ePico3801

V200R011C00

# User Guide

**Issue**     01

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# Huawei Technologies Co., Ltd.

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|---|---|
| Address: | Huawei Industrial Base |
| | Bantian, Longgang |
| | Shenzhen 518129 |
| | People's Republic of China |
| Website: | http://www.huawei.com |
| Email: | support@huawei.com |

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# About This Document

## Purpose

This document describes the ePico3801 in terms of its specifications, application scenarios, initial configuration, commissioning, configuration adjustments, and routine maintenance.

## Product Version

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

| Product Name | Product Version |
|---|---|
| ePico3801 | V200R011C00 |

## Intended Audience

This document is intended for:

- System engineers
- Maintenance engineers
- Network administrators

## Change History

For changes in the document, see **1 Changes in the ePico3801 User Guide**.

## Organization

**1 Changes in the ePico3801 User Guide**

This describes the changes in the *ePico3801 User Guide*.

**2 Introduction to the ePico3801**

The ePico3801 is a pico base station used as the radio access device in the uBro solution to enhance indoor coverage. Being one of a series of ePico products developed according to the FDD protocols in 3GPP R99/R4/R5/R6, the ePico3801 provides indoor users with improved radio access services. By enhancing ordinary indoor coverage, intensive coverage in office buildings, and hot-spot indoor coverage, the ePico3801 eliminates indoor dead zones and shares the load on the macro network.

## 3 ePico3801 Initial Configuration

This chapter describes how to perform initial configuration of the ePico3801 on the WebUI so that users can perform the configuration of the ePico3801 according to the access and authentication mode.

## 4 Commissioning the ePico3801

This chapter describes the commissioning and verification after the installation of the ePico3801 hardware. The commissioning ensures that the ePico3801 works properly as designed.

## 5 Reconfiguring the ePico3801

This chapter describes common reconfiguration items during the normal running of the ePico3801.

## 6 Maintaining the ePico3801

This chapter describes how to maintain the ePico3801. After the ePico3801 is put into use, you need to perform routine maintenance on the ePico3801 to ensure the proper running of the ePico3801.

# Conventions

### Symbol Conventions

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

| Symbol | Description |
|---|---|
| ⚠ DANGER | Indicates a hazard with a high level of risk, which if not avoided, will result in death or serious injury. |
| ⚠ WARNING | Indicates a hazard with a medium or low level of risk, which if not avoided, could result in minor or moderate injury. |
| ⚠ CAUTION | Indicates a potentially hazardous situation, which if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results. |
| ⚊ TIP | Indicates a tip that may help you solve a problem or save time. |
| 📖 NOTE | Provides additional information to emphasize or supplement important points of the main text. |

### General Conventions

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

| Convention | Description |
|---|---|
| Times New Roman | Normal paragraphs are in Times New Roman. |

| Convention | Description |
|---|---|
| **Boldface** | Names of files, directories, folders, and users are in **boldface**. For example, log in as user **root**. |
| *Italic* | Book titles are in *italics*. |
| `Courier New` | Examples of information displayed on the screen are in Courier New. |

**Command Conventions**

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

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

**GUI Conventions**

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

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

**Keyboard Operations**

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

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

**Mouse Operations**

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

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

# 1 Changes in the ePico3801 User Guide

This describes the changes in the *ePico3801 User Guide*.

## 01(2009-09-15)

This is the initial release.

Huawei Proprietary and Confidential

# 2 Introduction to the ePico3801

## About This Chapter

The ePico3801 is a pico base station used as the radio access device in the uBro solution to enhance indoor coverage. Being one of a series of ePico products developed according to the FDD protocols in 3GPP R99/R4/R5/R6, the ePico3801 provides indoor users with improved radio access services. By enhancing ordinary indoor coverage, intensive coverage in office buildings, and hot-spot indoor coverage, the ePico3801 eliminates indoor dead zones and shares the load on the macro network.

2.1 Position of the ePico3801 on the Network of the uBro Solution
The ePico3801 is used as the radio access device in the uBro solution.

2.2 Features of the ePico3801
The ePcio3801 is an enhanced pico base station used for indoor coverage. It uses IP access and supports HSPA. With the ePico3801, network planning and optimization are convenient, and security is high. The ePico3801 makes it possible to deploy flexible and seamless UMTS network coverage quickly.

2.3 Composition of the ePico3801
The ePico3801 consists of the ePico3801 body and the power adapter. The ePico3801 body provides the LEDs, reset button, power port, and FE port. The ePico3801 supports the AC power supply and Power over Ethernet (PoE) power supply, which require different power adapters.

2.4 Specifications of the ePico3801
The specifications of the ePico3801 involve its performance specifications, physical and electrical specifications.

2.5 Application Scenarios
The ePico3801 is widely used for indoor coverage in small and medium enterprises (SMEs), SOHOs, schools, and office buildings and for hot-spot indoor coverage at pubs, airports, stores, and hotels.

# 2.1 Position of the ePico3801 on the Network of the uBro Solution

The ePico3801 is used as the radio access device in the uBro solution.

The uBro solution adds the ePico3801, Access Gateway (AG), AP Home Register (AHR), and AP Manager to the existing UMTS network. The AG is responsible for controlling and managing ePico3801s. It also provides routing towards the UMTS core network. The ePico3801 is connected to the enterprise LAN or modem, the enterprise LAN or modem is connected to the public IP network, and the public IP network is connected to the AG. In this way, the ePico3801 can communicate with the AG, which connects the ePico3801 to the UMTS core network. The standard Uu interface is used between the ePico3801 and the UE to ensure compatibility with existing commercial terminals. **Figure 2-1** shows the position of the ePico3801 on the network of the uBro solution.

**Figure 2-1** Position of the ePico3801 on the network of the uBro solution



| ePico3801 | The functions of the ePico3801 are equivalent to the functions of the NodeB plus some functions of the RNC. It serves as the UMTS radio access device, performing radio modulation and demodulation, radio resource management, and power control. |
|---|---|
| AG | Used as the core network device in the uBro solution, the AG performs the following functions: <br> ● Forwarding signaling messages on the control plane and data on the user plane between the ePico3801 and the UMTS core network <br> ● Controlling and managing links for the ePico3801 |

| AHR | Used as the home server of the ePico3801, the AHR performs the following functions: <ul><li>Processing ePico3801 user definition and cancellation and managing subscription data</li><li>Implementing centralized management of the admission control lists of ePico3801s</li><li>Implementing zone management for ePico3801s</li><li>Completing boot parameter settings for ePico3801s</li><li>Implementing location detection and validity checks for ePico3801s</li></ul> |
|---|---|
| AP Manager | The AP Manager is located on the core network of the uBro solution and is responsible for centralized management and maintenance of ePico3801s on the entire network. The functions of the AP Manager are alarm management, configuration management, fault management, version management, software management, task management, security management, and log management. |
| SeGW | The security gateway (SeGW) is located at the entrance of the core network of the uBro solution and performs the following functions: <ul><li>Supporting standard firewall functions to provide security protection for the equipment on the core network of the uBro solution</li><li>Supporting the IP security protocol (IPSec) virtual private network (VPN) tunneling function, through which the SeGW establishes IPSec VPN tunnels between itself and ePico3801s to provide security protection for communications between ePico3801s and the network elements on the core network of the uBro solution</li></ul> |
| AAA | The Authentication, Authorization and Accounting (AAA) performs authentication for SIMs and USIMs. |
| UE | The user equipment (UE) is the user terminal. |
| IP clock server | The IP clock server provides clock sources for ePico3801s. |

## 2.2 Features of the ePico3801

The ePcio3801 is an enhanced pico base station used for indoor coverage. It uses IP access and supports HSPA. With the ePico3801, network planning and optimization are convenient, and security is high. The ePico3801 makes it possible to deploy flexible and seamless UMTS network coverage quickly.

### Enhanced Indoor Coverage Improving User Experience

- Deployed in factories or office buildings, the ePico3801 achieves seamless coverage on UMTS networks by solving the problem of poor penetration capabilities of the high UMTS frequency bands.

- The ePico3801 supports HSPA to provide high-speed stable data services. Users can easily enjoy high-quality UMTS services.

## High Usability Lowering Costs of Network Construction and Maintenance

- In the uBro solution, ePico3801s used for single-point coverage are entirely Plug and Play (PnP) devices. Therefore, the installation and commissioning of ePico3801s are convenient, lowering the costs of deployment and optimization. With ePico3801s, a UMTS network can be deployed quickly.

- If installed in an office building, ePico3801s do not require a private equipment room. Users install the ePico3801s and provide the power supply themselves. In addition, the ePico3801s are easy to transport. Thus, the network construction costs of mobile operators are lowered.

- Using the IPSec tunneling mode, ePico3801s are connected to the core network through the public IP network. The ePico3801s make full use of IP transmission resources and guarantee security in IP transmission. Thus, network construction costs are significantly lowered.

- Using the AP manager, which is a uniform management and maintenance platform, the ePico3801 automatically performs network discovery and parameter settings. The ePico3801 supports intelligent network planning and optimization, and software upgrades are automated. Thus, the usability is improved, and the network maintenance and optimization costs are lowered.

## Powerful Mechanism Guaranteeing Security

- Using the IKEv2 protocol to perform IPSec negotiation, the ePico3801 supports EAP-SIM and EAP-AKA authentication to guarantee network security.

- The ePico3801 supports user management and admission control. Thus, unauthorized UEs cannot use the ePico3801, and the user's investments are protected.

- The emergency call function provides high security for users.

- For the North American market, the ePico3801 meets the requirements for the E911 location function at a high precision. When a user dials an emergency number, the call request is first processed by the public safety answering point (PSAP) and then quickly forwarded to the local police department, emergency medical center, firefighting department, or legislative agency. By determining the location of the UE through GPS, the organization concerned can trace the user and provide help in time.

## Variety of Functions Raising User Satisfaction

- The ePico3801 supports AGPS.

- The ePico3801 supports customized location indication functions to inform UEs of the accurate network coverage. Compared with the macro UMTS network, the uBro network covered by ePico3801s provides better coverage and enables mobile operators to offer lower tariffs.

- Handovers and cell reselection can be performed between an ePico cell and a macro cell to ensure that the user chooses a network that provides a higher service quality at a lower tariff.

- The ePico3801 supports static relocation that complies with the 3GPP Uu interface protocol. In addition, The ePico3801 supports soft handovers to ensure service continuity when UEs move, thus improving user experience.

# 2.3 Composition of the ePico3801

The ePico3801 consists of the ePico3801 body and the power adapter. The ePico3801 body provides the LEDs, reset button, power port, and FE port. The ePico3801 supports the AC power supply and Power over Ethernet (PoE) power supply, which require different power adapters.

### 2.3.1 ePico3801 Body

The ePico3801 body consists of the ePico board, RF subboard, and plastic case. The ePico board is responsible for the main control of the system and the processing of baseband signals. In addition, the ePico board provides power supply for the RF unit and controls communication. The RF subboard receives, transmits, and processes RF signals.

### 2.3.2 Power Adapter

The ePico3801 can use the AC power supply or power supply from the PoE function. When the AC power supply is used, the PoE power supply system is shut down automatically. When the AC power supply is used, the ePico3801 needs to be configured with the AC/DC power adapter. When the PoE power supply is used, the ePico3801 needs to be configured with the power supply equipment (PSE).

# 2.3.1 ePico3801 Body

The ePico3801 body consists of the ePico board, RF subboard, and plastic case. The ePico board is responsible for the main control of the system and the processing of baseband signals. In addition, the ePico board provides power supply for the RF unit and controls communication. The RF subboard receives, transmits, and processes RF signals.

## Exterior of the ePico3801

The ePico3801 takes the shape of a case. It contains a built-in RF subsystem, baseband subsystem, transmission subsystem, control subsystem, and clock subsystem. The ePico3801 boasts a lower power consumption, compact structure, light weight, small size, and stylish appearance.

The ePico3801 can be configured with an internal or external antenna, depending on the actual requirements. **Figure 2-2** shows two ePico3801s, one with a built-in antenna and the other with an external antenna.

**Figure 2-2** Two ePico3801s, one with a built-in antenna and the other with an external antenna



## Ports and Buttons of the ePico3801

The ePico3801 provides a power port, FE port, USIM/SIM port, antenna port, LED, and reset button.

**Figure 2-3** shows the ports and buttons on the panel of the ePico3801.

**Figure 2-3** Ports and buttons on the panel of the ePico3801
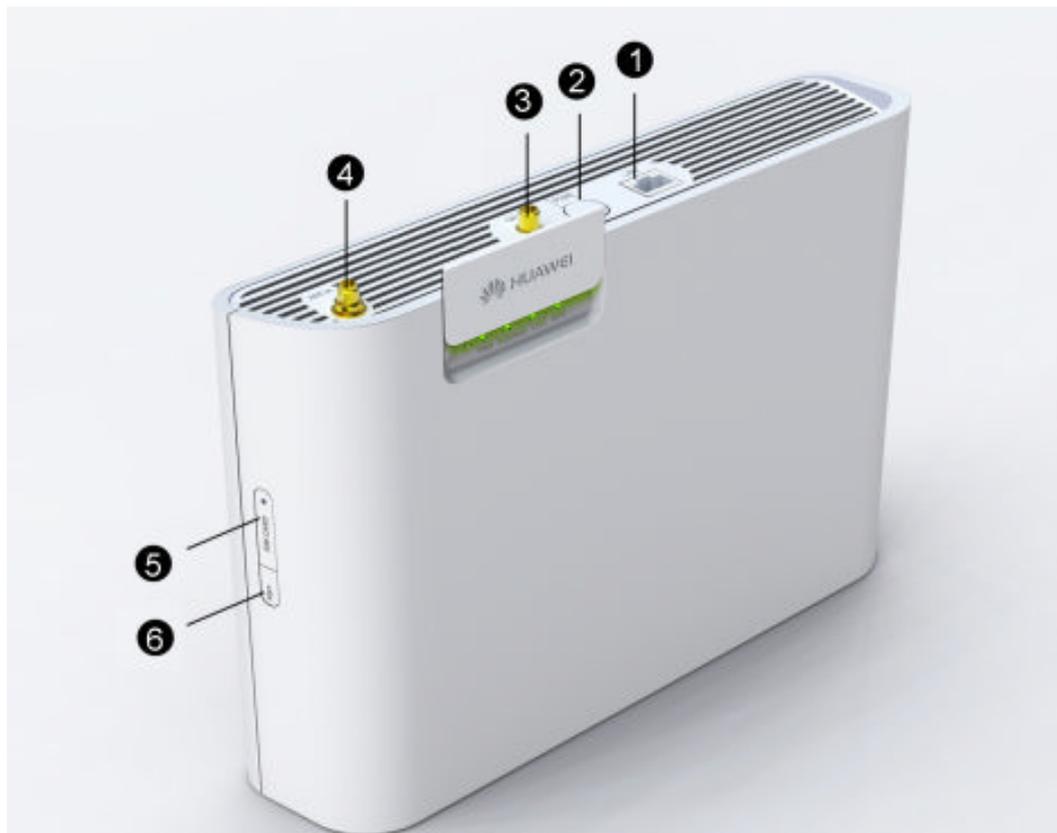


**Table 2-1** describes the functions of the ports and buttons of the ePico3801.

**Table 2-1** Functions of the ports and buttons of the ePico3801

| SN | Port or Button | Function |
|---|---|---|
| 1 | LAN | This port is used for both services and commissioning. An Ethernet cable connected to this port connects the ePico3801 to the Ethernet transmission equipment. When the PoE power supply is used, this port is used to provide the working power supply for the ePico3801. |
| 2 | PWR | This port is connected to an AC/DC power adapter to provide the 12 V DC power supply. |
| 3 | GPS | This port is the external GPS antenna port. |
| 4 | ANT/A | This port is the external UMTS antenna port. |
| 5 | SIM CARD | This port is used to hold the USIM or SIM card. |

| SN | Port or Button | Function |
|---|---|---|
| 6 | RST | This button is used to reset the device. You can press the RST button once to reset the ePico3801 or press this button three times consecutively to restore the factory settings of the ePico3801, such as the password used to log in to the WebUI and the IP address used for local maintenance of the ePico3801. |

## LEDs of the ePico3801

The ePico3801 has four LEDs, which show the running status of the ePico3801 through different colors and blinking frequencies.

The four LEDs are located on the front panel of the ePico3801. After sliding open the cover in the upper left corner of the front panel, you can see the four LEDs, as shown in **Figure 2-4**.

**Figure 2-4** LEDs of the ePico3801
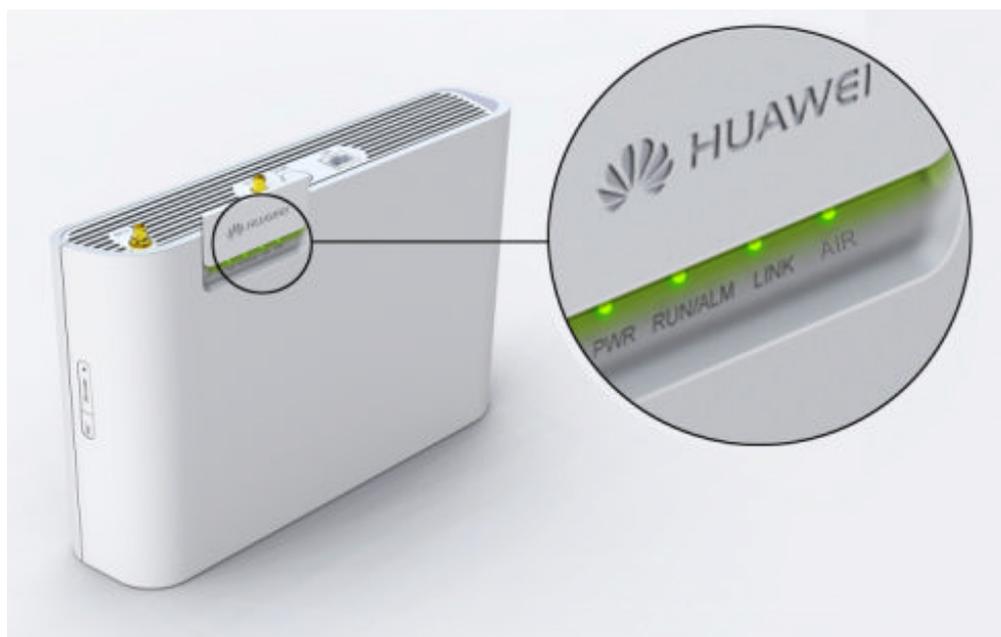


**Table 2-2** describes the status of the LEDs of the ePico3801.

**Table 2-2** Status of the LEDs of the ePico3801

| LED | Function | Color/Status | Meaning |
|---|---|---|---|
| PWR | This LED indicates the power status. | Off and green | There is no power supply, or the power supply is faulty. |
| | | On and green | The power supply is normal. |

| LED | Function | Color/Status | Meaning |
|---|---|---|---|
| RUN/ ALM | This LED indicates the running status. | Green and blinking (on for 1s and off for 1s) | A cell is already established and can provide services. The device is working properly. |
| | | Green and blinking (on for 0.125s and off for 0.125s) | The device is in the startup loading phase, or a software upgrade is in progress. |
| | | Red and blinking (on for 1s and off for 1s) | Critical alarms that affect services are generated. |
| | | Red and blinking (on for 0.125s and off for 0.125s) | The cell is unavailable. |
| | | On and red | The device is severely faulty and therefore needs to be repaired or replaced. |
| AIR | This LED indicates the status of the Uu interface. | On and green | There is no interference, and the device is working properly. The GPS signal is properly received. |
| | | Green and blinking (on for 1s and off for 1s) | The device is working properly, and users are using services. |
| | | On and red | There is no GPS signal. |
| | | Red and blinking (on for 1s and off for 1s) | The signal is exposed to slight interference. The device can work, but the communication quality is degraded. |
| | | Red and blinking (on for 0.125s and off for 0.125s) | The signal is exposed to severe interference, and therefore the device cannot work. |
| LINK | This LED indicates the connectivity of the Ethernet port. | Off and green | The Ethernet port is not properly connected. |
| | | On and green | The Ethernet port is properly connected. |
| | | Green and blinking | IP packets are being transmitted or received through the Ethernet port. |

## 2.3.2 Power Adapter

The ePico3801 can use the AC power supply or power supply from the PoE function. When the AC power supply is used, the PoE power supply system is shut down automatically. When the AC power supply is used, the ePico3801 needs to be configured with the AC/DC power adapter.

When the PoE power supply is used, the ePico3801 needs to be configured with the power supply equipment (PSE).

## AC Power Supply

When the AC power supply is used, the ePico3801 needs to be configured with the AC/DC power adapter, which converts the 110/220 V AC power supply to the 12 V DC power supply, used by the ePico3801 as its working power supply. **Figure 2-5** shows the AC/DC power adapter.

**Figure 2-5** AC/DC power adapter
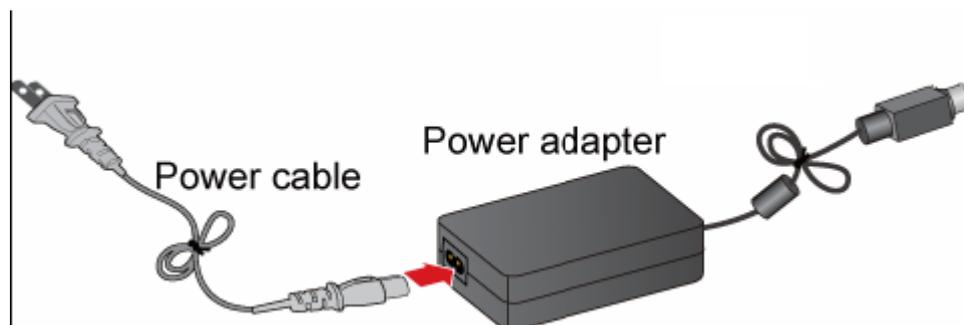


**Table 2-3** describes the specifications and parameters of the AC/DC power adapter.

**Table 2-3** Specifications and parameters of the AC/DC power adapter

| Item | Specification |
|---|---|
| Input voltage | 110/220 V AC (90 V AC to 264 V AC) |
| Frequency of the input voltage | 47 Hz to 63 Hz |
| Output voltage | 12 V DC (11.4 V DC to 12.6 V DC) |
| Output current | $\leqslant$ 2.9 A |

## PoE Power Supply

When the PoE power supply is used, the ePico3801 needs to be configured with the PSE, which powers the ePico3801 through the Ethernet cable. In this case, the AC/DC power adapter is not required. **Figure 2-6** shows the PSE.

**Figure 2-6** PSE



**Table 2-4** describes the ports on the PSE.

**Table 2-4** Ports on the PSE

| Port | Silkscreen | Description |
|------|-----------|-------------|
| Power supply port | - | Used for power input of the PSE |
| Data input port | DATA | Connected to the transmission device of the user |
| PoE output port | PoE | Connected to the ePico3801 |

**Table 2-5** describes the LEDs on the PSE.

**Table 2-5** LEDs on the PSE

| LED | Color and Status | Description |
|-----|-----------------|-------------|
| AC | On and green | The power supply is normal. |
|    | Off | There is no power input, or the PSE is faulty. |

| LED | Color and Status | Description |
|-----|-----------------|-------------|
| PORT | On and green | The PSE is properly connected to the ePico3801. |
| | Off | The connection between the PSE and the ePico3801 is faulty, or the PSE is faulty. |

**Table 2-6** describes the specifications and parameters of the PSE.

**Table 2-6** Specifications and parameters of the PSE

| Item | Specification |
|------|--------------|
| Input voltage | 110/220 V AC (90 V AC to 264 V AC) |
| Frequency range | 47 Hz to 63 Hz |
| Output voltage | -54 V DC (-52 V DC to -56 V DC) |
| Output current | $\leqslant$ 650 mA |

# 2.4 Specifications of the ePico3801

The specifications of the ePico3801 involve its performance specifications, physical and electrical specifications.

2.4.1 Performance Specifications
The performance specifications of the ePico3801 involve its RF performance, capacity, transmit power, and service capabilities.

2.4.2 Physical and Electrical specifications
The physical and electrical specifications of the ePico3801 are its physical specifications, power consumption specifications, and environmental specifications.

## 2.4.1 Performance Specifications

The performance specifications of the ePico3801 involve its RF performance, capacity, transmit power, and service capabilities.

### RF Specifications

**Table 2-7** RF specifications of the ePico3801

| Item | Specification | | |
|------|--------------|--|--|
| Frequency bands | Frequency band | RX band (MHz) | TX band (MHz) |
| | BAND I (2100 MHz) | 1920 to 1980 | 2110 to 2170 |

| Item | Specification | | |
|---|---|---|---|
| | Band II (1900 MHz) | 1850 to 1910 | 1930 to 1990 |
| | Band V (850 MHz) | 824 to 849 | 869 to 894 |
| Capacity | One carrier, one cell | | |
| TX power | In band I, the TX power is 100 mW (20 dBm). In band II and band V, the TX power is 250 mW (24 dBm). | | |
| Diversity | No transmit diversity or receive diversity | | |
| Receiver sensitivity | -110.0 dBm | | |
| Clock accuracy | ±0.1 ppm after locking | | |

📖 **NOTE**

The ePico3801 model whose output power is 250 mW supports band II and band V only, and the ePico3801 model whose output power is 100 mW supports band I only. The RF board that supports band I and the RF board that supports band II and band V have different TX powers. Band II and band V are supported by the same RF board, which can be configured to support either band II or band V based on the actual situation.

## Service Capabilities

Table 2-8 Service capabilities of the ePico3801

| Item | Specification |
|---|---|
| Ordinary PS and CS services | Supporting a maximum of 32 concurrent UEs |
| | Supporting a maximum of 32 concurrent UEs that use CS services |
| | Supporting a maximum of 16 concurrent UEs that use PS services |
| | The service combination of a single user can be made up of a maximum of one CS service and three PS services. |
| HSPA | The maximum rate in HSDPA is 7.2 Mbit/s. |
| | The maximum rate in HSUPA is 1.44 Mbit/s. |
| | Supporting a maximum of 8 concurrent UEs that use HSPA services |
| | Supporting concurrent 3GPP R99/R4/R5/R6 services |

| Item | Specification |
|------|---------------|
| UE mobility | Supporting the processes of addition, removal, and replacement in soft handovers that comply with the Uu interface protocols of 3GPP, thereby ensuring the mobility of UEs |
| | Supporting static relocation that complies with the Uu interface protocol of 3GPP |
| | Supporting reselection and handovers between ePico cells, between ePico cells and UMTS macro cells, and between ePico cells and inter-RAT cells. |
| | Supporting redirection to inter-RAT and inter-frequency cells for UEs that exceed the specifications |
| | Supporting access handovers for PS and VP UEs that exceed the specifications |

📖 **NOTE**

● Users that have only CS services are known as CS users. Users that have PS services are known as PS users. PS users can also have CS services.

● Among the three PS services in the maximum service combination of a single user, one service is carried by IMS.

## 2.4.2 Physical and Electrical specifications

The physical and electrical specifications of the ePico3801 are its physical specifications, power consumption specifications, and environmental specifications.

### Physical Specifications

**Table 2-9** Physical specifications of the ePico3801

| Item | Specification |
|------|---------------|
| Dimensions (length x width x height) | 250 mm x 60 mm x 175 mm |
| Weight | $\leqslant$ 2 kg |
| Volume | $\leqslant$ 2.5 L |
| Transmission port | One FE port |
| Protection rate | IP30 |
| Mean Time Between Failures | 88,861 hours |

## Power Consumption Specifications

**Table 2-10** Power Consumption Specifications of the ePico3801

| Item | | Specification |
|---|---|---|
| The TX power is 100 mW (20 dBm). | AC/DC power adapter | ≤ 28W |
| | PoE power supply | ≤ 30W |
| The TX power is 250 mW (24 dBm). | AC/DC power adapter | ≤ 32W |
| | PoE power supply | ≤ 35W |

## Environmental Specifications

**Table 2-11** Environmental specifications of the ePico3801

| Item | Specification |
|---|---|
| Temperature | Operating temperature: -5°C to +40°C |
| | Storage temperature:-40°C to +70°C |
| Relative humidity | Relative humidity of the operating environment: 5% RH to 95% RH |
| | Relative humidity of the storage environment: 5% RH to 95% RH |
| Altitude | -60 m to +4000 m |
| Air pressure | 70 kPa to 106 kPa |

# 2.5 Application Scenarios

The ePico3801 is widely used for indoor coverage in small and medium enterprises (SMEs), SOHOs, schools, and office buildings and for hot-spot indoor coverage at pubs, airports, stores, and hotels.

### 2.5.1 Access Networking Scenarios

The ePico3801 is connected to an enterprise LAN or modem, which connects the ePico3801 to the public IP network. Then, the public IP network connects the ePico3801 to the AG, and the AG connects the ePico3801 to the UMTS core network. Through convergence and UMTS traffic and signaling forwarding performed by the AG, routing towards the UMTS core network is achieved. The ePico3801 can be connected to the public IP network in LAN access mode or modem access mode.

### 2.5.2 Installation Scenarios

If installed in a factory or office building, the ePico3801 does not require a private equipment room.

The ePico3801 is designed to solve the indoor coverage problem of the UMTS network. With the ePico3801, mobile operators can deploy ordinary indoor coverage, intensive coverage in office buildings, and hot-spot indoor coverage quickly at low cost.

# 2.5.1 Access Networking Scenarios

The ePico3801 is connected to an enterprise LAN or modem, which connects the ePico3801 to the public IP network. Then, the public IP network connects the ePico3801 to the AG, and the AG connects the ePico3801 to the UMTS core network. Through convergence and UMTS traffic and signaling forwarding performed by the AG, routing towards the UMTS core network is achieved. The ePico3801 can be connected to the public IP network in LAN access mode or modem access mode.

## Modem Access

The ePico3801 can be connected the public IP network through a fixed phone modem or cable TV cable.

## Principle of Modem Access

Each ePico3801 is connected to the public IP network through a modem. The digital subscriber line access multiplexer (DSLAM) performs data convergence and distribution and isolates the ePico3801 from other ePico3801s through a private VLAN. The service data is sent to the broadband access server (BRAS) in Point-to-Point Protocol over Ethernet (PPPoE) or Dynamic Host Configuration Protocol (DHCP) mode, and the BRAS performs access authentication and billing for the public IP network. After the authentication is successful, the service data is sent to the SeGW on the core network of the uBro solution through the public IP network. The SeGW processes the data and forwards it to the AG and AAA. **Figure 2-7** shows the networking in modem access mode.

**Figure 2-7** Networking in modem access mode

Issue 01 (2009–09–23)
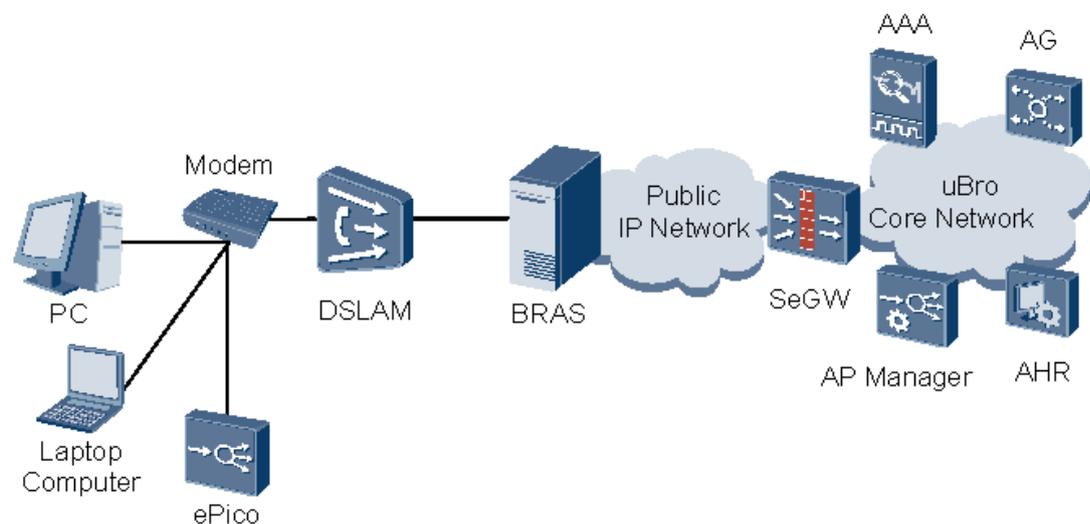
## Access Authentication

In modem access networking, access authentication and billing for the ePico3801 can be performed in one of the following three modes, depending on mobile operators' policies:

- PPPoE dial-up mode
- Static IP address mode
- DHCP mode

## LAN Access

The ePico3801 can be directly connected to the public IP network through a LAN.

## Principle of LAN Access

Each ePico3801 is directly connected to a switch or router through the enterprise LAN, which connects the ePico3801 to the public IP network and isolates the ePico3801 from other ePico3801s through a private VLAN. After the router performs Network Address Translation (NAT) for the service data, the service data is sent to the SeGW on the core network of the uBro solution through the public IP network. The SeGW processes the data and forwards it to the AG and AAA. **Figure 2-8** shows the networking in LAN access mode.

**Figure 2-8** Networking in LAN access mode
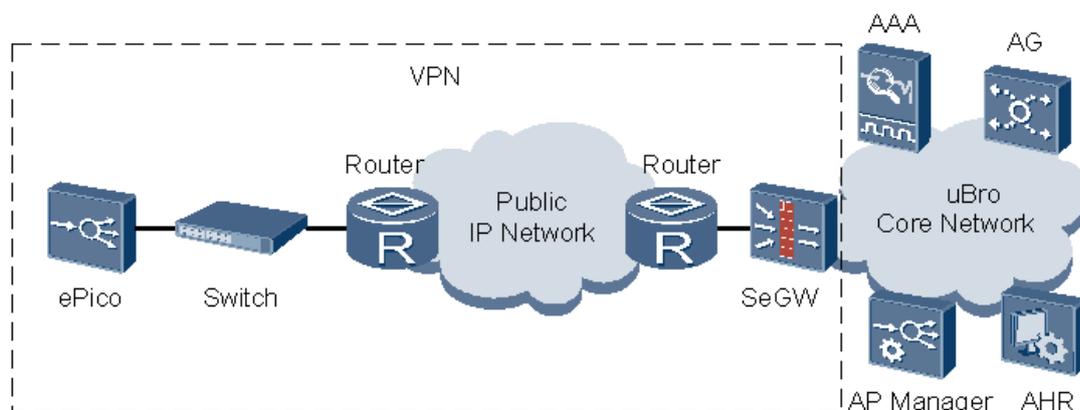


## Access Authentication

Like modem access networking, LAN access networking also supports access authentication in PPPoE dial-up mode, static IP address mode, and DHCP mode.

# 2.5.2 Installation Scenarios

If installed in a factory or office building, the ePico3801 does not require a private equipment room.

The ePico3801 is impact in structure and does not generate any noise. It can be easily installed on a ceiling, wall, or pole depending on the actual requirements, preferences, and situations. The installation process does not interfere with users' study or work. **Figure 2-9** shows the typical installation scenarios of the ePico3801.

**Figure 2-9** Typical installation scenarios of the ePico3801
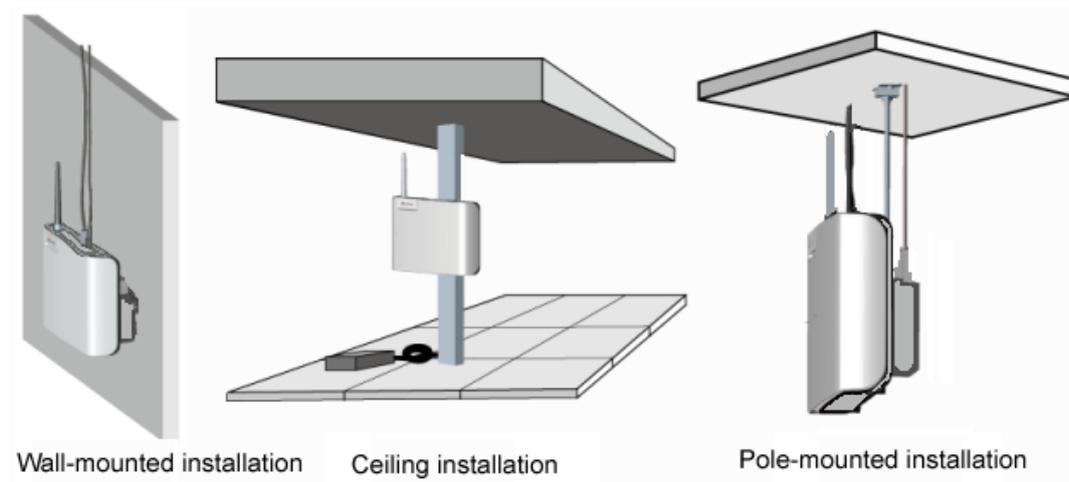


## 2.5.3 Typical Application Scenarios

The ePico3801 is designed to solve the indoor coverage problem of the UMTS network. With the ePico3801, mobile operators can deploy ordinary indoor coverage, intensive coverage in office buildings, and hot-spot indoor coverage quickly at low cost.

The ePico3801 has a good performance in terms of eliminating dead zones on the UMTS network, implementing hot-spot indoor coverage, and providing small-scale private network coverage. Typically, the ePico3801 provides small-scale private network coverage or hot-spot indoor coverage for users in SMEs. **Figure 2-10** shows the application of the ePico3801 in an SME.

**Figure 2-10** Application of the ePico3801 in an SME

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Copyright © Huawei Technologies Co., Ltd.
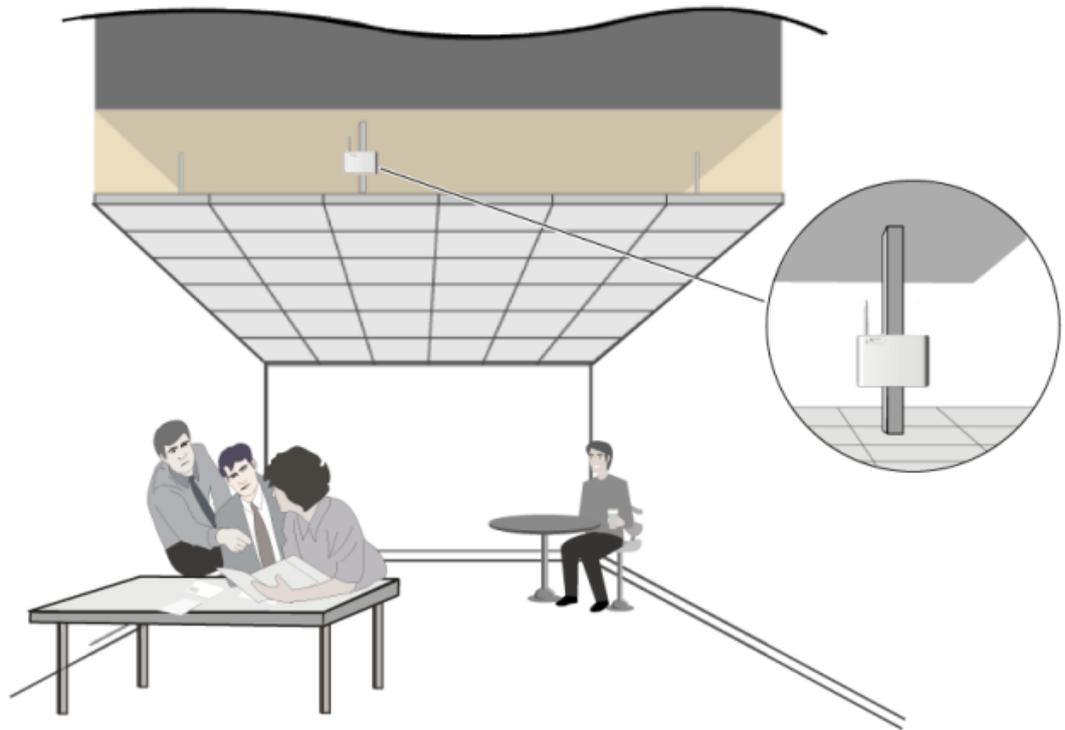
# 3 ePico3801 Initial Configuration

## About This Chapter

This chapter describes how to perform initial configuration of the ePico3801 on the WebUI so that users can perform the configuration of the ePico3801 according to the access and authentication mode.

### Prerequisite

The ePico3801 has been installed and powered on.

### Context

The ePico3801 can access the network through the following authentication modes: PPPoE dial-up, static IP address, and DHCP. For details, see **2.5.1 Access Networking Scenarios**. By default, the ePico3801 supports the DHCP authentication mode. The initial configuration is not required. If you need to use the PPPoE dial-up or static IP authentication mode, initial configuration is required.

3.1 Logging in to the ePico WebUI
This describes how to log in to the WebUI. For details about how to log in to the AP Manager, see the AP Manager Operator Guide.

3.2 Configuring the ePico3801
This chapter describes how to configure the ePico3801 on the WebUI when the ePico3801 accesses the network through the PPPoE dial-up or static IP address authentication mode.

# 3.1 Logging in to the ePico WebUI

This describes how to log in to the WebUI. For details about how to log in to the AP Manager, see the AP Manager Operator Guide.

## Prerequisite

- The ePico is powered on.

- The version of the web browser on the PC meets the requirement.

  the Internet Explorer (IE) must be version 6.0 or later versions; When logging in to the WebUI through the Internet Explorer 8.0, certain manual configuration is needed, Choose **Tools** > **Compatibility View Settings**, In the **Compatibility View Settings** dialog box, Choose **Display all websites in Compatibility View**, Click **Close**.

- The web browser does not use a proxy server.

  To check whether the web browser uses a proxy server, perform the following steps where IE 6.0 is taken as an example:

  1. Open the IE. Choose **Tools** > **Internet Options**. The **Internet Options** dialog box is displayed.

  2. In the **Internet Options** dialog box, click the **Connections** tab. Then, click **LAN Settings**.

  3. In the **Proxy server** area, ensure that the check box **Use a proxy server for your LAN** is not selected. Then, click **OK**.

## Procedure

**Step 1** Allocate an IP address for the computer. The IP address must be on the same network segment as the IP address of the ePico.

📖 **NOTE**

The default IP address of the ePico is 172.16.1.1, and the subnet mask is 255.255.255.0. To modify the default IP address, do as follows:

1. Type http://172.16.1.1 in the address box of the web browser. Then, press Enter. The login dialog box of the WebUI is displayed.
2. Click **configuration**.
3. Click **TARGET IP** in the left pane.
4. Click **Mod**.
5. Under **Input Parameter Values**, type the new IP address and the subnet mask. Then, click **Done**.
6. A message is displayed indicating that the change is successful. Exit the WebUI, and then log in to the WebUI again by using the new IP address.

**Step 2** Type the IP address of the ePico in the address box of the web browser. Then, press **Enter**. The login dialog box of the WebUI is displayed, as shown in **Figure 3-1**.

**Figure 3-1** Logging in to the WebUI
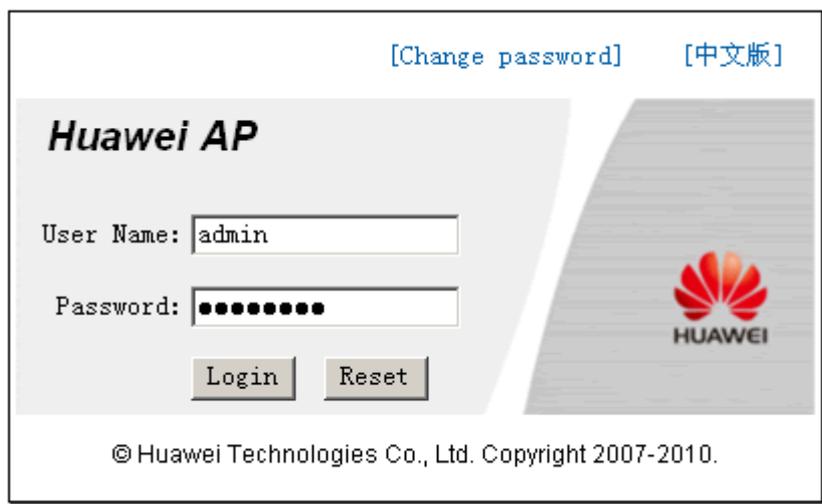


**Step 3** In the dialog box, type the user name and password under **User Name** and **Password** respectively. Then, click **Login**.

📖 **NOTE**

> The user name is set to admin and cannot be changed. The default password is the last eight digits of the APEI. The APEI is silk screened on the housing of the ePico. The system automatically prompts you to change your password during the initial login. You must change your password before logging in to the system normally.
>
> If you fail to log in to the system after the maximum number of consecutive login failures (three times by default) within the specified time (five minutes by default), the system is blocked for six hours by default. You can unblock the account after the duration times out or press the RST button to reset the system. If the duration of system unblocking is set to 0 on the AP Manager, it indicates that you must reset the ePico for re-login when your account is locked.
>
> Click **Change password** to change your password, The new password must meet the following conditions:
>
> ● The new password must consists of 8 to 18 characters.
>
> ● The new password cannot contain 3 or more consecutive same characters.
>
> ● The new password must contain at least 3 combinations of a lower-case letter, upper-case letter, number, and special character (such as ~!@#$%^*()-_=+\|[{}];:'",.>/?, and space).

**----End**

# 3.2 Configuring the ePico3801

This chapter describes how to configure the ePico3801 on the WebUI when the ePico3801 accesses the network through the PPPoE dial-up or static IP address authentication mode.

## Prerequisite

**3.1 Logging in to the ePico WebUI** is complete.

## Procedure

- The ePico3801 accesses the network through the PPPoE dial-up authentication mode.
    1.  In the WebUI home page, choose **Transfer Basic** > **ETHIP**, and then click **Del**.
    2.  Choose **PPPOELINK** and click **Add**. Then, enter the username and password for the PPPoE dial-up connection and click **Done**.
    3.  The ePico3801 restarts automatically to validate the new configuration.
- The ePico3801 accesses the network through the static IP address to be authenticated.
    1.  In the WebUI home page, choose **Transfer Basic** > **ETHIP**, and then click **Mod**.
    2.  Change the value of **Auto IP** to **DISABLE** and enter the required static IP address, net mask, and gateway IP address. Then, click **Done**.
    3.  The ePico3801 restarts automatically to validate the new configuration.

    **----End**

## Postrequisite

After the initial configuration, the following items must be confirmed:

- The corresponding ePico zone has been activated.
- The ePico3801 has registered in the corresponding zone.
- The network planning parameters of the ePico3801 have been set.

# 4 Commissioning the ePico3801

## About This Chapter

This chapter describes the commissioning and verification after the installation of the ePico3801 hardware. The commissioning ensures that the ePico3801 works properly as designed.

4.1 Commissioning Procedure
This chapter describes the prerequisites, required resources, and procedure of the ePico3801 commissioning.

4.2 Checking the Hardware Status
This chapter describes how to check the status of the ePico3801 hardware.

4.3 Checking the Network Transmission
This chapter describes how to check the network transmission of the ePico3801 to ensure that the ePico3801 communicates with other NEs properly.

4.4 Checking the Software Version
This chapter describes how to check the software version of the ePico3801.

4.5 Checking the Running Status
This chapter describes how to check the running status of the ePico3801.

4.6 Testing Services
This chapter describes how to test the services provided by the ePico3801 to ensure that the ePico3801 can provide basic telecommunication services such as CS and PS services.

4.7 Data Sheet for Commissioning
This chapter provides the data sheet that is used to record the process and result of the commissioning.

4.8 Communication Ports on the ePico3801

# 4.1 Commissioning Procedure

This chapter describes the prerequisites, required resources, and procedure of the ePico3801 commissioning.

## Prerequisite

- The NEs including the SeGW, AAA, APM, AHR, IP clock, and AG involved in the uBro solution are running properly. The network transmission is normal.
- The initial configuration of the ePico3801 is complete.

## Commissioning Resources

Table 4-1 describes the tools required for ePico3801 commissioning.

Table 4-1 Tools for ePico3801 commissioning

| Tool | Quantity | Description |
|---|---|---|
| PC | 1 | Log in to ePico local maintenance IP address through a PC to perform local commissioning, or log in to the AP Manager (APM) to perform commissioning. |
| UE | 2 | Use the UEs to make call tests on ePico3801 services. |
| Fixed-line telephone | 1 | Use the fixed-line telephone to make call tests on ePico3801 services. |

The following basic information must be obtained before the commissioning.

- The networking mode and transmission mode of the ePico3801 are available.
- The required software version and basic configuration data of the ePico3801 are available.

## Commissioning Procedures

Figure 4-1 shows the procedures for commissioning the ePico3801.

Figure 4-1 Commissioning procedures
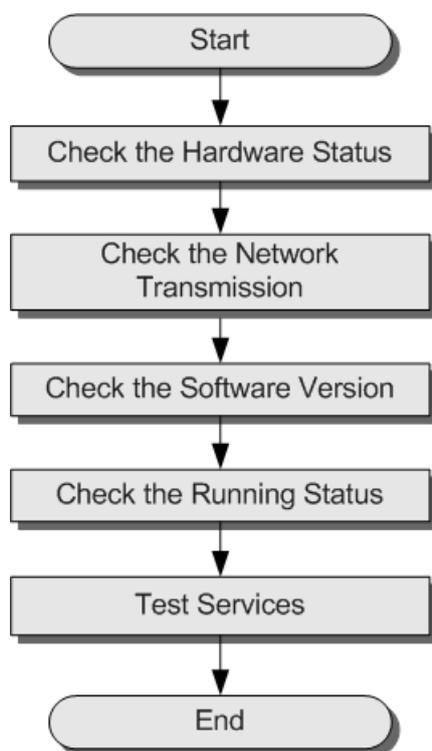


## Procedure

**Step 1**  **4.2 Checking the Hardware Status**.

**Step 2**  Check the network transmission status between the ePico3801 and the SeGW, AG, and APM. For details, see **4.3 Checking the Network Transmission**.

**Step 3**  **4.4 Checking the Software Version**.

**Step 4**  **4.5 Checking the Running Status**.

**Step 5**  Use the UEs to test the services provided by the ePico. For details, see **4.6 Testing Services**.

**----End**

# 4.2 Checking the Hardware Status

This chapter describes how to check the status of the ePico3801 hardware.

## Procedure

**Step 1**  Check the LEDs on the equipment.

If the LEDs on the ePico3801 are in the state described in **Table 4-2**, it indicates that the equipment is functioning properly.

**Table 4-2** Normal status of the LEDs

| LED | State |
|-----|-------|
| PWR | ON (green) |
| RUN/ALM | Blinking green (ON for 1s and OFF for 1s) |
| AIR | ON or blinking (green) |
| LINK | ON or blinking (green) |

**Step 2** If the LEDs on the equipment are in abnormal state, troubleshoot the problem by referring to **Table 4-3**.

**Table 4-3** Abnormal status of the LEDs

| LED | State | Description | Handling Method |
|-----|-------|-------------|-----------------|
| PWR | OFF (green) | No power supply is available or the power supply is improper. | Check whether the power ports are connected properly and whether the power supply system is faulty. |
| RUN/ ALM | Blinking green (ON for 0.125s and OFF for 0.125s) | The equipment is in the phase of starting and loading or the software of the equipment is being upgraded. | Wait for five minutes and then check the status of the RUN/ALM LED again. If the RUN/ALM LED still blinks four times every second, record the problem in the commissioning table for the analysis through the AP Manager (APM). |
| | Blinking red (ON for 1s and OFF for 1s) | A critical alarm is reported, which affects the services. The ePico3801 cannot provide services. | Record the problem in the commissioning table for the analysis through the APM. |
| | Blinking red (ON for 0.125s and OFF for 0.125s) | The cell cannot provide services. | **4.3 Checking the Network Transmission**, and then check the status of the LEDs again. If the RUN/ALM LED is still constantly ON, record the problem in the commissioning table for the analysis through the APM. |
| | ON (red) | The equipment is faulty and needs to be maintained or replaced. | Replace the equipment. |

| LED | State | Description | Handling Method |
|-----|-------|-------------|-----------------|
| AIR | ON (red) | There is no GPS signal. | ● Check the GPS antenna connector. If the connector is loose, reinsert the connector and fasten it.<br>● Change the position for installing the GPS antenna. |
| | Blinking red (ON for 1s and OFF for 1s) | The signals of the ePico3801 are under slight interference. The ePico3801 works properly, but the telecommunication quality deteriorates. | ● Eliminate the interference source around the equipment.<br>● Change the position for installing the ePico3801. |
| | Blinking red (ON for 0.125s and OFF for 0.125s) | The signals of the ePico3801 are under strong interference. The ePico3801 cannot work properly. | |
| LINK | OFF (green) | The Ethernet port is connected improperly. | Check whether the Ethernet ports on the ePico3801 and the peer equipment are faulty and whether the Ethernet cable is available. |

**----End**

# 4.3 Checking the Network Transmission

This chapter describes how to check the network transmission of the ePico3801 to ensure that the ePico3801 communicates with other NEs properly.

## Prerequisite

The ePico3801 hardware is checked and in normal status.

## Procedure

**Step 1** Check the **RUN/ALM** LED.

| If the RUN/ALM LED Is... | Then... |
|--------------------------|---------|
| Blinking green (ON for 1s and OFF for 1s) | The network transmission is normal. End the check. |
| Other status | Go to **Step 2**. |

**Step 2** **3.1 Logging in to the ePico WebUI**. In the **Execute Trouble Diagnose** window, select **Transfer Trouble Diagnose** and select **Show All Result**. Then, click **Start** to start checking the transmission status of the ePico3801.

**Step 3** Check the statistical information **SCTP State**, **SecGW LINK**, **APM LINK**, and **TSP Current State** and ensure that the transmission between the ePico3801 and the NEs is normal.

1. Check the **SecGW LINK** status.

| If... | Description | Then... |
|---|---|---|
| The test results of **SecGW LINK** are as follows:<br>4 packet(s) transmitted<br>4 packet(s) received<br>Percent 0.00 packet lost<br>round-trip min/avg/max = 1/3/10 ms | The network transmission between the ePico3801 and the SecGW is normal. | Go to **Step 3.2**. |
| The test result of **SecGW LINK** is **Invalid** or **TimeOut** | The communication between the ePico3801 and the SecGW fails. | ● Check whether the IP address of the firewall configured on the ePico is correct.<br>● Check whether the firewall works normally. |

2. Check the **SCTP State** status.

| If... | Description | Then... |
|---|---|---|
| The **SCTP State** status is **OK** | The SCTP link is established. | Go to **Step 3.3**. |
| The **SCTP State** status is **NOK** | The SCTP link is not established. The communication between the ePico and AG fails. | Ensure that the IPsec tunnel between the ePico3801 and the firewall is established successfully. |

3. Check the **APM LINK** status.

| If... | Description | Then... |
|---|---|---|
| The test results of **APM LINK** are as follows:<br>4 packet(s) transmitted<br>4 packet(s) received<br>Percent 0.00 packet lost<br>round-trip min/avg/max = 1/3/10 ms | The network transmission between the ePico3801 and the APM is normal. | Go to **Step 3.4**. |

| If... | Description | Then... |
|---|---|---|
| The test result of **APM LINK** is **Invalid** or **TimeOut** | The communication between the ePico3801 and the APM fails. | • Ensure that the transmission between the ePico and the firewall and between the firewall and the APM is normal.<br>• Ensure that the APM is installed with the current version of the ePico3801.<br>• Ensure that the IPsec tunnel between the ePico and the firewall is established successfully. |

4.  Check the **TSP Current State** status.

| If... | Description | Then... |
|---|---|---|
| The **TSP State** status is **TransOK** | The network transmission is normal. | End the check. |
| The **TSP Current State** status is **NOK** | The network transmission is faulty. | Rectify the fault according to the displayed fault cause of **TSP Current State**. |

  📖 **NOTE**

  If the fault persists, contact the Huawei technical support engineers.

**----End**

# 4.4 Checking the Software Version

This chapter describes how to check the software version of the ePico3801.

## Prerequisite

- The network transmission between the ePico3801 and the AP Manager (APM) is normal.
- The ePico3801 hardware is normal.
- You have logged in to the WebUI through a computer.

## Procedure

- Log in to the WebUI to check the software version of the equipment.

  The software version is directly displayed in the upper right of the WebUI window.

- Log in to the APM to check the software version of the equipment.

  Choose **Configuration** > **Single Configuration**. In the **Terminal Search** area, enter the relevant information of the equipment, and then click **Search**. The query result is displayed in the **Terminal List** area.

  **----End**

## Postrequisite

If the software version of the equipment is incorrect, upgrade the software version by referring to the *APM Operator Guide*.

# 4.5 Checking the Running Status

This chapter describes how to check the running status of the ePico3801.

## Prerequisite

The ePico3801 hardware is in normal state, the transmission is available, and the running software version is correct.

## Procedure

**Step 1** Check the equipment alarm on the AP Manager (APM) and clear the existing alarm by referring to the *APM Operator Guide*.

| If... | Then... |
|---|---|
| An alarm is generated | Clear the alarm according to **Help**. |
| An active alarm cannot be cleared | Record the alarm in the **4.7 Data Sheet for Commissioning**. |

**----End**

# 4.6 Testing Services

This chapter describes how to test the services provided by the ePico3801 to ensure that the ePico3801 can provide basic telecommunication services such as CS and PS services.

## Prerequisite

- The ePico cell is set up.
- Two functional UEs (UE 1 and UE 2) are ready.
- The IMSIs of UE 1 and UE 2 are added to the ePico permission list.
- A functional fixed-line phone is ready.
- The CS and PS domains in the core network are functional.

## Testing Items

**Table 4-4** describes the basic items in the ePico3801 service test.

**Table 4-4** Basic items in the service test

| Testing Items | Method | Expected Result |
|---|---|---|
| Test voice call services. | UE 1 or UE 2 originates a voice call to a fixed-line phone. | The voice quality is good, and there is no loud noise. |
| | UE 1 originates a voice call to UE 2. | The voice quality is good, and there is no loud noise. |
| Test video call services. | UE 1 originates a video call to UE 2. | ● The voice is clear. ● The video is clear and uninterrupted. ● The voice is synchronized with the video. |
| Test streaming video services. | UE 1 performs the VOD services. | ● The voice is clear. ● The video is clear and uninterrupted. ● The voice is synchronized with the video. |

# 4.7 Data Sheet for Commissioning

This chapter provides the data sheet that is used to record the process and result of the commissioning.

**Table 4-5** Data sheet for commissioning

| Site Name | | | |
|---|---|---|---|
| Models | | | |
| Commission Time | | | |
| Commissioning Engineer | | | |
| Commissioning Result | ☐ Successful;☐ Failed | | |
| Commissioning Item | | Conclusion | Handling Exceptional Case |
| Commissioning Preparation Phase | Faults in hardware installation are rectified. | ☐ Yes; ☐ No | |
| | Negotiation data of the ePico3801 to be commissioned is added to the AP Manager (APM). | ☐ Yes; ☐ No | |

| Commissioning Phase | The hardware status is checked. | ☐ Yes; ☐ No | |
|---|---|---|---|
| | The network transmission status is checked. | ☐ Yes; ☐ No | |
| | The software version is checked. | ☐ Yes; ☐ No | |
| | The running status of the ePico3801 is checked. | ☐ Yes; ☐ No | |
| | The basic services are tested. | ☐ Yes; ☐ No | |
| | | | |
| | Description | Impact | |
| Unsolved Problems After Commissioning | | | |
| | | | |
| | Component | P/N | |
| Record of Faulty Equipment | | | |

# 4.8 Communication Ports on the ePico3801

This chapter describes the communication ports on the ePico3801. **Table 4-6** describes the communication ports on the ePico3801.

**Table 4-6** Communication ports on the ePico3801

| Protocol | A Side | A Side Port Number (RX) | B Side | B Side Port Number (TX) | Service | Authority Management |
|---|---|---|---|---|---|---|
| TCP | ePico 3801 | 80 | IE browser | 1024-65535 | WebUI port for local OM | Username and password |
| TCP | ePico 3801 | 6000 | LMT | 1024-65535 | MML port for local OM | Username and password |
| TCP | ePico 3801 | 6006 | LMT | 1024-65535 | Binary port for local OM | Username and password |

| Prot ocol | A Side | A Side Port Num ber (RX) | B Side | B Side Port Number (TX) | Service | Authority Manageme nt |
|---|---|---|---|---|---|---|
| TCP | ePico 3801 | 7547 | AP Manager | 1024-6553 5 | TR-069 protocol port | - |
| TCP | ePico 3801 | 500 | SeGW | 1024-6553 5 | Default IKE port of the IPSec | - |
| TCP | ePico 3801 | 4500 | SeGW | 1024-6553 5 | NAT protocol port of the IPSec | - |
| TCP | ePico 3801 | 3300 3 | CLK Server | 1024-6553 5 | Clock synchronization | - |

# 5 Reconfiguring the ePico3801

## About This Chapter

This chapter describes common reconfiguration items during the normal running of the ePico3801.

5.1 Configuring Automatic Network Planning Parameters
This chapter describes how to configure the automatic network planning parameters for the ePico3801 on the AP Manager (APM). For the deployment of most ePico3801s, the automatic network planning mode ensures a good radio environment.

5.2 Setting ePico Cell Parameters
This chapter describes how to set or modify the ePico cell parameters manually. This mainly introduces common configuration methods of the ePico cell parameters, including modifying the cell status, modifying the cell frequency and scramble code, and setting the maximum TX power.

5.3 Modifying Automatic Pilot Adjustment Parameters
This chapter describes how to modify the automatic pilot adjustment parameters. You need to set the automatic pilot adjustment parameters for the ePico3801 to ensure that the interference is effectively reduced and the voice quality meets the requirements. In normal cases, these parameters need not be modified after the parameter setting is complete.

5.4 Adjusting Mobility Management Parameters
This chapter describes how to adjust the ePico3801 parameters related to the cell reselection and handover if required. In normal cases, the information of the ePico cell is configured through automatic network planning. No manual configuration is required.

5.5 Adjusting the Transport Network
This chapter describes how to adjust the transport network of the ePico3801.

5.6 Adjusting the ePico3801 Functions
This chapter describes how to adjust the application of the ePico3801 basic functions. The basic functions consist of the HSPA status, emergency call redirection switch, permission reject reason, location indication mode, differentiated billing mode, and location positioning mode.

# 5.1 Configuring Automatic Network Planning Parameters

This chapter describes how to configure the automatic network planning parameters for the ePico3801 on the AP Manager (APM). For the deployment of most ePico3801s, the automatic network planning mode ensures a good radio environment.

## Prerequisite

- The ePico zone has been activated on the APM.

- You have logged in to the APM. The login account belongs to the Administrator or Operators group.

- You have obtained the frequency information planned for the ePico zone.

## Context

The frequency list information configured by running the following commands is valid only if the ePico3801 is in automatic network planning mode.

- Automatic network planning: The frequencies, scrambling codes, and information about neighboring cells are configured on the APM. After the ePico3801 is powered on and the cell is set up, the APM automatically issues the configuration information to the corresponding ePico3801. No manual configuration is required. By default, the factory parameter setting mode of the ePico3801 is automatic network planning.

- Manual network planning: Change the mode of configuring the frequency, scrambling code, and information about neighboring cells to manual configuration. For details, see **5.2 Setting ePico Cell Parameters**. You can change the configuration information of a cell as required.

## Procedure

**Step 1** Log in to the APM. Choose **Configuration** > **Zone Configuration** and select an ePico zone to be maintained. Then, click **Configure**.

**Step 2** In the displayed window, select the correct version from the **Version** drop-down list, and then click **Next**.

**Step 3** Set the parameters of the ePico zone. Choose **Zone Parameter** > **WIRELESS** > **Configuration** in the navigation tree to set the parameters of the ePico zone.

    1. Choose **APCELLFREQ** to set the frequency list of the ePico cell.

      📖 **NOTE**

      If the ePico cell is set up in automatic network planning mode, you need to configure the frequency list of the ePico cell. After the configuration is complete, the ePico searches all the frequencies in the frequency list to identify a frequency with the minimal interference for itself.

    2. Choose **APPSCODE** to set the scramble code list of the ePico cell.

    3. Choose **MCELLFREQ** to set the macro neighboring cell list of the ePico cell.

    4. Choose **GSMPLMNID** to set the mobile network code (MNC) of 2G neighboring cells.

    📖 **NOTE**

    For details about how to set the parameters, see **Help** in the corresponding command window.

**Step 4** After the parameter setting is complete, click **Confirm** and then click **Submit**. A system message is displayed, indicating whether the parameter setting is successful.

**----End**

# 5.2 Setting ePico Cell Parameters

This chapter describes how to set or modify the ePico cell parameters manually. This mainly introduces common configuration methods of the ePico cell parameters, including modifying the cell status, modifying the cell frequency and scramble code, and setting the maximum TX power.

## Prerequisite

- The parameters of the ePico zone have been set successfully.

- You have logged in to the AP Manager (APM). The login account belongs to the Administrator or Operators group.

## Procedure

**Step 1** Log in to the APM. Choose **Configuration** > **Single Configuration** and select an ePico3801 to be maintained. Then, click **Configure** to enter the configuration window.

**Step 2** Choose **Terminal Parameter** > **WIRELESS** > **Configuration** in the navigation tree to configure the automatic pilot adjustment parameters.

1. Choose **CELLSTATE** to modify the cell active status. Before activating the data of a cell, you need to ensure that the data of the cell is complete and valid.

2. Choose **CELLBASIC** to modify the basic information of the cell.

⚠ **CAUTION**

You can use this command to modify the AP frequency, scramble code, and neighboring cell configuration mode after deactivating the cell. If the cell is in activated state, you cannot modify the cell information directly.

3. Choose **CELL** to modify the basic information of the cell. You can use this command to modify the basic information such as the maximum TX power of a cell, PSCH TX power, SSCH TX power, PCPICHP TX power, BCH TX power, and downlink maximum TX power of UEs in a cell.

4. Choose **CELLRESETUPTIMER** to set the timer for cell reestablishment. This command is applicable to the automatic network planning mode. Before the timer for periodical cell reestablishment expires, the cell performs network planning automatically again. In this case, the ePico3801 automatically selects better parameters related to the network planning to reestablish the cell according to the new radio environment so that the network quality of the cell is optimized. If there are UEs in the cell when cell reestablishment time arrives, the ePico3801 skips this cell reestablishment time and then reestablishes the cell when the next cell reestablishment time arrives.

5. Choose **MAXUEPOWERPARA** to set the maximum allowed uplink TX power of a UE.

&#9737; **NOTE**

> If the maximum TX power of the UE is too low, the UE may not receive the AP signals, and thus the UE cannot process services. If the maximum TX power is too high, the uplink interference of other cells is generated.

&#9737; **NOTE**

> For details about how to set the parameters, see **Help** in the corresponding configuration window.

**Step 3** After the parameter setting is complete, click **Apply**. A system message is displayed, indicating whether the parameter setting is successful.

**----End**

# 5.3 Modifying Automatic Pilot Adjustment Parameters

This chapter describes how to modify the automatic pilot adjustment parameters. You need to set the automatic pilot adjustment parameters for the ePico3801 to ensure that the interference is effectively reduced and the voice quality meets the requirements. In normal cases, these parameters need not be modified after the parameter setting is complete.

## Prerequisite

- The parameters of the ePico zone have been set successfully.

- You have logged in to the AP Manager (APM). The login account belongs to the Administrator or Operators group.

## Context

ePico3801 supports two automatic pilot adjustment modes: fast automatic pilot adjustment based on dialing and period automatic pilot adjustment based on measurement.

## Procedure

**Step 1** Log in to the APM. Choose **Configuration** > **Single Configuration** and select an ePico3801 to be maintained. Then, click **Configure** to enter the configuration window.

**Step 2** Choose **Terminal Parameter** > **WIRELESS** > **Configuration** in the navigation tree to configure the automatic pilot adjustment parameters.

1. Choose **PCPICHPWR** to set the BCH transmit power from the PCPICH transmit power (PCPICH).

2. Choose **AUTOPOWER** to set the automatic pilot adjustment algorithm based on calls.

3. Choose **AUTOPOWERSTAT** to set the automatic pilot adjustment algorithm based on measurement.

4. Choose **AUTOTESTNUM** to set the automatic pilot test number of the ePico3801.

&#9737; **NOTE**

> For details about how to set the parameters, see **Help** in the corresponding configuration window.

**Step 3** After the parameter setting is complete, click **Apply**. A system message is displayed, indicating whether the parameter setting is successful.

**----End**

# 5.4 Adjusting Mobility Management Parameters

This chapter describes how to adjust the ePico3801 parameters related to the cell reselection and handover if required. In normal cases, the information of the ePico cell is configured through automatic network planning. No manual configuration is required.

5.4.1 Modifying 3G Macro Neighboring Cells
This chapter describes how to manually add 3G macro neighboring cells on the AP Manager (APM). This operation can be performed only in manual network planning mode.

5.4.2 Modifying 2G Macro Neighboring Cells
This chapter describes how to manually add 2G macro neighboring cells on the AP Manager (APM). This operation can be performed only in manual network planning mode.

5.4.3 Modify HCS Reselection Parameters
This chapter describes how to modify the hierarchical cell structure (HCS) parameters of the ePico3801. The ePico3801 supports the preferential camping-on mode of the HCS. You can adjust the configuration to ensure that the ePico cell has a high priority. In this case, the UE preferentially selects an ePico cell to camp on it. This requires that the HCS parameters are also set in the macro network.

5.4.4 Modifying Signal Quality Offset Reselection Parameters
This chapter describes how to modify the signal quality offset reselection parameters. The ePico supports the reselection camping-on mode based on the signal quality offset. You can adjust the signal quality offset value of the ePico to ensure that the UE preferentially selects an ePico cell to be a serving cell after comparing the signal quality of the macro cell with the signal quality of the ePico cell.

5.4.5 Modifying the ePico3801 Parameters Related to the Handover to 3G Macro Cells
This chapter describes how to set the ePico3801 parameters manually to implement the handover to the 3G macro cells or ePico cells. In normal cases, these parameters of the ePico3801 are set automatically. No manual setting is required.

5.4.6 Modifying the ePico3801 Parameters Related to the Handover to 2G Macro Cells
This chapter describes how to modify the ePico3801 parameters manually to implement the handover to the 2G macro cells. In normal cases, these parameters of the ePico3801 are set automatically. No manual setting is required.

# 5.4.1 Modifying 3G Macro Neighboring Cells

This chapter describes how to manually add 3G macro neighboring cells on the AP Manager (APM). This operation can be performed only in manual network planning mode.

## Prerequisite

- The parameters of the ePico zone have been set successfully.

- You have logged in to the APM. The login account belongs to the Administrator or Operators group.

## Context

If the signal quality of a UE in an ePico cell is poor, the UE needs to be handed over to a 3G inter-RAT neighboring cell. In this case, the information about 3G neighboring cells needs to be configured.

📖 **NOTE**

> If the 2G inter-RAT neighboring cells also exist, however, the UE may be handed over to a 2G or 3G neighboring cell. This is determined by the parameter setting. For details, see **5.4.5 Modifying the ePico3801 Parameters Related to the Handover to 3G Macro Cells**.

## Procedure

**Step 1** Log in to the APM. Choose **Configuration** > **Single Configuration** and select an ePico3801 to be maintained. Then, click **Configure** to enter the configuration window.

**Step 2** Choose **Terminal Parameter** > **WIRELESS** > **Configuration** in the navigation tree to configure the 3G macro neighboring cell parameters.

1. Choose **NRNC** to set the information about the neighboring RNCs.

2. Choose **NRNCCELL** to add, delete, or modify the cells controlled by the neighboring RNCs.

3. Choose **INTERFREQNCELL** to add, delete, or modify the inter-frequency neighboring cells.

4. Choose **INTRAFREQNCELL** to add, delete, or modify the intra-frequency neighboring cells.

📖 **NOTE**

- The commands in **Step 2.2**, **Step 2.3**, and **Step 2.4** can be executed only after the information about the neighboring RNCs is configured.

- For details about how to set the parameters, see **Help** in the corresponding configuration window.

**Step 3** After the parameter setting is complete, click **Apply**. A system message is displayed, indicating whether the parameter setting is successful.

**----End**

# 5.4.2 Modifying 2G Macro Neighboring Cells

This chapter describes how to manually add 2G macro neighboring cells on the AP Manager (APM). This operation can be performed only in manual network planning mode.

## Prerequisite

- The parameters of the ePico zone have been set successfully.

- You have logged in to the APM. The login account belongs to the Administrator or Operators group.

## Context

If the signal quality of a UE in an AP cell is poor, the UE needs to be handed over to a 2G inter-RAT neighboring cell. In this case, the information about 2G neighboring cells needs to be configured. If both the 2G and 3G neighboring cells exist, the UE is handed over to a 3G neighboring cell by default. If you require the UE to be handed over to a 2G neighboring cell, you need to run the **HOCOMM** command in the APM window to change the related parameter setting. For details, see **5.4.5 Modifying the ePico3801 Parameters Related to the Handover to 3G Macro Cells**.

## Procedure

**Step 1**  Log in to the APM. Choose **Configuration** > **Single Configuration** and select an ePico3801 to be maintained. Then, click **Configure** to enter the configuration window.

**Step 2**  Choose **Terminal Parameter** > **WIRELESS** > **Configuration** in the navigation tree to configure the automatic pilot adjustment parameters.

    1.    Choose **GSMCELL** to add the GSM neighboring cell information.

    2.    Choose **GSMNCELL** to configure the GSM neighboring cells.

    📖 **NOTE**

        For details about how to set the parameters, see **Help** in the corresponding configuration window.

**Step 3**  After the parameter setting is complete, click **Apply**. A system message is displayed, indicating whether the parameter setting is successful.

    **----End**

# 5.4.3 Modify HCS Reselection Parameters

This chapter describes how to modify the hierarchical cell structure (HCS) parameters of the ePico3801. The ePico3801 supports the preferential camping-on mode of the HCS. You can adjust the configuration to ensure that the ePico cell has a high priority. In this case, the UE preferentially selects an ePico cell to camp on it. This requires that the HCS parameters are also set in the macro network.

## Prerequisite

- The core network must support the HCS and the HCS parameters are set in the macro network.

- The parameters of the ePico zone have been set successfully.

- You have logged in to the AP Manager (APM). The login account belongs to the Administrator or Operators group.

## Context

The HCS priority of the ePico cell is set to the highest value. In addition, the HCS parameters and cell reselection parameters of the macro cell are set. In this case, UEs can preferentially reselect the ePico cell to be a serving cell.

## Procedure

**Step 1**  Log in to the APM. Choose **Configuration** > **Single Configuration** and select an ePico3801 to be maintained. Then, click **Configure** to enter the configuration window.

**Step 2**  Choose **Terminal Parameter** > **WIRELESS** > **Configuration** > **CELLHCS** in the navigation tree to set the HCS parameters.

    📖 **NOTE**

        For details about how to set the parameters, see **Help** in the corresponding configuration window.

**Step 3**  After the parameter setting is complete, click **Apply**. A system message is displayed, indicating whether the parameter setting is successful.

    **----End**

# 5.4.4 Modifying Signal Quality Offset Reselection Parameters

This chapter describes how to modify the signal quality offset reselection parameters. The ePico supports the reselection camping-on mode based on the signal quality offset. You can adjust the signal quality offset value of the ePico to ensure that the UE preferentially selects an ePico cell to be a serving cell after comparing the signal quality of the macro cell with the signal quality of the ePico cell.

## Prerequisite

- The parameters of the ePico zone have been set successfully.

- You have logged in to the AP Manager (APM). The login account belongs to the Administrator or Operators group.

## Context

When a UE tends to reselect a cell, it evaluates the intra-frequency, inter-frequency, and inter-RAT neighboring cells and then compares the measured EC/Io and RSCP values of the current serving cell with those of the pilot channels of the neighboring cells. After that, the UE selects a neighboring cell with the optimal signal quality to be a serving cell and camps on the cell.

## Procedure

**Step 1** Log in to the APM. Choose **Configuration** > **Single Configuration** and select an ePico3801 to be maintained. Then, click **Configure** to enter the configuration window.

**Step 2** Choose **Terminal Parameter** > **WIRELESS** > **Configuration** > **CELLSELRESEL** to set cell selection and cell reselection parameters.

&#x1F4D6; **NOTE**

> For details about how to set the parameters, see **Help** in the corresponding configuration window.

**Step 3** After the parameter setting is complete, click **Apply**. A system message is displayed, indicating whether the parameter setting is successful.

**----End**

# 5.4.5 Modifying the ePico3801 Parameters Related to the Handover to 3G Macro Cells

This chapter describes how to set the ePico3801 parameters manually to implement the handover to the 3G macro cells or ePico cells. In normal cases, these parameters of the ePico3801 are set automatically. No manual setting is required.

## Prerequisite

- The 3G macro neighboring cells have been configured automatically or manually.

- You have logged in to the AP Manager (APM). The login account belongs to the Administrator or Operators group.

## Procedure

**Step 1** Log in to the APM. Choose **Configuration** > **Single Configuration** and select an ePico3801 to be maintained. Then, click **Configure** to enter the configuration window.

**Step 2** Choose **Terminal Parameter** > **WIRELESS** > **Configuration** in the navigation tree to set the handover parameters.

1. Choose **INTRAFREQHO** to set the ePico3801-oriented intra-frequency handover measurement algorithm parameters.

2. Choose **INTERFREQHOCOV** to set the ePico3801-oriented inter-frequency handover measurement algorithm (based on coverage) parameters.

3. Choose **HOCOMM** to set common handover parameters.

&#x1F4D6; **NOTE**

> For details about how to set the parameters, see **Help** in the corresponding command configuration window.

**Step 3** After the parameter setting is complete, click **Apply**. A system message is displayed, indicating whether the parameter setting is successful.

**----End**

# 5.4.6 Modifying the ePico3801 Parameters Related to the Handover to 2G Macro Cells

This chapter describes how to modify the ePico3801 parameters manually to implement the handover to the 2G macro cells. In normal cases, these parameters of the ePico3801 are set automatically. No manual setting is required.

## Prerequisite

- The 2G macro neighboring cells have been configured automatically or manually.

- You have logged in to the AP Manager (APM). The login account belongs to the Administrator or Operators group.

## Procedure

**Step 1** Log in to the APM. Choose **Configuration** > **Single Configuration** and select an ePico3801 to be maintained. Then, click **Configure** to enter the configuration window.

**Step 2** Choose **Terminal Parameter** > **WIRELESS** > **Configuration** > **INTERRATHOCOV** in the navigation tree to set the inter-RAT handover algorithm parameters, such as the thresholds, hysteresis, and trigger delay time of the active set and the inter-RAT system.

&#x1F4D6; **NOTE**

> For details about how to set the parameters, see **Help** in the corresponding configuration window.

**Step 3** After the parameter setting is complete, click **Apply**. A system message is displayed, indicating whether the parameter setting is successful.

**----End**

# 5.5 Adjusting the Transport Network

This chapter describes how to adjust the transport network of the ePico3801.

### 5.5.1 Modifying Clock Synchronization Parameters

This chapter describes how to configure clock synchronization parameters of the ePico3801.
The clock synchronization ensures high clock precision so that the ePico3801 can work properly.

### 5.5.2 Modifying Transmission Parameters

This chapter describes how to modify transmission parameters. Generally, the transmission
parameters need not be modified after being set. Modifying transmission parameters may affect
the network connection. In addition, some transmission parameters being modified can take
effect only after the ePico3801 is restarted.

### 5.5.3 Modifying the VLAN Attributes

This chapter describes how to configure the VLAN attributes according to the service type.

# 5.5.1 Modifying Clock Synchronization Parameters

This chapter describes how to configure clock synchronization parameters of the ePico3801.
The clock synchronization ensures high clock precision so that the ePico3801 can work properly.

## Prerequisite

- The parameters of the ePico zone have been set successfully.

- You have logged in to the AP Manager (APM). The login account belongs to the
  Administrator or Operators group.

## Context

- The ePico3801 supports the following clock synchronization modes:

  – Clock synchronization over the Um interface: Under the coverage of the macro cell, the
    AP uses the main SCH to perform timeslot synchronization and then synchronizes the
    clock over the Um interface. The AP integrated with the GSM receiver supports two
    clock synchronization modes: 3G clock synchronization over the Um interface and 2G
    clock synchronization over the Um interface (preferred). 3G clock synchronization over
    the Um interface synchronizes clock from the CPICH with the surrounding 3G macro
    base stations. This mode implements the clock synchronization within a short period,
    but the ongoing services are disrupted. 2G clock synchronization over the Um interface
    synchronizes the clock output from the GSM receiver. This mode implements the clock
    synchronization within a short period and the ongoing services are not disrupted. Note
    that the neighboring cell information must be configured for the clock synchronization
    over the Um interface.

  – IP clock synchronization: If the AP is not in the coverage area of the macro cell or the
    AP is providing services, the IP clock synchronization mode is used. When the AP
    synchronizes the clock for the first time after it is switched on, the clock synchronization
    over the Um interface is started to ensure a fast clock synchronization. When the AP
    enters the normal working state, the IP clock synchronization is used to ensure the
    processing of the ongoing services provided by the AP.

- Clock status:

  – Free-run: If the clock synchronization is not being performed, for example, after the
    clock synchronization is successful or the clock synchronization fails due to the timer
    expiration, the clock is in free-run state.

– Fast pull-in: After the board starts the clock synchronization and detects that the clock packet is normal, the related algorithm calculates the required DA value based on the clock packet. During the calculation period, the clock is in fast pull-in state.

– Locked: The ePico3801 adjusts the system clock according to the calculated DA value. If the output clock is within the required precision range, the clock is locked. After that, the ePico3801 continues to receive clock packets for a certain period to adjust the DA value when the clock stays locked.

– Hold: After the clock synchronization is successful and the clock enters locked state, the ePico3801 receives clock packets for a certain period to adjust the DA value. If the clock source is lost or becomes abnormal during this period, the clock enters hold state. If the clock is being synchronized, another clock synchronization cannot be started.

## Procedure

**Step 1** Log in to the APM. Choose **Configuration** > **Single Configuration** and select an ePico3801 to be maintained. Then, click **Configure** to enter the configuration window.

**Step 2** Choose **Terminal Parameter** > **OM** > **Maintenance** in the navigation tree to set clock synchronization parameters of the ePico3801.

1. Choose **SET_IPCLKPARAM** to set IP clock parameters.

2. Choose **SET_IPCLKTEST** to perform the IP clock delay and jitter test.

📖 **NOTE**

For details about how to set the parameters, see **Help** in the corresponding command configuration window.

**Step 3** Choose **Terminal Parameter** > **TRANSFER** > **Configuration** > **MD5PARA** in the navigation tree to configure the MD5 username and password. This command is used when the ePico3801 uses the MD5 authentication.

**Step 4** After the parameter setting is complete, click **Apply**. A system message is displayed, indicating whether the parameter setting is successful.

**----End**

# 5.5.2 Modifying Transmission Parameters

This chapter describes how to modify transmission parameters. Generally, the transmission parameters need not be modified after being set. Modifying transmission parameters may affect the network connection. In addition, some transmission parameters being modified can take effect only after the ePico3801 is restarted.

## Prerequisite

● The parameters of the ePico zone have been set successfully.

● You have logged in to the AP Manager (APM). The login account belongs to the Administrator or Operators group.

## Procedure

**Step 1** Log in to the APM. Choose **Configuration** > **Single Configuration** and select an ePico3801 to be maintained. Then, click **Configure** to enter the configuration window.

**Step 2** Choose **Terminal Parameter** > **TRANSFER** > **Configuration** in the navigation tree to set transmission parameters.

1. Choose **DNSSERVER** to set the IP address of the DNS server.

2. Choose **DSCPMAP** to set the priority of the service packet.

3. Choose **ETHPORT** to set the FE port parameters.

4. Choose **IPRT** to set the IP route.

5. Choose **IPSECALGORITHM** to set the IPSEC algorithm.

6. Choose **LIMITRATE** to set the limit rate for port transmission.

7. Choose **MULPARA** to set the transmission bandwidth multiplexing function.

8. Choose **PPPOEATTR** to set the attributes of the PPPoE link.

9. Choose **SALIFETIME** to set the life cycle of the SA.

10. Choose **SCTPPARA** to set the SCTP parameters.

11. Choose **URL** to set the domain name or IP address of the preset SGW.

&#x1f4d5; **NOTE**

> For details about how to set the parameters, see **Help** in the corresponding command window.

**Step 3** After the parameter setting is complete, click **Apply**. A system message is displayed, indicating whether the parameter setting is successful.

**----End**

# 5.5.3 Modifying the VLAN Attributes

This chapter describes how to configure the VLAN attributes according to the service type.

## Prerequisite

- The parameters of the ePico zone have been set successfully.

- You have logged in to the AP Manager (APM). The login account belongs to the Administrator or Operators group.

- The VLANs have been correctly configured for the LAN switch and the ePico3801 has been connected to the corresponding VLAN interface.

## Procedure

**Step 1** Log in to the APM. Choose **Configuration** > **Single Configuration** and select an ePico3801 to be maintained. Then, click **Configure** to enter the configuration window.

**Step 2** Choose **Terminal Parameter** > **TRANSFER** > **Configuration** > **VLAN** in the navigation tree to configure the VLAN attributes.

&#x1f4d5; **NOTE**

> For details about how to set the parameters, see **Help** in the corresponding configuration window.

**Step 3** After the parameter setting is complete, click **Apply**. A system message is displayed, indicating whether the parameter setting is successful.

**----End**

# 5.6 Adjusting the ePico3801 Functions

This chapter describes how to adjust the application of the ePico3801 basic functions. The basic functions consist of the HSPA status, emergency call redirection switch, permission reject reason, location indication mode, differentiated billing mode, and location positioning mode.

### 5.6.1 Modifying the HSPA Status
This chapter describes how to modify the HSPA status of the ePico cell so that the HSPA function can be activated or deactivated.

### 5.6.2 Configuring the Emergency Call Redirection Switch
This chapter describes how to configure the emergency call redirection switch on the AP Manager (APM) so that the emergency calls can be made in other cells.

### 5.6.3 Modifying the Access Reject Reason
This chapter describes how to manually modify the UE access reject reason on the AP Manager (APM). The reject reason can be configured as required.

### 5.6.4 Modifying the Location Indication Mode
This chapter describes how to configure the location indication mode on the AP Manager (APM) so that the UEs can receive location messages after entering the ePico cell. The location indication mode is classified into the PLMN location indication and the SMS location indication.

### 5.6.5 Setting the Differentiated Billing Parameters
This chapter describes how to set the differentiated billing parameters on the AP Manager (APM).

### 5.6.6 Configuring the Locating Function
This chapter describes how to configure the ePico3801 locating function so that the UEs in the coverage area of the ePico3801 can be accurately located.

# 5.6.1 Modifying the HSPA Status

This chapter describes how to modify the HSPA status of the ePico cell so that the HSPA function can be activated or deactivated.

## Prerequisite

- The parameters of the ePico zone have been set successfully.
- You have logged in to the AP Manager (APM). The login account belongs to the Administrator or Operators group.

## Procedure

**Step 1** Log in to the APM. Choose **Configuration** > **Single Configuration** and select an ePico3801 to be maintained. Then, click **Configure** to enter the configuration window.

**Step 2** Choose **Terminal Parameter** > **WIRELESS** > **Configuration** in the navigation tree to set the HSPA status parameters of the ePico3801.

1. Choose **CELLHSUPASTATE** to set the cell HSUPA active state.

2. Choose **CELLHSDPASTATE** to set the cell HSDPA active state.

📖 **NOTE**

> For details about how to set the parameters, see **Help** in the corresponding configuration window.

**Step 3** After the parameter setting is complete, click **Apply**. A system message is displayed, indicating whether the parameter setting is successful.

**----End**

# 5.6.2 Configuring the Emergency Call Redirection Switch

This chapter describes how to configure the emergency call redirection switch on the AP Manager (APM) so that the emergency calls can be made in other cells.

## Prerequisite

- The parameters of the ePico zone have been set successfully.

- You have logged in to the APM. The login account belongs to the Administrator or Operators group.

## Context

The emergency call redirection function can be activated by parameter setting. After this function is activated, the emergency calls can be redirected to inter-frequency or inter-RAT neighboring cells (inter-frequency neighboring cells are preferred). If there is no inter-frequency or inter-RAT neighboring cell around the ePico cell, the emergency calls are still initiated from the ePico cell.

## Procedure

**Step 1** Log in to the APM. Choose **Configuration** > **Single Configuration** and select an ePico3801 to be maintained. Then, click **Configure** to enter the configuration window.

**Step 2** Choose **Terminal Parameter** > **WIRELESS** > **Configuration** > **CORRMALGOSWITCH** in the navigation tree to configure the emergency call redirection switch.

📖 **NOTE**

> For details about how to set the parameters, see **Help** in the corresponding configuration window.

**Step 3** After the parameter setting is complete, click **Apply**. A system message is displayed, indicating whether the parameter setting is successful.

**----End**

# 5.6.3 Modifying the Access Reject Reason

This chapter describes how to manually modify the UE access reject reason on the AP Manager (APM). The reject reason can be configured as required.

## Prerequisite

- The parameters of the ePico zone have been set successfully.

- You have logged in to the APM. The login account belongs to the Administrator or Operators group.

## Context

When a UE without authorization attempts to access an ePico cell in close mode, the ePico cell sends a rejection message to the UE. As a result, the UE fails to access the ePico cell. The reject reason can be configured as required.

## Procedure

**Step 1** Log in to the APM. Choose **Configuration** > **Single Configuration** and select an ePico3801 to be maintained. Then, click **Configure** to enter the configuration window.

**Step 2** Choose **Terminal Parameter** > **WIRELESS** > **Configuration** > **ACCESSREJECTOPT** in the navigation tree to configure the access reject reason.

  📖 **NOTE**

  For details about how to set the parameters, see **Help** in the corresponding command window.

**Step 3** After the parameter setting is complete, click **Apply**. A system message is displayed, indicating whether the parameter setting is successful.

  **----End**

# 5.6.4 Modifying the Location Indication Mode

This chapter describes how to configure the location indication mode on the AP Manager (APM) so that the UEs can receive location messages after entering the ePico cell. The location indication mode is classified into the PLMN location indication and the SMS location indication.

## Context

The PLMN location indication or SMS location indication mode can be selected as required so that the UEs can receive location messages after entering the ePico cell.

- PLMN location indication: When a UE enters an ePico cell, the ePico3801 sends a customized message to the UE. After the UE associates the PLMN ID with the message sent from the ePico3801, the customized message instead of the PLMN ID is displayed on the UE. This indicates that the UE is in the coverage area of the ePico cell. After the UE moves to a macro cell, the PLMN ID of the macro cell is displayed on the UE. This indicates that the UE is in the coverage area of the macro cell.

- SMS location indication: When a UE enters an ePico cell, the ePico3801 sends an SMS message to notify that the UE is in the coverage area of the ePico3801 cell.

  📖 **NOTE**

  The contents of both the PLMN location indication and SMS location indication need to be set in the AHR subscription information. For details, see the *AHR Operator Guide*.

  If you select the SMS location indication, you need to enable the SMS location indication switch and set the penalty time as required.

## Procedure

**Step 1** Log in to the APM. Choose **Configuration** > **Single Configuration** and select an ePico3801 to be maintained. Then, click **Configure** to enter the configuration window.

**Step 2** Choose **Terminal Parameter** > **WIRELESS** > **Configuration** > **LOCATIONINDSWITCH** in the navigation tree to configure the location indication mode.

&#9906; **NOTE**

> For details about how to set the parameters, see **Help** in the corresponding command window.

**Step 3** After the parameter setting is complete, click **Apply**. A system message is displayed, indicating whether the parameter setting is successful.

**----End**

## 5.6.5 Setting the Differentiated Billing Parameters

This chapter describes how to set the differentiated billing parameters on the AP Manager (APM).

### Prerequisite

- User level is defined in the subscription information.

- The parameters of the ePico zone have been set successfully.

- You have logged in to the APM. The login account belongs to the Administrator or Operators group.

### Context

The billing requirement is differentiated according to the identity of a UE in different scenarios. This ensures operators to provide individualized services to users. Currently, ePico provides four levels of UE identities: owner, member, friend, and guest.

### Procedure

**Step 1** Log in to the APM. Choose **Configuration** > **Zone Configuration** and select an ePico to be maintained. Then, click **Configure**.

**Step 2** In the displayed window, select the correct version from the **Version** drop-down list, and then click **Next**.

**Step 3** Choose **Zone Parameter** > **WIRELESS** > **Configuration** > **APCELLAC** to set the differentiated billing parameters.

&#9906; **NOTE**

> For details about how to set the parameters, see **Help** in the corresponding command window.

**Step 4** After the parameter setting is complete, click **Apply**. A system message is displayed, indicating whether the parameter setting is successful.

**----End**

## 5.6.6 Configuring the Locating Function

This chapter describes how to configure the ePico3801 locating function so that the UEs in the coverage area of the ePico3801 can be accurately located.

### Prerequisite

- The registered location information (longitude and latitude) of the ePico3801 is correctly recorded in the AHR subscription information. For details, see the *AHR Operator Guide*.

● The parameters of the ePico zone have been set successfully.

● You have logged in to the AP Manager (APM). The login account belongs to the Administrator or Operators group.

● The locating mode of the ePico3801 is specified.

## Context

The ePico supports the following UE locating modes:

● UE emergency call locating: When a UE initiates an emergency call, the ePico3801 reports the Service Area Identity (SAI) of itself to the core network. After receiving the SAI, the core network sends the SAI and the MSISDN of the UE to the corresponding emergency call center. After that, the emergency center locates the UE according to the SAI. The reported SAI, however, is the SAI of the ePico zone. Thus, the locating precision is not high.

● LCS service: The ePico3801 reports the SAI or geographical location of itself to the core network according to the location indication displayed on the LCS server. After receiving the SAI or geographical location information, the core network sends the information to the LCS server to locate the UE.

● AGPS locating: If the ePico3801 is installed with an AGPS device, the ePico3801 directly reports the geographical location to the core network after receiving the information from the AGPS device.

## Procedure

**Step 1** Set the SAC of the ePico zone. For details, see **5.6.5 Setting the Differentiated Billing Parameters**.

**Step 2** Choose **Terminal Parameter** > **WIRELESS** > **Configuration** > **SMLC** in the navigation tree to set the emergency call locating parameters.

 **NOTE**

> After an emergency call is initiated, if the core network sends a locating request, the AP responds to the request according to the parameters set on the SMLC.
>
> For details about how to set the parameters, see **Help** in the corresponding command window.

**Step 3** After the parameter setting is complete, click **Apply**. A system message is displayed, indicating whether the parameter setting is successful.

**----End**

# 6 Maintaining the ePico3801

## About This Chapter

This chapter describes how to maintain the ePico3801. After the ePico3801 is put into use, you need to perform routine maintenance on the ePico3801 to ensure the proper running of the ePico3801.

6.1 ePico3801 Routine Maintenance Items
This chapter describes how to perform routine checks on the hardware and monitor the running status of the ePico3801.

6.2 Powering On and Powering Off the ePico3801
This chapter describes how to power on and power off the ePico3801.

6.3 Replacing the ePico3801
This chapter describes how to replace the ePico3801. Replacing the ePico3801 disrupts the services carried on the ePico3801.

# 6.1 ePico3801 Routine Maintenance Items

This chapter describes how to perform routine checks on the hardware and monitor the running status of the ePico3801.

## Equipment Maintenance

**Table 6-1** describes the maintenance items for the ePico3801 equipment.

**Table 6-1** Maintenance items for the equipment

| Item | Checking Frequency | Operation | Reference Standard |
|---|---|---|---|
| Equipment surface | Monthly or quarterly | Check whether the surface of the equipment is damaged and whether the label on the equipment is legible. | The surface of the equipment is not damaged and the label on the equipment is legible. |
| Equipment cleanness | Monthly or quarterly | Check whether the equipment is clean. | The surface of the equipment is clean. |
| LEDs | Monthly or quarterly | Check whether the LEDs on the equipment are normal. | Refer to the meanings of the LED status. |

## Monitoring of Running Status

You can choose one of the following methods to monitor the running status of the ePico3801.

- **3.1 Logging in to the ePico WebUI**. Select the diagnose mode in the WebUI window. The WebUI provides equipment trouble diagnose, wireless trouble diagnose, and transfer trouble diagnose and directly displays the diagnose result.

- You can perform the interface tracing and real-time monitoring of the ePico3801 on the Local Maintenance Terminal (LMT) to analyze the running status of the ePico3801. For details, see the *LMT User Guide*.

- You can perform software management, alarm management, data backup, and performance counter measurement of the ePico3801 through the AP Manager (APM). The ePico3801 automatically saves the configuration data and performance counter logs periodically on the APM. This facilitates the query and analysis of the ePico3801 running status. For details, see the *APM Operator Guide*.

# 6.2 Powering On and Powering Off the ePico3801

This chapter describes how to power on and power off the ePico3801.

This chapter describes how to power on the ePico3801, and check the running status of the ePico3801 based on the status of the LEDs.

6.2.2 Powering Off the ePico3801
This chapter describes how to power off the ePico3801.

# 6.2.1 Powering On the ePico3801

This chapter describes how to power on the ePico3801, and check the running status of the ePico3801 based on the status of the LEDs.

## Prerequisite

- The hardware and cables of the ePico3801 are installed.

- The input voltage stays within a normal range.

- The PSE is powered on normally in the case that the PoE power supply is available.

## Procedure

**Step 1** Provide the power supply to the ePico3801.

- AC power supply: Connect the power cable of the ePico3801 to the AC power supply terminal bar, and power on the ePico3801.

- PoE power supply: Connect the **PoE** port on the PSE to the **LAN** port on the ePico3801 main equipment through the Ethernet cable to power on the ePico3801.

**Step 2** Open the LED cover and check the status of the LEDs.

For the normal status of the LEDs, see **Ports and Buttons of the ePico3801**.

**Step 3** Perform the subsequent operation according to the status of the LEDs.

| If... | Then... |
|---|---|
| The LEDs are in normal state | The ePico3801 is running properly. Go to **Step 4**. |
| The PWR LED is in abnormal state | Perform the following operations to rectify the fault: <br> ● Check the input power. <br> ● Replace the ePico3801. <br> After the fault is rectified, power on the ePico3801 again. |
| The RUN/ALM LED is in abnormal state | Perform the following operations to rectify the fault: <br> ● Reset the ePico3801. <br> ● Clear the alarm. <br> ● Replace the ePico3801. <br> After the fault is rectified, power on the ePico3801 again. |

| If... | Then... |
|---|---|
| The AIR LED is in abnormal state | Perform the following operations to rectify the fault:<br>● Eliminate the radio interference source around the ePico3801.<br>● Change the position for installing the ePico3801.<br>● Reset the ePico3801.<br>After the fault is rectified, power on the ePico3801 again. |
| The LINK LED is in abnormal state | Perform the following operations to rectify the fault:<br>● Reconnect the Ethernet cable.<br>● Replace the Ethernet cable.<br>● Reset the ePico3801.<br>● Replace the ePico3801.<br>After the fault is rectified, power on the ePico3801 again. |

**Step 4** Close the LED cover. The powering on procedure is complete.

**----End**

## 6.2.2 Powering Off the ePico3801

This chapter describes how to power off the ePico3801.

### Procedure

**Step 1** Power off the ePico3801 in different power supply modes.

| If... | Then... |
|---|---|
| The AC power supply is available | Go to **Step 2**. |
| The PoE power supply is available | Go to **Step 3**. |

**Step 2** Remove the power cable from the AC power terminal bar to power off the ePico3801.

**Step 3** Remove the RJ45 connector of the Ethernet cable from the LAN port on the ePico3801 to power off the ePico3801 and cut off the power of the PSE.

**----End**

# 6.3 Replacing the ePico3801

This chapter describes how to replace the ePico3801. Replacing the ePico3801 disrupts the services carried on the ePico3801.

### Prerequisite

● A new ePico3801 for replacement is ready and the bar code is recorded.

- The position for installing the ePico3801 is recorded.

- The cable connections of the ePico3801 are recorded.

- The user service tool kit is ready.

## Procedure

**Step 1** **Power off the ePico3801**.

**Step 2** Remove all the cables from the ePico3801 and take appropriate insulation measures.

**Step 3** Remove the ePico3801.

**Step 4** Install the new ePico3801. For details about the installation procedures, see the *ePico3801 Quick Guide*.

**Step 5** Connect all the cables to the new ePico3801.

**Step 6** **Power on the ePico3801**.

**Step 7** **Perform initial configuration on the ePico3801**.

**Step 8** Perform commissioning by referring to the **4 Commissioning the ePico3801** and ensure that the corresponding services in the cell provided by the new ePico3801 are normal.

**Step 9** Adjust the configuration of the ePico3801 as required by referring to **5 Reconfiguring the ePico3801**.

**----End**

## Postrequisite

Contact the local Huawei office to handle the faulty ePico3801.

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