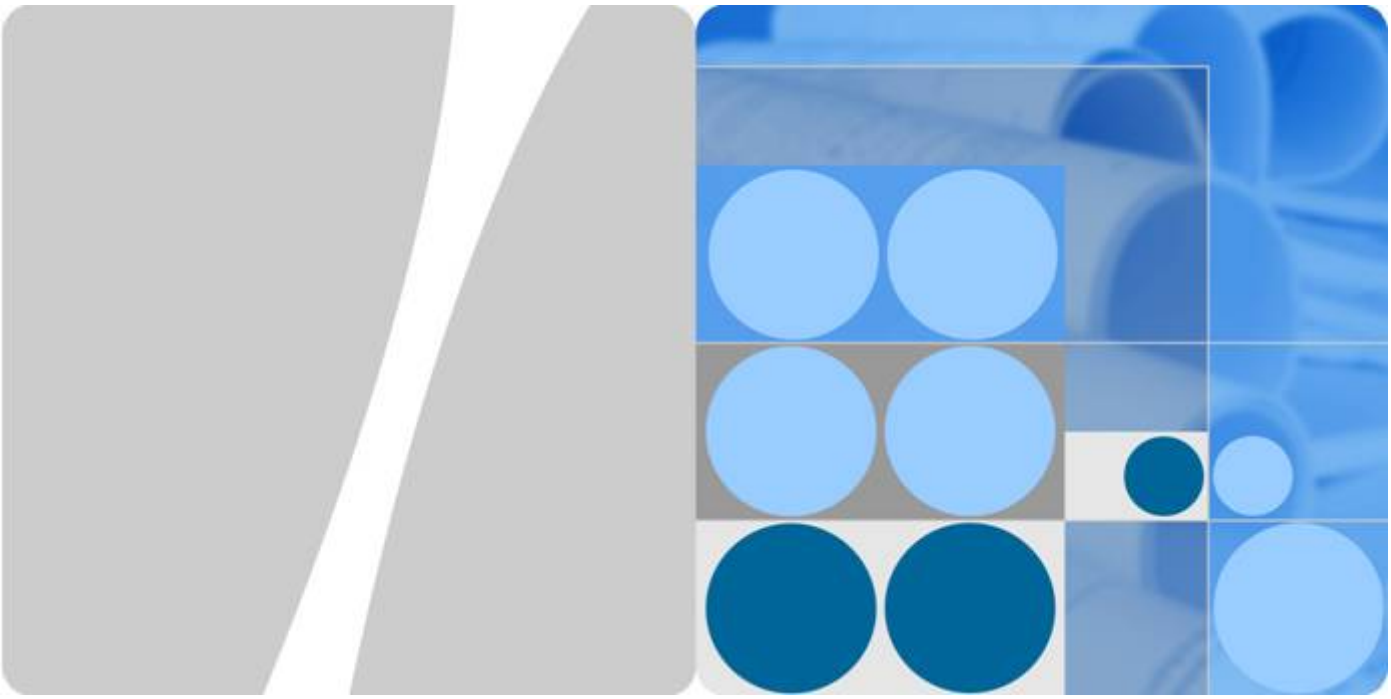


BTS3902E WCDMA

Hardware Description

Issue 09

Date 2014-05-16

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 a 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 provides reference for planning and deploying an BTS3902E WCDMA. It presents the exterior and describes the ports, functions, cable types, connector specifications, and cable connections of the BTS3902E WCDMA.

Product Version

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

Product Name	Product Version
BTS3902E WCDMA (referred to as the BTS3902E in this document)	V200R013C00 and later versions
	V100R008C00 and later versions The single-mode base station version mapping to V100R008C00 is: NodeB V200R015C00

Intended Audience

This document is intended for:

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

Organization

1 Changes in *BTS3902E WCDMA Hardware Description*

This chapter describes the changes in *BTS3902E WCDMA Hardware Description*.

2 BTS3902E Overview

This chapter presents the BTS3902E exterior and describes the ports and indicators on the BTS3902E.

3 BTS3902E Cables

This chapter provides BTS3902E cable exteriors and describes the pin assignments for the wires of the cables and installation positions for the cables.

4 BTS3902E Auxiliary Devices

This chapter describes the BTS3902E auxiliary devices.

Conventions

Symbol Conventions

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

Symbol	Description
 DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
 NOTICE	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.
 NOTE	Calls attention to important information, best practices and tips. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

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**.

Convention	Description
Italic	Book titles are in *italics*.
`Courier New`	Examples of information displayed on the screen are in Courier New.

Command Conventions

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

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

GUI Conventions

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

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

Keyboard Operations

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

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

Mouse Operations

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

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

Contents

1 Changes in *BTS3902E WCDMA Hardware Description*

This chapter describes the changes in *BTS3902E WCDMA Hardware Description*.

09 (2014-05-16)

This is the ninth commercial release.

Compared with 08 (2014-02-28), no information is added.

Compared with 08 (2014-02-28), this issue incorporates the following change:

Topic	Change Description
Entire document	The BTS3902E working at the 850 MHz frequency band is added.

Compared with 08 (2014-02-28), no information is deleted.

08 (2014-02-28)

This is the eighth commercial release.

Compared with 07 (2013-12-05), no information is added.

Compared with 07 (2013-12-05), this issue incorporates the following change:

Topic	Change Description
About This Document	Modified the description of the application scope of this document.

Compared with 07 (2013-12-05), no information is deleted.

07 (2013-12-05)

This is the seventh commercial release.

Compared with 06 (2013-11-30), no information is added.

Compared with 06 (2013-11-30), this issue incorporates the following change:

Topic	Change Description
Entire document	The DC-powered BTS3902E working at the AWS frequency band is added.

Compared with 06 (2013-11-30), no information is deleted.

06 (2013-11-30)

This is the sixth commercial release.

Compared with 05 (2012-12-30), no information is added.

Compared with 05 (2012-12-30), this issue incorporates the following changes:

Topic	Change Description
About This Document	V100R008C00 is added to the application scope of this document.
3.7 Cascading FE/GE Fiber Optic Cable	Modified the cable name from **Interconnection Cable Between FE/GE Optical Ports** to **Cascading FE/GE Fiber Optic Cable**.
3.8 Cascading FE/GE Cable	Modified the cable name from **Interconnection Cable Between FE/GE Electrical Ports** to **Cascading FE/GE Cable**.

Compared with 05 (2012-12-30), no information is deleted.

05 (2012-12-30)

This is the fifth commercial release.

Compared with 04 (2012-09-15), no information is added.

Compared with 04 (2012-09-15), this issue incorporates the following changes:

Topic	Change Description
2.2 BTS3902E Ports	Modified the DBG port description.

Topic	Change Description
3.3 BTS3902E Power Cable	Modified the pin assignment for the wires of the power cable between an AC surge protection box and a power device.
3.6 FE/GE Cable	Modified the pin assignment for the wires of the FE/GE cable.
4.2 (Optional) AC Surge Protection Box	Added the description of wiring terminal for a ground cable on the cabling cavity panel.

Compared with 04 (2012-09-15), no information is deleted.

04 (2012-09-15)

This is the fourth commercial release.

Compared with 03 (2012-06-30), no information is added.

Compared with 03 (2012-06-30), this issue incorporates the following change:

Topic	Change Description
2.2 BTS3902E Ports	Added the PoE port description.

Compared with 03 (2012-06-30), no information is deleted.

03 (2012-06-30)

This is the third commercial release.

Compared with 02 (2012-03-15), no information is added.

Compared with 02 (2012-03-15), this issue incorporates the following changes:

Topic	Change Description
3.2 BTS3902E PGND Cables	Added the length of the cables.
3.5 FE/GE Fiber Optic Cable	
3.6 FE/GE Cable	

Compared with 02 (2012-03-15), no information is deleted.

02 (2012-03-15)

This is the second commercial release.

Compared with 01 (2011-11-19), no information is added.

Compared with 01 (2011-11-19), this issue incorporates the following change:

Topic	Change Description
Entire document	The ground terminals of BTS3902E are updated.

Compared with 01 (2011-11-19), no information is deleted.

01 (2011-11-19)

This is the first commercial release.

Compared with draft B (2011-09-22), no information is added.

Compared with draft B (2011-09-22), no information is changed.

Compared with draft B (2011-09-22), no information is deleted.

Draft B (2011-09-22)

This is a draft release.

Compared with draft A (2011-06-30), this issue includes the following new information:

- **4.1 IFS06**

Compared with draft A (2011-06-30), this issue incorporates the following changes:

Topic	Change Description
2.1 BTS3902E Exterior	The position of the ESN is modified.
3.4 (Optional) Alarm Cable for the BTS3902E	Modified the cable name from BTS3902E Monitoring Signal Cable to BTS3902E Alarm Cable.

Compared with draft A (2011-06-30), no information is deleted.

Draft A (2011-06-30)

This is a draft release.

2 BTS3902E Overview

About This Chapter

This chapter presents the BTS3902E exterior and describes the ports and indicators on the BTS3902E.

2.1 BTS3902E Exterior
The BTS3902E has a modular design with its ports on the bottom.

2.2 BTS3902E Ports
The BTS3902E ports are on the bottom, and the indicators are on the front.

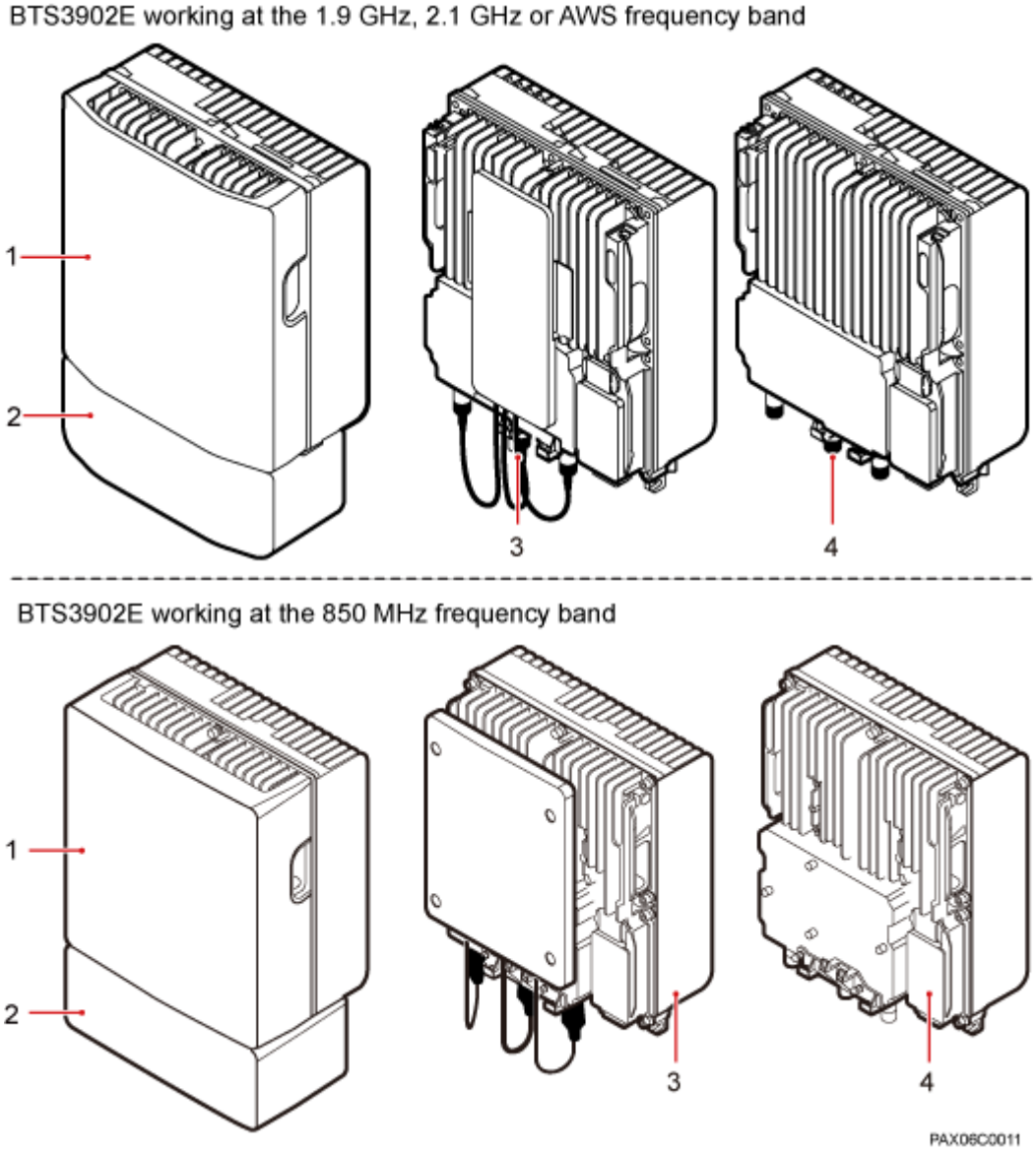
2.3 BTS3902E Indicators
A BTS3902E has six indicators, which indicate the running status of the BTS3902E.

2.1 BTS3902E Exterior

The BTS3902E has a modular design with its ports on the bottom.

Figure 2-1 shows the BTS3902E. The BTS3902E on the left has a housing, and the BTS3902E on the right does not have a housing. The camouflage shell is optional.

Figure 2-1 BTS3902E



(1) Upper housing (2) Camouflage shell (3) BTS3902E with built-in antenna (4) BTS3902E with external antennas

Figure 2-2 shows the dimensions of a BTS3902E, **Table 2-1** shows the specifications of a BTS3902E

Figure 2-2 Dimensions of a BTS3902E

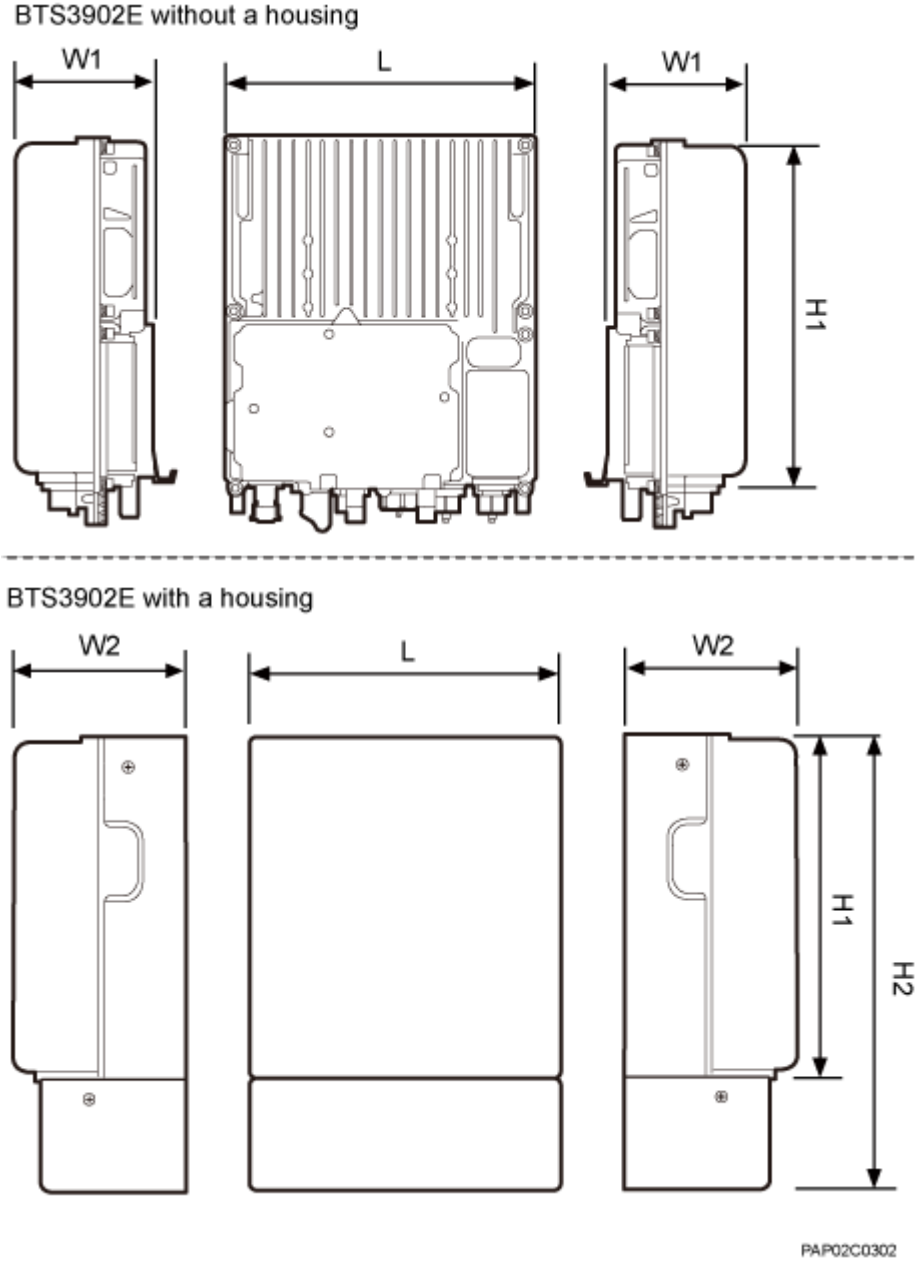


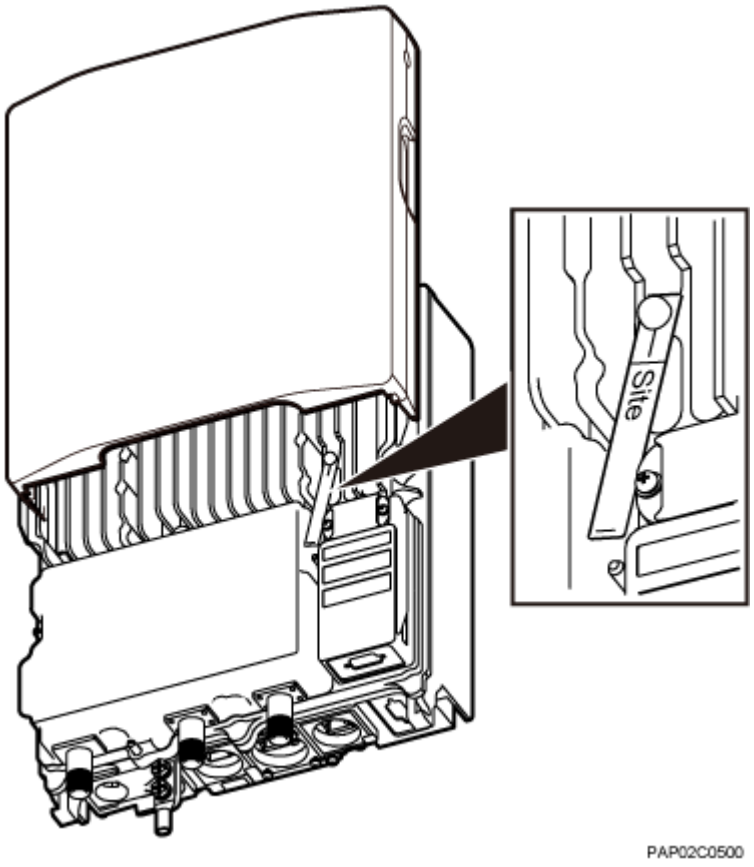
Table 2-1 Specifications of a BTS3902E

Module	Dimensions (H1 x W1 x D) (Without the Housing)	Dimensions (H2 x W2 x D) (with the Housing)
BTS3902E working at the 1.9 GHz, 2.1 GHz or AWS frequency band	300 mm x 120 mm x 270 mm	400 mm x 145 mm x 277 mm

Module	Dimensions (H1 x W1 x D) (Without the Housing)	Dimensions (H2 x W2 x D) (with the Housing)
BTS3902E working at the 850MHz frequency band	300 mm x 127 mm x 270 mm	400 mm x 170 mm x 277 mm

The electronic serial number (ESN) identifies a unique device, which is used during commissioning. The ESN is printed on a label, as shown in **Figure 2-3**.

Figure 2-3 ESN position



2.2 BTS3902E Ports

The BTS3902E ports are on the bottom, and the indicators are on the front.

The BTS3902E working at the 1.9 GHz, 2.1 GHz, 850 MHz frequency band supports AC power supply, and the BTS3902E working at the AWS frequency band supports DC power supply. The two types of BTS3902Es have the same appearance and dimensions.

Figure 2-4 shows the positions of the BTS3902E ports and indicators.

Figure 2-4 Positions of the BTS3902E ports and indicators

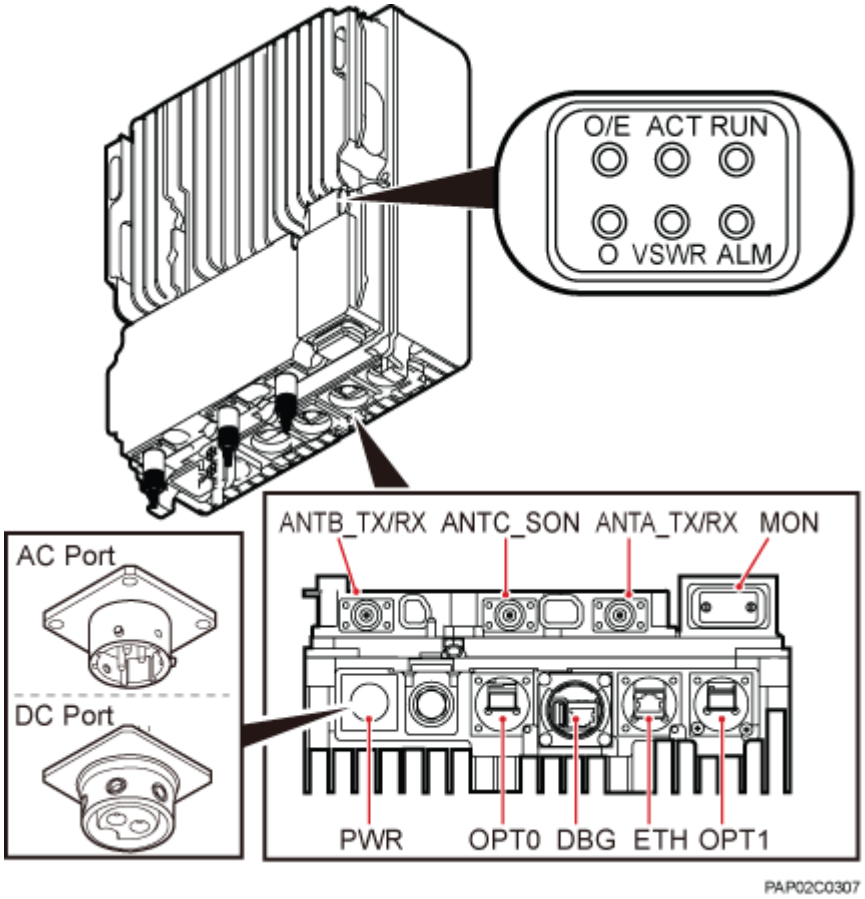


Table 2-2 describes the BTS3902E ports and indicators.

Table 2-2 BTS3902E ports and indicators

Item	Silkscreen	Description
Ports	ANTA_TX/RX	TX/RX port A
	ANTB_TX/RX	TX/RX port B
	ANTC_SON	SON antenna port
	ETH	FE/GE electrical port or power over Ethernet (PoE) port*
	OPT0	FE/GE optical port
	OPT1	FE/GE optical port*
	MON	Environment monitoring port for an RS485 input and four dry contact inputs
	PWR	Power supply port

Item	Silkscreen	Description
	DBG	There are two ports: ● Network port, used for local commissioning on the LMT ● USB port**, used for local commissioning with a USB flash drive and for clock testing
Indicators	RUN	For details, see **2.3 BTS3902E Indicators**
	ALM	
	ACT	
	VSWR	
	O/E	
	O	

NOTE

- *: The ETH port and OPT1 port cannot be used simultaneously.
- **: The security of the USB port is ensured by encryption. The USB port is used for commissioning the base station rather than importing or exporting the base station configuration.

2.3 BTS3902E Indicators

A BTS3902E has six indicators, which indicate the running status of the BTS3902E.

For details about the indicator positions on the BTS3902E panel, see **2.2 BTS3902E Ports**.

Table 2-3 describes BTS3902E indicators.

Table 2-3 BTS3902E indicators

Indicator	Color	Status	Description
RUN	Green	Steady on	There is power supply, but the BTS3902E is faulty.
		Off	There is no power supply, or the BTS3902E is faulty.
		Blinking (on for 1s and off for 1s)	The BTS3902E is working properly.
		Blinking (on for 0.125s and off for 0.125s)	Software is being loaded to the BTS3902E, or the BTS3902E is not started.

Indicator	Color	Status	Description
ALM	Red	Steady on	Alarms are generated, and the BTS3902E must be replaced.
		Blinking (on for 1s and off for 1s)	Alarms are generated. The alarms may be caused by the faults on the related boards or ports. Therefore, the necessity for BTS3902E replacement is uncertain.
		Off	No alarm is generated.
ACT	Green	Steady on	The BTS3902E is working properly with TX channels enabled.
		Blinking (on for 1s and off for 1s)	The BTS3902E is working properly with TX channels disabled.
VSWR	Red	Off	No VSWR alarm is generated.
		Blinking red (on for 1s and off for 1s)	VSWR alarms are generated on the ANTB_TX/RX port.
		Steady red	VSWR alarms are generated on the ANTA_TX/RX port.
		Blinking red (on for 0.125s and off for 0.125s)	VSWR alarms are generated on the ANTA_TX/RX and ANTB_TX/RX ports.
O/E	Green	Steady on	The OPT1 or ETH port is connected properly.
		Blinking (on for 0.125s and off for 0.125s)	The OPT1 or ETH port is transmitting or receiving data.
		Off	The OPT1 or ETH port is connected improperly.
O	Green	Steady on	The OPT0 port is connected properly.
		Blinking (on for 0.125s and off for 0.125s)	The OPT0 port is transmitting or receiving data.
		Off	The OPT0 port is connected improperly.

3 BTS3902E Cables

About This Chapter

This chapter provides BTS3902E cable exteriors and describes the pin assignments for the wires of the cables and installation positions for the cables.

3.1 BTS3902E Cable List
BTS3902E cables connect different devices.

3.2 BTS3902E PGND Cables
The BTS3902E PGND cable connects a BTS3902E and a ground bar, ensuring proper grounding of the BTS3902E. The maximum length of a PGND cable is 30 m (98.42 ft).

3.3 BTS3902E Power Cable
A BTS3902E power cable feeds power to a BTS3902E from an external power device.

3.4 (Optional) Alarm Cable for the BTS3902E
The BTS3902E alarm cable, transmits alarm signals from an external device to a BTS3902E so that the base station monitors the operating status of external devices. This cable is optional.

3.5 FE/GE Fiber Optic Cable
A fast Ethernet or gigabit Ethernet (FE/GE) fiber optic cable transmits fiber signals between a BTS3902E and a transmission device. The maximum length of a FE/GE fiber optic cable is 20 m (65.61 ft). This cable is optional.

3.6 FE/GE Cable
The fast Ethernet or gigabit Ethernet (FE/GE) cable transmits FE/GE signals between a BTS3902E and a transmission device. This cable is optional, and the maximum length of a FE/GE Cable is 20 m (65.62 ft).

3.7 Cascading FE/GE Fiber Optic Cable
A cascading FE/GE Fiber Optic Cable connects two FE/GE optical ports on two modules.

3.8 Cascading FE/GE Cable
A cascading FE/GE cable connects two FE/GE electrical ports on two modules.

3.9 BTS3902E RF Jumper
The superflexible 1/2" radio frequency (RF) jumper used by the BTS3902E transmits and receives RF signals.

3.1 BTS3902E Cable List

BTS3902E cables connect different devices.

3.1.1 AC Cable List (Working at The 1.9 GHz or 2.1 GHz Frequency Band)

This section lists the AC cables applied to the BTS3902E working at the 1.9 GHz or 2.1 GHz frequency band.

Table 3-1 lists the AC cables applied to the BTS3902E working at the 1.9 GHz or 2.1 GHz frequency band.

Table 3-1 AC cable list of the BTS3902E (working at the 1.9 GHz or 2.1 GHz frequency band)

Cable Name	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
3.2 BTS3902E PGND Cables	OT terminal (M6, 16 mm^2)	Ground terminal for the BTS3902E	OT terminal (M6, 16 mm^2)	AC surge protection box
			Prepared onsite to match the ground bar	Ground terminal on the ground bar
3.3.1 AC Power Cable (Working at The 1.9 GHz or 2.1 GHz Frequency Band)	3-pin waterproofed round AC connector	PWR port on the BTS3902E	OT terminal (M4, 1.5 mm^2)	AC surge protection box
	OT terminal (M4, 4 mm^2)	AC surge protection box	Bare wire	Power device
	3-pin waterproofed round AC connector	PWR port on the BTS3902E	Bare wire	Power device
3.4 (Optional) Alarm Cable for the BTS3902E	DB15 male connector	MON on the BTS3902E	Bare wire	External monitoring device
3.5 FE/GE Fiber Optic Cable	DLC connector	OPT0 port on the BTS3902E	DLC connector	External transmission device

Cable Name	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
3.7 Cascading FE/GE Fiber Optic Cable	DLC connector	OPT0/OPT1 port on the BTS3902E	DLC connector	OPT0/OPT1 port on the BTS3902E
3.6 FE/GE Cable	RJ45 connector	ETH port on the BTS3902E	RJ45 connector	External transmission device
3.8 Cascading FE/GE Cable	RJ45 connector	ETH port on the BTS3902E	RJ45 connector	ETH port on the BTS3902E
3.9 BTS3902E RF Jumper	Type N male connector	ANTA_TX/RX, ANTB_TX/RX, or ANTC_SON port on the BTS3902E	Type N male connector	Antenna system

3.1.2 AC Cable List (Working at The 850 MHz Frequency Band)

This section describes the AC power cables applied to the BTS3902E working at the 850 MHz frequency band.

Table 3-2 lists the AC power cables applied to the BTS3902E working at the 850 MHz frequency band.

Table 3-2 AC power cable list of the BTS3902E (working at the 850 MHz frequency band)

Cable Name	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
3.2 BTS3902E PGND Cables	OT terminal (M6, 6 mm^2)	Ground terminal of the BTS3902E	OT terminal (M6, 6 mm^2)	AC surge protection box
			Prepared onsite to match the ground bar	Ground terminal on the ground bar

Cable Name	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
3.3.2 AC Power Cable (Working at The 850 MHz Frequency Band)	3-pin waterproofed round AC connector	PWR port on the BTS3902E	OT terminal (M4, 1.5 mm^2)	AC surge protection box
	OT terminal (M4, 2.5 mm^2)	AC surge protection box	Bare wire	Power device
	3-pin waterproofed round AC connector	PWR port on the BTS3902E	Bare wire	Power device
3.4 (Optional) Alarm Cable for the BTS3902E	DB15 male connector	MON on the BTS3902E	Bare wire	External monitoring device
3.5 FE/GE Fiber Optic Cable	DLC connector	OPT0 port on the BTS3902E	DLC connector	External transmission device
3.7 Cascading FE/GE Fiber Optic Cable	DLC connector	OPT0/OPT1 port on the BTS3902E	DLC connector	OPT0/OPT1 port on the BTS3902E
3.6 FE/GE Cable	RJ45 connector	ETH port on the BTS3902E	RJ45 connector	External transmission device
3.8 Cascading FE/GE Cable	RJ45 connector	ETH port on the BTS3902E	RJ45 connector	ETH port on the BTS3902E
3.9 BTS3902E RF Jumper	Type N male connector	ANTA_TX/RX, ANTB_TX/RX, or ANTC_SON port on the BTS3902E	Type N male connector	Antenna system

3.1.3 DC Cable List (Working at The AWS Frequency Band)

This section lists the DC cables applied to the BTS3902E working at the AWS frequency band.

Table 3-3 lists the DC cables applied to the BTS3902E working at the AWS frequency band.

Table 3-3 DC cable list of the BTS3902E (working at the AWS frequency band)

Cable Name	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
3.2 BTS3902E PGND Cables	OT terminal (M6, 16 mm^2)	Ground terminal of the BTS3902E	Prepared onsite to match the ground bar	Ground terminal on the ground bar
3.3 BTS3902E Power Cable	2-pin waterproofed round DC connector	PWR port on the BTS3902E	Bare wire	Power device
3.4 (Optional) Alarm Cable for the BTS3902E	DB15 male connector	MON on the BTS3902E	Bare wire	External monitoring device
3.5 FE/GE Fiber Optic Cable	DLC connector	OPT0 port on the BTS3902E	DLC connector	External transmission device
3.7 Cascading FE/GE Fiber Optic Cable	DLC connector	OPT0/OPT1 port on the BTS3902E	DLC connector	OPT0/OPT1 port on the BTS3902E
3.6 FE/GE Cable	RJ45 connector	ETH port on the BTS3902E	RJ45 connector	External transmission device
3.8 Cascading FE/GE Cable	RJ45 connector	ETH port on the BTS3902E	RJ45 connector	ETH port on the BTS3902E

Cable Name	One End		The Other End	
	Connector	Installation Position	Connector	Installation Position
3.9 BTS3902E RF Jumper	Type N male connector	ANTA_TX/RX, ANTB_TX/RX, or ANTC_SON port on the BTS3902E	Type N male connector	Antenna system

3.2 BTS3902E PGND Cables

The BTS3902E PGND cable connects a BTS3902E and a ground bar, ensuring proper grounding of the BTS3902E. The maximum length of a PGND cable is 30 m (98.42 ft).

Exterior

The PGND cable is green and yellow. Both ends of the cable are OT terminals. **Figure 3-1** shows the PGND cable.

Figure 3-1 PGND cable

(1) OT terminal

NOTE

- When an AC surge protection box (which is optional) is configured for a BTS3902E that uses AC power supply, two PGND cables are required. One provides equipotential connection between the AC surge protection box and the BTS3902E, and the other connects the AC surge protection box and a ground bar to ensure proper grounding of the AC surge protection box.
- One end of the PGND cable connected to the BTS3902E or AC surge protection box is an M6 OT terminal. The other end connected to the ground bar is an OT terminal added onsite.

Cables

Specifications of the used PGND cables vary with the operating frequency band. You are advised to prepare the PGND cables with a cross-sectional area not less than that of the copper-core cable of the same specifications. **Table 3-4** lists the specifications of PGND cables.

Table 3-4 Specifications of PGND cables

Cable Name	Cross-Sectional Area	One End	The Other End	Cable Color
PGND cable used for the 1.9 GHz, 2.1 GHz AWS frequency band	16 mm^2 (0.025 $in.^2$)	OT terminal (M6, 16 mm^2 [0.025 $in.^2$])	OT terminal (M6, 16 mm^2 [0.025 $in.^2$])	Yellow and green
PGND cable used for the 850 MHz frequency band	6 mm^2 (0.025 $in.^2$)	OT terminal (M6, 6 mm^2 [0.025 $in.^2$])	OT terminal (M6, 6 mm^2 [0.025 $in.^2$])	Yellow and green

OT terminals must be added to both ends of the PGND cable onsite. You can determine the color of the cable and whether to use two-hole terminals in compliance with local regulations.

Figure 3-2 shows a two-hole terminal.

Figure 3-2 Two-hole terminal

3.3 BTS3902E Power Cable

A BTS3902E power cable feeds power to a BTS3902E from an external power device.

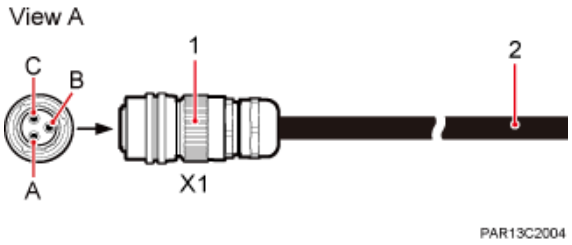
3.3.1 AC Power Cable (Working at The 1.9 GHz or 2.1 GHz Frequency Band)

This section describes the AC power cable applied to the BTS3902E working at the 1.9 GHz or 2.1 GHz frequency band. For outdoor BTS3902Es, the AC surge protection box is optional.

- Without AC Surge Protection Box

  Figure 3-3 shows the power cable between the BTS3902E and the power device when no AC surge protection box is configured. The cross-sectional area of the power cable is 1.5 mm^2.

Figure 3-3 Power cable between a BTS3902E and a power device



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

Table 3-5 describes the pin assignment for the wires of the power cable between a BTS3902E and a power device.

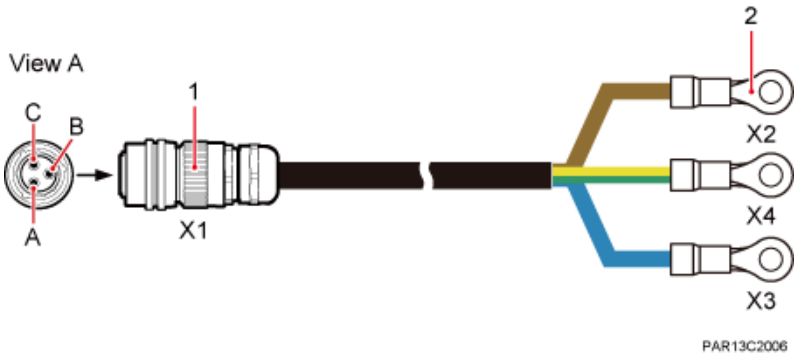
Table 3-5 Pin assignment for the wires of the BTS3902E power cable (AC surge protection box not configured)

BTS3902E End	Power Device End	Wire Color	Description
X1.A	Bare wire	Brown	L
X1.C		Blue	N
X1.B		Yellow and green	PE

- With an AC Surge Protection Box

  Figure 3-4 shows the power cable between a BTS3902E and an AC surge protection box, which is already configured. The cross-sectional area of the power cable is 1.5 mm^2.

Figure 3-4 Power cable between a BTS3902E and an AC surge protection box



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

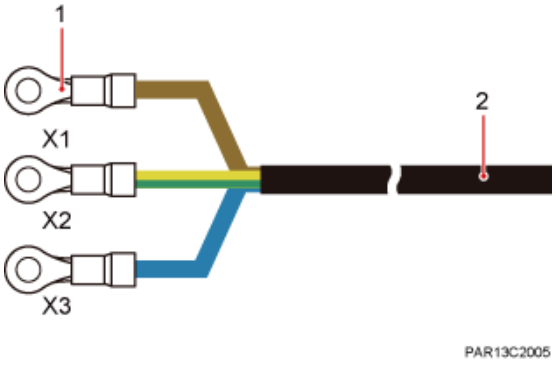
Table 3-6 describes the pin assignment for the wires of the power cable between a BTS3902E and an AC surge protection box.

Table 3-6 Pin assignment for the wires of the BTS3902E power cable (AC surge protection box configured)

BTS3902E End	AC Surge Protection Box End	Wire Color	Description
X1.A	X2	Brown	L
X1.C	X3	Blue	N
X1.B	X4	Yellow and green	PE

Figure 3-5 shows the power cable between a power device and an AC surge protection box, which is already configured. The cross-sectional area of the power cable is 4 mm^2.

Figure 3-5 Power cable between an AC surge protection box and a power device



(1) OT terminal (2) Bare wire

Table 3-7 describes the pin assignment for the wires of the power cable between an AC surge protection box and a power device.

Table 3-7 Pin assignment for the wires of the power cable between an AC surge protection box and a power device

AC Surge Protection Box End	Power Device End	Wire Color	Description
X1	Bare wire	Brown	L
X31		Blue	N
X2		Yellow and green	PE

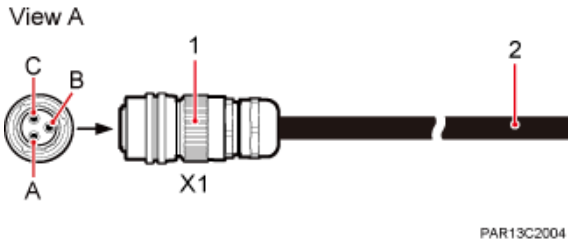
3.3.2 AC Power Cable (Working at The 850 MHz Frequency Band)

This section describes the AC power cables applied to the BTS3902E working at the 850 MHz frequency band. For outdoor BTS3902Es, the AC surge protection box is optional.

- Without AC Surge Protection Box

  Figure 3-6 shows the power cable between the BTS3902E and the power device when no AC surge protection box is configured. The cross-sectional area of the power cable is 1.5 mm^2.

  Figure 3-6 Power cable between a BTS3902E and a power device

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

  Table 3-8 describes the pin assignment for the wires of the power cable between a BTS3902E and a power device.

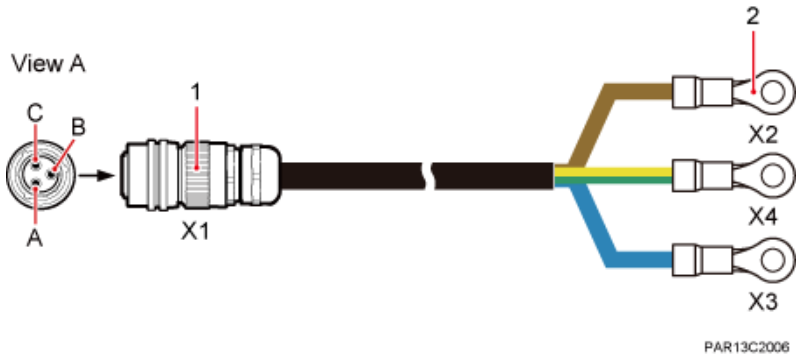
  Table 3-8 Pin assignment for the wires of the BTS3902E power cable (AC surge protection box not configured)

BTS3902E End	Power Device End	Wire Color	Description
X1.A	Bare wire	Brown	L
X1.C		Blue	N
X1.B		Yellow and green	PE

- With an AC Surge Protection Box

  Figure 3-7 shows the power cable between a BTS3902E and an AC surge protection box, which is already configured. The cross-sectional area of the power cable is 1.5 mm^2.

Figure 3-7 Power cable between a BTS3902E and an AC surge protection box



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

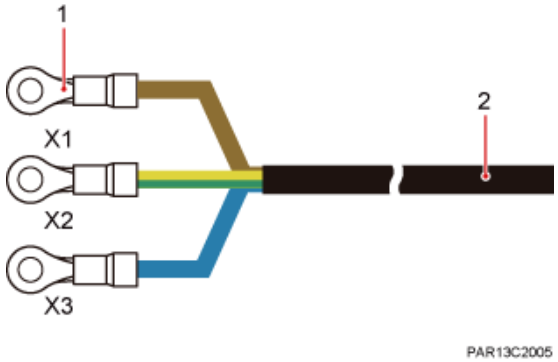
Table 3-9 describes the pin assignment for the wires of the power cable between a BTS3902E and an AC surge protection box.

Table 3-9 Pin assignment for the wires of the BTS3902E power cable (AC surge protection box configured)

BTS3902E End	AC Surge Protection Box End	Wire Color	Description
X1.A	X2	Brown	L
X1.C	X3	Blue	N
X1.B	X4	Yellow and green	PE

Figure 3-8 shows the power cable between a power device and an AC surge protection box, which is already configured. The cross-sectional area of the power cable is 2.5 mm^2.

Figure 3-8 Power cable between an AC surge protection box and a power device



(1) OT terminal (2) Bare wire

Table 3-10 describes the pin assignment for the wires of the power cable between an AC surge protection box and a power device.

Table 3-10 Pin assignment for the wires of the power cable between an AC surge protection box and a power device

AC Surge Protection Box End	Power Device End	Wire Color	Description
X1	Bare wire	Brown	L
X31		Blue	N
X2		Yellow and green	PE

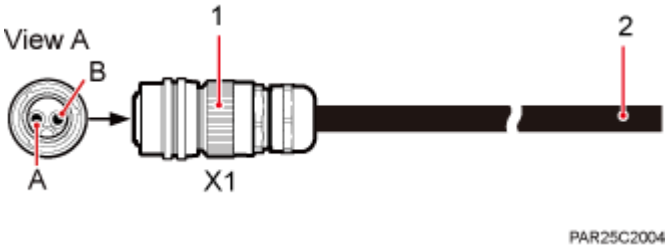
3.3.3 DC Power Cable (Working at the AWS Frequency Band)

This section describes the DC power cables applied to the BTS3902E working at the AWS frequency band.

- Exterior

  Figure 3-9 shows a BTS3902E power cable. There are two types of power cables in terms of cross-sectional areas: 3.3 mm^2 (12 AWG) complying with North American standards and 4 mm^2 complying with European standards.

  Figure 3-9 Power cable between a BTS3902E and power equipment

  (1) 2-pin waterproofed round DC connector (2) Bare wire

- Pin Assignment

  Table 3-11 and Table 3-12 list the pin assignment for the wires of a BTS3902E power cable.

  NOTE

  The colors and structures of cables vary according to countries and areas. If cables are purchased at local markets, the cables must comply with local rules and regulations.

Table 3-11 Pin assignment for the wires of a BTS3902E power cable complying with North American standards

One End (On the BTS3902E Side)	The Other End (On the Power Equipment Side)	Wire Color	Description
X1.A	Bare wire	Blue	NEG(-)
X1.B		Black	RTN(+)

Table 3-12 Pin assignment for the wires of a BTS3902E power cable complying with European standards

One End (On the BTS3902E Side)	The Other End (On the Power Equipment Side)	Wire Color	Description
X1.A	Bare wire	Blue	NEG(-)
X1.B		Brown	RTN(+)

NOTE

The BTS3902E power cable can be purchased at the local market in Britain. The colors of the core wires are brown NEG(-) and blue RTN(+).

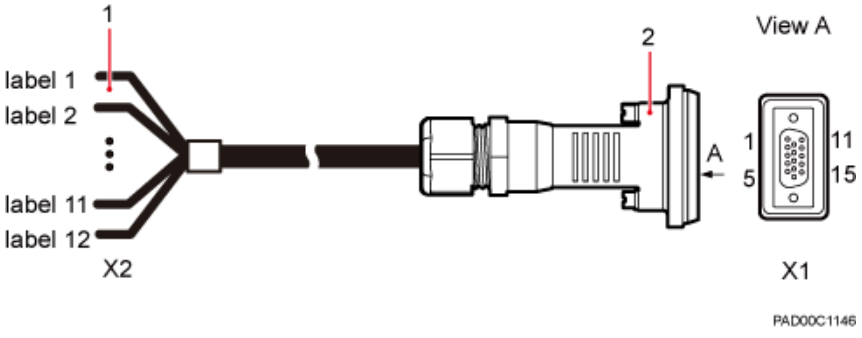
3.4 (Optional) Alarm Cable for the BTS3902E

The BTS3902E alarm cable, transmits alarm signals from an external device to a BTS3902E so that the base station monitors the operating status of external devices. This cable is optional.

Exterior

Figure 3-10 shows the alarm cable for the BTS3902E.

Figure 3-10 Alarm cable for the BTS3902E



(1) Bare wire (2) DB15 male connector

Pin Assignment

Table 3-13 describes the pin assignment for the wires of the alarm cable.

Table 3-13 Pin assignment for the wires of the alarm cable for the BTS3902E

X1	X2	Color	Description	Port on the X2 End
X1.1	X2.1	Blue and white	Twisted pair	SWITCH_H1
X1.6	X2.2	Blue		GND
X1.2	X2.3	Orange and white	Twisted pair	SWITCH_H2
X1.7	X2.4	Orange		GND
X1.3	X2.5	Green and white	Twisted pair	SWITCH_H3
X1.8	X2.6	Green		GND
X1.4	X2.7	Brown and white	Twisted pair	SWITCH_H4
X1.9	X2.8	Brown		GND
X1.11	X2.9	Blue and red	Twisted pair	PSU 485 TX-
X1.12	X2.10	Blue		PSU 485 TX+
X1.13	X2.11	Orange and red	Twisted pair	PSU 485 RX-
X1.14	X2.12	Orange		PSU 485 RX+
X1.Shield	-	-	Shield	-

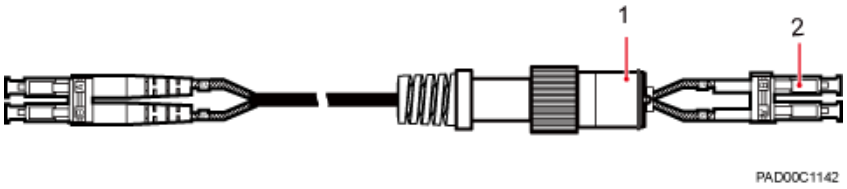
3.5 FE/GE Fiber Optic Cable

A fast Ethernet or gigabit Ethernet (FE/GE) fiber optic cable transmits fiber signals between a BTS3902E and a transmission device. The maximum length of a FE/GE fiber optic cable is 20 m (65.61 ft). This cable is optional.

Exterior

The FE/GE fiber optic cable has a round connector at one end and DLC connectors at both ends, as shown in Figure 3-11.

Figure 3-11 FE/GE fiber optic cable



(1) DLC connector (2) Round connector

3.6 FE/GE Cable

The fast Ethernet or gigabit Ethernet (FE/GE) cable transmits FE/GE signals between a BTS3902E and a transmission device. This cable is optional, and the maximum length of a FE/GE Cable is 20 m (65.62 ft).

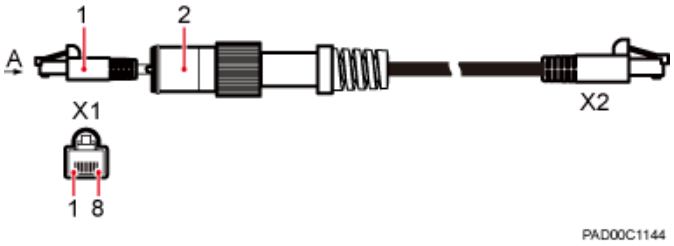
NOTE

The FE/GE cable can be used between two devices for a distance of less than 100 m (328.08 ft).

Exterior

The FE/GE Ethernet cable is a shielded straight-through cable with an RJ45 connector and round connector at one end and an RJ45 connector at the other end, as shown in **Figure 3-12**.

Figure 3-12 FE/GE cable



(1) RJ45 connector (2) Round connector

Pin Assignment

Table 3-14 describes the pin assignment for the wires of the FE/GE cable.

Table 3-14 Pin assignment for the wires of the FE/GE cable

Pin on the RJ-45 Connector	Wire Color	Wire Type	Pin on the RJ-45 Connector
X1.2	Orange	Twisted pair	X2.2
X1.1	White and orange		X2.1
X1.6	Green	Twisted pair	X2.6
X1.3	White and green		X2.3

Pin on the RJ-45 Connector	Wire Color	Wire Type	Pin on the RJ-45 Connector
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

3.7 Cascading FE/GE Fiber Optic Cable

A cascading FE/GE Fiber Optic Cable connects two FE/GE optical ports on two modules.

Exterior

A cascading FE/GE Fiber Optic Cable has a DLC connector and round connector at each end, as shown in **Figure 3-13**.

Figure 3-13 Cascading FE/GE Fiber Optic Cable

(1) DLC connector (2) Round connector

3.8 Cascading FE/GE Cable

A cascading FE/GE cable connects two FE/GE electrical ports on two modules.

Exterior

A Cascading FE/GE Cable has an RJ45 connector and round connector at each end, as shown in **Figure 3-14**.

Figure 3-14 Cascading FE/GE Cable

(1) RJ45 connector (2) Round connector

3.9 BTS3902E RF Jumper

The superflexible 1/2" radio frequency (RF) jumper used by the BTS3902E transmits and receives RF signals.

Exterior

One end of the RF jumper is a type N male connector, and the other end is connected to the antenna system.

Figure 3-15 shows an RF jumper with a type N male connector at each end.

Figure 3-15 RF jumper

(1) Type N male connector

4 BTS3902E Auxiliary Devices

About This Chapter

This chapter describes the BTS3902E auxiliary devices.

4.1 IFS06
An Indoor Floor installation Support (IFS06) is used for installing indoor BTS3902Es which are equipped with external antennas.

4.2 (Optional) AC Surge Protection Box
An AC surge protection box implements surge protection for AC input power. The AC surge protection box can be configured when the BTS3902E with an AC port is installed outdoors. Two AC surge protection boxes SPD60D and SPM60A are available for the BTS3902E.

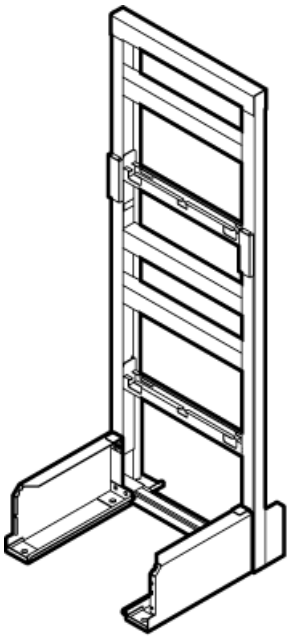
4.1 IFS06

An Indoor Floor installation Support (IFS06) is used for installing indoor BTS3902Es which are equipped with external antennas.

Exterior

Figure 4-1 shows an IFS06.

Figure 4-1 IFS06



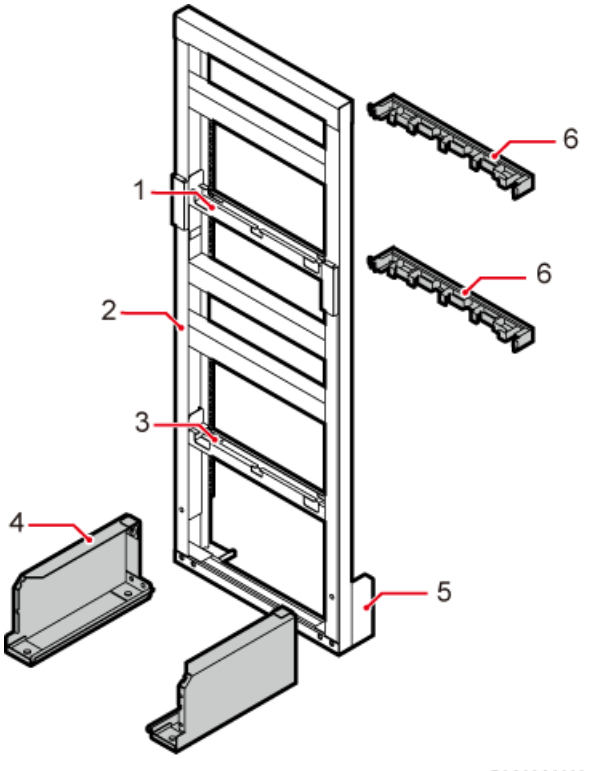
Function

- It can be installed on the ground.
- It supports the installation of four BTS3902Es.
- It supports the installation of two BTS3902Es.
- The upper and lower adjustable beams on an IFS06 can be moved up and down to fit for heights of BTS3902Es.

Structure

The IFS06 consists of the main frame, cable tray, upper and lower adjustable beams, and front and rear feet, as shown in **Figure 4-2**.

Figure 4-2 IFS06 structure



(1) Upper adjustable beam (2) Main frame (3) Lower adjustable beam

(4) Front foot (5) Rear foot (6) Cable tray

Specifications

Table 4-1 describes IFS06 specifications.

Table 4-1 IFS06 specifications

Item	Specification
Dimensions	1730 mm (79 in.) x 600 mm (23.62 in.) x 600 mm (23.62 in.) (H x W x D)
Weight	45 kg (99.23 lb)

4.2 (Optional) AC Surge Protection Box

An AC surge protection box implements surge protection for AC input power. The AC surge protection box can be configured when the BTS3902E with an AC port is installed outdoors. Two AC surge protection boxes SPD60D and SPM60A are available for the BTS3902E.

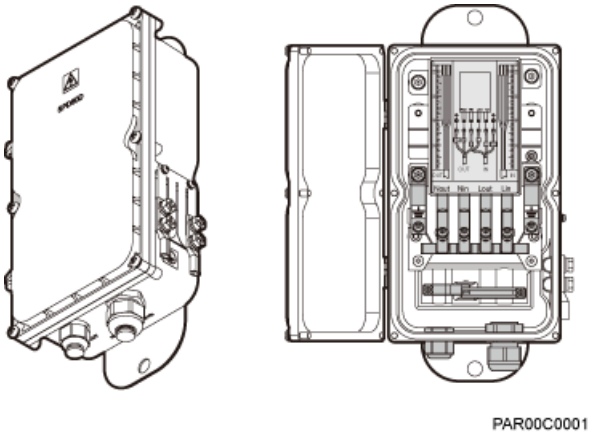
4.2.1 SPD60D (Working at the 1.9 GHz or 2.1 GHz Frequency Band)

The outdoor BTS3902E working at the 1.9 GHz or 2.1 GHz frequency band can use the SPD60D (Surge Protection Device 60D).

Exterior

Figure 4-3 shows the exterior of an SPD60D.

Figure 4-3 Exterior of an SPD60D



Specifications

Table 4-2 shows the specifications of an SPD60D.

Table 4-2 Specifications of an SPD60D

Item	Specification
Dimensions	240 mm (9.45 in.) x 140 mm (5.51 in.) x 75 mm (2.95 in.) (H x W x D)
Installation option	On a pole, on a wall, or on a wood pole
Surge protection capability	60 kA (8/20 us) in differential mode/common mode

Ports

Table 4-3 describes the ports on an SPD60D.

Table 4-3 Ports on an SPD60D

Item	Label	Description
Ports on the bottom panel	IN	Port for the AC input power cable between the onsite power device and the SPD60D
	OUT	Port for the AC output power cable between the SPD60D and the BTS3902E
Ports on the side panel	-	Port for the external ground cable
	-	Port for the BTS3902E ground cable
Ports on the cabling cavity panel	Nout	Wiring terminal for a power cable
	Nin	
	Lout	
	Lin	
	⏚	Wiring terminal for a ground cable

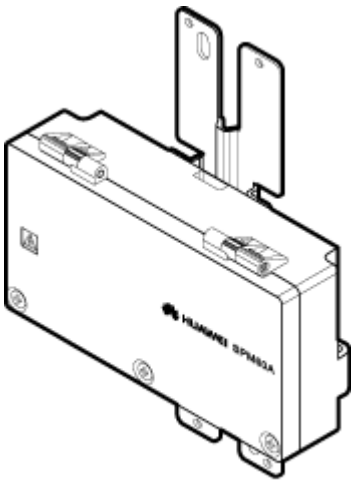
4.2.2 SPM60A (Working at the 850 MHz Frequency Band)

The outdoor BTS3902E working at the 850 MHz frequency band can use the SPM60A (Surge Protection Module 60A).

Exterior

Figure 4-4 shows the exterior of an SPM60A.

Figure 4-4 Exterior of an SPM60A



Specifications

Table 4-4 shows the specifications of an SPM60A.

Table 4-4 Specifications of an SPM60A

Item	Specification
Dimensions	240 mm (9.45 in.) x 140 mm (5.51 in.) x 75 mm (2.95 in.) (H x W x D)
Installation option	On a pole, or on a wall
Surge protection capability	60 kA (8/20 us) in differential mode/common mode

Ports

Figure 4-5 shows the ports on the SPM60A panel.

Figure 4-5 Ports on the SPM60A panel

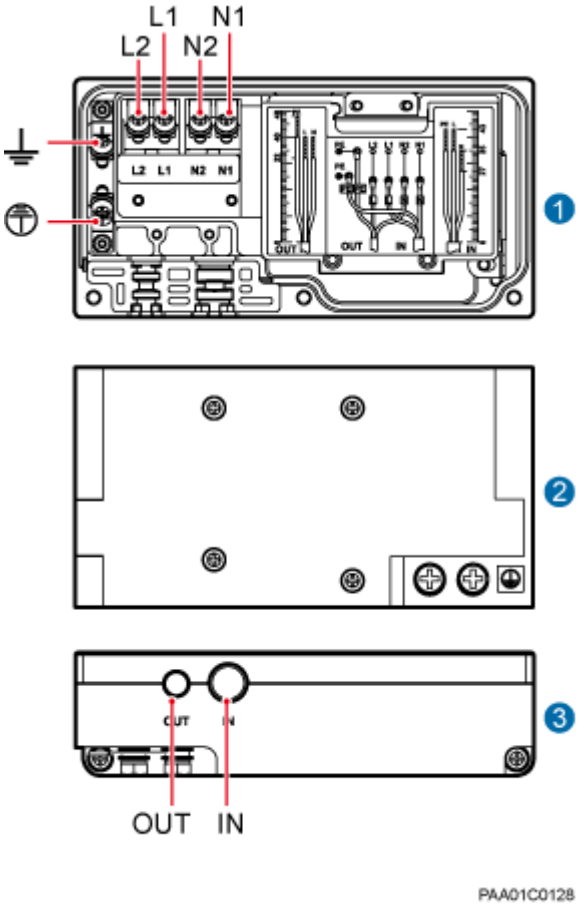
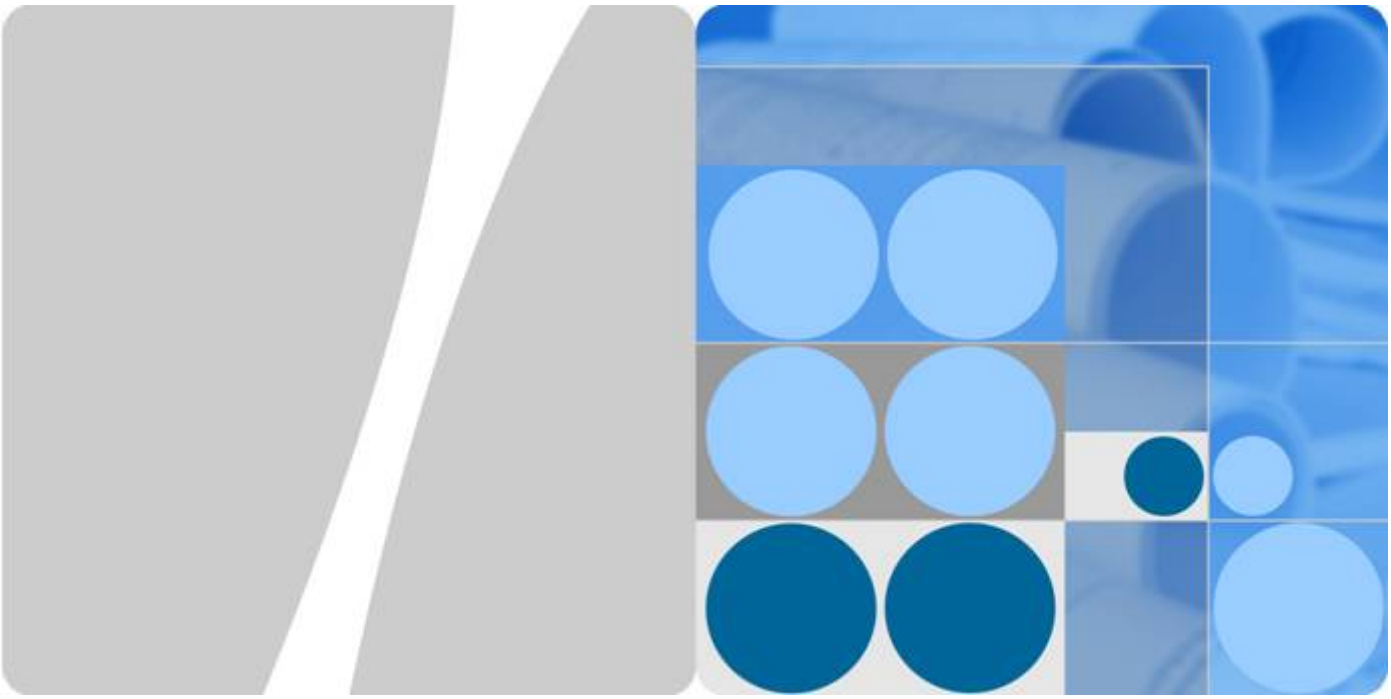


Table 4-5 describes the ports on an SPM60A.

Table 4-5 Ports on an SPM60A

Item	Label	Description
(1) Ports on the cabling cavity panel	N1	Wiring terminal for a power cable
	N2	
	L1	
	L2	
		PE: output ground terminal
		PE: input ground terminal
(2) Port on the bottom surface		External ground terminal
(3) Ports at the bottom	IN	Port for the AC input power cable between the onsite power device and the SPM60A
	OUT	Port for the AC output power cable between the SPM60A and the BTS3902E



BTS3902E WCDMA

Site Maintenance Guide

Issue 06

Date 2014-05-16

HUAWEI TECHNOLOGIES CO., LTD.

HUAWEI

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 a 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 routine maintenance procedures for the BTS3902E WCDMA, such as equipment maintenance and power-on and power-off operations. It also describes how to replace the BTS3902E WCDMA and optical modules.

Product Version

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

Product Name	Product Version
BTS3902E WCDMA (referred to as the BTS3902E in this document)	V200R013C00 and later versions
	V100R008C00 and later versions The single-mode base station version mapping to V100R008C00 is: NodeB V200R015C00

Intended Audience

This document is intended for:

- System engineers
- Site maintenance engineers

Organization

1 Changes in *BTS3902E WCDMA Site Maintenance Guide*

This chapter describes the changes in *BTS3902E WCDMA Site Maintenance Guide*.

2 Powering On and Powering Off a BTS3902E

After a BTS3902E is powered on, check the status of the indicators on the BTS3902E. When you power it off, you can perform normal power-off.

3 Replacing the BTS3902E

The BTS3902E is an integrated micro base station. Replacing a faulty BTS3902E interrupts all services carried by the base station.

4 Replacing the Attachment Plate

This section describes the procedure for replacing the attachment plate matching the angle-adjustable mounting kits with the attachment plate matching the aluminum mounting kits.

5 Replacing an Optical Module

An optical module implements optical-electrical conversion, enabling optical transmission between a BTS3902E and other devices. You must disconnect the fiber optic cable from an optical module before replacing the optical module. Disconnecting the fiber optic cable interrupts the transmission of optical signals.

Conventions

Symbol Conventions

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

Symbol	Description
	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.
	Calls attention to important information, best practices and tips. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

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.

Contents

1 Changes in *BTS3902E WCDMA Site Maintenance Guide*

This chapter describes the changes in *BTS3902E WCDMA Site Maintenance Guide*.

06 (2014-05-16)

This is the sixth commercial release.

Compared with 05 (2014-02-28), no information is added.

Compared with 05 (2014-02-28), this issue incorporates the following change:

Topic	Change Description
Entire document	The BTS3902E working at the 850 MHz frequency band is added.

Compared with 05 (2014-02-28), no information is deleted.

05 (2014-02-28)

This is the fifth commercial release.

Compared with 04 (2013-12-05), no information is added.

Compared with 04 (2013-12-05), this issue incorporates the following change:

Topic	Change Description
About This Document	Modified the description of the application scope of this document.

Compared with 04 (2013-12-05), no information is deleted.

04 (2013-12-05)

This is the fourth commercial release.

Compared with 03 (2013-11-30), no information is added.

Compared with 03 (2013-11-30), this issue incorporates the following change:

Topic	Change Description
Entire document	The DC-powered BTS3902E working at the AWS frequency band is added.

Compared with 03 (2013-11-30), no information is deleted.

03 (2013-11-30)

This is the third commercial release.

Compared with 02 (2012-03-15), no information is added.

Compared with 02 (2012-03-15), this issue incorporates the following change:

Topic	Change Description
About This Document	V100R008C00 is added to the application scope of this document.

Compared with 02 (2012-03-15), no information is deleted.

02 (2012-03-15)

This is the second official release.

Compared with 01 (2011-11-19), this issue incorporates the following new information:

- **4 Replacing the Attachment Plate**

Compared with 01 (2011-11-19), this issue incorporates the following change:

Topic	Change Description
3 Replacing the BTS3902E	Added the description about removing the BTS3902E when an angle-adjustable mounting kit is used.

Compared with 01 (2011-11-19), no information is deleted.

01 (2011-11-19)

This is the first official release.

Compared with draft A (2011-06-30), no information is added.

Compared with draft A (2011-06-30), no information is changed.

Compared with draft A (2011-06-30), no information is deleted.

Draft A (2011-06-30)

This is a draft release.

2 Powering On and Powering Off a BTS3902E

About This Chapter

After a BTS3902E is powered on, check the status of the indicators on the BTS3902E. When you power it off, you can perform normal power-off.

2.1 Powering On a BTS3902E

This section describes how to power on a BTS3902E and how to check the running status of the BTS3902E by observing the status of the indicators.

Prerequisites

- The BTS3902E and related cables are installed.
- The input power voltage of the BTS3902E is within the following range:
  - The input power voltage of the AC-powered BTS3902E working at the 1.9 GHz, 2.1 GHz or 850 MHz frequency band ranges from 100 V AC to 240 V AC.
  - The input power voltage of the DC-powered BTS3902E working at the AWS frequency band ranges from -57 V AC to -36 V AC.

Context

NOTICE

After you unpack a BTS3902E, you must power it on within 24 hours. If you power off the BTS3902E for maintenance, you must restore power to it within 24 hours.

Procedure

Step 1 Power on the BTS3902E.

CAUTION

Do not look into the optical module without eye protection after the BTS3902E is powered on.

Step 2 Wait three to five minutes, and then check the status of the BTS3902E indicators. For details, see BTS3902E Indicators in *BTS3902E WCDMA Hardware Description*.

NOTE

If BTS3902Es are cascaded, check the status of all BTS3902E indicators.

Step 3 Take corresponding actions based on the status of the indicators.

If...	Then...
The BTS3902E operates properly	End the power-on check task.
If the BTS3902E is faulty	Rectify the fault, and then go to **Step 1**.

----End

2.2 Powering Off a BTS3902E

This section describes how to power off a BTS3902E.

Procedure

Step 1 Turn off the external power switch of the BTS3902E.

----End

3 Replacing the BTS3902E

The BTS3902E is an integrated micro base station. Replacing a faulty BTS3902E interrupts all services carried by the base station.

Prerequisites

- The following tools and materials are available: ESD gloves or ESD wrist strap, M4 Phillips screwdriver, M6 Phillips screwdriver, M8 inner hexagon torque screwdriver, waterproof tape, and insulation tape.
- The BTS3902E to be replaced is confirmed, and the new BTS3902E is available.
- Associated personnel have gained permissions to access the site and have obtained the required keys.

Context

NOTE

- There are two types of the BTS3902E, for which the replacement procedure is the same. The following part uses one type as an example to describe how to replace the BTS3902E.
- The camouflage shell is optional. The following uses the BTS3902E equipped with a camouflage shell as an example.

Procedure

Step 1 Instruct the network operator to perform the following operations before replacing the BTS3902E:

1. On the NodeB, run the **BLK LOCELL** command to block all cells controlled by the NodeB.
2. Modify the ESN on the RNC by referring to the ESN on the new BTS3902E.
3. Upload the configuration files of the base station through FTP. For details, see the *Base Station Commissioning Guide*.
4. Copy the configuration files of the base station and software package into a USB flash drive or a PC on which the LMT is installed.

Step 2 Turn off the external power switch of the BTS3902E to power off the BTS3902E.

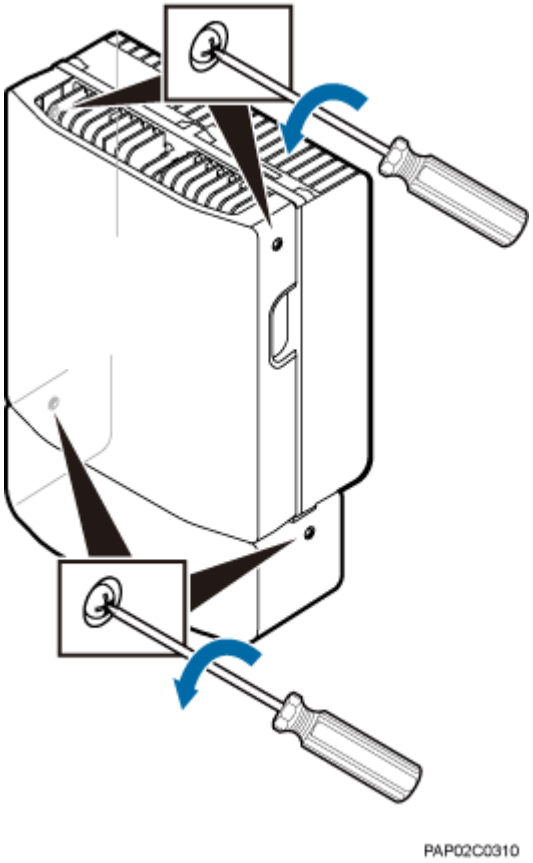
Step 3 Wear an ESD wrist strap or ESD gloves.

NOTICE

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

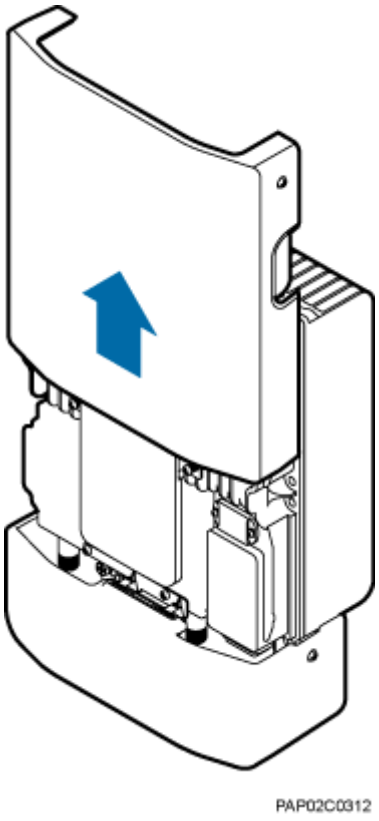
Step 4 Use an M4 Phillips screwdriver to loosen the four captive screws on the housing, as shown in **Figure 3-1**.

Figure 3-1 Loosening the screws on the housing



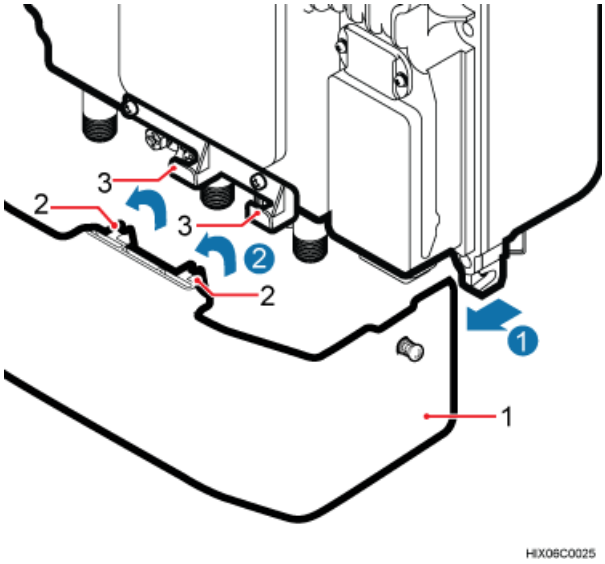
Step 5 Raise the upper housing until it is stopped, as shown in **Figure 3-2**.

Figure 3-2 Raising the upper housing



Step 6 Separate the slots on the camouflage shell from the tabs to remove the camouflage shell, as shown in **Figure 3-3**.

Figure 3-3 Removing the camouflage shell



(1) Camouflage shell (2) Slots (3) Tabs

Step 7 Record all the cable connections on the bottom of the faulty BTS3902E.

Step 8 Disconnect the cables connected to the external equipment from the bottom of the BTS3902E.

Step 9 Replace the BTS3902E.

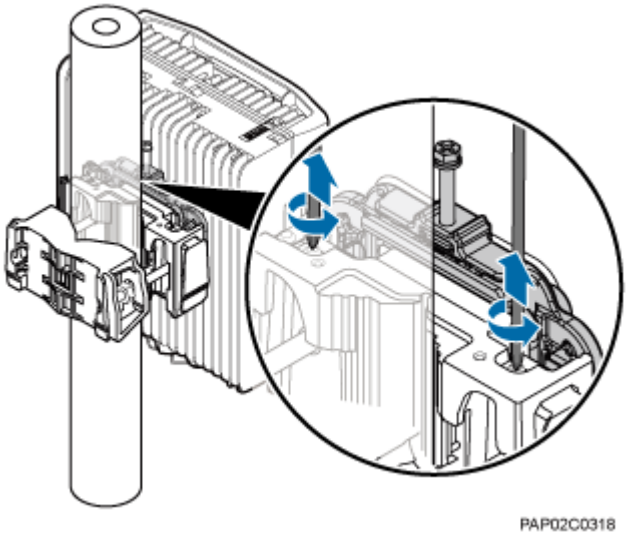
CAUTION

When removing the BTS3902E, hold the BTS3902E handle with two hands and slightly raise the BTS3902E to avoid the BTS3902E from falling down.

- When an aluminum mounting kit is used, perform the following operations:

1. Use an M4 Phillips screwdriver to loosen the captive screws on the two hoist clamps on the main mounting bracket, as shown in **Figure 3-4**.

Figure 3-4 Loosening captive screws on the main mounting bracket



2. Use an M6 Phillips screwdriver to tighten the screws on the attachment plate of the BTS3902E, as shown in **Figure 3-5**. Use the screw only for removing the BTS3902E to loosen the connection between the attachment plate and the main mounting bracket, and then raise the BTS3902E bottom to remove it, as shown in **Figure 3-6**.

Figure 3-5 Tightening screws on the attachment plate

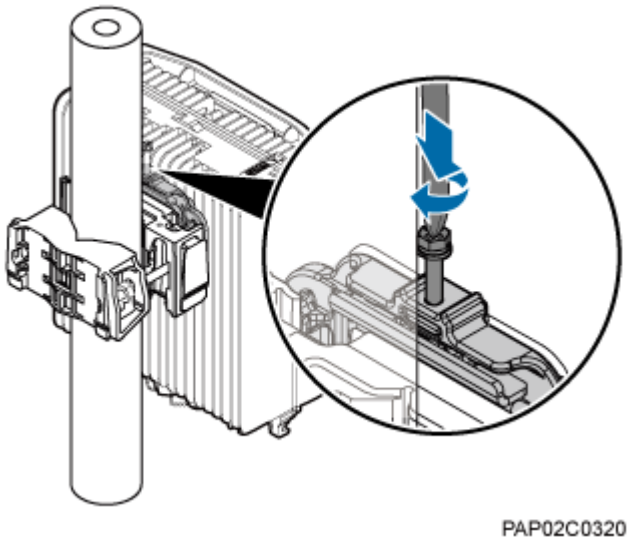
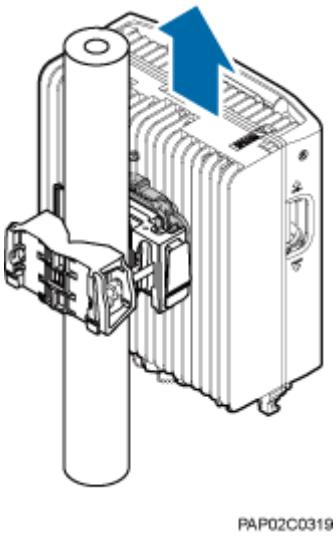


Figure 3-6 Raising the BTS3902E bottom

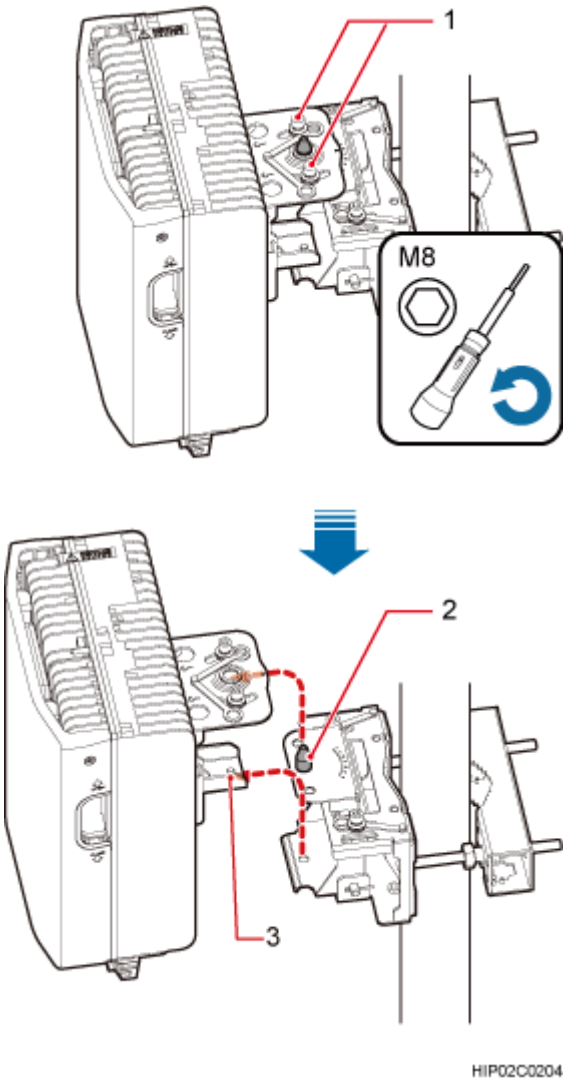


3. Tighten the captive screws on the two hoist clamps on the main mounting bracket to 1.4 N·m (12.39 lbf·in.). Install and waterproof a new BTS3902E.

- When an angle-adjustable mounting kit is used, perform the following operations:

1. Use an M8 hexagon screwdriver to loosen the four positioning screws to separate the upper and lower positioning pins with the mounting holes, and remove the BTS3902E, as shown in **Figure 3-7**.

Figure 3-7 Removing the BTS3902E



(1) Positioning screw (2) Positioning pins

2. Install and waterproof a new BTS3902E.

Step 10 Reconnect all cables to the BTS3902E and seal all vacant ports by waterproof caps.

Step 11 Power on the BTS3902E according to the instructions in **2.1 Powering On a BTS3902E**.

Step 12 Check whether the BTS3902E is working properly by observing the status of the indicators labeled O/E or O. For details about the status of the indicators, see BTS3902E Indicators in *BTS3902E WCDMA Hardware Description*.

Step 13 Go to **Perform the following operations on the LMT** or **use the USB storage device** depending on whether the laptop or USB storage device is used.

- Perform the following operations on the LMT:

1. In the **Software Update** window, select **Downloading the Data Configuration File**, **Download NodeB Software Package**, and **Download by Configuration** to download the configuration file and NodeB software package, and select **Effective Data Configuration**

File and **Activate NodeB Software** to activate the configuration file and NodeB software. After activation, the NodeB automatically resets, and the NodeB software takes effect in the NodeB. For details, see the *LMT User Guide*. For details, see the *LMT User Guide*.

2. Verify that no alarm related to the BTS3902E is generated. For details, see the *LMT User Guide*.

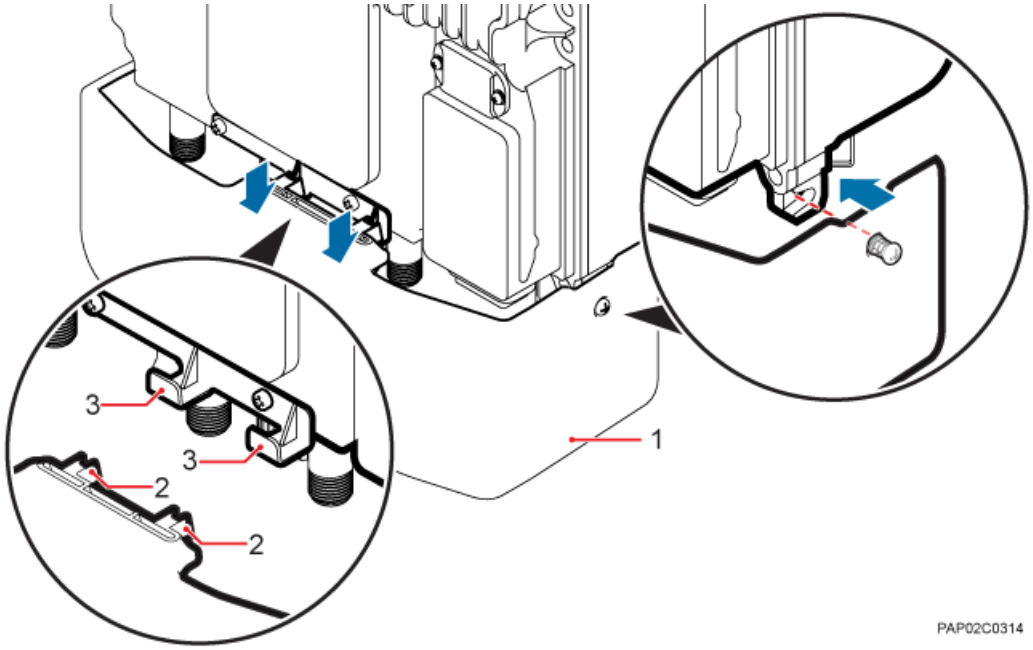
- Download the data configuration files and software package to the NodeB by using the USB storage device. For details, see the *NodeB Commissioning Guide*.

Step 14 Instruct the network operator to perform the following operations:

1. On the NodeB, run the **UBL LOCELL** command to unblock all cells controlled by the NodeB.
2. Synchronize the inventory information manually.
3. Set **TESTING** to **NORMAL** manually.

Step 15 Install the slots on the camouflage shell to the tabs to secure the shell, as shown in **Figure 3-8**.

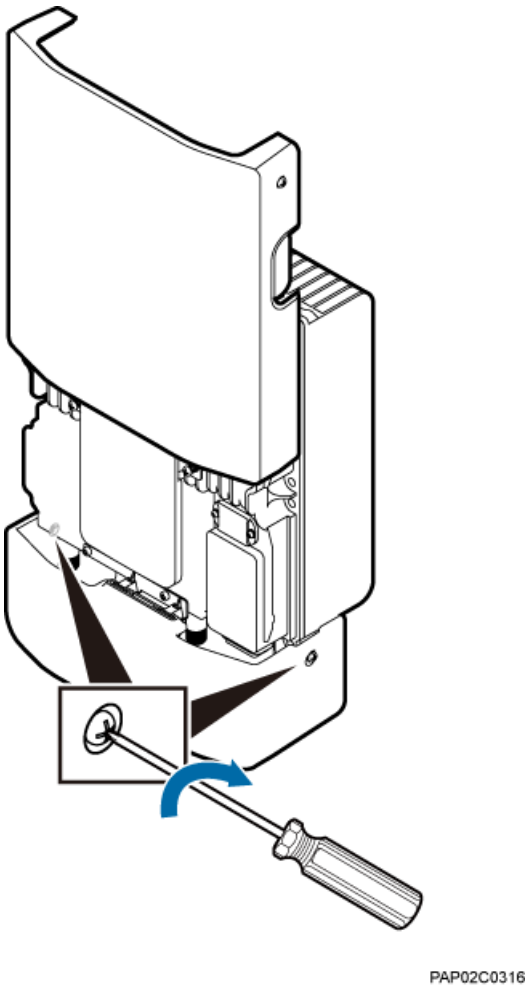
Figure 3-8 Installing the camouflage shell



(1) Camouflage shell (2) Slots (3) Tabs

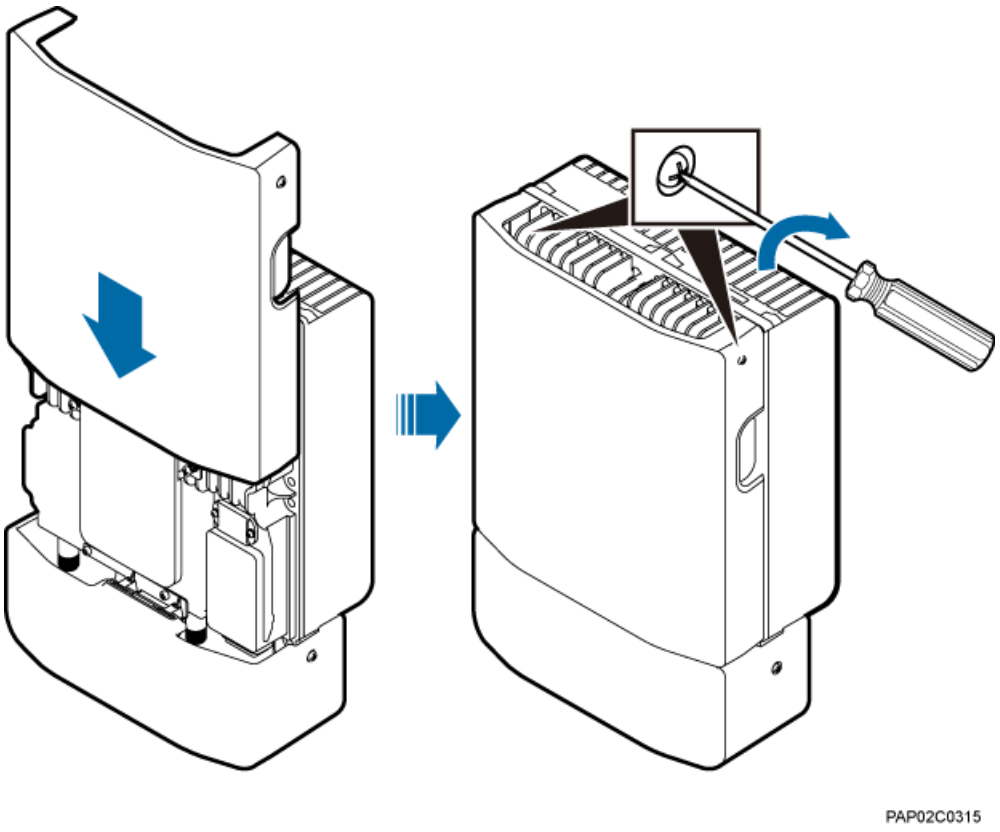
Step 16 Use an M4 Phillips screwdriver to tighten the two captive screws to 1.2 N·m (10.62 lbf·in.), as shown in **Figure 3-9**.

Figure 3-9 Tightening the screws



Step 17 Close the housing, and use an M4 Phillips screwdriver to tighten the two captive screws to 1.2 N·m (10.62 lbf·in.), as shown in **Figure 3-10**.

Figure 3-10 Closing the housing and tightening the screws



Step 18 Take off the ESD wrist strap or ESD gloves, and pack up all tools.

----End

Follow-up Procedure

- Put the replaced component into an ESD box or bag. Then, put the ESD box or bag into a carton padded with foam or into the packing box of the new board.
- Fill in the fault form with the detail information of the replaced board.
- Contact the local Huawei office to handle the faulty component.

4 Replacing the Attachment Plate

This section describes the procedure for replacing the attachment plate matching the angle-adjustable mounting kits with the attachment plate matching the aluminum mounting kits.

Prerequisites

- The tools and materials are available, such as the ESD wrist strap or ESD gloves and M6 screwdriver.
- The new attachment plate is available.
- Associated personnel have gained permissions to access the site and have obtained the required keys.

NOTE

Before replacing the attachment plate, power off the BTS3902E, and then power on the BTS3902E after the attachment plate is replaced according to the instructions in **2 Powering On and Powering Off a BTS3902E**. This section only describes the procedure for removing and installing the attachment plate.

Procedure

Step 1 Wear an ESD wrist strap or ESD gloves.

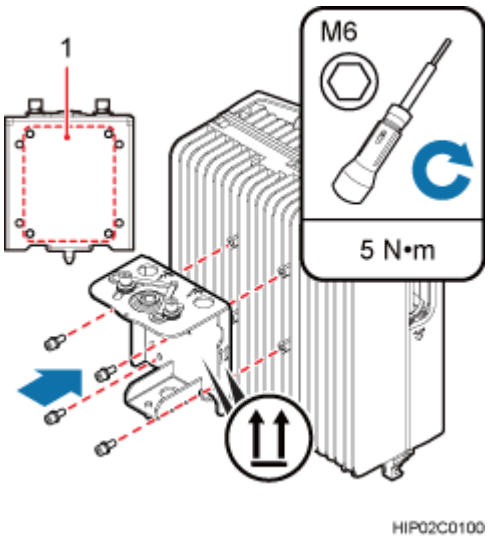
NOTICE

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

Step 2 Use an M6 screwdriver to loosen the screws that secure the attachment plate, and remove the attachment plate.

Step 3 Install the new attachment plate on the BTS3902E. Use an M6 screwdriver to tighten the screws to 5 N·m (44.25 lbf·in.), as shown in **Figure 4-1**.

Figure 4-1 Tightening screws on the attachment plate



(1) Mounting holes on the attachment plate

NOTE

The attachment plate needs to be installed based on the mounting holes shown in **Figure 4-1**.

Step 4 Take off the ESD wrist strap or ESD gloves, and pack up all tools.

----End

Follow-up Procedure

- Place the replaced component into the ESD box or bag. Then, place the ESD box or bag into a foam-padded carton or the packing box of the new component.
- Fill in the fault form with detailed information about the replaced component.
- Contact the local Huawei office to handle the replaced component.

5 Replacing an Optical Module

An optical module implements optical-electrical conversion, enabling optical transmission between a BTS3902E and other devices. You must disconnect the fiber optic cable from an optical module before replacing the optical module. Disconnecting the fiber optic cable interrupts the transmission of optical signals.

Prerequisites

- The type and number of optical modules to be replaced are confirmed, and new optical modules are ready.
- Tools and materials, such as electrostatic discharge (ESD) gloves, M4 Phillips screwdrivers, and an ESD box or bag, are ready.

Context

- The optical module is installed on the OPT0 or OPT1 port on the BTS3902E.
- Optical modules are hot-swappable.
- It takes about five minutes to replace an optical module on the BTS3902E, which involves disconnecting the fiber optic cable, removing the faulty optical module, inserting a new optical module, reconnecting the fiber optic cable, and waiting for the link on the Ethernet optical port to resume.

Procedure

Step 1 Wear ESD gloves.

NOTICE

Take proper ESD protection measures; for example, wear ESD gloves, to prevent electrostatic damage to the boards, modules, or electronic components.

Step 2 Record the connections of the optical module and fiber optic cable.

Step 3 Press the latch on the connector of the fiber optic cable, and then remove the connector from the faulty optical module.

CAUTION

Do not look into the fiber optic cable or optical module without eye protection after the fiber optic cable is removed from the optical module.

Step 4 Lower the puller on the faulty optical module, and then pull the puller until the optical module is removed from the BTS3902E.

Step 5 Prepare an optical module of the same type as the faulty optical module according to the label on the module. Install the new optical module onto the BTS3902E.

NOTE

The optical modules to be installed must match the rate at the fast Ethernet or gigabit Ethernet (FE/GE) port.

Step 6 Insert the fiber optic cable connector into the new optical module.

Step 7 Check the transmission of FE/GE signals by observing the status of the indicators labeled O/E or O. For details about the status of the indicators, see BTS3902E Indicators in *BTS3902E WCDMA Hardware Description*.

Step 8 Take off the ESD gloves, and pack up all the tools.

----End

Follow-up Procedure

- Place the removed optical module into the ESD box or bag. Then, place the ESD box or bag into a foam-padded carton or the packing box of the new module.
- Fill in the fault form with detailed information about the removed component.
- Contact the local Huawei office to handle the faulty optical module.