input power of the auxiliary BTS3900E power device. If time permits, set the corresponding MCB on the auxiliary BTS3900E power device to **OFF**.

----End

6.3 Replacing the BTS3900E

Replacing the BTS3900E disrupts all the services carried by it.

Prerequisite

- The quantity of the BTS3900Es to be replaced is checked, and new BTS3900Es are ready.
- The BTS3900E cable connections are recorded.
- The user service tool kit is ready.

Context

CAUTION

Take proper ESD protection measures, for example, wear an ESD wrist strap or a pair of ESD gloves, to prevent electrostatic damage to the boards, modules, or electronic components.

Procedure

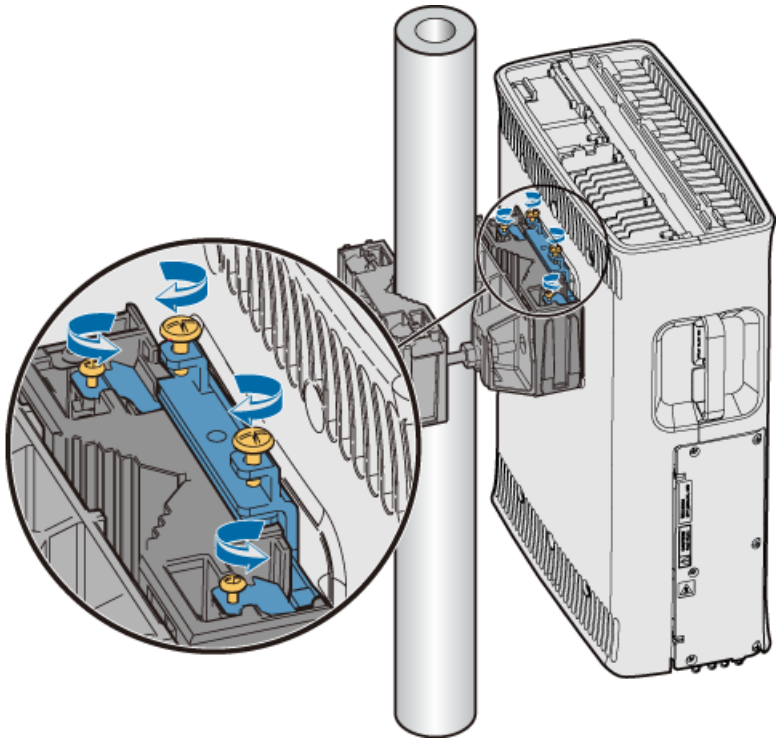
Step 1 Set the corresponding MCB on the auxiliary power device of the BTS3900E to OFF.

Step 2 Loosen the six captive screws on the cover plate of the cabling cavity to open the cover plate.

Step 3 Remove all the cables from the BTS3900E and take appropriate insulation measures.

Step 4 Loosen the captive screws of the two contact pieces on the main bracket. Then, tighten the two screws on the mounting plate of the BTS3900E.

Figure 6-1 Removing the BTS3900E



Step 5 Hold the BTS3900E bottom with both hands and lift the BTS3900E to remove it from the main fixture.

Step 6 Install a new BTS3900E. For details on the installation procedure, see the *BTS3900E GSM Installation Guide*.

Step 7 Connect all the BTS3900E cables.

Step 8 Check the settings of the DIP switch on the BTS3900E.

Step 9 Set the corresponding MCB on the auxiliary power supply device to **ON**.

Step 10 Check the state of the LEDs on the BTS3900E panel.

Step 11 Click **Board** in the left pane of the **Site Maintenance Terminal System** window, and then double-click **Board Management** in the right pane of the window. The **Board Management** window is displayed.

Step 12 In the **Board Management** window, check the operating status of the BTS3900E.

If...	Then...
The BTS3900E icon is green	The BTS3900E operates normally. Then, go to the next step.
The BTS3900E icon is not green	The BTS3900E does not operate normally. Then, reinstall the BTS3900E.

Step 13 In the **Board Management** window, right-click the target BTS3900E and choose **Board Information** from the displayed shortcut menu. Check whether the software version of the BTS3900E matches the current BTS software version.

If…	Then…
The software version of the BTS3900E does not match the current BTS software version	Load and activate the software.
The software version of the BTS3900E matches the current BTS software version	Go to the next step.

Step 14 In the **Board Management** window, right-click the target BTS3900E and choose **Board Warning** from the displayed shortcut menu. Check for the alarms related to the BTS3900E.

If…	Then…
Related alarms exist	Rectify the fault according to the handling suggestion.
No related alarm exists	The replacement of the BTS3900E is successful.

Step 15 Perform dialing tests and ensure that the corresponding services on the cell of the new BTS3900E are normal.

Step 16 Close the cover plate and tighten the six captive screws.

----End

Postrequisite

Contact the local Huawei office to handle the faulty BTS3900E.

6.4 Replacing an Optical Module

This describes how to replace a faulty optical module. The optical module provides the electrical-optical interface for the optical transmission between two cascaded BTS3900Es. During the replacement of the optical module, the optical cable is removed. Thus, the signal transmission between the two cascaded BTS3900Es is disrupted.

Prerequisite

- The number and type of the faulty optical module are confirmed, and new optical modules are ready.
- The installation positions of faulty optical modules and the connections of optical cables are recorded.
- The tools and materials such as the ESD wrist strap/ESD gloves and ESD box/ESD bag are ready.

Context

Optical modules are hot-swappable.

It takes about five minutes to replace the optical module of the BTS3900E, which involves the removal of the optical cable and the faulty optical module, the installation of the new optical module, the connection of the optical cable to the optical module, and the time elapsed for the restoration of the transmission links.

CAUTION

- Take proper ESD protection measures, for example, wear an ESD wrist strap or a pair of ESD gloves, to prevent electrostatic damage to the boards, modules, or electronic components.
- Do not look directly at the optical module after removing the connector of the optical cable from the optical module.

Procedure

Step 1 Press the latch on the optical cable connector, and then remove the connector from the faulty optical module.

Step 2 Turn the puller on the faulty optical module outwards. Then, hold the puller and take the faulty optical module out of the port. Thus, the optical module can be separated from the BTS3900E.

Step 3 Install a new optical module on the BTS3900E.

Step 4 Remove the dustproof caps from the optical connector and from the optical module, and then insert the connector into the new module.

----End

Postrequisite

Contact the local Huawei office to handle the faulty optical module.