

WIUA

A wireless interface unit type A (WIUA) is mainly used to monitor the running status of other components in the same cabinet. A WIUA can be installed in an IBBS200D, IBBS200T, IBBS300D, or IBBS300T.

Exterior

The following figure shows the exterior of a WIUA.

Figure 1 Exterior of a WIUA

(1) COM_IN port	(2) SETUP indicator	(3) STATE indicator
(4) Pairing button	(5) ANT port	–

Function

A WIUA provides the following functions:

- Provides one RS485 signal port for communicating with an upper-level component.
- Provides one antenna port for connecting to an antenna and communicating with external wireless components.
- Contains an antenna for performing wireless communication with other components in the same cabinet.
- Provides a pairing button for pairing with a lower-level component.
- Provides an electronic label.

The following figure shows the function of a WIUA.

Figure 2 WIUA function

Indicator

The following table describes the indicators on a WIUA.

Table 1 Indicators on a WIUA			
Label	Color	Status	Meaning
STATE	Red or green	Steady off	There is no power supply, or the board is

Table 1 Indicators on a WIUA

Label	Color	Status	Meaning
			faulty.
		Steady green	The board is performing self-check or loading and activation.
		Blinking green (on for 0.125s and off for 0.125s)	The board is not registered, or the communication is interrupted.
		Blinking green (on for 1s and off for 1s)	Communications are normal and no alarm is reported.
		Steady red	An alarm is generated, and the board must be replaced.
		Blinking red (on for 1s and off for 1s)	Communications are normal but an alarm is generated, and you need to locate the fault before deciding whether to replace the board.
SETUP	Green	Steady off	No power is supplied or the pairing function is not enabled, and the board does not exchange data with a lower-level device.
		Steady on	No data is being initialized and the pairing operation is not supported.
		Blinking (on for 0.125s and off for 0.125s)	The board is performing wireless exchange with a lower-level device.
		Blinking (on for 1s and off for 1s)	The board has been enabled with the pairing function.

Port and Button

The following table describes the ports and button on a WIUA.

Table 2 Ports and button on a WIUA	
Silkscreen	Description
COM_IN	RS485 signal port for communicating with an upper-level cascading port and reporting monitoring information
	Pairing button ^a
ANT	Port for connecting an external antenna ^b

NOTE:

a: The pairing button works as follows:

- After you press the pairing button on a WIUA, the WIUA can be paired with a lower-level device if the SETUP indicator is blinking green (on for 1s and off for 1s).
- If you press the pairing button again during a pairing process, the pairing process will be interrupted and the SETUP indicator is steady off.
- After the SETUP indicator blinks (on for 1s and off for 1s) for 10 minutes, the pairing function is automatically disabled.

b: When the WIUA is used together with an external antenna, the external antenna must be an omnidirectional antenna with a gain of less than 3 dBi and be installed by qualified personnel.

Engineering specifications

The following table lists the engineering specifications of the WIUA.

Table 3 Engineering specifications			
	Item	Specifications	Remarks
Power specifications	Input voltage	12 V DC	Operating voltage range: 9 V DC to 12 V DC
	Power consumption	2 W	–
Equipment	Dimensions (H x W	27 mm x 45 mm x	–

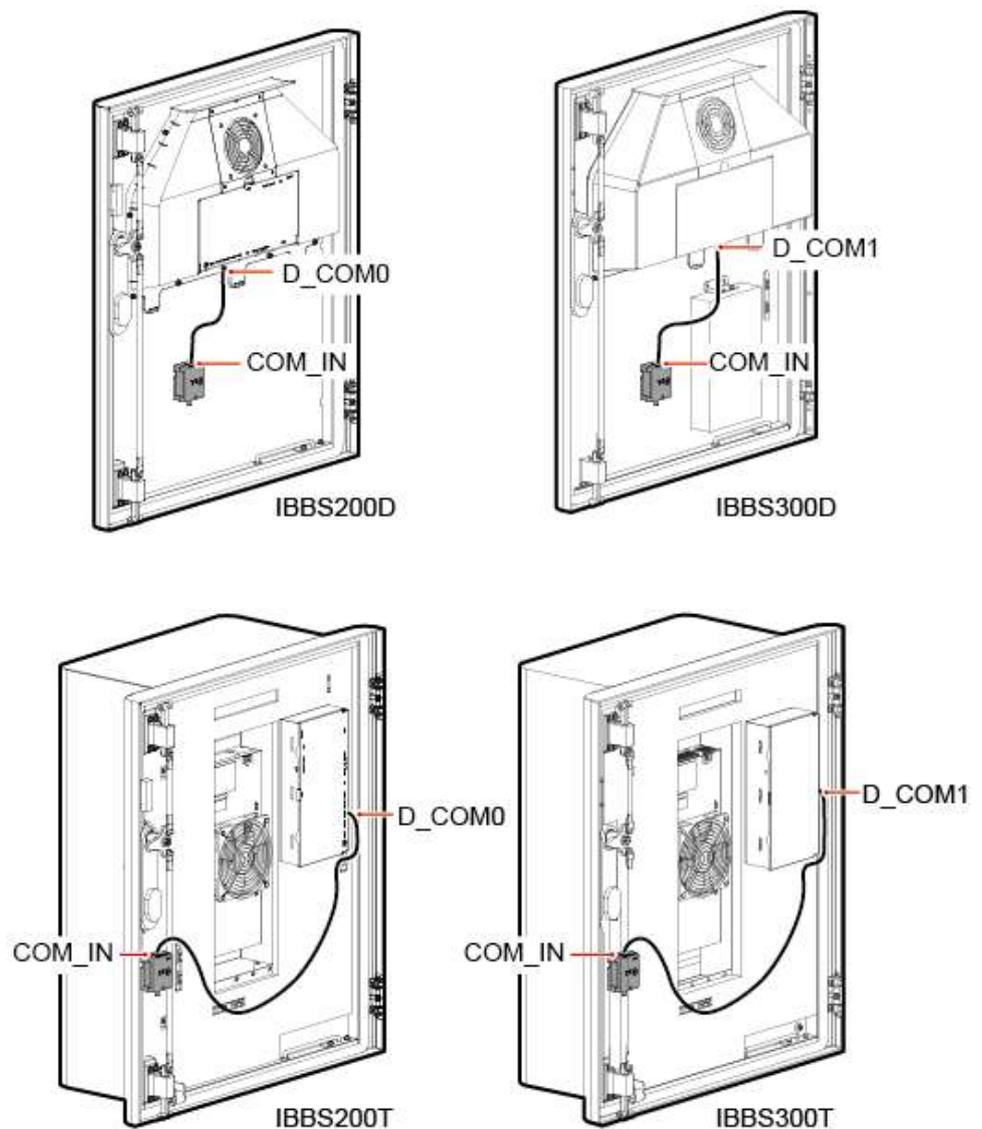
Table 3 Engineering specifications			
Item		Specifications	Remarks
specifications	x D)	55 mm (1.06 in. x 1.77in. x 2.17 in.)	
	Weight	0.1 kg (0.22 lb)	-
Environment specifications	Operating temperature	-40° C to +70° C	-
	Relative humidity	5% RH to 95% RH	-
	Altitude	-60 m to 4000 m (-196.85 ft to 13123.20 ft)	From the altitude of 1800 m (5905.51 ft), the maximum operating temperature drops by 1° C (33.8° F) each time the altitude increases by 220 m (721.78 ft).
	Storage temperature	-40° C to +70° C	It is recommended that the device be installed and used within one year after its delivery because of the failure rate.
	Protection level	IP20	-

Parent topic: [Monitoring Devices](#)

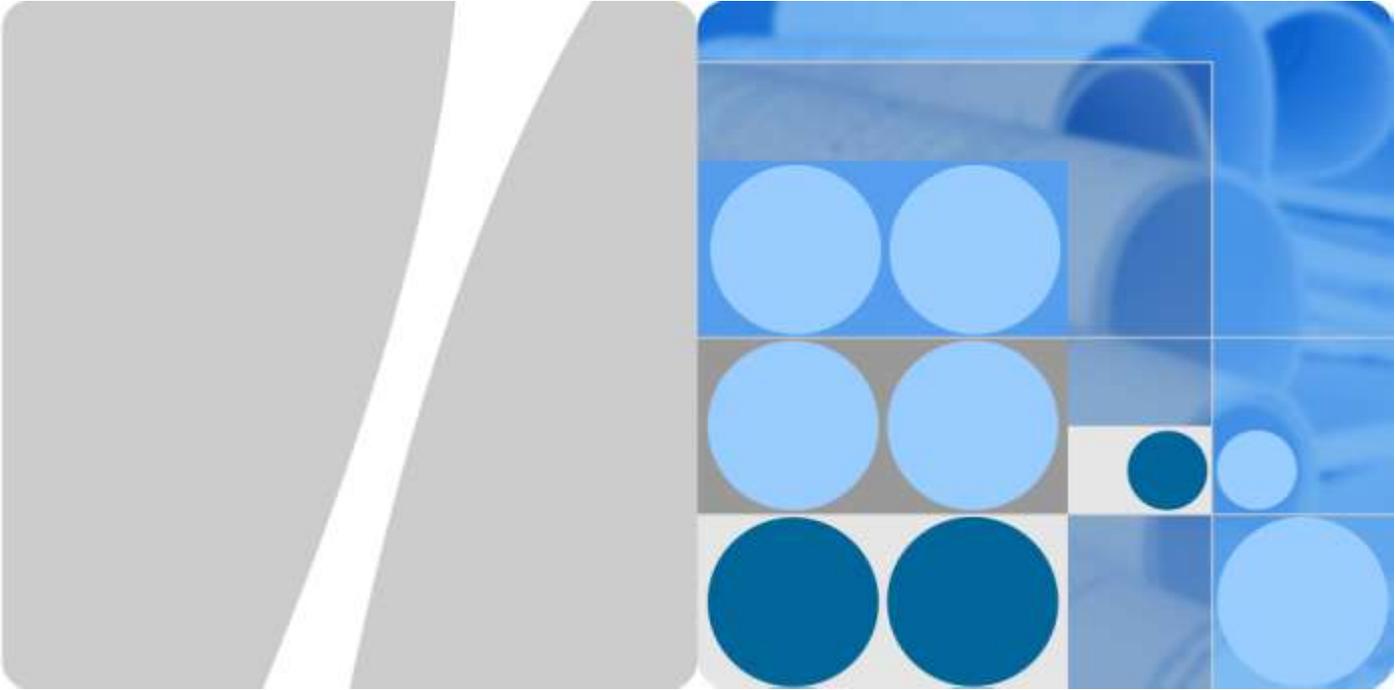
- **Installing a WIUA**

1. Clean the surface for installing the WIUA.
2. Remove the film from the rear of the WIUA, stick the WIUA to the surface of the Genesis battery, and press the eBat with a force of 2 N (17.7 lbf • in.) for 5s to 10s.
3. Connect one end of an RJ45 signal cable to the “COM_IN” port on the WIUA, and the other end to the “D_COM0” port on the CMUH board in the IBBS200D/IBBS200T or the “D_COM1” port on the CCU01D-03 board in the IBBS300D/IBBS300T.
4. The picture shows the position for installing a WIUA and how the cable is routed.

The PICTURE: WIUA installation position and cable connection



5. Route the cable according to the instructions in [Cabling Requirements](#), and then use cable ties to bind the cable.
 6. Label the installed cable according to the instructions in [Attaching a Cable-Tying Label](#).
-



Regulatory Compliance Statement

WIUA



Issue: 01

Date:2015-7-31

HUAWEI TECHNOLOGIES CO., LTD.



Copyright © Huawei Technologies Co., Ltd. 2010. All rights reserved.

No part of this document may be reproduced or transmitted in any form or by any means without prior written consent of Huawei Technologies Co., Ltd.

Trademarks and Permissions



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

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

Notice

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

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

Huawei Technologies Co., Ltd.

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

Website: <http://www.huawei.com>

Email: support@huawei.com

1 Regulatory Compliance Statement

About This Chapter

1.1 Declaration of Conformity to European Directives

1.1 Declaration of Conformity to European Directives

Figure 1-1 Declaration of Conformity to European Directives



TEL: 0755-28780808
 FAX: 0755-89652518
 http://www.huawei.com

Doc NO.: CE-01862409

Declaration of Conformity

For EU Directives and Regulations

For the following equipment

Product : Wireless Interface Unit
Model/Trademark : WIUA / HUAWEI
Manufacturer's Name : Huawei Technologies Co., Ltd.
Manufacturer's Address : Administration Building, Headquarters of
Huawei Technologies Co., Ltd., Bantian,
Longgang District, Shenzhen, 518129, P.R.C

is herewith confirmed to comply with the requirements which are set out in 1999/5/EC(R&TTE Directive), 2002/95/EC & 2011/65/EU (RoHS Directive), 2002/96/EC&2012/19/EU (WEEE Directive) and 2006/1907/EC(REACH Regulation). For the evaluation of the compliance with these Directives and Regulations, the following standards/requirements were applied:

Safety	EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013		
EMC	ETSI EN 301 489-1 V1.9.2	EN 55022:2010	CISPR 22:2008
	ETSI EN 301 489-17 V2.2.1	EN 55024:2010	CISPR 24:2010
Radio & Health	ETSI EN 300 328 V1.8.1 Council Recommendation 1999/519/EC EN 62479: 2010		
RoHS	2002/95/EC, 2011/65/EU, EN 50581: 2012		
REACH	EC NO. 1907/2006		
WEEE	2002/96/EC, 2012/19/EU		

CE Marking Date: Jul 30, 2015

Responsible for making this declaration is the:

Manufacturer Authorised representative established within the EU

Person responsible for making this declaration

Name/Title: Zhang Xingwei Regulation Compliance Manager

Print Name: Zhang Xingwei

Place/Date: Shenzhen, China Jul 30, 2015

2 Regulatory Compliance Information

About This Chapter

- 2.1 Regulatory Compliance Standards
- 2.2 European Regulatory Compliance
- 2.3 U.S.A Regulatory Compliance
- 2.4 Canada Regulatory Compliance
- 2.5 CISPR 22 Compliance
- 2.6 China RoHS hazardous substance table
- 2.7 India RoHS hazardous substance table
- 2.8 Other Markets

2.1 Regulatory Compliance Standards

Product complies with the standards listed in Table 2-1.

Table 2-1 Regulatory compliance standards

Discipline	Standards
EMC	<ul style="list-style-type: none"> • CISPR22 Class B • CISPR24 • EN55022 Class B • EN50024 • ETSI EN 301 489 Class B • CFR 47 FCC Part 15 Class B • ICES 003 Class B • AS/NZS CISPR22 Class B • GB9254 Class B • VCCI Class B • CNS 13438 Class B • IEC/EN61000-6-1 • IEC/EN61000-6-3
Safety	<ul style="list-style-type: none"> • IEC 60950-1 • IEC60950-22 • IEC/EN41003 • EN 60950-1 • UL 60950-1 • CSA C22.2 No 60950-1 • AS/NZS 60950.1 • BS EN 60950-1 • IS 13252 • GB4943
RF	<ul style="list-style-type: none"> • ETSI EN 300 328 • FCC Part 2 • FCC Part 15 • RSS-Gen • RSS-247
Health	<ul style="list-style-type: none"> • ICNIRP Guideline • 1999-519-EC • EN 62479 • OET Bulletin 65 • FCC Part 1 • IEEE Std C95.1 • RSS-102

Discipline	Standards
Environmental protection	<ul style="list-style-type: none"> • 2011/65/EU (RoHS) • EC NO. 1907/2006 (REACH) • 2002/96/EC (WEEE)
<p>NOTE</p> <p>EMC: electromagnetic compatibility</p> <p>NEBS: Network Equipment Build Standard</p> <p>RF: radio frequency</p> <p>CISPR: International Special Committee on Radio Interference</p> <p>EN: European Standard</p> <p>ETSI: European Telecommunications Standards Institute</p> <p>CFR: Code of Federal Regulations</p> <p>FCC: Federal Communication Commission</p> <p>IEC: International Electrotechnical Commission</p> <p>AS/NZS: Australian/New Zealand Standard</p> <p>VCCI: Voluntary Control Council for Interference</p> <p>CNS: Chinese National Standard</p> <p>UL: Underwriters Laboratories</p> <p>CSA: Canadian Standards Association</p> <p>BS: British Standard</p> <p>IS: Indian Standard</p> <p>GR: General Requirement</p> <p>FDA: Food and Drug Administration</p> <p>BTS: Base Transceiver Station</p> <p>GSM: Global System for Mobile communications</p> <p>WLAN: wireless local area network</p> <p>ICNIRP: International Commission on Non-Ionizing Radiation Protection</p> <p>OET: Office of Engineering Technology</p> <p>IEEE: Institute of Electrical and Electronics Engineers</p> <p>RoHS: restriction of the use of certain hazardous substances</p>	

2.2 European Regulatory Compliance

Product complies with the following European directives and regulations.

- 2004/108/EC (EMC)
- 2006/95/EC (low voltage)
- 1999/5/EC (R&TTE)
- 2011/65/EU (RoHS)
- EC NO. 1907/2006 (REACH)
- 2002/96/EC (WEEE)

Product complies with Directive 2002/95/EC, 2011/65/EU and other similar regulations from the countries outside the European Union, on the RoHS in electrical and electronic equipment. The device does not contain lead, mercury, cadmium, and hexavalent chromium and brominated flame retardants (Polybrominated Biphenyls (PBB) or Polybrominated Diphenyl Ethers (PBDE)) except for those exempted applications allowed by RoHS directive for technical reasons.

Product complies with Regulation EC NO. 1907/2006 (REACH) and other similar regulations from the countries outside the European Union. Huawei will notify to the European Chemical Agency (ECHA) or the customer when necessary and regulation requires.

Product complies with Directive 2002/96/EC on waste electrical and electronic equipment (WEEE). Huawei is responsible for recycling its end-of-life devices, and please contact Huawei local service center when recycling is required. Huawei strictly complies with the EU Waste Electrical and Electronic Equipment Directive (WEEE Directive) and electronic waste management regulations enacted by different countries worldwide. In addition, Huawei has established a system for recycling and reuse of electronic wastes, and it can provide service of dismantling and recycling for WEEE. By Huawei recycling system, the waste can be handled environmentally and the resource can be recycled and reused fully, which is also Huawei WEEE stratagem in the word. Most of the materials in product are recyclable, and our packaging is designed to be recycled and should be handled in accordance with your local recycling policies.

In accordance with Article 11(2) in Directive 2002/96/EC (WEEE), products were marked with the following symbol: a cross-out wheeled waste bin with a bar beneath as below:



In order to avoid the possibility of exceeding the Europe radio frequency exposure limits, human proximity to the equipment shall not be less than 20cm

2.3 U.S.A Regulatory Compliance

2.3.1 FCC Part 15

2.3.1 FCC Part 15

Product complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device does not cause harmful interference.

- This device must accept any interference received, including interference that may cause undesired operation.

If this device is modified without authorization from Huawei, the device may no longer comply with FCC requirements. In that a case, your right to use the device may be limited by FCC regulations. Moreover, you may be required to correct any interference to radio or television communications at your own expense.

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This device generates, uses and radiates radio frequency energy. If it is not installed and used in accordance with the instructions, it may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this device does cause harmful interference to radio or television reception, which can be determined by turning the device off and on, the user may take one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Reinforce the separation between the device and receiver.
- Connect the device into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or TV technician for assistance.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the equipment shall not be less than 20cm

2.4 Canada Regulatory Compliance

2.4.1 RSS-Gen statement

This device complies with Industry Canada licence-exempt RSS standard(s).

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radio électrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

2.4.2 RSS-102 statement

This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by Industrial Canada and meets the requirements for radiation exposure limits set forth for an uncontrolled environment.

In order to avoid the possibility of exceeding the Industrial Canada radio frequency exposure limits, human proximity to the equipment shall not be less than 20cm

Cet appareil est conçu et fabriqué pour ne pas dépasser les limites d'émission pour l'exposition à la fréquence radio (RF) de l'énergie fixée par l'Industrie Canada et répond aux exigences en matière de limites d'exposition aux rayonnements définies pour un environnement non contrôlé

Afin d'éviter la possibilité de dépasser les limites d'exposition aux fréquences radio industrielle du Canada, la proximité humaine pour l'appareil ne doit pas être inférieure à 20cm

2.6 CISPR 22 Compliance

Product complies with CISPR 22 for Class B by the ITE.

Class A ITE is a category of all other ITE that satisfies only the Class A ITE regulations, and not the Class B ITE regulations. Such equipment should not be restricted in its sale but the following warning shall be included in the instructions for use:

2.7 China RoHS hazardous substance table

This products described in this guide complies with “the Administration on the Control of Pollution Caused by Electronic Information Products” which is also called China RoHS

部件名称	产品中有害物质或元素的名称及含量					
	镉	铅	汞	六价铬	多溴联苯	多溴联苯醚
Alloy Parts	○	×	○	○	○	○
Metal Fittings	○	○	○	○	○	○
PCBA	○	×	○	○	○	○
Cable	○	○	○	○	○	○
Capacitor	○	×	○	○	○	○
Other electronics	○	×	○	○	○	○

Solder	○	×	○	○	○	○
Plastic and Polymer	○	○	○	○	○	○

○: 表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T11363-2006 标准规定的限量要求以下。
 ×: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006 标准规定的限量要求。

2.8 India RoHS hazardous substance table

This products described in this guide complies with the “e-waste (Management and Handling) Rules, 2011” of India which is also called India RoHS.

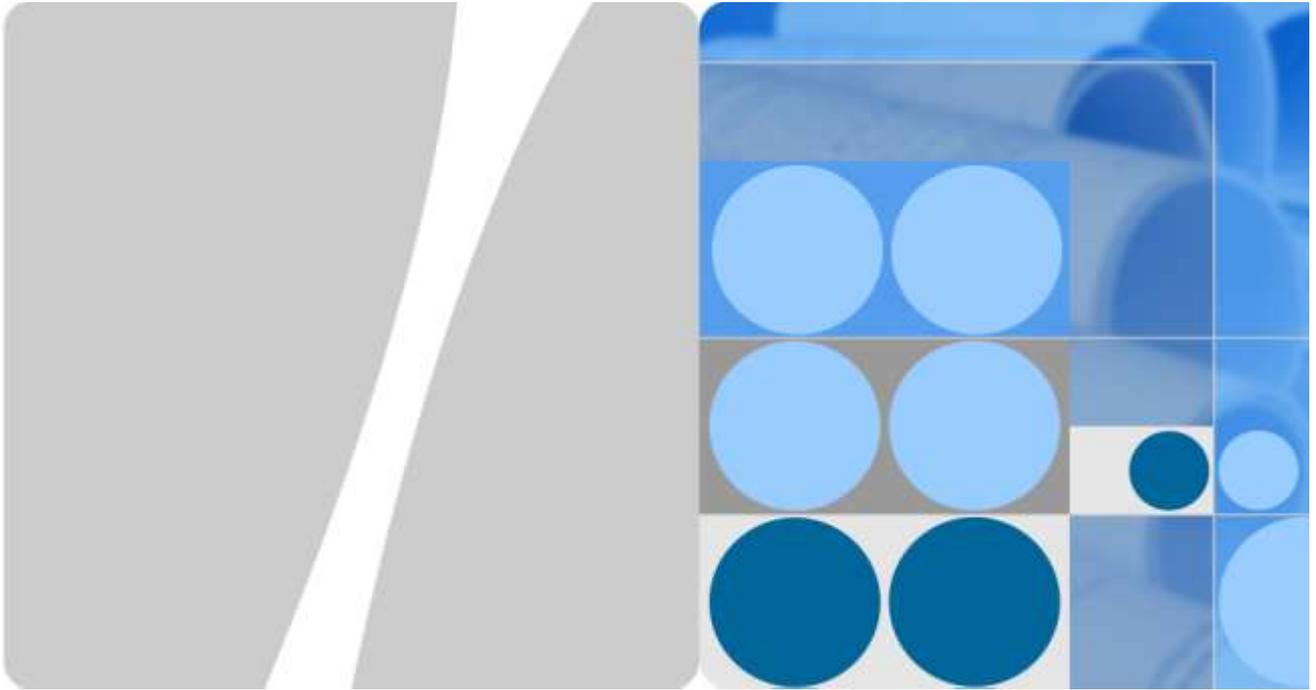
Part Descriptions	Restricted Substances in Product					
	Cd	Pb	Hg	Cr(VI)	PBBs	PBDEs
Alloy Parts	○	×	○	○	○	○
Metal Fittings	○	○	○	○	○	○
PCBA	○	×	○	○	○	○
Cable	○	○	○	○	○	○
Capacitor	○	×	○	○	○	○
Other electronics	○	×	○	○	○	○
Solder	○	×	○	○	○	○
Plastic and Polymer	○	○	○	○	○	○

○: indicates that the content of the toxic and hazardous substance in all the Homogeneous Materials of the part is below the concentration limit requirement as described in the e-waste (Management and Handling) Rules, 2011.
 ×: indicates that the content of the toxic and hazardous substance in at least one Homogeneous Material of the part exceeds the concentration limit requirement as described in S in the e-waste (Management and Handling) Rules, 2011.

2.9 Other Markets

For relevant compliance information/documentation for markets not mentioned above,

please contact Huawei representative



WIUA Safety Manual

Issue:01

Date:2015-7-31

HUAWEI TECHNOLOGIES CO., LTD.



错误! 未知的文档属性名称

2014-07-30

Contents

1 Safety Information	3
1.1 General Safety Precautions	3
1.2 Installation Environment Requirements	6
1.2.1 Indoor Installation	7
1.2.2 Outdoor Installation	8
1.3 Electrical Safety	10
1.4 Battery Safety	11
1.4.1 Safety Requirements for Rechargeable Batteries	12
1.4.2 Safety Requirements for Non-Rechargeable Batteries	13
1.5 Radiation Safety	13
1.5.1 Electromagnetic Field Exposure	13
1.5.2 Laser Radiation	15
1.6 Mechanical Safety	16
1.7 Maintenance Safety	18
1.8 Safety Sign Description	19

1 Safety Information

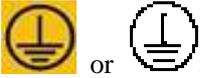
1.1 General Safety Precautions

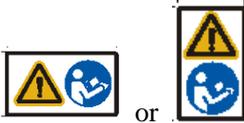
- Read all safety information before installing, operating and maintaining Huawei equipment.
- To ensure personal and equipment safety during installation, operation and maintenance, follow all safety precautions marked on equipment and described in manuals.
- Items marked **Caution**, **Warning** and **Danger** in the manual do not indicate all safety precautions to be obeyed, but only serve as a supplement to all safety precautions.
- The equipment should be used in the environment that meets design specifications. Otherwise, equipment failure may occur, and equipment malfunctions, parts damage, personal safety accidents, property loss and other exceptions resulting from such equipment failure are not within the scope of quality warranty.

Definitions

- **Skilled person:**
Skilled person is a term applied to persons who have training or experience in the equipment technology, particularly in knowing the various energies and energy magnitudes used in the equipment.
- **Instructed person:**
Person who have been instructed and trained by a skilled person, or who are supervised by a skilled person, to identify energy sources that may cause pain and to take precautions to avoid unintentional contact with or exposure to those energy sources. Under normal operating conditions, abnormal operating conditions or single fault conditions, instructed persons should not be exposed to parts comprising energy sources capable of causing injury. Understand potential dangers in operations, and can take proper measures to minimize the dangers.
- **User or operator:**
Ordinary person is the term applied to all persons other than instructed persons and skilled persons. Ordinary persons include not only users of the equipment, but also all persons who may have access to the equipment or who may be in the vicinity of the equipment.

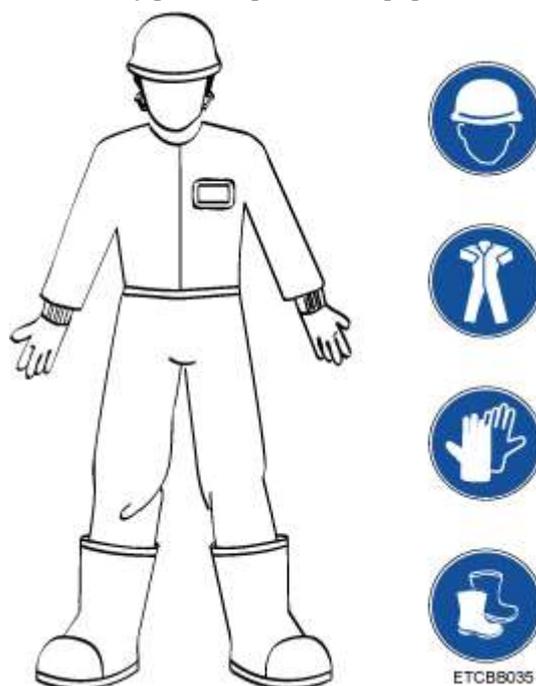
Conventions

- 
Caution: Caution Symbol, prompts users to be cautious. "Caution" items provide helpful suggestions or reference materials not covered in the document.
- 
Warning: Warning Symbol, prompts users to be careful. In this situation, users might perform an action that may result in an equipment damage or loss of data.
- 
Danger: Danger Symbol, indicates critical safety instructions. This warning symbol means a danger. Users are in a situation that could cause bodily injury. Before performing any operation on the equipment, involving electric circuits and understand the standard practices for preventing accidents.
- 
High Voltage Symbol: indicates a part exposed to a high voltage. This symbol warns operators that direct contact with the power grid voltage, or indirect contact with the power grid voltage through damp stuff or moisture is fatal. The symbol is attached next to a hazardous voltage point or a protective power supply cover that may be removed during maintenance.
- 
Overheating Symbol: indicates overheating. This symbol is attached to equipment surface that may cause scalds due to a high temperature. The symbol warns users not to touch the equipment during operation or maintenance. Heat insulation gloves should be used to prevent scalds.
- 
Microwave Symbol: indicates that a device emits microwaves. This symbol warns operators not to unfasten the transmitter output feeder or antenna feeder connector when the transmitter is working. If you need to unfasten the feeder connector or work next to the transmit antenna, turn off the transmitter. The symbol is attached next to the output socket of the transmitter power amplifier or antenna socket of the transmitter combiner to indicate RF radiation.
- 
Protective Earthing Symbol: indicates protection earthing. This symbol is attached next to a protection ground terminal, and used next to a terminal connecting equipment and an external ground system. An equipment ground cable is connected to an external ground bar through the protection ground terminal.
- 
Protective bonding Symbol: indicates equipotential bonding. This symbol is used next to equipotential terminals inside equipment.
- 
Electrostatic symbol: This symbol is used in all electrostatic sensitive areas. Before operating equipment attached with this symbol, wear ESD gloves or an ESD wrist strap.
- 
Altitude description symbol: This symbol indicates that equipment is safe to use only below the altitude of 2000 m.

-  : Non-tropical climate symbol: This symbol indicates that equipment is safe to use only in non-tropical climates.
-  : Symbol on/near a fan box/moving part. This symbol is silkscreened on or attached to a fan box panel to warn operators not to touch the fan with fingers. "Do not touch the blades when the fan is rotating!"
-  or  : Instruction reading symbol. This symbol is attached to remind instruction reading next to an equipment port to notify a user to read the manual for the usage of the port. Application scenarios of this symbol include but are not limited to:
 - For equipment with multiple power supplies, this symbol is used to replace the multi-power symbol next to power supplies, which indicates that the equipment has multiple power supplies and all the power supplies must be cut off to power off the equipment.
 - For equipment with multiple input ports, this symbol is used next to the output ports. Read the manual before connection to understand the rated value and configuration information of power output.
 - For equipment with multiple slots, this symbol is used next to the slots. Read the manual to understand the slot information, board restriction and usage conditions.

Basic Safety Precautions

- Instructed person must obtain related certificates after strict training, understand all the required safety regulations, and master correct operation methods before installing, operating and maintaining Huawei equipment.
- Equipment installation, operation, and maintenance must comply with local laws and regulations. Safety information in the manual only serves as a supplement to local laws and regulations, and:
 - Only skilled person and instructed person can install, operate, and maintain equipment.
 - Only skilled person and instructed person can remove safety facilities and maintenance equipment.
 - Operators should promptly report faults or errors that may cause safety issues.
 - Equipment operators, including operators, instructed person and skilled person, should have special operation qualifications required by the local country, such as high-voltage operation, climbing, and special equipment operation qualifications.
- If personal injury or equipment damage may occur during installation, equipment operators should stop operation immediately, report the situation to the project owner, and take effective protective measures.
- Installation, operation, and maintenance of outdoor equipment are strictly forbidden in lightning, rainy, snowy, windy and other adverse weather conditions. This includes but not limited to outdoor equipment transportation, cabinet installation, power cable installation, and outdoor cable connection.
- Do not wear watches, bracelets, bangles, rings, necklaces or other conductive objects during equipment installation, operation and maintenance.
- Dedicated insulation tools, such as insulation gloves, safety clothing, safety helmet, and safety shoes, must be used during equipment installation, operation, and maintenance, as shown in Figure 1-1.

Figure 1-1 Safety personal protective equipment (PPE)

- Equipment installation, operation, and maintenance must follow procedures in the *Hardware Installation and Maintenance Guide*, *Configuration Guide*, and *Operation and Maintenance Guide*.
- Use a voltmeter to measure the voltage at the contact point to prevent electric shocks before touching any metal surface or terminal.
- Ensure all slots are inserted with boards or filler panels. Prevent exposure of board hazardous voltage and energy, ensure normal working of ventilation channels, control electromagnetic interference, and prevent dusts or foreign matters from the backplane, mother board, and boards.
- After equipment installation, users should conduct routine checks and maintenance, and promptly replace faulty parts to ensure equipment safe running as required by the *Hardware Installation and Maintenance Guide* and *Operation and Maintenance Guide*.
- After equipment installation, clear equipment area and remove empty packaging materials, such as the carton box, foam, plastics, and cable ties.
- In case of fire, evacuate from the building or equipment area and press the fire alarm bell, or call the fire emergency number. Do not enter the burning building again in any cases.

1.2 Installation Environment Requirements

- Ensure the installation environment comply with equipment specifications, including the voltage, temperature, humidity, altitude, pollution degree, overvoltage category, and waterproof and dustproof classification.
- Do not place the equipment in a flammable, explosive gas or smog environment, or perform any operation in such environment.
- Keep acidic, alkaline or other corrosive gases away from the installation site.
- Keep the equipment away from sources of heat or fire, such as the electric heater, microwave oven, oven, water heater, fireplace fire, candle or other places that may

generate high temperatures. Otherwise, equipment housing will melt or the equipment will be heated and cause a fire.

- When the equipment is running, do not obscure or cover it with flammables, such as paper and cotton fabrics. Otherwise, heat dissipation of the equipment fails, which will cause housing deformation and a fire.
- The equipment (or system) must be installed and used in specified areas.
- Do not block air vents when the equipment is running. Keep air vents at a distance from the wall or other objects that block the air vents as required in the *Hardware Installation and Maintenance Guide*. The minimum distance is generally 5 cm if it is not specified.
- The equipment that cannot meet IP54 waterproof and dustproof standard cannot be used in outdoor environments.

1.2.1 Indoor Installation

- Ensure there is no water penetration, leakage or condensation (in case of air conditioner failure in the equipment room) on the equipment top. Otherwise, water may flow into the equipment, causing equipment failure.
- If fixed equipment has a large hole at the bottom, the equipment must be installed on concrete, tile or non-combustible surface.
- Prevent rats and pests from the installation site.

Wall Installation

- Before drilling holes on the wall, ensure there is no circuit, water conduit or gas pipeline in the wall area to be drilled to avoid body injury.
- Do not place any flammables or explosive objects above or under the equipment, and do not obscure the equipment with foreign objects within 1 m scope.
- In wall installation mode, ensure no hole facing upwards to prevent water ingress and equipment damage.
- Ensure screws are securely installed. Otherwise, the equipment may fall due to tension after cable connection, causing equipment damage or even personnel injury.

Desktop Installation

- Ensure that the desk or workbench is stable and well grounded.
- Do not put sundries on the equipment.
- Do not place cups filled with liquid on or next to the equipment. Otherwise, liquid may flow into the equipment and pose safety risks. If any sundries or liquid enters the equipment, immediately stop the equipment, cut off the power supply, remove all cables connected to the equipment, and contact after-sales personnel.

Cabinet Installation

- Before installing the equipment in a cabinet, ensure the cabinet is securely fastened to prevent incline or fall due to unbalanced center of gravity. Otherwise, it may cause personnel injury and equipment damage.
- Leave proper gaps around the equipment.
- For an enclosed cabinet, ensure adequate ventilation of the cabinet.

1.2.2 Outdoor Installation

- Installation, operation, and maintenance of outdoor equipment and cables are strictly forbidden in lightning, rainy, snowy, windy (wind force > 6) and other adverse weather conditions.
- The IP class of enclosure of outdoor equipment must be IP54 or higher.

Installation at Heights

- Work performed 2 m above the ground is regarded as work at heights.
- Stop work at heights if any of the following conditions occurs: adverse weather conditions such as lightning, rain, snow, wind (wind force > 6), steel tube still wet, and other conditions inducing dangers. If any of the preceding conditions occurs, work can resume only after a Huawei safety director and related technical personnel check all the equipment.



Warning

- Work at heights must comply with related local regulations.
 - Only skilled person and instructed person are allowed to work at heights.
 - Before working at heights, carefully check climbing tools and safety tools, such as the safety helmet, safety belt, ladder, springboard, scaffolding and hoisting equipment. If any tool does not meet the requirements, improve it immediately or reject the work at heights.
 - Take proper safety PPE (personal protective equipment), wear a safety helmet, a safety belt or waist rope, and secure the belt or rope to a robust structure. Do not tie it to an unstable object or metal with sharp edges. Prevent the fastener from detaching and causing a falling accident.
 - Make apparent signs at the site of work at heights to indicate a dangerous restricted area that denies access of irrelevant personnel.
 - Take care of the machinery and tools to avoid dropping them and injuring others.
 - Operators at heights cannot throw objects from heights to the ground, or from the ground to heights. Objects must be delivered by a strong rope, basket, elevated vehicle, or crane.
 - Avoid parallel work at heights and on the ground. If such work mode cannot be avoided, a special protective shed or other protective measures must be built in between the heights and ground, and tools and property are not allowed to be piled up at heights.
 - Guardrails and signs should be arranged for eaves and holes to prevent slips at work area at heights.
 - Do not pile up scaffolding, springboard, and other debris on the ground under the work area at heights. Personnel at the ground cannot linger on or pass through beneath the work area at heights.
 - The scaffolding, springboard, and workbench for work at heights must pass safety checks so that they are solid and secure and the scaffolding is not overloaded.
 - After the work, disassemble the scaffolding layer by layer from top to bottom. Do not disassemble top and bottom layers at the same time. When disassembling a part, prevent collapse of other parts.
 - The ladder used in work at heights must be intact and skid resistant to ensure safe climbing. The recommended angle between the ladder and the ground is 75 °. When using a step ladder, the rope must be strong and the ladder must be held.
 - Playing is forbidden during work at heights, and sleeping is forbidden in the work area at heights.
 - If finding any operator at heights violates the work regulations, the site manager or safety supervisor should promptly points out the problem and asks for correction. If the problem persists, the personnel can be suspended and the suspension is regarded as absenteeism.
 - Operators are responsible for the accidents resulted from violation of safety regulations or rejection of dissuasion. Supervision personnel should bear certain responsibility.
-

1.3 Electrical Safety

Grounding

- Before grounding, ensure the protection ground is reliably grounded in accordance with local building distribution specifications.
- For the equipment requiring grounding, connect the protective earthing cable essential before equipment installation, and disconnect the protective earthing cable after the equipment is removed.
- For the equipment using a socket with earthing terminal, ensure the earthing terminal is connected to the protective earthing essential.

AC/DC Operation Requirements



- The supply voltage of the power system is hazardous, and direct contact or indirect contact through damp stuff with the voltage may cause electric shocks.
 - Irregular and incorrect operations may cause accidents, such as a fire and electric shocks.
-
- If the power input of the equipment is permanent, a disconnected device which person can touch easy must be installed before the equipment.
 - For AC supplied model: The device applies to TN, TT power systems.
 - Before equipment electrical connection, disconnect the related external-equipment breaker.
 - Before connecting the load (electrical equipment) or battery cable, verify that the input voltage is within the rated voltage range of the equipment.
 - Before connecting the load (electrical equipment) or battery cable, verify the cable and terminal polarity to avoid reverse connection.
 - Before power-on, verify that equipment electrical connections are correct.
 - If the device has more than one power input, disconnect all power inputs to power off this device.

Cabling Requirements

- If the power cable is prepared at the site, only the insulation layer at the wiring part can be cut. Otherwise, it may cause short circuit and accidents such as body injury and a fire.
- Insulation layer aging or damage may occur when the cable is used in a high-temperature environment. Leave enough distances between the cable and power busbar, current shunt, fuse, heat sink and other heating devices.
- The signal cable and the strong current cable or high-voltage cable must be bound separately.
- Cables provided by the customer must comply with local cable regulations.
- Do not route any cable through the air exhaust vent in the cabinet.
- If cables are stored in an ambient temperature below 0 °C, move the cables to a room temperature environment and store the cables for more than 24 hours before installation

TNV Circuit

- To avoid electric shocks, do not connect the safety extra-low voltage (SELV) circuit to the telecommunication network voltage (TNV) circuit.
- Do not plug or remove the cable connected to the outdoor signal port in lightning weather.

ESD Requirements

- To avoid component damage caused by electrostatic on human body, wear ESD gloves or an ESD wrist strap and properly ground the other end of the ESD wrist strap before touching a circuit board.
- Hold the board edge where no components are installed, and do not touch chips with hands.
- Put removed boards in ESD packing for storage or transportation.

1.4 Battery Safety

Before battery installation, operation and maintenance, read the instructions provided by the manufacturer. Safety information in this document only provides important reminders. For detailed safety information, see the instructions provided by the battery manufacturer.

Basic Requirements

- Do not expose batteries in a high-temperature environment or around heat sources, such as the sunlight, heater, microwave oven, oven and water heater. Overheating batteries may cause explosion.
- Do not disassemble or refit batteries, do not insert foreign objects into batteries, and do not submerge batteries into water or other liquid. Otherwise, battery spill, overheating, fire or explosion may occur.
- Before battery installation and maintenance, wear goggles, rubber gloves, and protective clothing to avoid injury caused by electrolyte spill. In case of battery spill, prevent your skin and eyes from touching spilled liquid. Otherwise, immediately wash your skin or eyes with water and go to the hospital for medical treatment.
- Transport batteries according to the required direction, and do not tilt batteries or put them upside down.
- Disconnect the battery loop in battery installation and maintenance.
- Use batteries of the same or equivalent type to replace the faulty ones. Incorrect battery replacement may cause battery explosion.
- Do not connect metallic conductors to battery poles or contact battery endpoints. Otherwise, battery short circuit or overheating may occur, causing body injury.
- Follow local regulations to dispose batteries. Do not dispose batteries as domestic waste. Incorrect battery disposal may cause battery explosion.
- Do not drop, squeeze or puncture batteries. Prevent batteries from strong external pressure to avoid internal short circuit and overheating.
- Do not use damaged batteries.
- Do not allow children or pets to bite or swallow batteries. Otherwise, it will cause injury or battery explosion.

1.4.1 Safety Requirements for Rechargeable Batteries

- If the equipment uses rechargeable batteries, pay attention to the following safety precautions:
 - If any exception, such as battery discoloration, deformation, and overheating, occurs during battery use, charge or storage, immediately stop using these batteries and replace them with new ones.
 - Tighten battery cables or copper bars using the torque specified in the battery document. Otherwise, insecure connection of battery bolts will cause excessive connection voltage drop, or even burn up batteries due to excessive heat generated by overcurrent.
-



- Before installing batteries, carefully read safety precautions and master correct battery connection.
-

Battery Short Circuit Protection



Battery short circuit will produce strong instantaneous current and release a large amount of energy that may cause body injury and property loss.

If possible, disconnect connection of running batteries before other operations.

Flammable Gas Protection



- Do not use unsealed lead-acid batteries.
 - Lead-acid batteries should be placed and fixed horizontally to ensure the normal discharge of hydrogen and avoid burning or equipment corrosion.
-

Lead-acid batteries working in abnormal status will release flammable gas. Place the batteries at a ventilated and fire preventive place.

Battery Spill Protection



Battery overtemperature will lead to battery deformation, damage, and electrolyte spill.

- If battery temperature exceeds 60 °C, check whether electrolyte spills out. If any electrolyte spills out, promptly handle it.



Warning

If any electrolyte spills out, promptly use other liquid to absorb and neutralize it. When removing or moving the battery with spilled electrolyte, be careful with the electrolyte that can bring potential injury.

- When removing or moving the battery with spilled electrolyte, be careful with the electrolyte that can bring potential injury. If any electrolyte spills, use NaHCO_3 or Na_2CO_3 to neutralize and absorb it.

Battery Discharge Loss Protection

- After batteries are installed, ensure the battery fuse or battery breaker is disconnected before the power system works. This avoids battery damage caused by power discharge loss in case of long-term power-off.

1.4.2 Safety Requirements for Non-Rechargeable Batteries

- If the equipment uses dry batteries or non-rechargeable lithium batteries, pay attention to the following:
- If any exception, such as battery discoloration, deformation, and overheating, occurs during battery use or storage, immediately stop using these batteries and replace them with new ones.
- If this equipment uses non-removable, built-in batteries, do not replace the batteries on your own, so as not to damage the batteries or the equipment. Batteries can only be replaced by an authorized service center.
- Do not throw batteries into fire, or it will cause fire and explosion

1.5 Radiation Safety

1.5.1 Electromagnetic Field Exposure

This section describes safety precautions related to electromagnetic field exposure.



Warning

Strong electromagnetic signals harm human health.

- If the equipment is a radio transmitter or product supporting radio transmission, exposure of radio electromagnetic field (electromagnetic radiation) should be considered.
- For the high-voltage equipment or facility, exposure of power frequency electromagnetic field should be considered.
- When professional equipment or facility (such as wireless base station transceiver) is deployed, the user (such as radio service carrier) must comply with local laws and regulations.
- Before the equipment structure or antenna is modified, re-evaluation of electromagnetic field exposure should be considered.
- Before the radio frequency (RF) output specifications or parameters are modified, re-evaluation of electromagnetic field exposure should be considered.

- Before the site environment of professional equipment or facility is changed, re-evaluation of electromagnetic field exposure should be considered.

Restricted Area of Electromagnetic Field Exposure

An area with excessive electromagnetic field exposure (restricted area) is a hazardous area at a certain distance from the equipment or facility as required by exposure control limits of related regulations, so as to control public or operator exposure to electromagnetic field. Take proper measures to ensure the safe distance from electromagnetic field exposure, including but not limited to:

- Plan the professional equipment or facility site in an inaccessible area to the public, and do not publicize the location.
- Allow only authorized and instructed person to access the professional equipment or facility site.
- Before entering the area with excessive electromagnetic field exposure, professional personnel should know the location of the restricted area and shut down the transmitter.
- Set clear signs at the site to remind professional personnel that the current location is in or may be in the area with excessive electromagnetic field exposure.
- After site installation, conduct regular monitoring and checks.
- Set effective physical shields and apparent warning signs in all areas with excessive electromagnetic field exposure.
- Install an isolating device outside the equipment structure.
- Comply with local regulations in operations.

Installation and Use of a Wireless Base Station Transceiver

A base transceiver station (BTS) is properly designed so that its RF electromagnetic radiation is under the related standard limits of RF radiation hazard. Therefore, a normal working BTS does no harm to the public and working personnel. However, a BTS with defective antenna cables or other defects may result in excessive RF electromagnetic radiation.

Professional personnel should abide by the following rules in BTS installation and operation:

- Before installing and operating a BTS and its antenna, read safety recommendations and comply with local regulations.
- Before installing or maintaining an antenna close to the tower or mast with a BTS and its antenna, contact related personnel to shut down the antenna transmitter.
- If necessary, working personnel at the site should carry radiation monitoring and alarm instrument.

To ensure safety of public electromagnetic field exposure, abide by the following guiding principles in BTS antenna site installation:

- In rooftop installation, install antennas at a height over the height of personnel who may work or live on the rooftop.
- In rooftop installation, install transmit antennas far away from most visited areas, such as the rooftop access point, telephony service point, and HVAC equipment.
- In rooftop installation, install directional antennas peripherally and do not make them face towards buildings.
- Properly choose from large antennas (better signal coverage) and small antennas (less visual impact).
- Install antennas at a far site, although it may be mutually exclusive to local area requirements.

- When constructing a common installation site, pay special attention to antennas from different manufacturers, especially high-power broadcasting (FM/TV) antennas. Antennas are generally installed in one common site locally, which may increase safety risks.
- Take special preventive measures at antenna sites next to hospitals or schools.

Use of Other Wireless Equipment

- If any related equipment manual specifies the safe distance of electromagnetic field exposure, this distance requirement should be applied.
- No application distance is specified for the equipment with low RF transmit power that meets electromagnetic field exposure requirements.
- No application distance is specified for the equipment with special design that meets electromagnetic field exposure requirements in close use.

Use of High-voltage Equipment or Facility

- Only the power frequency electromagnetic field generated by high-voltage (for example, over 100 kV) equipment or facility are harmful to human. Therefore, the electromagnetic field needs to be evaluated according to related requirements.

1.5.2 Laser Radiation

This section describes laser safety precautions.



Do not get close to optical fibers without eye protection or look directly into optical fiber terminals.

-
- A laser transceiver is used in optical transmission system and related test tools. Unterminated optical fibers or connectors will emit invisible laser with very high power density. Viewing the laser output will pose an eye hazard.
 - Viewing bare optical fiber terminals or damaged optical fibers at a distance over 150 mm generally do not pose an eye hazard. Viewing optical fiber terminals with certain optical instruments, such as microscopes, magnifiers, and eye loupes, may pose an eye hazard.
 - Abide by the following operation requirements to avoid laser radiation hazards:
 - Only trained and authorized personnel are allowed to operate laser.
 - Wear goggles in laser or optical fiber operation.
 - Disconnect the light source before disconnecting optical fiber connectors.
 - After disconnecting optical fiber connectors, use optical fiber caps to protect all the connectors.
 - Do not look into unterminated optical fibers or connector terminals until the light source is disconnected. Immediately install dust-proof caps onto optical fiber connectors.
 - Ensure optical fibers and light source are disconnected before fiber cutting or splicing.
 - Use an optical power meter to measure optical power and verify that the light source is disconnected.
 - Avoid laser radiation before opening the front door of the optical transmission system.
 - Do not view optical fiber terminals or connectors with microscopes, magnifiers, or eye loupes.

1.6 Mechanical Safety

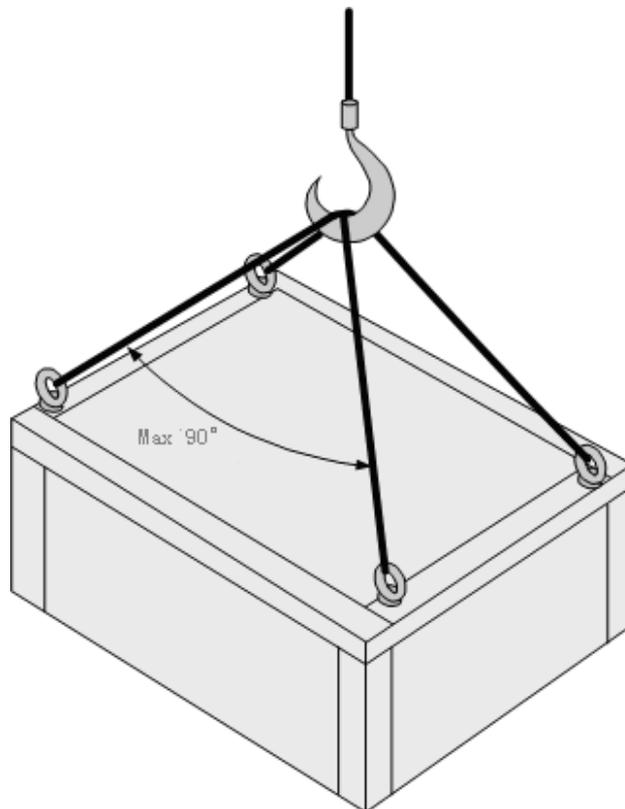
Hoisting Safety



Do not walk under the crane arm or hoisted objects when heavy objects are being hoisted.

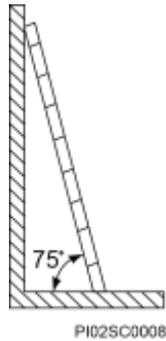
- Hoisting operators must be trained and qualified before starting to work.
- Hoisting tools must be checked to ensure tool completeness.
- Before hoisting, ensure that hoisting tools are securely fastened to fixed load-bearing objects or wall.
- During hoisting, ensure angles between lifting slings are not larger than 90° , as shown in Figure 1-2.

Figure 1-2 Hoisting heavy objects



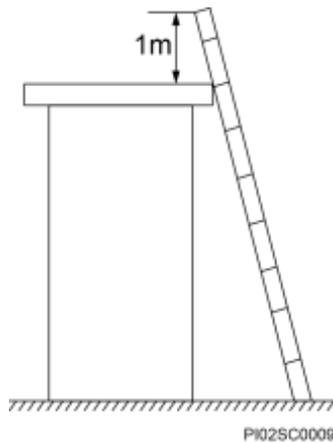
Ladder Use Safety

- Before using a ladder, check whether the ladder is intact and confirm its load bearing capacity. Do not use it with overload.
- The recommended angle between the ladder and the ground is 75° . You can use a right angle to measure the angle, as shown in Figure 1-3. Place the wider ladder legs at the bottom or take protective measures at the bottom to avoid skid. Place the ladder on a stable surface.

Figure 1-3 Ladder tilt angle

- Pay attention to the following points when climbing a ladder:
 - Prevent your center of gravity from deviating from the ladder edge.
 - Keep your body stable before climbing to ensure safety.
 - Do not climb over the fourth beam from the ladder top.

To climb up to a rooftop, the vertical height of the ladder above the rooftop must be more than 1 m, as shown in Figure 1-4.

Figure 1-4 1 m vertical height of the ladder above the rooftop

Drilling Safety

Pay attention to the following safety precautions when drilling holes on the wall or ground.



Caution

Do not drill holes on cabinets. Incorrectly drilled holes will damage cabinet electromagnetic shielding performance and internal cables. Metal scraps generated in drilling will cause short circuit on circuit boards in a cabinet.

- Wear goggles and protective gloves in drilling.
- Cover equipment before drilling to prevent metal scraps from entering equipment interior. Timely clear and eliminate metal scraps after drilling.

Heavy Object Transport Safety

- Prepare for load bearing in heavy object transport to avoid injury or sprain. When transporting a cabinet, keep your back straight and move steadily to avoid sprain.
- When transporting equipment with hands, wear protective gloves to avoid cut by edges.
- When moving or lifting a shelf, hold shelf handles or bottom edge, instead of handles of installed models in the cabinet, such as power modules, fan modules and boards.

1.7 Maintenance Safety

- Before replacing accessories or parts, wear an ESD wrist strap, and ensure the other end of the ESD wrist strap is grounded and the other end is properly contacted with skin.
- When replacing parts, take care of parts, bolts, and tools to prevent them from dropping into fans can damaging fans or equipment.
- When replacing shelves or parts in the cabinet, carefully pull the shelves or parts out from the cabinet to prevent unstable or heavy devices on the cabinet from causing injury or strain.

Replaceable Fuse



Use fuses of the same type and same rating to replace old ones.

Before replacing the fuse on the panel, disconnect the equipment power supply. Otherwise, an energy hazard or electric shock may occur, causing body injury.

- Replaceable fuses are installed on the panel next to the AC/DC power input port or output port.
- Reference the specifications of backup fuses or fuses on the panel to select the fuse type for replacement. Using different fuses of different specifications may cause equipment damage, body injury, and financial loss.

Fuse Welding

- If the fuse rated value is silkscreened on the board, Huawei authorized personnel replace fuses according to the silkscreened specifications.
- If the fuse rated value is not silkscreened on the board, do not maintain board fuses at site. Return them for depot repair. To replace fuses, Huawei authorized personnel replace the fuses according to the supplier model and rated value in the bill of materials (BOM).

Power Distribution Box and Board Replacement

- Before replacing a power distribution box, wear insulation gloves and ensure the external-equipment breaker is disconnected.
- When replacing a board, do not touch components on the board to avoid damage.
- Install filler panels in all vacant slots.

Fan Replacement

- Pull out a part of the fan module using handles, wait until the fan completely stops rotating, and slightly remove the fan module from the subrack. Prevent fan blades from hurting fingers.

Battery Replacement

- For details, see section 1.4 "Battery Safety."

1.8 Safety Sign Description

Laser Danger Class

Laser danger class sign: Class 1



Laser danger class sign: Class 1M



- When you see any of the preceding signs, do not get close to optical fibers without eye protection or look directly into optical fiber terminals.
- For other precautions, see the laser part in the laser radiation section.

Equipment Weight



The replaceable/pluggable part or equipment is over 18 kg and requires two people to transport it.



The replaceable/pluggable part or equipment is over 32 kg and requires three people to transport it.



The part or equipment is over 55 kg and requires a pallet truck or four people to transport it.

Dust Filter Periodic Clean



When you see this sign, periodically clean and replace dust filters.

Interlocking Kit Warning



After an outdoor equipment door is opened, use a metal pole to fasten the door to prevent accidents after unexpected closing. Lift the pole to close the door.

- When you see this sign, lift the pole before closing the door

High-voltage Cover Removal Danger



- When you see this sign, read all information in the safety manual and understand all precautions in the manual before operation.