

APAA00001

User Manual

Issue

Draft A

Date

2015-06-12

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About This Document

Overview

This document describes APAA00001, typical usage, software installation and operation, and method for using, operating, and maintaining APAA00001.

Intended Audience

This document is intended for:

- Technical support engineers
- Maintenance engineers

Documentation Obtaining

The electronic version of this document can be obtained from <http://support.huawei.com>.

Change History

Changes between document issues are cumulative. The latest document issue contains all the changes in earlier issues.

Document Issue

Draft A (2015-06-12)

This is draft A.

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1 Introduction to PAA

1.1 Overview

The portable AISG adapter (PAA) is an adapter that enables users to control antenna line devices (ALDs) using the PAA app. With a rechargeable battery inside, the PAA has a small size and can be carried easily, facilitating onsite ALD installation, commissioning, and maintenance.

APAA00001, the current PAA model, can provide working current to ALDs and implement conversions between bluetooth signals and RS485/OOK signals so that ALDs can be controlled by using an app.

APAA00001 can be used to control all types of Huawei ALDs. If the PAA is to be used with the ALDs supplied by peer vendors, you are advised to perform joint commissioning to confirm their compatibility with each other.

1.2 Product Specifications

Table 1-1 provides the product specifications of APAA00001.

Table 1-1 Product specifications of APAA00001

Electrical Specifications			
Operating Power Supply	Input: 12 V DC 2.0 A (AC/DC adapter) Output: 12 V DC 1.0 A (AC/DC adapter) or 15 V DC 1.0 A (rechargeable battery)		
Rechargeable Battery	Lithium battery: 14.8 V (≥ 2000 mAh) Maximum number of battery charging/discharging times: > 300		
AISG Connector	Female AISG connector equipped with eight pins compliant with the IEC 60130-9 and AISG standards	Pin 1 and pin 6	DC (+12 V) (AC/DC adapter)
			DC (+15 V) (rechargeable battery)
		Pin 3	RS485 B

Electrical Specifications			
		Pin 5	RS485 A
		Pin 7	DC return
Environmental Specifications			
Operating Temperature	-20 °C to +55 °C		
Storage temperature	0 °C to +45 °C		
Recharge temperature	0 °C to 40 °C		
Humidity	5% to 95%		
Service Life	Three years		
Mechanical Specifications			
Weight	0.52 kg (including the weight of a rechargeable battery)		
Dimensions (H x W x D)	204 mm x 88 mm x 30 mm		
Material	PC+ABS (30%)		

1.3 Appearance Description

1.3.1 Appearance

Figure 1-1 shows the appearance and dimensions of APAA00001.

Figure 1-1 Appearance and dimensions of APAA00001

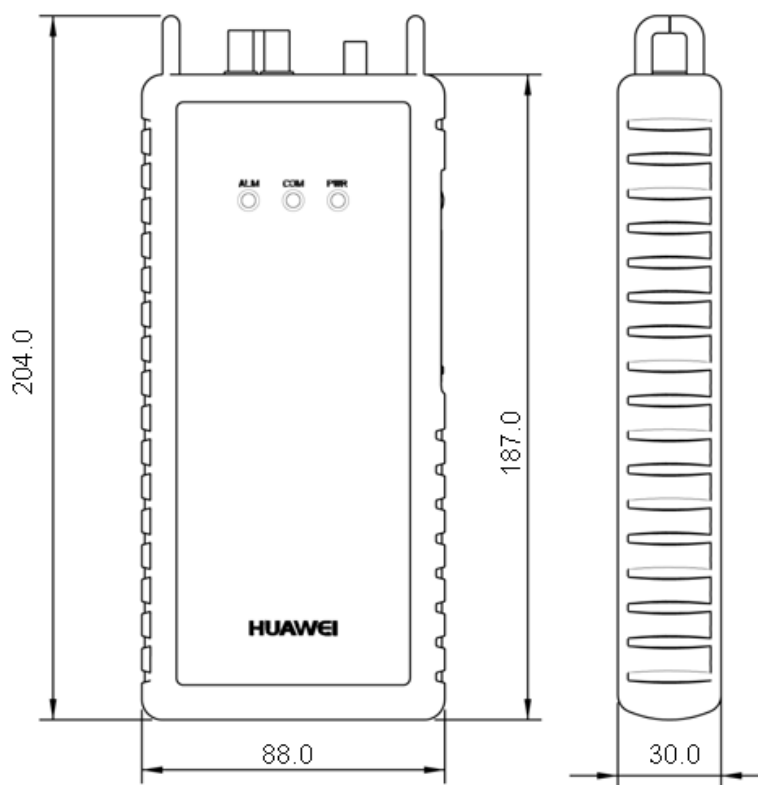


Figure 1-2 APAA00001 appearance



(1) AISG connection port

(2) Strap hole

(3) OOK connection port

- (4) Power supply indicator (5) Communication indicator (6) Alarm indicator
(7) Power button (8) Mini USB port (9) 12 V DC adapter port

Table 1-2 Ports on APAA00001

No.	Port	Description
1	AISG connection port	Connects the PAA to an ALD using an AISG cable.
2	Strap hole	Used to fasten straps so that the PAA can be carried easily.
3	OOK connection port	Connects the PAA to an ALD using an RF cable.
4, 5, and 6	Indicators	Indicate the power supply, communication, and alarm status of the PAA. For details, see Table 1-3
7	Power button	Used to power on or off the PAA. The PAA can be powered on or off by holding down this button.
8	Mini USB port	Reserved for further development and is not used temporarily.
9	12 V DC adapter port	Connects to the AC/DC adapter. When an AC/DC adapter is connected, the PAA automatically uses the input power supply as the operating power supply to charge the integrated battery.

Table 1-3 Indicators

No.	Indicator and Silkscreen	Description
4	Power indicator (PWR)	Indicates the power supply state. The indicator has four working status: <ul style="list-style-type: none"> Steady green: The PAA has sufficient battery power. Steady yellow: The PAA has moderate battery power. Steady red: The PAA has low battery power. Blinking at the frequency of 1 Hz: The battery inside the PAA is being recharged.
5	Communication indicator (COM)	The indicator blinks when the mobile app has been successfully connected to the PAA and communication is proper.
6	Alarm indicator (ALM)	The indicator is steady red when the PAA generates an alarm.

1.3.2 Accessory List

Table 1-4 lists the accessories of APAA00001.

Table 1-4 Accessories of APAA00001

No.	Accessory	Quantity
1	12 V DC adapter	1 PCS
2	AC power cable	1 PCS
3	AISG 1-to-2 cable	1 PCS
4	N(M)-DIN(M) adapter	1 PCS
5	N(M)-DIN(F) adapter	1 PCS
6	RF cable	1 PCS
7	Strap	1 PCS
8	User manual	1 PCS

12 V DC Adapter

The adapter parameters are as follows:

- Input: 100 V AC to 240 V AC, 0.8 A, 50 Hz to 60 Hz
- Output: 12 V DC, 2.0 A AC/DC

Figure 1-3 shows the 12 V DC adapter.

Figure 1-3 12 V DC adapter



AISG 1-to-2 Cable

The cable specifications are as follows:

- Connectors: Each AISG 1-to-2 cable has three 8-core connectors that comply with the IEC 60130-9 standard: one female connector and two male connectors.

- Cable: complies with the UL2464 standard.

Figure 1-4 AISG 1-to-2 cable



N(M)-DIN(M) Adapter

Figure 1-5 N(M)-DIN(M) adapter



N(M)-DIN(F) Adapter

Figure 1-6 N(M)-DIN(F) adapter



RF Cable

Figure 1-7 RF cable



AC Power Cable

China standard Power is as shown in figure 1-8, According to the different delivery area, the cable will be different.

Figure 1-8 AC power cable



Strap

Figure 1-9 Strap



2 App Installation Guidelines

Before you use the PAA to control an ALD, the PAA mobile app must be installed on your smartphone. The app can be downloaded by scanning the QR code or from the website.

Currently, PAA is available only on Android smartphones.

PAA has the following requirements for smartphones:

- Android 4.0 or later
- 1.5 GHz CPU or higher
- 1 GB flash memory or higher

2.1 App Download by Scanning the QR Code

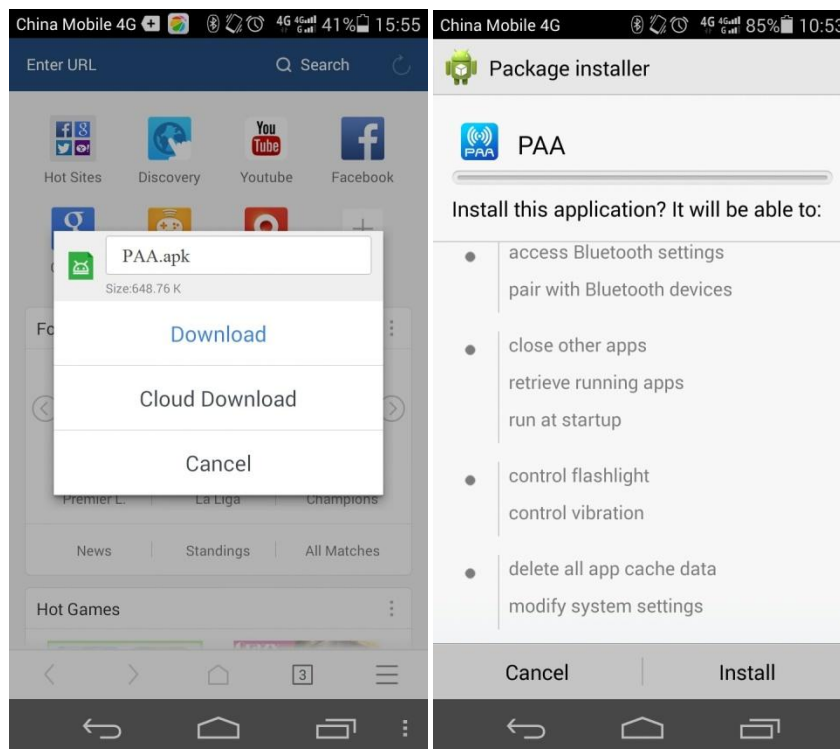
Procedure

- Step 1** Scan the QR code on the back of the PAA using the QR code scanning function of your smartphone, and then download the PAA app after the scanning is successful. (Some browsers may have use restrictions can not download, can replace try different browsers).

Figure 2-1 QR code of the PAA app



Figure 2-2 PAA app installation



Step 2 Click **Open**. On the displayed **Please Connect to Bluetooth** dialog box, click **OK** to enter the GUI for selecting bluetooth devices, and click the bluetooth device name of the PAA to connect the PAA. The bluetooth device name of the PAA consists of **PAA** and the last eight characters of the bar code labeled on the back of the PAA, and the bluetooth password is **1234**. Communication between the smartphone and the PAA through bluetooth can be checked based on the connection state between them.

- After the connection is successful, the app notifies the user that the PAA has been connected, and the main PAA GUI is displayed. In this situation, the communication indicator on the PAA blinks.
- If the connection fails, a notification indicating the failure is displayed at the lower part of the bluetooth GUI, and the bluetooth selection GUI of the app is still displayed.

2.2 App Download from the Website

Visit the following URL using the web browser of your smartphone and download the PAA app:

<http://w3m-beta.huawei.com/m/Service/ClientDownloadServlet?osType=3&appId=258&flag=0>

The installation method is the same as that used when the QR code is scanned.

3 Networking Guideline

3.1 Before Network Deployment

Before using the PAA, ensure that the following preparations have been made:

- The AISG cable or RF cable has been connected to the ALD.
- The PAA app has been installed properly.
- The battery inside the PAA is fully charged. If no, recharge the PAA or connect the PAA to the power adapter.

The mode in which the PAA controls an ALD depends on the ALD capability.

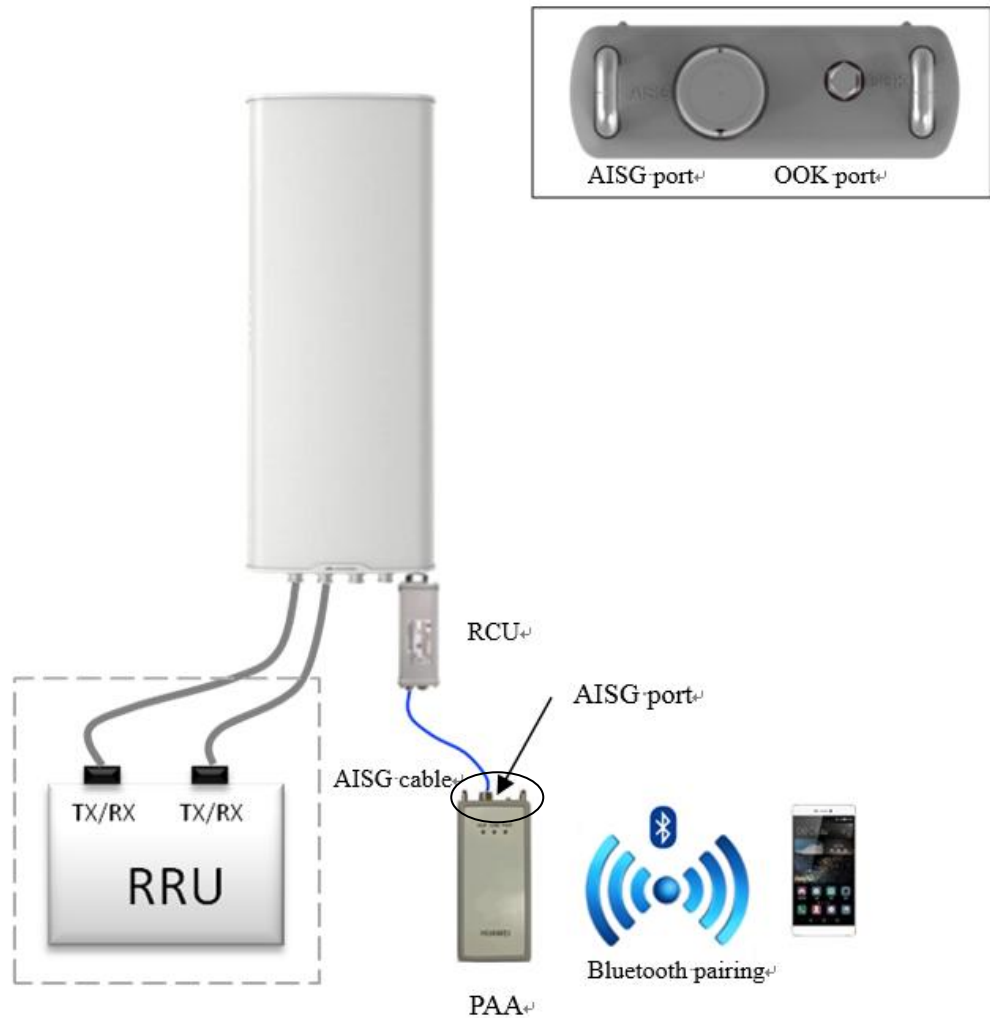
- If the ALD supports only the RS485 control mode, the PAA controls the ALD over the AISG port. For details, see section 3.2.1 "ALD Control over the AISG Port."
- If the ALD supports only the OOK control mode, the PAA controls the ALD over the OOK port. For details, see section 3.2.2 "ALD Control over the OOK Port."
- If the ALD supports both OOK and RS485 control modes, the PAA selects the control mode based on actual situations.

3.2 Typical Scenarios

3.2.1 ALD Control over the AISG Port

The AISG output port on the PAA is connected to the AISG input port on the ALD using an AISG cable, as shown in Figure 3-1.

Figure 3-1 ALD control over the AISG port (when an external RCU is used)



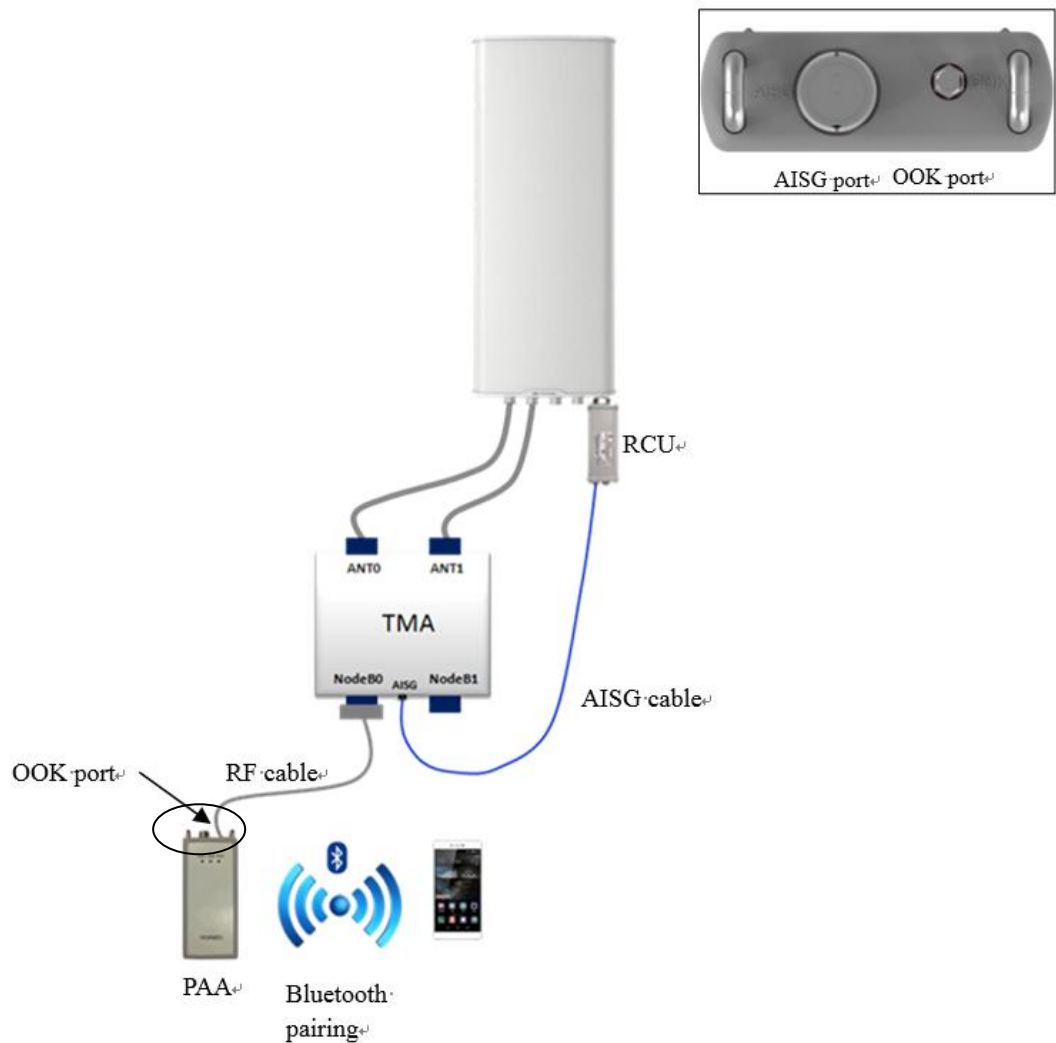
NOTE

- The total length of the AISG cable cannot exceed 50 m.
- Connectors and cables can be used for transfer during cable connection.
- The external power supply switch of the PAA must be turned on when the ALD is connected. Figure 3-4 shows the external power supply switch of the PAA.

3.2.2 ALD Control over the OOK Port

The OOK port on the PAA is connected to the RF port on the ALD, as shown in Figure 3-2.

Figure 3-2 ALD control over the OOK port



 **NOTE**

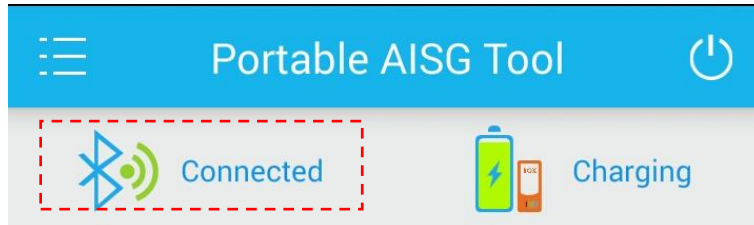
- The total length of the RF cable cannot exceed 50 m.
- Connectors and cables can be used for transfer during cable connection.
- The external power supply switch of the PAA must be turned on when the ALD is connected. Figure 3-4 shows the external power supply switch of the PAA.

3.3 Procedure

- Step 1** Select the networking drawing for cable connection based on the ALD capability.
- Step 2** Power on the PAA. When the power indicator is steady on, the PAA is powered on properly. If the PAA cannot be powered on, recharge the PAA by using the AC/DC adapter of the PAA. When the PAA is being recharged, the power indicator blinks.
- Step 3** Open the PAA app on the smartphone and then perform bluetooth pairing based on the displayed messages. The bluetooth device name of the PAA consists of **PAA** and the last eight characters of the bar code labeled on the back of the PAA. The bluetooth password is

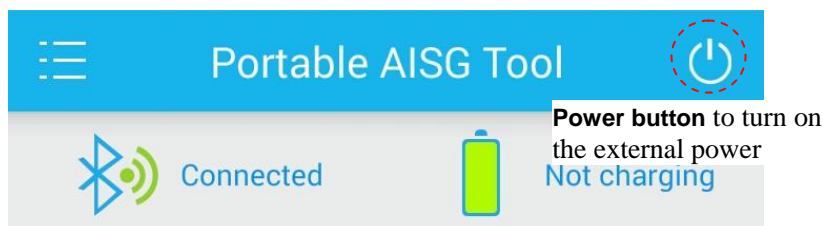
1234. After bluetooth pairing is successful, the communication indicator on the PAA blinks, and the PAA app indicates that the PAA has been connected successfully, as shown in Figure 3-3.

Figure 3-3 PAA successfully connected



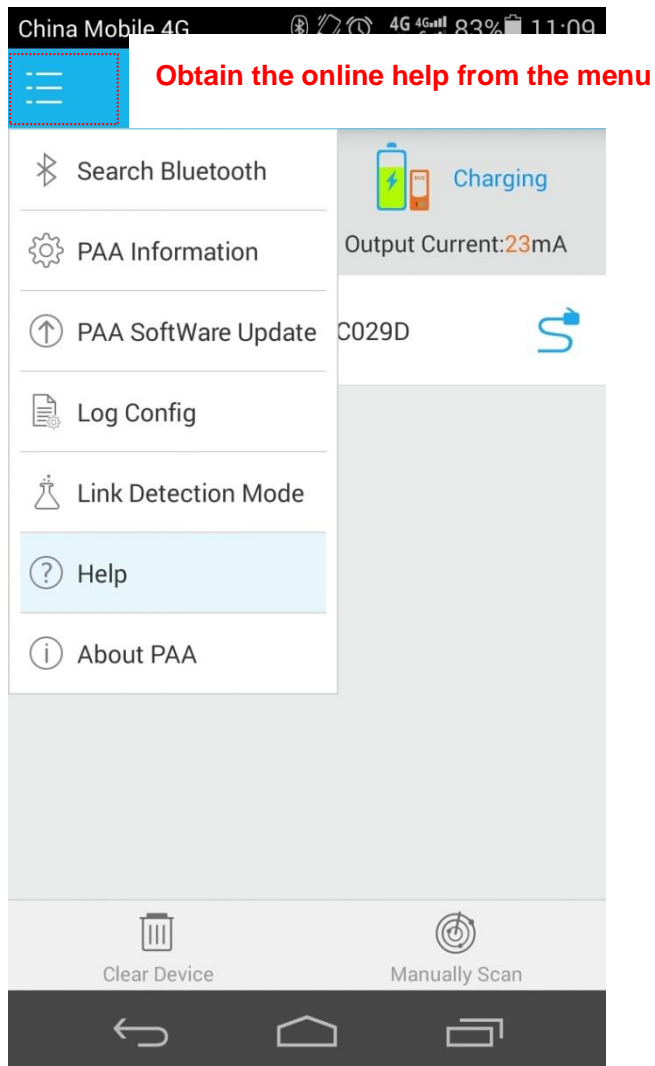
Step 4 Tap the power switch on the app to turn on the external power supply switch of the PAA, as shown in Figure 3-4. If the power switch on the app turns white, the external power supply switch of the PAA has been turned on. If the power switch on the app turns gray, the external power supply switch of the PAA has been turned off.

Figure 3-4 Turning on the external power supply switch of the PAA



In actual application, the PAA app GUI may slightly vary with app versions. For details, see the online help of the app.

Figure 3-5 Opening the online help of the PAA app



4 System Maintenance

4.1 Routine Maintenance

During the use and maintenance of the PAA, its battery and shell must be protected.

4.1.1 Battery

The rechargeable battery inside the PAA is a lithium battery. Inappropriate use of the battery may compromise its life cycle or even lead to safety risks.

- The battery cannot be overly recharged or discharged. Otherwise, its life cycle is compromised.
- The PAA must be recharged and discharged at least once every one or two months if it is not used for a long time.
- The dedicated AC/DC adapter of the PAA must be saved properly. Do not use other models of AC/DC adapters to recharge the PAA.
- If the PAA is used without any external power supply, ensure that the PAA is fully recharged.
- The PAA must not be used or placed near high-temperature sources, such as fire or heaters. Otherwise, the battery may be overheated, disconnected, or even fail, thereby compromising the battery life.
- The PAA cannot be used in places with strong electrostatic and magnetic fields. Otherwise, the battery safety protection unit may be damaged, causing safety issues.
- If the battery becomes smelly, overheated, discolored, or deformed, or any other exception occurs during its use, storage, and recharging, remove the battery from the PAA immediately and stop using the battery.



NOTE

Unused batteries must be properly disposed. The electrical polarity can be wrapped up using insulation material to prevent fire.

- The battery may fail if either of the following conditions are met:
 - The battery is fully recharged within 1 hour after the recharging starts.
 - An alarm indicating low battery power is displayed within 0.5 hour after the battery is used.

In this case, contact Huawei technical support to replace the battery.

- The rechargeable battery inside the PAA is provided by the battery supplier specified by Huawei. If the battery needs to be replaced, contact Huawei technical support.

4.1.2 PAA Shell

The PAA shell is made of PC+ABS materials, and is vulnerable to scratches or breakage.

- The battery must be kept away from violent collision when it is transported, carried, and stored.
- The PAA must not be used outdoors during a thunderstorm.
- If the PAA is to be used at a high position, it is recommended that the PAA be fastened using a strap or protected with a bag to minimize the possibility that the PAA falls to the ground.
- After the PAA is used, the USB and AISG connection ports need to be protected using dedicated protective caps so that foreign matters cannot enter the PAA.

4.1.3 Silicone Shell

The protective shell of the PAA is made of silicone materials and is vulnerable to scratches or breakage.

- The silicone shell cannot be in contact with keen-edge objects.
- The silicone shell must not be frequently removed or violently stretched. Otherwise, the shell may be deformed.
- It is recommended that the silicone shell be cleaned using wet cloth or a toothbrush with toothpaste or alcohol and then washed using clean water. Do not soak the silicone shell into water for a long time, violently brush the shell, or dry the shell at high temperature using a hair dryer.
- The silicone shell may easily be covered with dust, grease stain, or other foreign matters due to electrostatic attraction. Therefore, it is recommended that the PAA be placed in a paper case at a cool and dry environment if it is not used for a long time.

4.2 Alarm Handling

When the PAA app is used to control the PAA, PAA alarms can be queried using the app. For details about alarm codes, see section A.2 "Alarm Codes."

4.2.1 Hardware Fault Alarm Handling

Background

A hardware fault alarm is reported when the flash memory or I²C bus inside the PAA is faulty.

Table 4-1 describes the hardware fault alarm.

Table 4-1 Hardware fault alarm

Symptom	Impact on the System	Severity	Cause
This alarm is reported when the flash memory or I ² C bus inside the PAA is faulty. In this situation, the alarm indicator is steady on. This alarm can be queried using the PAA app.	The data storage or read functions, such as battery status query and board temperature query, may be faulty.	Major	<ul style="list-style-type: none"> The read/write function of the flash memory is faulty. The flash memory fails. The I²C bus is faulty. The I²C bus fails.

Handling Method

Restart the PAA.

- If the PAA communicates properly with the smartphone and the alarm is cleared after the restart, no further actions are required.
- If the alarm persists, the PAA has been damaged. In this case, replace the PAA with a new one or contact Huawei technical support.

----End

4.2.2 AISG/OOK Overcurrent Alarm Handling

Background

If the ALD connected to the AISG or OOK port on the PAA has overly strong current or is short-circuited, the PAA forcibly shuts down the external power supply and an AISG/OOK overcurrent alarm is reported.

Table 4-2 describes the AISG/OOK overcurrent alarm.

Table 4-2 AISG/OOK overcurrent alarm

Symptom	Impact on the System	Severity	Cause
If the ALD connected to the AISG or OOK port on the PAA has overly strong current or is short-circuited, the AISG/OOK overcurrent alarm is reported. In this situation, the PAA forcibly shuts down the external power supply and the alarm indicator is steady on. This alarm can be queried using the PAA app.	The ALD cannot be connected or controlled for software uploading, device information query, or other purposes.	Major	<ul style="list-style-type: none"> • The instantaneous current is overly strong during hot swapping. • The number of ALDs connected to the PAA is too large, or the operating current of the ALD is excessively strong. • The ALD is short circuited. • The ALD experiences a hardware fault. • The PAA is faulty.

Procedure

- Step 1** Tap the external power supply switch on the PAA app to turn on the external power supply from the PAA again.
- No further actions are required if the external power supply is successfully turned on, the PAA communicates successfully with the ALD, and the alarm is cleared.
 - After the power supply switch is turned on, the PAA forcibly shuts down the external power supply. If the alarm still persists, go to Step 2
- Step 2** Check whether the communication link or each PAA is short-circuited.
- If a short circuit occurs, rectify the fault and then turn on the external power supply from the PAA again. If the alarm is cleared, no further actions are required. If the alarm persists, go to Step 3.
 - If no short circuit occurs, go to Step 3
- Step 3** Check whether the total working current of all the ALDs connected to the PAA exceeds 1 A.
- If the total current is not greater than 1 A, go to Step 4.
 - If the total current is greater than 1 A, decrease the number of ALDs so that the total current is equal to or less than 1 A, and then turn on the external power supply from the PAA. If the alarm is cleared, no further actions are required. If the alarm persists, go to Step 4.
- Step 4** Replace the faulty ALD and then turn on the external power supply from the PAA again.
- If the alarm is cleared, no further actions are required.
 - If the alarm persists, replace the PAA. If the alarm is cleared after the replacement, no further actions are required. If the alarm persists, contact Huawei technical support.

----End

4.2.3 Battery Not in Position Alarm Handling

Background

The PAA reports a battery not in position alarm upon detecting that the battery circuit is in poor contact.

Table 4-3 describes the battery not in position alarm.

Table 4-3 Battery not in position alarm

Symptom	Impact on the System	Severity	Cause
The PAA reports a battery not in position alarm upon detecting that the battery circuit is in poor contact. In this situation, the alarm indicator is steady on. This alarm can be queried using the PAA app.	If the external power supply of the PAA is insufficient or becomes unavailable, the ALD connected to the PAA cannot be calibrated or the downtilt cannot be set. At the same time, the battery power and temperature cannot be measured and the possibility of battery self-locking increases.	Minor	The battery connector inside the PAA is loosely connected or in poor contact.

Procedure

Contact Huawei technical support so that the PAA can be disassembled or returned to Huawei for maintenance.

4.3 Troubleshooting

4.3.1 Battery Fault

- The battery may fail if any of the following conditions exists:
The battery is fully recharged within 1 hour.
 - Low battery power is notified within 0.5 hour after the battery is used.
 - The battery status displayed in the app does not change during battery recharging.
 In this case, contact Huawei technical support to replace the PAA.
- If the alarm indicator is steady on, use the PAA app to query whether a battery not in position alarm is reported. If yes, contact Huawei technical support or replace the PAA.

4.3.2 PAA Power-On/Off Failure

- Hold down the PAA power button for 10s to forcibly power off the PAA. Then, try another power-on operation. If the PAA still cannot be powered on, remove and then reinsert the power adapter. If the fault persists, contact Huawei technical support or replace the PAA.

- If the power button does not work for multiple times when the PAA is used, the button or the button spring may be faulty. In this case, contact Huawei technical support to replace the PAA.

5 FCC Statements

5.1 Warning Statement FCC § 15.21

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

5.2 Statement FCC § 15.19

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

5.3 FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Note: This equipment 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 equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

5.4 IC RSS warning

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.

IC Radiation Exposure Statement:

This equipment complies with IC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

A Appendix

A.1 Acronyms and Abbreviations

A

ABS	acrylonitrile-butadiene-styrene
AC	alternating current
AISG	Antenna Interface Standards Group
ALD	antenna line device

C

CPU	central processing unit
------------	-------------------------

D

DC	direct current
-----------	----------------

G

GB	gigabit
GHz	gigahertz
GUI	graphical user interface

I

I2C inter-integrated circuit

IEC International Electrotechnical Commission

O

OOK on-off-keying

P

PAA portable AISG adapter

PC personal computer

Q

QR quick response code

R

RCU remote control unit

RF radio frequency

U

URL uniform resource locator

USB Universal Serial Bus

A.2 Alarm Codes

The following alarm codes may be displayed on the PAA.

Alarm Code	Type	Displayed Information	Remarks
0x11	Alarm code	Hardware Error	A hardware alarm is reported.
0x30	Alarm code	AISG/OOK Over Current	An AISG/OOK overcurrent alarm is reported.
0x32	Alarm code	Battery Not In Position	A battery not in position alarm is reported.