robustel | User Guide

R3000 LG

Industrial LoRaWAN Gateway

Low Power Consumption & Long Rang Communication

robustOS

Guangzhou Robustel LTD
www.robustel.com

About This Document

This document provides hardware and software information of the Robustel R3000 LG, including introduction, installation, configuration and operation.

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Important Notice

Due to the nature of wireless communications, transmission and reception of data can never be guaranteed. Data may be delayed, corrupted (i.e., have errors) or be totally lost. Although significant delays or losses of data are rare when wireless devices such as the gateway is used in a normal manner with a well-constructed network, the gateway should not be used in situations where failure to transmit or receive data could result in damage of any kind to the user or any other party, including but not limited to personal injury, death, or loss of property. Robustel accepts no responsibility for damages of any kind resulting from delays or errors in data transmitted or received using the gateway, or for failure of the gateway to transmit or receive such data.

Safety Precautions

General

- The gateway generates radio frequency (RF) power. When using the gateway, care must be taken on safety issues related to RF interference as well as regulations of RF equipment.
- Do not use your gateway in aircraft, hospitals, petrol stations or in places where using cellular products is prohibited.
- Be sure that the gateway will not be interfering with nearby equipment. For example: pacemakers or medical equipment. The antenna of the gateway should be away from computers, office equipment, home appliance, etc.
- An external antenna must be connected to the gateway for proper operation. Only uses approved antenna with the gateway. Please contact authorized distributor on finding an approved antenna.
- Always keep the antenna with minimum safety distance of 20 cm or more from human body. Do not put the antenna inside metallic box, containers, etc.
- When used, the device needs a suitable environment.

1. If indoors, it needs to be provided an indoor enclosure.
2. If outdoors, it needs to be provided a rain proof enclosure.

- RF exposure statements
    1. For mobile devices without co-location (the transmitting antenna is installed or located more than 20cm away from the body of user and nearby person)
- FCC RF Radiation Exposure Statement
    1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
    2. This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and human body.

Note: Some airlines may permit the use of cellular phones while the aircraft is on the ground and the door is open. Gateway may be used at this time.

Using the Gateway in Vehicle

- Check for any regulation or law authorizing the use of cellular devices in vehicle in your country before installing the gateway.
- The driver or operator of any vehicle should not operate the gateway while driving.
- Install the gateway by qualified personnel. Consult your vehicle distributor for any possible interference of electronic parts by the gateway.
- The gateway should be connected to the vehicle's supply system by using a fuse-protected terminal in the vehicle's fuse box.
- Be careful when the gateway is powered by the vehicle's main battery. The battery may be drained after extended period.

Protecting Your Gateway

To ensure error-free usage, please install and operate your gateway with care. Do remember the following:

- Do not expose the gateway to extreme conditions such as high humidity / rain, high temperature, direct sunlight, caustic / harsh chemicals, dust, or water.
- Do not try to disassemble or modify the gateway. There is no user serviceable part inside and the warranty would be void.
- Do not drop, hit or shake the gateway. Do not use the gateway under extreme vibrating conditions.
- Do not pull the antenna or power supply cable. Attach/detach by holding the connector.
- Connect the gateway only according to the instruction manual. Failure to do it will void the warranty.
- In case of problem, please contact authorized distributor.

Federal Communication Commission Interference Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class 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 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.

FCC Caution:

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

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment shall be installed and operated with minimum distance 20.8cm between the radiator & body.

ICES WARNING:

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:
(1) This device may not cause interference.
(2) This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique 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;
(2) L' appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d' en compromettre le fonctionnement.

Radio Frequency Exposure Statement for IC

This equipment complies with IC exposure limits set forth for an uncontrolled environment. This equipment shall be installed and operated with minimum distance 30.3 cm between the radiator & body.

Cet équipement est conforme aux limites d'exposition IC définies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec une distance minimale de 30.3 cm entre le radiateur et la carrosserie.

Regulatory and Type Approval Information

Table 1: Directives

2011/65/EU	The European RoHS2.0 2011/65/EU Directive was issued by the European parliament and the European Council on 1 July 2011 on the restriction of the use of certain Hazardous substances in electrical and electronic equipment.
2012/19/EU	The European WEEE 2012/19/EU Directive was issued by the European parliament and the European Council on 24 July 2012 on waste electrical and electronic equipment.
2013/56/EU	The European 2013/56/EU Directive is a battery Directive which published in the EU official gazette on 10 December 2013. The button battery used in this product conforms to the standard of 2013/56/EU directive.

Table 2: Standards of the electronic industry of the People's Republic of China

SJ/T 11363-2006	The electronic industry standard of the People's Republic of China SJ/T 11363-2006 "Requirements for Concentration Limits for Certain Toxic and Hazardous Substances in Electronic Information Products" issued by the ministry of information industry of the People's Republic of China on November 6, 2006, stipulates the maximum allowable concentration of toxic and hazardous substances in electronic information products. Please see **Table 3** for an overview of toxic or hazardous substances or elements that might be contained in product parts in concentrations above the limits defined by SJ/T 11363-2006.
SJ/T 11364-2014	The electronic industry standard of the People's Republic of China SJ/T 11364-2014 "Labeling Requirements for Restricted Use of Hazardous Substances in Electronic and Electrical Products" issued by the ministry of Industry and information technology of the People's Republic of China on July 9, 2014, stipulates the Labeling requirements of hazardous substances in electronic and electrical products, environmental protection use time limit and whether it can be recycled. This standard is applicable to electronic and electrical products sold within the territory of the People's Republic of China, and can also be used for reference in the logistics process of electronic and electrical products. The orange logo below is used for Robustel products: Indicates its warning attribute, that is, some hazardous substances are contained in the product. The "10" in the middle of the legend refers to the environment-friendly Use Period (EFUP) * of electronic information product, which is 10 years. It can be used safely during the environment-friendly Use Period. After the environmental protection period of use, it should enter the recycling system. *The term of environmental protection use of electronic information products refers to the term during which the toxic and hazardous substances or elements contained in electronic information products will not be leaked or mutated and cause serious pollution to the environment or serious damage to people and property under normal conditions of use.

Table 3: Toxic or Hazardous Substances or Elements with Defined Concentration Limits

Name of the Part	Hazardous Substances									
	(Pb)	(Hg)	(Cd)	(Cr(VI))	(PBB)	(PBDE)	(DEHP)	(BBP)	(DBP)	(DIBP)
Metal parts	o	o	o	o	-	-	-	-	-	-
Circuit modules	o	o	o	o	o	o	o	o	o	o
Cables and cable assemblies	o	o	o	o	o	o	o	o	o	o
Plastic and polymeric parts	o	o	o	o	o	o	o	o	o	o

o:
Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in RoHS2.0.
X:
Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials for this part *might exceed* the limit requirement in RoHS2.0.
-:
Indicates that it does not contain the toxic or hazardous substance.

Document History

Updates between document versions are cumulative. Therefore, the latest document version contains all updates made to previous versions.

Date	Firmware Version	Document Version	Change Description
16 Oct., 2017	1.0.0	v.1.0.0	Initial release
20 Dec., 2017	1.0.0	v.1.0.1	Updated model and certification info Added the image for GPS antenna
10 Apr., 2018	1.0.0	v.1.0.2	Added new LoRa standard 433-434 MHz (Europe) Updated LoRa interface information
28 Jun., 2018	1.0.0	v.1.0.3	Revised the company name
19 Jul., 2018	1.0.0	v.1.0.4	Revised the product name
29 Jan., 2019	1.0.0	v.1.0.5	Revised the certifications
27 Feb., 2019	1.0.0	v.1.0.6	• Revised the Max transmitted power of Lora interface • Revised the description of Max sensitivity • Revised the English Grammar
14 Mar., 2019	1.0.0	v.1.0.7	Added the FCC Statement
22 Jul., 2019	1.0.0	v.1.0.8	• Revised the description of enclosure • Revised the Regulatory and Type Approval Information
26 Nov., 2019	1.0.0	v.1.0.9	• Revised the description of Update firmware via tftp
13 Aug., 2020	1.0.0	v.1.1.0	• Revised the Regulatory and Type Approval Information • Revised the SMA LoRa stubby antenna information in Package Contents • Deleted some redundant descriptions in product specifications
6 May., 2021	3.1.6	v.1.1.1	• Added the IC statement • Added the requirements for antenna installers • Revised the company address

Contents

Chapter 1 Product Overview

1.1 Key Features

Robustel R3000 LG is an industrial-grade LoRaWAN gateway, integrated with LoRaWAN wireless communication technology and cellular network technology, to provide users with wireless long-distance data transmission services. R3000 LG allows access to various types of LoRa application nodes, and supports wired Ethernet and wireless 4G/3G/2G access to the cloud platform, mainly for LoRaWAN data transmission between LoRa node and cloud platform.

LPWAN technology is a type of RF Technology designed for low cost and mostly battery operated end devices and sensors. LoRaWAN is a MAC level protocol that uses LoRa Radio Technology as its physical layer. One can create both public and private networks with LoRaWAN. The LoRa Alliance has created a fully open LoRaWAN standard allowing the creation of star based LPWAN networks where end devices and sensors communicate with gateways connected to a cloud based (or on premise) LoRaWAN Network server. All communications are fully 128-bit AES encrypted, bidirectional and end devices can register onto the network over the air.

1.2 Package Contents

Before installing your R3000 LG, verify the kit contents as following.
Note: The following pictures are for illustration purposes only, not based on their actual sizes.

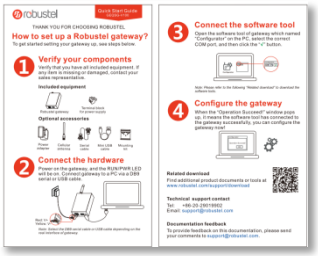
- 1 x Robustel R3000 LG Industrial LoRaWAN Gateway

- 1 x 3-pin 5 mm male terminal block with lock for power supply

- 1 x 7-pin 3.5 mm male terminal block with lock for serial and console port

- 1 x 4-pin 3.5 mm male terminal block for digital input interface

- 1 x *Quick Start Guide* with download link of other documents or tools



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

Optional Accessories (sold separately)

- 3G/4G SMA cellular antenna (stubby/magnet optional)

  Stubby antenna

  Magnet antenna

- SMA LoRa stubby antenna

- GPS antenna

- Wall mounting kit

- 35 mm DIN rail mounting kit

- Ethernet cable

- AC/DC power adapter (12V DC, 1.5 A; EU/US/UK/AU plug optional)

1.3 Specifications

LoRa Interface

- Number of antennas: 1
- Connector: SMA female with 50 ohms impedance
- Standards: 433-434 MHz (Europe)
  863-870 MHz (Europe)
  470-510 MHz (China)
  915-927 MHz (Australia)
  902-928 MHz (North America)
  920-928 MHz (Japan)
- Max transmitted power: +24.5dBm
- Max sensitivity: -142 dBm
- Reception capacity: Supports 8 channels, and each channel can receive data simultaneously
  Supports 1 MHz bandwidth demodulation
- Communication range: 15 km

Cellular Interface

- Number of antennas: 2 (MAIN + AUX)
- Connector: SMA female
- SIM: 2 (3.0 V & 1.8 V)

Ethernet Interface

- Number of ports: 2 x 10/100 ports, 2 x LAN or 1 x LAN + 1 x WAN
- Magnet isolation protection: 1.5 KV

GPS/GLONASS Interface (Optional)

- Number of antennas: 1
- Connector: SMA female with 50 ohms impedance
- Acquisition sensitivity: GPS: greater than -148 dBm
  GLONASS: greater than -145 dBm
  Navigation sensitivity: GPS: greater than -163 dBm
  GLONASS: greater than -157 dBm
  Tracking sensitivity: GPS: greater than -165 dBm
  GLONASS: greater than -161 dBm
- Horizontal position accuracy: GPS: 2.5 m
  GLONASS: 2.6 m
- Protocol: NMEA-0183 v4.10

Serial Interface

- Number of ports: 1 x RS-232 or 1 x RS-485
- Connector: 7-pin 3.5 mm female socket with lock
- ESD protection: ±15 KV
- Baud rate: 300 bps to 230400 bps
- Parameters: 8E1, 8O1, 8N1, 8N2, 7E2, 7O2, 7N2, 7E1
- RS-232: TxD, RxD, RTS, CTS, GND
- RS-485: Data+ (A), Data- (B)

Digital Input

- Number of ports: 2 x DI (dry contact)
- Connector: 4-pin 3.5 mm female socket
- Isolation: 3KVDC or 2KVrms
- Absolute maximum VDC: “V+” +5V DC (DI)
- Absolute maximum ADC: 300 mA

Others

- 1 x RST button
- 1 x Micro SD interface
- 1 x USB 2.0 host up to 480 Mbps
- 1 x CLI interface
- LED indicators - 1 x RUN, 1 x MODEM, 1 x USR, 1 x RSSI, 1 x NET, 1 x SIM
- Built-in RTC, Watchdog, Timer

Power Supply and Consumption

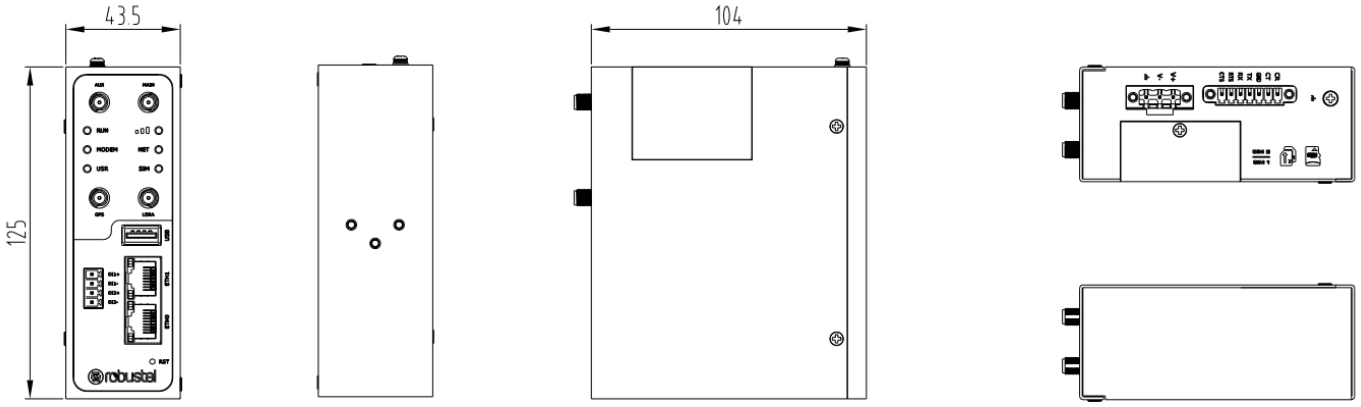
- Connector: 3-pin 5 mm female socket with lock
- Input voltage: 9 to 60V DC
- Power consumption: Idle: 100 mA@12 V
  Data link: 400 mA (peak) @12 V

Physical Characteristics

- Ingress protection: IP30

- Housing & Weight: Metal, 570 g
- Dimensions: 125 x 104 x 43.5 mm
- Installations: Desktop, wall mounting and 35 mm DIN rail mounting

1.4 Dimensions



Front View | Rear View | Side View | Top&Bottom View

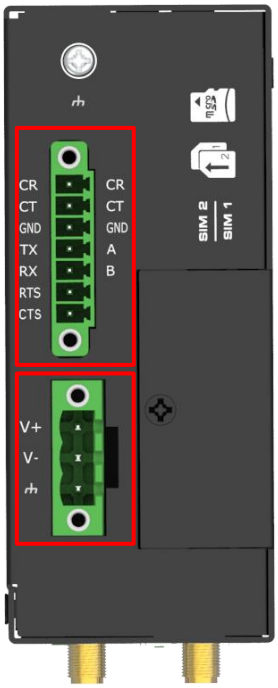
1.5 Warning

WARNING – EXPLOSION HAZAD. DO NOT REMOVE OR REPLACE WHILE CIRCUIT IS LIVE UNLESS THE AREA IS FREE OF IGNITIBLE CONCENTRATIONS.

AVERTISSEMENT — RISQUE D'EXPLOSION. NE PAS RETIRER OU REMPLACER LORSQUE LE CIRCUIT EST SOUS TENSION, À MOINS QUE LE MILIEU SOIT LIBRE DE SUBSTANCES INFLAMMABLES CONCENTRÉES.

Chapter 2 Hardware Installation

2.1 PIN Assignment



PIN	Debug	RS-232	RS-485	Direction
1	CR	--	--	Gateway ← Device
2	CT	--	--	Gateway → Device
3	GND	GND	GND	--
4	--	TXD	Data+(A)	Gateway → Device
5	--	RXD	Data+(B)	Gateway ← Device
6	--	RTS	--	Gateway → Device
7	--	CTS	--	Gateway ← Device

PIN	Polarity
8	Positive
9	Negative
10	GND

PIN	DI	Direction
1	DI1+	Gateway ← Device
2	DI1-	Gateway ← Device
3	DI2+	Gateway ← Device
4	DI2-	Gateway ← Device

2.2 LED Indicators

The R3000 LG has been designed to be placed on a desktop. Below is the front view of the R3000 LG.

Name	Color	Status	Description
RUN	Green	On, fast blinking (250 mSec blink time)	Gateway is powered on (System is initializing)
		On, blinking (500 mSec blink time)	Gateway starts operating
		Off	Gateway is powered off
MODEM	Green	On, solid	Link connection is working
		Off	Link connection is not working
USR-OpenVPN	Green	On, solid	OpenVPN connection is established
		Off	OpenVPN connection is not established
USR-IPsec	Green	On, solid	IPsec connection is established
		Off	IPsec connection is not established
	Green	On, solid	High Signal strength (21-31) is available
	Yellow	On, solid	Medium Signal strength (11-20) is available
	Red	On, solid	Low Signal strength (1-10) is available
	/	Off	No signal
NET	Green	On, solid	Connection to 4G network is established

	Yellow	On, solid	Connection to 3G network is established
	Red	On, solid	Connection to 2G network is established
	/	Off	Connection to network is not established or establishing
SIM	Green	On, blinking	Backup card is being used
		Off	Main card is being used

Note: You can choose the display type of USR LED. For more details, please refer to **3.29 Service > Advanced**.

2.3 USB Interface

Function	Operation
Firmware upgrade	USB interface is used for batch firmware upgrading, but cannot be used for sending or receiving data from slave devices which connected to it. You can insert a USB storage device into the gateway's USB interface, such as a U disk or a hard disk. If there have a supported configuration file or a gateway firmware in this USB storage device, the gateway will automatically update the configuration file or the firmware. For more details, see **3.10 Interface > USB**.

2.4 Reset Button

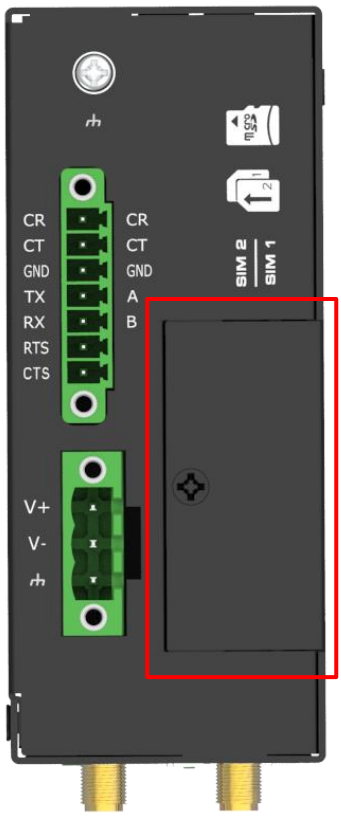
Function	Operation
Reboot	Press and hold the RST button for 2 to 7 seconds under the operating status.
Restore to factory default settings	Wait for 3 seconds after powering up the gateway, press and hold the RST button until all six LEDs start blinking one by one, and release the button to return the gateway to factory defaults.

2.5 Ethernet Port

There are two Ethernet ports on R3000 LG, including ETH0 and ETH1. Each Ethernet port has two LED indicators. The yellow one is a link indicator, while the green one is a speed indicator. For details about status, see the table below.

Indicator	Status	Description
Link indicator	On, solid	Connection is established
	On, blinking	Data is being transferred
	Off	Connection is not established
Speed indicator	On, solid	100 Mbps mode
	Off	10 Mbps mode

2.6 Insert or Remove SIM Card/Micro SD Card



Insert or remove the SIM/Micro SD card as shown in the following steps.

- **Insert SIM card/Micro SD card**

1. Make sure gateway 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/Micro SD card slot.
3. To insert SIM card/Micro SD card, press the card with finger until you hear a click and then tighten the screws associated with the cover by using a screwdriver.
4. To put back the cover and tighten the screws associated with the cover by using a screwdriver.

- **Remove SIM card/Micro SD card**

1. Make sure gateway 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/Micro SD card slot.
3. To remove SIM card/Micro SD card, press the card with finger until it pops out and then take out the card.
4. To put back the cover and tighten the screws associated with the cover by using a screwdriver.

Note:

1. Recommended torque for inserting is 1.0 N.m, and the maximum allowed is 1.2 N.m.
2. Use the specific card when the device is working in extreme temperature (temperature exceeding 40 °C), because the regular card for long-time working in harsh environment will be disconnected frequently.
3. Do not forget to twist the cover tightly to avoid being stolen.

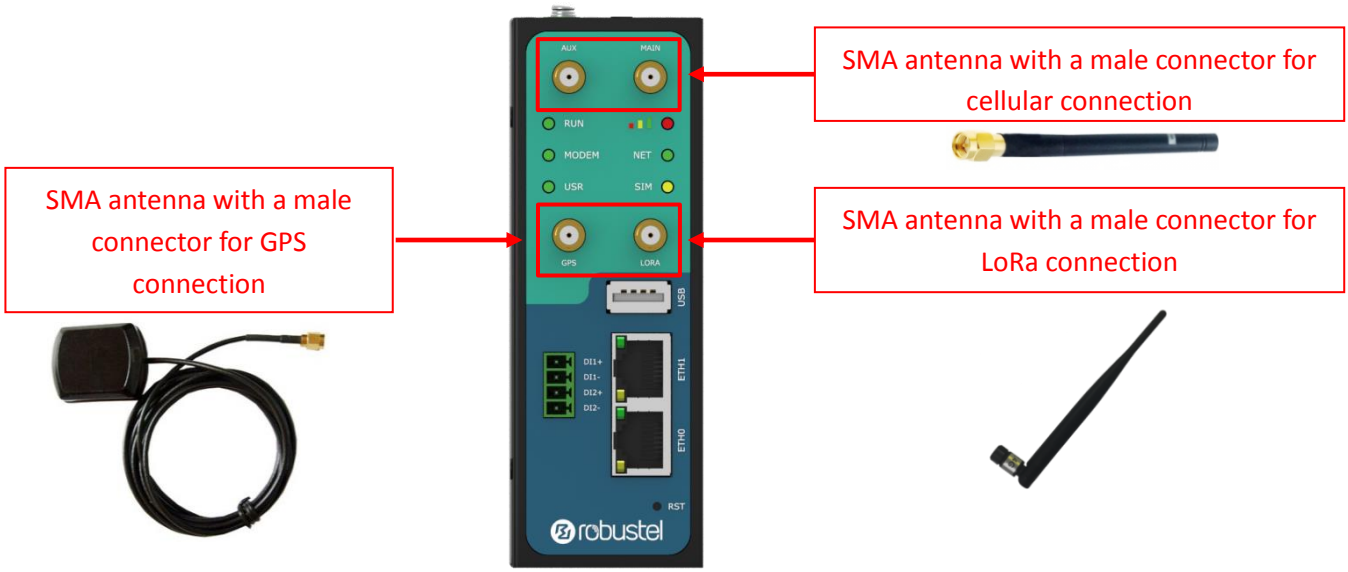
4. Do not touch the metal of the card surface in case information in the card will lose or be destroyed.
5. Do not bend or scratch the card.
6. Keep the card away from electricity and magnetism.
7. Make sure gateway is powered off before inserting or removing the card.

2.7 Attach External Antenna (SMA Type)

Attach an external SMA antenna to the gateway's antenna connector and twist tightly. Make sure the antenna is within the correct frequency range provided by the ISP and with 50 Ohm impedance.

Note:

1. Recommended torque for tightening is 0.35 N.m.
2. The antenna needs to be installed by professionals.



2.8 Mount the Gateway

The gateway can be placed on a desktop or mounted to a wall or a 35 mm DIN rail.

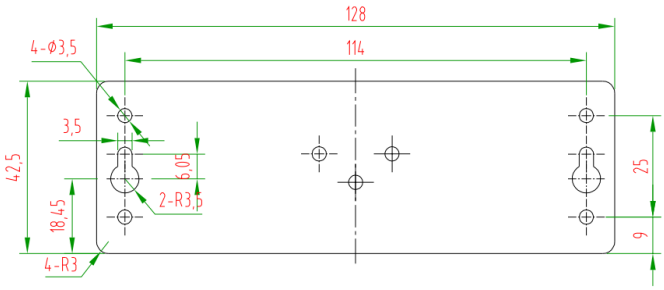
Note:

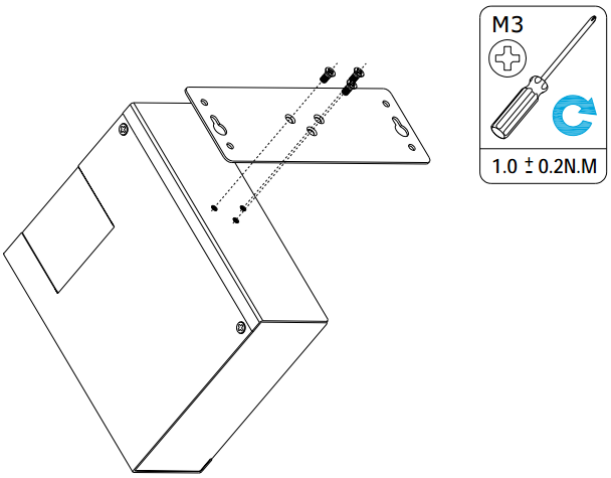
When used, the device needs a suitable environment.

1. If indoors, it needs to be provided an indoor enclosure.
2. If outdoors, it needs to be provided a rain proof enclosure.

Two methods for mounting the gateway

- Wall mounting (measured in mm)

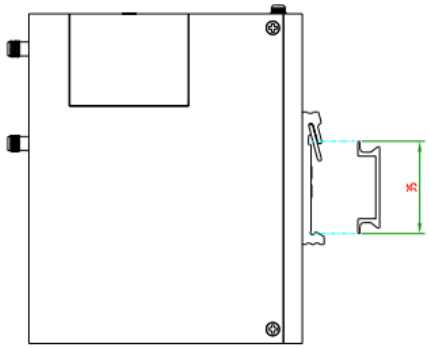


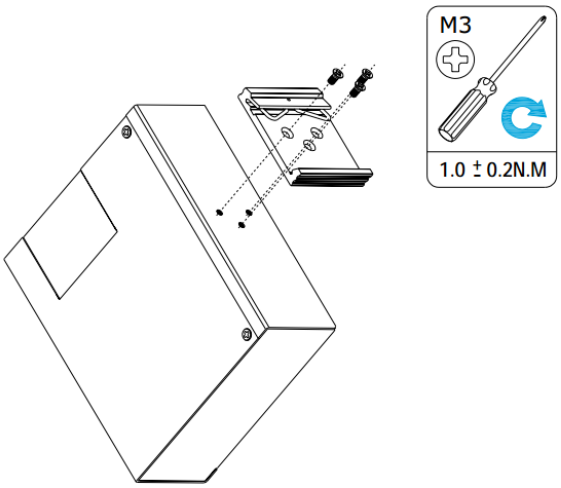


Use 3 pcs of M3*4 flat head Phillips screws to fix the wall mounting kit to the gateway, and then use 2 pcs of M3 drywall screws to mount the gateway associated with the wall mounting kit on the wall.

Note: Recommended torque for mounting is 1.0 N.m, and the maximum allowed is 1.2 N.m.

- DIN rail mounting (measured in mm)

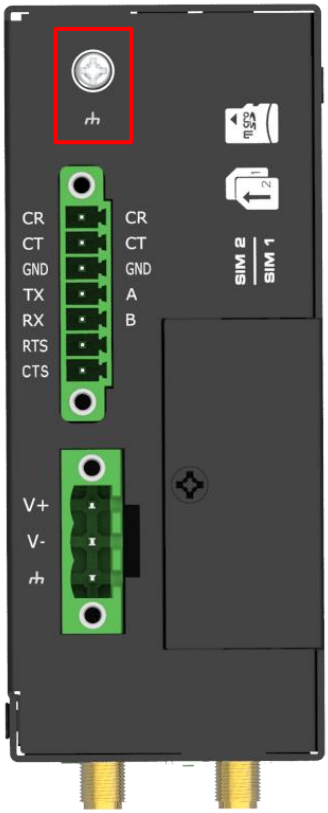




Use 3 pcs of M3*6 flat head Phillips screws to fix the DIN rail to the gateway, and then hang the DIN rail on the mounting bracket. It is necessary to choose a standard bracket.

Note: Recommended torque for mounting is 1.0 N.m, and the maximum allowed is 1.2 N.m.

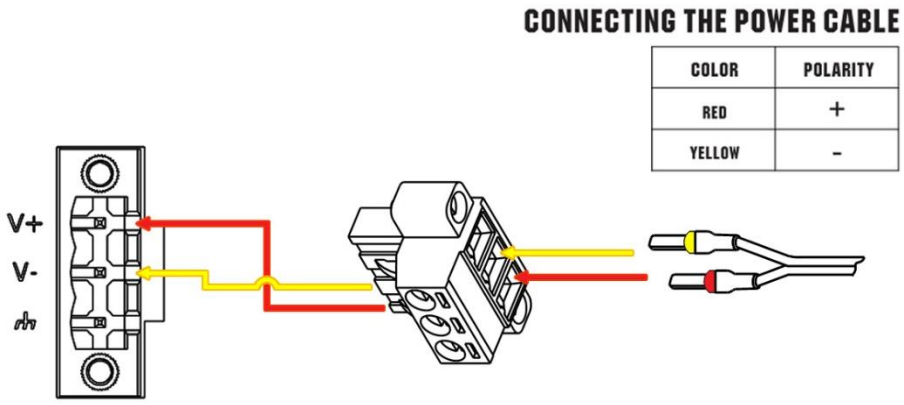
2.9 Ground the Gateway



Gateway grounding helps prevent the noise effect due to electromagnetic interference (EMI). Connect the gateway 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.

2.10 Power Supply



R3000 LG supports reverse polarity protection, but always refers to the figure above 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 60V DC.

Chapter 3 Initial Configuration

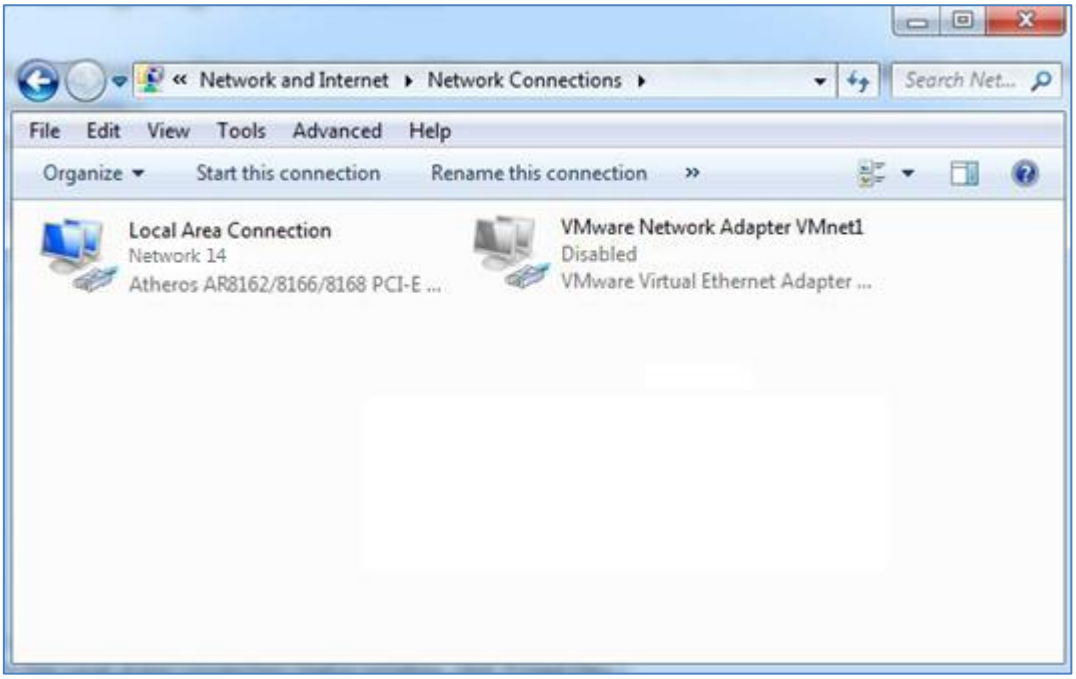
The gateway can be configured through your web browser that including IE 8.0 or above, Chrome and Firefox, etc. A web browser is included as a standard application in the following operating systems: Linux, Mac OS, Windows 98/NT/2000/XP/Me/Vista/7/8, etc. It provides an easy and user-friendly interface for configuration. There are various ways to connect the gateway, 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 gateway. 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 gateway. If you encounter any problems accessing the gateway 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 gateway.

3.1 Configure the PC

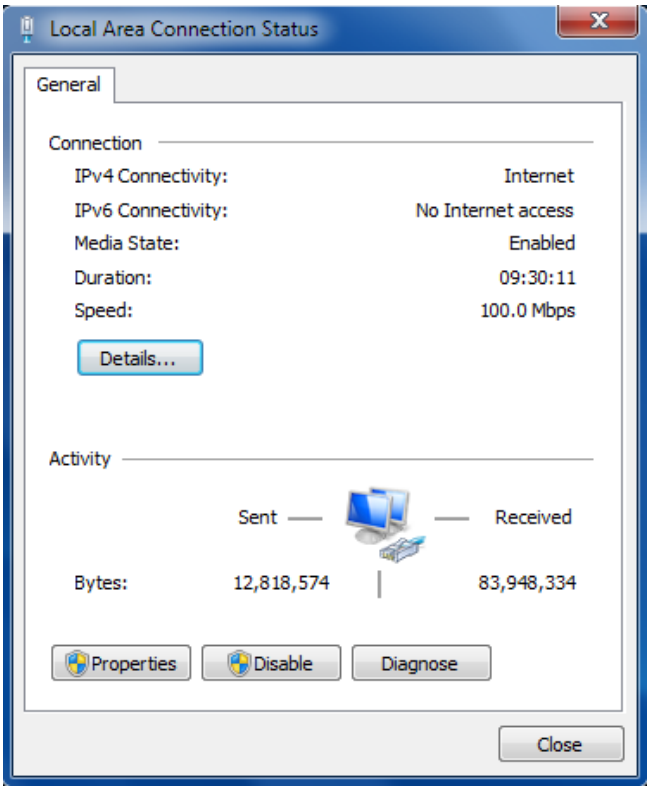
There are two methods to get IP address for the PC. One is to obtain an IP address automatically from "Local Area Connection", and another is to configure a static IP address manually within the same subnet of the gateway. Please refer to the steps below.

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

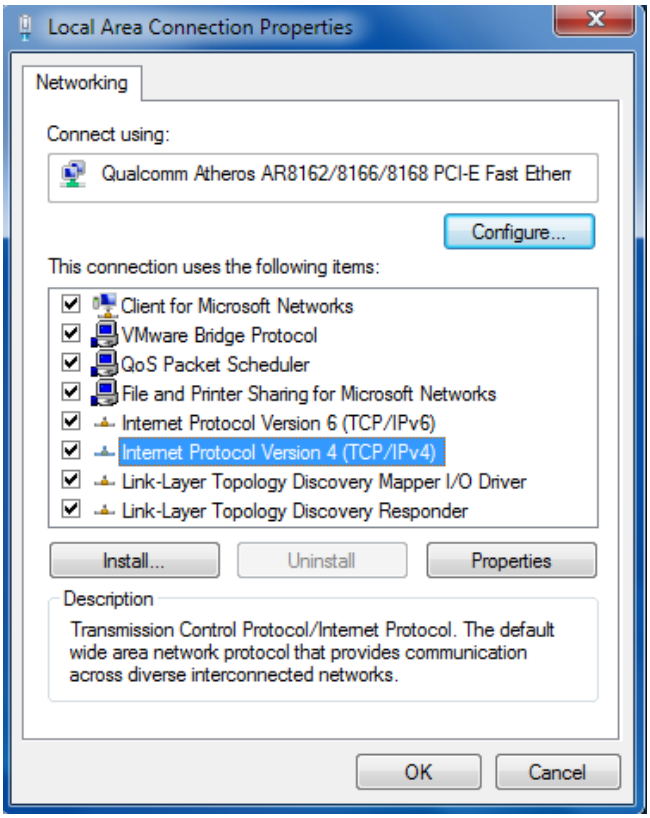
1. Click **Start > Control panel**, double-click **Network and Sharing Center**, and then double-click **Local Area Connection**.



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

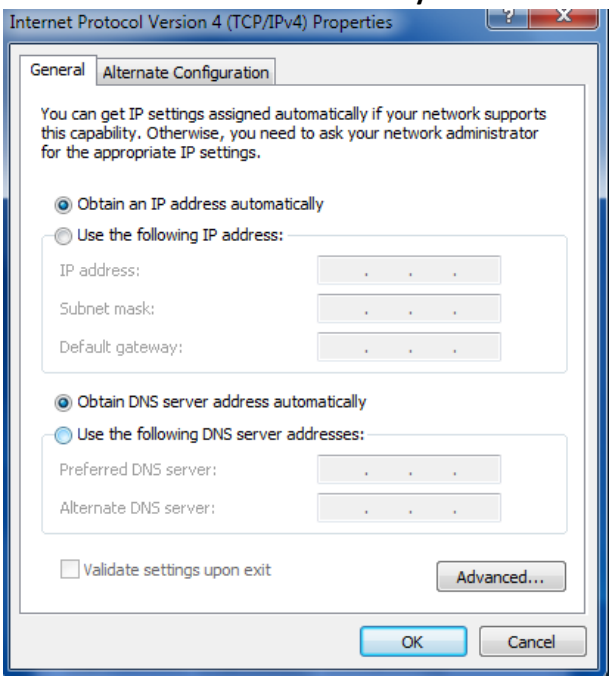


3. Choose **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**.



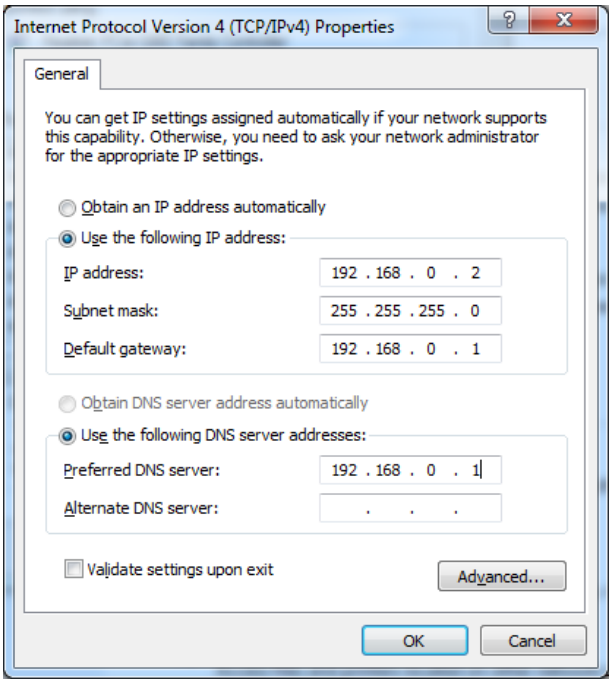
4. Two ways for configuring the IP address of PC.

Obtain an IP address automatically:



Use the following IP address:

(Configured a static IP address manually within the same subnet of the gateway)



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

3.2 Factory Default Settings

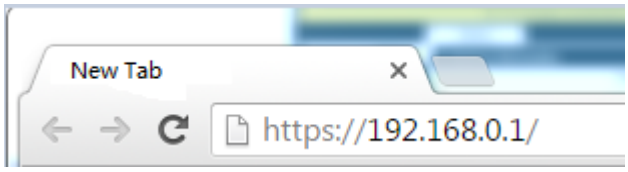
Before configuring your gateway, you need to know the following default settings.

Item	Description
Username	admin
Password	admin
ETH0	192.168.0.1/255.255.255.0, LAN mode
ETH1	192.168.0.1/255.255.255.0, LAN mode
DHCP Server	Enabled

3.3 Log in the Gateway

To log in to the management page and view the configuration status of your gateway, please follow the steps below.

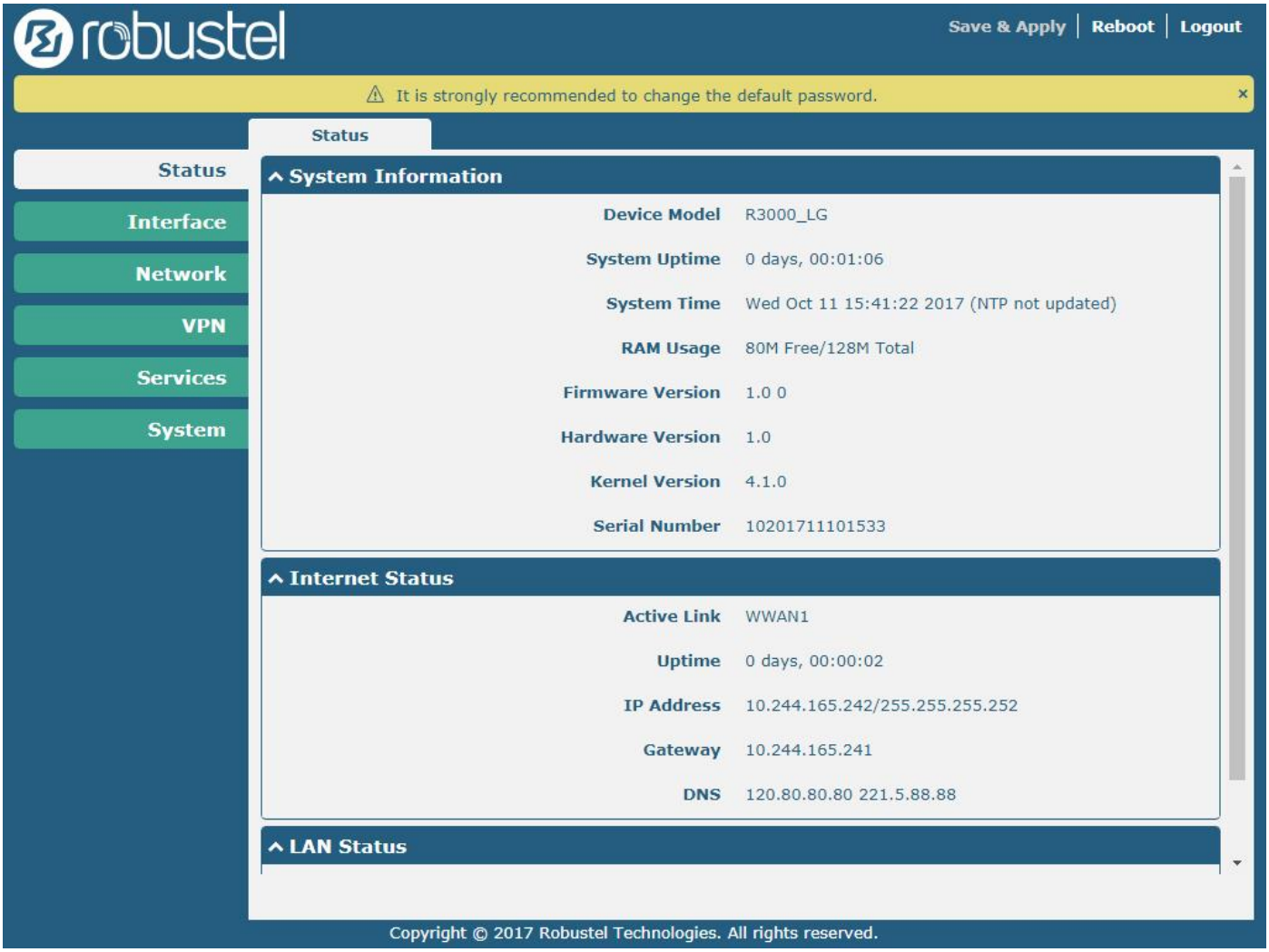
1. On your PC, open a web browser such as Internet Explorer, Google and Firebox, etc.
2. From your web browser, type the IP address of the gateway into the address bar and press enter. The default IP address of the gateway is 192.168.0.1, though the actual address may vary.
   Note: If a SIM card with a public IP address is inserted in the gateway, enter this corresponding public IP address in the browser's address bar to access the gateway wirelessly.



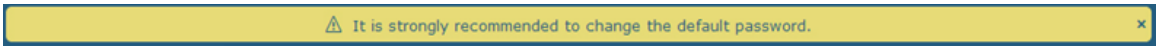
3. In the login page, enter the username and password, choose language and then click **LOGIN**. The default username and password are "admin".
   Note: If enter the wrong username or password over six times, the login web will be locked for 5 minutes.

3.4 Control Panel

After logging in, the home page of the R3000 LG's web interface is displayed, for example.



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



It is strongly recommended for security purposes that you change the default username and/or password. To change your username and/or password, see **3.35 System > User Management**.

Control Panel		
Item	**Description**	**Button**
Save & Apply	Click to save the current configuration into gateway's flash and apply the modification on every configuration page, to make the modification taking effect.	Save & Apply
Reboot	Click to reboot the gateway. If the Reboot button is yellow, it means that some completed configurations will take effect only after reboot.	Reboot
Logout	Click to log the current user out safely. After logging out, it will switch to login page. Shut down web page directly without logout, the next one can	Logout

	login web on this browser without a password before timeout.	
Submit	Click to save the modification on current configuration page.	Submit
Cancel	Click to cancel the modification on current configuration page.	Cancel

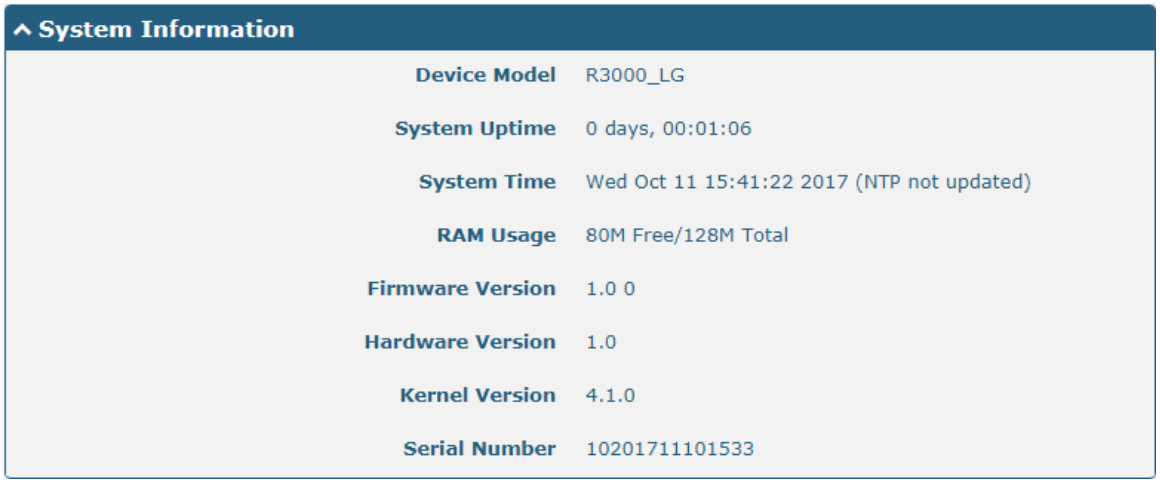
Note: The steps of how to modify configuration are as bellow:

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.

3.5 Status

This page allows you to view the System Information, Internet Status and LAN Status of your Gateway.

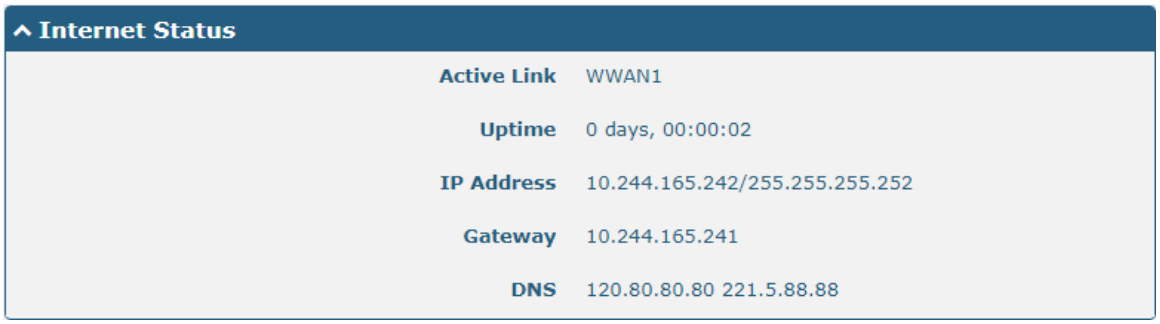
System Information



System Information	
Item	**Description**
Device Model	Show the model name of your device.
System Uptime	Show the current amount of time the gateway has been connected.
System Time	Show the current system time.
RAM Usage	Show the free memory and the total memory.

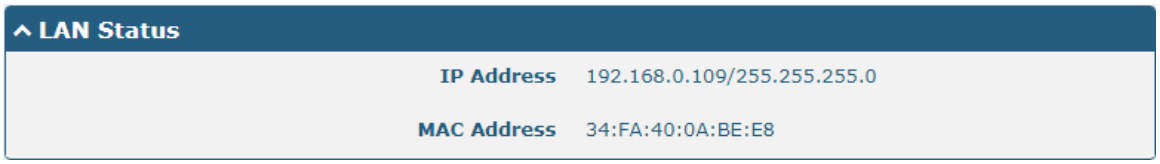
Firmware Version	Show the firmware version running on the gateway.
Hardware Version	Show the current hardware version.
Kernel Version	Show the current kernel version.
Serial Number	Show the serial number of your device.

Internet Status



Internet Status	
Item	**Description**
Active Link	Show the current active link.
Uptime	Show the current amount of time the link has been connected.
IP Address	Show the IP address of current link.
Gateway	Show the gateway address of the current link.
DNS	Show the current primary DNS server and secondary server.

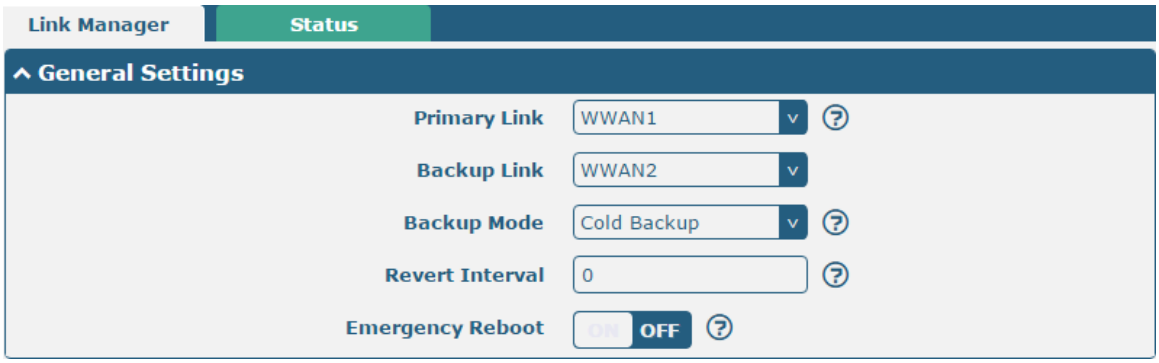
LAN Status



LAN Status	
Item	**Description**
IP Address	Show the IP address and the Netmask of the gateway.
MAC Address	Show the MAC address of the gateway.

3.6 Interface > Link Manager

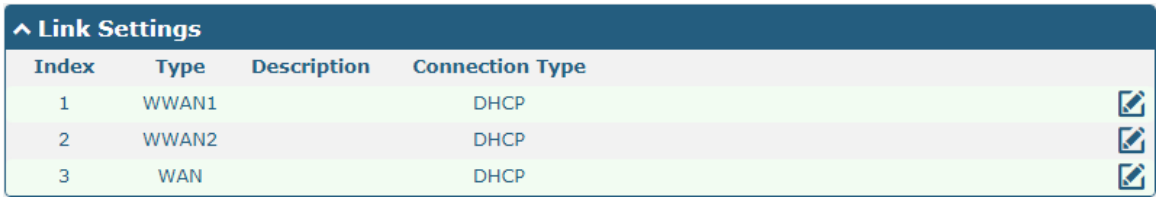
This section allows you to setup the link connection.



General Settings @ Link Manager		
Item	**Description**	**Default**
Primary Link	Select from "WWAN1", "WWAN2" or "WAN". • WWAN1: Select to make SIM1 as the primary wireless link • WWAN2: Select to make SIM2 as the primary wireless link • WAN: Select to make WAN as the primary wired link **Note:** WAN link is available only if enable eth0 as WAN port in **Interface > Ethernet > Ports > Port Settings**.	WWAN1
Backup Link	Select from "WWAN1", "WWAN2", "WAN" or "None". • WWAN1: Select to make SIM1 as backup wireless link • WWAN2: Select to make SIM2 as backup wireless link • WAN: Select to make WAN as the primary wired link **Note:** WAN link is available only if enable eth0 as WAN port in **Interface > Ethernet > Ports > Port Settings**. • None: Do not select any backup link	WWAN2
Backup Mode	Select from "Cold Backup", "Warm Backup" or "Load Balancing". • Cold Backup: The inactive link is offline on standby • Warm Backup: The inactive link is online on standby • Load Balancing: Use two links simultaneously **Note**: R3000 LG do not support warm backup and load balancing in the situation of two WWAN links.	Cold Backup
Revert Interval	Specify the number of minutes that elapses before the primary link is checked if a backup link is being used in cold backup mode. 0 means disable checking. **Note:** Revert interval is available only under the cold backup mode.	0
Emergency Reboot	Click the toggle button to enable/disable this option. Enable to reboot the whole system if no links available.	OFF

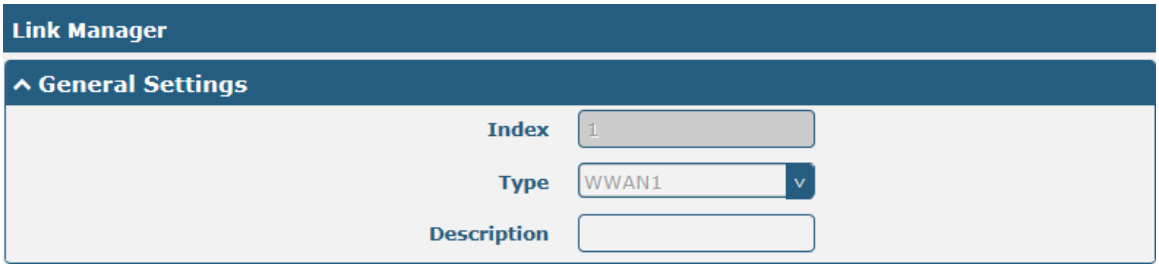
Note: Click ? for help.

Link Settings allows you to configure the parameters of link connection, including WWAN1/WWAN2 and WAN. It is recommended to enable Ping detection to keep the gateway always online. The Ping detection increases the reliability and also costs the data traffic.

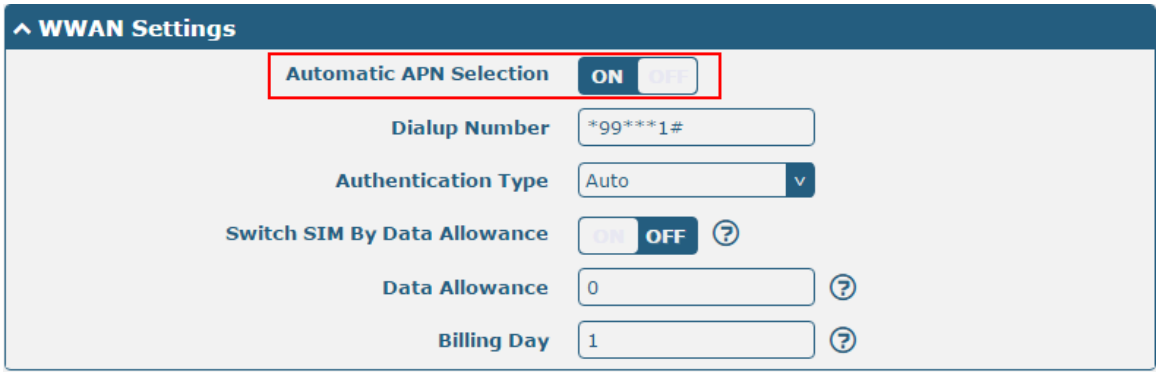


Click on the right-most of WWAN1/WWAN2 to enter the configuration window.

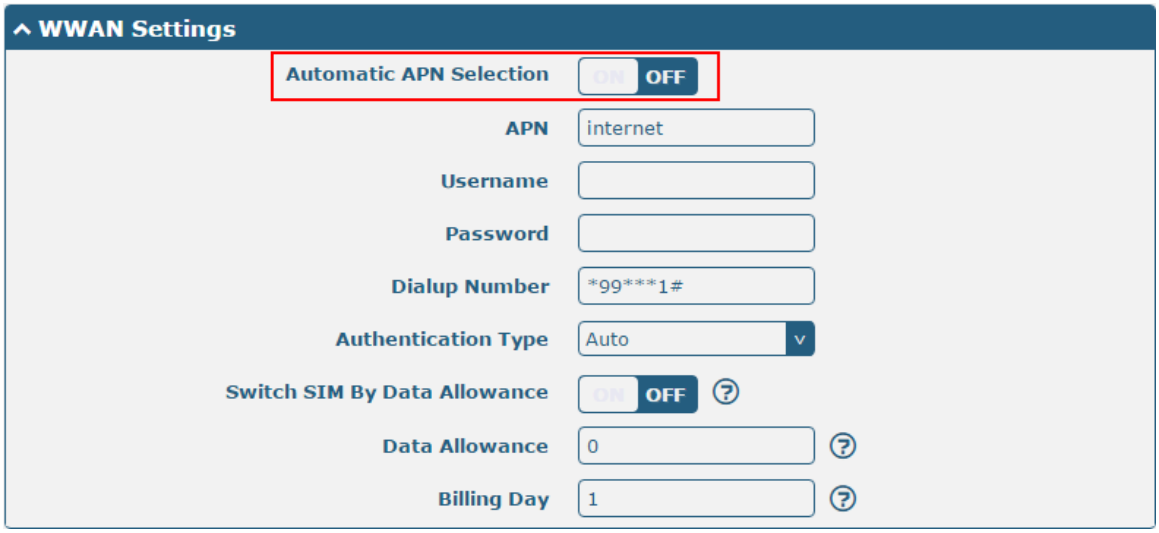
WWAN1/WWAN2

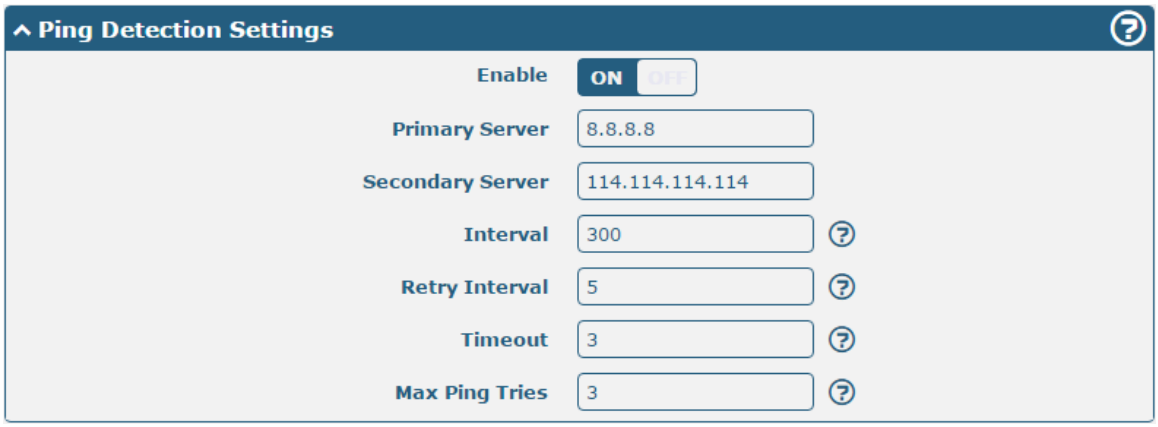


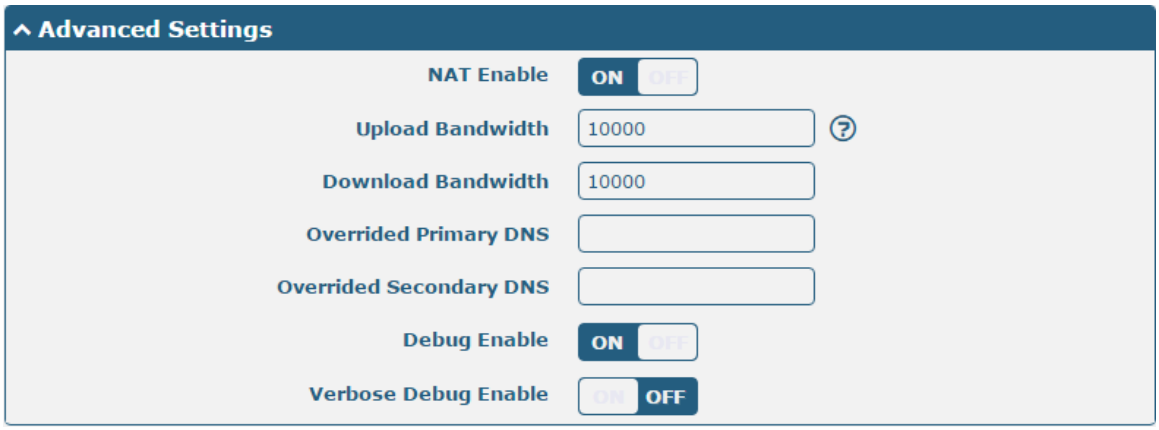
The window is displayed as below when enabling the "Automatic APN Selection" option.



The window is displayed as below when disabling the "Automatic APN Selection" option.





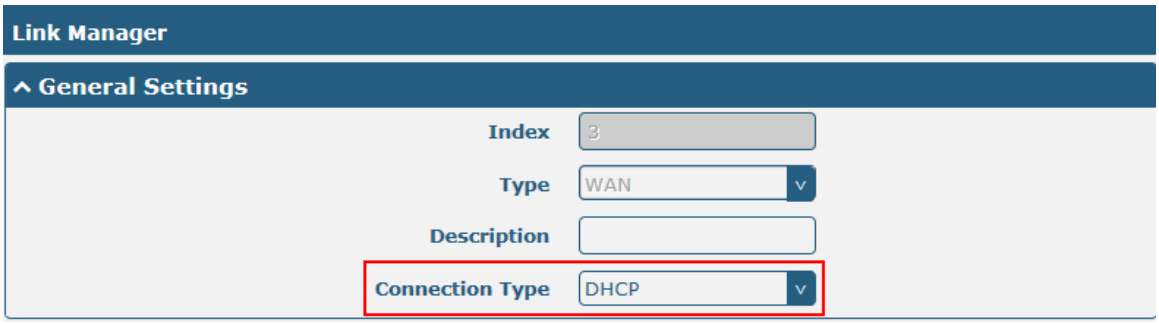


Link Settings (WWAN)		
Item	**Description**	**Default**
General Settings		
Index	Indicate the ordinal of the list.	--
Type	Show the type of the link.	WWAN1
Description	Enter a description for this link.	Null
WWAN Settings		
Automatic APN Selection	Click the toggle button to enable/disable the "Automatic APN Selection" option. After enabling, the device will recognize the access point name automatically. Alternatively, you can disable this option and manually add the access point name.	ON
APN	Enter the Access Point Name for cellular dial-up connection, provided by local ISP.	internet
Username	Enter the username for cellular dial-up connection, provided by local ISP.	Null
Password	Enter the password for cellular dial-up connection, provided by local ISP.	Null
Dialup Number	Enter the dialup number for cellular dial-up connection, provided by local ISP.	*99***1#
Authentication Type	Select from "Auto", "PAP" or "CHAP" as the local ISP required.	Auto
Switch SIM By Data Allowance	Click the toggle button to enable/disable this option. After enabling, it will switch to another SIM when the data limit reached. **Note**: Only used for dual-SIM backup.	OFF

Link Settings (WWAN)		
Item	**Description**	**Default**
Data Allowance	Set the monthly data traffic limitation. The system will record the data traffic statistics when data traffic limitation (MiB) is specified. The traffic record will be displayed in **Interface > Link Manager > Status > WWAN Data Usage Statistics**. 0 means disable data traffic record.	0
Billing Day	Specify the monthly billing day. The data traffic statistics will be recalculated from that day.	1
Ping Detection Settings		
Enable	Click the toggle button to enable/disable the ping detection mechanism, a keepalive policy of the gateway.	ON
Primary Server	Gateway will ping this primary address/domain name to check that if the current connectivity is active.	8.8.8.8
Secondary Server	Gateway will ping this secondary address/domain name to check that if the current connectivity is active.	114.114.114.114
Interval	Set the ping interval.	300
Retry Interval	Set the ping retry interval. When ping failed, the gateway will ping again every retry interval.	5
Timeout	Set the ping timeout.	3
Max Ping Tries	Set the max ping tries. Switch to another link or take emergency action if the max continuous ping tries reached.	3
Advanced Settings		
NAT Enable	Click the toggle button to enable/disable the Network Address Translation option.	ON
Upload Bandwidth	Set the upload bandwidth used for QoS, measured in kbps.	10000
Download Bandwidth	Set the download bandwidth used for QoS, measured in kbps.	10000
Overrided Primary DNS	Override primary DNS will override the automatically obtained DNS.	Null
Overrided Secondary DNS	Override secondary DNS will override the automatically obtained DNS.	Null
Debug Enable	Click the toggle button to enable/disable this option. Enable for debugging information output.	ON
Verbose Debug Enable	Click the toggle button to enable/disable this option. Enable for verbose debugging information output.	OFF

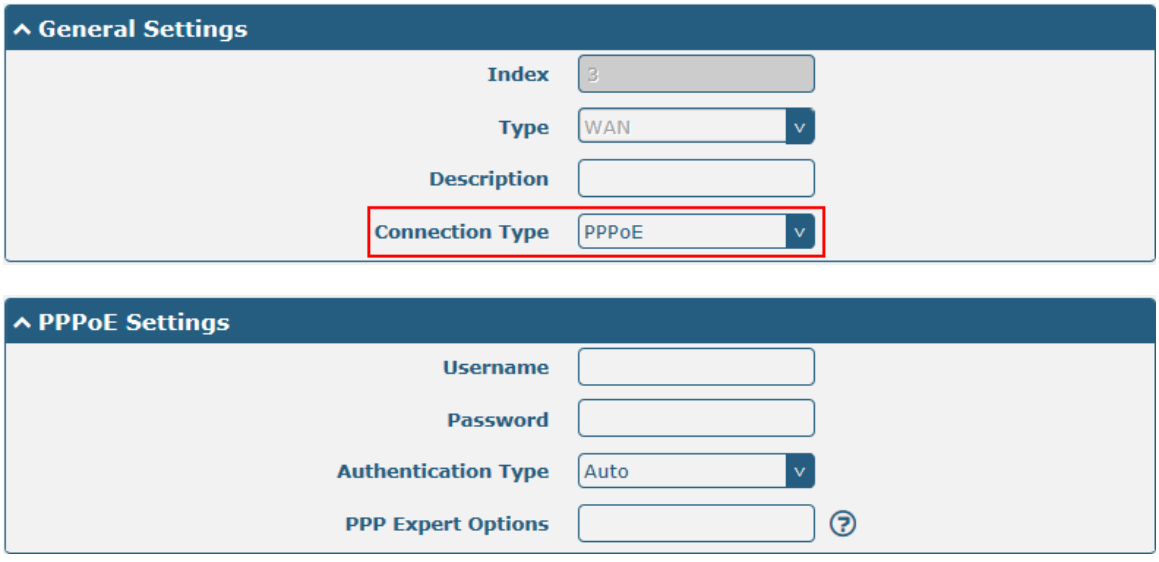
WAN

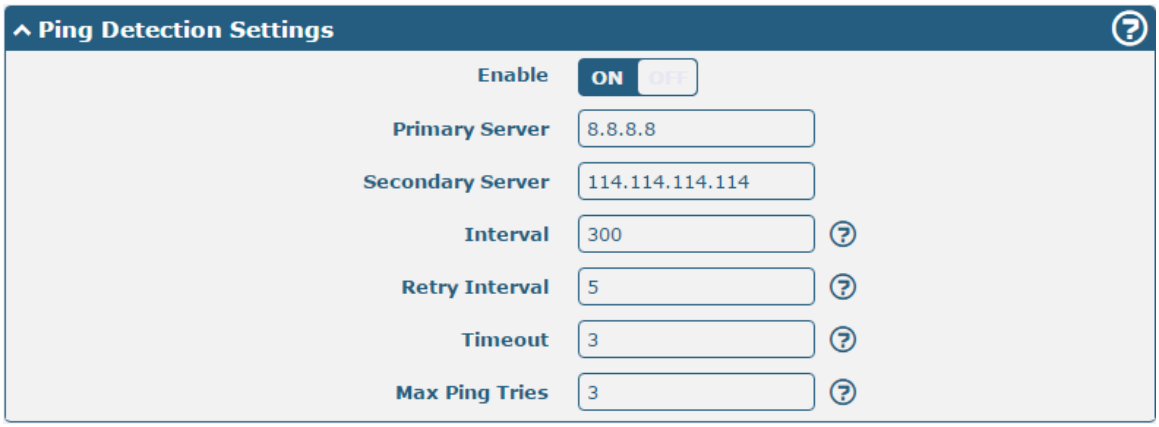
Gateway will obtain IP automatically from DHCP server if choosing “DHCP” as connection type. The window is displayed as below.

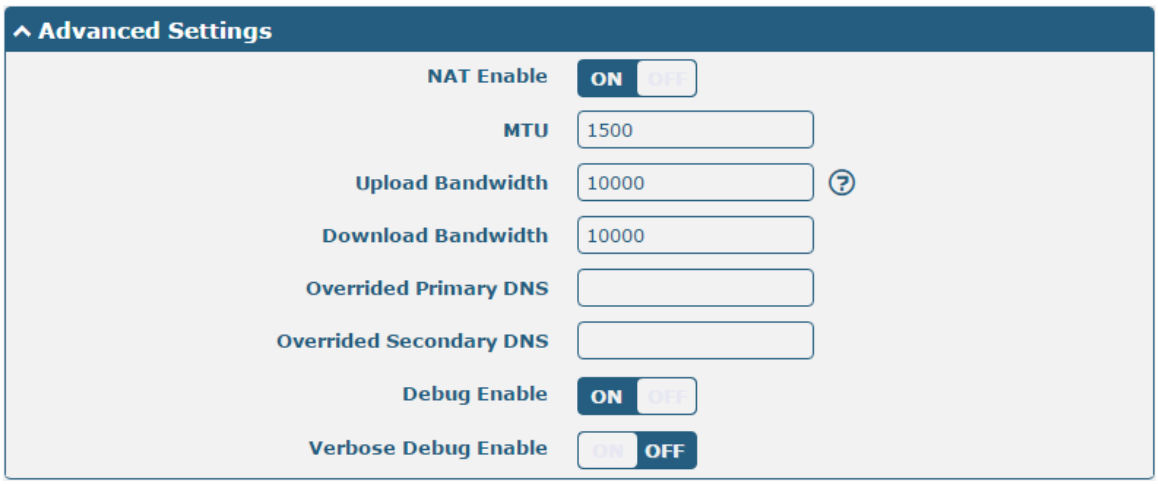


The window is displayed as below when choosing “Static” as the connection type.

The window is displayed as below when choosing “PPPoE” as the connection type.





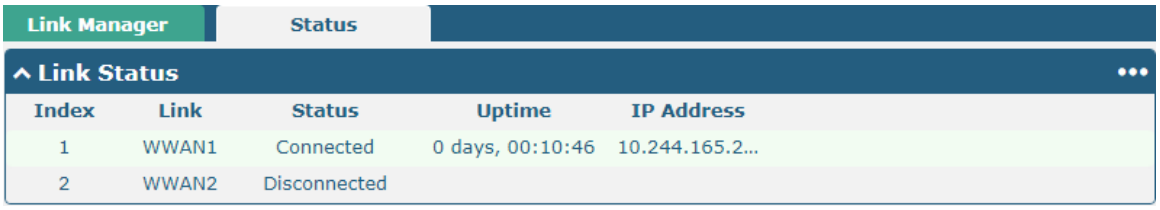


Link Settings (WAN)		
Item	**Description**	**Default**
General Settings		
Index	Indicate the ordinal of the list.	--
Type	Show the type of the link.	WAN
Description	Enter a description for this link.	Null
Connection Type	Select from “DHCP”, “Static” or “PPPoE”.	DHCP
Static Address Settings		
IP Address	Set the IP address with Netmask which can access the Internet. IP address with Netmask, e.g. 192.168.1.1/24	Null
Gateway	Set the gateway of the IP address in WAN port.	Null
Primary DNS	Set the primary DNS.	Null
Secondary DNS	Set the secondary DNS.	Null
PPPoE Settings		
Username	Enter the username provided by your Internet Service Provider.	Null
Password	Enter the password provided by your Internet Service Provider.	Null
Authentication Type	Select from “Auto”, “PAP” or “CHAP” as the local ISP required.	Auto
PPP Expert Options	Enter the PPP Expert options used for PPPoE dialup. You can enter some other PPP dial strings in this field. Each string can be separated by a semicolon.	Null
Ping Detection Settings		

Enable	Click the toggle button to enable/disable the ping detection mechanism, a keepalive policy of the gateway.	ON
Primary Server	Gateway will ping this primary address/domain name to check that if the current connectivity is active.	8.8.8.8
Secondary Server	Gateway will ping this secondary address/domain name to check that if the current connectivity is active.	114.114.114.114
Interval	Set the ping interval.	300
Retry Interval	Set the ping retry interval. When ping failed, the gateway will ping again every retry interval.	5
Timeout	Set the ping timeout.	3
Max Ping Tries	Set the max ping tries. Switch to another link or take emergency action if the max continuous ping tries reached.	3
Advanced Settings		
NAT Enable	Click the toggle button to enable/disable the Network Address Translation option.	ON
MTU	Enter the Maximum Transmission Unit.	1500
Upload Bandwidth	Enter the upload bandwidth used for QoS, measured in kbps.	10000
Download Bandwidth	Enter the download bandwidth used for QoS, measured in kbps.	10000
Overrided Primary DNS	Override primary DNS will override the automatically obtained DNS.	Null
Overrided Secondary DNS	Override secondary DNS will override the automatically obtained DNS.	Null
Debug Enable	Click the toggle button to enable/disable this option. Enable for debugging information output.	ON
Verbose Debug Enable	Click the toggle button to enable/disable this option. Enable for verbose debugging information output.	OFF

Status

This page allows you to view the status of link connection and clear the monthly data usage statistics.



Click the right-most button ••• to select the connection status of the current link.

Click the row of the link, and it will show the details information of the current link connection under the row.

Click the **Clear** button to clear SIM1 or SIM2 monthly data traffic usage statistics. Data statistics will be displayed only if enable the Data Allowance function in **Interface > Link Manager > Link Settings > WWAN Settings > Data Allowance**.

3.7 Interface > LAN

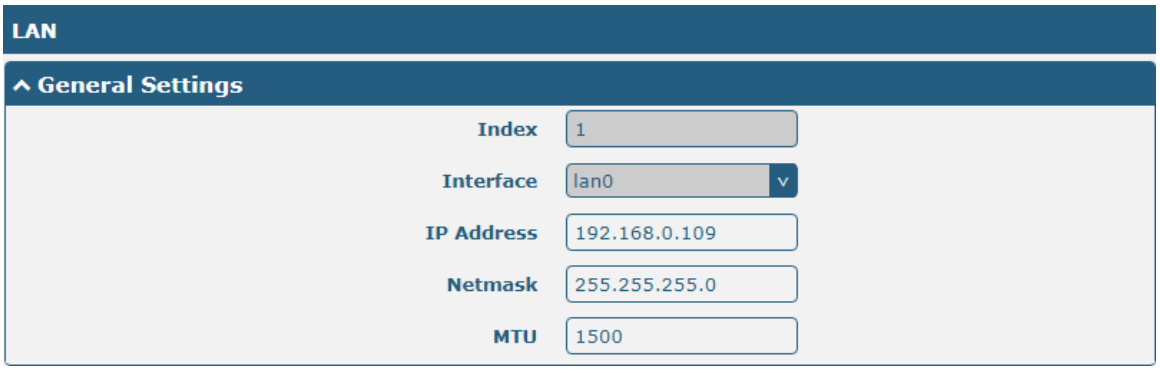
This section allows you to set the related parameters for LAN port. There are two LAN ports on R3000 LG, including ETH0 and ETH1. The ETH0 and ETH1 can freely choose from lan0 and lan1, but at least one LAN port must be assigned as lan0. The default settings of ETH0 and ETH1 are lan0 and their default IP are 192.168.0.1/255.255.255.0.

LAN

By default, there is a LAN port (lan0) in the list. To begin adding a new LAN port (lan1), please configure ETH0 or ETH1 as lan1 first in **Ethernet > Ports > Port Settings**. Otherwise, the operation will be prompted as "List is full".

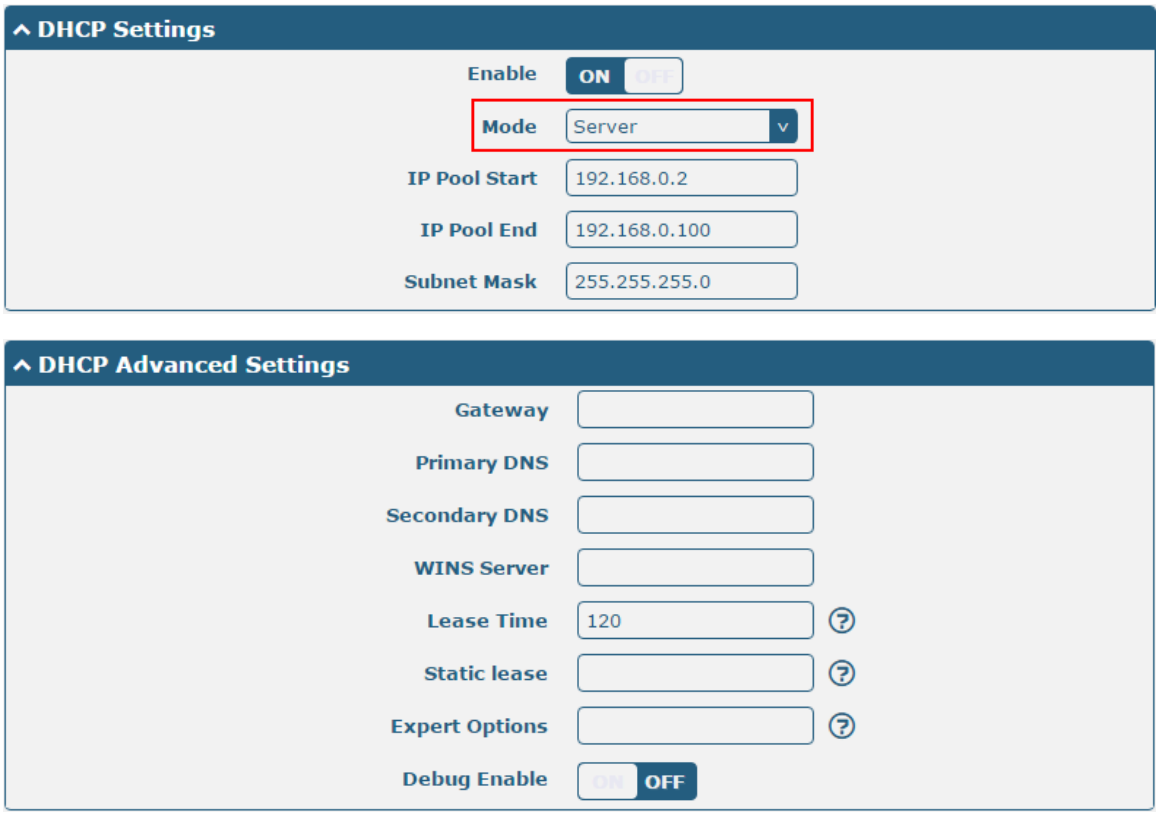
Note: Lan0 cannot be deleted.

You may click + to add a new LAN port, or click ✕ to delete the current LAN port. Now, click to edit the configuration of the LAN port.

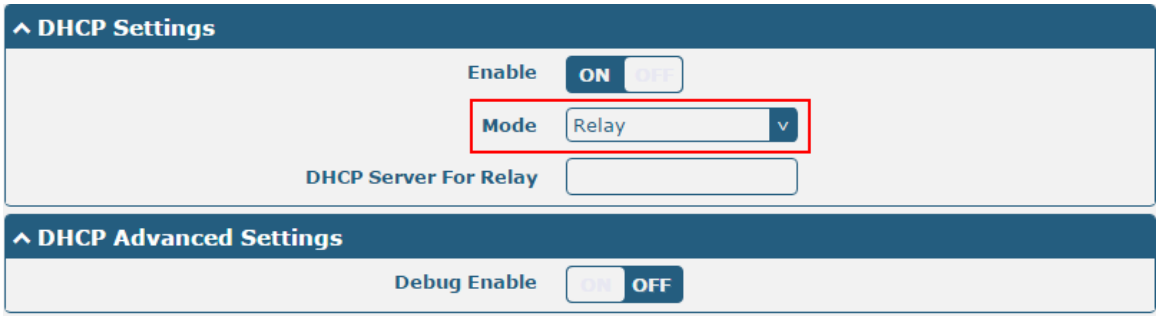


General Settings @ LAN		
Item	**Description**	**Default**
Index	Indicate the ordinal of the list.	--
Interface	Show the editing port. Lan1 is available only if it was selected by one of ETH0~ETH1 in **Ethernet > Ports > Port Settings**, and so on.	--
IP Address	Set the IP address of the LAN port.	192.168.0.1
Netmask	Set the Netmask of the LAN port.	255.255.255.0
MTU	Enter the Maximum Transmission Unit.	1500

The window is displayed as below when choosing “Server” as the mode.



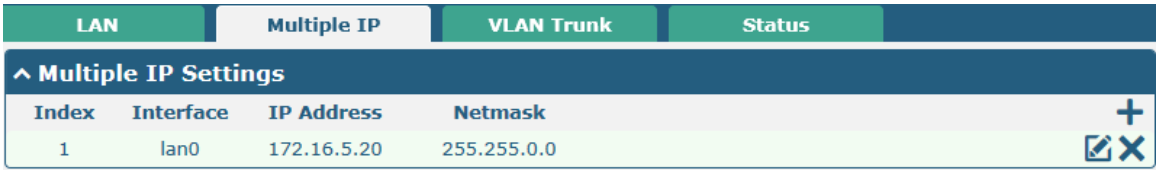
The window is displayed as below when choosing “Relay” as the mode.



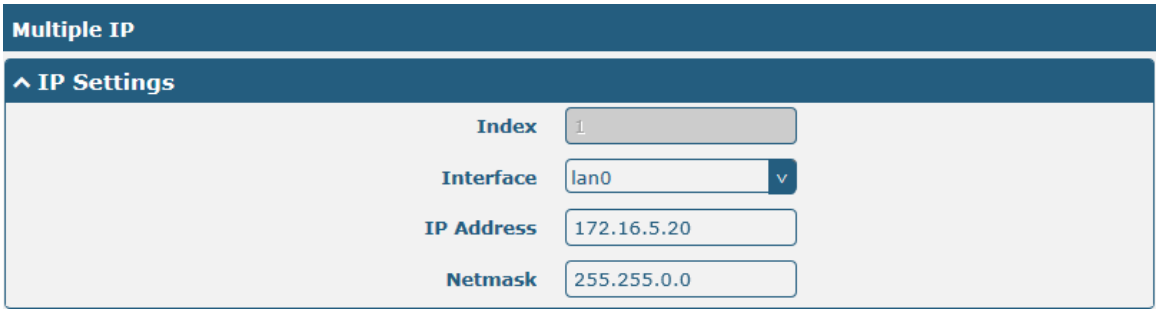
LAN		
Item	**Description**	**Default**
DHCP Settings		
Enable	Click the toggle button to enable/disable the DHCP function.	ON
Mode	Select from “Server” or “Relay”. • Server: Lease IP address to DHCP clients which have been connected to LAN port • Relay: Gateway can be a DHCP Relay, which will provide a relay tunnel to solve the problem that DHCP Client and DHCP Server are not in a same subnet	Server
IP Pool Start	Define the beginning of the pool of IP addresses which will be leased to DHCP clients.	192.168.0.2

LAN		
Item	**Description**	**Default**
IP Pool End	Define the end of the pool of IP addresses which will be leased to DHCP clients.	192.168.0.100
Subnet Mask	Define the subnet mask of IP address obtained by DHCP clients from DHCP server.	255.255.255.0
DHCP Server for Relay	Enter the IP address of DHCP relay server.	Null
DHCP Advanced Settings		
Gateway	Define the gateway assigned by the DHCP server to the clients, which must be on the same network segment with DHCP address pool.	Null
Primary DNS	Define the primary DNS server assigned by the DHCP server to the clients.	Null
Secondary DNS	Define the secondary DNS server assigned by the DHCP server to the clients.	Null
WINS Server	Define the Windows Internet Naming Service obtained by DHCP clients from DHCP sever.	Null
Lease Time	Set the lease time which the client can use the IP address obtained from DHCP server, measured in seconds.	120
Static lease	Bind a lease to correspond an IP address via a MAC address. format: mac,ip;mac,ip;..., e.g. FF:ED:CB:A0:98:01,192.168.0.200	Null
Expert Options	Enter some other options of DHCP server in this field. format: config-desc;config-desc, e.g. log-dhcp;quiet-dhcp	Null
Debug Enable	Click the toggle button to enable/disable this option. Enable for DHCP information output.	OFF

Multiple IP



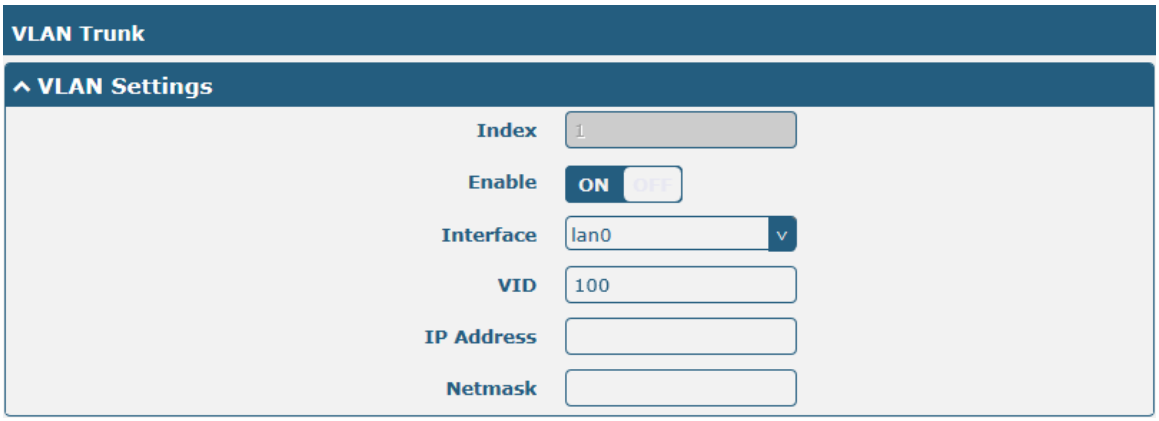
You may click ➕ to add a multiple IP to the LAN port, or click ✖ to delete the multiple IP of the LAN port. Now, click ✎ to edit the multiple IP of the LAN port.



IP Settings		
Item	**Description**	**Default**
Index	Indicate the ordinal of the list.	--
Interface	Show the editing port.	--
IP Address	Set the multiple IP address of the LAN port.	Null
Netmask	Set the multiple Netmask of the LAN port.	Null

VLAN Trunk

Click + to add a VLAN. The maximum count is 8.

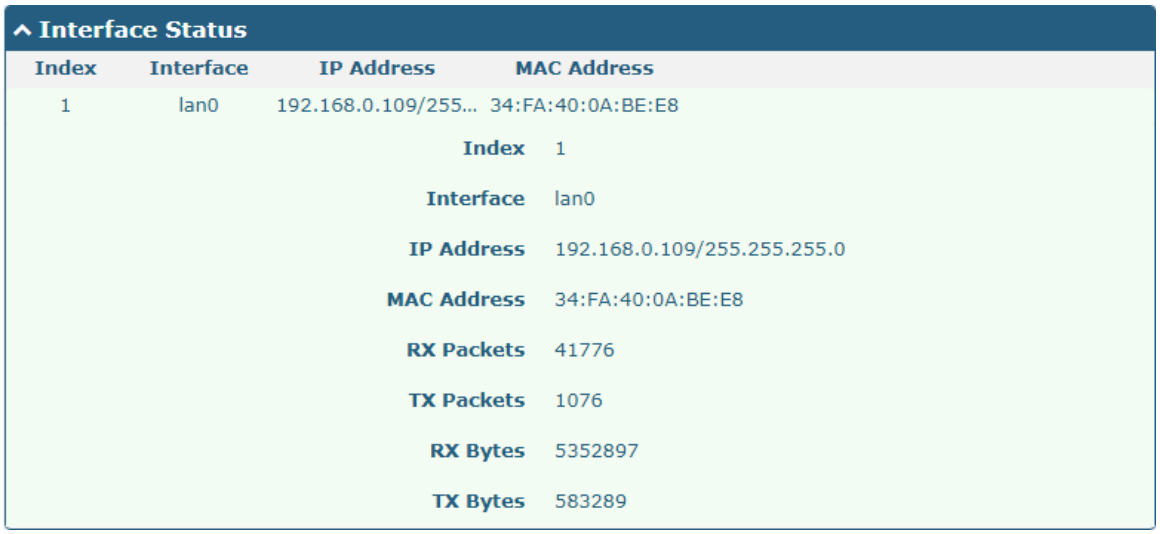


VLAN Settings		
Item	**Description**	**Default**
Index	Indicate the ordinal of the list.	--
Enable	Click the toggle button to enable/disable this VLAN. Enable to make gateway can encapsulate and de-encapsulate the VLAN tag.	ON
Interface	Choose the interface which wants to enable VLAN trunk function. Select from "lan0" or "lan1" depends on your ETH0 and ETH1's corresponding LAN ports.	lan0
VID	Set the tag ID of VLAN and digits from 1 to 4094.	100
IP Address	Set the IP address of VLAN port.	Null
Netmask	Set the Netmask of VLAN port.	Null

Status

This section allows you to view the status of LAN connection.

Click the row of status, the details status information will be displayed under the row. Please refer to the screenshot below.



3.8 Interface > Ethernet

This section allows you to set the related parameters for Ethernet. There are two Ethernet ports on R3000 LG, including ETH0 and ETH1. The ETH0 on the gateway can be configured as either a WAN or a LAN port, while ETH1 can only be configured as a LAN port. By default, ETH0 and ETH1 are lan0, and their IP are 192.168.0.1/255.255.255.0. Since lan0 must be assigned to one port and WAN port must be assigned to the ETH0, there are four configurations. You can choose the appropriate configuration to fit your current needs. The specific port configurations are shown below.

Port Settings

Index	Port	Port Assignment
1	eth0	lan0
2	eth1	lan0

Port Settings

Index	Port	Port Assignment
1	eth0	lan0
2	eth1	lan1

Port Settings

Index	Port	Port Assignment
1	eth0	lan1
2	eth1	lan0

Port Settings

Index	Port	Port Assignment
1	eth0	wan
2	eth1	lan0

This section introduces you to set the parameters of the WAN port.

Ports | Status

Port Settings

Index	Port	Port Assignment
1	eth0	wan
2	eth1	lan0

Click button of eth0 to configure its parameters. The port assignment can be changed by selecting from the drop down list.

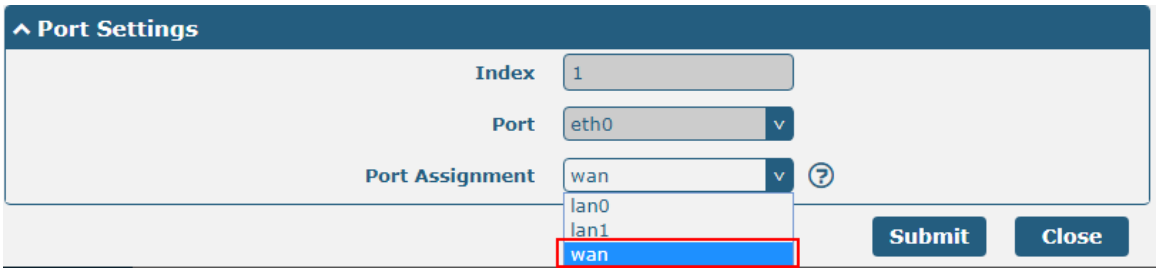
Ports

Port Settings

Index: 1

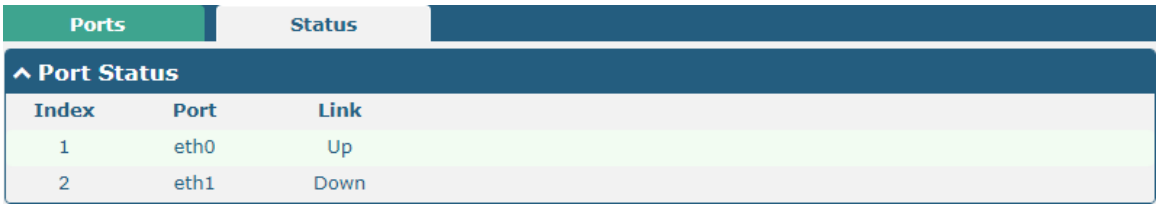
Port: eth0

Port Assignment: lan0

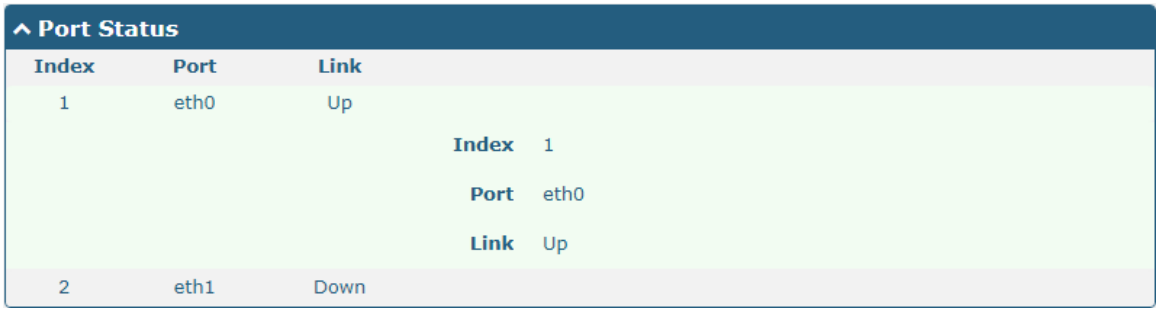


Port Settings		
Item	**Description**	**Default**
Index	Indicate the ordinal of the list.	--
Port	Show the editing port, read only.	--
Port Assignment	Choose the Ethernet port's type, as a WAN port or a LAN port. When setting the port as a LAN port, you can click the drop-down list to select from "lan0" or "lan1".	lan0

This column allows you to view the status of Ethernet port.

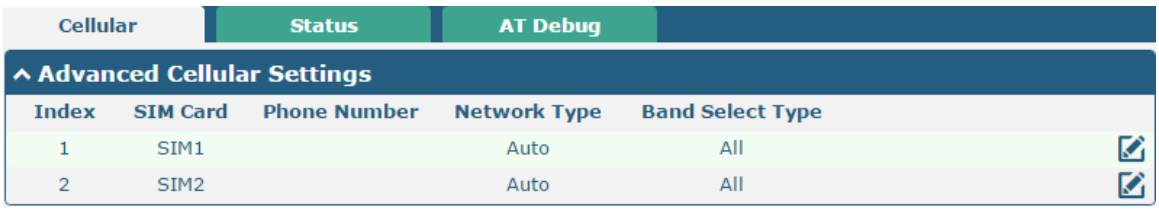


Click the row of status, the details status information will be displayed under the row. Please refer to the screenshot below.

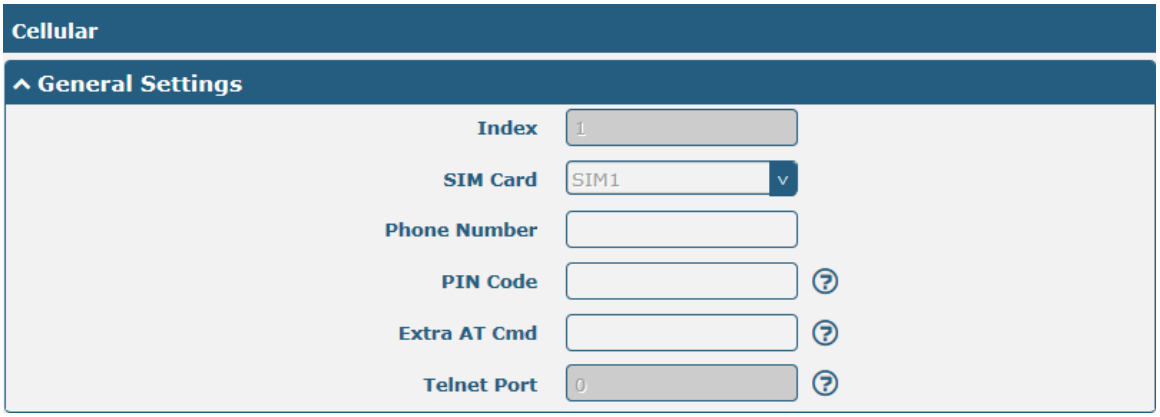


3.9 Interface > Cellular

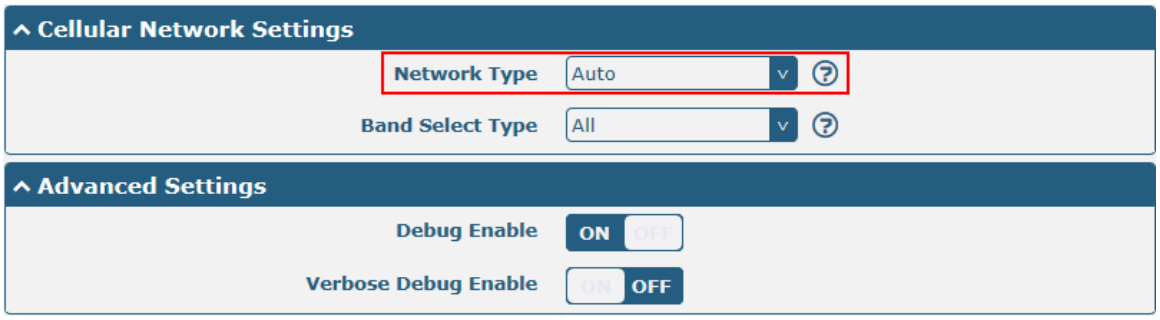
This section allows you to set the related parameters of Cellular. The R3000 LG has two SIM card slots, but do not support two SIM cards online simultaneously due to its single-module design. If insert single SIM card at the first time, SIM1 slot and SIM2 slots are available.



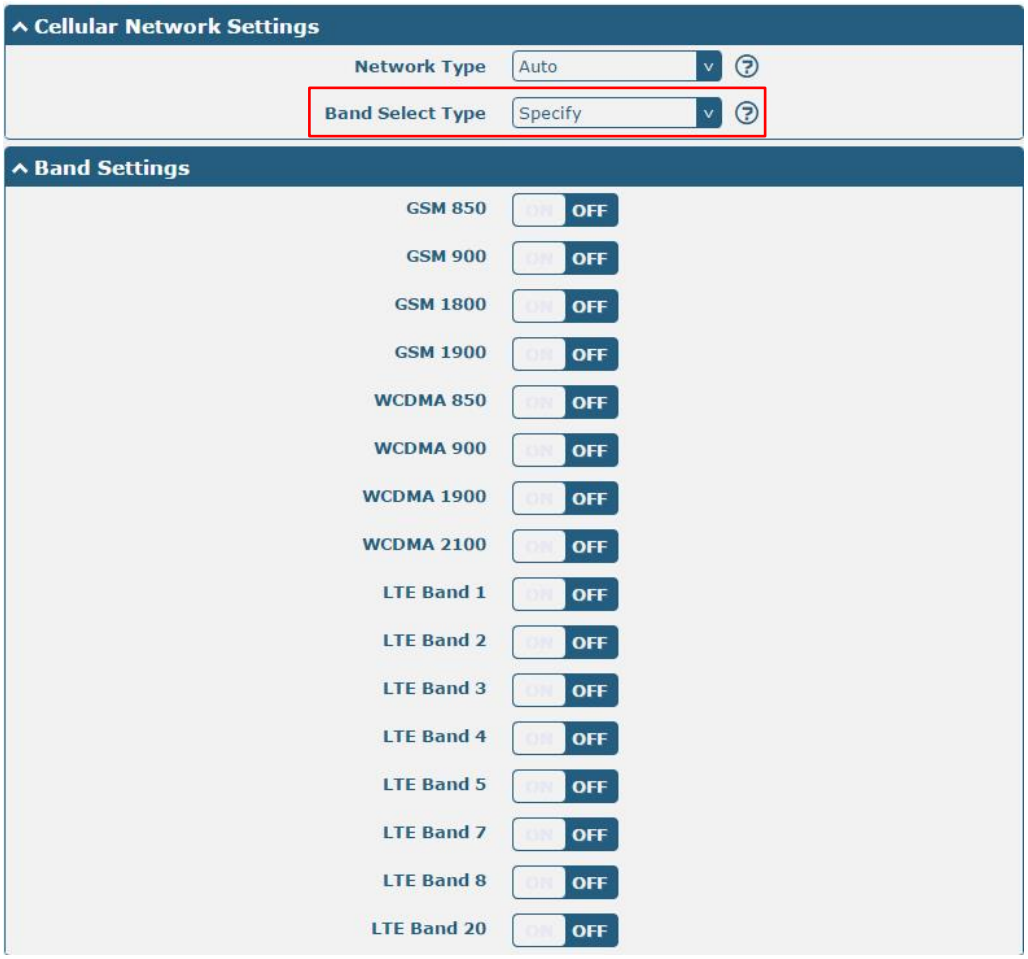
Click of SIM 1 to edit the parameters.

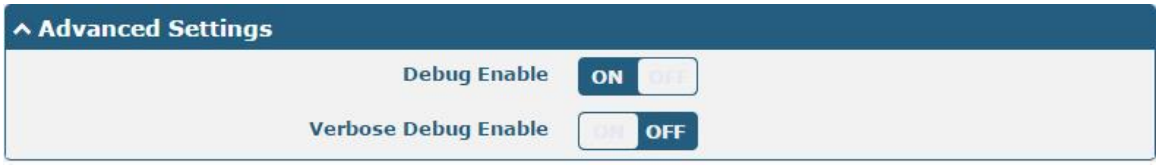


The window is displayed as below when choosing "Auto" as the network type.



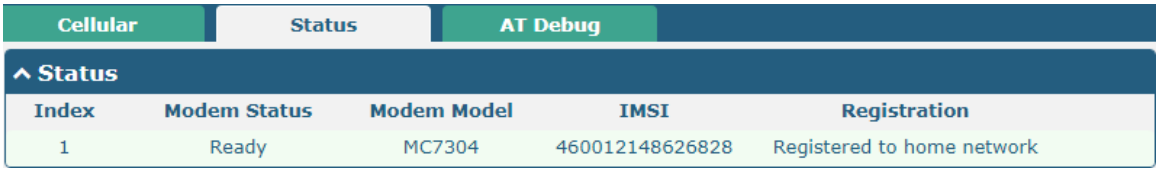
The window is displayed as below when choosing "Specify" as the band select type.





Cellular		
Item	**Description**	**Default**
General Settings		
Index	Indicate the ordinal of the list.	--
SIM Card	Show the currently editing SIM card.	SIM1
Phone Number	Enter the phone number of the SIM card.	Null
PIN Code	Enter a 4-8 characters PIN code used for unlocking the SIM.	Null
Extra AT Cmd	Enter the AT commands used for cellular initialization.	Null
Telnet Port	Specify the Port listening of telnet service, used for AT over Telnet.	0
Cellular Network Settings		
Network Type	Select from "Auto", "2G Only", "2G First", "3G Only", "3G First", "4G Only", "4G First". • Auto: Connect to the best signal network automatically • 2G Only: Only the 2G network is connected • 2G First: Connect to the 2G Network preferentially • 3G Only: Only the 3G network is connected • 3G First: Connect to the 3G Network preferentially • 4G Only: Only the 4G network is connected • 4G First: Connect to the 4G Network preferentially	Auto
Band Select Type	Select from "All" or "Specify". You may choose certain bands if choosing "Specify".	All
Advanced Settings		
Debug Enable	Click the toggle button to enable/disable this option. Enable for debugging information output.	ON
Verbose Debug Enable	Click the toggle button to enable/disable this option. Enable for verbose debugging information output.	OFF

This section allows you to view the status of the cellular connection.

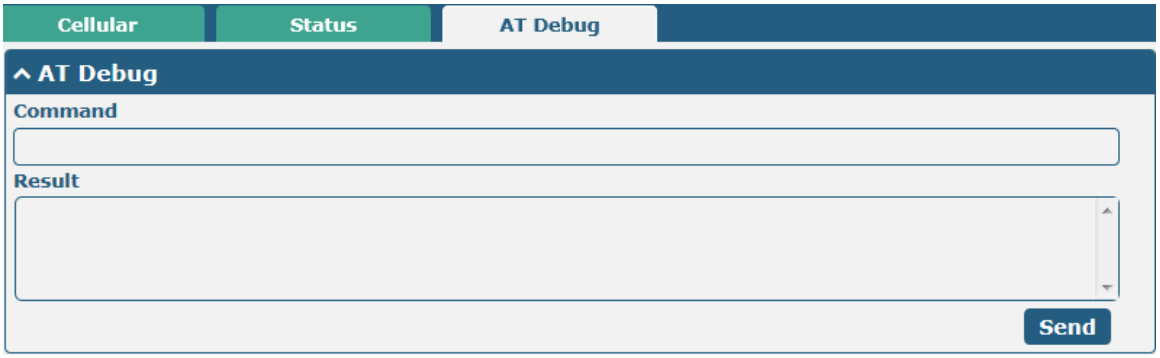


Click the row of status, the details status information will be displayed under the row.

Status	
Item	**Description**
Index	Indicate the ordinal of the list.
Modem Status	Show the status of the radio module.
Modem Model	Show the model of the radio module.
Current SIM	Show the SIM card that your gateway is using.
Phone Number	Show the phone number of the current SIM. **Note:** This option will be displayed if enter manually in **Cellular > Advanced Cellular Settings > SIM1/SIM2 > General Settings > Phone Number**.
IMSI	Show the IMSI number of the current SIM.
ICCID	Show the ICCID number of the current SIM.
Registration	Show the current network status.
Network Provider	Show the name of Network Provider.
Network Type	Show the current network service type, e.g. GPRS.
Signal Strength	Show the signal strength detected by the mobile.
Bit Error Rate	Show the current bit error rate.
PLMN ID	Show the current PLMN ID.
Local Area Code	Show the current local area code used for identifying different area.

Status	
Item	**Description**
Cell ID	Show the current cell ID used for locating the gateway.
IMEI	Show the IMEI (International Mobile Equipment Identity) number of the radio module.
Firmware Version	Show the current firmware version of the radio module.

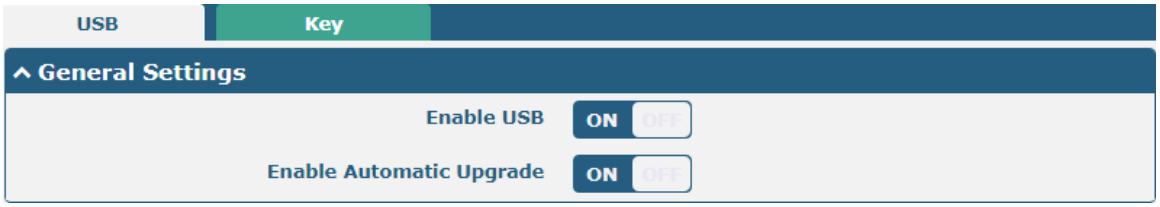
This page allows you to check the AT Debug.



AT Debug		
Item	**Description**	**Default**
Command	Enter the AT command that you want to send to cellular module in this text box.	Null
Result	Show the AT command responded by cellular module in this text box.	Null
Send	Click the button to send AT command.	--

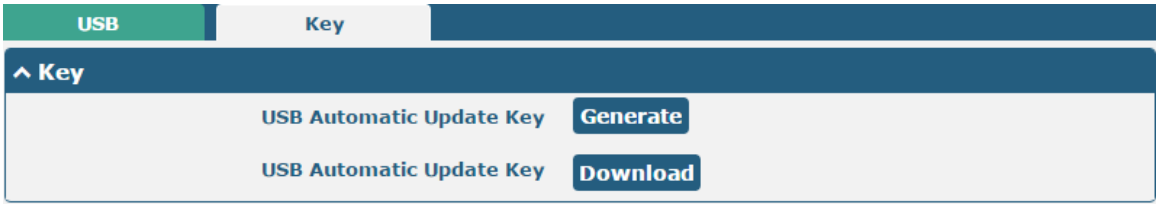
3.10 Interface > USB

This section allows you to set the USB parameters. The USB interface of the gateway can be used for firmware upgrade and configuration upgrade.



General Settings @ USB		
Item	**Description**	**Default**
Enable USB	Click the toggle button to enable/disable the USB option.	ON
Enable Automatic Upgrade	Click the toggle button to enable/disable this option. Enable to automatically update the firmware of the gateway when inserting a USB storage device with a gateway firmware.	ON

Gateway has the key for USB automatic update. User can generate the key in this page.

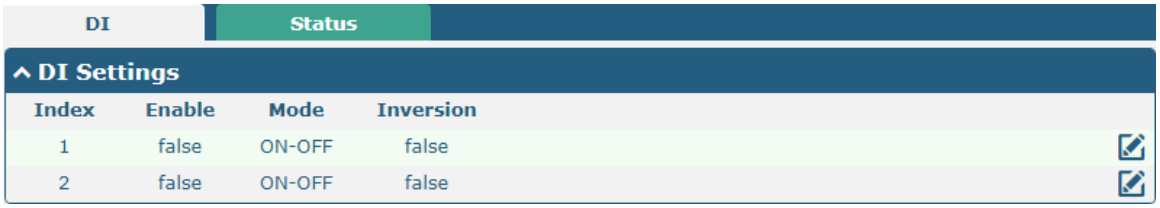


Key		
Item	**Description**	**Default**
USB Automatic Update Key	Click **Generate** to generate a key, and click **Download** to download the key.	--

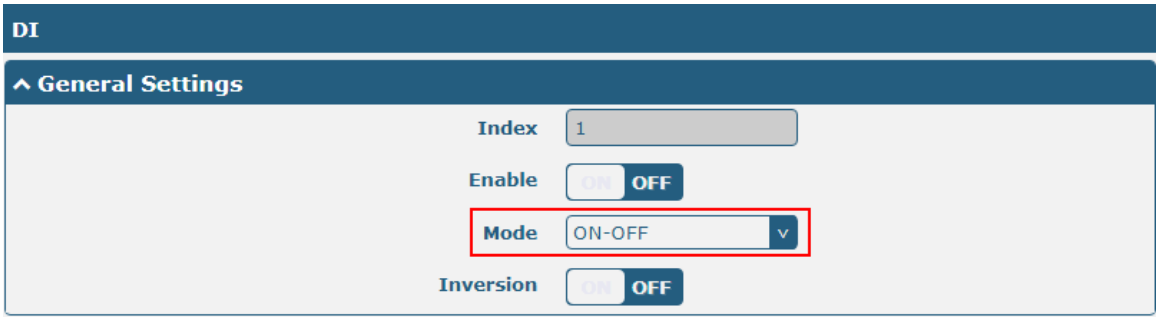
3.11 Interface > DI

This section allows you to set the DI parameters. Digital Input interface is a specific interface for R3000 LG, which can be used for triggering alarm.

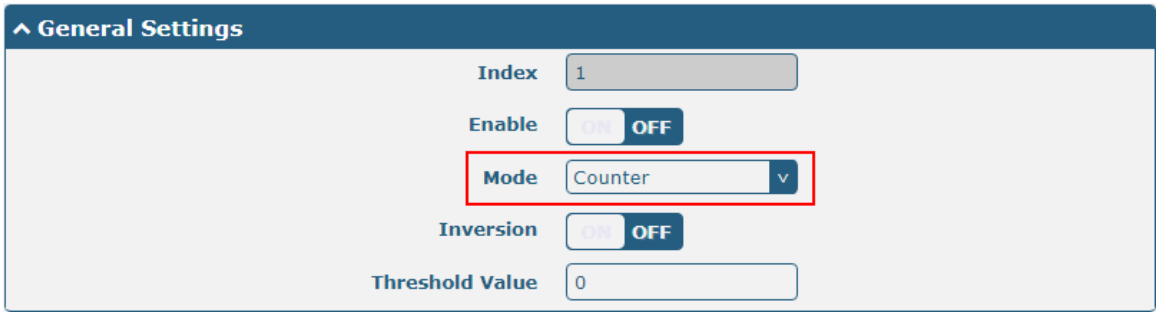
DI



Click the right-most button of index 1 as below. The default mode is “ON-OFF”.



The window is displayed as below when choosing “Counter” as the mode.

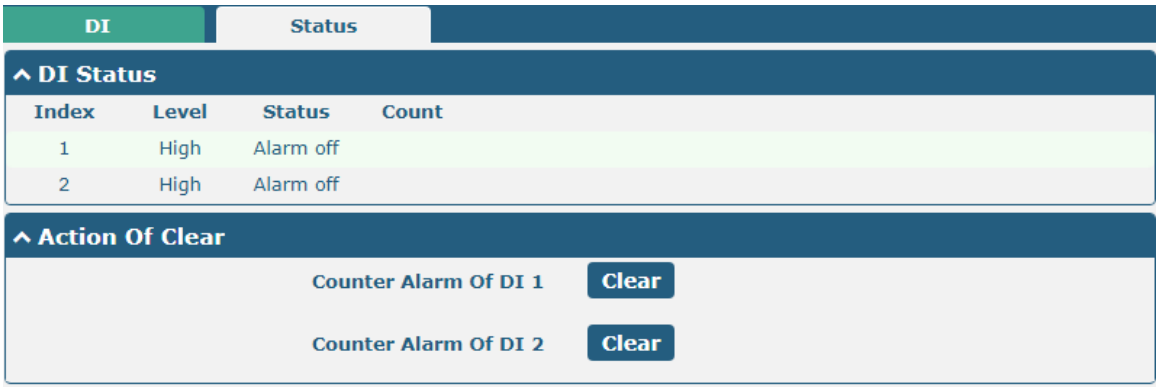


General Settings @ DI		
Item	**Description**	**Default**
Index	Indicate the ordinal of the list.	--
Enable	Click the toggle button to enable/disable this DI.	OFF
Mode	Select from "ON-OFF" or "Counter". • ON-OFF: DI interface support ON and OFF mode (high or low level electrical) trigger DI alarm. The mode default to ON, and OFF mode is available only when enabling the inversion feature ON—Under this mode, DI alarm status will be triggered to ON when DI interface open from GND or input a high level electrical (logic 1), on the contrary DI alarm status will be trigged to OFF when DI interface connect to GND or input a low level electrical (logic 0) OFF—Under this mode, DI alarm status will be triggered to ON when DI interface connect to GND or input a low level electrical (logic 0), on the contrary DI alarm status will be trigged to OFF when DI interface open from GND or input a high level electrical (logic 1) • Counter: Event counter mode	ON-OFF
Inversion	Click the toggle button to enable/disable this option. Enable to set DI mode as OFF mode.	OFF
Threshold Value	Set the threshold vale. It will trigger alarm when event counter reaches this figure. After triggering alarm, DI will keep counting but not trigger alarm again. Enter 0 to 65535 digits. (0=will not trigger alarm) **Note**: This option is only available when DI under the "Counter" mode.	Null

Note: It defaults as high alarm, while turns to low alarm after enabling the "Inversion" button.

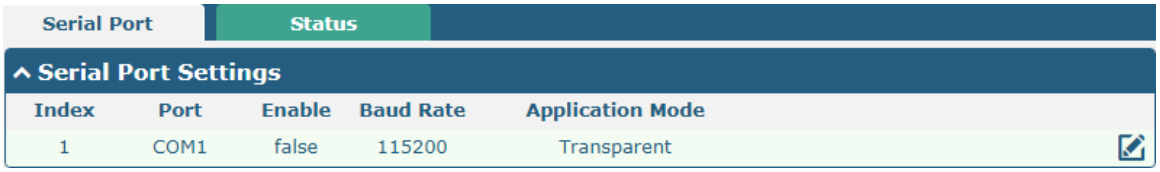
Status

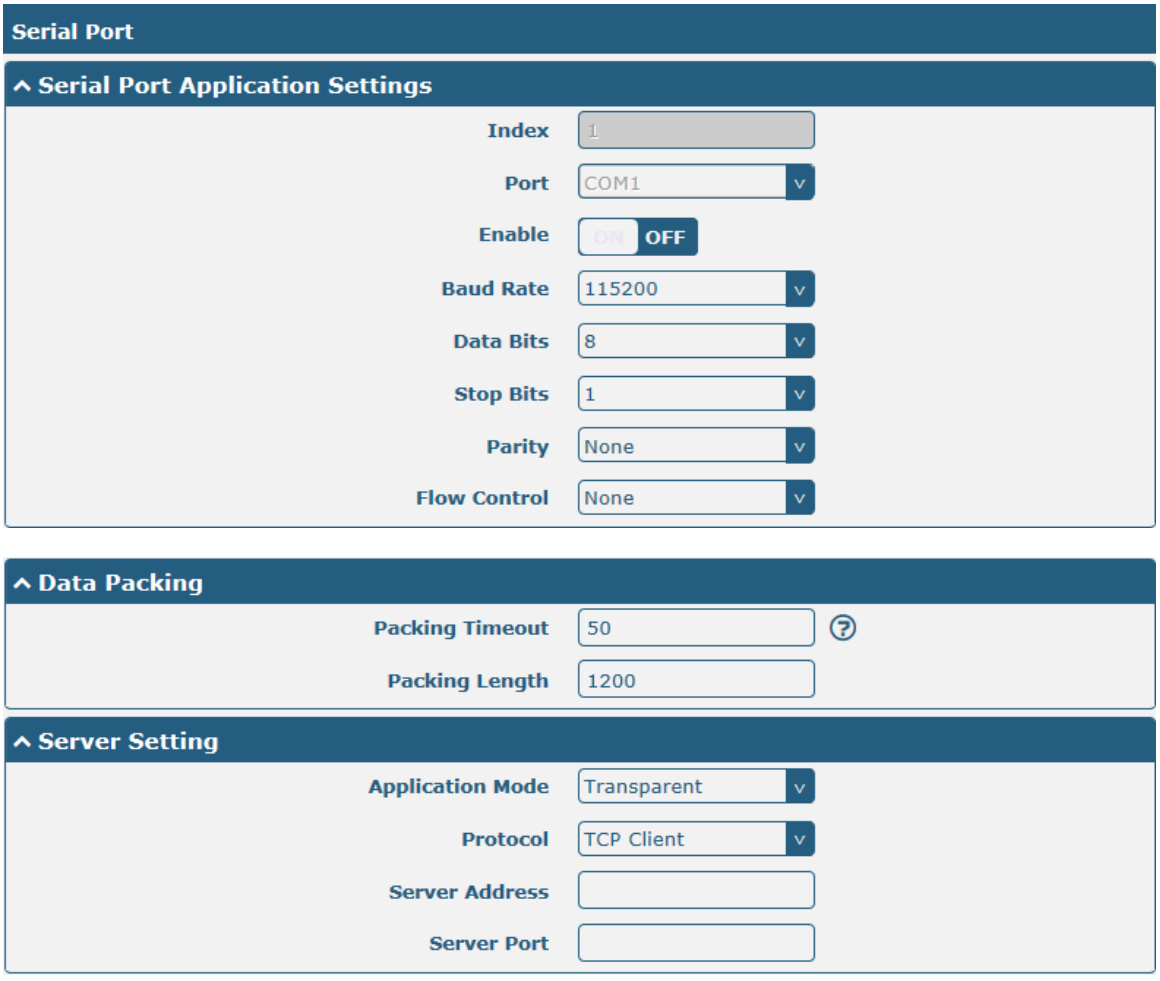
This window allows you to view the status of DO and DI interface. It also can clear the counter alarm of DI in here. Click **Clear** button to clear DI1 or DI2 monthly usage statistics info for counter alarm.



3.12 Interface > Serial Port

This section allows you to set the serial port parameters. Serial port provides a way to transfer serial data to IP data, or vice versa, and transmit these data via wired or wireless network to achieve data transparent transmission. R3000 LG supports one RS-232 or one RS-485 across a 7-pin 3.5 mm male socket with lock. Click the "Serial Port" column, and click the edit button of COM1.

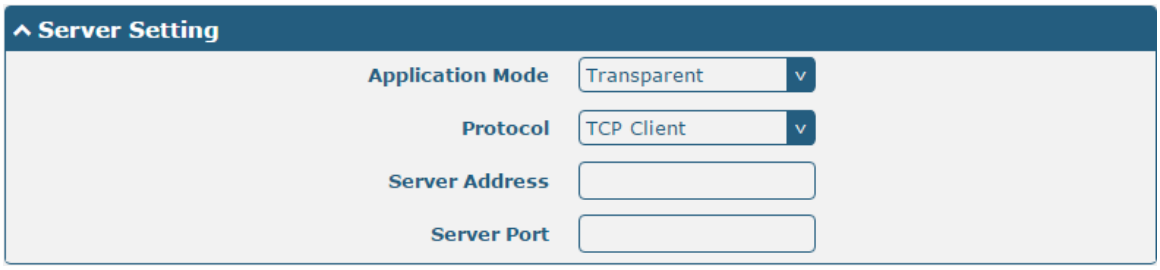




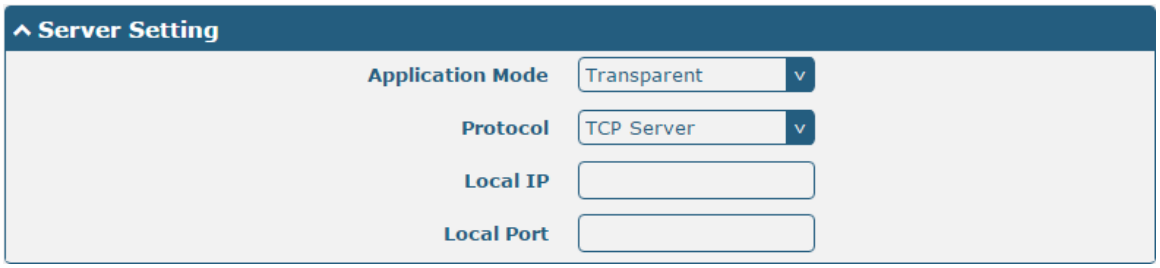
Serial Port		
Item	**Description**	**Default**
Serial Port Application Settings		
Index	Indicate the ordinal of the list.	--
Port	Show the current serial's name, read only.	COM1
Enable	Click the toggle button to enable/disable this serial port. When the status is OFF, the serial port is not available.	OFF
Baud Rate	Select from "300", "600", "1200", "2400", "4800", "9600", "19200", "38400",	115200

	“57600” , “115200” or “230400”.	
Data Bits	Select from “7” or “8”.	8
Stop Bits	Select from “1” or “2”.	1
Parity	Select from “None”, “Odd” or “Even”.	None
Flow control	Select from “None”, “Software” or “Hardware”.	None
Data Packing		
Packing Timeout	Set the packing timeout. The serial port will queue the data in the buffer and send the data to the Cellular WAN/Ethernet WAN when it reaches the Interval Timeout in the field. **Note**: Data will also be sent as specified by the packet length even when data is not reaching the interval timeout in the field.	50
Packing Length	Set the packet length. The Packet length setting refers to the maximum amount of data that is allowed to accumulate in the serial port buffer before sending. When a packet length between 1 and 3000 bytes is specified, data in the buffer will be sent as soon it reaches the specified length.	1200

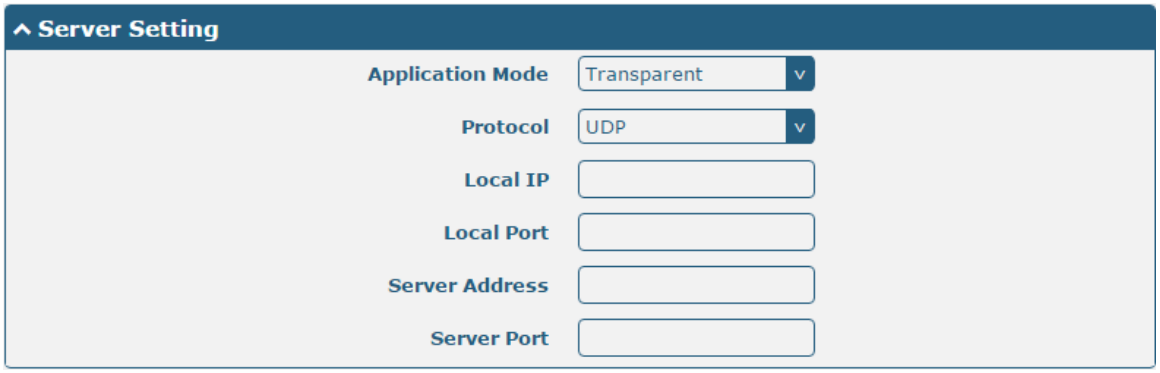
- The window is displayed as below when choosing “Transparent” as the application mode and “TCP Client” as the protocol.



The window is displayed as below when choosing “Transparent” as the application mode and “TCP Server” as the protocol.

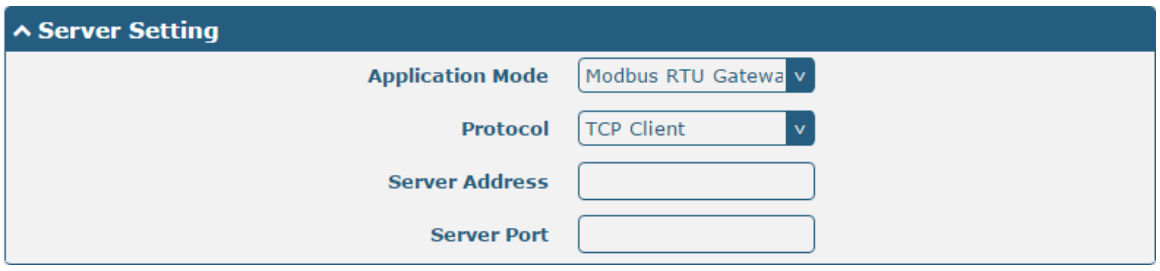


The window is displayed as below when choosing “Transparent” as the application mode and “UDP” as the protocol.

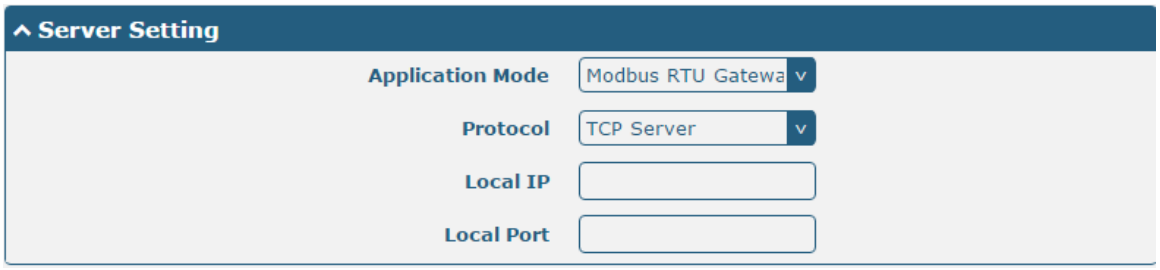


The window is displayed as below when choosing “Transparent” as the application mode and “Robustlink” as the protocol.

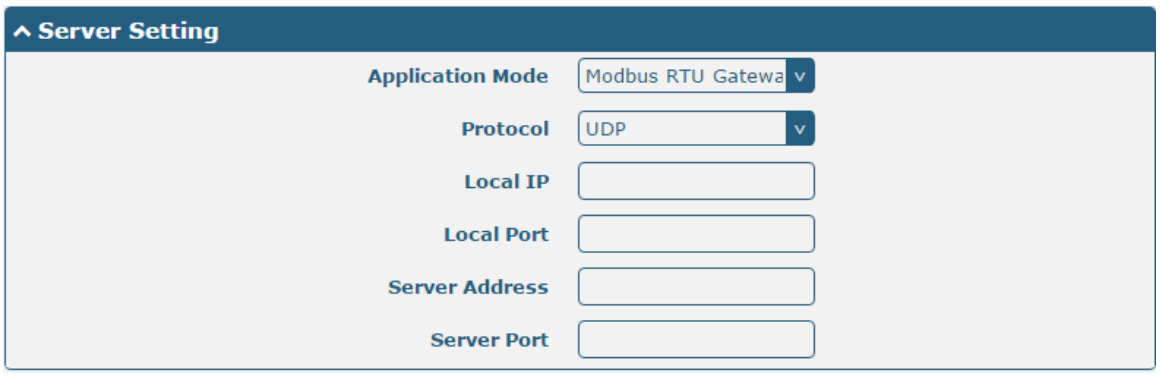
- The window is displayed as below when choosing “Modbus RTU Gateway” as the application mode and “TCP Client” as the protocol.



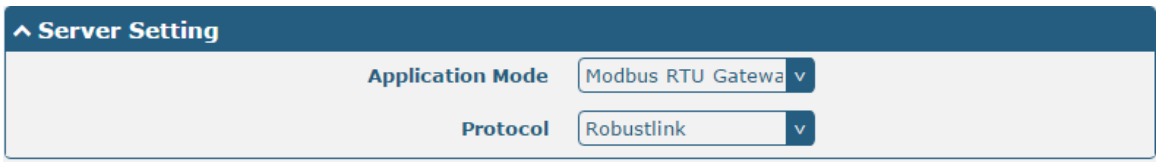
The window is displayed as below when choosing “Modbus RTU Gateway” as the application mode and “TCP Server” as the protocol.



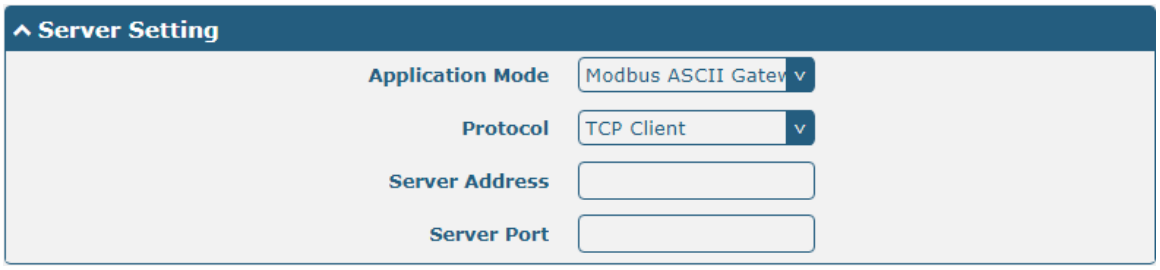
The window is displayed as below when choosing “Modbus RTU Gateway” as the application mode and “UDP” as the protocol.



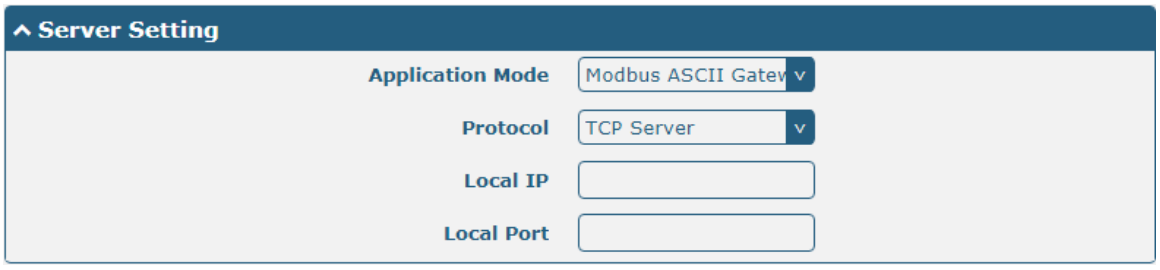
The window is displayed as below when choosing “Modbus RTU Gateway” as the application mode and “Robustlink” as the protocol.



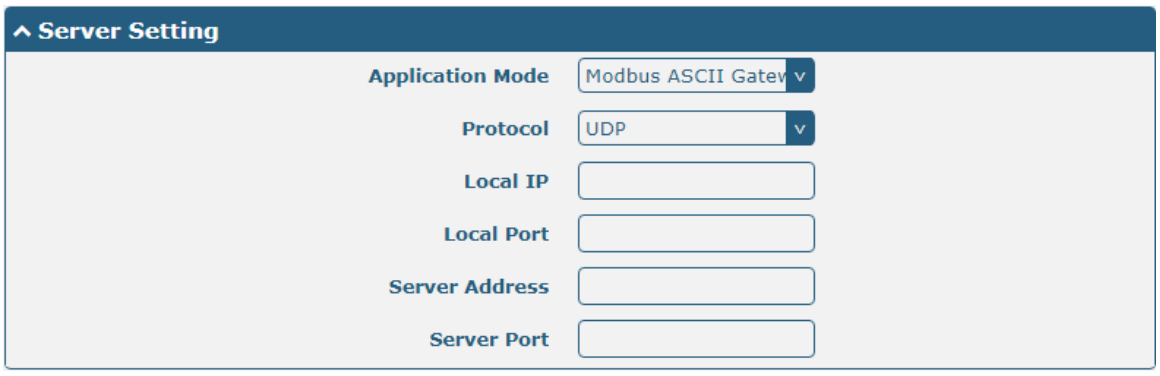
- The window is displayed as below when choosing “Modbus ASCII Gateway” as the application mode and “TCP Client” as the protocol.



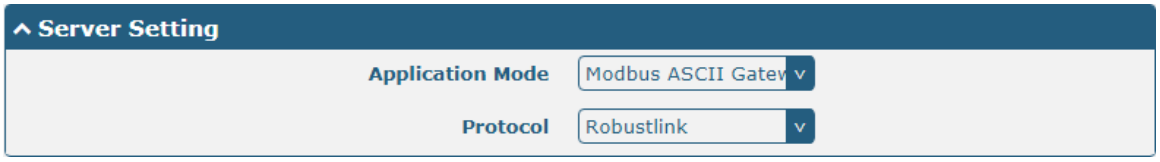
The window is displayed as below when choosing “Modbus ASCII Gateway” as the application mode and “TCP Server” as the protocol.



The window is displayed as below when choosing “Modbus ASCII Gateway” as the application mode and “UDP” as the protocol.



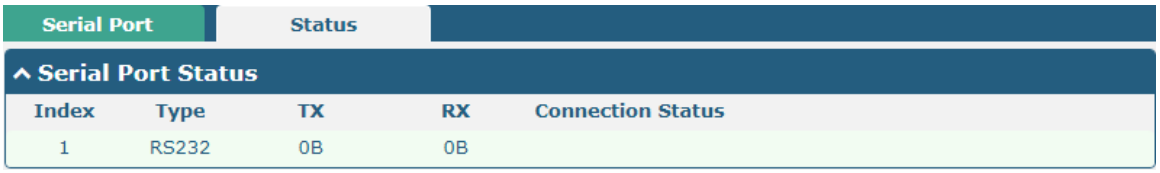
The window is displayed as below when choosing “Modbus ASCII Gateway” as the application mode and “Robustlink” as the protocol.



Server Settings		
Item	**Description**	**Default**
Application Mode	Select from “Transparent”, “Modbus RTU Gateway” or “Modbus ASCII Gateway”. • Transparent: Gateway will transmit the serial data transparently • Modbus RTU Gateway: Gateway will translate the Modbus RTU data to Modbus TCP data and sent out, and vice versa • Modbus ASCII Gateway:	Transparent

Server Settings		
Item	**Description**	**Default**
Protocol	Select from “TCP Client”, “TCP Server”, “UDP” or “Robustlink”. • TCP Client: Gateway works as TCP client, initiate TCP connection to TCP server. Server address supports both IP and domain name • TCP Server: Gateway works as TCP server, listening for connection request from TCP client • UDP: Gateway works as UDP client • Robustlink: Gateway will automatically upload the serial data to Robustlink platform under the Robustlink protocol. Robustlink is a management platform from Robustel. This function only available when Gateway is connects to Robustlink	TCP Client
Server Address	Enter the address of server which will receive the data sent from gateway’s serial port. IP address or domain name will be available.	Null
Server Port	Enter the specified port of server which is used for receiving the serial data.	Null
Local IP @ Transparent	Enter gateway’s LAN IP which will forward to the internet port of gateway.	Null
Local Port @ Transparent	Enter the port of gateway’s LAN IP.	Null
Local IP @ Modbus	Enter the local IP of under Modbus mode.	Null
Local Port @ Modbus	Enter the local port of under Modbus mode.	Null

Click the “Status” column to view the current serial port type.

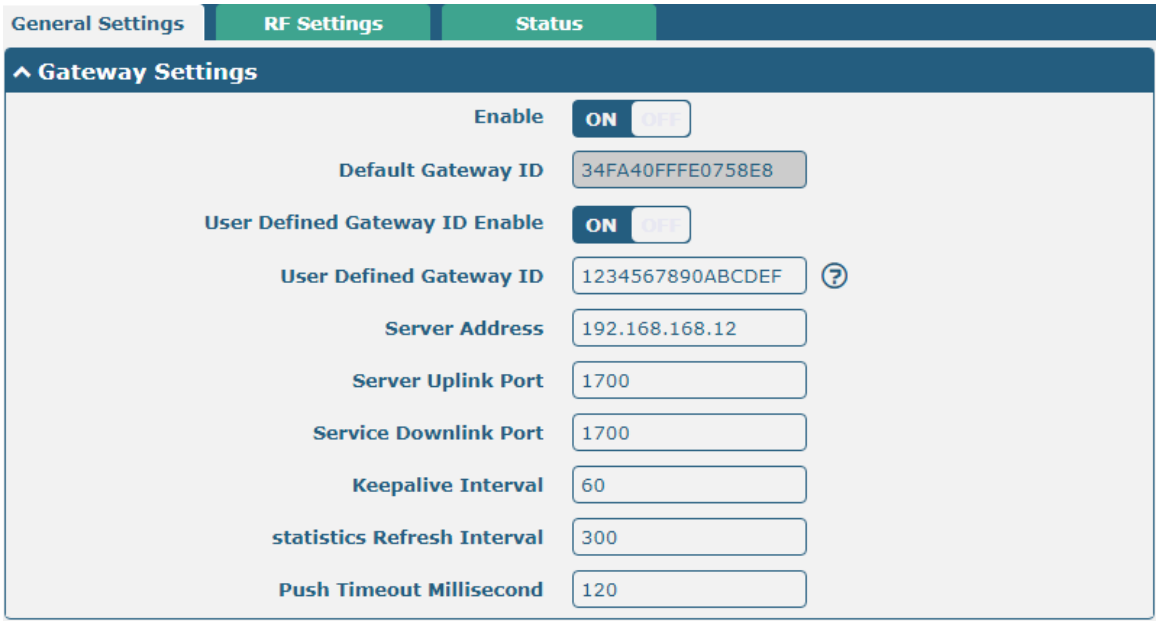


3.13 Interface > LoRa

This section allows you to set the LoRaWAN parameters.

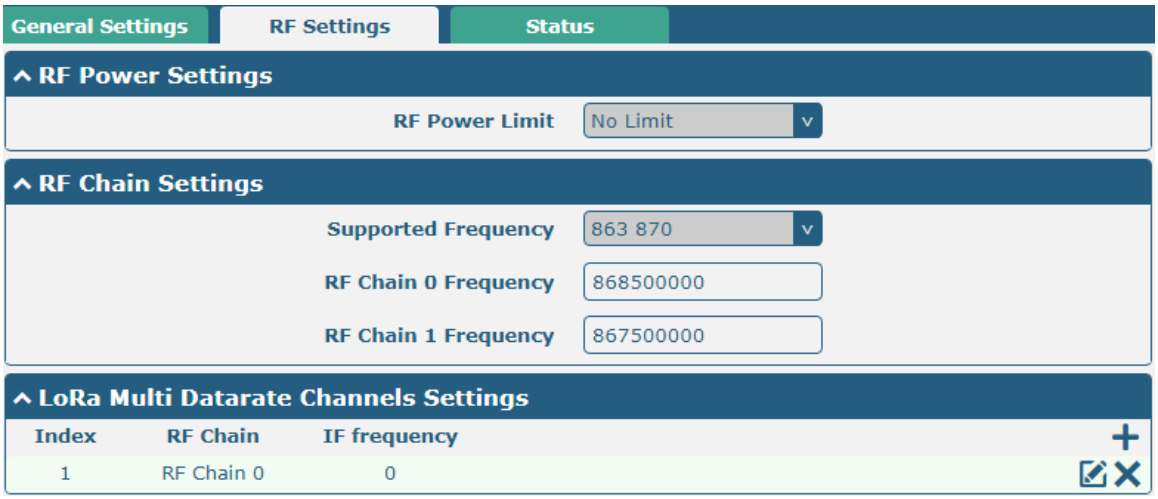
General Settings

Click “General Settings > Gateway Settings” to configure your node parameters. Here takes an example as below.

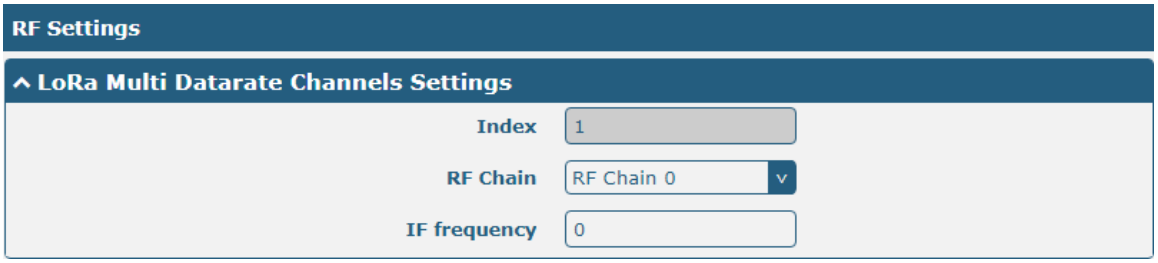


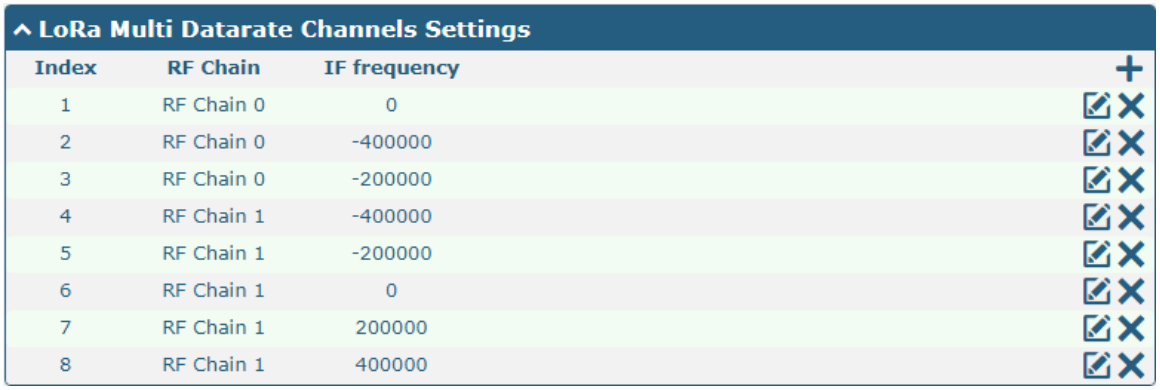
Gateway Settings		
Item	**Description**	**Default**
Enable	Click the toggle button to enable/disable the LoRaWAN forwarding of the gateway.	OFF
Default Gateway ID	Set the default gateway ID, or you could define the Gateway ID with a unique 64-bit sequence by yourself.	Null
User Defined Gateway ID Enable	Click the toggle button to enable/disable this option.	OFF
User Defined Gateway ID	Enter your defined Gateway ID.	Null
Server Address	Enter the remote IP of the LoRaWAN Server.	Null
Server Uplink Port	Enter the port of the LoRaWAN Server to upload data.	Null
Service Downlink Port	Enter the port of the LoRaWAN Server to send data to your gateway.	Null
Keepalive Interval	Enter the interval of keepalive packet which is sent from gateway to LoRaWAN server to keep the connection stable and alive.	Null
Statistics Refresh Interval	Enter the interval to refresh the statistics status of your gateway.	Null
Push Timeout Millisecond	Enter the timeout to wait for the response from server after the gateway sends data of mode, measured in ms.	Null

RF Settings

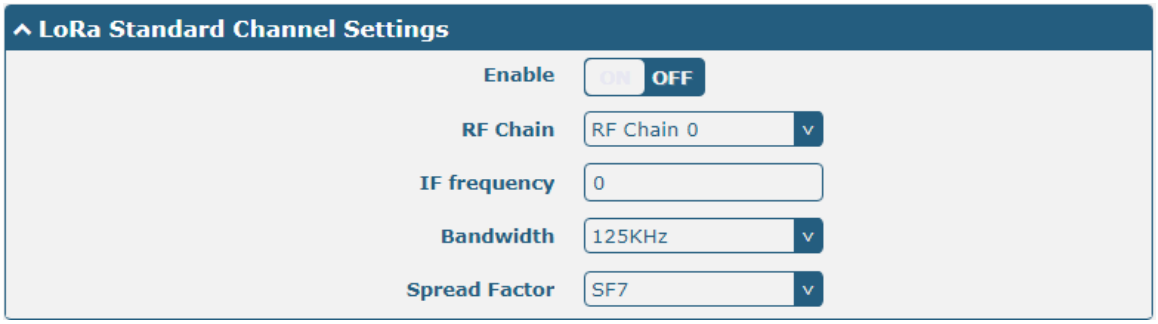


Click + to add a channel. The maximum count is 8.

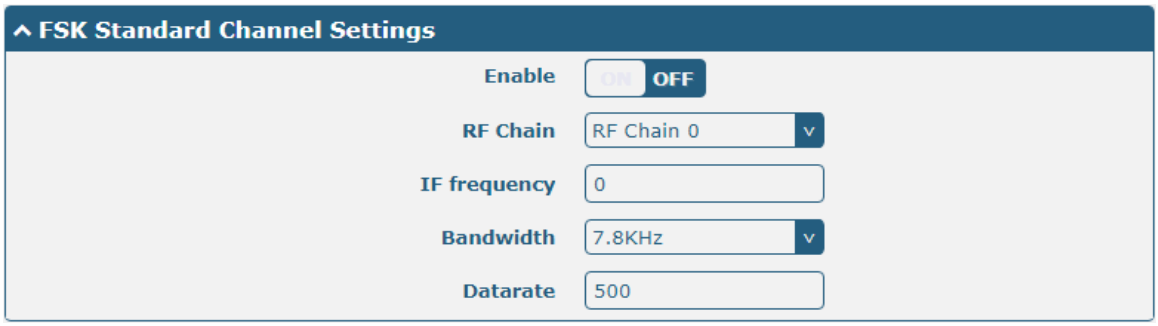




Use LoRa Standard channel to establish communication between nodes and gateway.



Use FSK modulation instead of LoRa.

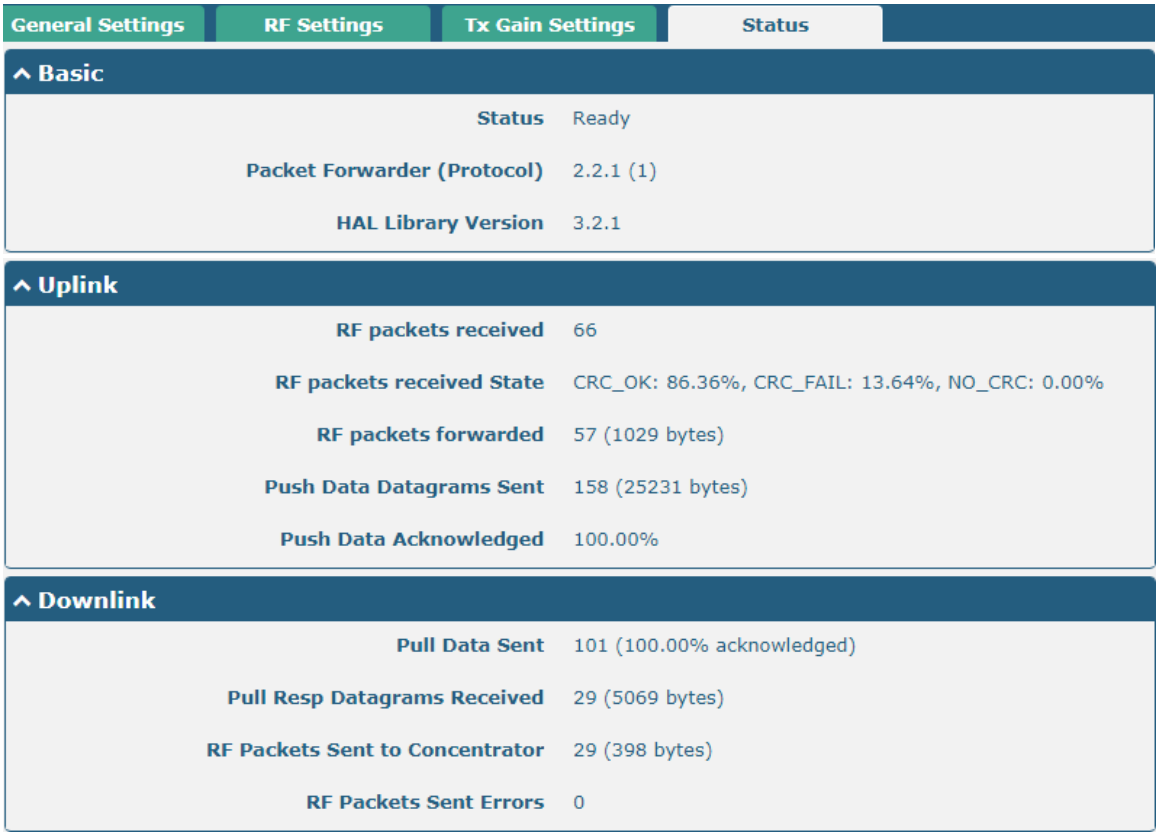


RF Settings		
Item	**Description**	**Default**
RF Power Settings		
RF Power Limit	Used to indicate the maximum transmit power limit for current gateway. • No_Limit: Transmit power is not limited, depending on the transmit power value sent by the LoRaWAN server • EU_433: Maximum transmit power is limited to 10dbm or less • EU_868_870: Maximum transmit power is limited to 14dbm or less • CN_470_510: The maximum transmit power is limited to 17dbm or less • US_902_928: Maximum transmit power is limited to 26dbm or less • AU_915_928: Maximum transmit power limit below 26dbm • AS_923: Maximum transmit power is limited to 14dbm or less • KR_920_923: Maximum transmit power is limited to 23dbm or less • Max_Power: Use the maximum transmit power which is about 24.5dbm **Note**: The above options are not configurable and need to be set before delivery.	No Limit
RF Chain Settings		
Supported Frequency	Choose the supported frequency depending on the LoRaWAN module.	863 870
RF Chain 0 Frequency	Enter the central frequency of radio transceiver 0 which supports transmitting and receiving.	Null
RF Chain 1 Frequency	Enter the center frequency of radio transceiver 1 which only supports receiving data from nodes.	Null
LoRa Multi Datarate Channels Settings		
Index	Indicate the ordinal of the list.	--
RF Chain	Choose Chain 0 or Chain 1 as RF Chain.	RF Chain 0
IF frequency	Enter the IF frequency, measured in Hz. The offset between the central frequency of specific channel and the central frequency of chain is 0/1. Eg: RF Chain 0, IF frequency: -20000. It means the central frequency of this channel should be 868300000=868500000-200000.	0
LoRa Standard Channel Settings		
Enable	Click the toggle button to enable/disable this option.	OFF
RF Chain	Choose Chain 0 or Chain 1 as RF Chain.	Chain 0

RF Settings		
Item	**Description**	**Default**
IF frequency	Enter the IF frequency valued from -500000 to 500000, and measured in Hz. The offset between the center frequency of specific channel and the center frequency of chain 0/1.	0
Bandwidth	Choose the selectable bandwidth, measured in KHz.	500KHz
Spread Factor	Enter the selectable spreading factor. The channel with large spreading factor corresponds to a low rate, while the small one corresponds to a high rate.	250000
FSK Standard Channel Settings		
Enable	Click the toggle button to enable/disable this option.	OFF
RF Chain	Choose Chain 0 or Chain 1 as RF Chain.	Chain 0
IF frequency	Enter the IF frequency valued from -500000 to 500000, and measured in Hz. The offset between the center frequency of specific channel and the center frequency of chain is 0/1.	0
Bandwidth	Choose the selectable bandwidth, measured in KHz.	500KHz
Datarate	Enter the data rate valued from 500 to 250000 and measured in Bit.	250000

Status

Click “Status” to view your node status.

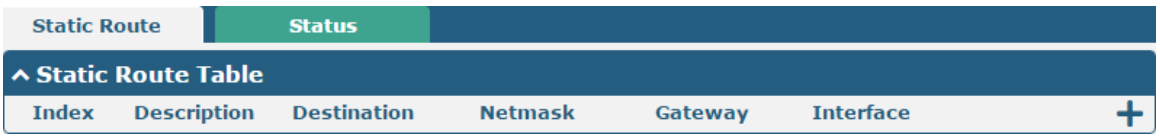


Status	
Item	**Description**
Basic	
Status	Show the LoRaWAN status of your gateway.
Packet Forwarder (Protocol)	Show the version of Packet forwarder.
HAL Library Version	Show the driver version of LoRaWAN chipset inside gateway.
Uplink	
RF packets received	Show the count of data packet from node to gateway.
RF packets received State	Show the RF packets receiving state. • CRC_OK: Percentage of CRC verification • CRC_Fail: Percentage of CRC verification failure • NO_CRC: Percentage of abnormal packets without CRC
RF packets forwarded	Packets that CRC verified are sent from gateway to server.
Push Data Datagrams Sent	The total quantity of packets sent from gateway to server, including the RF packets forwarded and statistics packets.
Push Data Acknowledged	Percentage of acknowledged packets among Push Data Datagrams Sent:
Downlink	
Pull Data Sent	Show the number of keepalive packets sent to the server, and percentage of acknowledged packet regarding the keepalive packet from the server.
Pull Resp Datagrams Received	Show the packet counts and size that will be sent from server to gateway.
RF Packets Sent to Concentrator	Show the RF packet counts and size that will be sent from gateway to node.
RF Packets Sent Errors	Show the RF packet counts that fail to be sent from server to node.

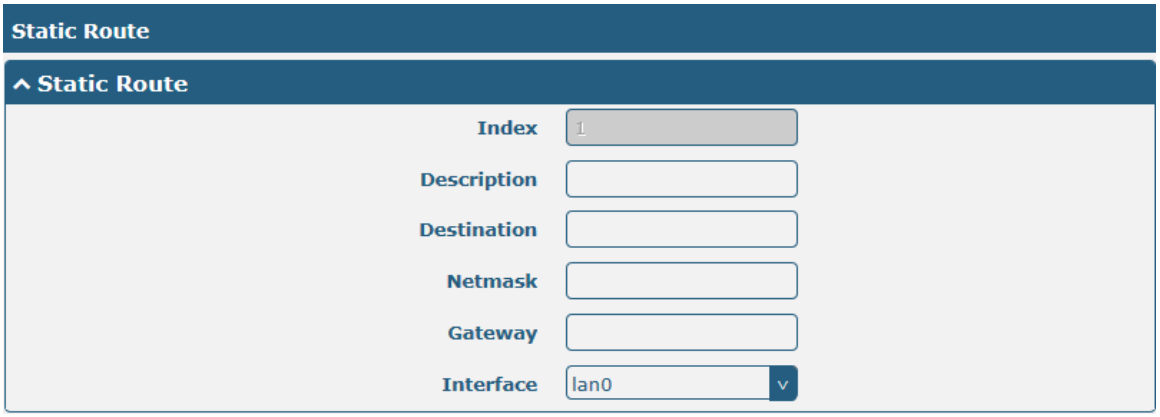
3.14 Network > Route

This section allows you to set the static route. Static route is a form of routing that occurs when a gateway uses a manually-configured routing entry, rather than information from a dynamic routing traffic. Route Information Protocol (RIP) is widely used in small network with stable use rate. Open Shortest Path First (OSPF) is made gateway within a single autonomous system and used in large network.

Static Route



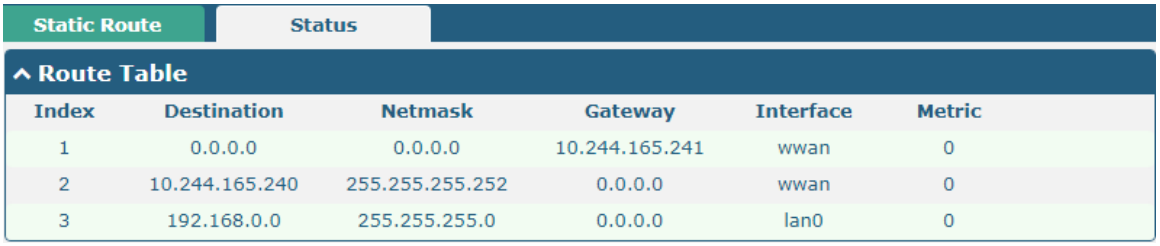
Click + to add static routes. The maximum count is 20.



Static Route		
Item	**Description**	**Default**
Index	Indicate the ordinal of the list.	--
Description	Enter a description for this static route.	Null
Destination	Enter the IP address of destination host or destination network.	Null
Netmask	Enter the Netmask of destination host or destination network.	Null
Gateway	Define the gateway of the destination.	Null
Interface	Choose the corresponding port of the link that you want to configure.	wwan

Status

This window allows you to view the status of route.

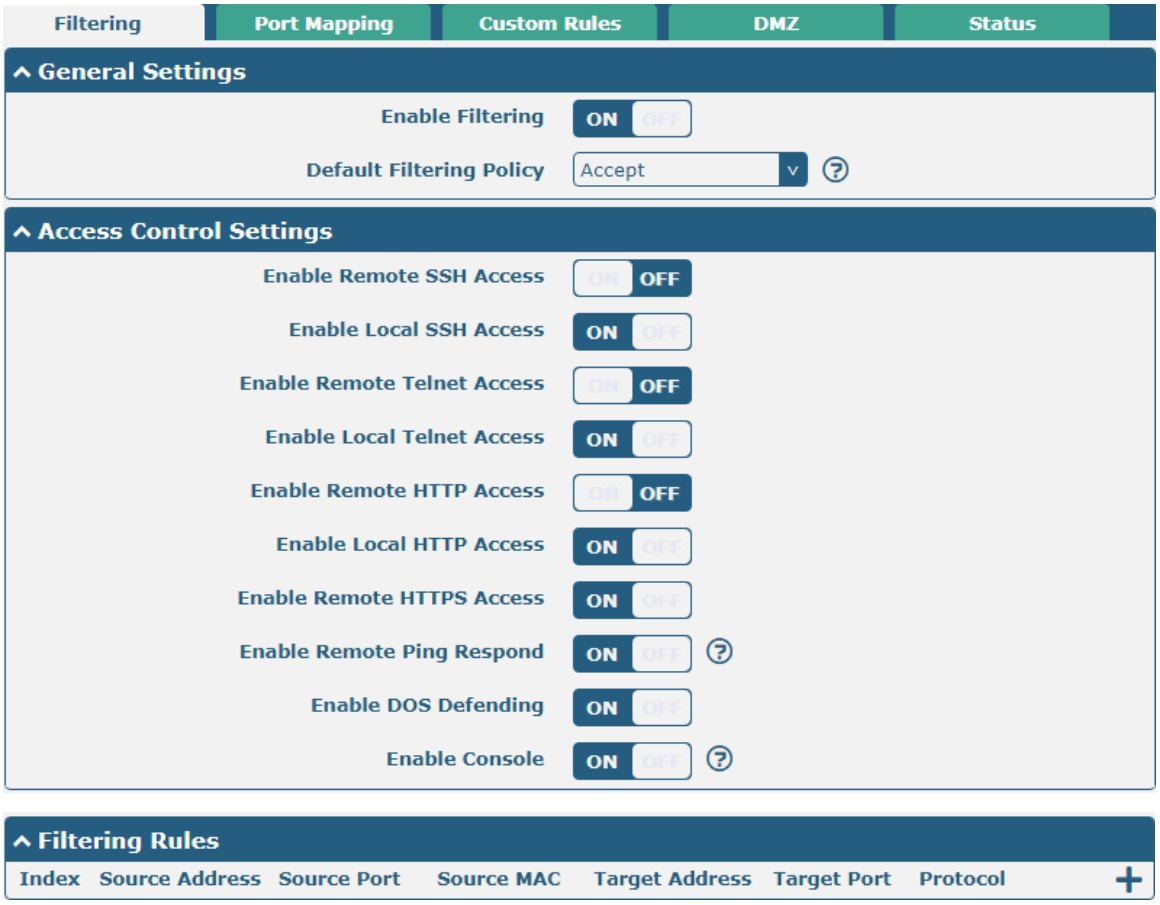


3.15 Network > Firewall

This section allows you to set the firewall and its related parameters, including Filtering, Port Mapping and DMZ.

Filtering

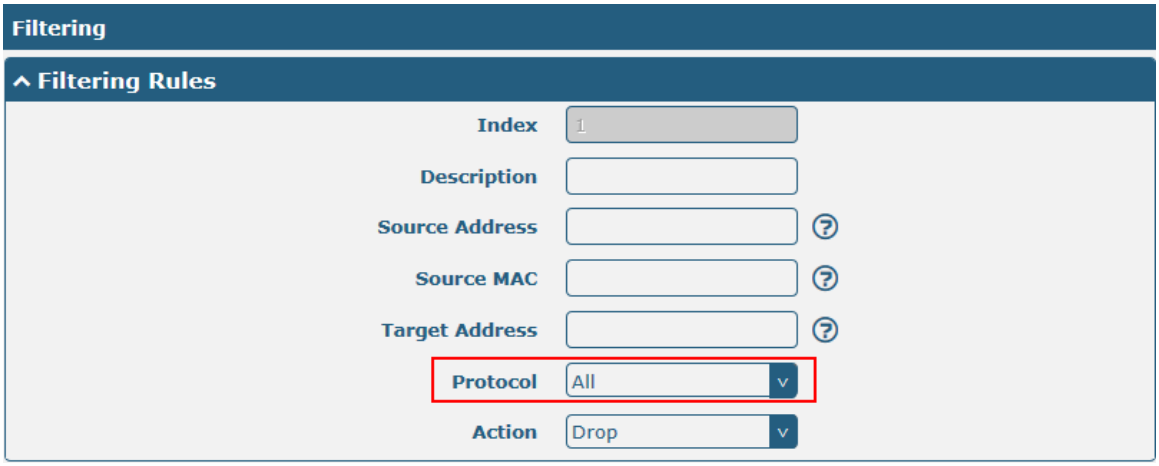
The filtering rules can be used to either accept or block certain users or ports from accessing your gateway.



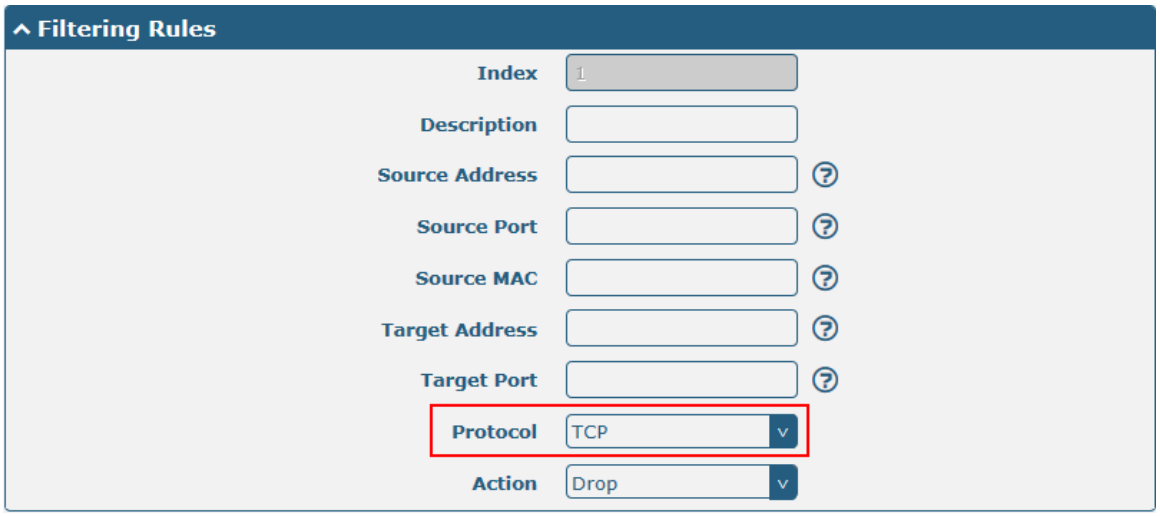
Filtering		
Item	**Description**	**Default**
General Settings		
Enable Filtering	Click the toggle button to enable/disable the filtering option.	ON
Default Filtering Policy	Select from “Accept” or “Drop”. Cannot be changed when filtering rules table is not empty. • Accept: Gateway will accept all the connecting requests except the hosts which fit the drop filter list • Drop: Gateway will drop all the connecting requests except the hosts which fit the accept filter list	Accept
Access Control Settings		
Enable Remote SSH Access	Click the toggle button to enable/disable this option. When enabled, the Internet user can access the gateway remotely via SSH.	OFF

Filtering		
Item	**Description**	**Default**
Enable Local SSH Access	Click the toggle button to enable/disable this option. When enabled, the LAN user can access the gateway locally via SSH.	ON
Enable Remote Telnet Access	Click the toggle button to enable/disable this option. When enabled, the Internet user can access the gateway remotely via Telnet.	OFF
Enable Local Telnet Access	Click the toggle button to enable/disable this option. When enabled, the LAN user can access the gateway locally via Telnet.	ON
Enable Remote HTTP Access	Click the toggle button to enable/disable this option. When enabled, the Internet user can access the gateway remotely via HTTP.	OFF
Enable Local HTTP Access	Click the toggle button to enable/disable this option. When enabled, the LAN user can access the gateway locally via HTTP.	ON
Enable Remote HTTPS Access	Click the toggle button to enable/disable this option. When enabled, the Internet user can access the gateway remotely via HTTPS.	ON
Enable Remote Ping Respond	Click the toggle button to enable/disable this option. When enabled, the gateway will reply to the Ping requests from other hosts on the Internet.	ON
Enable DOS Defending	Click the toggle button to enable/disable this option. When enabled, the gateway will defend the DOS. Dos attack is an attempt to make a machine or network resource unavailable to its intended users.	ON
Enable Console	Click the toggle button to enable/disable this option.	ON

Click + to add a filtering rule. The maximum count is 20. The window is displayed as below when defaulting “All” or choosing “ICMP” as the protocol. Here take “All” as an example.



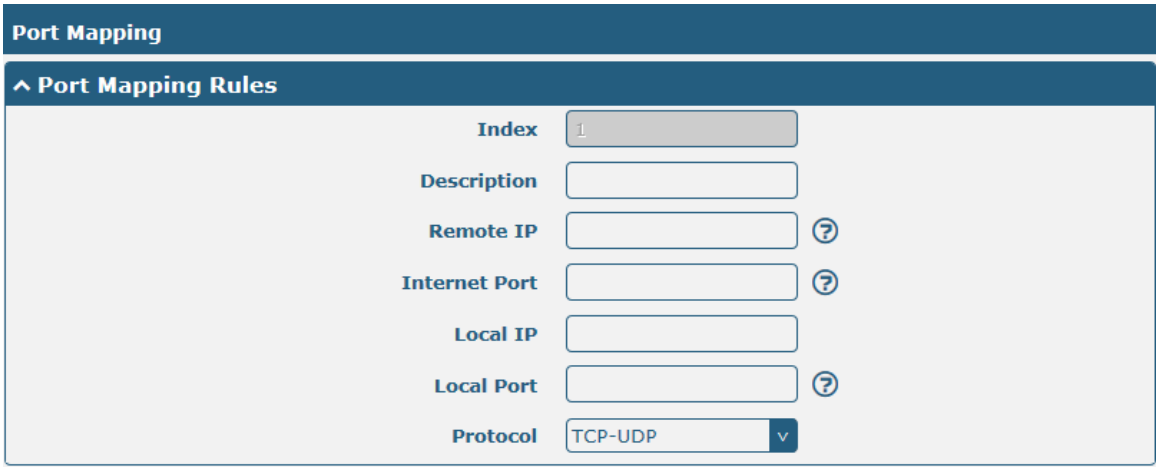
The window is displayed as below when choosing “TCP”, “UDP” or “TCP-UDP” as the protocol. Here take “TCP” as an example.



Filtering Rules		
Item	**Description**	**Default**
Index	Indicate the ordinal of the list.	--
Description	Enter a description for this filtering rule.	Null
Source Address	Specify an access originator and enter its source address.	Null
Source Port	Specify an access originator and enter its source port.	Null
Source MAC	Specify an access originator and enter its source MAC address.	Null
Target Address	Enter the target address which the access originator wants to access.	Null
Target Port	Enter the target port which the access originator wants to access.	Null
Protocol	Select from “All”, “TCP”, “UDP”, “ICMP” or “TCP-UDP”. **Note**: It is recommended that you choose “All” if you don’t know which protocol of your application to use.	All
Action	Select from “Accept” or “Drop”. • Accept: When Default Filtering Policy is drop, gateway will drop all the connecting requests except the hosts which fit this accept filtering list • Drop: When Default Filtering Policy is accept, gateway will accept all the connecting requests except the hosts which fit this drop filtering list	Drop

Port Mapping

Click + to add port mapping rules. The maximum rule count is 40.



Port Mapping Rules		
Item	**Description**	**Default**
Index	Indicate the ordinal of the list.	--
Description	Enter a description for this port mapping.	Null
Remote IP	Specify the host or network which can access the local IP address. Empty means unlimited, e.g. 10.10.10.10/255.255.255.255 or 192.168.1.0/24	Null
Internet Port	Enter the internet port of gateway which can be accessed by other hosts from internet.	Null
Local IP	Enter gateway's LAN IP which will forward to the internet port of gateway.	Null
Local Port	Enter the port of gateway's LAN IP.	Null
Protocol	Select from "TCP", "UDP" or "TCP-UDP" as your application required.	TCP-UDP

Custom Rules

Click + to add custom rules. The maximum rule count is 40.