

**Telrad**  
**CPE-12000U-PRO-1D-5.x-Conn.**  
**User Manual**

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## Note

The content of this User Manual has been made as accurate as possible. However, due to continual product improvements, specifications and other information are subject to change without notice.

This device must be installed by professional installer.

## Federal Communication Commission Interference Statement

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.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## FCC Caution

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

## 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 20 cm between the radiator & your body.

## Prerequisite Skills and Knowledge

To use this document effectively, you should have a working knowledge of Local Area Networking (LAN) concepts and wireless Internet access infrastructures. In addition, you should be familiar with the following:

- Hardware installers should have a working knowledge of basic electronics and mechanical assembly, and should understand related local building codes.
- Network administrators should have a solid understanding of software installation procedures for network operating system and troubleshooting knowledge. LTE CPE has a web GUI which supports http/https protocol; it could be used to configure the CPE settings through the web browser by user's PC. Please refer to the following pages for more detail.

## 1. Product Overview

This CPE supports LTE air interface with popular operating systems like Windows, Linux and Mac.

Once you have identified the place for CPE, insert USIM card supplied by your service provider at the appropriate place, plug in the adapter in the AC socket and DC in the power port of CPE. Power On device, after few minutes the CPE should attach itself to the LTE network. It is as simple as that. It is advised to read this manual at leisure to make best use of the CPE. Products follow LTE standard protocols, When the product has no data transmission, it will stop transmitting.

### 1.1. LTE Specification

See LTE module spec, below table is an example

Key features	Specification
<b>3GPP Version</b>	Release 12
<b>UE category</b>	Category 12
<b>Bandwidth-No CA</b>	10,20MHz
<b>MIMO</b>	2Tx/4Rx
<b>UL/DL sub frame configuration</b>	Configuration 1,2,3,4,5,6
<b>Special sub frame configuration</b>	0,1,2,3,4,5,6,7,8
<b>Transfer mode</b>	TM1, TM2, TM3, TM4, TM7, TM8, TM9
<b>Data Speed</b>	Down load 420Mbps, Up load 30Mbps

### 1.2. Basic Specifications

Interface definition	
<b>RJ45</b>	1 Giga Ethernet Ports with passive PoE PIN enabled (56V)
<b>USIM interface</b>	One USIM interface under the cover
Power supply	
<b>Power supply</b>	Passive POE
<b>Max power consumption</b>	56V / 0.45A
<b>Maxim length of Ethernet cable</b>	100 meters
Environmental Parameters	

<b>Water &amp; Dust Protection</b>	IP67
<b>Operating Temperature</b>	-40 to +60 °C
<b>Humidity</b>	0 to 95%

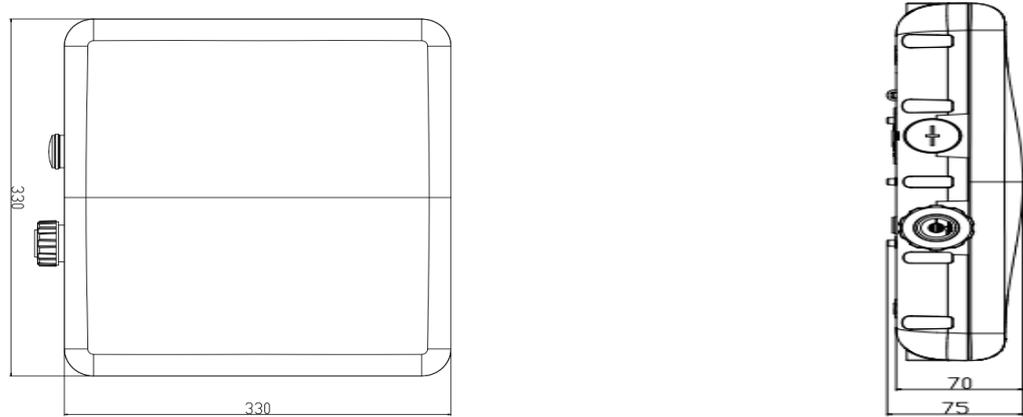
### 1.3. Electrical and Environmental Specification

<b>Item</b>	<b>Specification</b>
Operating Temperature	-40°C to +60°C
Operating Humidity	0 to 95%
Lightning protection ability	Common mode 6kV /Differential mode1.5kV

## 2. Product Package

<b>Items</b>	<b>Quantity</b>
<b>ODU unit</b>	1
<b>Mounting Kit</b>	1
<b>User Manual</b>	1
<b>Installation Guide</b>	1
<b>Charger</b>	1

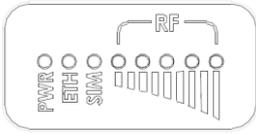
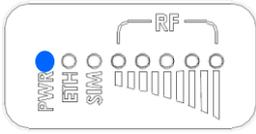
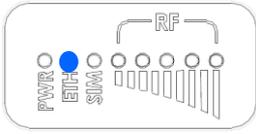
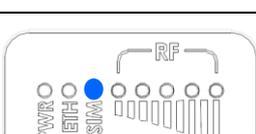
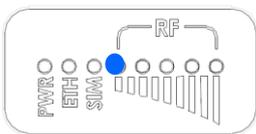
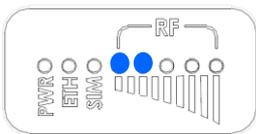
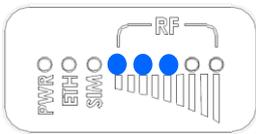
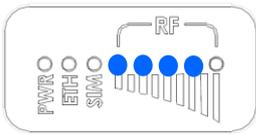
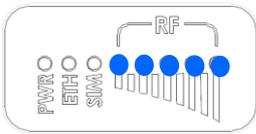
### 3. Mechanical Specifications



**Figure 1: CPE12000 Bottom View**

Item	Description
<b>Size</b>	330(L) x 330(W) x 75(H) mm(IP67)
<b>Color</b>	Off-White
<b>LED</b>	Power, ETH, SIM, 5 RF CINR bars
<b>RJ45 connector</b>	1 Giga port, need support passive POE 56V
<b>USIM Interface</b>	1 USIM interface inside the cover

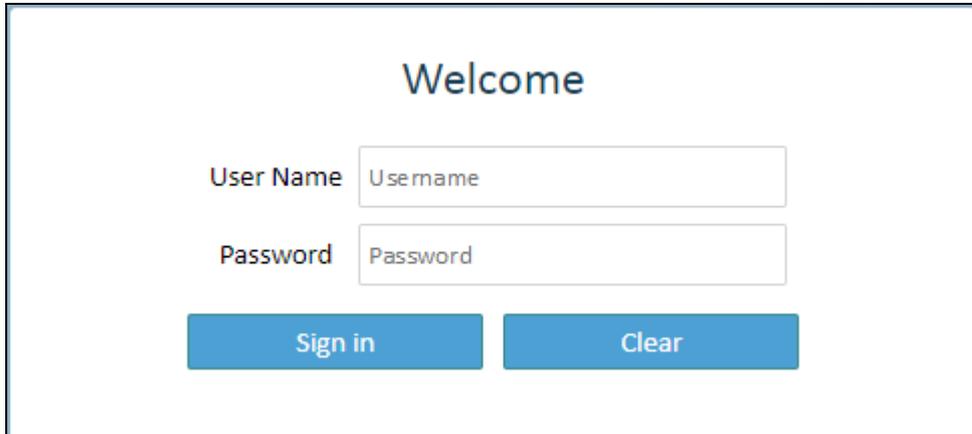
## LED Indicators

LED name	Location	Color	LED Behavior	Status Indication
<b>LED List</b>		<b>Blue</b>		
<b>PWR</b>		<b>Blue</b>	<b>ON</b>	
		<b>Blue</b>	<b>OFF</b>	
<b>ETH</b>		<b>Blue</b>	<b>Steady ON</b>	
		<b>Blue</b>	<b>Blinking</b>	
		<b>Blue</b>	<b>OFF</b>	
<b>SIM</b>		<b>Blue</b>	<b>Steady ON</b>	
		<b>Blue</b>	<b>Blinking when On-hook</b>	
		<b>Blue</b>	<b>OFF</b>	
<b>RF Link Status LED Bar:</b>			When CPE is power on, LED bar indicates SINR	
RF Status 1		<b>Blue</b>	<b>Steady ON</b>	$1 \text{ dB} \leq \text{SINR} < 8\text{dB}$
RF Status 2		<b>Blue</b>	<b>Steady ON</b>	$8\text{dB} \leq \text{SINR} < 12\text{dB}$
RF Status 3		<b>Blue</b>	<b>Steady ON</b>	$12\text{dB} \leq \text{SINR} < 16\text{dB}$
RF Status 4		<b>Blue</b>	<b>Steady ON</b>	$16\text{dB} \leq \text{SINR} < 24\text{dB}$
RF Status 5		<b>Blue</b>	<b>Steady ON</b>	$24\text{dB} \leq \text{SINR}$

## 4. Login

Open your Web browser and enter 192.168.254.251,  
**Default is username / passwords are:**

- **admin / admin for end-user**



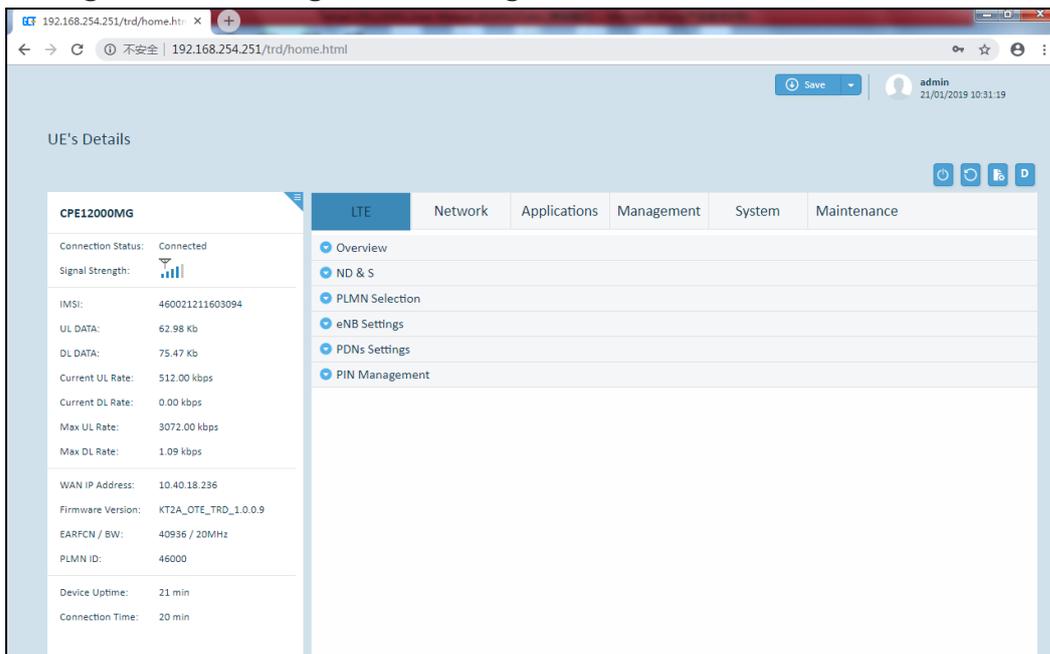
The screenshot shows a web browser window with the URL 192.168.254.251/trd/home.html. The page has a light blue header with the word 'Welcome' in the center. Below the header, there are two input fields: 'User Name' with the placeholder text 'Username' and 'Password' with the placeholder text 'Password'. At the bottom of the form, there are two blue buttons: 'Sign in' and 'Clear'.

Figure 4-1 Login

## 5. Home page

### 5.1 LTE

There are 6 function on this page, they are "Overview", "ND & S", "PLMN Selection", "eNB Settings", "PDNs Settings", "PIN Management"



The screenshot shows a web browser window with the URL 192.168.254.251/trd/home.html. The page displays 'UE's Details' for a device named 'CPE12000MG'. The device is connected, and the signal strength is shown as a bar chart. The details include IMSI, UL/DL DATA rates, Current/Max UL/DL Rates, WAN IP Address, Firmware Version, EARFCN / BW, PLMN ID, Device Uptime, and Connection Time. A navigation menu is visible on the right side of the page, with tabs for 'LTE', 'Network', 'Applications', 'Management', 'System', and 'Maintenance'. Under the 'LTE' tab, there are six menu items: 'Overview', 'ND & S', 'PLMN Selection', 'eNB Settings', 'PDNs Settings', and 'PIN Management'.

Figure 5-1 LTE

### 5.1.1 Overview

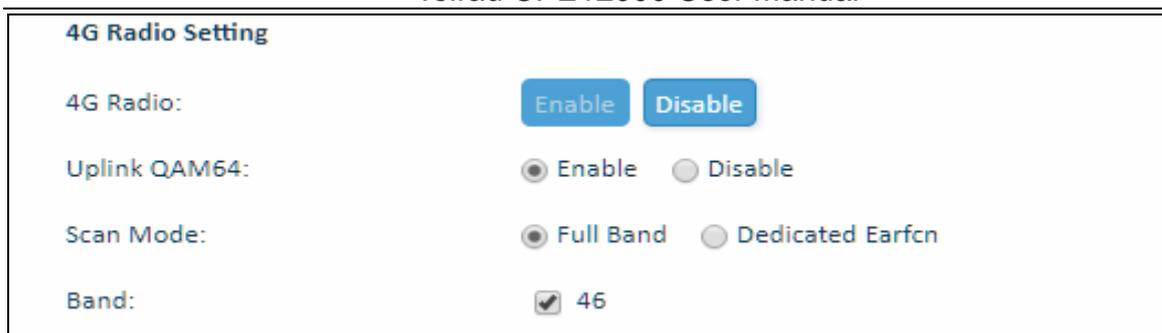
There are more LTE information on this page, they are “Serial Number”, “IMEI”, “IMSI”, “Supported Band”, “Firmware version” and so on.

Overview	
<b>Overview</b>	
Serial Number:	AT210119A006
IMEI:	863779023124709
IMSI:	N/A
Supported Band:	46
Firmware Version:	KT2A_OTE20_TRD_1.0.0.18
<b>Connection</b>	
Media State:	QUERYPIN
Connection Time:	0 sec
Registered PLMN:	UnKnown
IPv4 Address:	UnKnown
IPv4 DNS:	UnKnown
IPv6 Address:	UnKnown
IPv6 DNS:	UnKnown
<b>Radio Statistics</b>	
Tx Power:	N/A
RSRP (dBm):	N/A
RSRQ (dB):	N/A
SINR (dB):	N/A

Figure 5-1-1 Overview

### 5.1.2 ND&S

On this page include “Uplink QAM64”, “Scan Mode” and “Band”



**4G Radio Setting**

4G Radio:

Uplink QAM64:  Enable  Disable

Scan Mode:  Full Band  Dedicated Earfcn

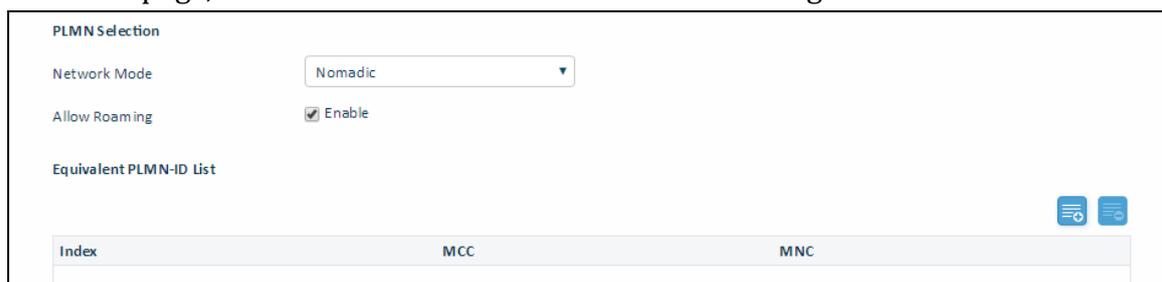
Band:  46

Figure 5-1-2 ND&amp;S

- **Uplink QAM64:** Enable/Disable
- **Scan Mode:** Full band/Dedicated Earfcn
- **Band:** Supported Band selection (Default band is 46)

### 5.1.3 PLMN Selection

On this page, include “Network Mode “and “Allow Roaming”



**PLMN Selection**

Network Mode:

Allow Roaming:  Enable

Equivalent PLMN-ID List

Index	MCC	MNC

Figure5-1-3 PLMN Selection

- **Network Mode:** there are two modes Nomadic, Mobile  
 Nomadic: modified scanning eNB selection.  
 Mobile: regular scanning PLMN/ eNB selection.
- **Allow Roaming:**  
 If “allow roaming” is checked, then CPE first selects eNBs from the Home/ Equivalent PLMN-IDs, Otherwise If not available, it tries connection to “any” PLMN-ID.  
 If “allow roaming” is not checked, the CPE is allowed to connect to eNBs from Home/ Equivalent PLMN-IDs only.
- **Equivalent PLMN-ID List:** Home PLMN-ID can be created automatically from SIM’s IMSI (read-only). Customer can also add PLMN-ID.

### 5.1.4 eNB Settings

On this page, include “Preferred eNB Settings” , “ Preferred eNB List” and “ Sorted eNB List”.

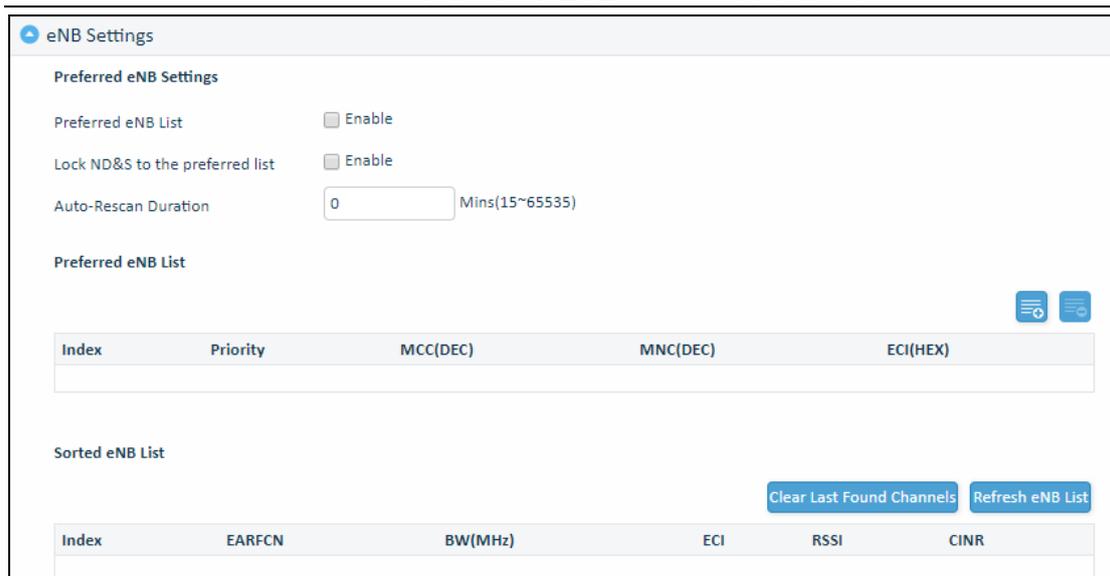


Figure5-1-4 eNB Settings

- **Preferred eNB List:** Enable/ disable “preferred” selection checkbox.

When CPE performs scan it should build a list of all found eNBs, there have Few regions – each region is sorted (top down)

Region A (top priority) – list of “preferred BS”, sorted by the relative eNB priority

Region B – eNBs from Home PLMN-ID or Equivalent PLMN-ID, not in the “preferred” list, sorted by the best CINR

Region C – eNBs from the Last Registered PLMNID (if Roaming is enabled), sorted by the best CINR

Region D – all the rest eNBs (if Roaming is enabled), sorted by the best CINR

Default value is disable, from Region B to Region D select Preferred eNB List. If Preferred eNB List is enable, from Region A to Region D select Preferred eNB List.

- **Lock ND&S to the preferred list:** limit eNB selection to the “preferred” list only. Condition – this checkbox should be possible only if “enable preferred list” is checked.
- **Auto-Rescan Duration:** Forces CPE to perform periodic re-scan/ re-connection (Nomadic mode only) – in order to connect to the best/ preferred eNB according to the “best eNB list”  
Default value is 0-disable, hence in case the UE is attached to the first one in the list, the UE will not rescan even it is configured.
- **Preferred eNB list:** configure “preferred” list
- **Sorted eNB List:** you can clean last found channels and refresh eNB list.

### 5.1.5 PDNs Settings

The default APN is “internet”, if you want to configure the LTE APN, you can add the new APN and change default APN, then you can configure the APN settings by clicking on the

 button.

Default PDN					
Cid	APN Name	PDN Type	AUTH Type	User Name	Password
1		IPv4	PAP		

PDNs List					
Cid	APN Name	PDN Type	AUTH Type	User Name	Password

Figure 5-1-5 Bearer Settings

### 5.1.6 PIN Management

From this page, you can see the USIM card status and PIN status.

The default PIN status is disabled; you can input the correct PIN to enable the PIN function. The maximum PIN attempts are 3, otherwise you must enter PUK to reset the PIN code. The USIM will be invalid after the unsuccessful attempts for 10 times.

PIN Information	
USIM Card Status	NO UICC
Remaining PIN Attempts	

[Refresh](#)

Figure 5-1-6 PIN Management

## 5.2 Network

### 5.2.1 Overview

On this page, you can see LAN setting information. They are “LAN IP address”, “LAN Subnet Mask”, “Local DNS”, “LAN Porte Status”, “Speed / Duplex”, “Sent(Errors/Dropped)”, “Received(Error/Dropped”, “RX CRC Errors” and so on.

Overview	
<b>LAN Status</b>	
LAN MAC Address	34:8A:9A:69:12:7D
LAN IP Address	192.168.254.251
LAN Subnet Mask	255.255.255.0
Local DNS	
LAN Port Status	Up
Speed / Duplex	1000Mb/s / Full
Sent(Errors/Dropped)	0 packets / 0 packets
Received(Errors/Dropped)	0 packets / 0 packets
RX CRC Errors	0
Collisions	0
Sent	4115935 bytes / 8899 packets
Received	2234956 bytes / 13987 packets

Figure 5-2-1-1 Overview

### 5.2.2 Internet

On this page, include “Connection Mode”, “NAT”, “MGMT and Date Interface”, and “MTU”.

Internet Connection	
Connection Mode:	<input checked="" type="radio"/> Router/ NAT <input type="radio"/> L2 Bridge(GRE) <input type="radio"/> L3 Bridge
NAT:	<input checked="" type="checkbox"/> Enable
MGMT and Date Interface:	<input checked="" type="radio"/> Combine <input type="radio"/> Separate
<b>Optional</b>	
MTU:	<input type="text" value="1400"/> (Default:1600)

Figure 5-2-2-1 Internet

- **Connection Mode:** Route/NAT, L2 Bridge(GRE), L3 Bridge
- **NAT:** Default Enable
- **MGMT and Date Interface:** Combine/ Separate

### 5.2.5 LAN

On this page, include “LAN Reset”, “Device IP” and “DHCP”

**Link MaxBitRate & Duplex**

LAN Reset

Duplex

Max Bit Rate

**Device IP**

Local IP Address

Subnet Mask

Manual DNS  Enable

**DHCP**

DHCP Server  Enable

Figure 5-2-3-1 LAN

- **LAN Reset:** Restore of LAN default setting.
- **Duplex:** Autot/Full/Half
- **Max Bit Rate:** 10Mbps/100Mbps/1000Mbps
- **Local IP Address :** Enter the IP address of your router (factory default: 192.168.254.251).
- **Subnet Mask:** An address code that determines the size of the network. Normally use 255.255.255.0 as the subnet mask.
- **DHCP:** Default Enable
- **DHCP Address Allocation:** Specify an IP address for the DHCP server to start and end with when assigning IP address.
- **DHCP lease time:** The Lease Time is the amount of time a network user will be allowed connection to the router with their current dynamic IP address. Enter the amount of time in minutes and the user will be "leased" this dynamic IP address. After the time is up, the user will be assigned a new dynamic IP address automatically.
- **Static IP - IP/MAC binding function,** the system will assign a fixed IP address to the MAC according to the rules.

## 5.2.6 VPN

A virtual private network (VPN) is a point-to-point connection across a private or public network (Internet).

VPN Passthrough allows the VPN traffic to pass through the router. Thereby we can establish VPN connections to remote network.

VPN Protocol

Protocol Type: GRE

GRE

GRE Destination IP Address: 172.16.0.1

Figure 5-2-4-1 VPN

### 5.2.7 QoS

On this page, include “DSCP Configuration” and “TOS Configuration”, you can change QoS setting by manual.

DSCP Configuration

Data Traffic DSCP:  0 (0~63)

Management Data DSCP:  6 (0~63)

TOS Configuration

Data Traffic TOS:  0 (0~255)

Management Data TOS:  0 (0~255)

Figure 5-2-5-1 QoS

- **Data Traffic DSCP: Default value is 0. The range is 0~63.**
- **Management Data DSCP: Default value is 6. The range is 0~63.**
- **Data Traffic TOS: Default value is 0. The range is 0~255.**
- **Management Data TOS: Default value is 0. The range is 0~255.**

## 5.3 Applications

### 5.3.1 Port forwarding

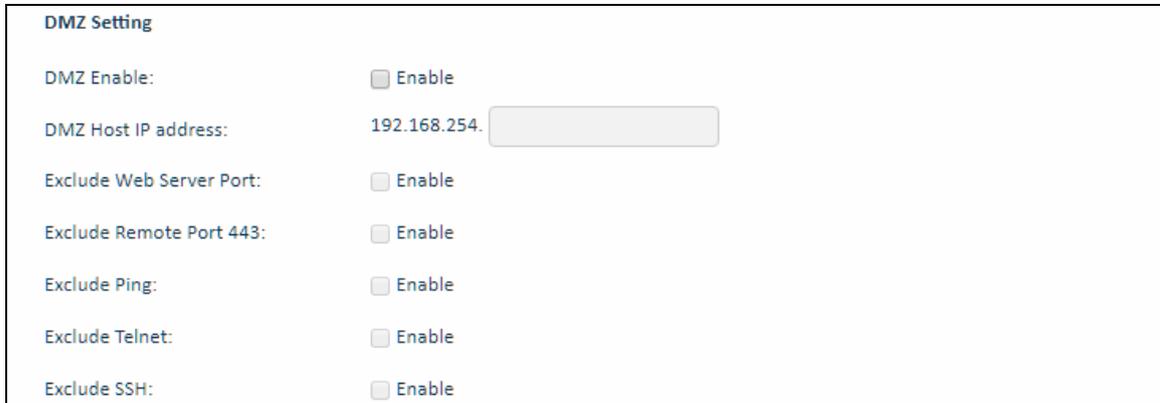
Clicking on the “” button, you can configure IP address, port range to achieve the port forwarding purpose.

Port forwarding List

Index	Rule name	IP address	Protocol	External port	Internal port

### 5.3.2 DMZ

From this page, you can configure a De-militarized Zone (DMZ) to separate internal network and Internet.



<b>DMZ Setting</b>	
DMZ Enable:	<input checked="" type="checkbox"/> Enable
DMZ Host IP address:	192.168.254. <input type="text"/>
Exclude Web Server Port:	<input type="checkbox"/> Enable
Exclude Remote Port 443:	<input type="checkbox"/> Enable
Exclude Ping:	<input type="checkbox"/> Enable
Exclude Telnet:	<input type="checkbox"/> Enable
Exclude SSH:	<input type="checkbox"/> Enable

Figure 5-3-2-1 DMZ

- **DMZ Enable:** Default value is Disable
- **DMZ Host IP address:** The IP address of your PC.
- **Exclude Web Server Port:** Default value is Disable
- **Exclude Remote Port 443:** Default value is Disable
- **Exclude Ping:** Default value is Disable
- **Exclude Telnet:** Default value is Disable
- **Exclude SSH:** Default value is Disable

### 5.3.2 DDNS

The dynamic DNS function is disabled in default, you can choose the dynamic DNS provider to configure the DDNS settings.



<b>DDNS Setting</b>	
DDNS Enable	<input type="checkbox"/> Enable

Figure 5-3-3-1 DDNS

## 5.4 Management

### 5.4.1 Device Management

On this page, include “ Allow ping from WAN ”, “Telnet Service”, “ SSH Service”, “ Access Control ”and “ HTTPs From WAN”.

Device Management Control	
Allow ping from WAN	<input checked="" type="checkbox"/> Enable
Telnet Service	<input type="checkbox"/> Enable
SSH Service	<input type="checkbox"/> Enable
Access Control	Unrestricted Access
HTTPs From WAN	<input checked="" type="checkbox"/> Enable HTTPs Port 8080

Figure 5-4-1-1 Device Management

### 5.4.2 TR069

On this page, include “TR069 Enable” and “TR069 Configuration”

TR069 Enable	
TR069:	<input checked="" type="checkbox"/> Enable
TR069 Configuration	
ACS Interface:	lteOpdn0
ACS Port:	7547
ACS URL:	http://cpe.tr69.management.server:80
ACS Username:	quickynikynyoky
ACS Password:	.....
Re-enter Password:	.....
Periodic Inform Enable:	<input checked="" type="checkbox"/> Enable
Periodic Inform Interval:	3600 seconds(90-604800)
Periodic Inform Time:	2001 - 01 - 01 T 00 : 00 : 00
CPE Username:	quickynikynyoky
CPE Password:	.....
Re-enter Password:	.....

Figure 5-4-2-1 TR069

- **TR069:** Default value is Enable
- **ACS Interface:** Default value is "lte0pdn0"
- **ACS Port:** Default value is "7547"
- **ACS URL:** Default " http://cpe.tr69.management.server:8080/ftacs/ACS"
- **ACS Username:** Default value is " quickynikynyoky"
- **ACS Password:** Default value is " quickynikynyoky"
- **Re-enter Password:** Default value is " quickynikynyoky"
- **Periodic Inform Enable:** Default value is Enable
- **Periodic Inform Interval:** Default value is "3600", Range is " 90-604800"
- **Periodic Inform Time:** Default value is "2001-01-01"~"00-00-00"
- **CPE Username:** Default value is " quickynikynyoky"
- **CPE Password:** Default value is " quickynikynyoky"
- **Re-enter Password:** Default value is " quickynikynyoky"

#### 5.4.2 SNMP

On this page, include "Snmpd", " Snmpd Read Only Community", " Snmpd Read Write Community", you can change setting by manual.

SNMP	
Snmpd	<input checked="" type="checkbox"/> Enable
Snmpd Read Only Community	<input type="text" value="public"/>
Snmpd Read Write Community	<input type="text" value="private"/>

Figure 5-4-3-1 SNMP

- **Snmpd:** Default value is Enable
- **Snmpd Read Only Community:** Default value is "public"
- **Snmpd Read Write Community:** Default value is "public"

## 5.5 System

### 5.5.1 Password

The default password is admin, you can enter 1~32 characters for 2 times as your new password. Then you would logout automatically and you should login to the system by the

new password.

The screenshot shows a web interface for password configuration. At the top, there is a header 'Password' with a blue arrow icon. Below it, the 'Password' section is titled. The form contains four rows: 'User Name' with a text input containing 'admin'; 'Old Password' with a text input and '(1~32)' to its right; 'New Password' with a text input and '(1~32)' to its right; and 'Confirm Password' with a text input and '(1~32)' to its right.

Figure 5-5-1-1 Password

### 5.5.2 NTP

On this page, include “NTP Server”, “ Specify NTP Server”, “ Alternate NTP Server” and “NTP Synchronization”, you can change setting by manual.

The screenshot shows the 'NTP Settings' section. It includes four rows: 'NTP Server:' with a dropdown menu showing 'Specify Server'; 'Specify NTP Server:' with a text input containing 'pool.ntp.org'; 'Alternate NTP Server:' with an empty text input; and 'NTP Synchronization:' with a text input containing '300' and the unit 'seconds' to its right.

Figure5-5-2-1 NTP Settings

### 5.5.3 Configuration Management

Clicking the “Export” button, the current settings will be saved as a data file to the local PC. You can restore the device configuration from the files that you saved.

The screenshot shows the 'Config Management' section. It is divided into two sub-sections: 'Backup & Restore Settings' and 'Reboot'. Under 'Backup & Restore Settings', there are three rows: 'Export Settings' with an 'Export' button; 'Import Settings Location' with a 'Choose File' button, the text 'No file chosen', and an 'Update' button; and 'Restore Factory Settings' with a 'Restore' button. Under 'Reboot', there is one row: 'Reboot the device' with a 'Reboot' button.

Figure 5-5-3-1 Config Management

### 5.5.4 Firmware Update

On this page, you can upgrade the current Router version from the local PC. 30s is needed to complete the whole upgrade process, and then the device will reboot automatically.

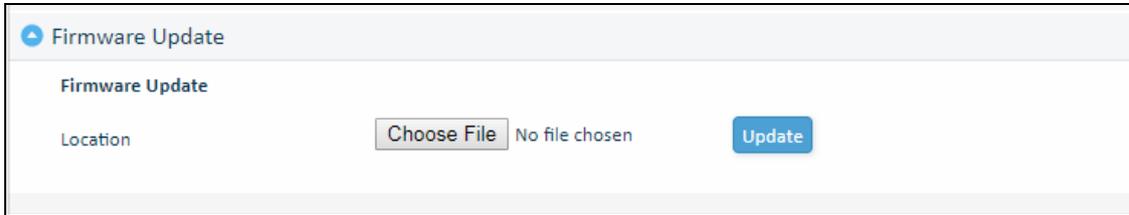


Figure 5-5-4-1 Firmware Update

## 5.6 Maintenance

### 5.6.1 Ping

On this page, you can ping IP address by manual.

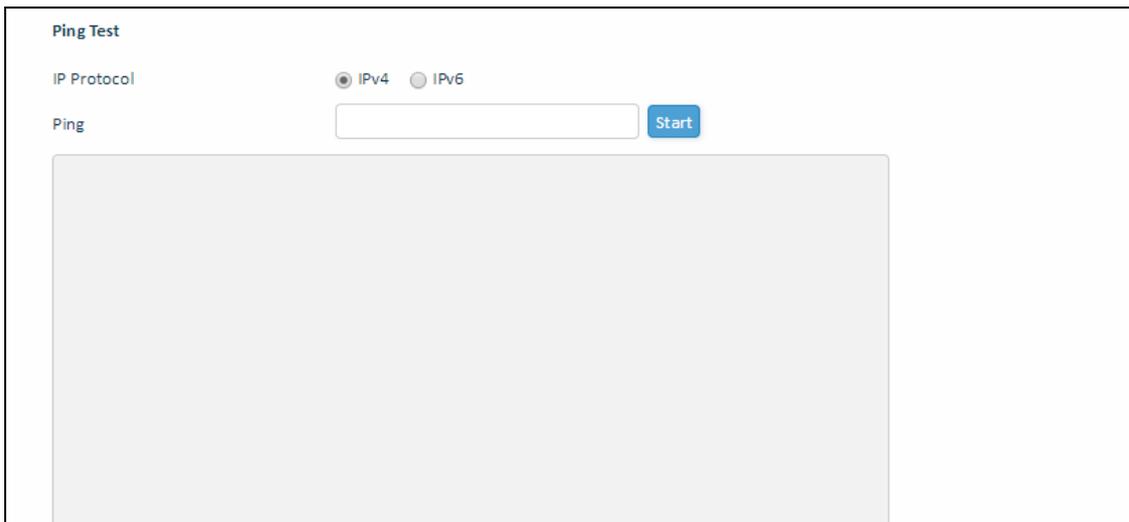


Figure 5-6-1-1 ping

### 5.6.2 Iperf

On this page, you can use the page of “iperf”, test throughput function.

Status	<input checked="" type="button" value="Enable"/> <input type="button" value="Disable"/>
Server Address	<input type="text" value="8.8.8.8"/>
Server Port	<input type="text" value="5001"/> (1024~65535)
Management Port	<input type="text" value="5001"/> (1024~65535)
Measurement Time	<input type="text" value="60"/> Seconds
Protocol Type	TCP <input type="button" value="v"/>
Window size	<input type="text" value="256"/> KB
TCP Client Number	<input type="text" value="1"/> (1~10)
<b>Result</b>	
Uplink Speed	- Mbps
Downlink Speed	- Mbps

Figure 5-6-2-1 Iperf

- **Status:** Default value is “Enable”
- **Server Address:** Default value is “8.8.8.8”
- **Server Port:** Default value is “5001”, the range is 1024~65535
- **Management Port:** Default value is “5001”, the range is 1024~65535
- **Measurement Time:** Default value is “60”
- **Protocol Type:** TCP/UDP
- **Windows size:** Default value is “256”
- **TCP Client Number:** Default value is “1”, the range is 1~10

### 5.6.3 Traceroute

On this page, you can Trace IP address by manual.

**Traceroute**

**Traceroute Test**

IP Protocol  IPv4  IPv6

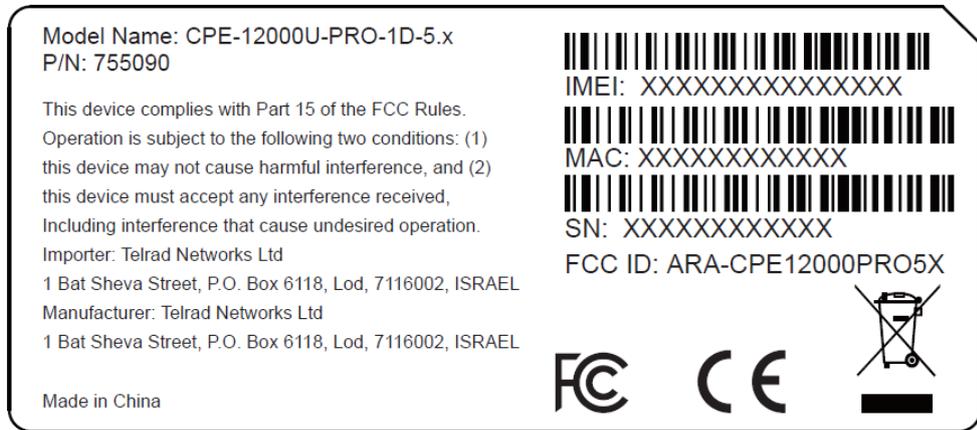
Trace

Figure 5-6-3-1 Traceroute

## 6. Product Shipping Package

### 1. Main Label

On Main Label, you can see IMEI/MAC/SN on it.

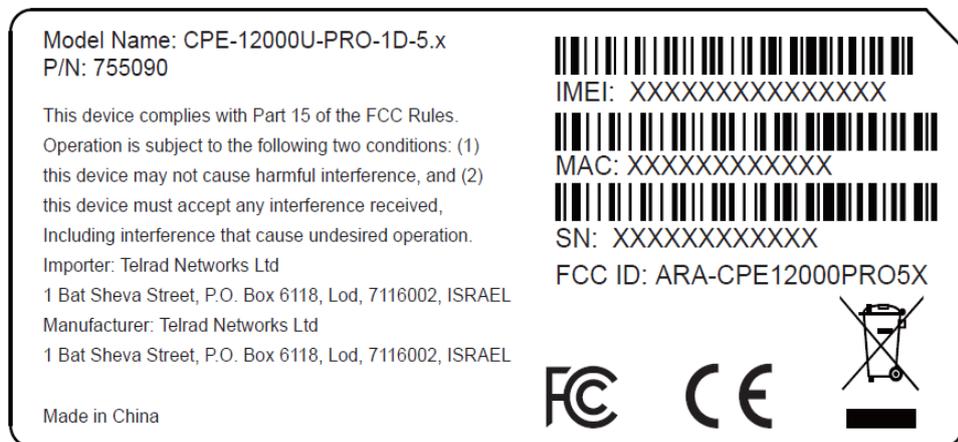


尺寸：89.5x39.5mm,公差+0.2mm  
材质：白色不干胶

Figure 1: Main Label

### 2. Gift Label

On Main Label, you can see IMEI/MAC/SN on it.



尺寸：89.5x39.5mm,公差+0.2mm  
材质：白色不干胶

Figure 1: Gift Label

## 7. Revision History

Author	Revision	Changes	Date
Fhan	1.0	Create Draft	2018-12-20
Fhan	1.1	Add customer issue	2019-01-08
Fhan	1.2	Add customer issue	2019-01-10
Telrad	1.3	Modifications	2019-01-13
XPpan	1.4	Add customer issue	2019-01-23
JiaWang	1.5	Change menu	2019-06-17