Installation and Configuration

Quick Guide

R2000 Dual--

Industrial Dual Module Cellular VPN Router with Power over Ethernet

Package Contents

Before installing the R2000 Dual Router, verify the kit contents as following:

- 1 x Robustel R2000 Dual Industrial Dual Module Cellular VPN Router with Power over Ethernet
- 1 x Terminal block for power
- 1 x *Quick Start Guide* with download link of other documents or tools

Optional Accessories (sold separately)

- AC/DC power adapter
- POE power adapter
- SMA cellular antenna for 3G/4G LTE
- Stubby/magnet RP-SMA Wi-Fi antenna
- Wall mounting kit
- 35 mm DIN rail mounting kit

If any of the above items is missing or damaged, please contact your Robustel sales representative

Preparation before Testing

REQUIRED: R2000 Dual Router x 1, PC x 1, SIM card x 1, Ethernet cable x 1, SMA antenna x 2, power supply with terminal block x 1

OPTIONAL: 35 mm DIN rail mounting kit x 1, M3*6 flat head Phillips screw x 3; or wall mounting kit x 2, M2.5*4 flat head Phillips screw x 4, M3 drywall screw x 2

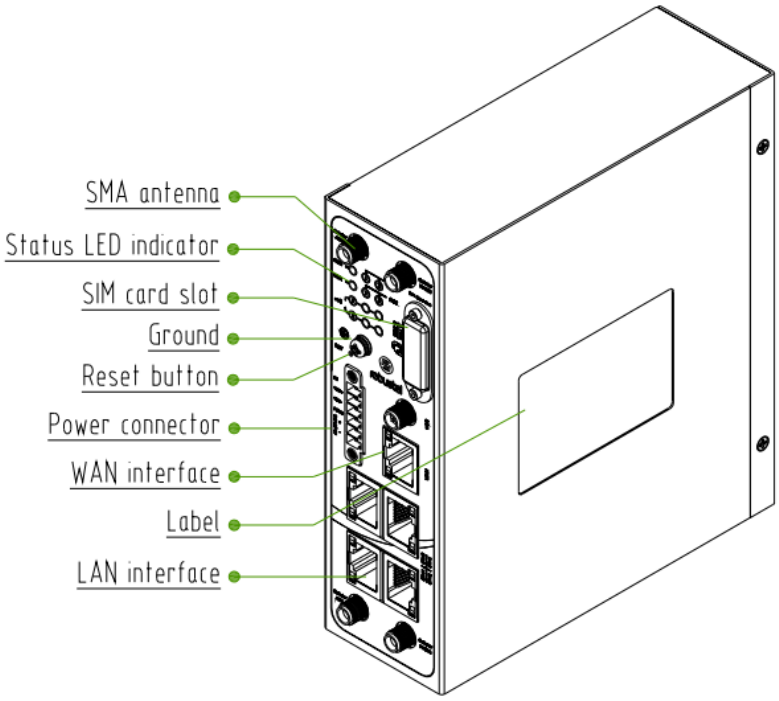
The following pictures are just for illustration purposes only, not based on their actual sizes

Environmental Requirements

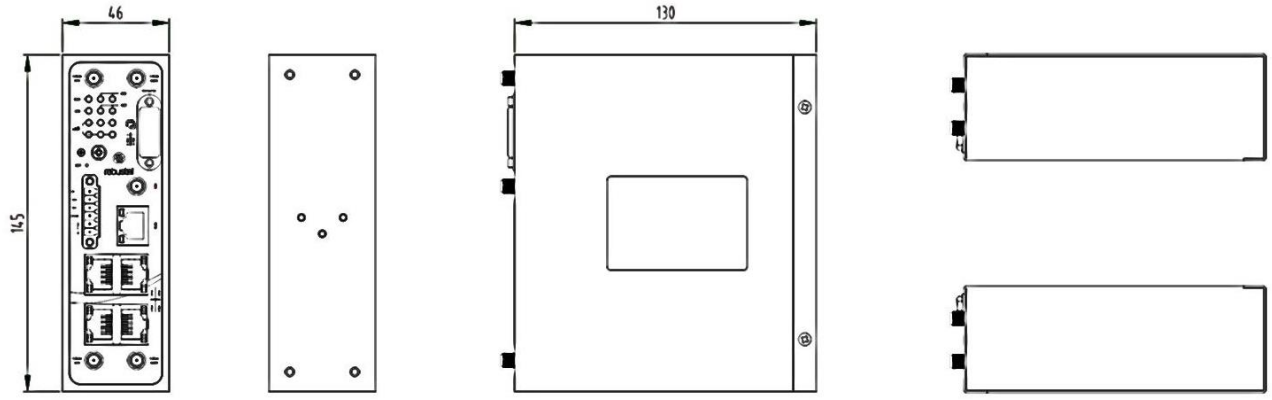
- Power input: 9 to 48V DC
- Power consumption: 100 mA@12 V in idle state
  800 mA (peak)@12 V in communication state
- Operating temperature: -40 to 70°C
- Relative humidity: 5 to 95% RH

Chapter 1 Hardware Introduction

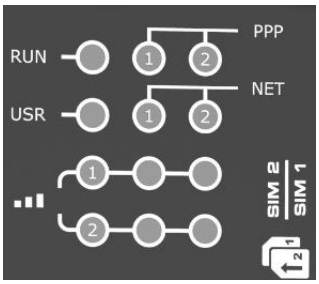
1.1 Overview



1.2 Dimensions



1.3 LEDs



Name	Color	State	Description
RUN	Green	On, 1/2 sec blink	Router is ready.
		On, 1 sec blink	Router is booting.
		Off	Router is powered off.
PPP	Green	LED 1 is on	SIM1 PPP connection is working.
		LED 2 is on	SIM2 PPP connection is working.
USR	Green	On	OpenVPN: OpenVPN is connected. IPsec: IPsec is connected. Wi-Fi: Wi-Fi is connected.
		Off	OpenVPN: OpenVPN is disconnected. IPsec: IPsec is disconnected. Wi-Fi: Wi-Fi is disconnected.
NET (LED 1 stands for SIM 1, LED 2 stands for SIM 2)	Green	On, blinking green	Unable to connect to the best network. E.g. When R2000 Dual uses the 4G SIM card but cannot connect to the 4G network, the NET LED will always blink. The condition of 3G and 2G network will, too.
		On, solid green	Connect to the best network. E.g. When R2000 Dual uses the 4G SIM card and connects to the 4G network, the NET LED will turn to solid green. The condition of 3G and 2G network will, too.
		Off	Unable to access any network.
Signal Strength (Light 1 stands for SIM 1, light 2 stands for SIM 2)	Green	All LEDs are on	Signal level: 21-31 (Optimum signal level)
	Green	Two LEDs are on	Signal level: 11-20 (Average signal level)
	Green	Only one LED is on	Signal level: 1-10 (Abnormal signal level)
	When the network disconnected, those three signal LEDs are designed as a binary combination code to indicate a series of error report. On: 1 Off: 0 001 AT command failed 010 No SIM card detected 011 Need to enter the PIN code		

	100	Need to enter the PUK code
	101	Registration failed
	110	Something wrong happened in the module

1.4 Reset Button

Function	Operation
Reboot	Press and hold the Reset button for at least 2~7 seconds under the operating status.
Restore to factory default settings	Wait for 5 seconds after powering up the router, press and hold the Reset button by a small non-conductive stick with a blunt end until all twelve LEDs blinking one by one, and release the button within 5 second to return the router to factory defaults.

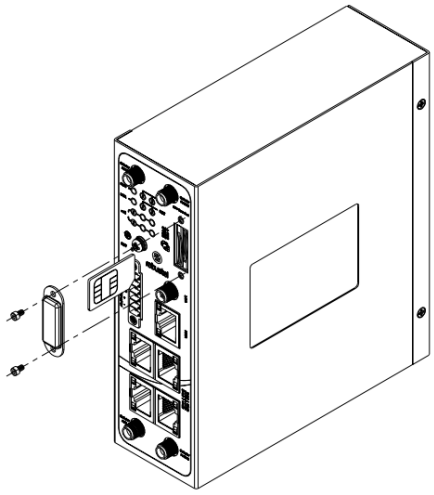
1.5 Ethernet Ports

R2000 Dual Router has five Ethernet ports. Eth0 is a WAN port and Eth1~Eth4 are LAN ports supporting POE feature. Every Ethernet port has two LED indicators, while each indicator has three states. The yellow one is **Link Indicator** and the green one doesn't mean anything. For details see the table below.

Indicator	State	Description
Link Indicator	On	Connection is working
	On, blinking	Data is being transmitted
	Off	Connection is not working

Chapter 2 Hardware Installation

2.1 Insert or Remove SIM Card



- **Insert SIM Card**

1. Make sure the router is powered off.
2. To remove slot cover, loosen the screws associated with the cover by using a screwdriver and then find the SIM card slot.
3. To insert SIM card, press the card with fingers until it snaps on.
4. Put back the slot cover and tighten the screws associated with the cover by using a screwdriver.

- **Remove SIM Card**

1. Make sure the router is powered off.
2. To remove slot cover, loosen the screws associated with the cover by using a screwdriver and then find the SIM card slot.
3. To remove SIM card, press the card with fingers until it pops out, and then take out the SIM card.
4. Put back the slot cover and tighten the screws associated with the cover by using a screwdriver.

Note:

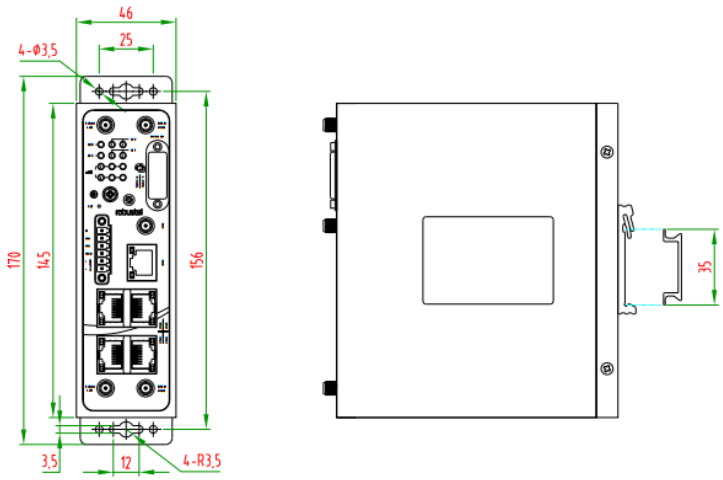
1. Recommended torque for inserting is 0.5 N.m, and the maximum allowed is 0.7 N.m.
2. Use the specific M2M SIM card when the device is working in extreme temperature (temperature exceeding 0-40℃), because the regular SIM card for long-time working in harsh environment (temperature exceeding 0-40℃) will be disconnected frequently.
3. Do not forget to twist the cover tightly to avoid being stolen.
4. Do not touch the metal of the SIM card surface in case information in the card will lost or be destroyed.
5. Do not bend or scratch the SIM card.
6. Keep the SIM card away from electricity and magnetism.
7. Make sure router is powered off before inserting or removing the SIM card.

2.2 Attach External Antenna (SMA Type)

Connect the SMA external antenna connector to the router's antenna interface and twist tightly.
Make sure the antenna is within the correct frequency range provided by the operator and with 50 Ohm impedance.
Note: Recommended torque for mounting is 0.35 N.m.

2.3 Mount the Router

The R2000 Dual Router supports flat surface placement, wall mounting and DIN rail mounting.
(unit: mm)



Wall Mount Din Rail

- **Two methods for mounting the router**

1. Wall mounting:
   Use 4 pcs of M2.5*4 flat head Phillips screws to fix the wall mounting kits to the router, and then use 2 pcs of M3 drywall screws to mount the router associated with the wall mounting kit on the wall.
   Note: Recommended torque for mounting is 0.5 N.m, and the maximum allowed is 0.7 N.m.

2. DIN rail mounting:
   Use 3 pcs of M3*6 flat head Phillips screws to fix the DIN rail to the router, and then hang the DIN rail on the bracket. It is necessary to choose the standard bracket.
   Note: Recommended torque for mounting is 1.0 N.m, and the maximum allowed is 1.2 N.m.
   When mounting the kit onto the DIN rail, make sure that its metal springs are orientated towards the top of the DIN rail.

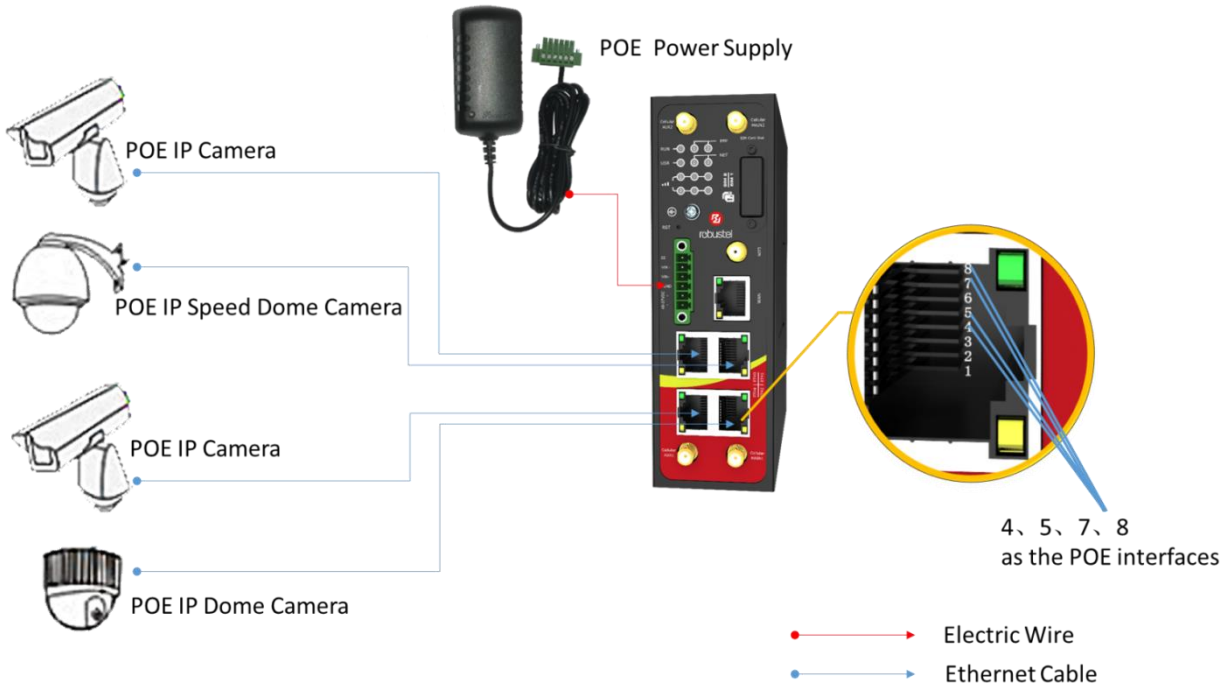
2.4 Ground the Router

Router grounding helps prevent the noise effect due to electromagnetic interference (EMI). Connect the router to the site ground wire by the ground screw before powering on.

Note: This product is appropriate to be mounted on a sound grounded device surface, such as a metal panel.

2.5 POE Connection

R2000 Dual's four fast Ethernet LAN ports support POE feature (Voltage range: 48 to 57V DC), which can electrify the network terminal devices such as IP camera and other WLAN AP etc. See figure below for more details.



2.6 Connect the Router to the PC

Connect the router's Ethernet port (eth1/eth2/eth3/eth4) to a PC via a standard cross-over cable.

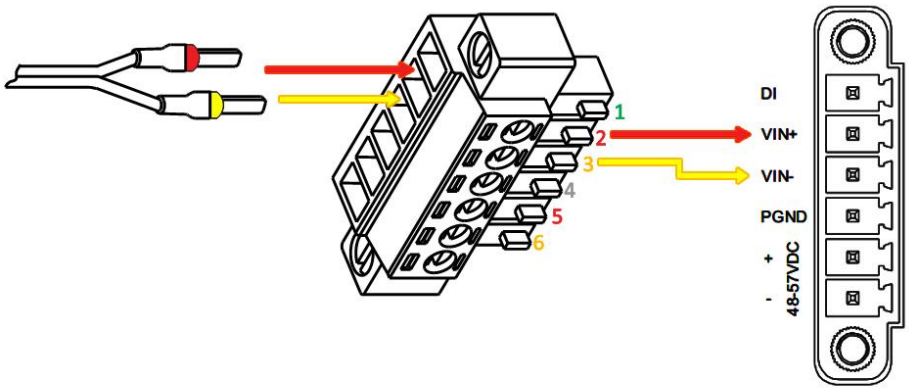
2.7 Power Supply

R2000 Dual Router supports reverse polarity protection, but always refers to the figure below to connect the power adapter correctly. There are two cables associated with the power adapter. Following to the color of the head, connect the cable marked red to the positive pole through a terminal block, and connect the yellow one to the negative in the same way.

Note: The range of power voltage is 9 to 48V DC.

CONNECTING THE REGULAR POWER SUPPLY

COLOR	POLARITY
RED	+
YELLOW	-

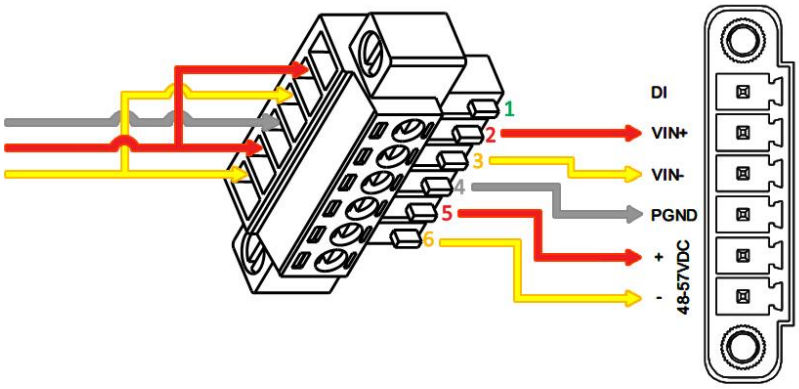


R2000 Dual Router also supports POE feature. Please refer to the figure below to connect the power adapter correctly.

Note: The range of power voltage is 48 to 57V DC.

CONNECTING THE POE POWER SUPPLY

PIN	NAME
1	DI
2	VIN+
3	VIN-
4	PGND
5	POE+
6	POE-



Chapter 3 Initial Configuration

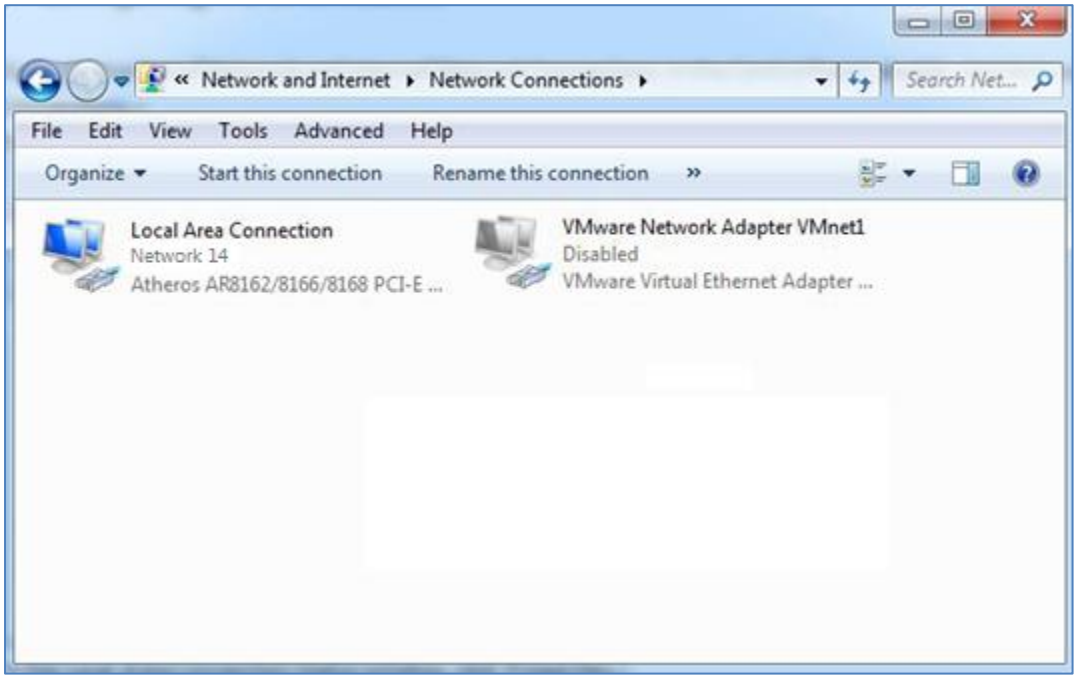
The router can be configured through your web browser that including IE 8.0 or above, Chrome and Firefox, etc. A web browser is included as a standard application in the following operating systems: Linux, Mac OS, Windows 98/NT/2000/XP/Me/Vista/7/8, etc. It provides an easy and user-friendly interface for configuration. There are various ways to connect to the router, either through an external repeater/hub or connect directly to your PC. However, make sure that your PC has an Ethernet interface properly installed prior to connecting the router. You must configure your PC to obtain an IP address through a DHCP server or a fixed IP address that must be in the same subnet as the router. If you have any problems accessing the router web interface, it is advisable to uninstall your firewall program on your PC, as this tends to cause problems accessing the IP address of the router.

3.1 Configure the PC

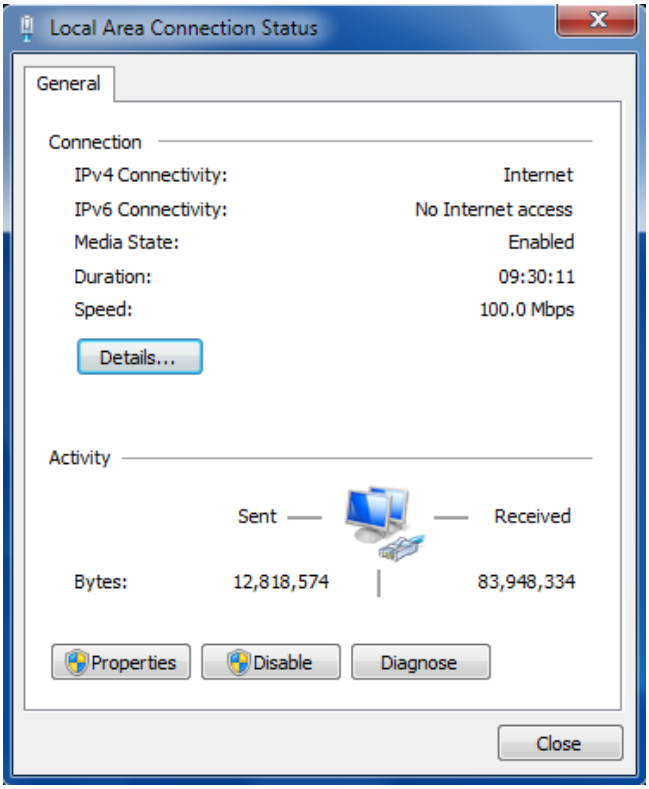
There are two methods to obtain IP address for the PC, one is to obtain an IP address automatically from Local Area Connection, and another is to configure a static IP address manually within the same subnet of the router. Please refer to the steps below.

Here take **Windows 7** as example, and the configuration for windows system is similar.

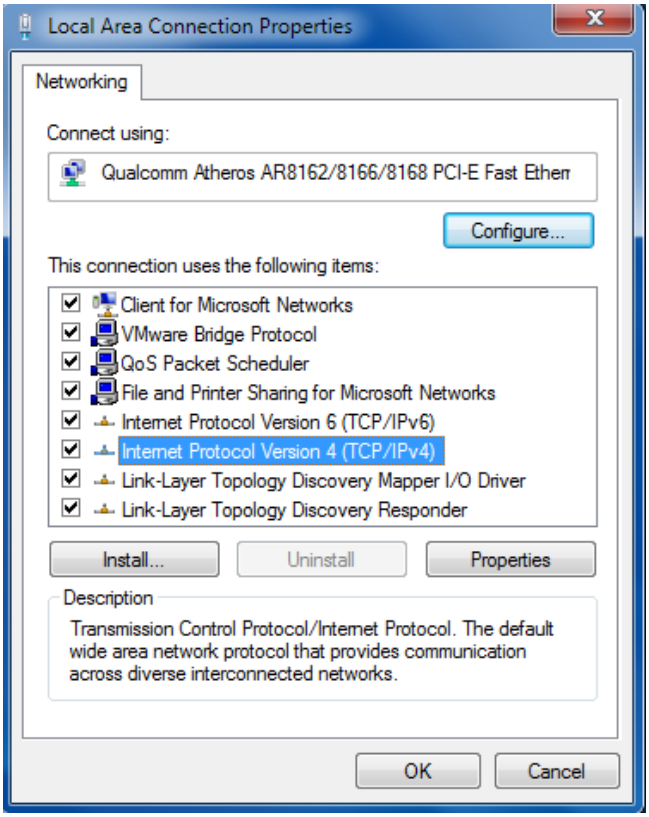
1. Go to **Start > Control Panel**, double-click **Network and Sharing Center**, and then double-click **Local Area Connection**.



2. Click **Properties** in the window of **Local Area Connection Status**.

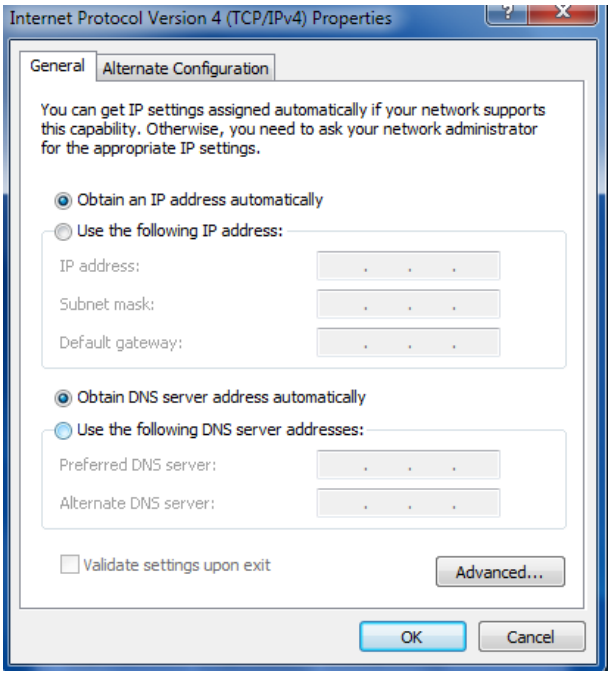


3. Choose **Internet Protocol Version (TCP/IPv4)** and click **Properties**.

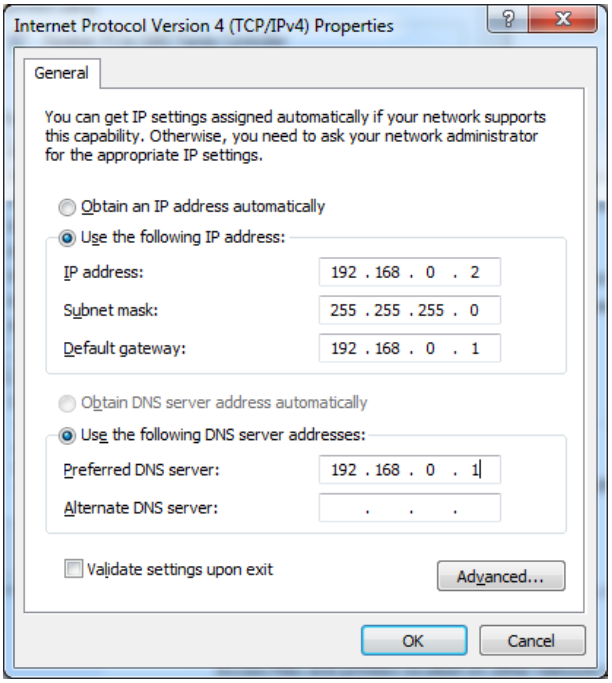


4. Two ways for configuring the IP address of PC:

Obtain an IP address automatically:



Use the following IP address (configured a static IP address manually within the same subnet of R2000 Dual Router):



5. Click **OK** to finish the configuration.

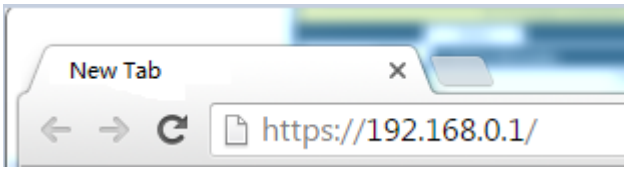
3.2 Login the Router

Before configuring your router, you need to know the following default settings.

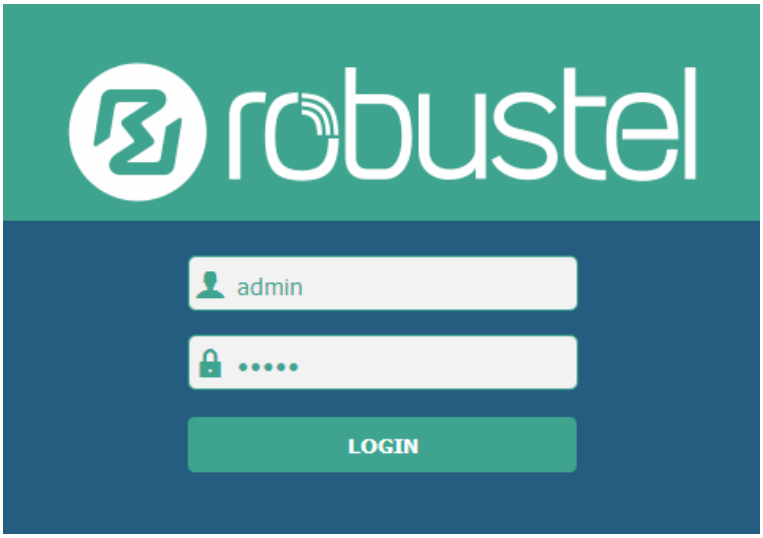
Item	Description
Username	admin
Password	admin
Eth0	DHCP
Eth1	192.168.0.1/255.255.255.0, lan0, DHCP Server Enabled.
Eth2	192.168.0.1/255.255.255.0, lan0, DHCP Server Enabled.
Eth3	192.168.0.1/255.255.255.0, lan0, DHCP Server Enabled.
Eth4	192.168.0.1/255.255.255.0, lan0, DHCP Server Enabled.

1. On your PC, open a web browser such as Internet Explorer, Google and Firefox etc.

2. From your web browser, enter the IP address of the router. The default IP address of R2000 Dual Router is 192.168.0.1, though the actual address may vary.

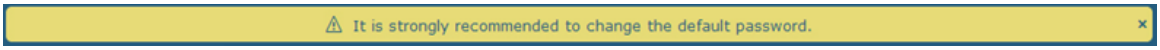


3. In the login page, enter the username and password, choose language and then click **LOGIN**.
Note: If enter the wrong username or password over six times, the login web will be locked for 5 minutes.



4. The home page of the R2000 Lite router's web interface is displayed, for example.

Using the original password to log in the router, the page will pop up the following tab



click × to close the pop-up tab.

Control Panel		
Item	**Description**	**Button**
Save & Apply	Click to save the current configuration into router's flash and apply the modification on every configuration page, to make the modification taking effect.	Save & Apply
Reboot	Click to reboot the router. If the Reboot button is yellow, it means that some completed configurations will take effect only after reboot.	Reboot
Logout	Click to exit safely, then it will switch to login page. Shut down web page directly without logout, the next one can login web on this browser without a password before timeout.	Logout
Submit	Click to submit the modification on current configuration page.	Submit
Cancel	Click to cancel the modification on current configuration page.	Cancel

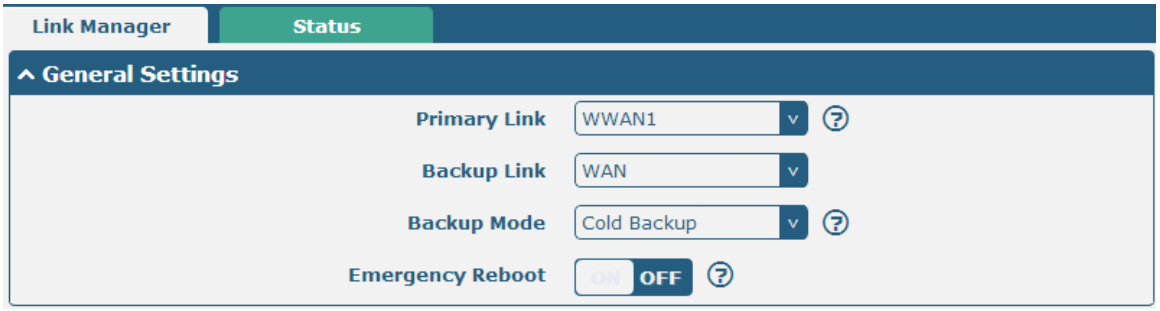
Note: The steps of how to modify configuration are as bellow:

1. Modify in one page;
2. Click **Submit** under this page;
3. Modify in another page;
4. Click **Submit** under this page;
5. Complete all modification;
6. Click **Save & Apply** .

3.3 Configure the Cellular

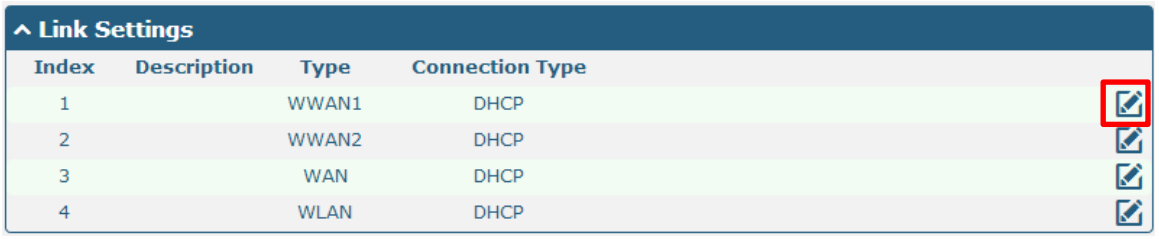
- ### Configure the Cellular

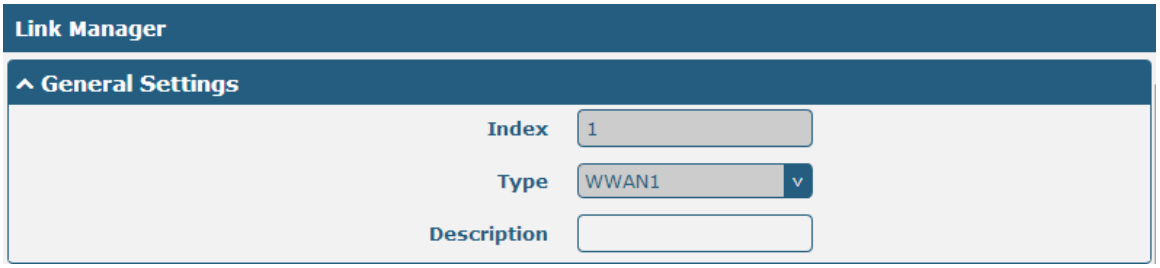
Click **Interface > Link Manager > Link Manager > General Settings**, choose "WWAN1" as the primary link and "WAN" as the backup link and "Cold Backup" as the backup mode, then click **Submit > Save & Apply** to make the configuration take effect.



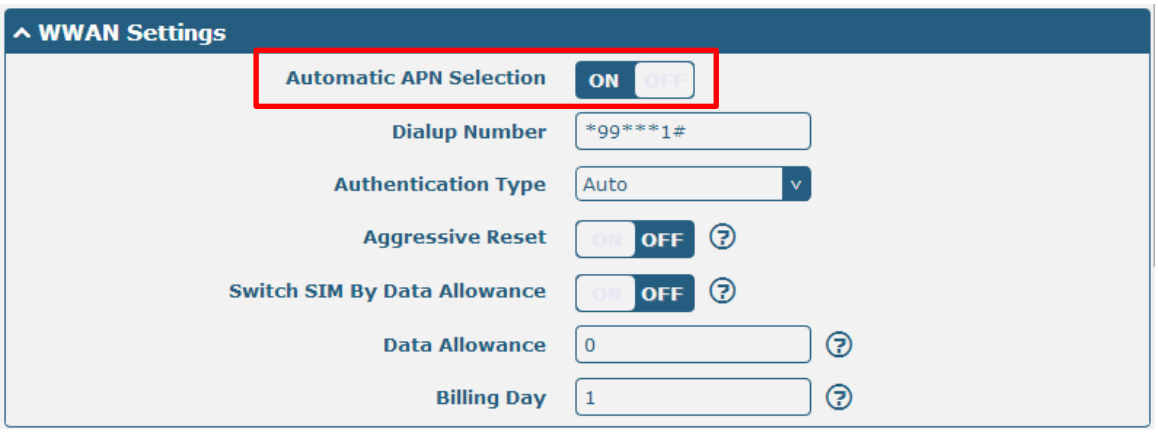
Link Settings section allows user to configure the parameter of link connection, include the WWAN1/WWAN2, WAN and WLAN. It is recommended to enable Ping detection to keep router always online. The Ping detection increases the reliability and also cost data traffic.

Click the edit button of WWAN1, refer to the figure below to set it parameters according to the current ISP, and then click Submit > Save & Apple to make it take effect.

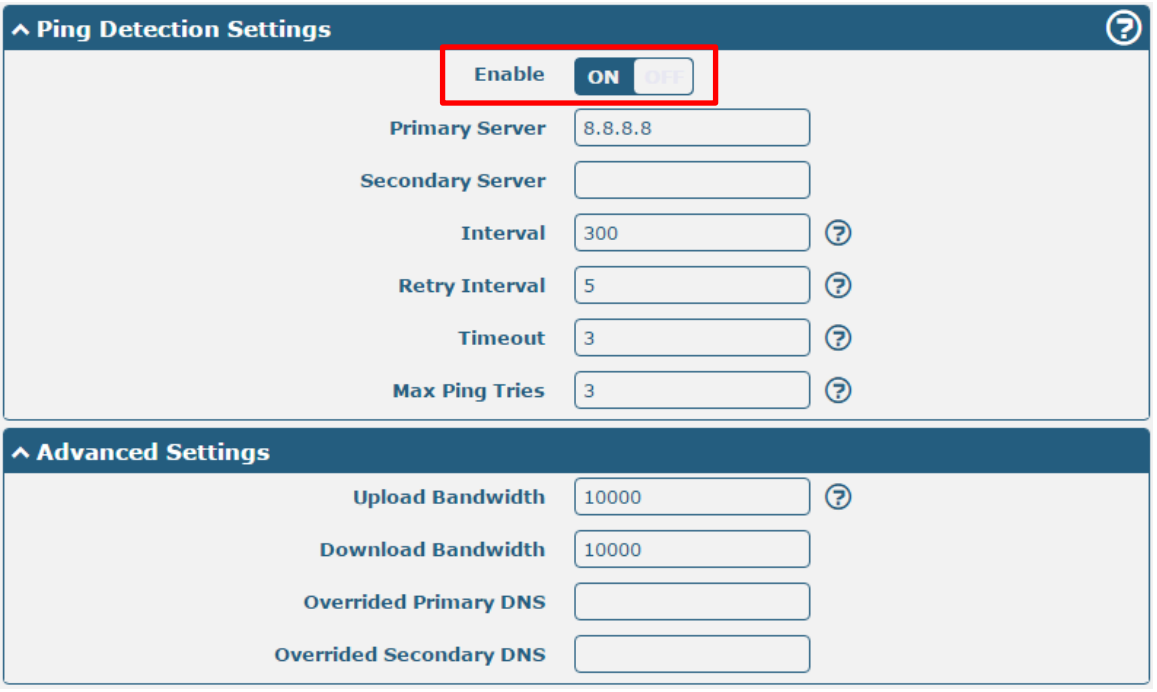




Enable **Automatic APN Selection**, the window is displayed as below:



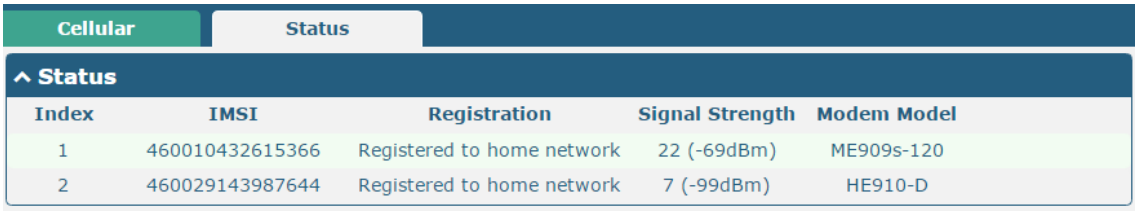
Enable Ping, the window is displayed as below:



The modifications will take effect after clicking **Submit > Save & Apply**.

- **Check the Cellular Connection Status**

Click **Interface > Cellular > Status**, and click the row of status, then the details status information will be displayed under the row.



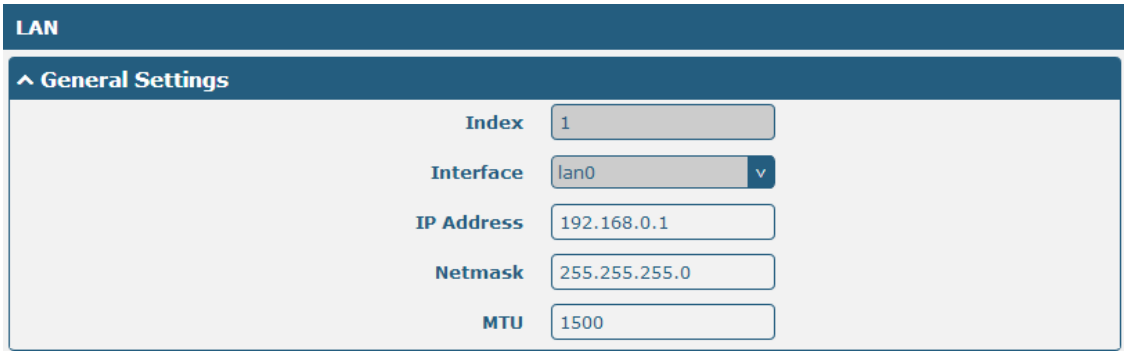
3.4 Configure the IP Address

- **Configure Lan0**

For R2000 Dual, the maximum number of LAN port is four which include lan0, lan1, lan2 and lan3.
Lan0~lan3 is available when they were selected randomly by eth1~eth4.
All of eth1~eth4 were default to lan0, and the default IP is 192.168.0.1/255.255.255.0.

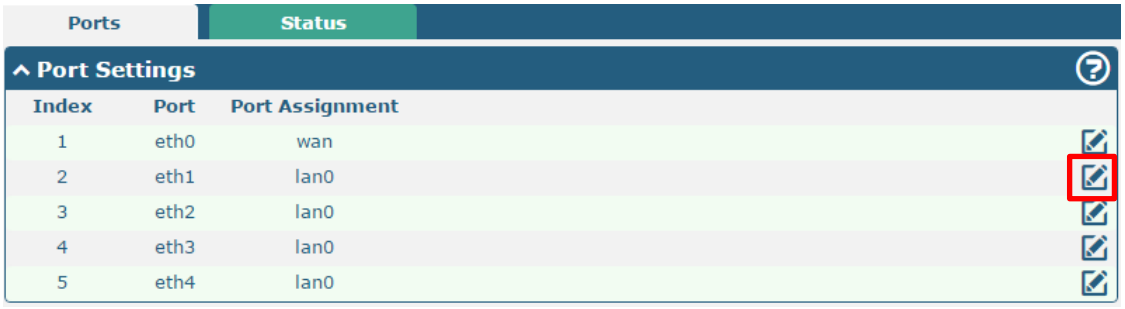
Go to **Interface > LAN > LAN > Network Settings**, for example:

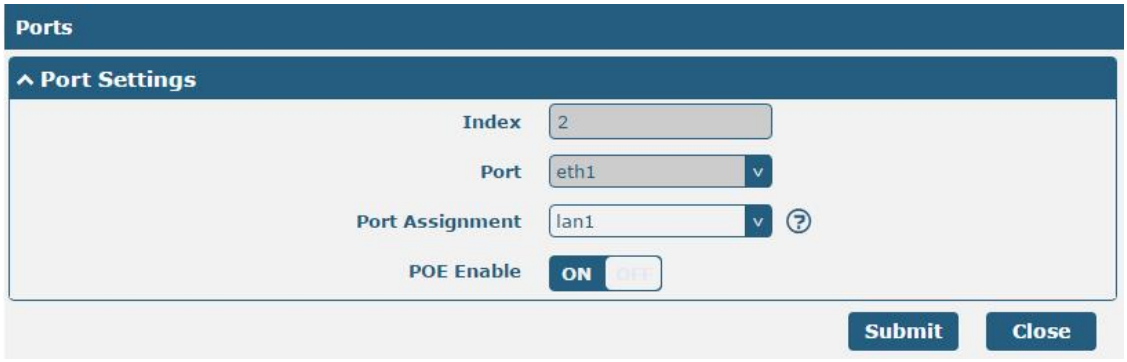
Click the edit button of the current LAN port, modify the **IP Address** and **Netmask** of lan0. And then click **Submit > Save & Apply** to make the modification take effect.



- **Configure Lan1**

Go to the **Interface > Ethernet**, click the edit button of eth1, and choose lan1 as the **Port Assignment**.

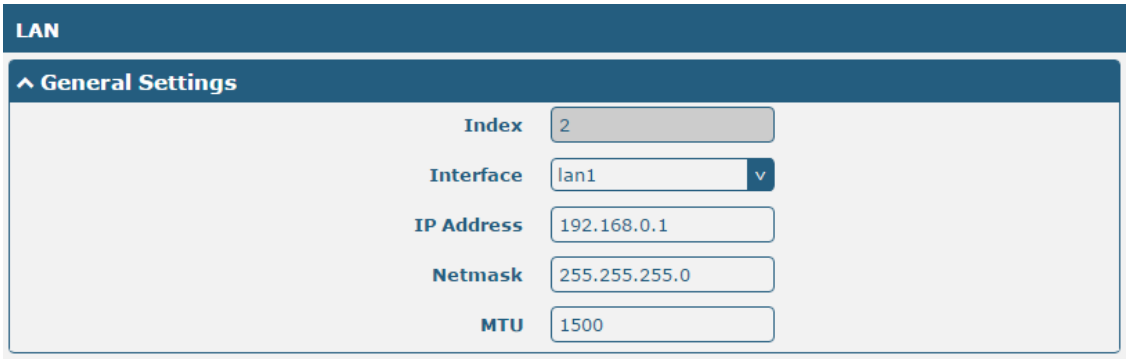




Click **Submit > Save & Apply** to make the modification take effect.

Go to **Interface > LAN**, and click the add button:

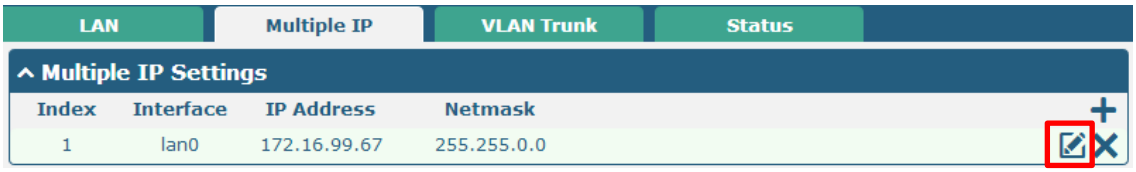
Select the interface as lan1, and configure the **IP Address** and **Netmask** of lan1.



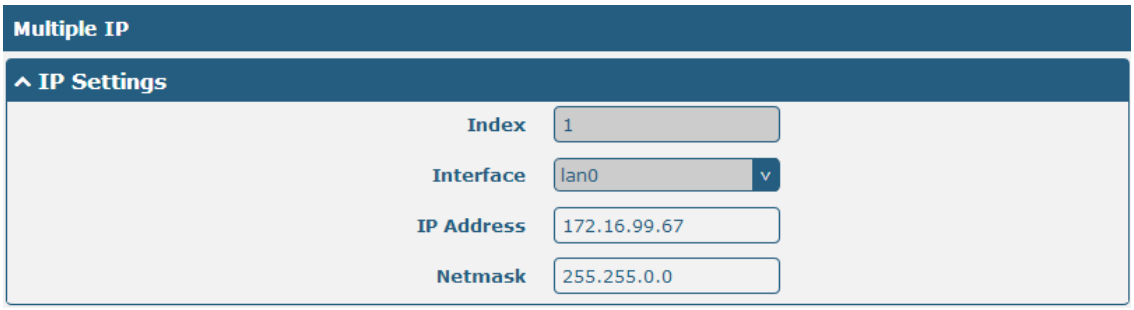
Click **Submit > Save & Apply** to make the modification take effect.

- ## Configure Multiple IP

Go to **Interface > LAN > LAN > Multiply IP**, for example:

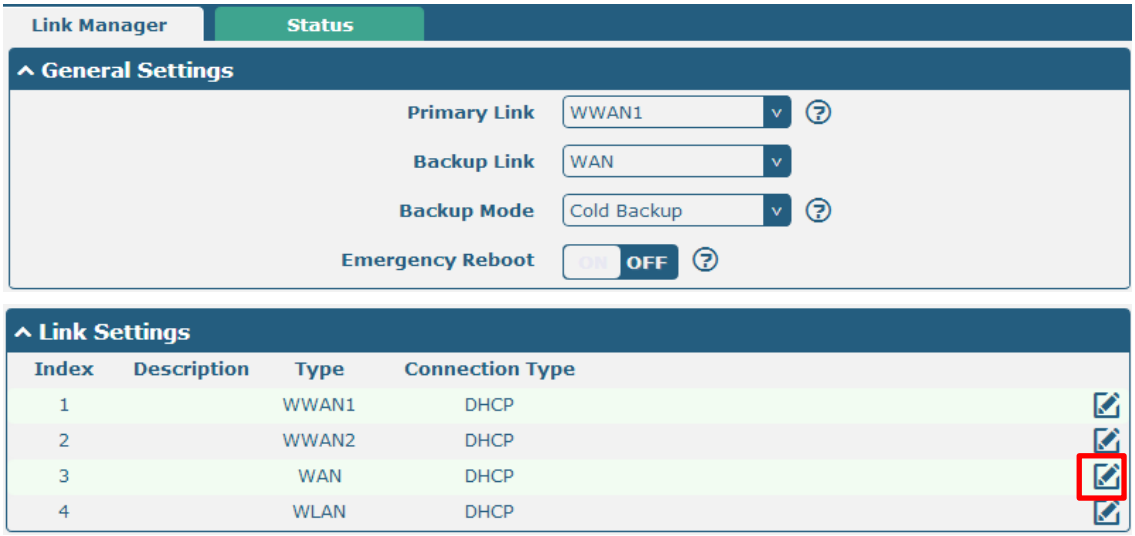


Click to edit the multiple IP of the LAN interface. Click to delete the multiple IP of the LAN interface. Click to add a multiple IP to the LAN interface.

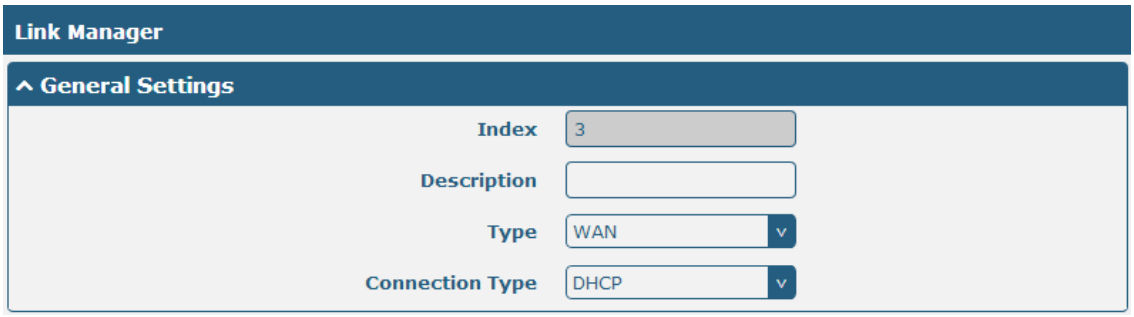


- ## Configure WAN

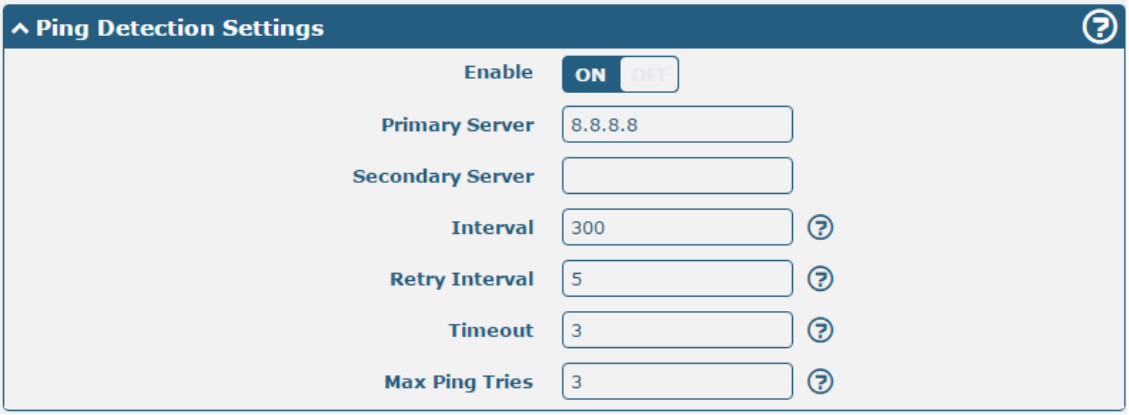
Go to **Interface > Link Manager > General Settings**, and click the edit button of WAN to enter the link configuration window.

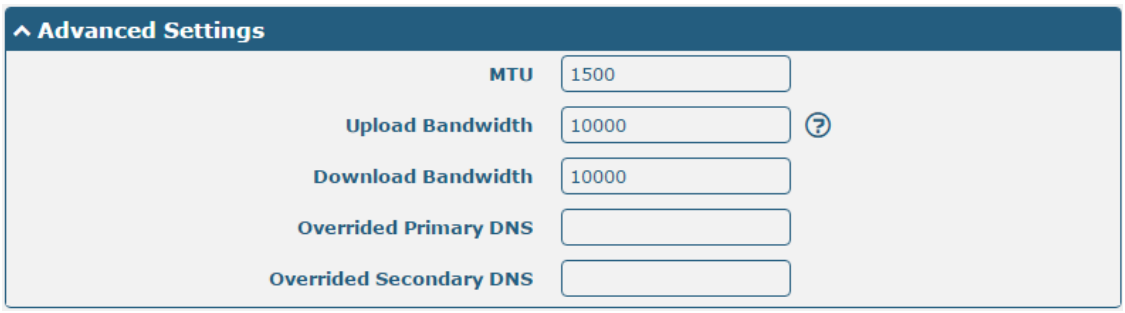


Configure the WAN interface parameters such as the **Connection Type** as below:



Enable **Ping**, the window is displayed as below:




Advanced Settings
MTU
1500
Upload Bandwidth
10000
Download Bandwidth
10000
Overrided Primary DNS
Overrided Secondary DNS

Chapter 4 FAQ

Connected to the router successfully and obtained the IP address automatically, but failed to login the webpage.

1. Check the cable connection.
2. Check whether the green LED of the current connected port is solid or blinking.
3. Check whether another DHCP server or host occupies the IP address within the same LAN and causes IP conflict. If yes, connect the router to the PC directly to modify the IP address pool of DHCP.
4. Confirm whether the DHCP function has been closed factitiously if this is not the first use of this router. If yes, configure the IP address of the PC's LAN interface manually to make the router and the PC can access each other in the same LAN; or restore to the factory default settings of the router via the Reset button.
5. Check the firewall of the router to confirm whether the access is restricted or the HTTP protocol is closed. Please restart the firewall.

What to do if I forgot the IP address of the router?

Press and hold the Rest button to return the router to factory defaults, and then enter "192.168.0.1" in your browser to log in the router again. See Chapter 1.4 for more details about Reset button.