DW516

5G Router User Manual

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Contents

Package Contents

The following items should be found in your package:

- DW516: 5G/4G/3G Router
- Power Adapter
- Ethernet Cable
- User Manual

Note:

Make sure that the package contains the above items. If any of the listed items are damaged or missing, please contact your distributor/Service Provider.

Conventions

Device\ Router or DW516 mentioned in this guide stands for 5G router DW516 without any explanation.

Chapter 1 Introduction

This chapter introduces what DW516 can do and shows its appearance. This chapter contains the following sections:

1.1 Device Overview

DW516 is designed to fully meet the need of Small Office/Home Office (SOHO) networks and users demanding higher networking performance. Once you have identified the place for CPE, insert USIM card supplied by your service provider at the appropriate place, plug DC in the power port of CPE. After few minutes the CPE should attach itself to the LTE network. And built-in Ethernet (Rj45 Port) supply high-speed connection to your wired device.

Moreover, it is simple and convenient to set up and configure this router via its intuitive web interface.

1.2 Main Features & Interface

- Supports 5G/4G/3G network
  - 5G NR n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n77/n78/n79
  - FDD-LTE Band B1/B2/B3/B4/B5/B7/B8/B20/B28/B32/B66
  - TDD-LTE Band B38/B40/B41
  - WCDMA Band 1, 2, 5, 8
  - LTE UE Category: Cat 12
  - 3GPP Compliance: Release 15

- Internal Cellular Omni-directional and smart directional Antennas.
- Internal Wi-Fi antennas support dual band 2.4/5GHz for 802.11 b/g/n/ac/ax.
- Wi-Fi 6 Supported
- 2 x RJ45 10/100/1000 auto adaptive Ethernet Port.
- One Ethernet Port can be used as WAN Port, if required.
- 1 x RJ11 port to connect Telephone for Voice over LTE/5G-NR.
- 4FF standard USIM card size support.
- Easy Web management interface.
- Multiple APN (max is 5).
- TR069 remote management.
- FOTA/Remote Update.
- IP20 Compliance

1.3 Panel Layout

1.3.1 The Front Panel

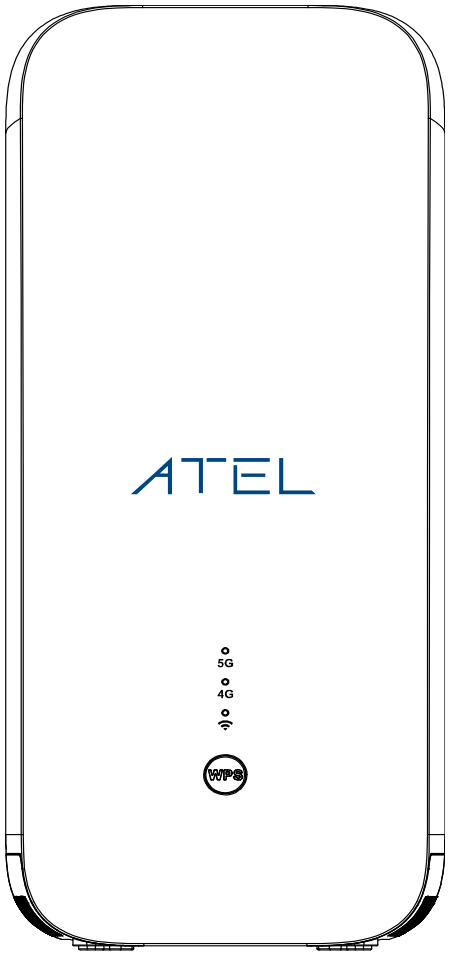


Figure 1 Front Panel sketch

The following IDs are located on the front panel (refer above image from top to bottom)

ID	Description
5G	Led to indicate about 5G Network
4G	Led to indicate about 4G Network
Wi-Fi	Led to indicate about Wi-Fi status of the Device
WPS Button	Push button to activate WPS feature.

LEDs are located on the front panel.

You might see difference with Led behavior as described below due to continue development to meet customer requirements.

LED	Status	Color	Description
5G	On	Green	Indicates Strong Signal Quality SINR >10dB
	On	Blue	Indicates Normal Signal Quality 10dB< SINR >4dB
	On	Yellow	Indicates Weak Signal Quality SINR <4dB
	Blinking	Yellow	Searching Network or Network Interruption
	On	Red	No SIM or SIM Failure

	Off	---	Indicates Device is powered off
4G	On	Green	Indicates Strong Signal Quality SINR >10dB
	On	Blue	Indicates Normal Signal Quality 10dB< SINR >4dB
	On	Yellow	Indicates Weak Signal Quality SINR <4dB
	Blinking	Yellow	Searching Network or Network Interruption
	On	Red	No SIM or SIM Failure
	Off	---	Indicates Device is powered off
Wi-Fi	On	Green	Indicates Wi-Fi is on
	Blinking	Blue	Indicates Intelligent Matching or WPS Connecting
	Off	---	Indicates Wi-Fi is off

Table 1 LED Definition

1.3.2 The Rear Panel

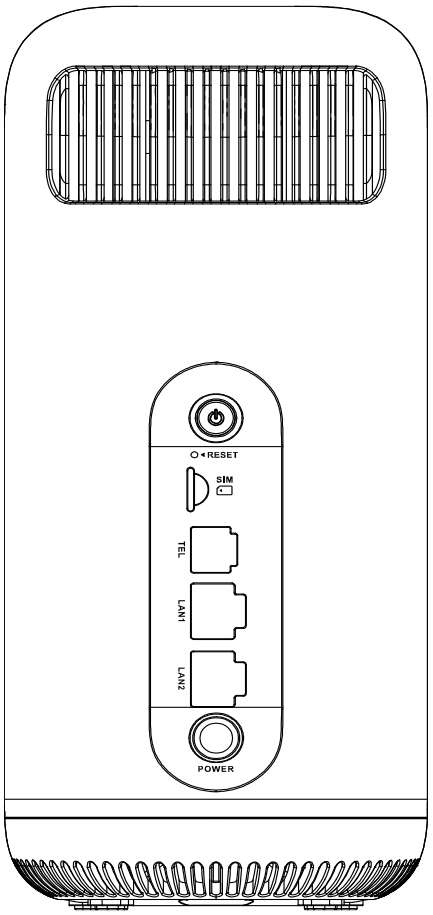


Figure 2 Rear Panel sketch

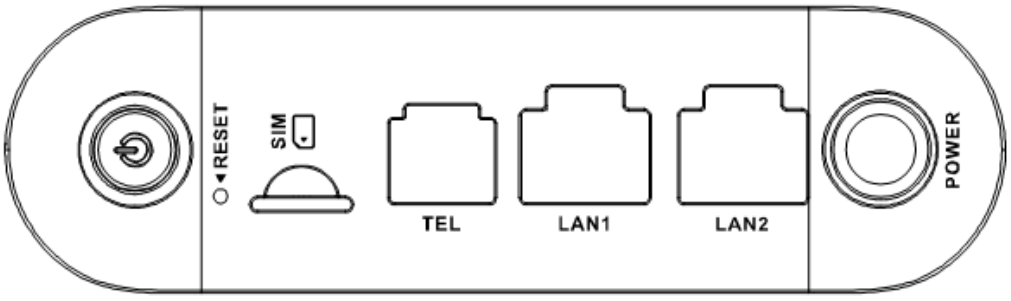


Figure 2 Rear Panel Ports

The following ports are located on the rear panel (refer above image from left to right)

Port ID	Description
Power Button	Press this button to power on device after plug in the power adaptor.
RESET	Pin-hole switch to do factory reset.
SIM	Insert the SIM card (4FF Size) into the slot as directed with image.
TEL	This RJ11 port helps to connect a telephone using telephone line.
LAN1	This RJ45 port helps connect local PC using Ethernet cable.
LAN2	This RJ45 port helps connect local PC using Ethernet cable.
POWER	Port where you will connect the power supply using power adaptor.

1.3.3 All Side View

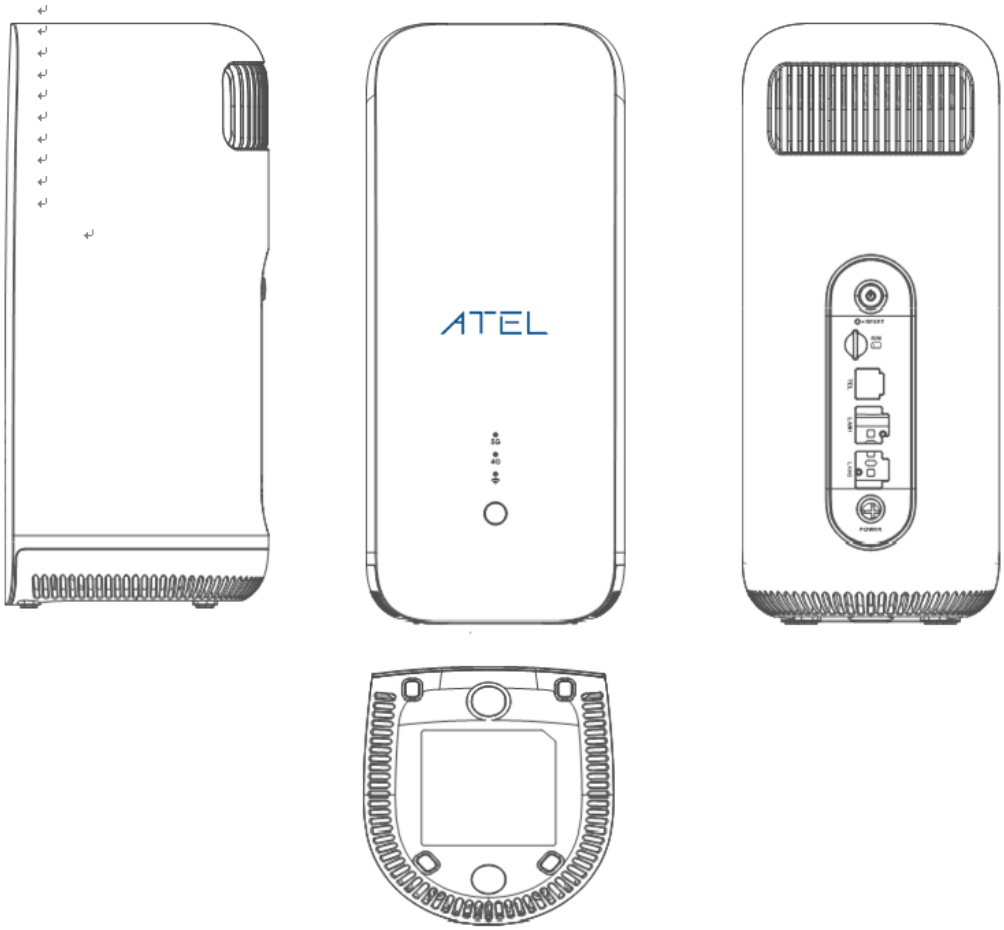


Figure 4 All Side View

1.3.4 General Application of DW516

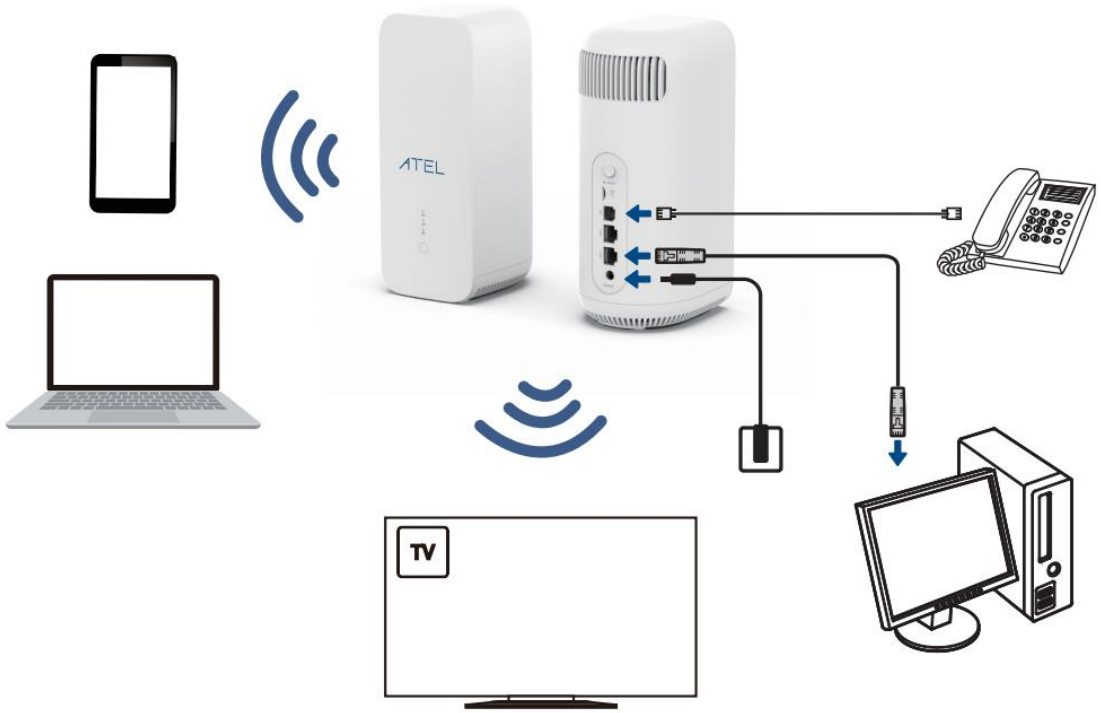


Figure 3 Local Users and Telephone connected to DW516 via Ethernet/Wi-Fi & Phone cable

Chapter 2 Connecting the router

2.1 System requirements

- SIM card with Internet access enable
- PCs with a working Ethernet Adapter and an Ethernet cable with RJ45 connectors
- Web browser, such as Microsoft Internet Explorer, Mozilla Firefox or Apple Safari

2.2 Installation Environment Requirements

- Place the router in a well-ventilated place far from any heater or heating vent
- Avoid direct irradiation of any strong light (such as sunlight)
- Keep at least 2 inches (5 cm) of clear space around the router
- Operating Temperature: -10℃~55℃
- Operating Humidity: 5%~95%, Non-condensing

2.3 Connecting the router

The router supports internet services over 3G/4G/5G network. By default, router will attempt to connect 5G network then on 4G or 3G network.

1. Insert the SIM card into the slot until you hear a click.

Note:

Use a standard nano SIM card (4FF) size.

2. Connect Telephone on RJ11 Port with telephone cable for Voice.

3. Connect your PC with the device via Ethernet cable for wired connection or via Wi-Fi for wireless connection.
   You can find Wi-Fi details like SSID and password from the device label.

4. Connect Power adaptor from power outlet to the DC port to turn on the device.

5. Verify the hardware connection by checking the following LEDs' status.
   If 5G or 4G LED is on, your device is connected to the Internet successfully and ready to use.

Note:

For better Internet connection, please make sure the 5G/4G LED is ON. Otherwise, move device to another location that receives stronger signals, i.e.: near a window kindly refer to LED Definition for more details.

Chapter 3 Quick Installation Guide

This chapter will show you how to configure the basic functions of your DW516 using Quick Setup within minutes.

1. Set up the TCP/IP Protocol in "Obtain an IP address automatically" mode on your PC. If you need instructions as to how to do this, please refer to Appendix B: Configuring the PC.
2. Connect your computer to DW516 on LAN port via an Ethernet cable.
   LAN led should be turned ON, that indicates that Router is connected successfully to your PC

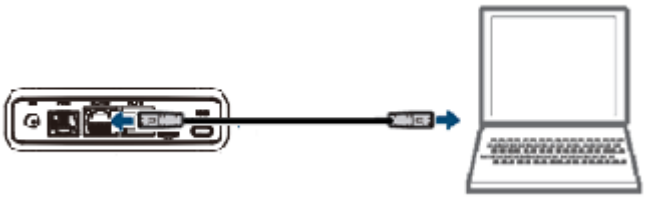


Figure 7 LAN connection to PC

3. To access the configuration utility, open a web-browser and type the default address http://192.168.0.1 in the address field of the browser.
4. By default, the device username is 'admin'. For password, please check your device label for the unique Online Portal password.

Figure 8 Login Window

Note:

- If the above screen does not pop-up, Try clear your web browser cache memory
- Try check connection with ping, open command prompt and input to **ping 192.168.0.1**
  You should be able see ping response if connection is established

5. Once logged in successfully, you will see Home page where all the basic configurations related to router are presented for quick check i.e. SIM status, Network status

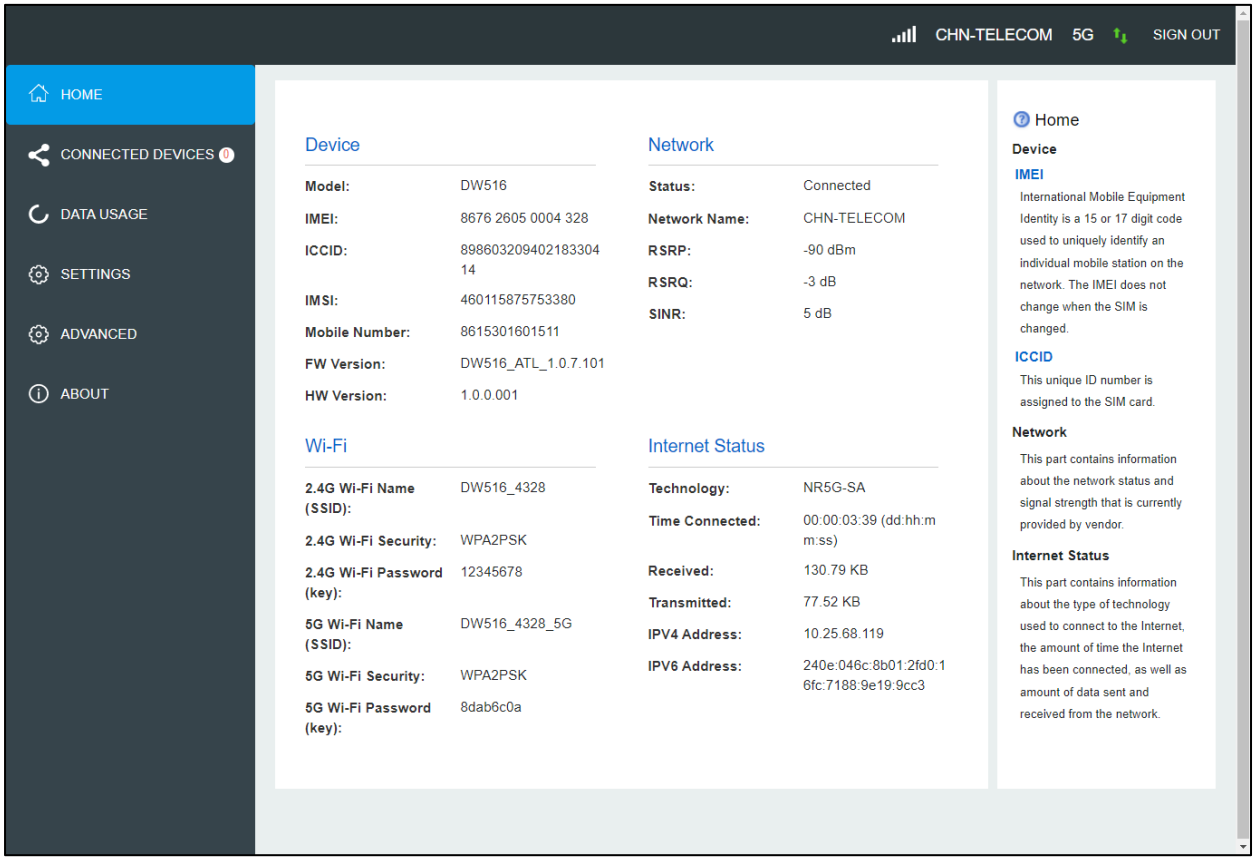


Figure 9 Home

Chapter 4 Router Configurations

This chapter will show each Web page's key functions and the configuration procedure.

4.1 Login

1. To access the configuration utility, open a web-browser and type the default address http://192.168.0.1 in the address field of the browser.

2. By default, the device username is 'admin'. For password, please check your device label for the unique Online Portal password.

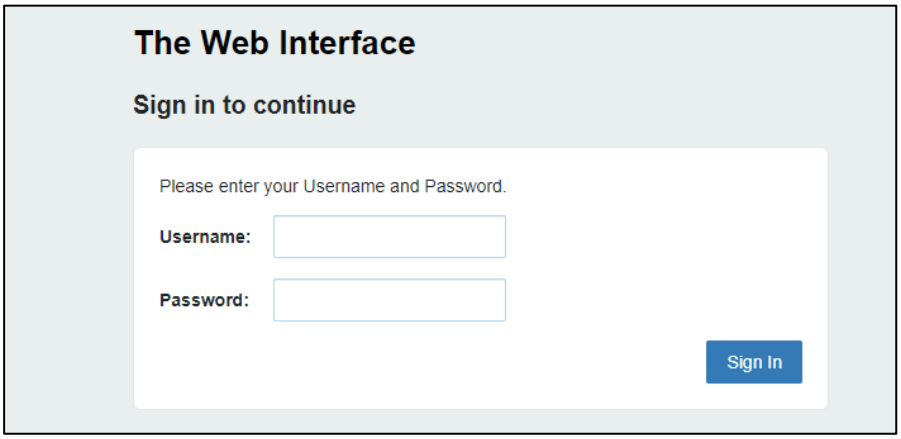


Figure 10 Login Window

After your successful login, you will see the main menus on the left of the Web-based utility.

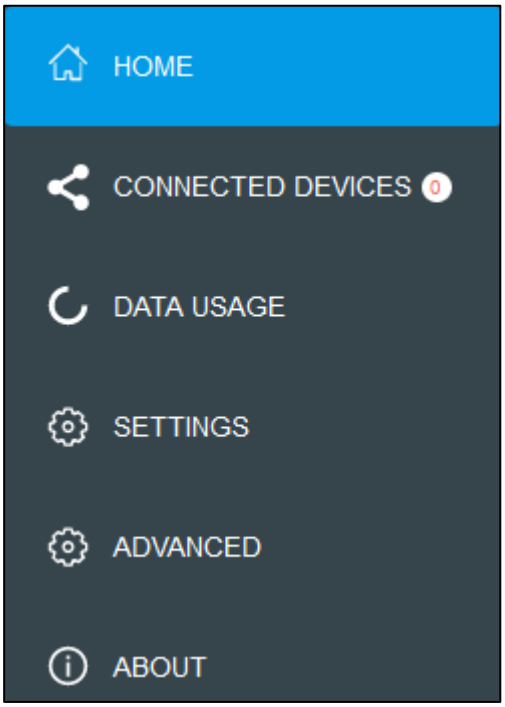


Figure 4 Main Menu Bar

Menu interface includes six sections/Submenus: HOME, CONNECTED DEVICES, DATA USAGE, SETTINGS, ADVANCED, ABOUT. You can manage the router configuration through the menu page and modify the parameters according to your needs.

The detailed explanations for each menu & their key functions are described below.

4.2 Home

Home menu page provides the device, network, Wi-Fi, internet status about the router.

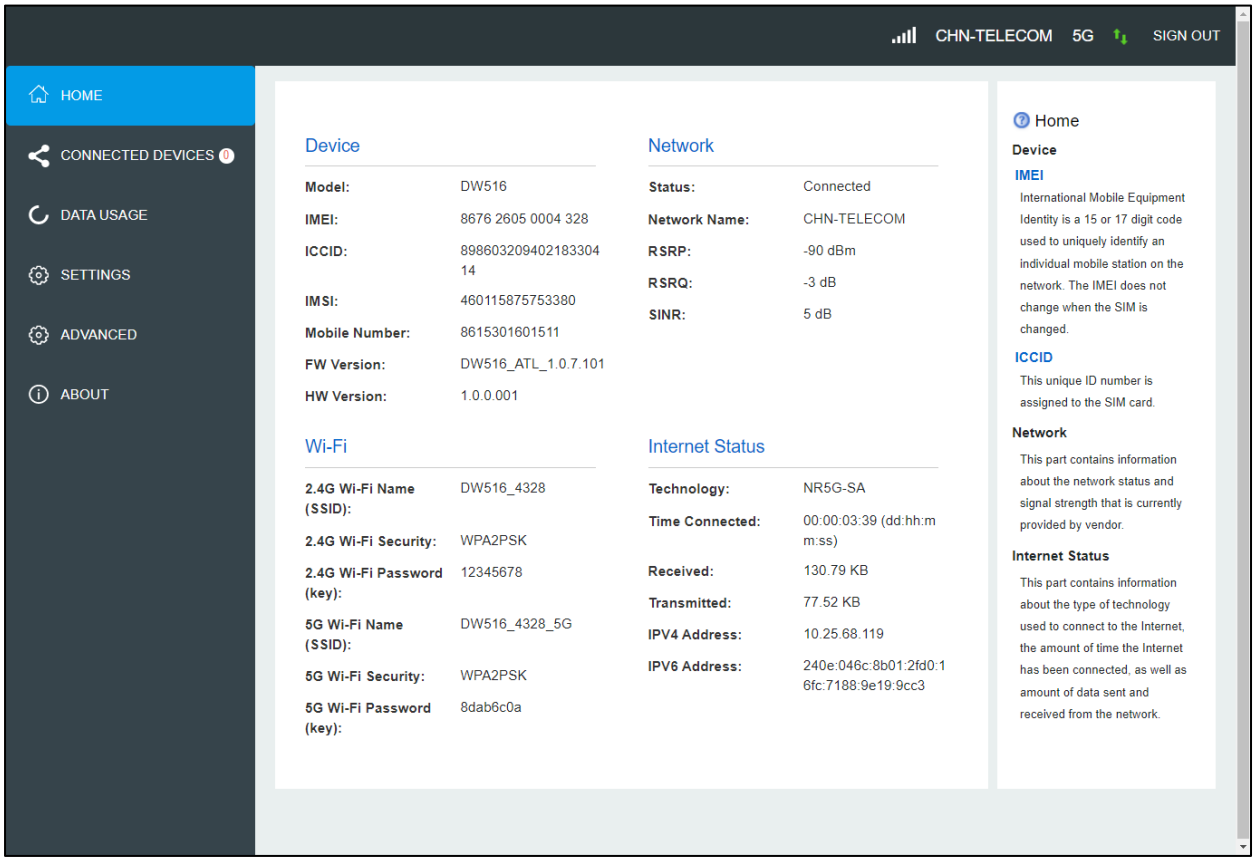


Figure 12 home menu

4.3 Connected Devices

On this page, you can see Connected Devices and Blocked Devices.

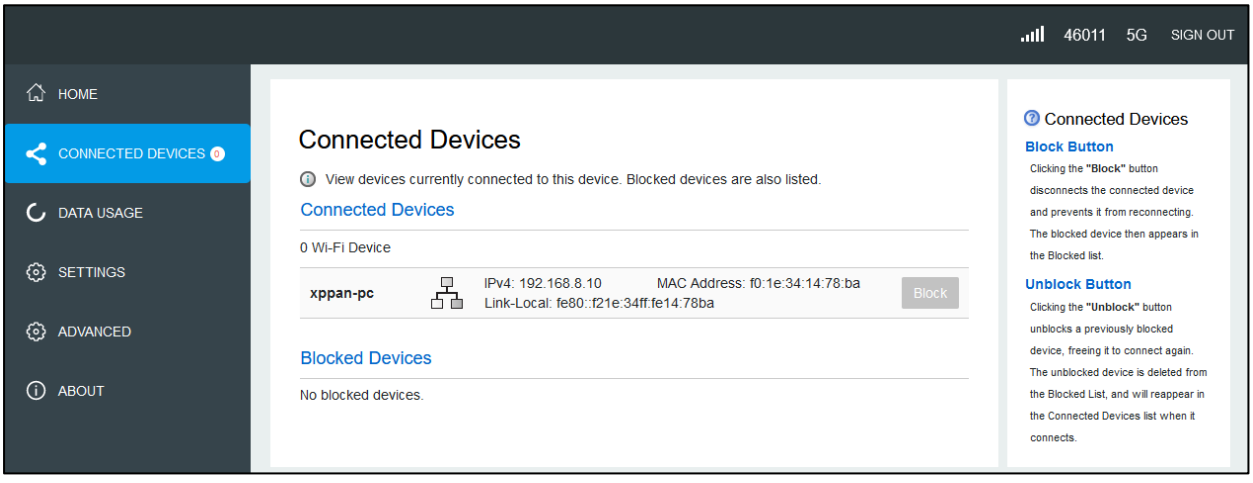


Figure 13 connected devices Menu

- **Connected Devices**: This field lists the device(s) connected to your device.
- To block a device, choose a desired device and click the Block button. The Wi-Fi connection to the blocked device will be disconnected and the blocked device will appear in the Blocked Devices list.

- **Blocked Devices**: Shows the devices that are blocked. Choose a blocked device and click Unblock button, this device will disappear from the "Blocked Devices" list. It will show in the "Connected Devices" again after it connects to your device

4.4 Data Usage

Your estimated data usage is displayed below.
This may not match your bill. Check with your service provider for billable usage.
Choose Day of Month, Usage Limit and Click Save Changes to save your settings.

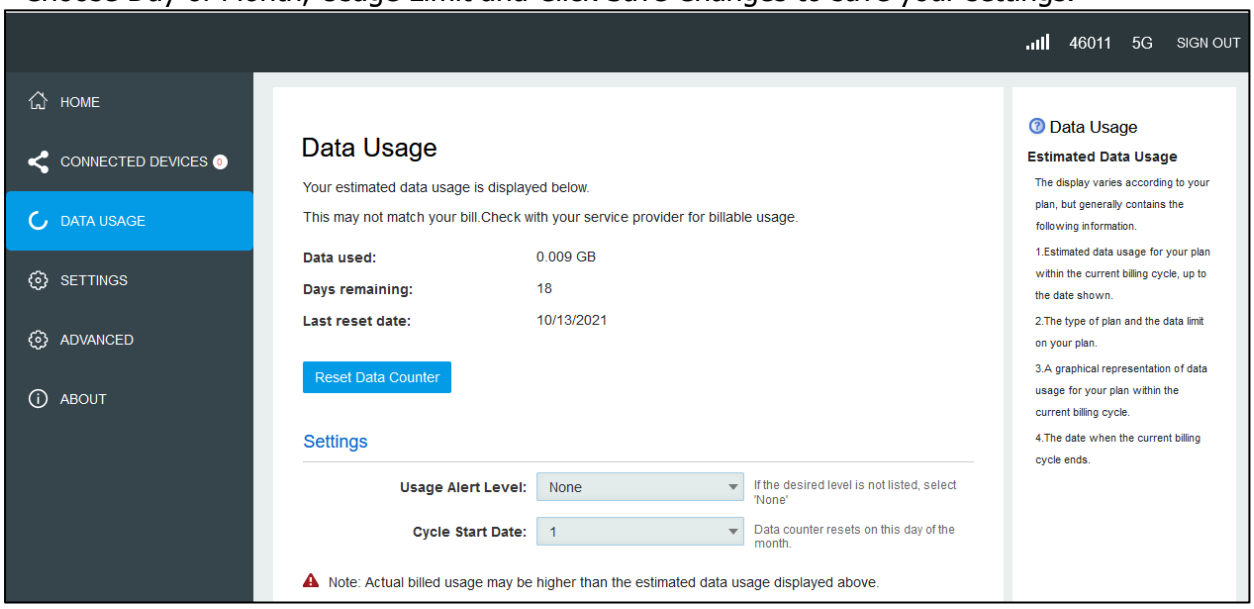
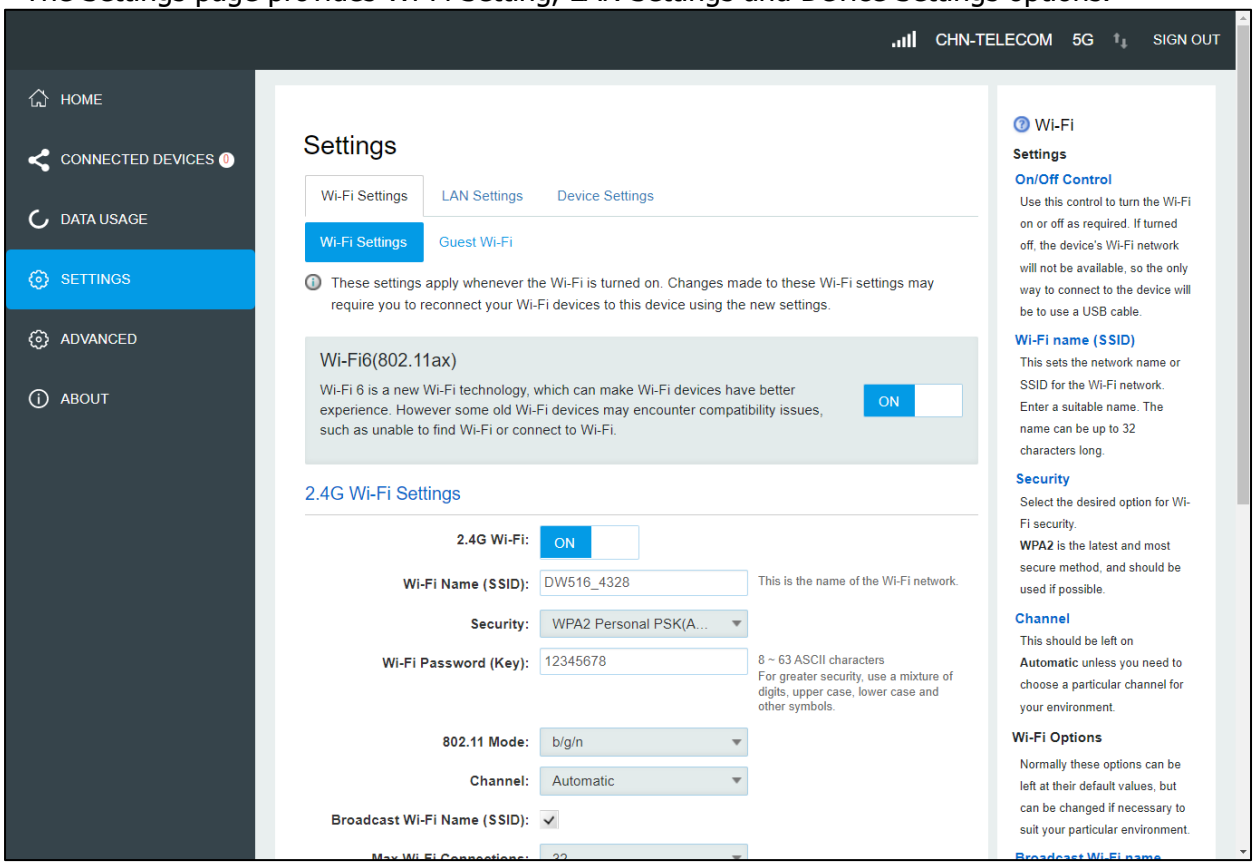


Figure 54 data usage menu

4.5 Settings

The Settings page provides Wi-Fi Setting, LAN Settings and Device Settings options.



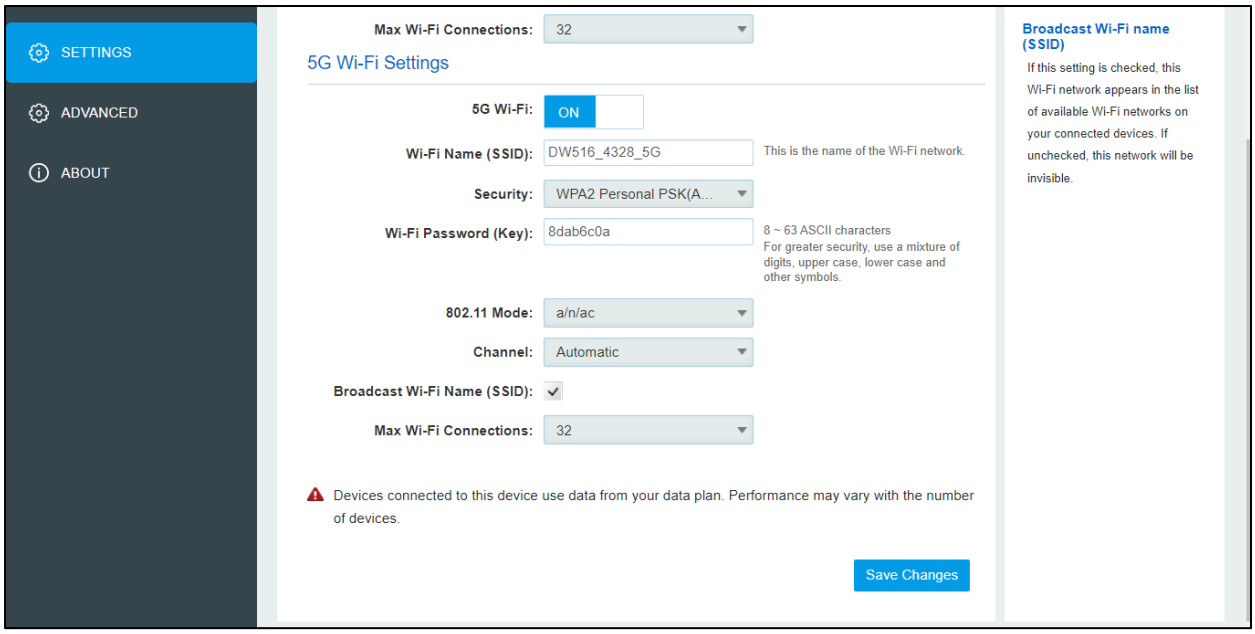


Figure 65 Wi-Fi settings menu

4.5.1 Wi-Fi settings

These settings apply whenever 2.4G Wi-Fi and 5G Wi-Fi are turned on. Changes made to these Wi-Fi settings may require you to reconnect your Wi-Fi devices for the new settings to come into effect.

- **2.4G Wi-Fi settings**
- **2.4G Wi-Fi ON/OFF:** Turn on to allow Wi-Fi devices to connect to this device. 2.4G Wi-Fi devices will not connect to this device after it is turned off.
- **Wi-Fi name (SSID):** To identify your wireless network, a name called the SSID (Service Set Identifier) is used. You can set a name with a max of 32 characters. Make sure that your SSID is unique if there are other wireless networks operating in your area.
- **Security:** You can set the wireless security and encryption to prevent the router from unauthorized access and monitoring. The default security is WPA2 Personal PSK(AES). You can also set Security as "None", "WPA Personal/PSK", "WPA2 Personal/PSK(AES)", "WPA/WPA2 Mixed Mode".

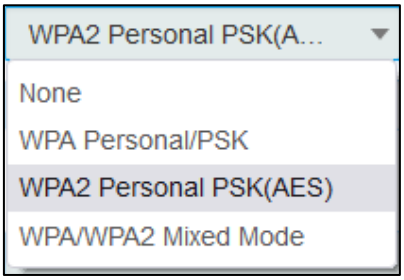


Figure 76 2.4G Wi-Fi security menu

- **Channel:** The default "Channel" is "Automatic". You can set it from channel 1 to channel 11.

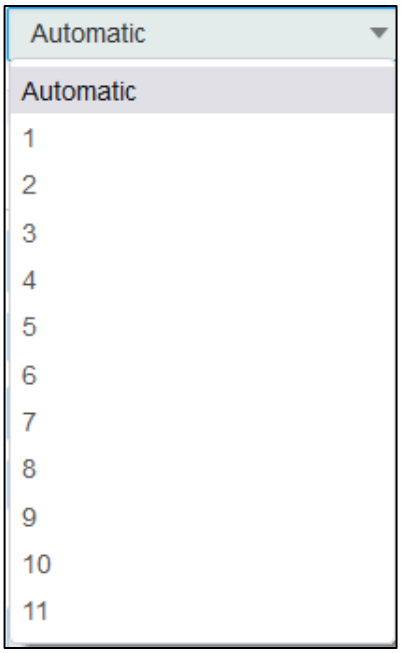


Figure 87 2.4G Wi-Fi channel menu

- **Broadcast Wi-Fi name (SSID):** The wireless device can search and connect to the SSID after turning on "Broadcast Wi-Fi name (SSID)". The wireless device must input SSID manually to connect to the SSID after turning off "Broadcast Wi-Fi name (SSID)".

- **5G Wi-Fi settings**
- **5G Wi-Fi ON/OFF:** Turn on to allow Wi-Fi devices to connect to this device. 5G Wi-Fi devices will not connect to this device after it is turned off.
- **Wi-Fi name (SSID):** To identify your wireless network, a name called the SSID (Service Set Identifier) is used. You can set a name with a max of 32 characters. Make sure that your SSID is unique if there are other wireless networks operating in your area.
- **Security:** You can set the wireless security and encryption to prevent the router from unauthorized access and monitoring. The default security is WPA2 Personal PSK(AES). You can also set Security as "None", "WPA Personal/PSK", "WPA2 Personal/PSK(AES)", "WPA/WPA2 Mixed Mode".

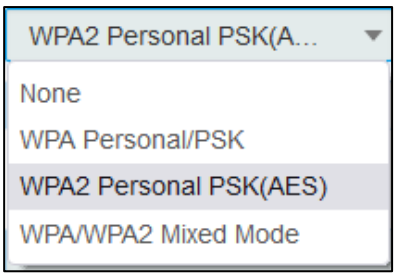


Figure 98 5G Wi-Fi security menu

- **Channel:** The default "Channel" is "Automatic". You can set it from channel 36 to channel 161.

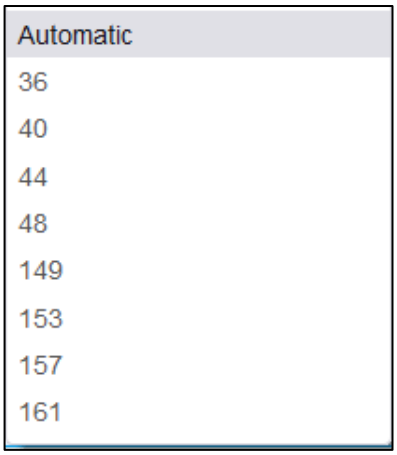


Figure 109 5G Wi-Fi channel menu

- **Broadcast Wi-Fi name (SSID):** The wireless device can search and connect to the SSID after turning on "Broadcast Wi-Fi name (SSID)". The wireless device must input SSID manually to connect to the SSID after turning off "Broadcast Wi-Fi name (SSID)".

4.5.2 LAN Settings

From the Online Portal, click Settings > LAN Settings to display the device. Information shown in the following figure.

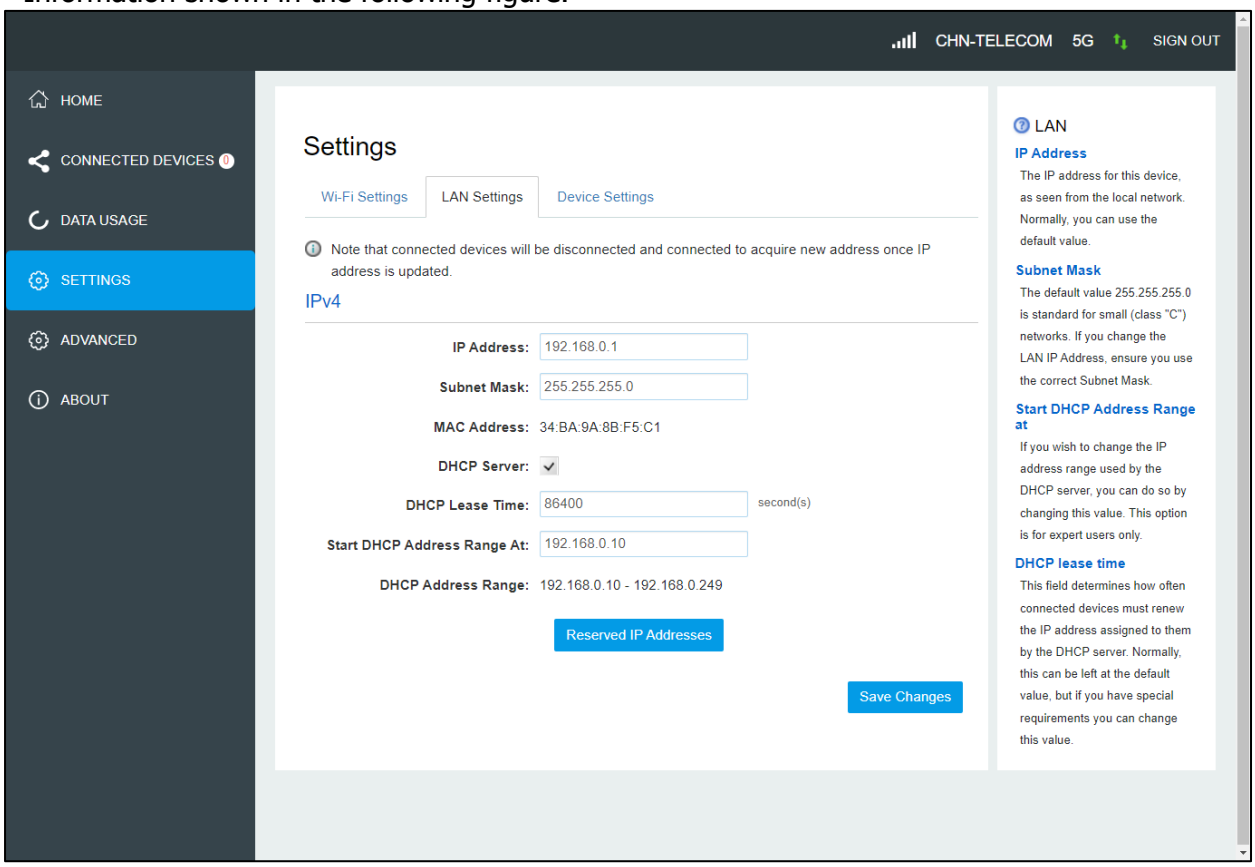


Figure 20 Lan settings menu

- **IP Address:** Enter the IP address of your Device Hotspot (factory default: 192.168.0.1).
- **Subnet Mask:** An address code that determines the size of the network. Normally use 255.255.255.0 as the subnet mask.
- **MAC Address:** It is written to the device at the time of manufacture.
- **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.

- **Start DHCP address range at:** Specify an IP address for the DHCP server to start with when assigning IP address. The default start address is 192.168.0.10
- **Reserve IP Address:** You can reserve an IP address so that it is always assigned to the same connected device. Every reserved IP address must be within the range of IP addresses used by DHCP.

4.5.3 Device Settings

From the Online Portal, click Settings >Device Settings to display the device. Information shown in the following figure.

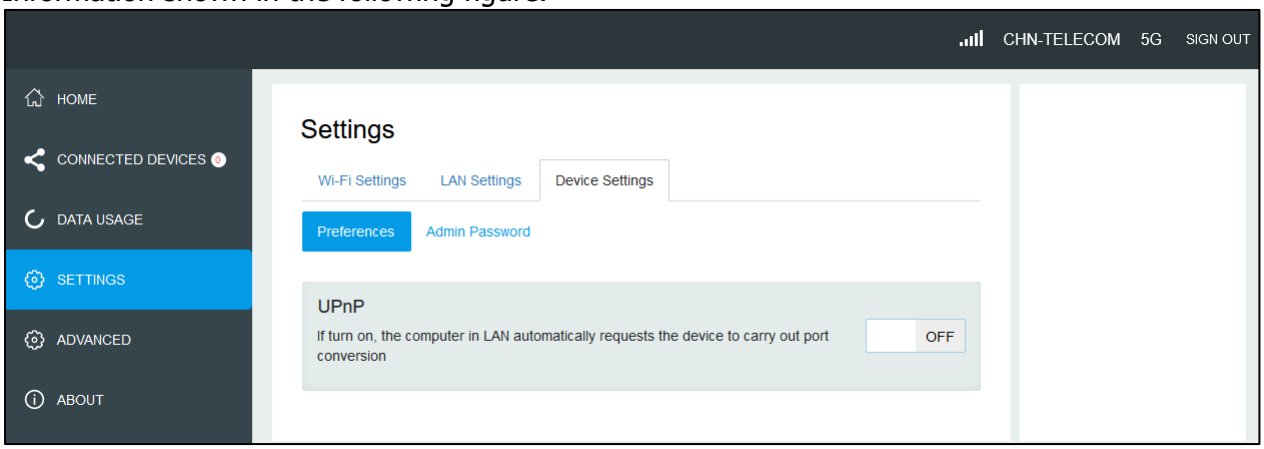


Figure 21 device settings menu

- **Preferences**
- **UPnP (Universal Plug and Play):** UPnP (which stands for Universal Plug and Play) is a feature that allows the devices on your home network to discover each other and access certain services. If you don't use applications that need port forwarding, such as peer-to-peer applications, game servers, and many VoIP programs, you may be better off disabling UPnP entirely.

- **Admin Password**
- **Admin Password:** The Admin Password is used to sign in to this Online Device Management Portal. To change the password, you must enter the current Admin Password. You will be locked out after 5 incorrect password attempts. You will need to restart the device and enter the Online Portal again.

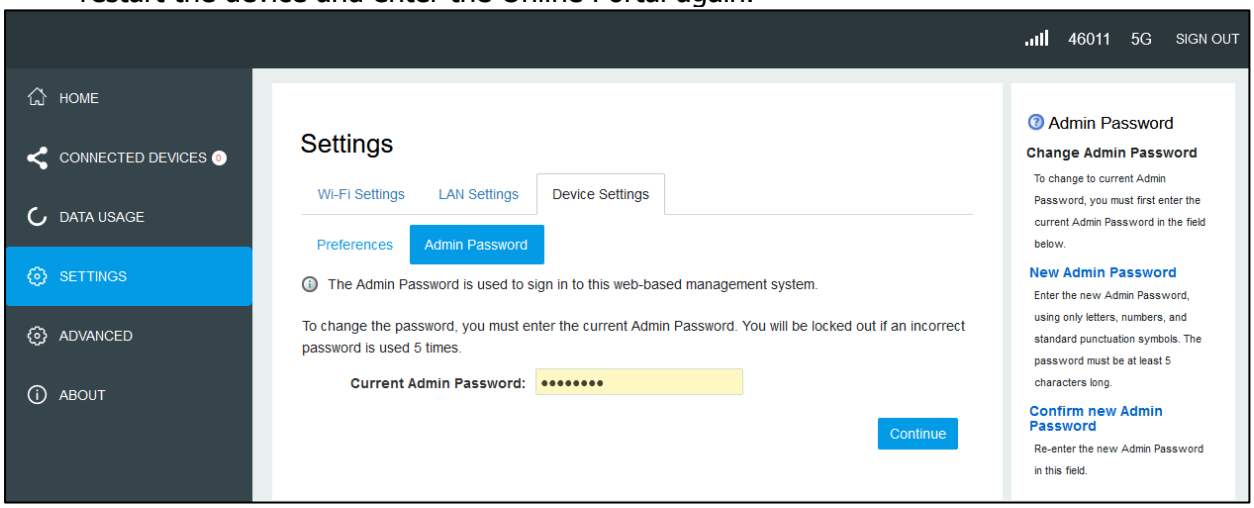


Figure 22 admin password menu

4.6 Advance

On this page, you can see two menus: Mobile Network and Firewall Settings

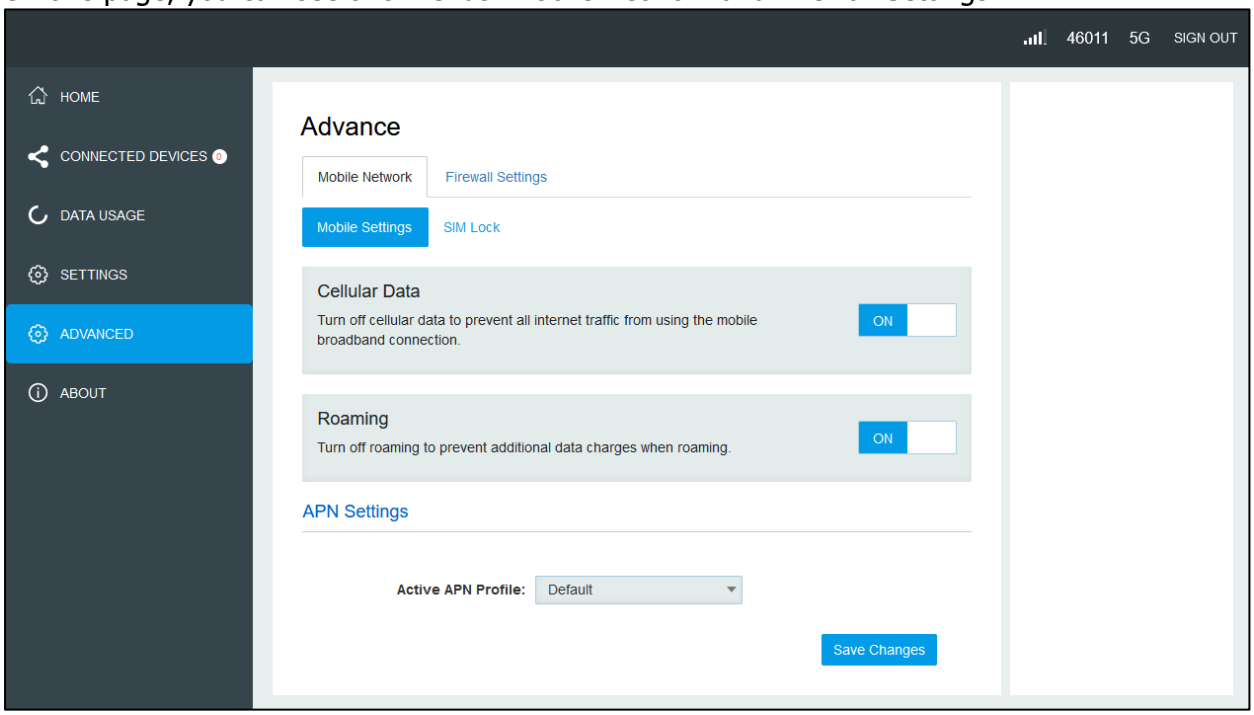


Figure 23 advance menu

4.6.1 Mobile Network

From this page, you can see two menus: Mobile Settings and SIM Lock.

- **Mobile Settings**

- **Cellular Data:** Turn off cellular data to prevent all internet traffic from using the mobile broadband connection.
- **Roaming:** Turn Data Roaming on or off. Turn it ON to require confirmation before connecting to the roaming network.
- **APN Settings:** You can use the default APN to connect to the Internet. You can also add new APNs.

- **SIM Lock**

For additional security, the SIM card inside your device may be locked with a PIN code. When locked, the PIN code must be entered before the device will connect to the internet. The default PIN is available from your service provider.
If the PIN Lock feature is ON, you will need to enter the SIM PIN every time the device is powered on.

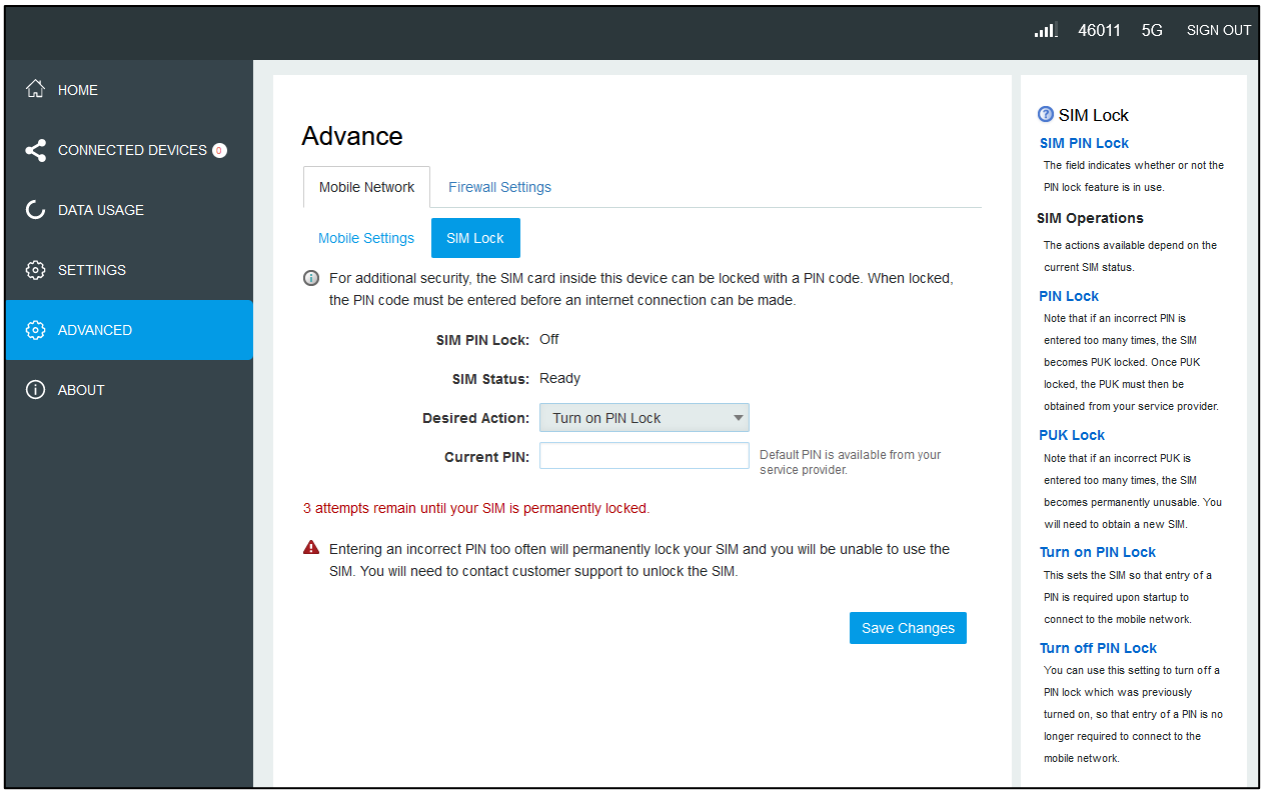


Figure 24 SIM lock menu

When you enter the right PIN code, the status of SIM will change to "Ready", and you can connect to the internet.

Note:

- Entering an incorrect PIN more than 3 times will permanently lock your SIM and you will need to enter the PUK code to unlock. You will need to ask your Service provider to get the PUK code.

4.6.2 Firewall Settings

On this page, you can see four menus: Firewall, MAC Filter, Port Filtering and Port Forwarding.

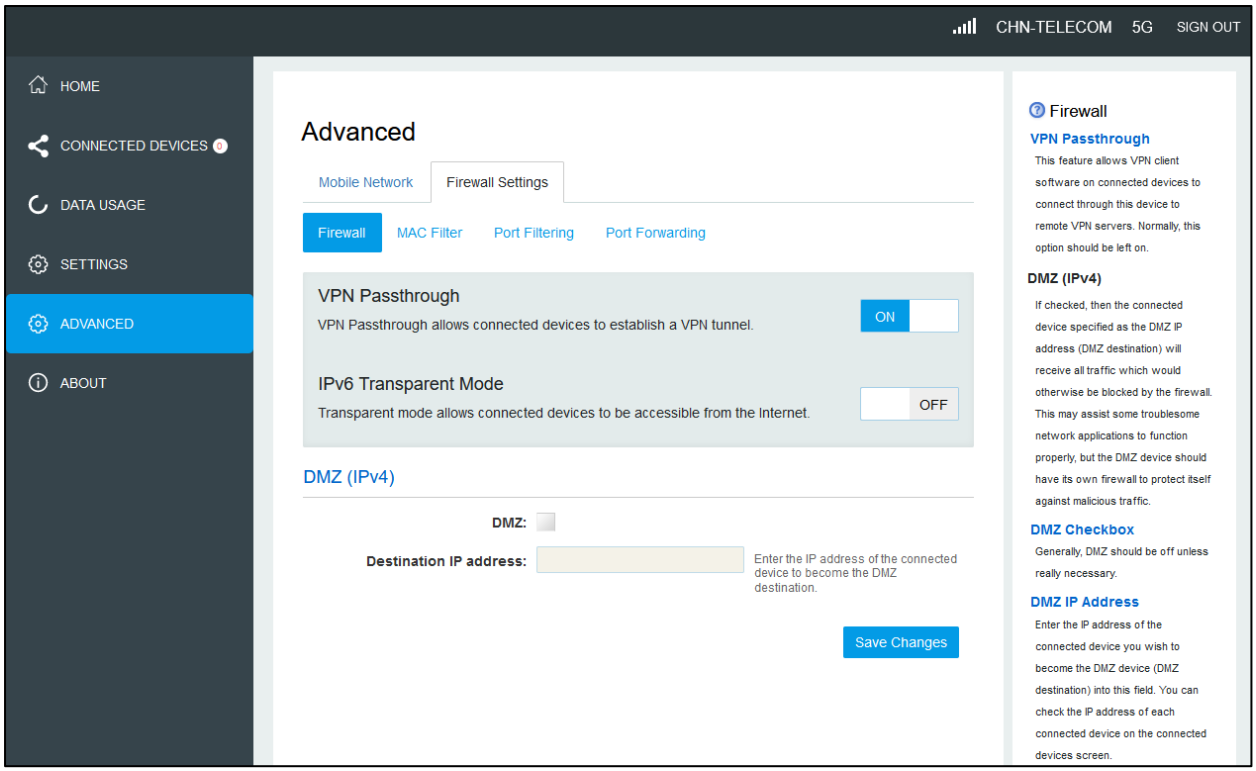


Figure 25 firewall settings menu

- **Firewall**

This page contains Firewall-related settings:

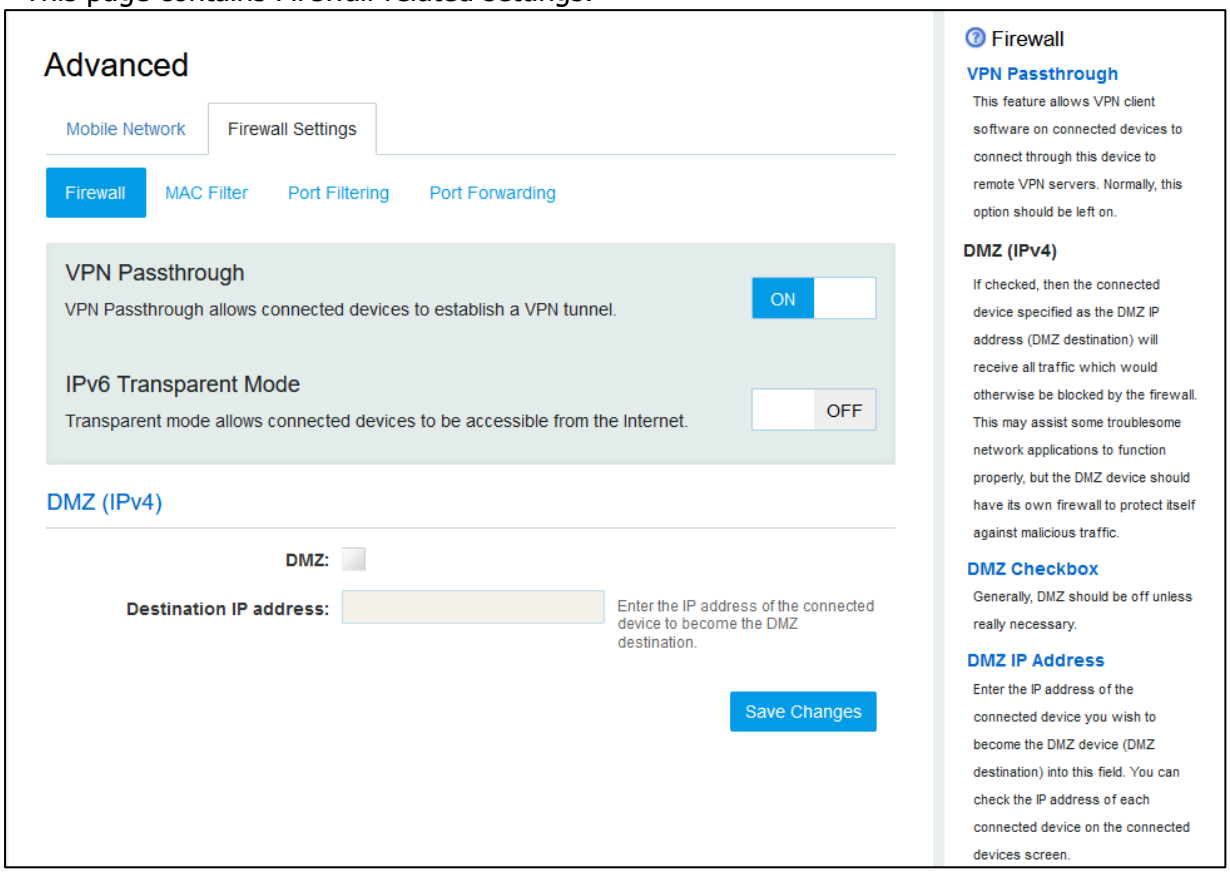


Figure 26 firewall menu

- **VPN Passthrough:** After turned on, VPN Passthrough allows connected devices to establish a VPN tunnel.
- **IPv6 Transparent Mode:** After turned on, IPv6 Transparent mode allows connected devices to be accessible from the Internet.

- **DMZ(IPv4):** Enter the IP address of the connected device in the Destination IP address input field to become the DMZ destination. After enabling the DMZ feature, all the applications of the connected device will be visited.

- **Mac Filter**

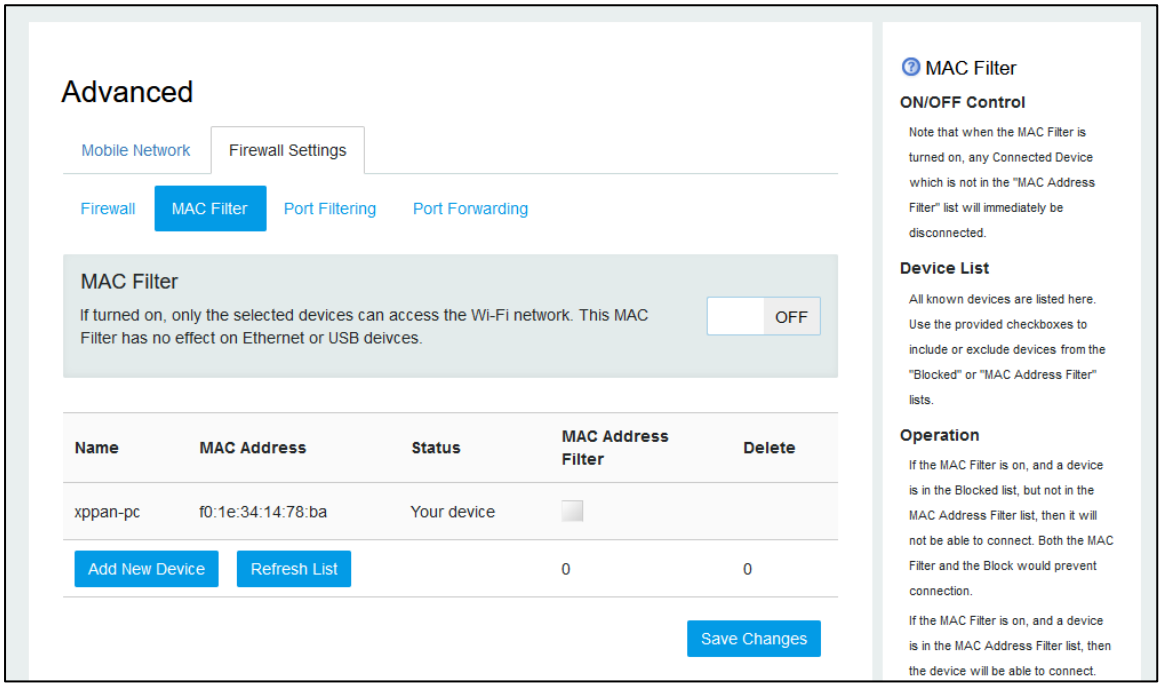


Figure 27 MAC filter Menu

The default "MAC Filter" status is "OFF". If the MAC Filter is on and devices are listed in MAC Address Filter list, then all of the listed devices will be able to connect to the device.
For any given device, the interaction of the MAC Filter with the "Block" feature on the Connected Devices screen is shown on the following table.

Included in Block List	Included in MAC Filter List	Connection
No	Yes	Allowed
No	No	Not allowed
Yes	Yes	Not allowed
Yes	No	Not allowed

Table 2 MAC filter list Definition

The "Block" (Blacklist) feature is always available. After blocked, the blocked devices will disconnect from the device.

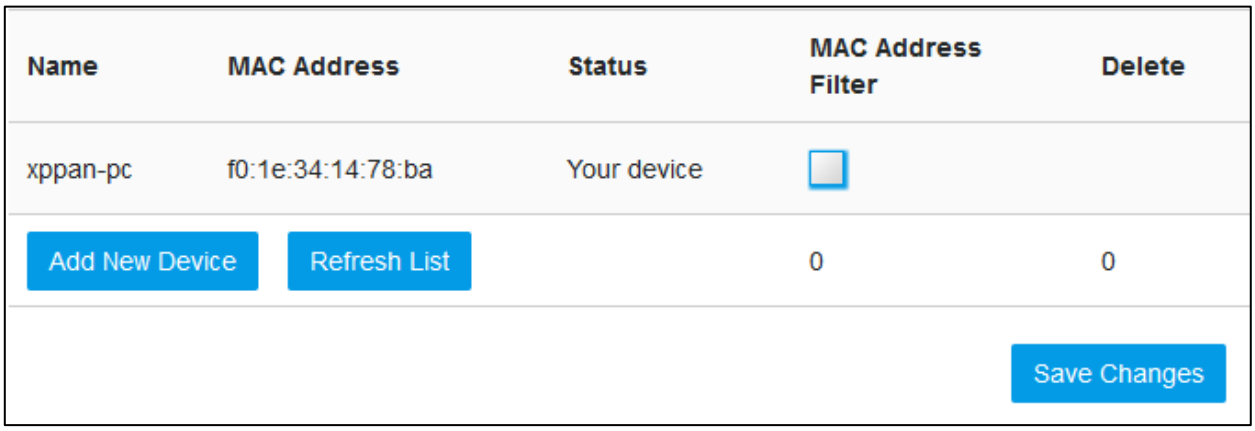
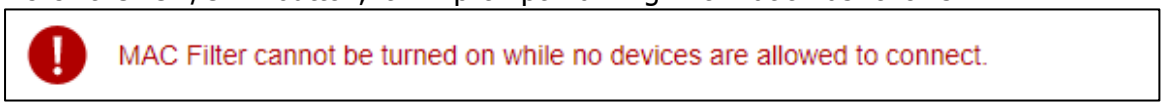


Figure 28 MAC filter list Menu

Because enabling the MAC Filter could potentially disconnect all devices, the user needs to populate the "MAC Address Filter" list first while the MAC Filter is OFF. Otherwise when you

click the "ON/OFF" button, it will prompt warning information as follows:



After changing the "MAC Filter" to "ON", only the local "MAC Address Filter" listed devices can connect to the device, other devices will disconnect from the device.

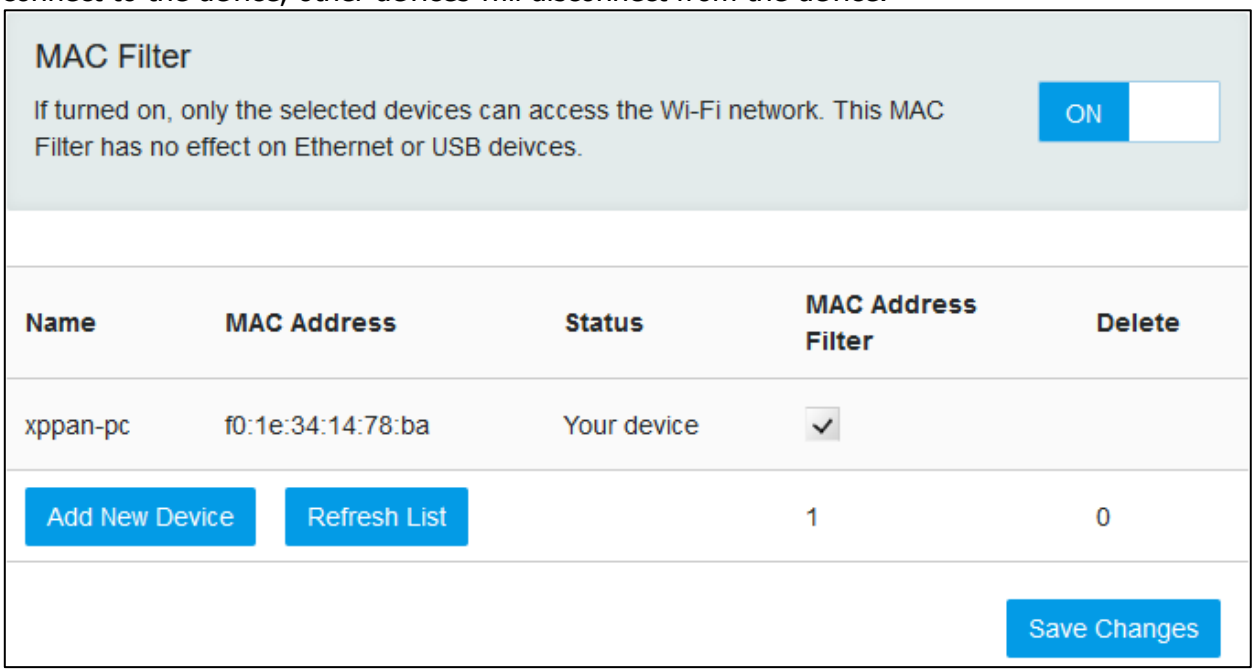


Figure 29 turn on MAC filter Menu

You can click "Add New Device" button to add the devices. The added devices can connect the device.

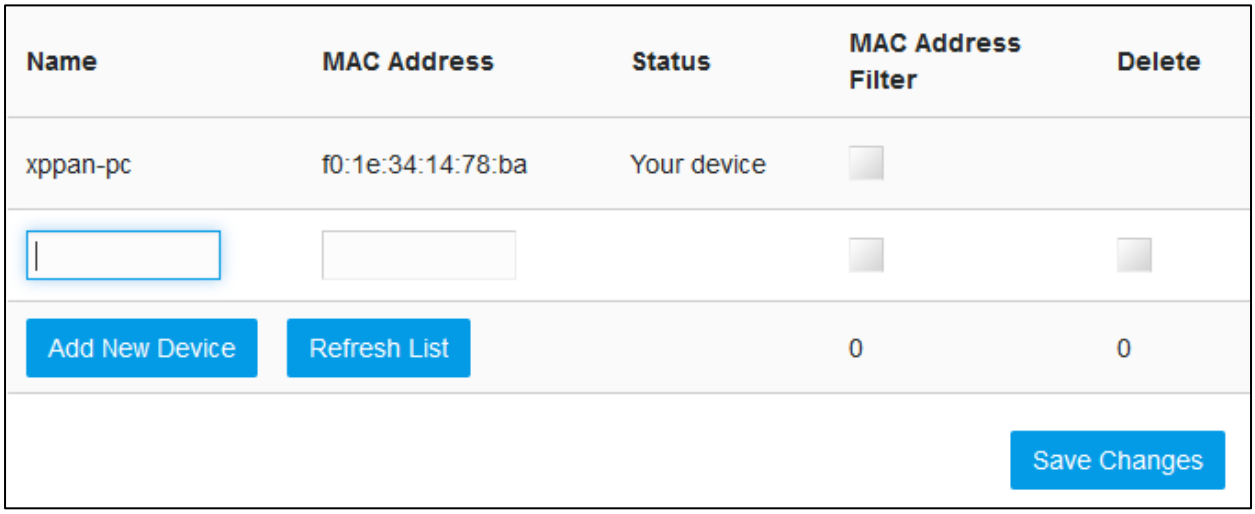


Figure 30 add new device Menu

- **Port Filtering**

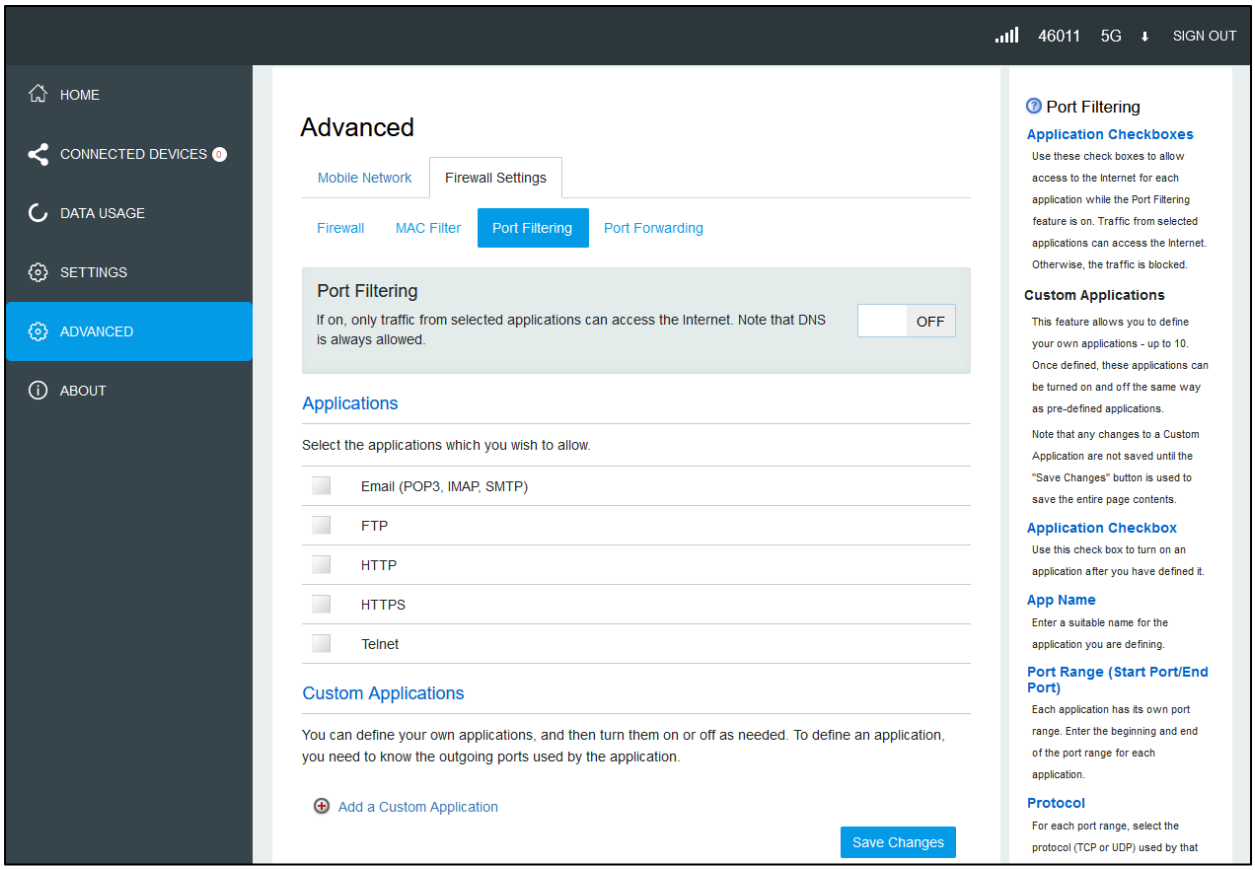


Figure 31 port filtering menu

- **Applications**
  The default applications have "Email (POP3, IMAP, SMTP)", "FTP", "HTTP", "HTTPS" and "Telnet". If port filtering is on, only traffic from selected applications can access the Internet. Note that DNS is always allowed.

- **Custom Applications**
  Click "Add a Custom Application" to define your own applications, and then turn them on or off as needed. To define an application, you need to know the outgoing ports used by the application.

- **Port Forwarding**

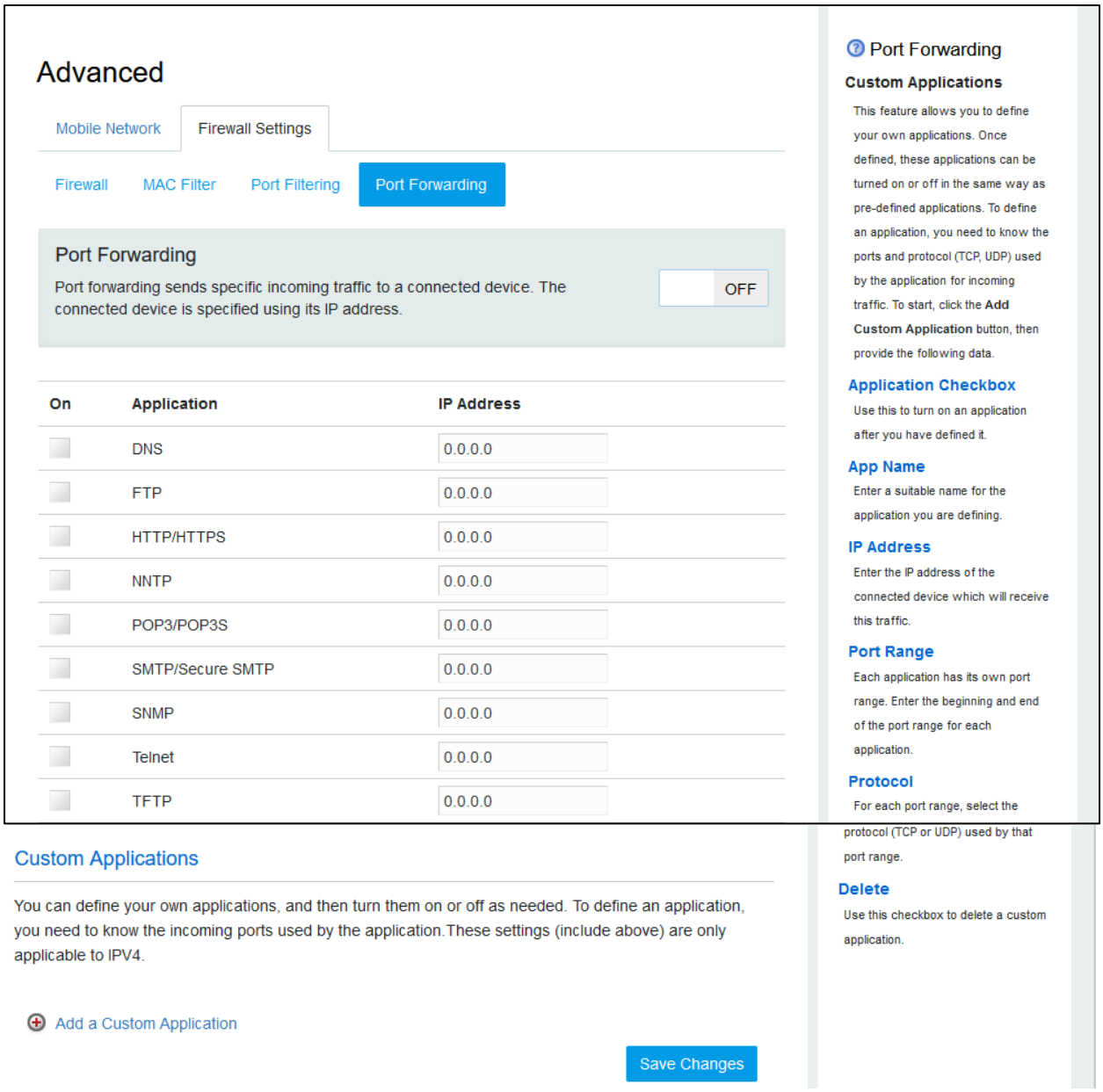


Figure 32 port forwarding menu

- **Applications**
  The default applications have "DNS", "FTP", "HTTP", "POP3", "SMTP", "SNMP", "Telnet" and "TFTP". Port forwarding sends specific incoming traffic to a connected device. The connected device is specified using the IP address.

- **Custom Application**
  Click "Add a Custom Application" to define your own applications, and then turn them on or off as needed. To define an application, you need to know the incoming ports used by the application.

4.7 About

From the Online Portal main screen, click the About tab to view the available information.

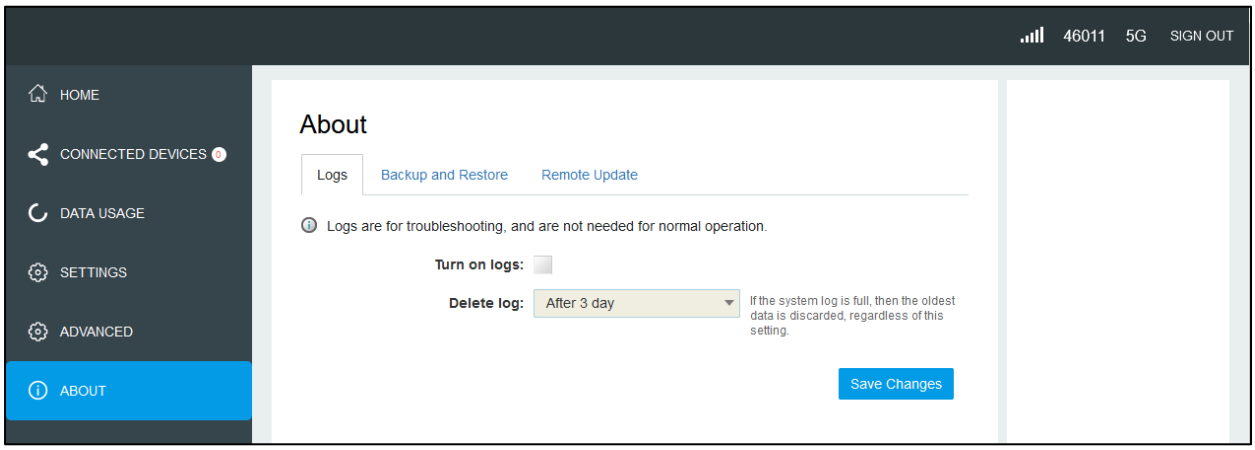


Figure 11 about menu

4.7.1 Logs

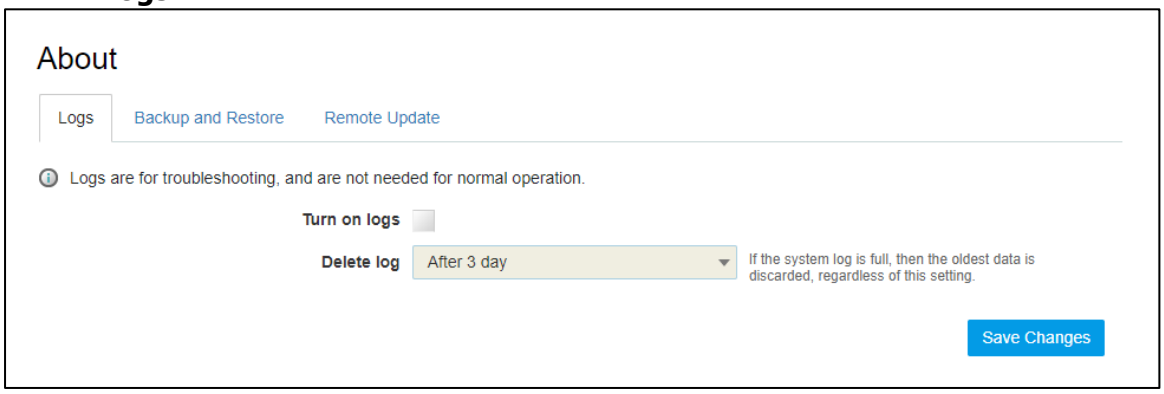


Figure 34 logs menu

- **Turn on Logs**

Turn on the logs as needed.

- **Delete log**

This setting determines for how long the log data is retained. Select the desired option. Note that if the log is full, the oldest data is deleted, regardless of this setting.

- **Log**

This log contains data regarding connections to the mobile network.

- **Clear Log**

Clicking this button will delete all existing log data. This makes new data easier to read.

- **Refresh**

Use this to update the log data which is displayed.

4.7.2 Backup and Restore

On this page, you can operate Backup, Restore, Restore to Factory Defaults and Restart.

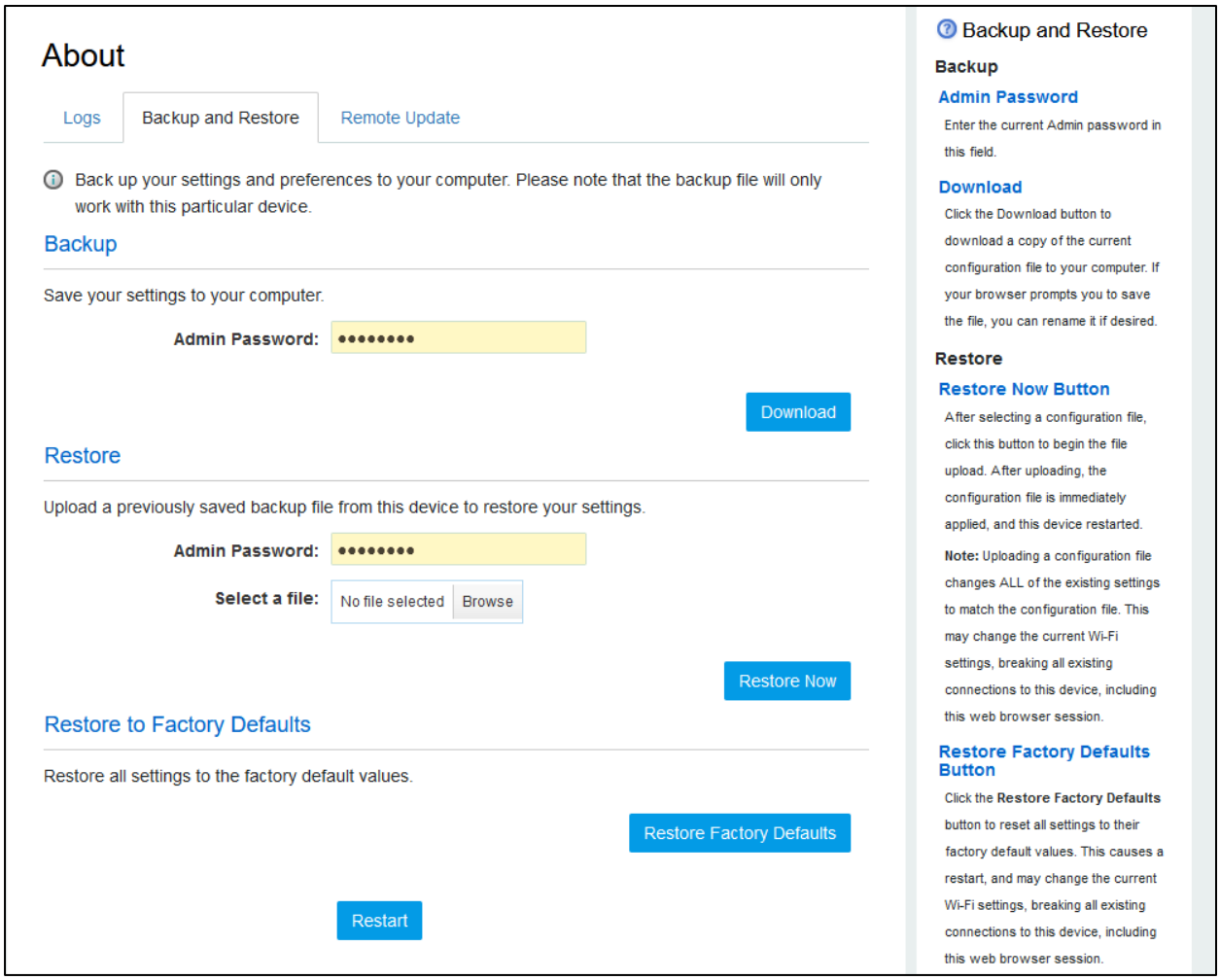


Figure35 backup and restore menu

- **Backup:** Backup your device settings and preferences to your computer.

Note:

The backup file will only work with this particular device.

You will be locked out if an incorrect password is used too many times.

- **Restore:** Click "Browse" to select a Bin file available on connected PC on LAN with router and then click **Restore Now** button to begin the procedure, the device will automatically reboot after updated completely.
- **Restore to Factory Defaults:** Click on Restore Factory Defaults button to change the entire existing router configuration to factory defaults.
  One confirmation window will be appeared, click on **Confirm** if want to proceed or click **Cancel** if want to abort the process.

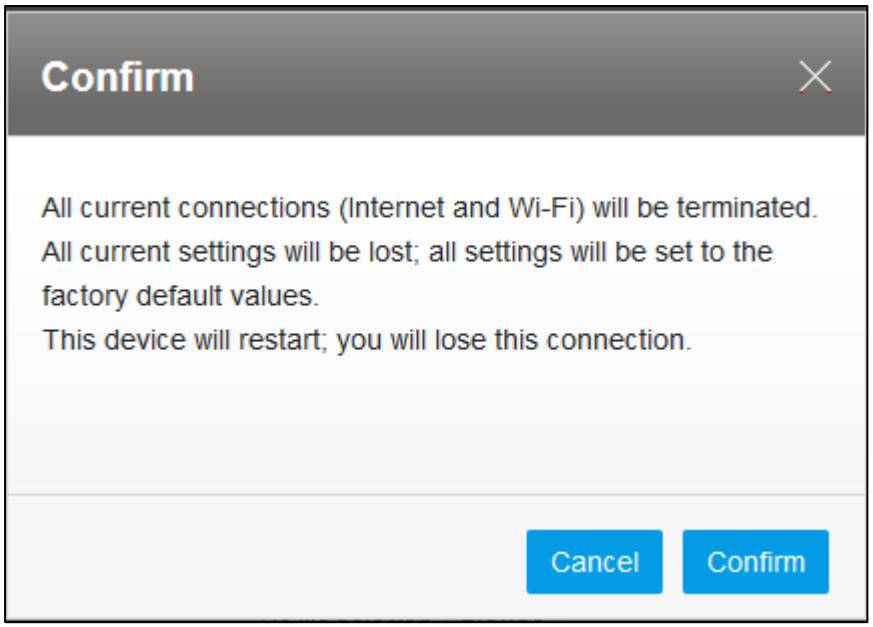


Figure 36 Message prompt for Restore

Note:

All changed configurations will be lost after rest and router will come up with factory default configurations.

- **Restart:** Click on Restart button. One confirmation window will be appeared, click on **Confirm** if want to proceed, then the Router will reboot immediately or click **Cancel** if want to abort the process.

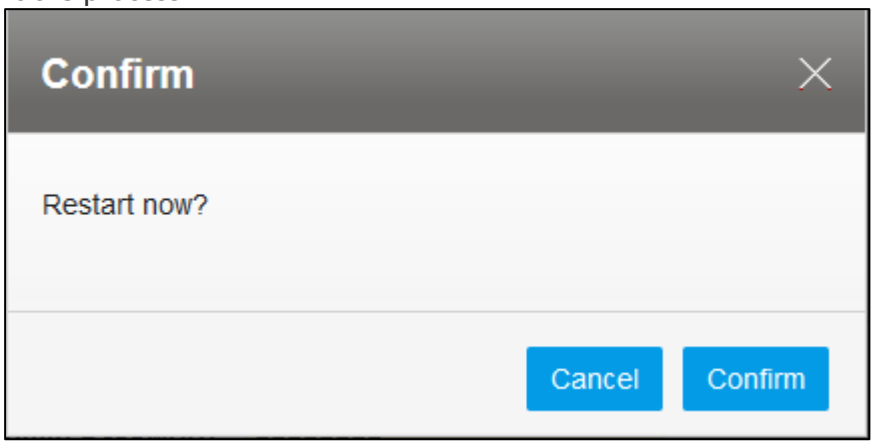


Figure 37 Message prompt for Restart

4.7.3 Remote Update

With this menu, if a new software version on remote server, you can download the SW package available on remote server and upgrade itself.

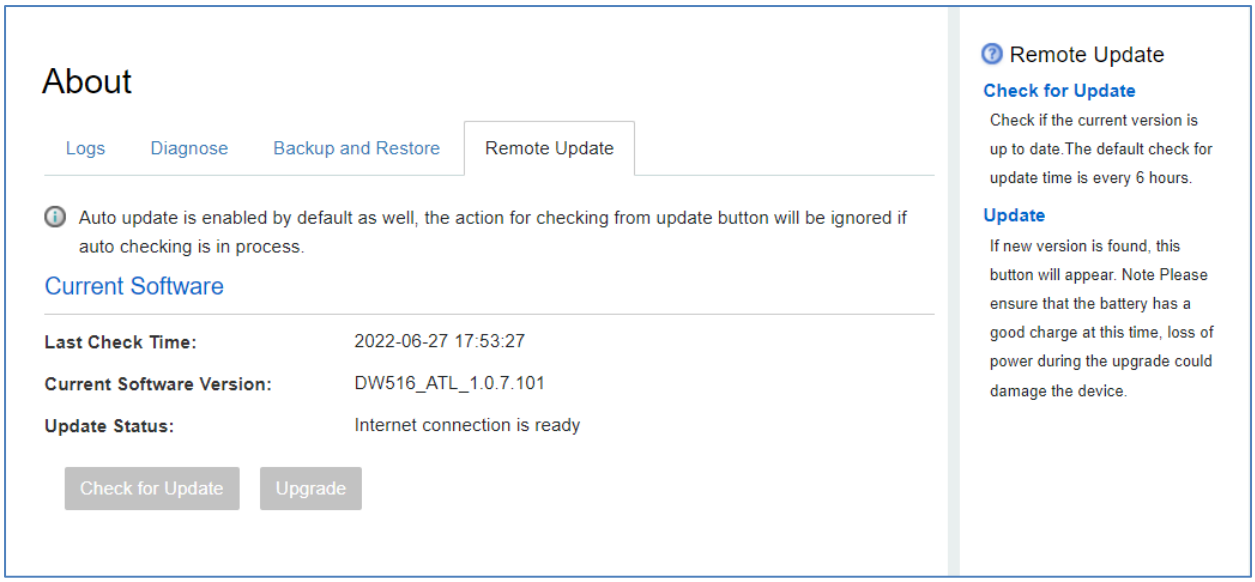


Figure 38 remote update menu

- **Check for Update:** "Check for Update" button is only active (blue color) every 6 hours. When active, you can click the "Check for Update" button to check for new software version. If a new version is detected, the "Upgrade" button will become active (blue color).
- **Upgrade:** If a software upgrade is available, click the active "Upgrade" button to launch the upgrade manually. Once the upgrade is completed, the device will reboot and the new software version will display.

Appendix: Troubleshooting & FAQ

1. What can I do if the login page does not appear?

- Verify that the computer is set to obtain an IP address automatically from the Router. In case, if your Computer failed to obtain IP addresses from router, you can try set IP address manually, refer to Troubleshooting & FAQ Q5
- Verify that http://192.168.0.1 is correctly entered in the web browser and click Login.
- Use another web browser and try again or try clear your browser history or cache memory.
- Reboot your router and try again.
- Disable and enable the active network adapter and try again.

2. What can I do if I cannot access the Internet?

- Check Signal LED status for signal bars, refer to LED definition for details.
- Check Cellular LED Status ,it is should be lit ON, refer to LED definition for details.
- Verify that your SIM card is activated for 5G, LTE, WCDMA services
- Verify that your SIM card has sufficient credit.
- Verify that your SIM card is in your ISP's service area.
- Check the LAN LED status. On state indicates that your PC is connected with Router.
  - Open a web browser and enter http://192.168.0.1 in the address bar.
  - If the login page does not appear, refer to FAQ > 1 and then try again.
- Check more details about Router status on dashboard parameters and contact to your ISP.
- If convenient , Try Reset the router , refer to Troubleshooting & FAQ Q3

3. How do I restore the router to its factory default settings?

There are two ways to Reset/Factory defaults to Router

- With the router powered on, press and hold down the **RST** button on the side panel of the router about 10 seconds and release it. The router will restore and reboot automatically.

- Login to the web About page of the router, and go to Backup and Restore, click Restore Factory Defaults button to factory defaults and wait until the reset process completes.

Note:
During Rest process, just make sure power adaptor & full charged battery is connected with router to ensure uninterrupted power supply.

4. What can I do if I forget my web management page password?

Refer to Troubleshooting & FAQ > Q3 to restore the router to its factory default settings and then use the default User Name "admin", and please check your device label for the unique Online Portal default password.

5. Manual IP address Configuration to the PC

In this section, we'll introduce how to configure the IPV4 address manually in Windows OS 10 for reference. First make sure your PC/Computer 's Ethernet Adapter is working, refer to the adapter's manual if needed.

a) On the Windows taskbar, click the window button, and then type Control Panel. Click on Control panel if appears as mentioned below

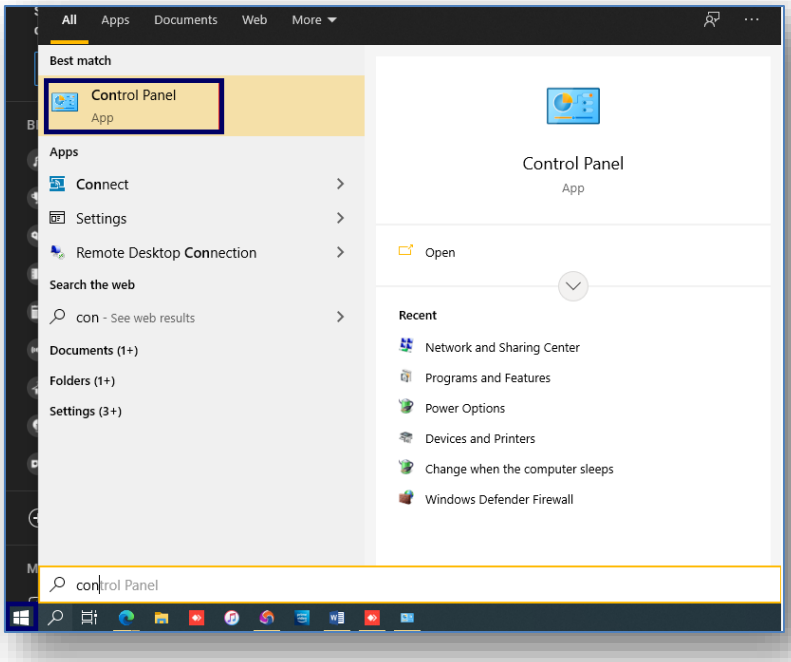


Figure 39 PC search

b) Click the View network status and tasks.

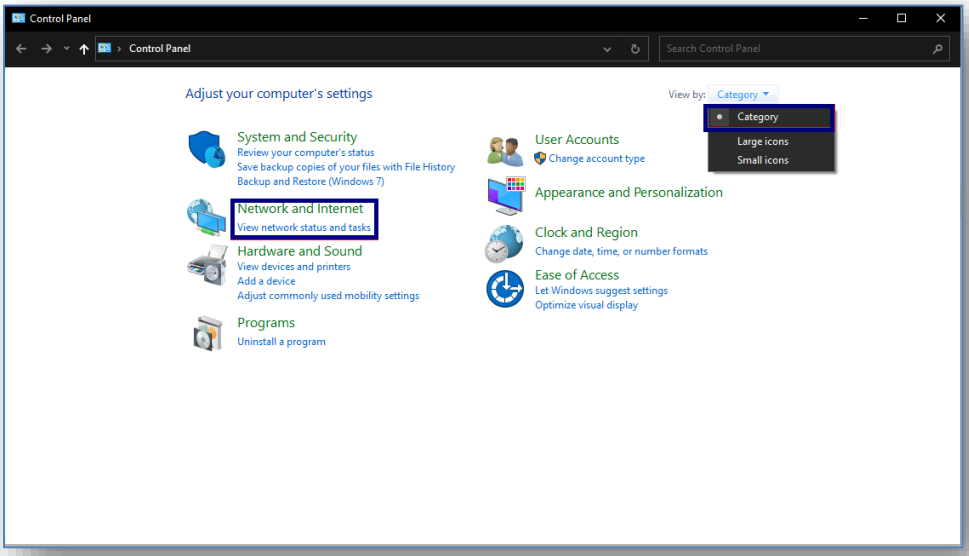


Figure 4012 PC Control Panel

c) Select the Ethernet/LAN adapter.

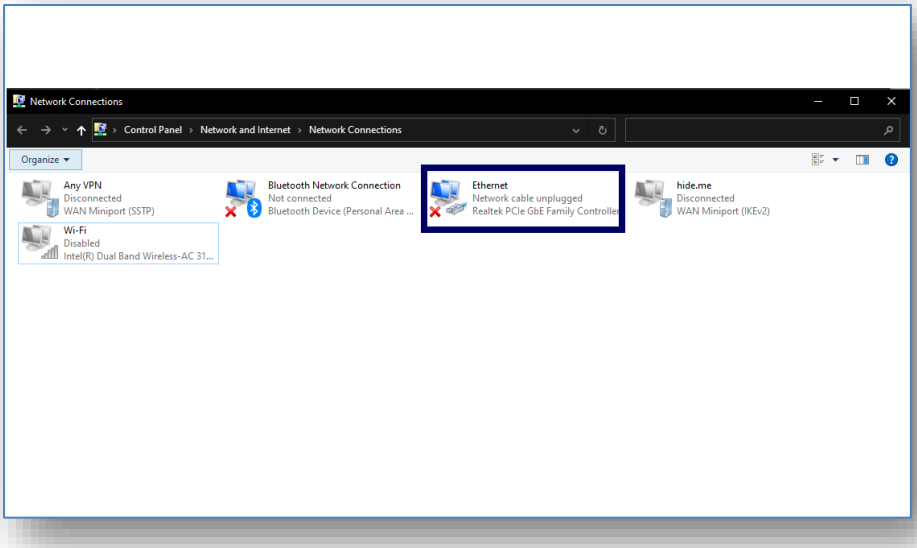


Figure 41 PC LAN Adaptor

d) Click the right button on mouse, and Select **Properties**.

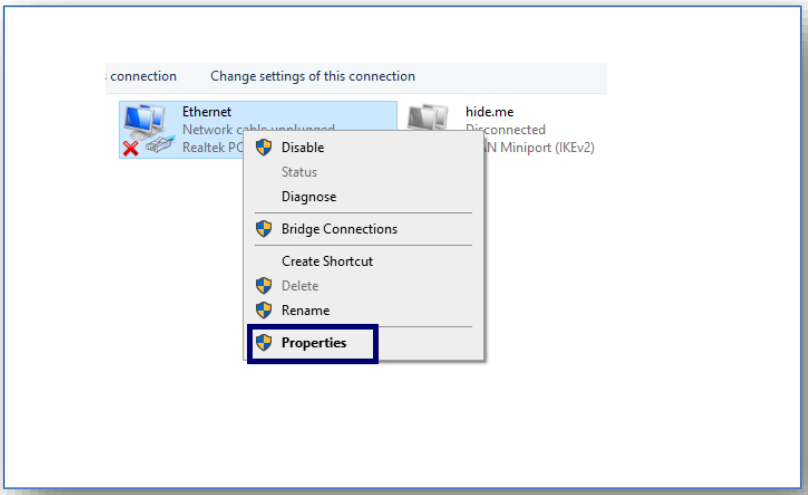


Figure 42 PC LAN Properties

e) In the prompt page that showed below, double click on the Internet Protocol Version 4 (TCP/IPv4).

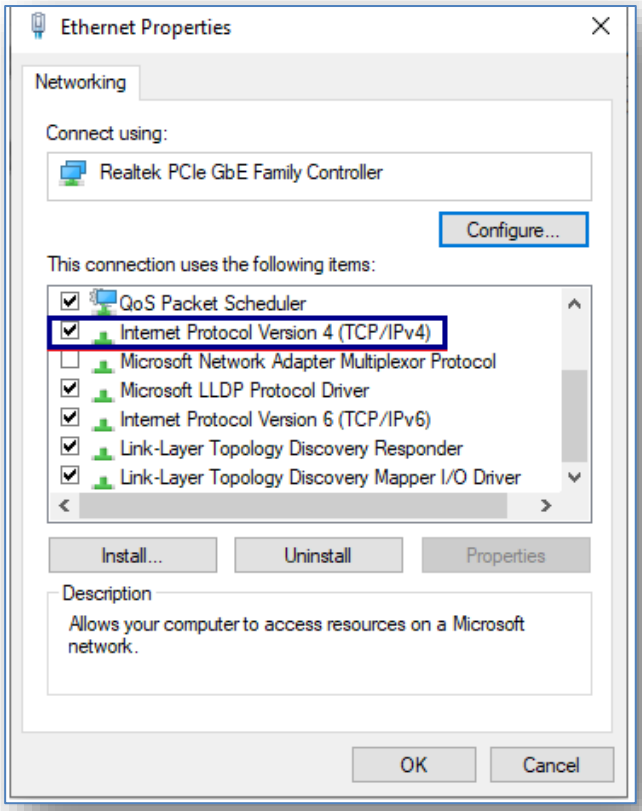


Figure 43 IPv4 Window on PC

The following Internet Protocol Version 4 (TCP/IPv4) Properties window will display and the IP Address tab is open on this window by default, you have two ways to configure the TCP/IP protocol below:

- **Setting IP address automatically**

Select **Obtain an IP address automatically**, Choose **Obtain DNS server address automatically**, as shown in the Figure below:

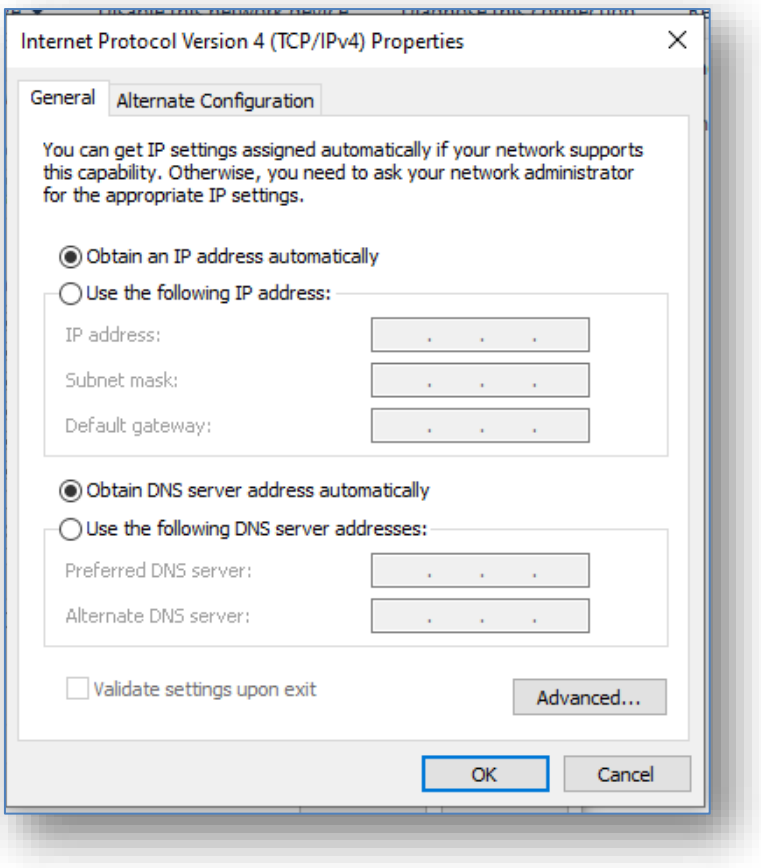


Figure 44 Auto/Default IP Configuration to PC

- **Setting IP address manually**

1. Select Use the following IP address radio button. And the following items available.
2. If the Device's LAN IP address is 192.168.0.1, type IP address is 192.168.8.x (x is from 10 to 254), and Subnet mask is 255.255.255.0.
3. Type the Device's LAN IP address (the default IP is 192.168.0.1) into the Default gateway field.
4. Select Use the following DNS server addresses radio button. In the Preferred DNS Server field, you can type the DNS server IP address, which has been provided by your ISP or public DNS like Google 8.8.8.8 or device own IP 192.168.0.1 as per your preference.

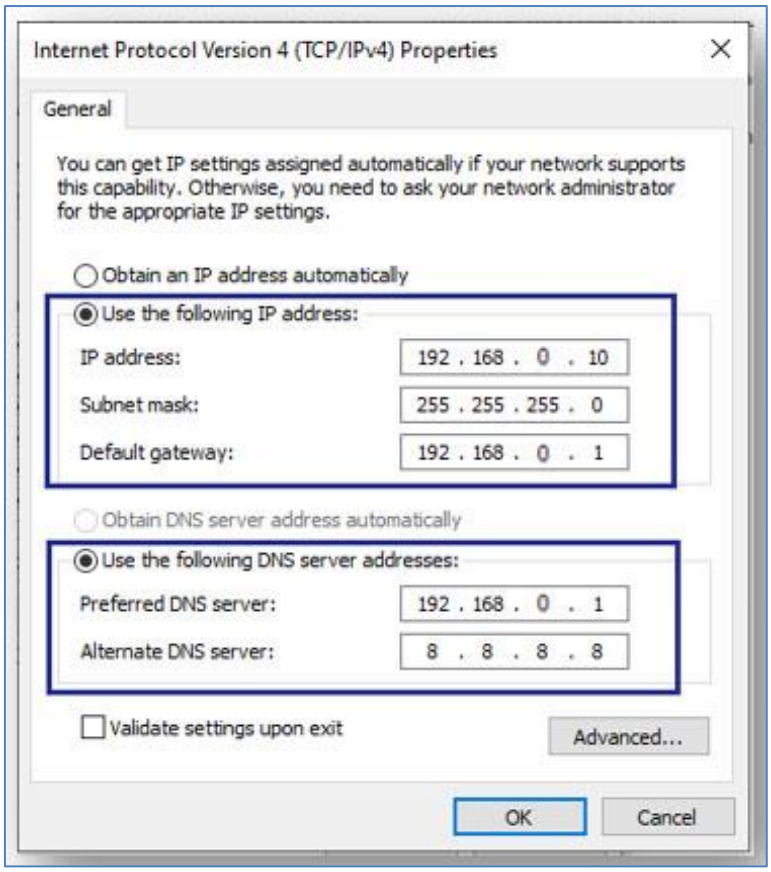


Figure 45 Manual IP configuration to PC

Now click **OK** to keep your settings.

Once you configured the IP address on your PC successfully, you should be able to connect our router on LAN. If you find any issue, please make sure you followed all the procedure and then contact to service provider or distributor for further technical help.