MF28B
User Manual

LEGAL INFORMATION

Content

Welcome

Thank you for choosing ZTE MF28B Router (hereinafter referred to as "unit" or "router"). To get the most from your router and to keep it in the best condition, please read this manual carefully.

The pictures, symbols and contents in this manual are for your reference only. They might not be completely identical with your router. ZTE operates a policy of continuous development. We reserve the right to update the technical specifications in this manual at any time without prior notice.

Getting started

The router operates on the LTE/HSUPA/HSDPA/WCDMA network and supports data service.

Appearance

USB Port   WPS Button

LED Indicators

(U)SIM Port

Interface
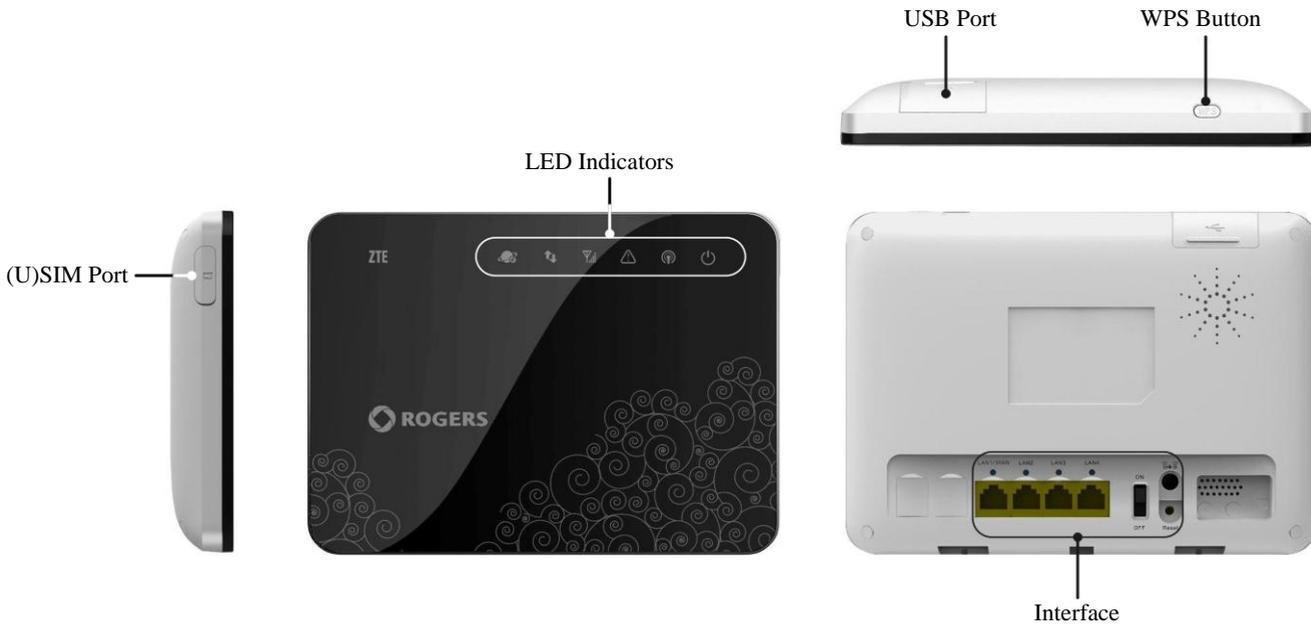
WPS button: Activate the PBC (Push Button Config) function.

LED Indicator
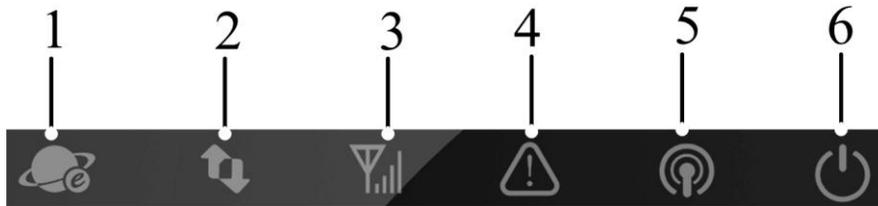
Indicator	State	Description
1 Network mode indication	Blue	Registered to 4G (LTE) network
	Green	Registered to 3G network
	OFF	Not Registered
2 WAN connection status indication	Always ON	WAN connection established
	Blinking	WAN connection establishing
	OFF	WAN connection not established
3 WAN signal strength indication	Always ON	Signal strength is very good or good
	Blinking	Signal strength is weak
	OFF	No signal

4 Error indication	Blinking	Error Status: No SIM card inserted, PIN enabled without entering correct PIN code on Web UI, or Incorrect SIM card inserted when SIM lock enabled
5 Wi-Fi indication	Always ON	WLAN works normally without data transmission
	Blinking	WLAN works normally with data transmission
	OFF	WLAN shut down
6 Power indication	Always ON	Green--Once device has been initialized and under operational status Red--Once power button is pushed and device is being initialized
	OFF	Once power button is pushed and device is powered off

Interface Description
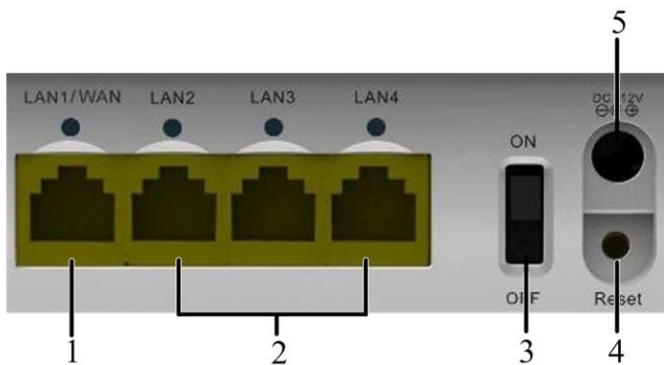
1.**LAN1/WAN**: Ethernet connections to internet.

2. **LAN2~LAN4**: Ethernet connections to computer.

3. **ON/OFF**: Turn the router ON or OFF.

4. **Reset**: Restore the router to the factory default settings by holding for 7 seconds.

5. **POWER Socket**: Connect to the external power supply.

Installation

Inserting (U)SIM Card

Open the protect cover of (U)SIM port Insert the (U)SIM card into the (U)SIM port.
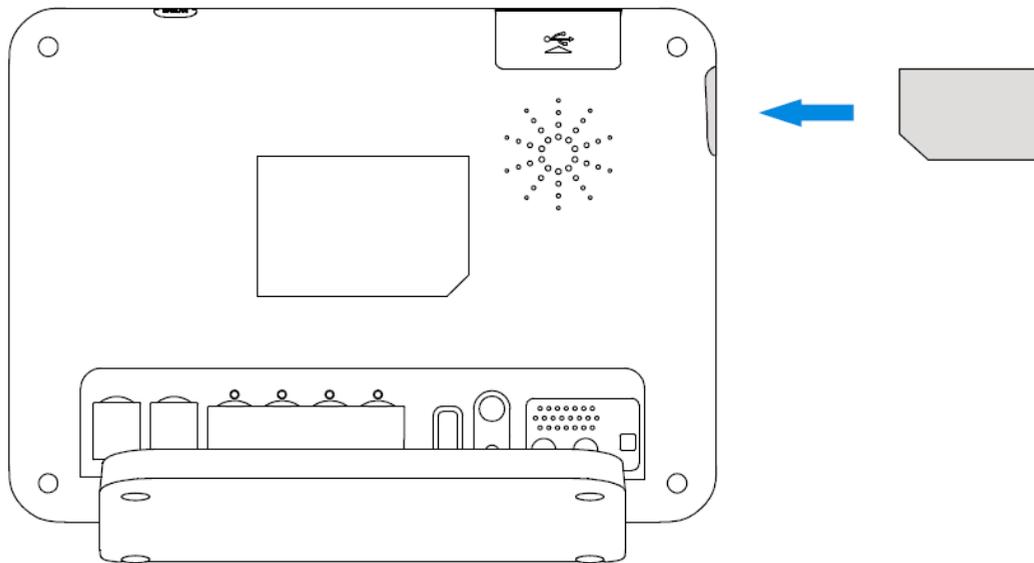
Please power off the router and remove the external power adapter before removing or inserting the (U)SIM card. If not, the router or (U)SIM card may be damaged.

About (U)SIM Card

Avoid handling the (U)SIM card unnecessarily. Hold the card by the edges to prevent static damage. Keep the (U)SIM card away from electrical and magnetic appliances.

If you cannot get service, make sure that：

• You are in an area which has network coverage.

• You are using the correct (U)SIM card.

Connecting to Computer

Connect your computer to the **LAN** interface with an Ethernet cable (RJ45).

NOTE Notes:

The router will adapt the Ethernet cable style (crossover or straight) automatically.

Connecting to LAN1/WAN

Connect WAN with an Ethernet cable (RJ45).

Connecting with External Power

Connect the external power adaptor to a standard power outlet. Insert the plug into the socket at the rear of the router.

Switching on Your Device

1. Turn the power switch on to get started.

   NOTE Notes:

   Do not put anything on the top of the router. Do not lay routers to overlap each other when using.

2. Wait 1～2 minutes after turning the router on before you use the service. The 3G/4G network mode & POWER indicator should be lit on.

Notes:

If the net mode indication LED is blinking constantly, try to move the router to another location. The router takes 1~2 minutes to initialize, attach to the network and obtain an IP address.

Power Supply

For normal operation, connect the router to the external power adapter. In case of power failure or when there is no available external power supply, the router will not work.

Internet Access

The router does not require any drivers, and it supports all operating systems with Ethernet LAN capability, such as Windows XP, Vista, Windows 7, MAC OS X and Linux. The router supports at least four computers surfing on internet using Ethernet cable at the same time.

Note: All the parameter settings in this chapter are just for your reference. Please contact your service provider for detail.

Preparation

Establishing a connection between your device and the client

Via RJ45 Ethernet cable

1.Connect your device and the client with the RJ45 Ethernet cable.

2.Power on your device.

The connection between your device and the client will be established successfully a moment later.

Via Wi-Fi

1. Power on your device directly. It will take 1~2 minutes to initialize, and then Wi-Fi LED is blinking.

2. Use your normal Wi-Fi application on the client to search the available wireless network.

    Notes: You need to check your Wireless Network Connection. Set the client to obtain an IP address automatically in the Internet protocol (TCP/IP) properties, and the client will get an IP address like"192.168.1.100".

3. Select the SSID of your device, and then click **Connect**.
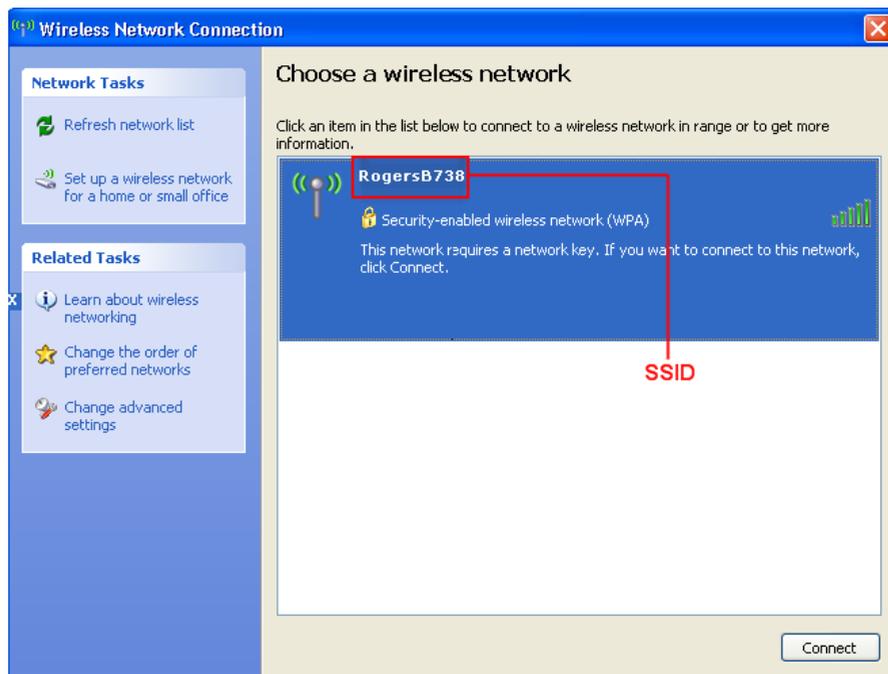
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4. Wait a moment, the connection between your device and the client will be established
   successfully.

Accessing the Internet

Before accessing the internet, make sure;

1. Switch on the device.

2. Establish a connection between your device and the client.

Accessing the Internet by Bridge Mode

1.Connect the device with LAN port.

2.Login the WebGUI and set the **Operation Mode** as **Bridge** mode.

Accessing the Internet by Cable Broadband

1.Connect the device with LAN1/WAN port.

2.Login the WebGUI and set the **Operation Mode** as **Cable Broadband** mode**.**

3.Set **WAN Connection** in WebGUI.

Accessing the Internet by LTE Gateway

Note: Please make sure that you have install (U)SIM card before you switch on the device.

1.Login the WebGUI and set the **Operation Mode** as **4G Gateway**.

2. Set **WAN Connection** in WebGUI.

Accessing the WebGUI Configuration Page

1. Make sure the connection between your device and the client is correct.

2. Launch the internet browser and enter http://192.168.1.1 in the address bar.

   NOTE Notes:

3.The login page appears as follows.

Login

In the Web GUI Configuration page, select the desired language and input the password (the default **Password** is **admin**).

Click **Login** to log in the device.

 Notes:

If you check **Save** after type in password, the device will save it. Next time when you want to login the device with the same password, what you need to do is click **Login**.

When you login, the following interface appears.
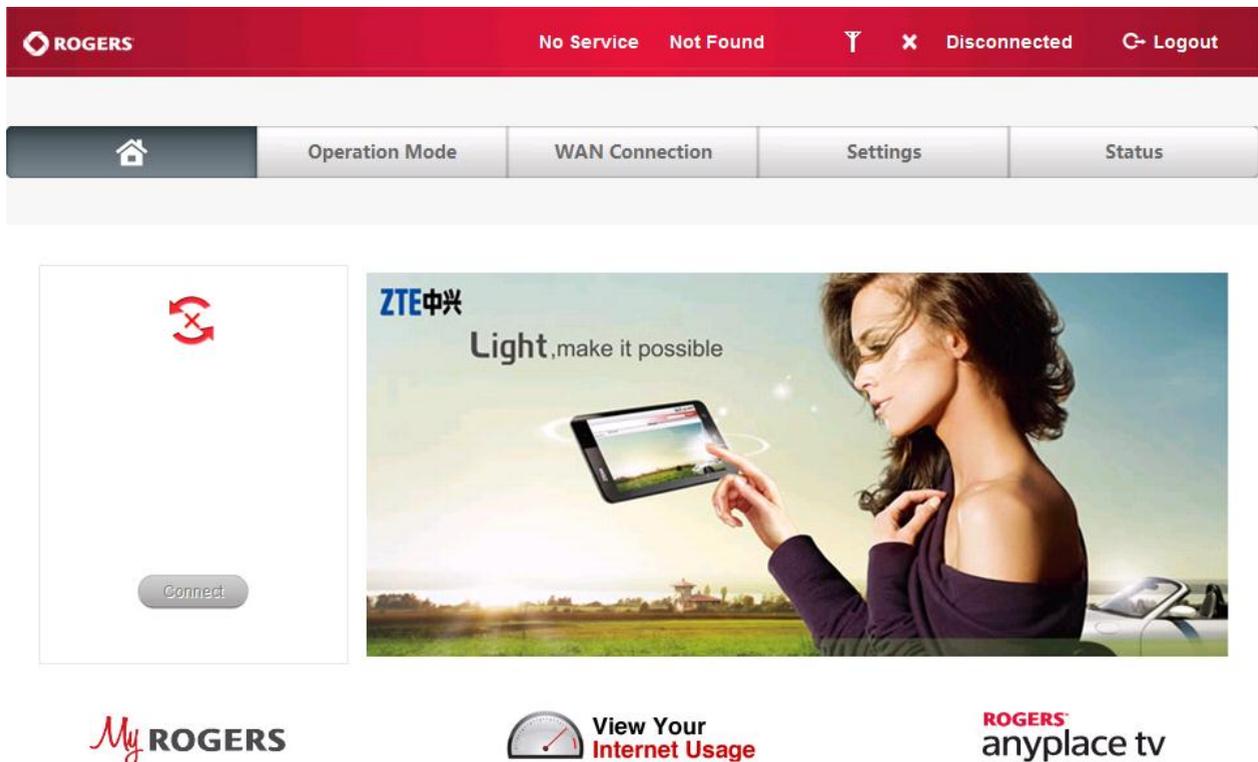
Operation Mode

When you login the web GUI, you need to choose the operation mode to make the correct setting.
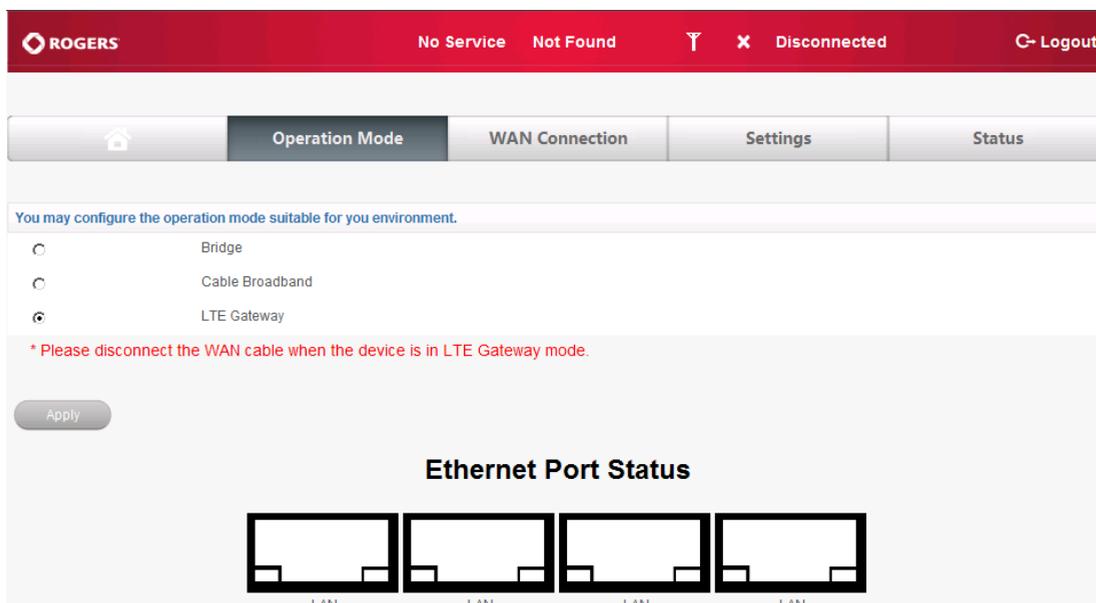
There are three operation modes:

• **Bridge**：Connect to Internet by Dial-up program on computer.

• **Cable Broadband**: Connect to Internet by WAN.

• **LTE Gateway**: Connect to Internet by (U)SIM.

Please choose the correct operation mode according to your actual network condition. For detailed information, please contact network operator. Click **Apply** to finish the setting.

WAN Connection

In Cable Broadband mode

Click **WAN Connection**, you can configure how to connect to the Internet.

PPPoE

Select **PPPoE**，input the **User Name** and **Password** supplied by the network provider, and select the Connect mode.

· **Auto Connect**: The router will automatically connect to WAN when it is powered on.

· **Manual Connect**: Connect to Internet or disconnect from Internet manually.

Click **Apply** to confirm your configuration, and then the figure will show in the wan connection status.

Static

Select **Static** to access the following interface:

Input the related parameters, and then click **Apply** to confirm your configuration.

DHCP

Select **DHCP** to access the following interface:
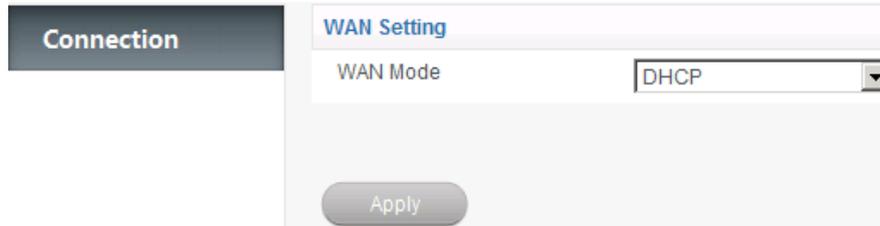
Click **Apply** to confirm your configuration.

In 4G Gateway mode

Dial Up

Click **WAN Connection > Connection**, you can configure how to connect to the Internet.
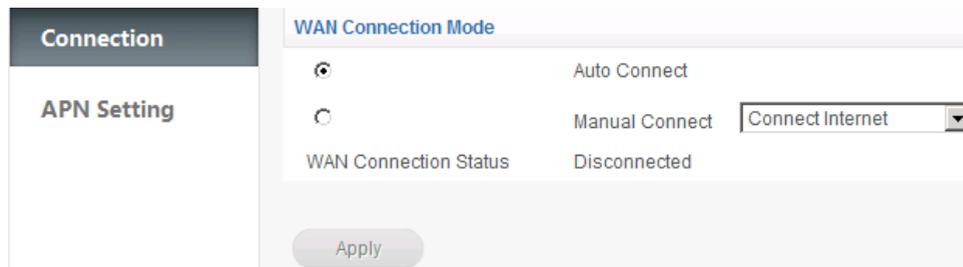
There are two connection modes:

· **Auto Connect**: The router will automatically connect to WAN when it is powered on.

· **Manual Connect**: Connect to Internet or disconnect from Internet manually.

Click **Apply** to confirm your configuration, and then the figure will show in the wan connection status.

APN Settings

Click **WAN Connection > APN Setting**, you can configure APN setting.

 Profile Selection: Choose the desired profile name.

Profile Name: The name of the profile.

· **APN**: Access Point Name.

· **PDP Type**: Packet Data Protocol (PDP) Type IP is recommended unless service provider instructs others.

· **PDP Setting**: PDP address mode. If a fixed IP address is given by your service provider, select **Manual PDP**. Otherwise select the **Auto PDP** and the router will automatically obtain this parameter.

· **DNS**: If a fixed IP address is given by your service provider, then choose **Manual DNS**. Otherwise, choose **Auto DNS**, and device will automatically obtain parameters.

· **Authentication**: Password Authentication Protocol (PAP) provides a simple method without encryption for the peer to establish its identity using a 2-way handshake. Challenge-Handshake Authentication Protocol (CHAP) is used to periodically verify the identity of the peer using a 3-way handshake.

· **User Name**: User name is used to obtain authentication from the ISP when the connection is established

· **Password**: Password is used to obtain authentication from the ISP when the connection is established.

Click **Set default** to set this profile as the default profile.

Settings

Note:

· Do not modify any settings unless instructed by your service provider.

· Please disconnect the device from the network before change the settings.

Network Select

This is only available in LTE gateway mode. Select **Settings > Network Select**, the Band Selection Mode is shown in the following figure:
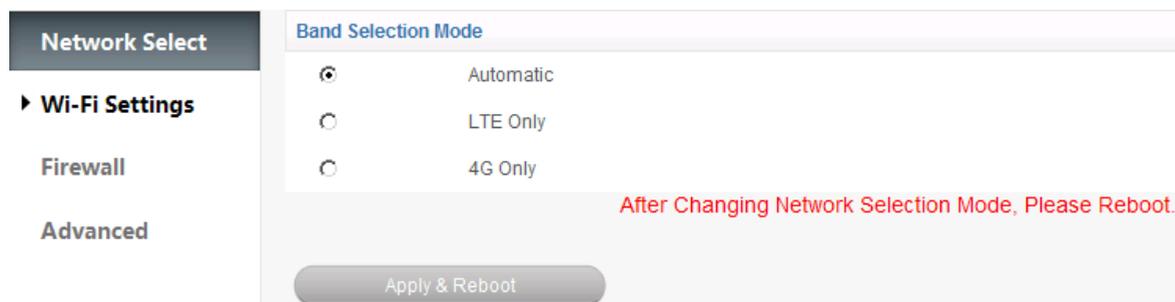
· **Automatic**: Device searches for available network.

· **LTE Only**: Device searches for LTE network only.

· **3G Only**: Device searches for WCDMA network only.

Click **Apply & Reboot** to confirm your configuration.

Wi-Fi Settings

Station list

Select **Settings > Wi-Fi Setting > Station List**, the wireless network stations are shown in the following figure:

Basic

Select **Settings > Wi-Fi Setting > Basic**, the wireless network basic parameters are shown in the following figure:

· **Wi-Fi On/Off**: Enable/disable the Wi-Fi function.

· **Network Mode**: If all of the wireless devices connect with this router in the same transmission mode, performance will be improved by choosing the appropriate wireless mode.

· **Network Name (SSID)**: Service Set Identifier (SSID). Enter a string less than 32 characters as the name for your wireless local area network (WLAN).

· **Broadcast Network Name (SSID)**: Disable or Enable (Default) this function. If **Enable** is selected, the router broadcasts the SSID, and other devices can detect and connect to it. Otherwise, other devices cannot detect and connect to it, add the SSID manually to connect.

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• **AP Isolation**: When **Enabled** is selected, each of your wireless clients will not be able to communicate with each other. Otherwise, the wireless communication via WLAN is available.

• **Frequency(Channel)**: Choose the appropriate channel to optimize the performance and coverage of your wireless network.

•The HT physical Mode parameters are shown below:

• **Channel Bandwidth**: Set the HT physical channel bandwidth.

• **Guard Interval**: Guard interval is to introduce immunity to propagation delays, echoes and reflections, to which digital data is normally very sensitive.

• **Extension Channel**: Set extension channel. Extension channel is also able to send and receive data.

Click **Apply** to confirm your configuration.

Advanced

Select **Wi-Fi Setting > Advanced**, the advanced wireless network parameters are shown in the following figure:

• **Beacon Interval**: The router broadcasts beacon message to announce that it has buffered frames to deliver. The default value is 100 (ms).Beacons are packets sent by an access point to synchronize a wireless network. Specify a beacon interval value. is recommended.

• **Data Beacon Rate(DTIM)**: A Delivery Traffic Indication Message(DTIM) informs next clients to listen to broadcast and multicast messages.

• **Fragment Threshold**: This value should remain at its default value of 2346. If you experience a high packet error rate, you may slightly increase your fragment threshold. Setting the fragment threshold too low may result in poor performance.

• **Short Preamble**: The length of CRC block in the frames during the wireless communication.

Click **Apply** to confirm your configuration.

Security

Select **Wi-Fi Setting > Security**, the Security parameters are shown in the following figure:

Unless one of these encryption modes is selected, wireless transmissions to and from your wireless network can be easily intercepted and interpreted by unauthorized users.

The security modes are described below:

· **Open**: You can authenticate successfully with a SSID, whether it is valid or empty.

· **WPA-PSK/WPA2-PSK**: Apply both the WPA-PSK and WPA2-PSK scheme.

Click **Apply** to confirm your configuration.

WPS

Select **Wi-Fi Setting > WPS**, the WPS configuration is shown in the following figure:

Firewall

You can set up firewall rules to protect your network from virus, worm and malicious activity on the Internet. This function is not available on **Bridge** mode.

 Notes:

You can set the maximum 10 filtering items for **MAC/IP/Port Filtering** and **Port Forwarding**.

MAC/IP/Port Filtering

Select **Settings > Firewall > Mac/IP/Port Filtering**, the Mac/IP/Port Filtering is shown in the following figure:

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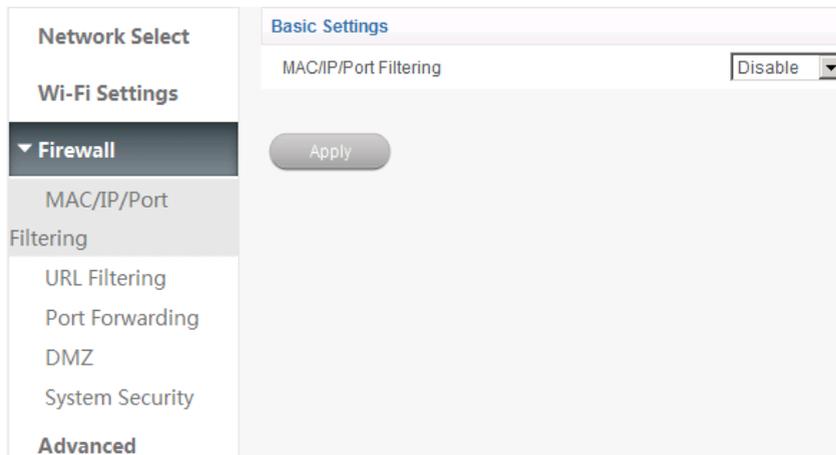
If you select **Enable**, the filter settings will appear:
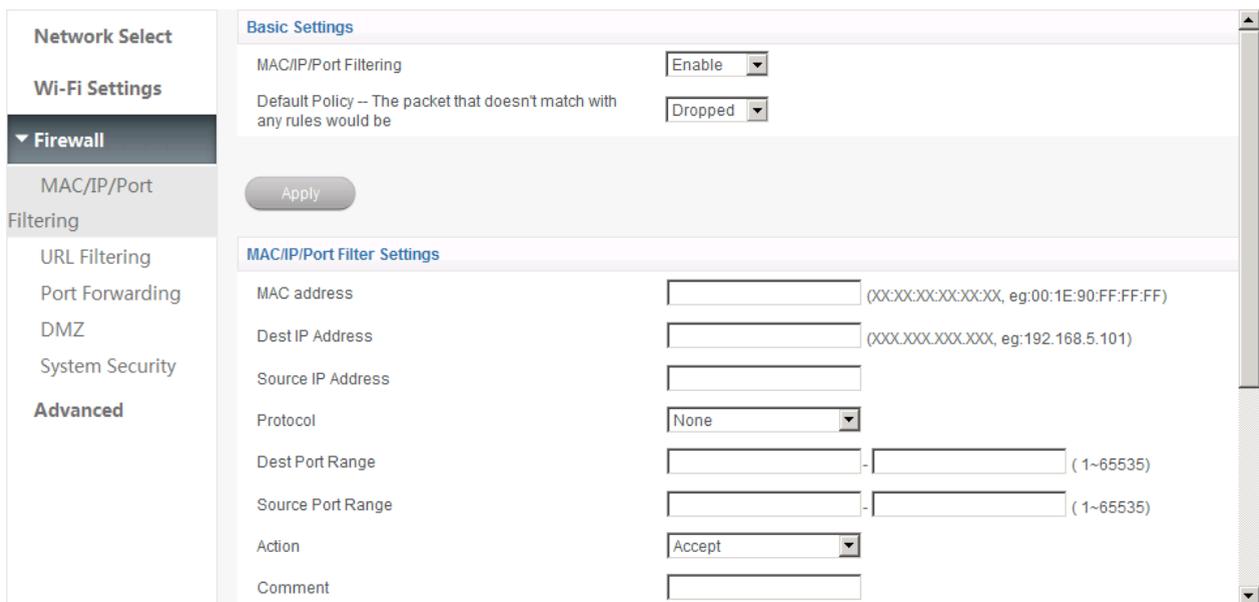
• **MAC address**: Set the MAC address that will be filtered.

• **Dest IP Address**: Set the destination IP address that will be filtered.

• **Source IP Address**: Set the source IP address that will be filtered.

• **Protocol**: Set which protocol will be used for filtering.

• **Dest Port Range**: Set the destination port numbers that will be filtered

• **Source Port Range**: Set the source port numbers that will be filtered.

• **Action**: Set how to handle the packet if it matches with the rule.

• **Comment**: Type comment for the filter settings.

Click **Apply** to confirm your configuration.

Click **Delete** to delete the rule which you selected.

Click **Reset** to clear what you select or input.

To add a new rule:

1. Select **Enable** in the **Basic Settings** area.

2. Click **Apply**.

3. Input the detailed information in the **Mac/IP/Port Filtering Settings** area.

4. Click **Apply** in the **Mac/IP/Port Filtering Settings** area.

URL Filtering

You can setup content filter to restrict the improper content access. Select **Firewall > URL Filtering**, the URL Filtering is shown in the following figure:

Type URL address, and then click **Add** to add the URL address into the filtering list. The new URL filtering item will be shown in the **Current Webs URL Filters** field.

Notes:

Port Forwarding

You can setup virtual servers to provide services on the Internet. Select **Firewall > Port Forwarding**, the virtual server settings is shown in the following figure:
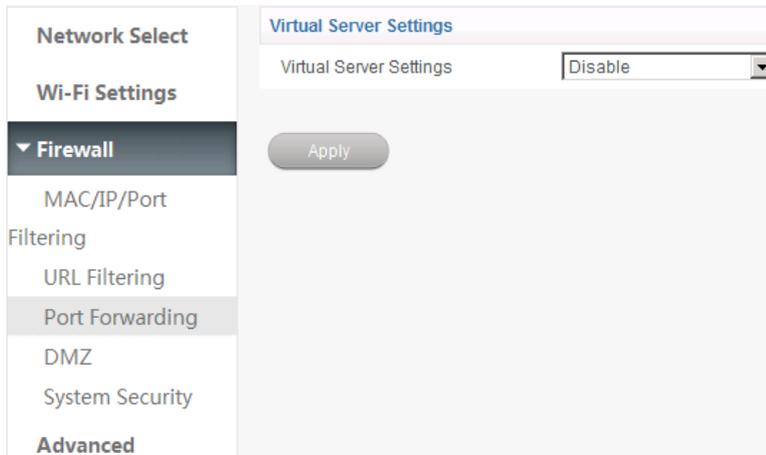
If you select **Enable**, the Virtual Server Settings will appear:
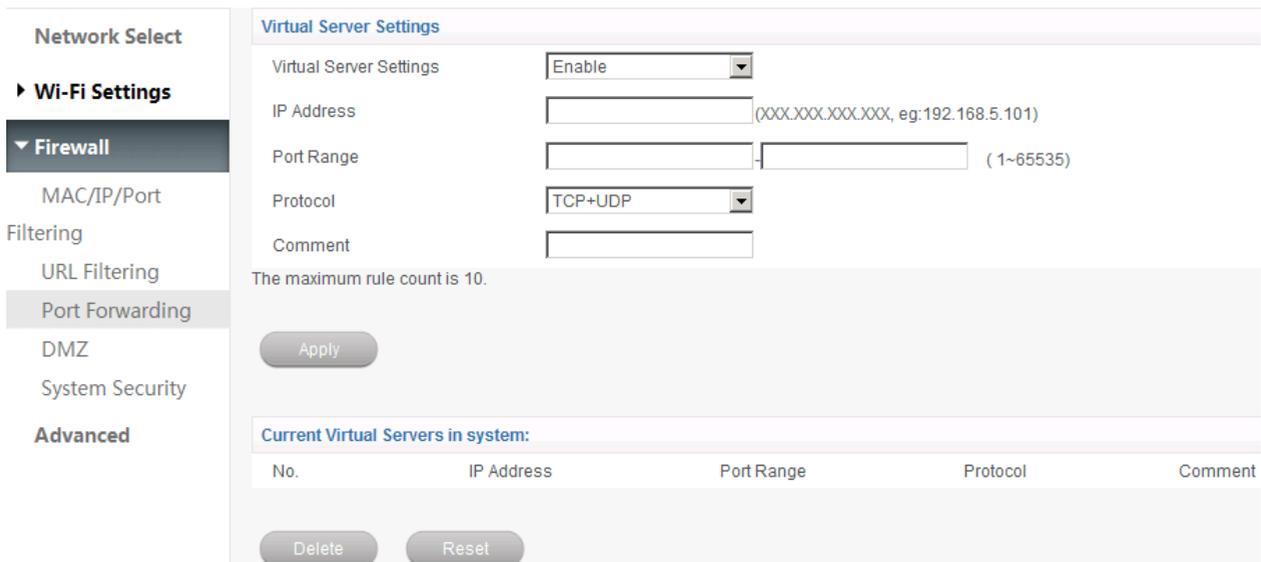
· **IP Address**: Set IP address for the virtual server.

· **Port Range**: Set port numbers for the virtual server.

· **Protocol**: Set protocol for the virtual server.

· **Comment**: Type comment for the virtual server settings.

Click **Apply** to confirm your configuration.

DMZ

You can set up a De-militarized Zone(DMZ) to separate internal network with the Internet. Select **Firewall > DMZ**, the DMZ setting is shown in the following figure:
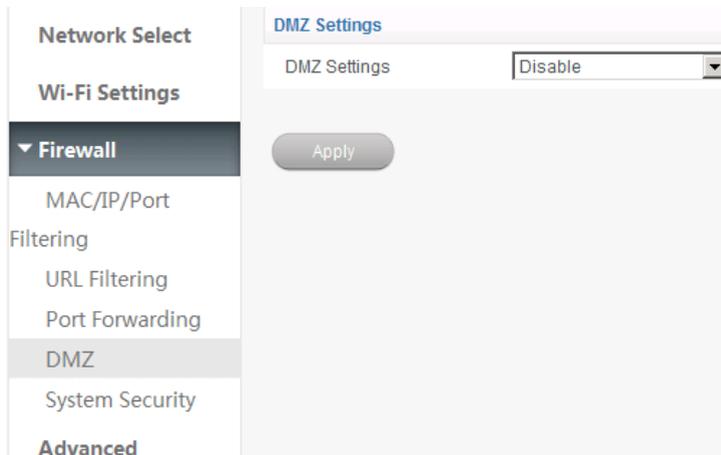
If you select **Enable**, input the **DMZ IP Address**, and then click **Apply** to confirm your configuration.
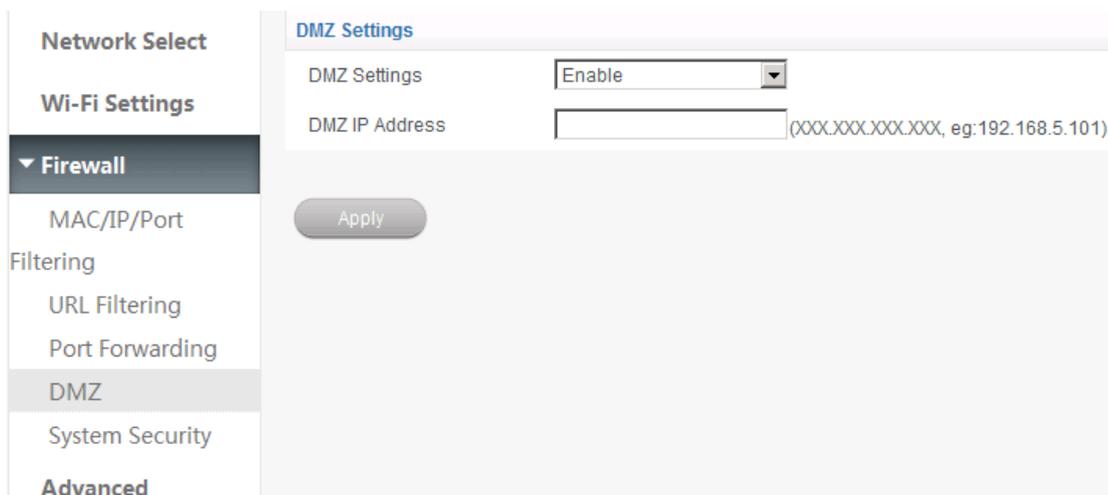
System Security

You can configure system firewall to protect AP or router from being attacking. Select **Firewall > System Security**, the system security setting is shown in the following figure:
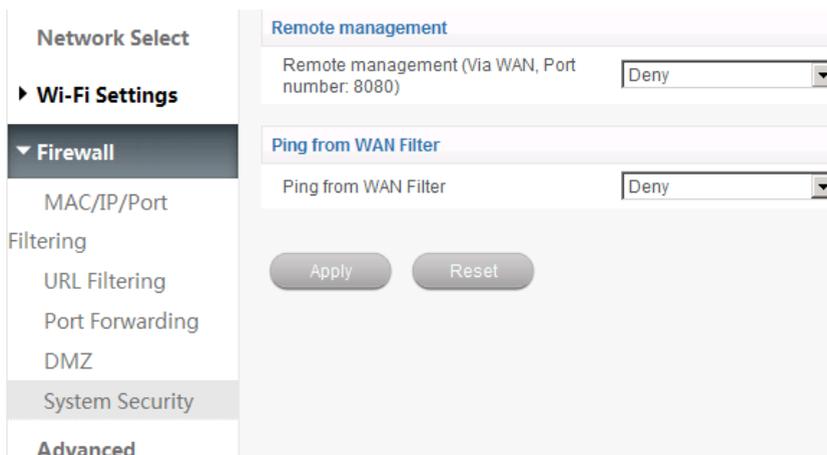
Allow or **Deny** the remote management function, **Allow** or **Deny** ping from WAN filter on requirement, and then click **Apply**.

Advanced

Management

Select **Settings > Advanced > Management**, the administrator settings information is shown in the following figure:
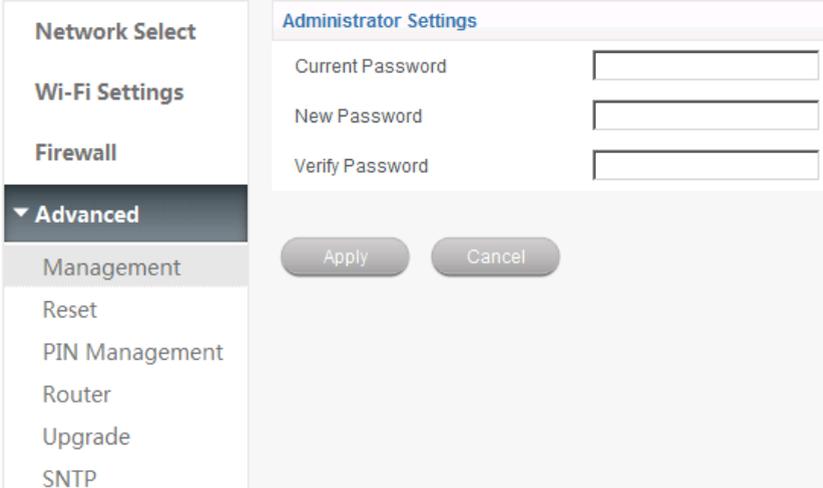
You can change the login password. Click **Apply** to confirm your configuration.

Restore

Select **Settings > Advanced > Reset**, click **Reset** to set all the settings to the factory default values, and then the device will restart automatically.
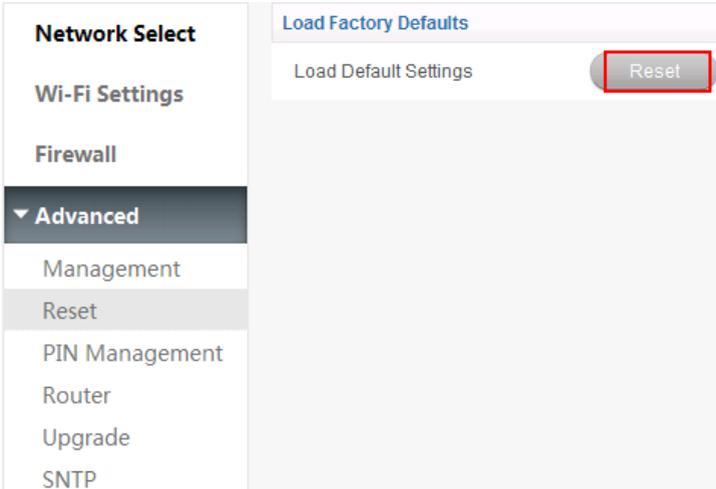
PIN Manage

Note: This function is available only in LTE Gateway mode.

Select **Settings > Advanced > PIN Management**, the following page displays:

If you select **Modify**, the following page will display:

Input the old PIN code, and then input the new PIN code two times. Click **Apply** to confirm your configuration.

 Notes:

Consecutive inputting wrong PIN code for three times will cause locking of (U)SIM card. To unlock, you need PUK code.

PIN code and PUK code may be offered together with the (U)SIM card. If not, please contact with network operator. Please change default PIN code to your own as soon as possible.

Router

Note: This function is available in LTE Gateway mode and Cable Broadband mode.

Select **Settings > Advanced > Router**, the router information is shown in the following figure:

· **IP Address**: IP address for LAN interface.

· **Subnet Mask**: Subnet mask for the IP address.

· **MAC Address**: MAC address for the LAN interface.

· **DHCP Server**: Enable or disable DHCP Server function.

· **DHCP IP Pool**: Allocate begin and end IP address for IP pool.

· **DHCP Lease Time**: Define how long the leased IP address will be expired, and will relocate new IP address.

· **UPNP**: Enable/disable UPNP.

Click **Apply** to confirm your configuration.

Upgrade

Select **Settings > Advanced > Upgrade** to upgrade the software version of the router.

Click **Browse...** to locate the latest software version, and then click **Upgrade**.

SNTP

Select **Settings > Advanced > SNTP** to set the time of the router.
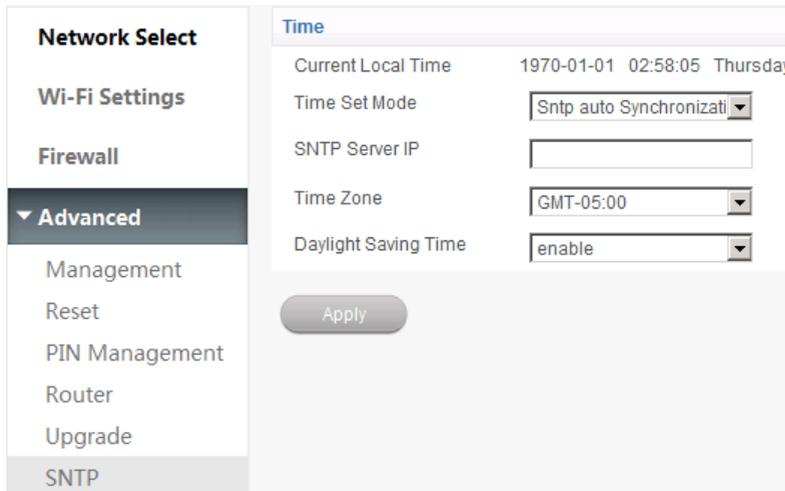
You can select **Manual Set Time** or **SntP auto Synchronization,** and then click **Apply** to confirm your configuration.**.

Status

Basic Status

Select **Status > Basic Status**, the system information is shown in the following figure:
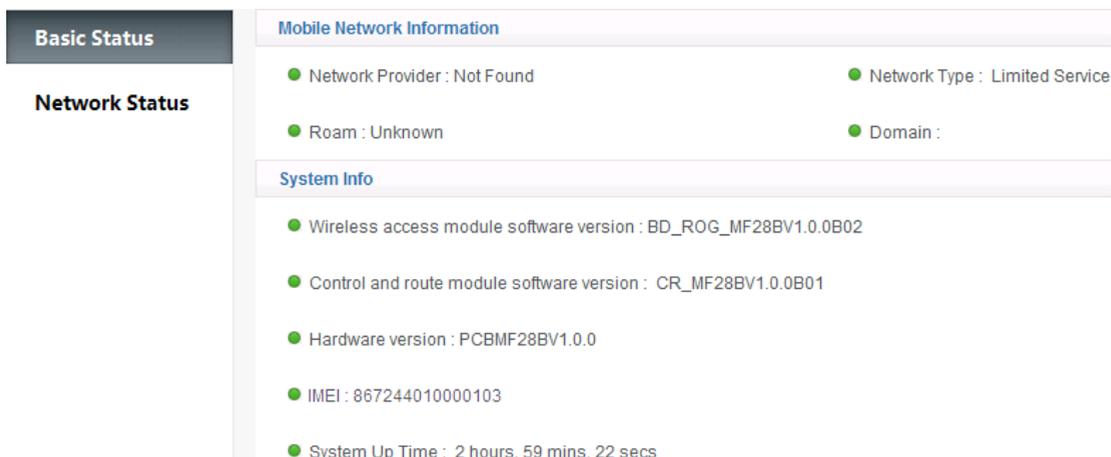
Network Status

Select **Status > Network Status**, the system information is shown in the following figure:
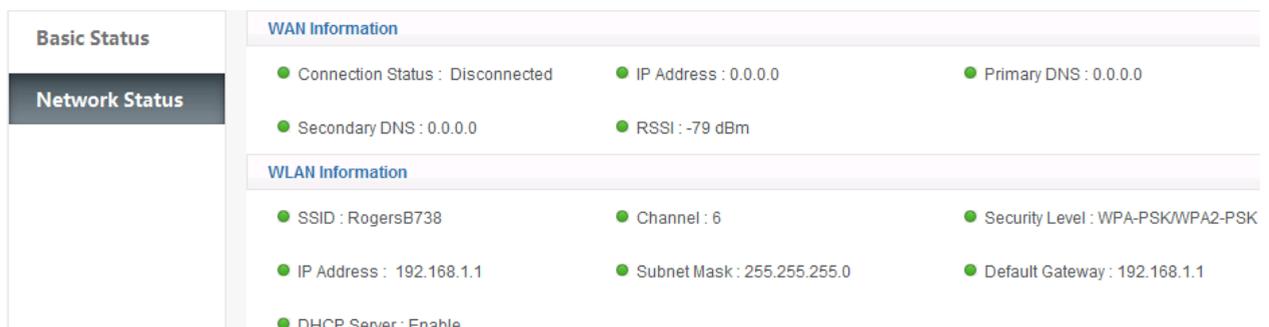
Usage of WPS

If your client device supports WPS, you need not to input the password manually after WPS has

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been available. Please do the following:

1. Start up your device.

2. Launch the client device connected to your device.

3. Enable the WPS function of your device.

4. Enable the WPS function of the client.

Notes:

Enable the WPS function of the client within 2 minutes, otherwise reactivate WPS function.

For the detailed operations about the client, please refer to the client's instruction.

Logout

Select **Logout**, a pop-up window will appear as the following figure shown:

Please confirm logout?

Click ___ to logout the web page.

U-Disk Master

1. Start up your device.

2. Launch the client device connected to your device.

3. Connect the storage devices (i.e.USB disk) to the USB port of the device.
4. Select **Start** > **Run** of the computer.
5. Input \\192.168.1.1, and then click **OK**.
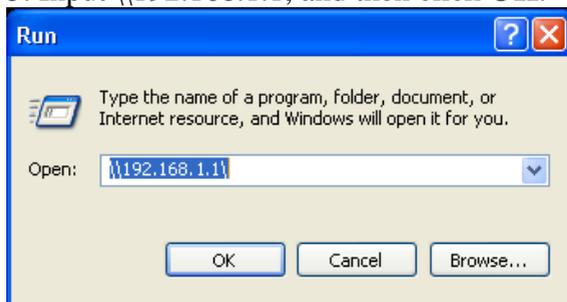
6.Input User Name and Password. The default User Name and Password are **admin**. Then you can view storage devices.

Troubleshooting

Internet Related Problems

Symptoms	Possible Problems/ Solutions
I cannot access the internet at all.	Please check your configuration settings. Please wait 1~ 2 minutes for the router to initialize. Check your service indicator LED's.
The download or upload speeds are very slow.	The speed is dependent on signal strength. Check your signal strength and network type.

Others

Symptoms	Possible Problems/ Solutions
The RSSI signal indicator is always blinking or does not light.	This indicates poor reception. Try moving the router to another location near the window.

Glossary

3G: Third Generation.
4G: Fourth Generation.

APN: Access Point Name

DHCP: Dynamic Host Configuration Protocol.
DHCP Server: A server or service with a server that assigns IP addresses.
Firewall: A hardware or software boundary that protects a network or single computer from unwanted outside traffic.
DNS: Domain Name System (or Service or Server)

Ethernet: A frame-based computer networking technology for local area networks (LANs)

HSDPA: High Speed Downlink Packet Access

HSUPA: High Speed Uplink Packet Access

IP: Internet Protocol

LAN: Local Area Network

LED: Light - emitting Diode

LTE: The UMTS Long Term Evolution

PDP: Packet Data Protocol

PIN: Personal Identification Number

Port Forwarding: A process that allows remote devices to connect to a specific computer within a private LAN.

PUK: PIN Unlocking Key

RSSI: Radio Signal Strength Indicator

SSID: Service Set Identifier. The name assigned to a Wi-Fi network.

UPNP: Universal Plug and Play

(U)SIM: Subscriber Identification Module

WCDMA: Wideband CDMA (Code-Division Multiple Access)

WLAN: Wireless LAN

WPA-PSK: Wi-Fi Protected Access–PreShared Key

WPA/WPA2: Wi-Fi Protected Access. A security protocol for wireless 802.11 networks from the Wi-Fi Alliance.

General Information

Safety Precautions

• Some electronic devices may be susceptible to electromagnetic interference. Locate the router away from TV set, radio and other electronic equipment to avoid electromagnetic interference.

• The router may interfere with medical devices like hearing aids and pacemakers. Consult a physician or the manufacturer of the medical device before using the router.

• Please keep yourself at least 20 centimeters away from router.

• Do not use your router in dangerous environments such as oil terminals or chemical factories where there are explosive gases or explosive products being processed.

• Please use original accessories or accessories that are authorized by ZTE. Unauthorized accessories may affect the router performance, damage the router or cause danger to you.

• Do not attempt to dismantle the router. There are no user serviceable parts.

• Do not allow the router or accessories to come into contact with liquid or moisture at any time. Do not immerse the router in any liquid.

• Do not place objects on top of the router. This may lead to overheating of the device.

• The device must be placed in ventilation environment for use.

• Do not expose the router to direct sunlight or store it in hot areas. High temperature can shorten the life of electronic devices.

• Do not allow children to play with the router or charger.

• The router is for indoor use only. Do not use the router outside.

Cleaning and Maintaining

• Use an antistatic cloth to clean the router. Do not use chemical or abrasive cleanser as these could damage the plastic case. Turn off your router before you clean it.

• Use the router within the temperature range of -10 ℃ ～ +55 ℃, and the storage temperature range is -20 ℃ ～+60 ℃. The humidity range is 5%~95%.

• Do not use your router during a thunderstorm. Remove the mains power pack from the wall socket.

• Do not take out your (U)SIM card unnecessarily. The (U)SIM card may be easily lost or it can be damaged by static electricity.

FCC Compliance

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.

Caution: Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

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

—Reorient or relocate the receiving antenna.

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

RF Exposure

This device meets the government's requirements for exposure to radio waves.
This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission of the U.S. Government.

●This device complies with FCC radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20cm (8 inches) during normal operation.
The FCC grant can be found under the Display Grant section of http://www.fcc.gov/oet/fccid after searching on FCC ID: **Q78-MF28B**.

IC

This radio transmitter (identify the device by certification number, or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type，are strictly prohibited for use with this device.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:
(1) this device may not cause interference, and
(2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:
(1) l'appareil ne doit pas produire de brouillage, et
(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en

This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

IC: 5200A-MF28B

IMPORTANT NOTE:
IC Radiation Exposure Statement
This EUT is compliance with general population/uncontrolled exposure limits in IC RSS-102.
This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permission antenna gain（in dBi）and required impedance for each.

Limited Warranty

· This warranty does not apply to defects or errors in the Product caused by:

  i. Reasonable Router Appearance Disfiguration.

  ii. End User's failure to follow ZTE's installation, operation or maintenance instructions or procedures.

  iii. End User's mishandling, misuse, negligence, or improper installation, disassemble, storage, servicing or operation of the Product.

  iv. Modifications or repairs not made by ZTE or a ZTE-certified individual.

  v. Power failures, surges, fire, flood, accident, actions of third parties or other events outside ZTE's reasonable control.

  vi. Usage of products of third Parties, or usage in conjunction with third party products provided that such defects is due to the combined usage.

  vii. Any other cause beyond the range of normal usage for Products. End User shall have no right to reject, return, or receive a refund for any Product from ZTE under the above-mentioned situations.

· This warranty is end user's sole remedy and ZTE's sole liability for defective or nonconforming items, and is in lieu of all other warranties, expressed, implied or statutory, including but not limited to the implied warranties of merchantability and fitness for a particular purpose, unless otherwise required under the mandatory provisions of the law.

Limitation of Liability

ZTE shall not be liable for any loss of profits or indirect, special, incidental or consequential damages resulting from or arising out of or in connection with using of this product, whether or not ZTE had been advised, knew or should have known of the possibility of such damages, including, but not limited to lost profits, interruption of business, cost of capital, cost of substitute facilities or product, or any downtime cost.