



# **AM4000D Outdoor CPE User Manual**

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## PLEASE READ THESE SAFETY PRECAUTIONS!

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### RF Energy Health Hazard



The radio equipment described in this guide uses radio frequency transmitters. Although the power level is low, the concentrated energy from a directional antenna may pose a health hazard.

Do not allow people to come in close proximity to the front of the antenna while the transmitter is operating.

### Protection from Lightning



Before connecting this instrument to the power line, make sure that the voltage of the power source matches the requirements of the instrument. The unit must be standards.

### Disposal and Recycling Information



Pursuant to the WEEE EU Directive electronic and electrical waste must not be disposed of with unsorted waste. Please contact your local recycling authority for disposal of this product.

### Reduction of Hazardous Substances



This CPE is compliant with the EU Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Regulation (Regulation No 1907/2006/EC of the European Parliament

and of the Council) and the EU Restriction of Hazardous Substances (RoHS) Directive (Directive 2002/95/EC of the European Parliament and of the Council).

### FCC Notice, USA

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

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE 1: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

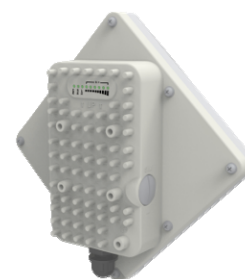
NOTE 2: Any changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

## FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 30cm between the radiator & your body.

### 1. Overview

The ODU is a high performance 4G LTE outdoor CPE product designed to enable quick LTE fixed data service deployment to the remote customers. It provides high data throughput and networking features to end users who need both bandwidth and quality service in the remote area.



#### 1.1. User Interface Specification

Model	Description & User Interface
ODU	<ul style="list-style-type: none"><li>- Panel antenna: B41 13dBi</li><li>- 1 RJ45 10/100M LAN Port</li><li>- PWR, RUN, LAN, SIM, LTE(1-5) LEDs</li><li>- 24 VDC PoE supply, ODU Power &lt;12 Watts</li><li>- Dimensions: 203 mm (L) x 203 mm (W) x 76.5 mm (D)</li><li>- Weight: &lt; 1.5 Kg</li></ul>

#### 1.2. LTE Interface Specification

Frequency Bands	Band 41
Radio Access	3GPP LTE Release9
Operation Mode	TDD, 2RX, 1TXD, DLMIMO
Output Power	> 23 dBm at antenna port
Throughput	Category 4
SIM Support	SIM card slot

## 2. GettingStarted

### 2.1. Packing list and CPE Unit

Upon receiving the product, please unpack the product package carefully. Each product is shipped with the following items:

**Table 2-1 Packing List**

Outdoor CPE Products	Quantity
ODU unit	1
Power adapter	1
Power Line	1
Mounting brackets	1
PC Ethernet Cable	1

If you find any of the items missed, please contact our local distributor immediately.

#### **CPE Unit:**

Please unpack the package and check the units as following list.



### 2.2. Installing the Equipment

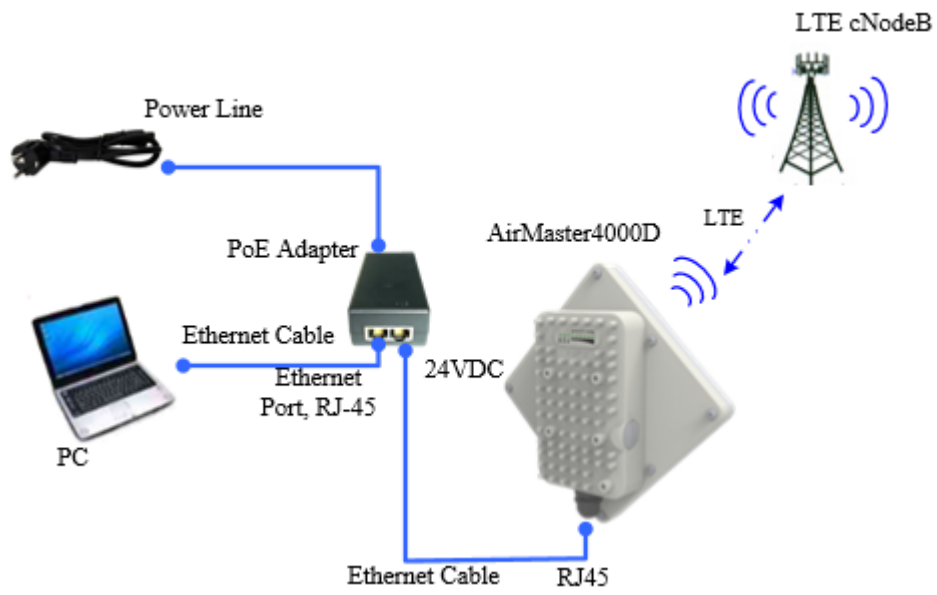
#### ◆ **Device logic connection**

For outdoor CPE product, it is suggested that the CPE device be installed in a shaded area to avoid direct sun light exposure which may cause over heat in certain extreme weather condition.

The CPE should be properly grounded for proper protection against lightning or power surge.

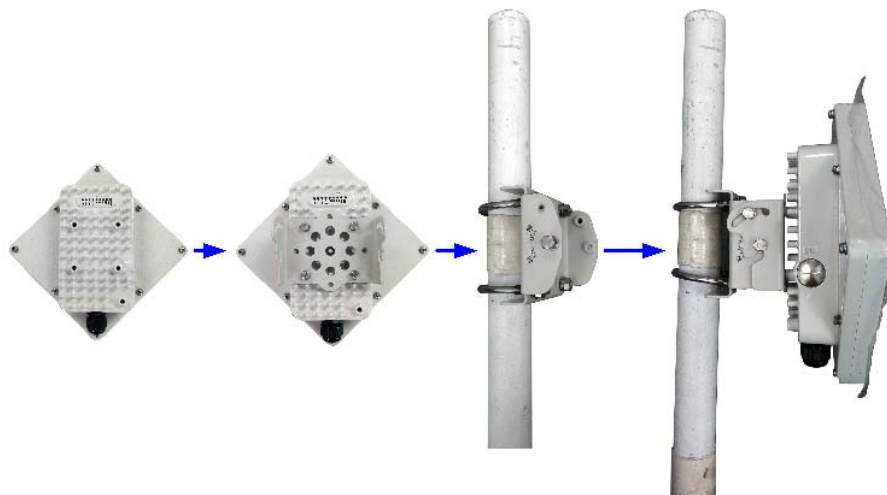
To power on the device, the outdoor CPE must uses a 24V PoE integrated DC power supply adapter. The power adapters can operate in 90-250V AC range and therefore can be used in different country. Once the device is powered up, the user should wait for about 2 minutes before the device becomes operational. For CPE with the RUN LED indicator, a slowly flashing light indicates the system has completed the startup procedure.

To connect PC, LAN switch or other type of IP device to the CPE product, the user should use standard CAT5 Ethernet cable and connect to the appropriate LAN port. Once connect the CPE LAN LED indicator should come on.



◆ **Installing Outdoor Unit (ODU)**

**Mounting Bracket::**



**Header Connection:**





#### ◆ LED Display

LED Indicator	Function	Description
PWR	Power Indicator	Green Color – Device is powered on
RUN	System Run Indicator	Fast Blinking – Device is rebooting Slow Blinking – Device is in normal operation
LAN	LAN port status	Solid Green – LAN port is up Blinking Green – LAN data activity in progress
SIM	SIM Card Indicator	Light is on – SIM card state ready.
RF(5LEDs)	RF Signal Strength	5 level signal strengths indication by 5 green LEDs 1 green LED: RSRP<= -118dBm 2 green LEDs: -118 dBm <=RSRP< -105 dBm 3 green LEDs:-105dBm<=RSRP< -95dBm 4 green LEDs:-95dBm<=RSRP< -85dBm 5 green LEDs:-85dBm<=RSRP

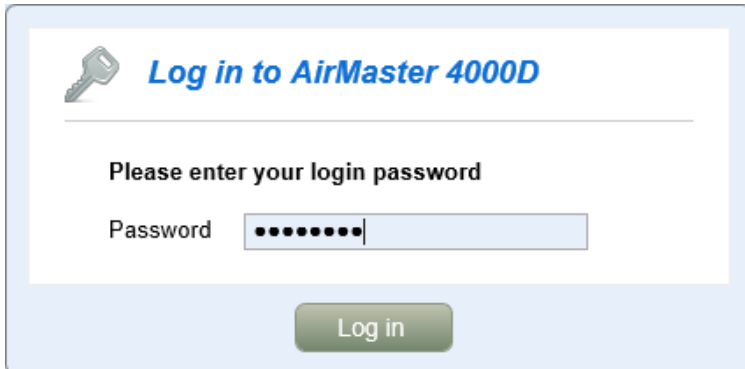
### 3. Managing CPE Device

The ODU supports several management interfaces including TELNET, WEB, and TR-069 for local or remote managements. However normal end user is only provided with WEB based access

#### 3.1. WEB Login--192.168.0.1

It is a preferred to setup the CPE using a Web browser from a local PC connected to device LAN

port. The user should ensure that the connected PC acquired IP address via DHCP from the device. After IP connectivity is established between the PC and CPE device, the user may launch a Web browser and specify <http://192.168.0.1> in the address bar. A window will pop up requesting password. Input the user login password and then click the “Log In” button. After successful log on, the default home page of the WEB GUI interface will appear. Note that the default user password is “admin123”.



### 3.2. LTE Status Display-Overview

Once the user is logged in, the following window LTE Information window will be prompted for viewing. The page gives quite detailed LTE information including the System Information, the PCI and the Connection status.



**LTE Information**

**System Information**

Manufacturer	KZ TECH
Model Name	AirMaster 4000D
Chip Model	SQN31X0
Serial Number	KZT082FFD984
IMEI	864423020401062
IMSI	460119990623071
Duplexing Scheme	TDD
Supported Band	41
Firmware Version	3.3.2.0-0_[M]

**Radio Information**

RSRP	-115.34 / -117.15 dBm
RSSI	-73.61 dBm
RSRQ	-11.44 dB
SINR	6.03 dB
CQI	10
Rank Indication	0
Transmit Mode	TM3
UL/DL Bandwidth	20000 / 20000 KHz
UL/DL Earfcn	41140 / 41140
RRC State	active
EMM State	registered home
CRNTI	4387
PCI	237
eNodeB ID	492295
Cell ID	96
TX Power	23 dBm
UL/DL Throughput	0 / 0 Kbps

**Connection**

Media State	ATTACHED
Connection Time	2min 52 sec
SIM Card State	Ready
Signal Quality	25%
Network Description	ctlte.MNC011.MCC460.GPRS
Registered PLMN	46011
Bearer Info	ID 5, QCI 8, RLC TM
IPv4 Address	10.95.77.139
IPv4 DNS	202.96.128.86 202.96.134.133
IPv6 Address	
IPv6 DNS	

**Activity**

Sent	18,323 bytes / 133 packets
Received	42,359 bytes / 98 packets

**Help**

**System Information:**  
This section shows the basic device 4G Radio hardware and firmware information.

**Radio Information:**  
This section shows the basic wireless information.

**Connection:**  
This section shows the status of connection for 4G Radio.

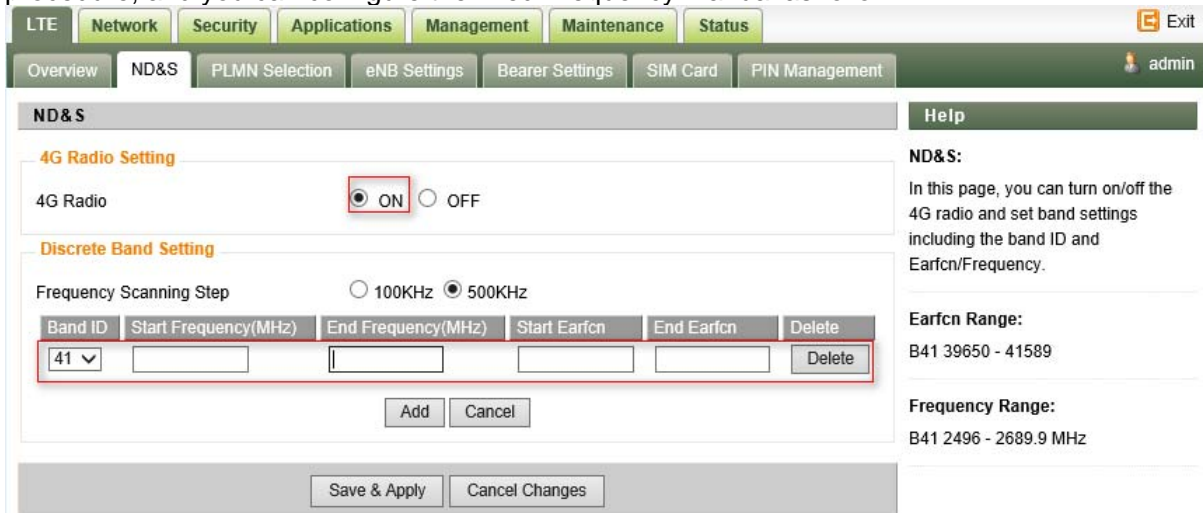
**Activity:**  
Shows received and sent wan packet/byte statistics

### 3.3. LTE Configuration

#### ◆ Radio Settings-ND&S Configure

There is a LTE radio button which is used for the user can turn the radio on or off to restart the LTE module.

The CPE would scan frequency auto as soon as the system has completed the startup procedure, and you can configure the fixed Frequency manual as follow:

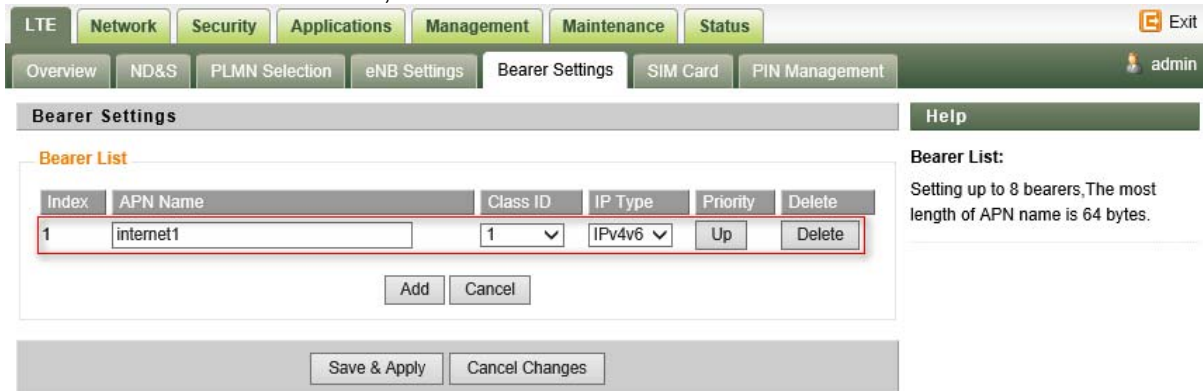


Band ID	Start Frequency(MHz)	End Frequency(MHz)	Start Earfcn	End Earfcn	Delete
41					Delete

**Note:** After configure any parameters of the device, you must click the “**Save & Apply**” button to save the configuration otherwise the configuration will not take effect.

#### ◆ APN Setting-Bearer configure

The Bearer List is design for the operator to configure the APN. You can configure the only one APN for all the service classes, as follow:



Index	APN Name	Class ID	IP Type	Priority	Delete
1	internet1	1	IPv4v6	Up	Delete

And the operator also can configure two APNs for Manage and data service classes. As follow picture, the Management Data Class will be transport via the “internet1 “ network and the Data Traffic Class will be transport via the “internet2” network.

LTE Network Security Applications Management Maintenance Status Exit

Overview ND&S PLMN Selection eNB Settings **Bearer Settings** SIM Card PIN Management admin

### Bearer Settings

**Bearer List**

Index	APN Name	Class ID	IP Type	Priority	Delete
1	internet1	1	IPv4v6	Up	Delete
2	internet2	2	IPv4v6	Up	Delete

Add Cancel

Save & Apply Cancel Changes

**Help**

**Bearer List:**  
Setting up to 8 bearers, The most length of APN name is 64 bytes.

And the CPE will obtain two different IP for two networks, as follow:

LTE Network Security Applications Management Maintenance Status Exit

System Network **LAN** admin

### Network Status

**PDN Info**

PDN Index: 1

APN: ctlte.MNC011.MCC460.GPRS

IP Address: 10.71.72.38

DNS: 202.96.128.86 202.96.134.133

IPv6 Address:

IPv6 DNS:

CID: 1

**Route**

Destination	Default Gateway	Genmask	Flags	Metric	Ref	Use	Iface
default	*	0.0.0.0	U	0	0	0	icc0.1121
10.1.1.0	*	255.255.255.0	U	0	0	0	br0
127.0.0.0	*	255.0.0.0	U	0	0	0	lo
192.168.0.0	*	255.255.255.0	U	0	0	0	br0

**ARP**

IP Address	HW type	Flags	HW Address	Mask	Device
192.168.0.100	0x1	0x2	f4:8e:38:72:fa:c0	*	br0
202.96.128.86	0x1	0x2	6c:ad:f0:02:d9:86	*	icc0.1122

**PDN Info:**  
When the wanprotol is PDN show PDN IP Map.

**Route:**  
The routing table information.

**ARP:**  
The ARP table information.

LTE Network Security Applications Management Maintenance Status Exit

System Network LAN admin

### Network Status

**PDN Info**

PDN Index: 2

APN: ctlte.MNC011.MCC460.GPRS

IP Address: 100.100.220.73

DNS: 202.96.128.86 202.96.134.133

IPv6 Address:

IPv6 DNS:

CID: 2

**Route**

Destination	Default Gateway	Genmask	Flags	Metric	Ref	Use	Iface
default	*	0.0.0.0	U	0	0	0	icc0.1121
10.1.1.0	*	255.255.255.0	U	0	0	0	br0
127.0.0.0	*	255.0.0.0	U	0	0	0	lo
192.168.0.0	*	255.255.255.0	U	0	0	0	br0

**ARP**

IP Address	HW type	Flags	HW Address	Mask	Device
192.168.0.100	0x1	0x2	f4:8e:38:72:fa:c0	*	br0
202.96.128.86	0x1	0x2	6c:ad:f0:02:d9:86	*	icc0.1122
202.96.134.133	0x1	0x2	6c:ad:f0:02:d9:86	*	icc0.1122

**Help**

**PDN Info:**  
When the wanprotol is PDN show PDN IP Map.

---

**Route:**  
The routing table information.

---

**ARP:**  
The ARP table information.

### 3.4. eNodeB Selection

The CPE would lock on the ND&S to connecting after the operator enabled the **Lock ND&S** when the Co-Channel Interference (CCI) is around.

#### ◆ PLMN Selection

Setting “**Network Mode**” as **Nomadic**, then click the “**Search**” button, After the CPE searched the “**PLMN ID**”, select the applicable PLMN ID and click “**Add Info list**” button to add the PLMN ID to the PLMN-List.

LTE Network Security Applications Management Maintenance Status Exit

Overview ND&S **PLMN Selection** eNB Settings Bearer Settings SIM Card PIN Management admin

### PLMN Selection

**PLMN Selection**

Network Mode: Nomadic

PLMN ID: 460 01 UNICOM

Home PLMN-ID: 460,11

Allow Roaming:  Enable

Search  
Add into list

**Equivalent PLMN-ID list**

Index	MCC	MNC	Priority	Delete
1	<input type="text" value="460"/>	<input type="text" value="01"/>	<span>Up</span>	<span>Delete</span>

Add Cancel

Save & Apply Cancel Changes

**Help**

**PLMN Selection:**  
Enable manual search. It will interrupt the current data network when searching available network.

---

**Equivalent PLMN-ID list:**  
PLMN-ID configuration and priority setting. Equivalent PLMN-ID isn't configured, select Home PLMN to attach

◆ **eNodeB Setting**

After Enable the **Preferred eNB List** and configure the **Earfcn/PCI**, the CPE will scan the corresponding ND&S and connecting to it.

LTE → **eNB Settings** → **Enable Preferred eNB List** → **Enable Lock ND&S to the preferred list** → **add the Earfcn and PCI** → **Save & Apply**

**eNB Settings**

**Preferred eNB Settings**

Preferred eNB List  Enable

Lock ND&S to the preferred list  Enable

Auto-Rescan Duration  Mins(15~65535)

Priority	Earfcn	PCI(0~503)	Delete
1	41140	237	Delete

**Sorted eNB List**

Index	Earfcn	PCI	RSRP(dBm)	RSRQ(dB)	RSSI(dBm)	CINR(dB)
1	41140	237	-117.9	-14	-96.1	1

**Help**

**eNB Settings:**  
UE selects eNB from the preferred eNBs preferentially only when enabled.

**Earfcn Range:**  
B41 39650 - 41589

**Auto-Rescan Duration:**  
Range 15-65535 mins; 0 - timer is disabled!

**3.5. Network Configuration**

◆ **Modify MTU Size**

The default Operation Mode is Router, and the PC of the user that connected to device LAN port will obtain IP address via DHCP server of the device. The default MTU Size is 1400, user can modify the MTU Size if necessary

[LTE](#) | [Network](#) | [Security](#) | [Applications](#) | [Management](#) | [Maintenance](#) | [Status](#) Exit

[Internet](#) | [LAN](#) | [VPN](#) | [QoS](#) | [DDNS](#) | [Traffic Control](#) admin

### Internet Setup

**Internet Connection**

Connection Mode:  Router / NAT  L2 Bridge (GRE)  L3 Bridge  
 NAT:  Enable

**Optional**

Device Name:   
 Host Name:   
 Domain Name:   
 MTU:    
 IP Type:  IPv4  IPv6  IPv4v6

**DS-Lite Connection**

DS-Lite Configuration:  Disable  Manual Config  
 AFTR IPv6 Address:   
 B4 IPv4 Address: 192 . 0 . 0 .  (Optional)  
 WAN IPv6 Address:   
 IPv6 WAN Default Gateway:

**Help**

**Host Name:**  
Enter the host name provided by your ISP.

---

**Domain Name:**  
Enter the domain name provided by your ISP.

---

**DS-Lite Connection:**  
Enter the AFTR address information provided by your Internet Service Provider(ISP).

---

◆ **Change model from Router to Bridge**

The operation mode could be changed from Router to Bridge if necessary .Change model as follow picture: **Network**→**Internet**→**L3 Bridge**→**Save & Apply**



**Internet Setup**

**Internet Connection**

Connection Mode:  Router / NAT  L2 Bridge (GRE)  L3 Bridge

**Optional**

Device Name: KZ TECH

Host Name:

Domain Name:

MTU: Manual 1300

IP Type:  IPv4  IPv6  IPv4v6

**DS-Lite Connection**

DS-Lite Configuration:  Disable  Manual Config

AFTR IPv6 Address:

B4 IPv4 Address: 192.0.0. (Optional)

WAN IPv6 Address:

IPv6 WAN Default Gateway:

Buttons: Save & Apply, Cancel Changes

The operator's PC which connected the LAN port of CPE will auto obtain the IP of APN Net when the CPE attached to the APN network, then you can connected to the APN network for data services. And the PC should configure a static IP address as 10.1.1.x manual in order to visit the CPE managing page <http://10.1.1.1> .

### 3.6. Service Configuration-DMZ Setting

By enabling this option will make the specified local LAN host (DMZ IP) was exposed to the Internet, all ports can be accessed by other computers on the Internet.

**Demilitarized Zone (DMZ)**

**DMZ**

DMZ Enable Status:  Enable  Disable

DMZ Host IP Address: 192.168.0.100

Exclude Web Server Port:  Enable

Exclude Remote Port:  Enable

Exclude Ping:  Enable

Buttons: Save & Apply, Cancel Changes

### 3.7. System Maintenance

WEB GUI menu to configure the device in more details (see diagram below). The configuration is easy to use and self explanatory.

#### ◆ Telnet Enable (for beta release)

The users can telnet to the CPE in the beta release when set the Remote connection as Enable. Then set the Access Control as Unrestricted Access.

LTE	Network	Security	Applications	Management	Maintenance	Status	Exit
Device Management		TR069 Configuration				admin	
<b>Device Management Setting</b>						<b>Help</b>	
<b>Device Mangement</b> Device Management Mode: TR069						<b>Local:</b> Means user will configure all the device setting locally.	
<b>Device Management Control</b> Remote connection(telnet&ssh): <input checked="" type="checkbox"/> Enable Access Control: Unrestricted Access Auto-Logout Timeout: Enable 20 ( minutes:1 ~ 25 )						<b>TR069:</b> Means the device will be managed remotely using standard TR069 platform.	
Save & Apply    Cancel Changes						<b>Access Control:</b> It defines the login restriction for Web and SSHD access, as well controls how hard RESET works.	

cmd shell and run command:

telnet 192.168.0.1

Login: root

Password: root123

#### ◆ TR069 Configuration

After setting the Device Management Mode as TR069, you must also configure the validity ACS URL for monitoring the device via standard TR-069 ACS systems.

LTE	Network	Security	Applications	Management	Maintenance	Status	Exit
Device Management		TR069 Configuration				admin	
<b>Device Management Setting</b>						<b>Help</b>	
<b>Device Mangement</b> Device Management Mode: TR069						<b>Local:</b> Means user will configure all the device setting locally.	
<b>Device Management Control</b> Remote connection(telnet&ssh): <input checked="" type="checkbox"/> Enable Access Control: Unrestricted Access Auto-Logout Timeout: Enable 20 ( minutes:1 ~ 25 )						<b>TR069:</b> Means the device will be managed remotely using standard TR069 platform.	
Save & Apply    Cancel Changes						<b>Access Control:</b> It defines the login restriction for Web and SSHD access, as well controls how hard RESET works.	



LTE Network Security Applications Management Maintenance Status Exit

Device Management TR069 Configuration admin

**TR069 Management Setting** Help

**TR069 Configuration**

ACS URL

ACS Username

ACS Password

Re-enter Password

Periodic Inform Enable

Periodic Inform Interval  seconds(90~604800)

Periodic Inform Time  -  -  T  :  :  (eg2000-01-01T01:01:01)

CPE Username

CPE Password

Re-enter Password

**ACS STUN Configuration**

STUN Enable Status  Enable

Server Address

Server Port  (0~65535)

Username

Password

Re-enter Password

Minimum Keep Alive Period  seconds(10~90)

Maximum Keep Alive Period  seconds(10~90)

Save & Apply Cancel Changes Connect ACS

◆ **Firmware Upgrade over HTTP**

Select the **Default settings** to reset the CPE after upgrade  
 Click on the **Browser** button to select the firmware file to be uploaded to the device.  
 Click the **Upgrade** button to begin the upgrade process.

LTE Network Security Applications Management Maintenance Status Exit

General Firmware Upgrade Config Management Ping System Reset admin

**Firmware Management** Help

**Local Firmware Upgrade**

Reset to defaults after upgrade  No Reset  Reset to Factory Defaults

Please select a file to upgrade

**Remote Firmware Upgrade**

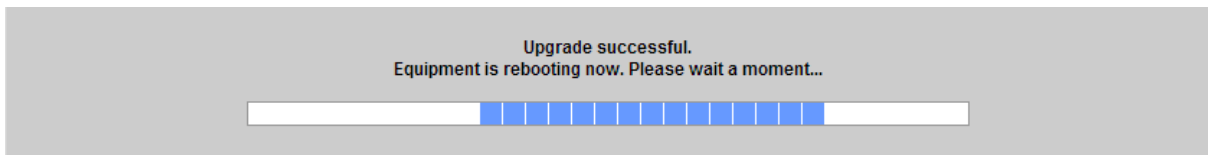
Update Method  ▾

Save & Apply Cancel Changes

**Local Firmware Upgrade:**  
 Click on the *Browse...* button to select the firmware file to be uploaded to the device.  
 Click the *Upgrade* button to begin the upgrade process which must not be interrupted.

**Remote Firmware Upgrade:**  
 You need to fill in the connection configs of HTTP,FTP or TFTP server.  
 Click the *Upgrade* button to begin the upgrade process which must not be interrupted.

Please do not interrupt the upgrade process and continue to wait for the following pop window appear. The CPE will reboot after upgrade successful.



### ◆ Change Password

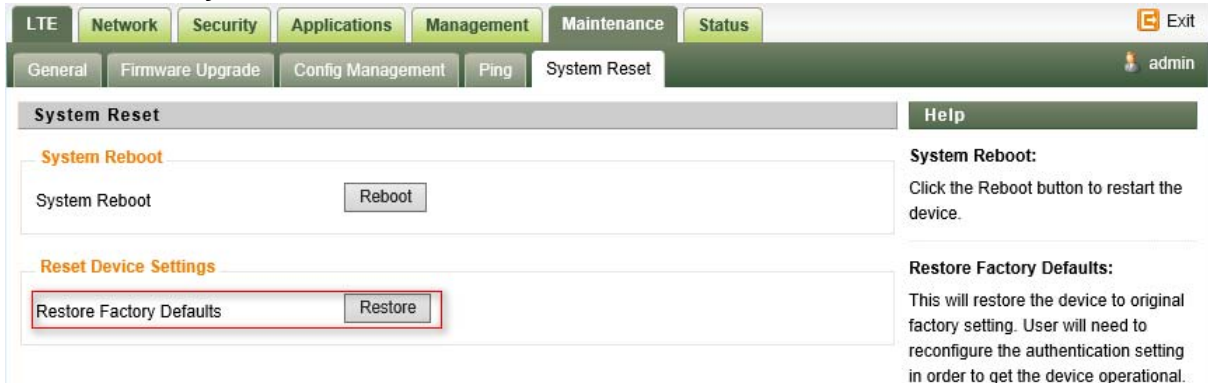
You can select the language or modify the web login password via the Maintenance page.



### ◆ Load Factory Default

Click the “Restore” button will restore the device to original factory setting. User will need to reconfigure the authentication setting in order to get the device operational.

**Maintenance → System Reset → Restore**



## 4. FAQ and Troubleshooting

### 1) My PC cannot connect to the CPE.

- Re-plug the PC Ethernet cable and check if the PC LAN connection is up or showing activity.
- Check if the system run LED is on. If it is not, check the power cord and make sure it is connected properly. Also verify that the AC power supply is available.
- If the PC LAN shows no activity and system run LED is off but the power cord is connected properly and there is AC supply, then it is likely the adapter is damaged. Please contact distributor to obtain replacement part.

**2) My PC cannot acquire IP from the CPE.**

- First check if the NIC is up and working properly. Then check the PC NIC configuration and make sure the DHCP is enabled.
- Open the MS-DOS window, enter “ipconfig /release” and “ipconfig /renew” commands and see if PC can obtain IP correctly.
- If the problem persists, please contact the operator or distributor for further diagnose.

**3) My CPE networking is not working properly.**

- You may want to check if the LTE connection is up and running properly. You can do this by login the WEB GUI and check the Interface Info page.
- You may want to perform a factory reset and see if the problem is being corrected. You can do this by log into the WEB GUI using “admin” password and perform restore the unit to default factory setting.
- If the problem cannot be corrected by factory reset, please contact the operator or distributor for further diagnose.

**4) I forget the login password and like to reset the unit to factory default.**

- Please contact the operator or distributor and give them the MAC address of the unit. The operator or distributor can issue you a RESET password for you to enter in the WEB login window.
- After the unit is reset to factory default, you can login using the default password.