Bivocom®

Industrial 5G/4G IoT Gateway
TG463 Series User Guide

Note: interfaces of hardware for different model will be different.

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About This Guide

Thank you for choosing Bivocom Industrial 5G/4G LTE IoT Gateway TG463 Series.

Please thoroughly read this user guide before you configure and install the device.

This manual is compatible with below models

Model	Description
TG463-NR	Industrial 5G IoT Gateway
TG463-LF	Industrial 4G LTE IoT Gateway

Note: please contact Bivocom team to choose the version of hardware you need for your IoT application, as different interfaces on hardware will have different part number, such as, dual sim, with/without GPS, etc.

Table of Contents

1. Introduction

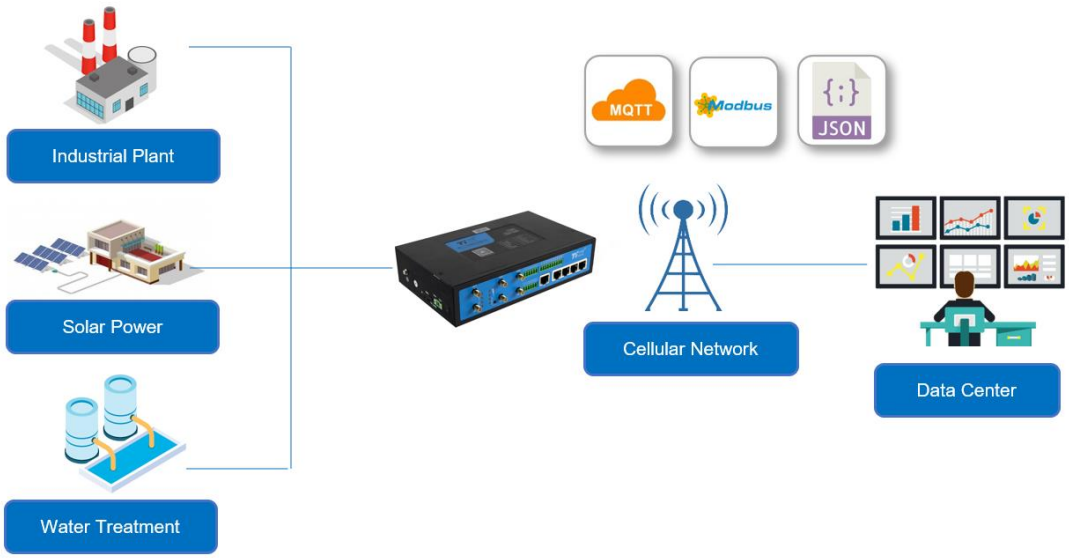
1.1 Overview

The TG463 series is a 5G NR IoT gateway designed for IoT, M2M, and eMBB applications requiring higher speed, lower latency data transmission, and capacity of edge computing. It provides OpenWrt based Linux OS embedded environment that allows developers and engineers to program and install their own application based on Python, C/C++ to the hardware themselves. In addition, its rich I/O is ideal for connecting with diverse field equipment and sensors and transferring the data to the cloud server via 5G/4G LTE cellular network.

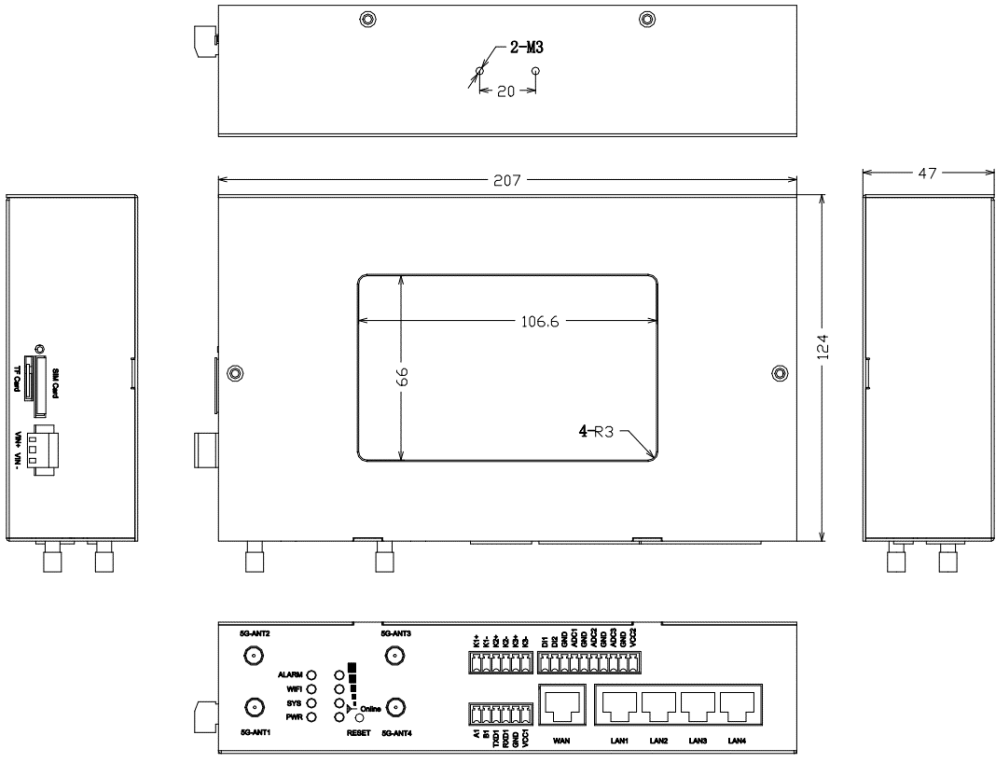
The TG463 series IoT gateway can be used for a wide variety of applications, such as smart pole, smart cities, smart office, smart buildings, smart traffic light, digital signage advertising, vending machines, ATM, etc.

1.2 Applications

TG463 Series IoT Gateways utilizes cellular network to connect your edge devices and controller devices to your center for remote monitoring and control.
Typical application as below.



1.3 Dimensions:



1.4 Physical Characteristics

Physical Characteristics	
Housing	Metal, IP30
Dimensions	207X124X47mm (8.15*4.88*1.85in), Antenna and other accessories are not included
Weight	1,000g(2.2lbs), without accessories

2. Getting Started

2.1 Package Checklist

The following components are included in your standard TG463 package.
Check the list before installation. If you find anything missing, Please feel free to contact Bivocom.

1. TG463 Gateway 1PCS
2. Power Adapter 1PCS
   (DC 12V/1.5A, EU/US/UK/AU plug optional)

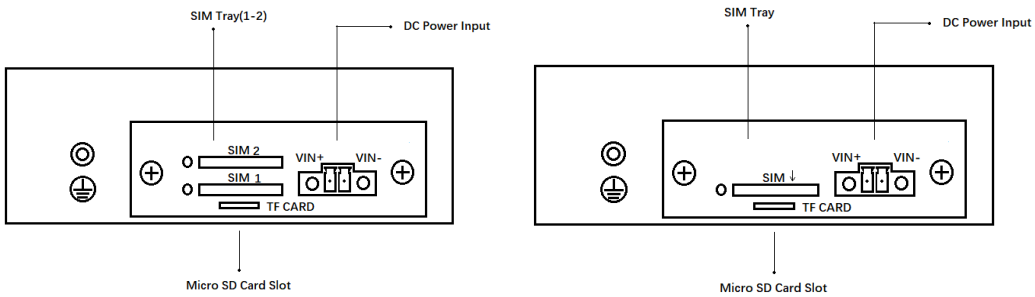
3. Cellular Antenna
   5G version: 4PCS
   4G version: 2PCS
4. WIFI Antenna 2PCS
5. RS232 Cable 1PCS
   (DB9 Female, 1 meter)
6. Ethernet Cable(1 meter): 1PCS
7. 10-Pin Terminal Block: 1PCS
8. 6-Pin Terminal Block: 2PCS
9. 2-Pin Terminal Block: 1PCS
10. DIN-Rail Mount Kits: 1PCS

2.2 Installation

2.2.1 Insert SIM/UIM Card

TG463 supports normal SIM/UIM only, so if you're using a Micro SIM or Nano SIM card, you will have to use a Micro SIM or Nano SIM to Normal SIM adapter, which normally comes with your SIM card package.
Before you insert the SIM card, make sure your router is powered off, then use a needle object(such as a pen) to push the button near the SIM tray(see page below), it will flick out immediately. Put the SIM card to SIM tray with chipset upside, insert it to router and make sure it's tightly matched.

Warning: DON NOT install SIM/UIM card when router is powered on.

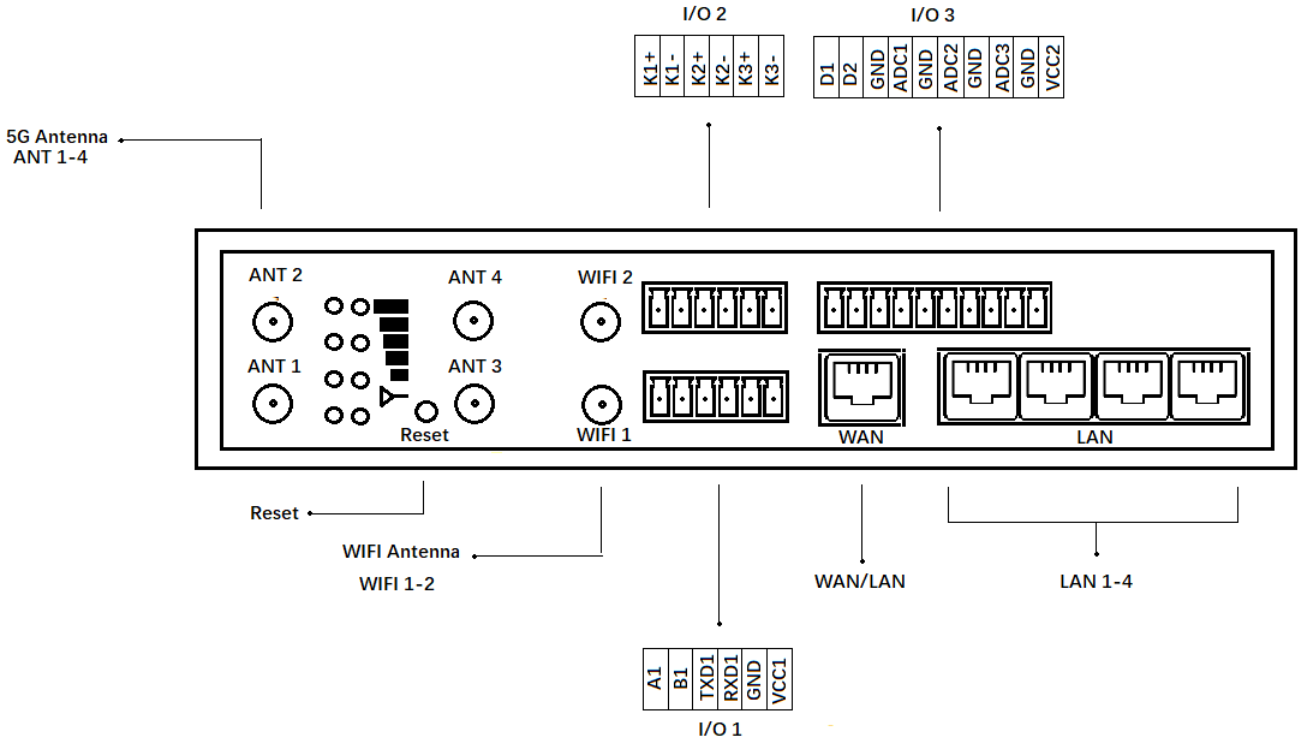


Note: standard package only supports single SIM, dual SIM is an optional feature.

2.2.2 Interfaces connection

Hardware Interfaces Instruction (TG463-NR, 5G Version as an example)

Before we start to install and configure the TG463, let's have a quick view of the interfaces of it.



1) Definition for I/O 1

No.	Item	Description
1	A1	RS485 port, used for connecting to sensors, controllers
2	B1	
3	TXD1	RS232 port, used for connecting to sensors, controllers
4	RXD1	
5	GND	
6	VCC1	DC power output 1, 12VDC output, current 1A), Built-in overcurrent protection, for external devices DC power input

2) Definition for I/O 2

No.	Item	Description
7	K1+	Relay 1, Used to control external device, up to 5A and 30VDC/250VAC switch
8	K1-	
9	K2+	Relay 2, Used to control external device, up to 5A and 30VDC/250VAC switch
10	K2-	
11	K3+	Relay 3, Used to control external device, up to 5A and 30VDC/250VAC switch
12	K3-	

3) Definition for I/O 3

No.	Item	Description
13	DI1	Digital input(0-30V Input) Status “0”: 0-3V, status “1”: 5-30V
14	DI2	
15	GND	
16	ADC1	Analog input 1 3 x 16-bit ADC, supports 4-20mA current signal input, or 0-5V voltage signal input(configurable)
17	GND	
18	ADC2	Analog input 2 3 x 16-bit ADC, supports 4-20mA current signal input, or 0-5V voltage signal input(configurable)
19	GND	
20	ADC3	Analog input 3 3 x 16-bit ADC, supports 4-20mA current signal input, or 0-5V voltage signal input(configurable)
21	GND	
22	VCC2	DC power output 2, 12VDC output, current 1A), Built-in overcurrent protection, for external devices DC power input

TG463 support 1x RS232 and 1x RS485 serial ports, which can be used for IoT sensors/controllers, firmware upgrade, system log checking, debug, etc.
Besides, TG463 also comes with 2x digital inputs, 3 analog inputs, 3 relay outputs, 2 DC power output and 5-Gigabit ethernet ports.

TG463 designed with industrial terminal block interface, and the RS232 cable in this package with ends of female connector and stripping cable, the signal of console cable is defined as below,

RS232 Cable(with DB9 female connector and stripping cable)

Color of cable	Corresponding DB9-Female Pin No.	Corresponding Pin No. of Router (See I/O 1)
Blue	2 (RX)	3(TX)
Brown	3 (TX)	4(RX)
Black	5 (GND)	5(GND)

RS485 Cable

Color of cable	TG463 Router
Red	1(A)
Black	2(B)

Relay Interface (Relay1, Relay2)

Relay Feature	Control the external switch
Load capacity	Maximun Voltage switch: 30VDC/220VAC Maximun Current switch: 5A

DI Interface (DI1, DI2)

DI Feature	Detect the slave device status
Input Range	Logic 0: wet contact 0-3VDC, or dry contact close. Logic 1: wet contact 5-30VDC, or dry contact open.

ADC Interface (ADC1, ADC2, ADC3)

ADC Feature	Acquire the slave device analog input
Input Range	4~20mA Current input, or 0-5V Voltage input.

2.2.3 Power Supply

We suggest you use Bivocom standard power adapter (1.5A/12VDC) comes with the standard package. If you have to use your own DC power supply, make sure the power range is 5-35VDC and it is stable enough(Ripple shall be less than 300mV, and Instantaneous voltage shall not larger than 35V), meanwhile, power shall over 4W.

2.2.4 Cellular Antenna

TG463 provides 4 cellular antennas(TG463-NR, 5G version), which comes with SMA male connector, screw the SMA male antenna to TG463(SMA female port, ANT 1-4), make sure it is screwed tightly to ensure the strength of signal.

2.2.5 WIFI Antenna

TG463 provides 2 WIFI antennas which comes with SMA female connector, screw the antenna to 2 TG463 WIFI ports(male), make sure it's screwed tightly to ensure the strenght of signal.

2.3 LED Indicators

TG463 Series Gateway provides 8 LED indicators, as following.

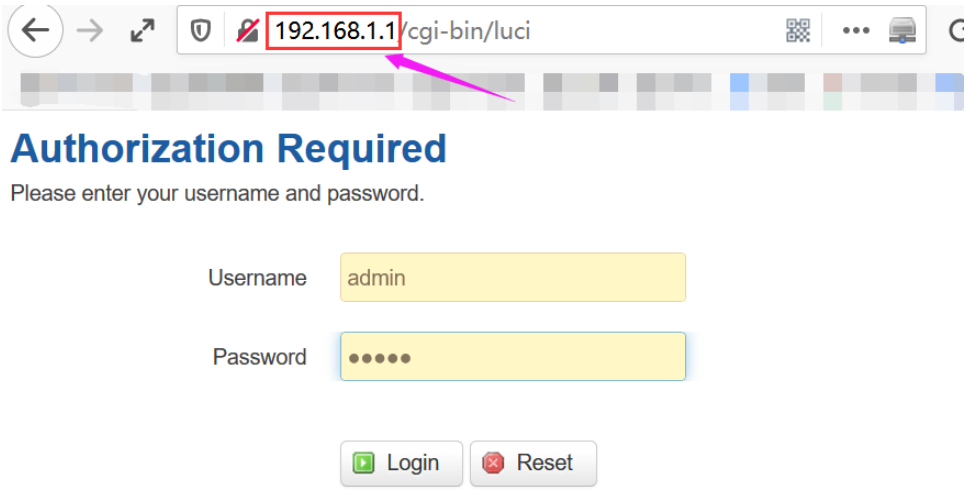
Indicator	Status	Content
Power	On	Powered On

	Off	Powered Off
Signal Strength	1 Lights	Signal weak
	2 Lights	Signal Middium
	3 Lights	Signal Strong
System	Blink	System works
	Off	System doesn't work
Online	On	Gateway accesses to Internet
	Off	Gateway doesn't access to Internet
Alarm	On	● SIM/UIM Card is not insert corectly or broken ● Antenna signal is too weak
	1 Blink Per Second	Cellular module was not registered to Gateway
	2 Blinks Per Second	Gateway can't access to Internet
	Off	Gateway doesn't have any alarm
WIFI	On	WIFI Enabled
	Off	WIFI Disabled
WAN	On	WAN is connected
	Off	WAN is not connected
LAN	LAN1 Blink	LAN1 works
	LAN2 Blink	LAN2 works
	LAN3 Blink	LAN3 works
	LAN4 Blink	LAN4 works
	Off	LAN is not connected

3. Configuration and Management

To enter into the web config UI, there are 2 ways: Ethernet port and WIFI hotspot.
Use an Ethernet cable to connect the LAN port of TG463 to your laptop, or use your laptop or mobile phone to connect to WIFI hotspot 'Bivocom' of TG463, login with password: admin123, normally your laptop will get an IP address from TG463 DHCP as 192.168.1.xx, otherwise please manually configure your laptop IP to 192.168.1.100.

Open browser, enter 192.168.1.1 to enter into to login page, enter username: admin, and password: admin, to go to configuration page.



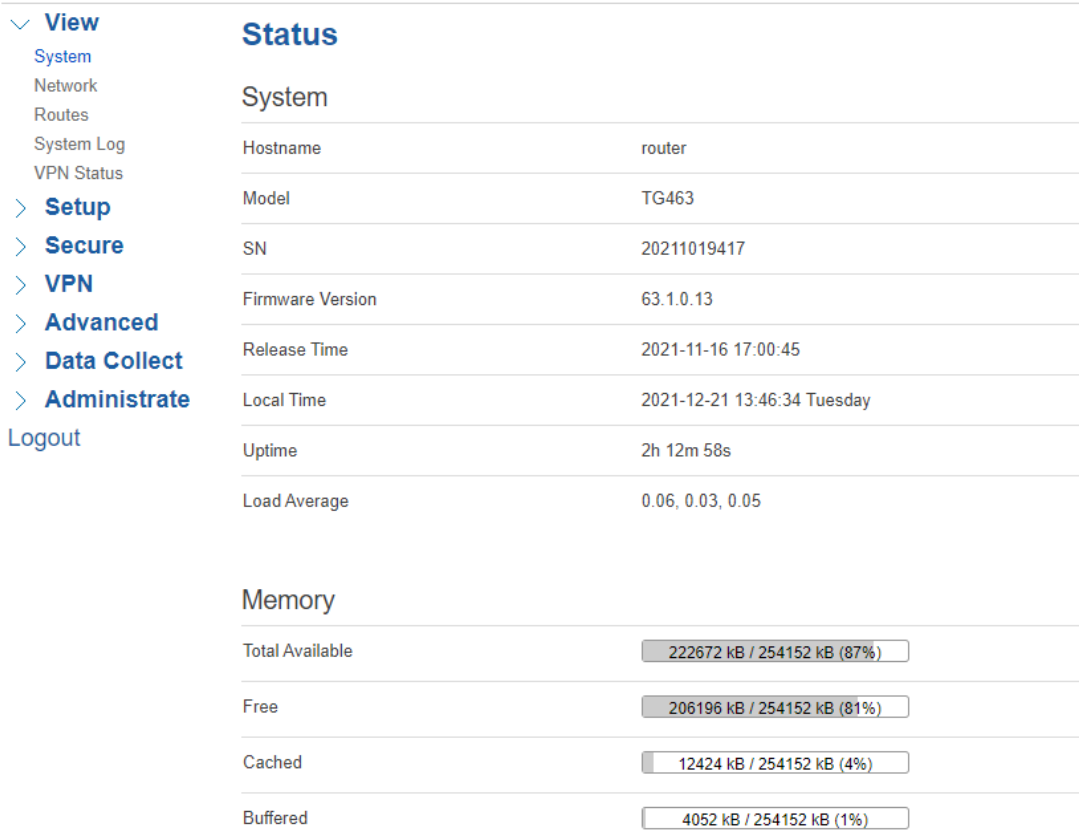
After enter into the web config page, you'll see a list of menu on left side, as below.

3.1 View

To check the following system information.

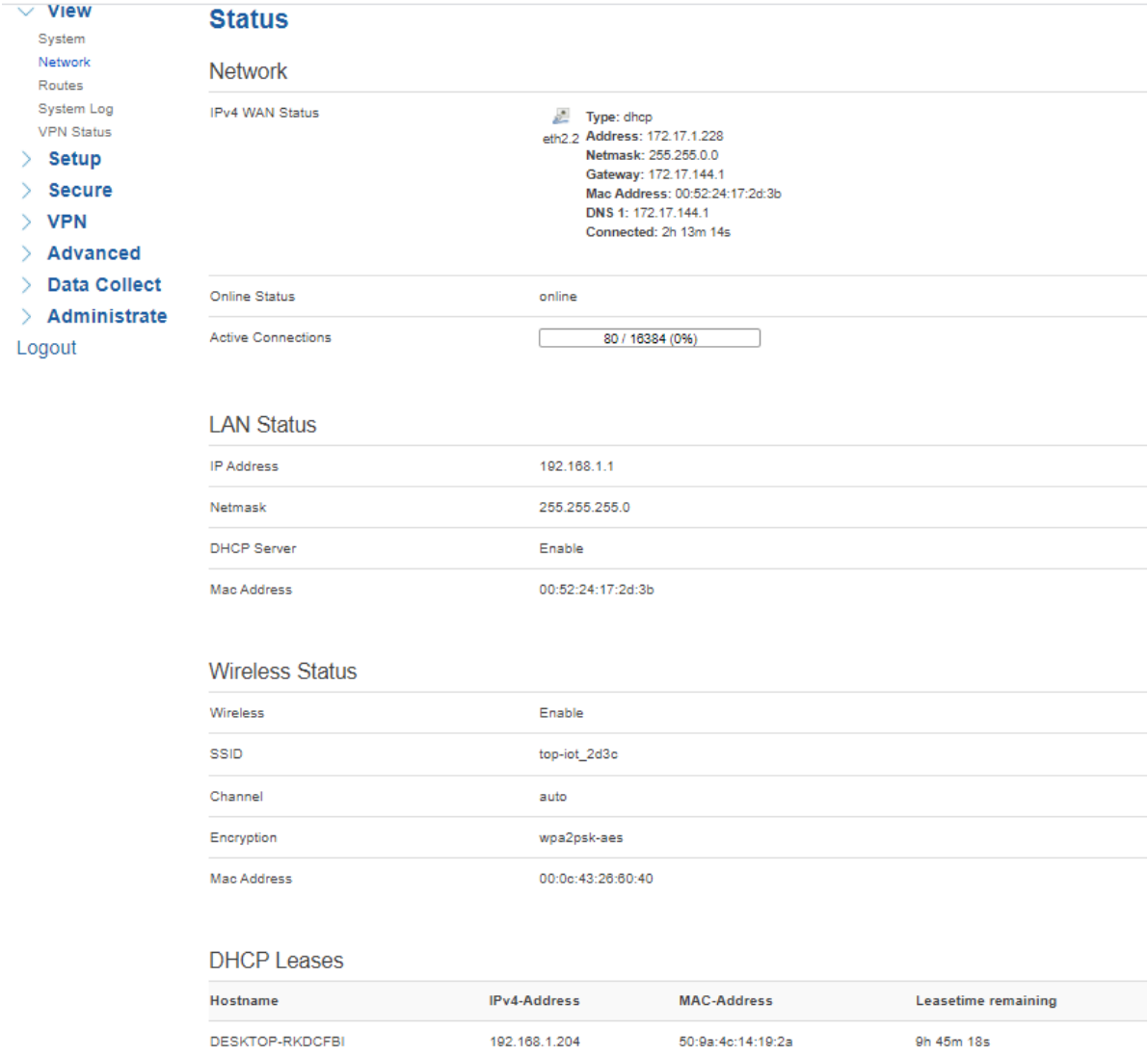
3.1.1 System

Display system related information, such as firmware version, local time, SN, uptime, etc.



3.1.2 Network

Display WAN, LAN, WiFi, DHCP network information.



3.1.3 Routing Tables

Display routing tables.

ARP

IPv4-Address	MAC-Address	Interface
172.17.144.1	00:52:24:89:2d:03	eth2.2
172.17.144.77	1c:a0:b8:80:95:ae	eth2.2
192.168.1.204	50:9a:4c:14:19:2a	br-lan
172.17.1.188	a4:55:90:81:4e:47	eth2.2
172.17.144.21	00:e0:4c:36:26:0c	eth2.2
192.168.1.10	00:00:00:00:00:00	br-lan
172.17.1.232	00:00:00:00:00:00	eth2.2
172.17.0.146	00:00:00:00:00:00	eth2.2

Active IPv4-Routes

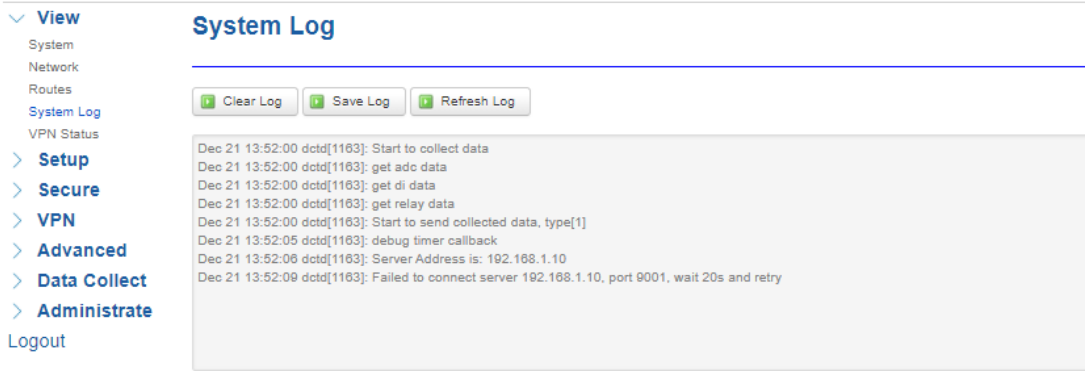
Network	Target	IPv4-Gateway	Metric
wan	0.0.0.0/0	172.17.144.1	0
wan	172.17.0.0/16	0.0.0.0	0
wan	172.17.144.1	0.0.0.0	0
lan	192.168.1.0/24	0.0.0.0	0

Active IPv6-Routes

Network	Target	IPv6-Gateway	Metric
loopback	0:0:0:0:0:0:0:0/0	0:0:0:0:0:0:0:0/0	FFFFFFFF

3.1.4 System Log

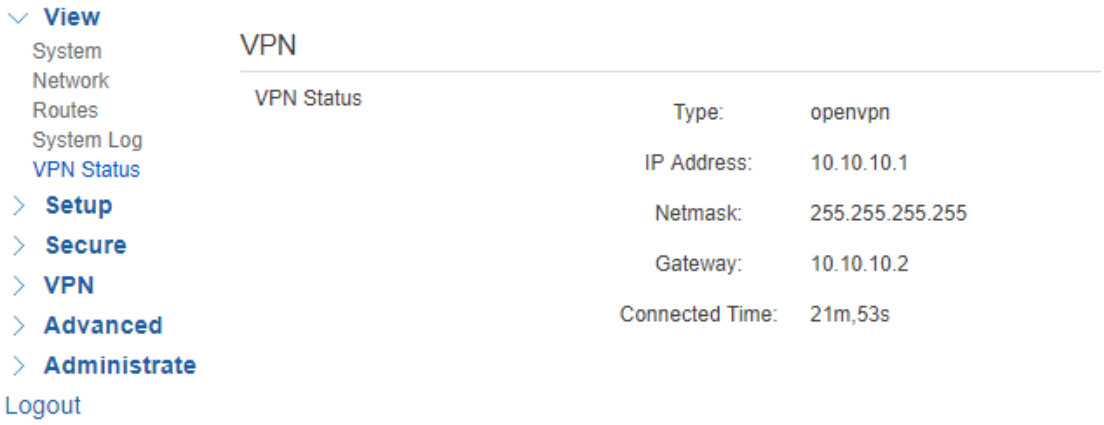
Display system log.



3.1.5 VPN Status

Display VPN status.

Bivocom TG463 supports IPsec, PPTP, L2TP, OpenVPN, GRE protocols, after it's successfully connected to your VPN server, it'll display some info as below, such as, Type, Connect Status, Uptime, Subnet Mask, etc.



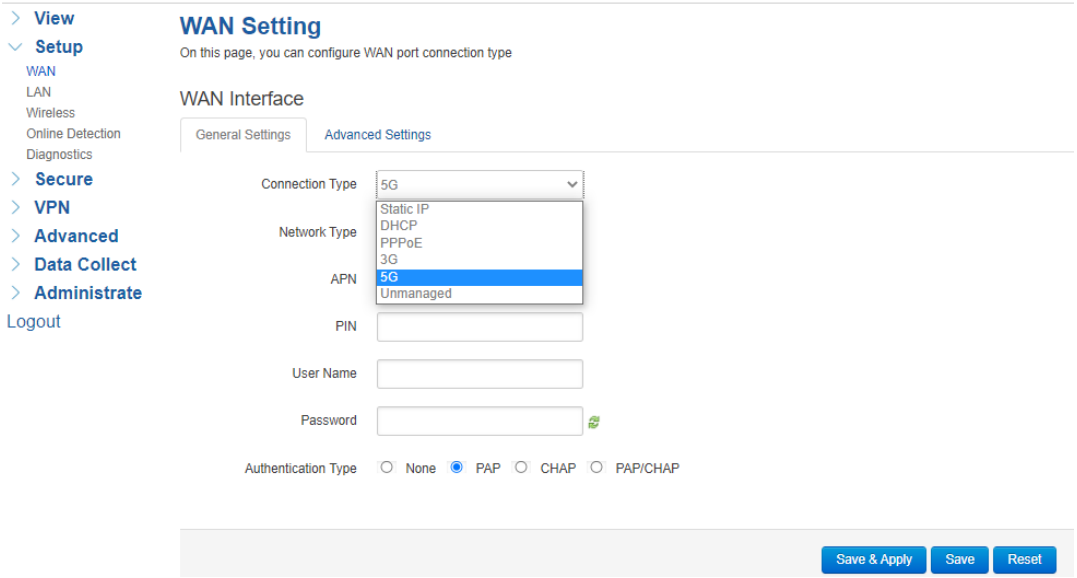
3.2 Setup

Main menu of this page includes, WAN, LAN, Wireless, Online Detection, Diagnostics.

3.2.1 WAN

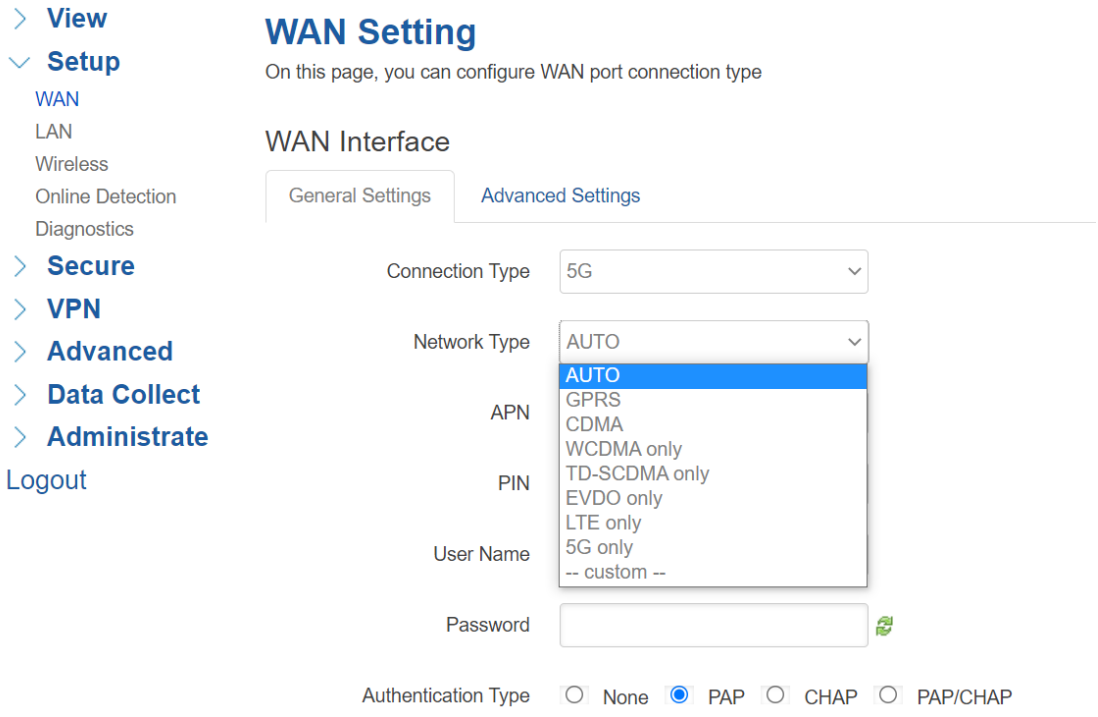
1) Connection Type

WAN supports DHCP/Static IP/PPPoE/3G/4G/5G connection type.
Choose the mode you need to configure the related parameters, then you can connect to the internet.
Below we take cellular type(5G) as an example.



2) Network Type

Type of network, the default value is AUTO, you can keep it or choose your own preference, including 5G only, LTE only, 3G only, etc.



3) APN

For standard SIM card, just keep it as blank, while If you're using SIM card with APN required, then you have to input the APN from your Telco, and different Telco might have different APN, please ask your Telco if you have no idea of what your APN is.

4) PIN

PIN code of SIM card, normally, just keep it as blank, so please use it carefully, or the SIM card may be locked.

5) PAP/CHAP Username

Only for private network SIM card, if you're using public network SIM card, just keep it as blank.

6) PAP/CHAP Password

Only for private network SIM card, if you're using public network SIM card, just keep it as

blank.

7) Authentication Type

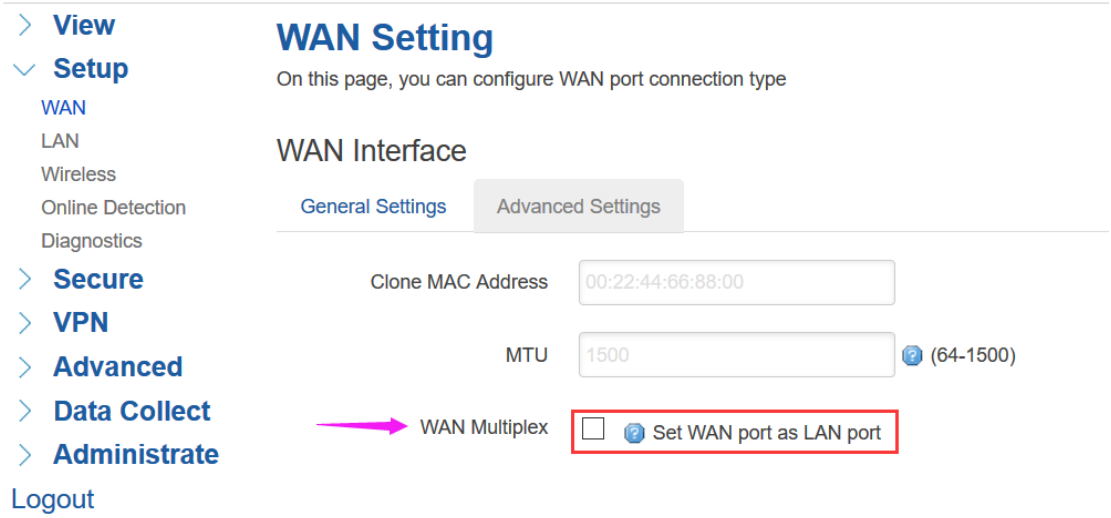
If there have username and password, you need to choose authentication type.
Normally, just keep it as default.

- PAP, Plaintext Authentication
- CHAP, Handshake authentication

You need to choose the authentication type according to Telco's network, or you may fail to dial up.

8) WAN Used As LAN

When you use 5G/4G/3G/2G cellular network to access internet, you can go to "Advanced Settings" to change the WAN to act as a LAN port.

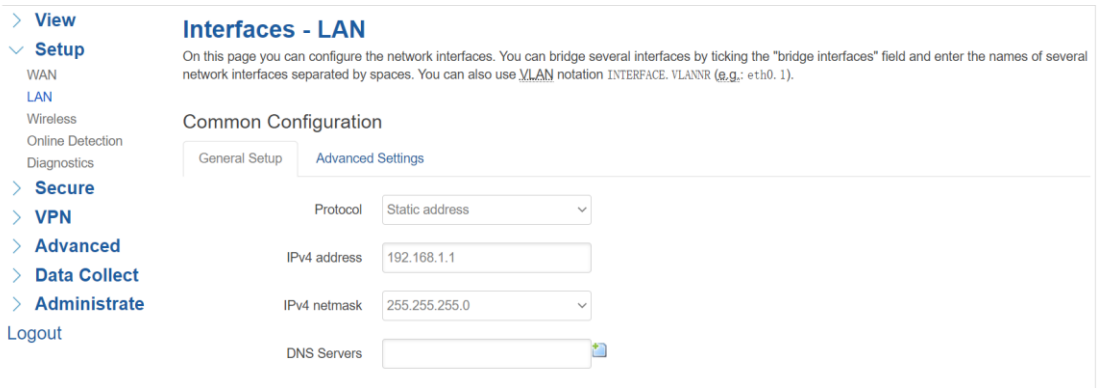


3.2.2 LAN

Menu of LAN are mainly for configuring IP address of router, enabling DHCP server, and assign the IP address.
The meaning of the parameters are as follows.

1) IPv4 Address

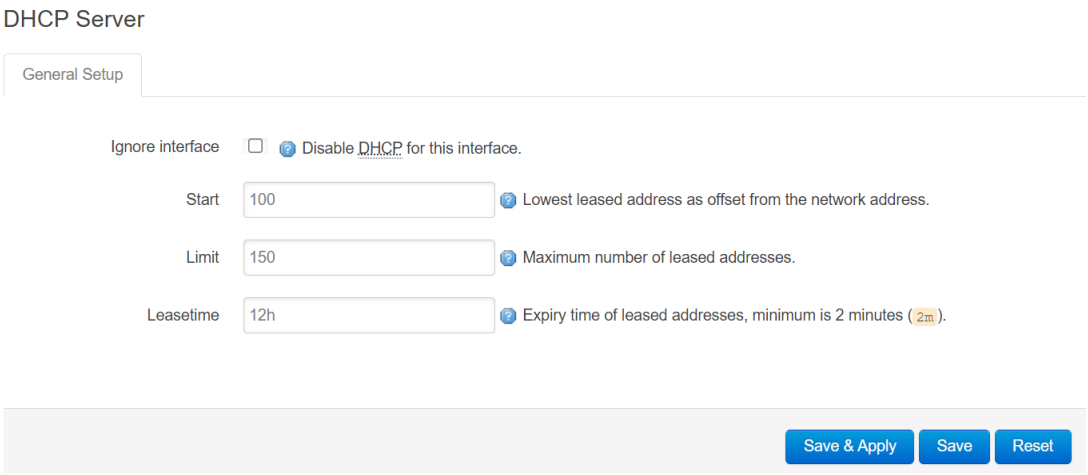
To configure IP address of LAN port, default value is 192.168.1.1, which is also the login IP address when you want to enter into the web config page, so you can change the IP address of LAN yourself.



2) IPv4 Netmask

The netmask of LAN port IP address.

3) DHCP Server



- **Disable DHCP**

Click to disable DHCP server.

- **Start**

Assign the IP address of DHCP server. For example, 100 means IP address starts from 192.168.1.100.

- **Limit**

Assignable number of IP address, to ensure numbers of IP address of start and limit not exceed 250.

- **Lease time**

Time of assigning the IP address.

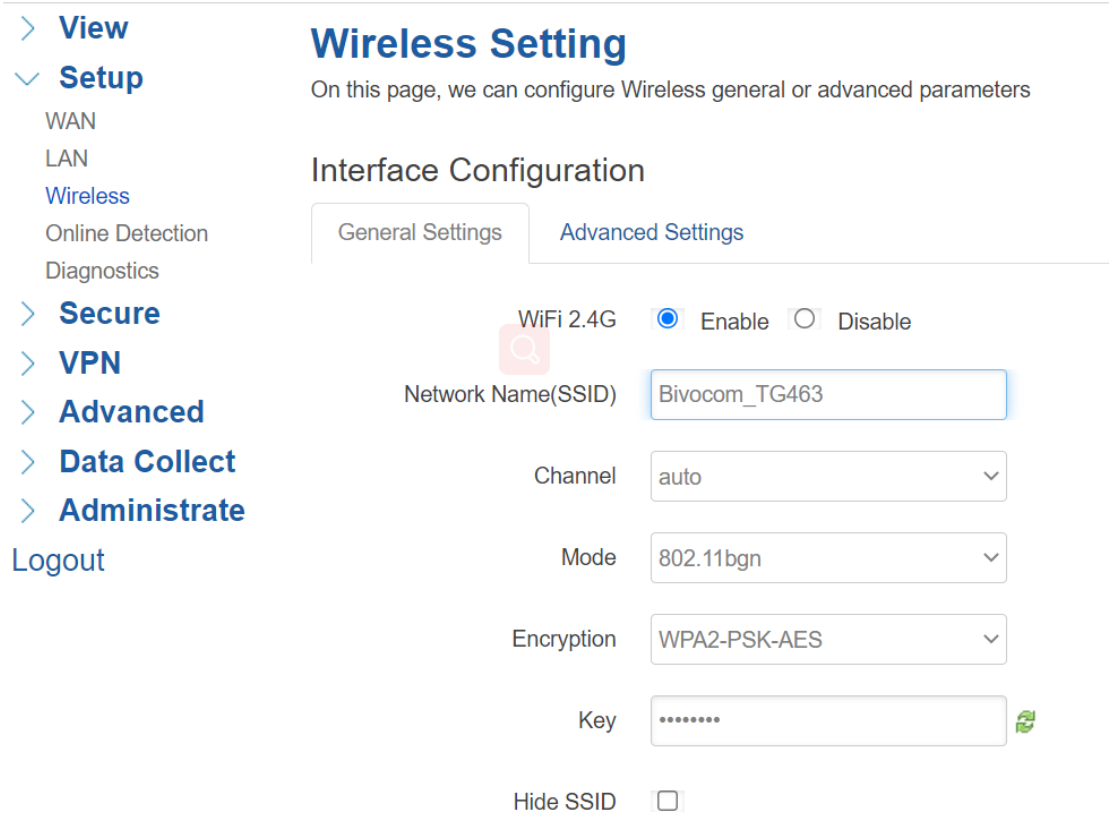
3.2.3 Wireless

Menu of wireless are mainly for configuring parameters of WIFI hotspot, such as, SSID, work mode, password, etc.

Note: standard package of TG463 only supports 2.4G WIFI, if you need dual band WIFI, please ask Bivocom representative for more info when place the order.

WIFI 2.4G

Click 'Enable', to enable the WIFI function.



1) Network Name（SSID）

WIFI hotspot name.

2) Channel

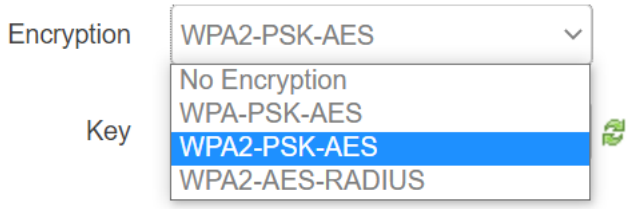
Support 1-13 channels, default value is auto, channel can be changed automatically.

3) Mode

Support 802.11b, 802.11g, 802.11bgn, and default value is 802.11bgn.
802.11b up to 11Mbps, 802.11g up to 54Mbps and 802.11n up to 300Mbps.

4) Encryption

You can choose different encryption type as below.



5) Key

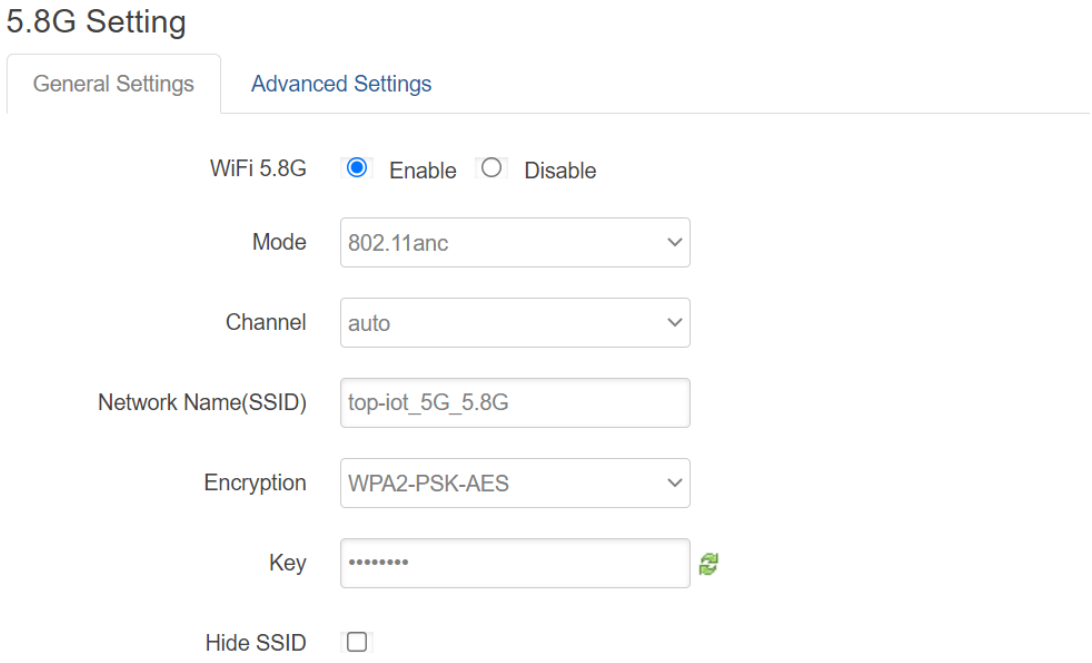
Password of WIFI hotspot, user needs to input it to access the internet shared by WIFI. The minimum length of password is 8 bytes.

6) Hide SSID

When Hide SSID enabled, SSID is invisible, and user need to enter the SSID to access the WIFI hotspot.

5.8G Setting(Option)

5.8G WIFI is an optional feature, if you choose the dual band WIFI version, below are some parameters of 5.8G WIFI you'll configure.
Click 'Enable', to enable the WIFI function.



1) Mode

Support 802.11a, 802.11an, 802.11ac and 802.11anc, and default value is 802.11anc.

2) Channel

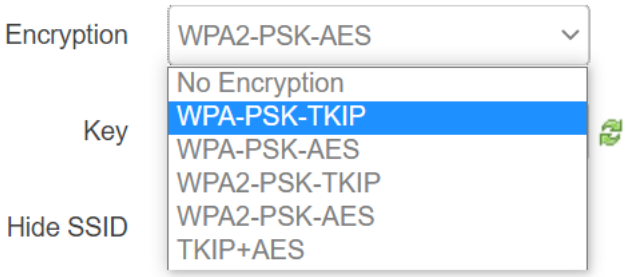
Support 149, 153, 157, 161, 165 channels, default value is auto, channel can be changed automatically.

3) Network Name（SSID）

WIFI hotspot name.

4) Encryption

You can choose different encryption type as below.



5) Key

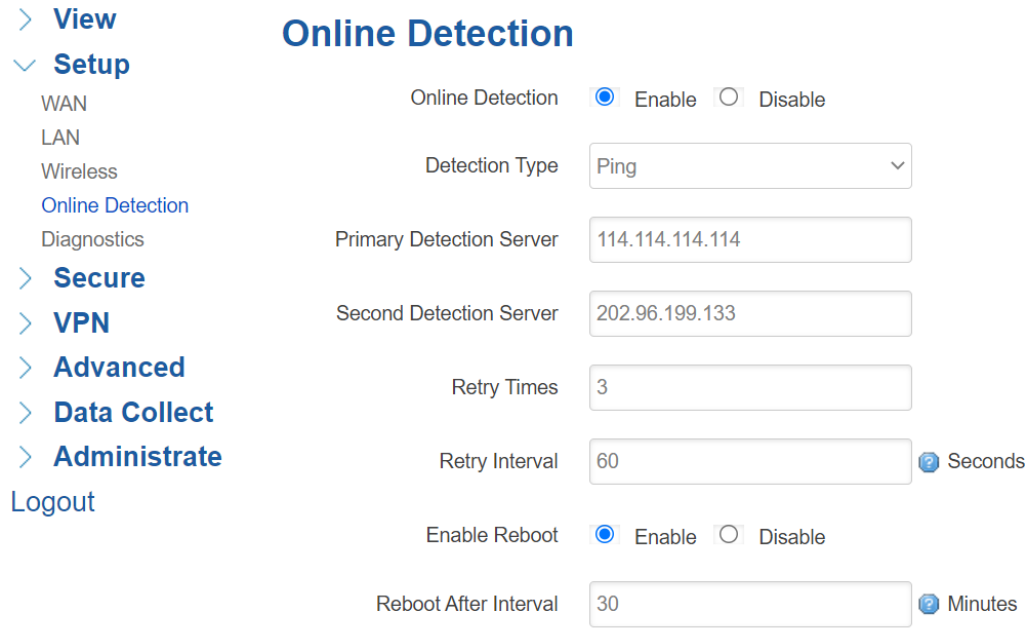
Password of WIFI hotspot, user needs to input it to access the internet shared by WIFI. The minimum length of password is 8 bytes.

6) Hide SSID

When Hide SSID enabled, SSID is invisible, and user need to enter the SSID to access the WIFI hotspot.

3.2.4 Online Detection

Online detection will auto check the internet connection status of the router, if there has issue of connection, router will auto reconnect. If it fails to reconnect after times of trial, router will reboot, to ensure getting online.
The meaning of the parameters are as follows.



1) Detection Type

There are 3 types: ping, traceroute and DNS.

- **Ping**

Router will ping an IP address or DNS, if works, that means router is online.

- **Traceroute**

Traceroute will trace routing path, if achieves the target address, that means router is online.

- **DNS**

DNS will analytic a domain, if it works, that means router is online.

Note: the default setting is Ping, which is highly recommended, as traceroute will cost dataflow of SIM card, while DNS is faster, but as it has cache, it may show the router is online even it is offline.

2) Primary Detection Server

It can be an IP address or a Domain Name configured by youself.

3) Second Detection Server

If primary detection server fails, then router will auto switch to second detection server.

4) Retry Times

You can set up retry time in case detection fails.

5) Retry Interval

The interval time between 2 detections.

6) Enable Reboot

Click enable, and router will reboot within the time set if it fails to reconnect.

7) Reboot After Interval

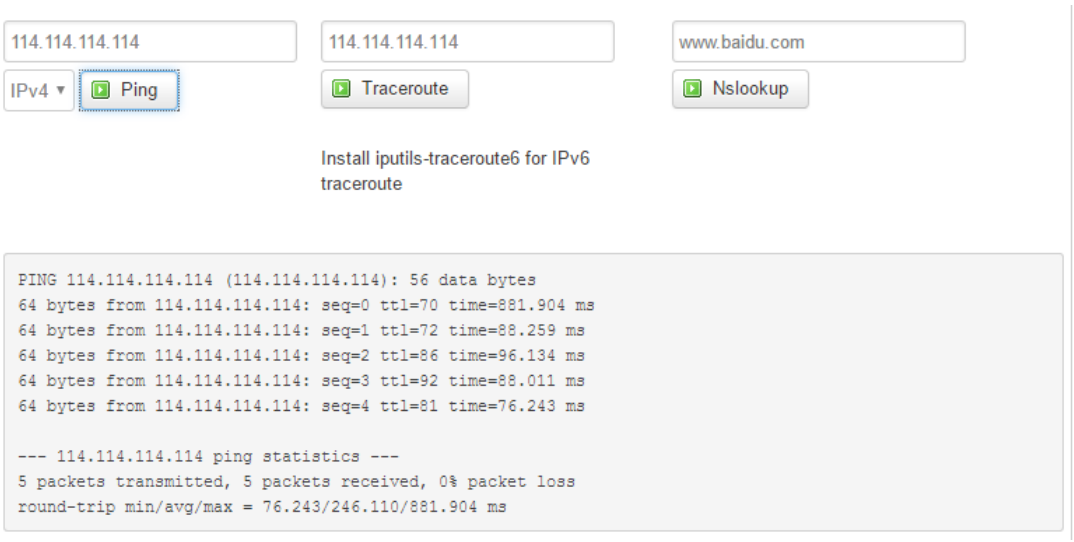
You can specify the time for offline, to reboot the router.

3.2.5 Diagnostics

There are 3 types of diagnostics: ping, traceroute and nslookup
Parameter of ping and traceroute can be a Domain Name or an IP address, used for checking if router is online or not. While nslookup is to analytic domain.

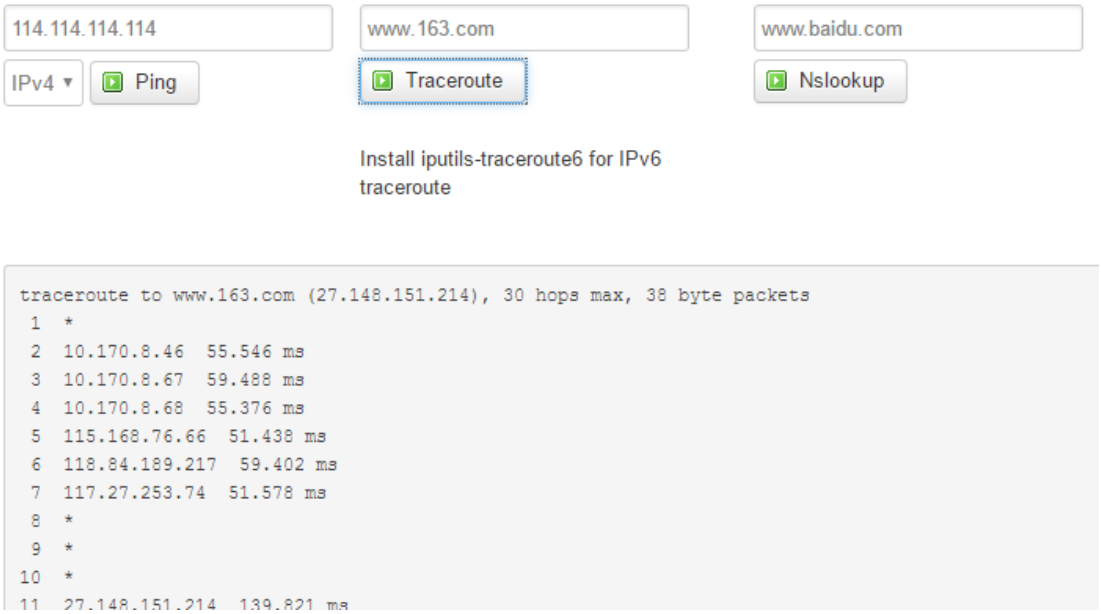
1) Ping

Click ping, then you can check if there is response from an IP address, as bellow.



2) Traceroute

Click traceroute, then you can see similar reponse as below.



3) Nslookup

Click nslookup, then you can see similar reponse as below.

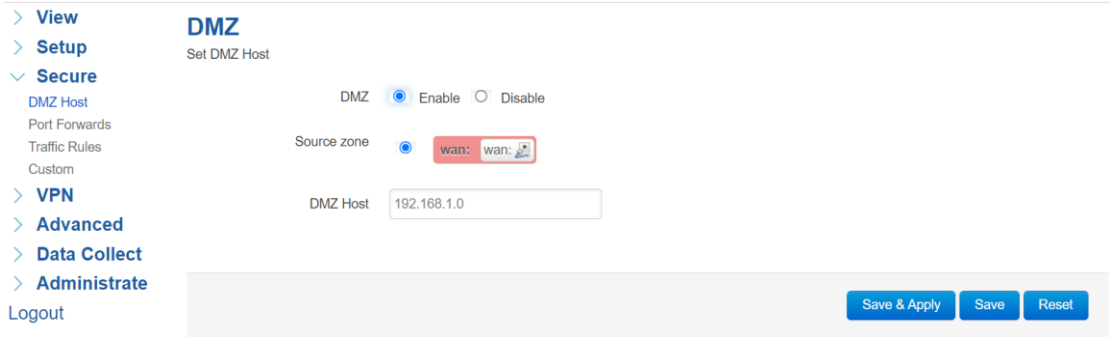

```
Server:    127.0.0.1
Address 1: 127.0.0.1 localhost

Name:      www.baidu.com
Address 1: 14.215.177.38
Address 2: 14.215.177.37
```

3.3 Secure

Menu of Secure are for configuring the firewall, to ensure the security of accessing to internet, and implement the port forwarding, access control, data packet filtering, and other functions.

3.3.1 DMZ Host

DMZ can forward the port of WAN to a host of LAN; all packet from WAN will be forwarded to specified host of LAN.



1) DMZ

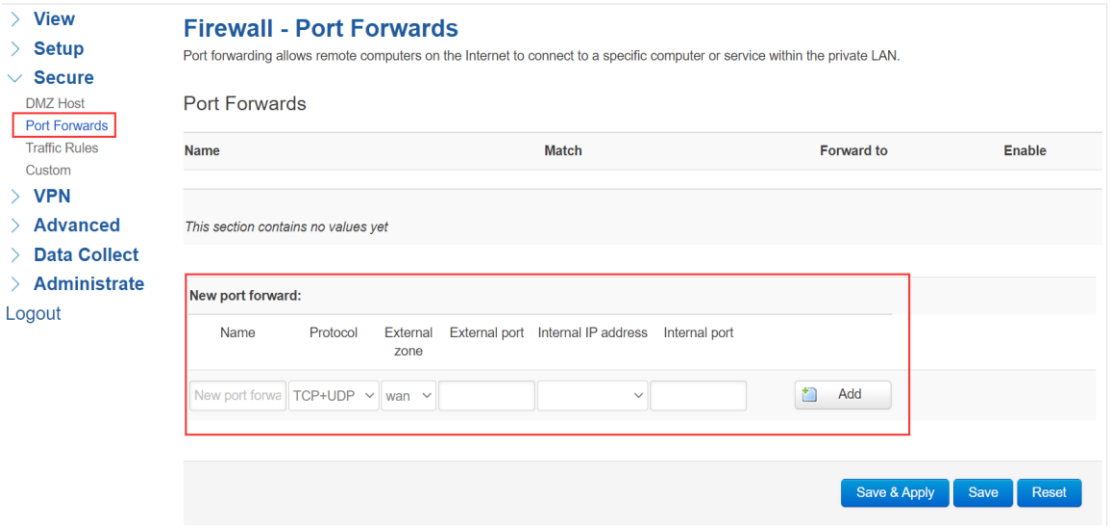
You can enable or disable the DMZ.

2) DMZ Host

An IP address of a host of LAN you want to map.

3.2.2 Port Forwarding

Comparing with DMZ, Port Forwarding is for more precise control, user can forward the data packet of a port to a host of LAN, to forward different port to different host.



1) Name

You can name the rule you created.

2) Protocol

You can choose TCP, UDP, or TCP/UDP.

3) External Port

Destination port before port forwarding.

4) Internal IP Address

The Host IP address to forward.

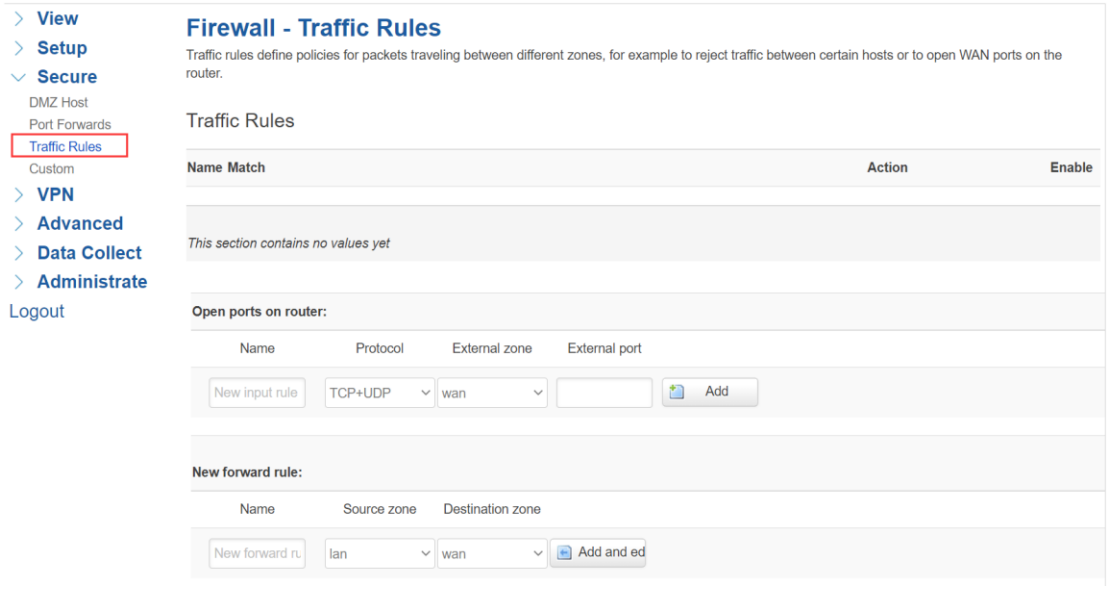
5) Internal Port

The destination port after port forwarding. Normally, external port and internal port are the same, but also can be different.

After configured above-mentioned, click ‘Add’, then a new rule will be added, and click ‘Save & Apply’, to have the rule take effect.

3.3.3 Traffic Rules

Traffic rules is used for opening some router ports, such as remote access the configuration page of router, you can open port 80; for remote SSH connection, you can open port 22.



1) Name

You can name the rule yourself.

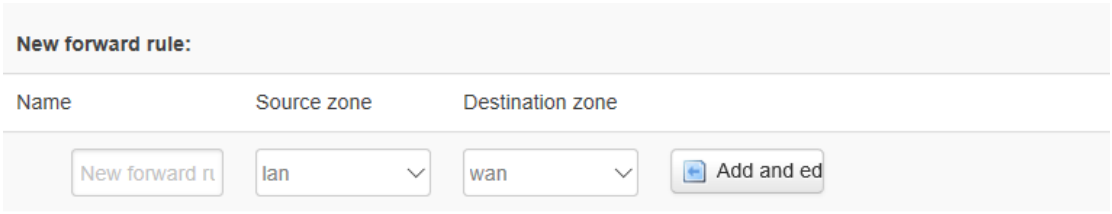
2) Protocol

Choose the protocol of you want to forward can be TCP, UDP, or TCP/UDP.

3) External Port

Choose the port you want to open.

In addition, traffic rule can be used for creating some access control rules, it can be from LAN to WAN, or WAN to LAN.



1) Name

You can name the rule yourself.

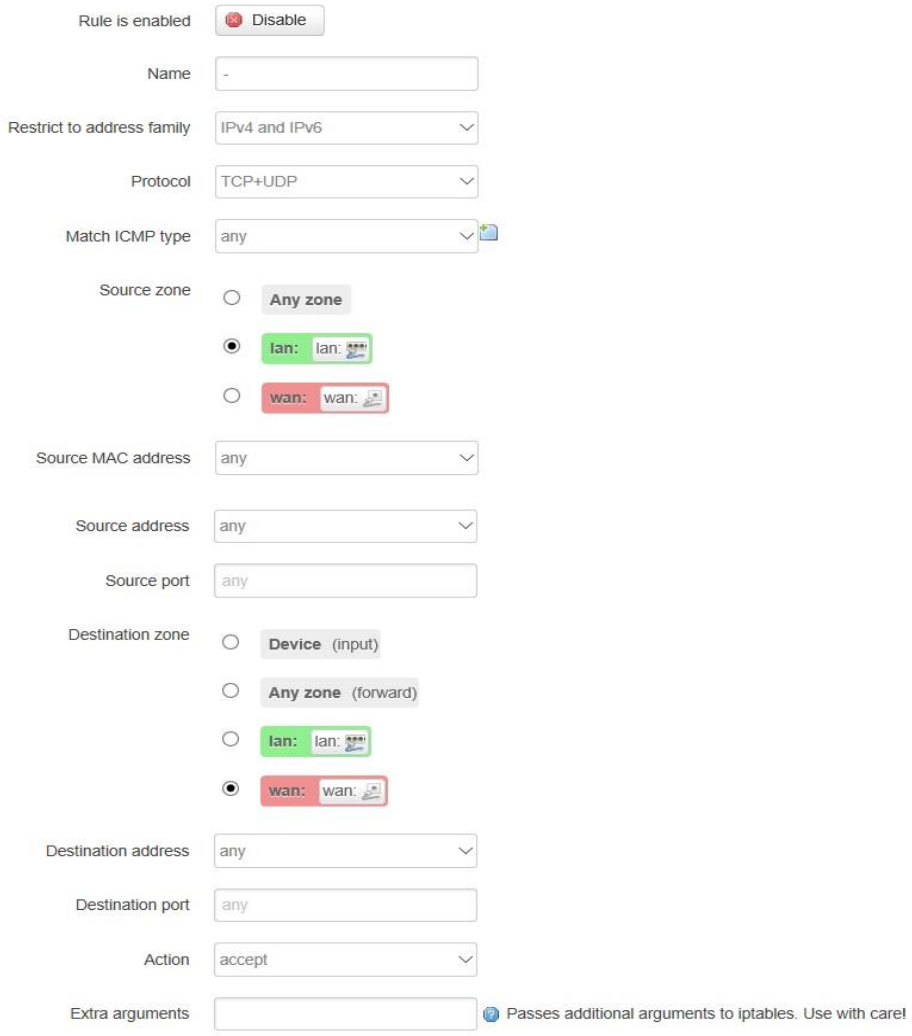
2) Source Zone

You can choose where to start the data packet.

3) Destination Zone

You can choose where to forward the data packet.

Click 'Add and Edit', then you can get more detailed matching condition.



1) Restrict to Address Family

You can choose IPv4, IPv6, or Pv4/IPv6.

2) Protocol

To choose the protocol you want for access control, it can TCP, UDP, ICMP or TCP/UDP.

3) Source MAC Address

To choose the source MAC address of data packet.

4) Source Address

To choose the source IP address of data packet.

5) Source Port

To choose the source port of data packet.

6) Destination Address

To choose the destination IP address of data packet.

7) Destination Port

To choose the destination port of data packet.

8) Action

If the above-mentioned conditions matched, then you can choose below actions.

- **Accept**

Allow data packet to go through.

- **Drop**

Drop data packet

- **Reject**

Drop data packet, and return an unachievable data packet.

- **Don’t Track**

No action.

3.3.4 Custom

Custom rules allow you to execute arbritary iptables commands which are not otherwise covered by the firewall framework. The commands are executed after each firewall restart, right after the default ruleset has been loaded.
Users can also customize some firewall rules themselves, as those rules is consisted of iptable, we suggest users that are familiar with iptables command to do this. When you add rules, please add them at the bottom of existing rules, and don’t delete them.

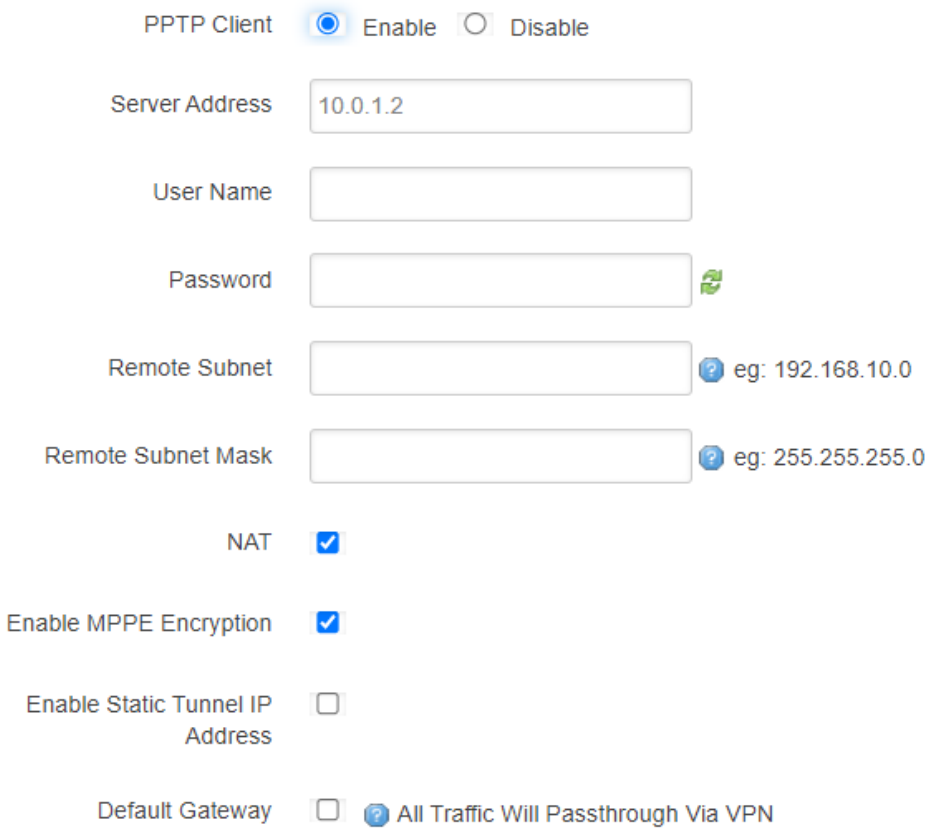
3.4 VPN

VPN is used to establish a virtual private channel, and all the data in this channel will be encrypted to ensure that data security during transmission.
TG463 support VPN: PPTP, L2TP, OpenVPN and IPSec. PPTP/L2TP are layer 2 VPN, and OpenVPN is VPN based on SSL, while IPSec is layer 3 VPN. PPTP/L2TP are more convenient to use, while OpenVPN and IPSec is more complex, as they need complex certification management, meanwhile, they offer more secured encrypted data.

3.4.1 PPTP

You can configure either PPTP client or PPTP server, but not both of them at the same time, as that may cause uncertain issues.

1) PPTP Client



1. PPTP Client

You can enable or disable PPTP client.

2. Server Address

To enter the IP address or Domain Name of PPTP server.

3. User Name and Password

To enter the user name and password provided by server.

4. Remote Subnet

To enter the remote subnet, for example, if LAN of PPTP server is 192.168.2.1, then you can enter remote subnet 192.168.2.0.

5. Remote Subnet Mark

To enter the remote subnet mask, normally it is 255.255.255.0.

6. NAT

If click NAT, all packets come from ppp0, and the source IP of the packets will be replaced as IP of ppp0.

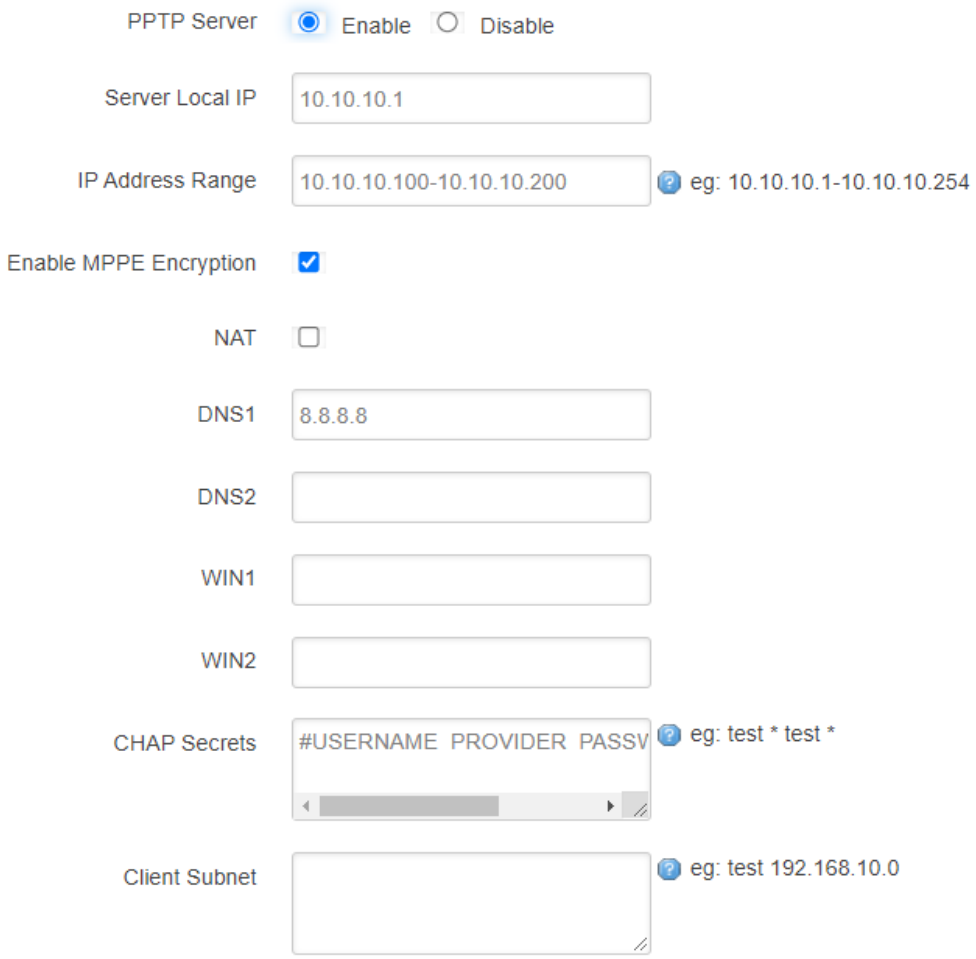
7. Enable MPPE Encryption.

You can enable MPPE encryption here.

8. Default Gateway

Click Default Gateway, then a default route will be established under ppp0, and all the data will go through this route.

2) PPTP Server



1. PPTP Server

You can enable or disable PPTP server.

2. Server Local IP

To enter the server local IP address.

3. IP Address Range

Type the range of assigned IP address.

4. Enable MPPE Encryption.

You can enable MPPE encryption here.

5. DNS1/DNS2

To enter the assigned DNS address.

6. WIN1/WIN2

To enter the WIN address.

7. CHAP Secrets

To create a username and password under CHAP Secrets, format as below,

Username<space>*<space>password<space>*

For example, if you want to create a username: test, password: test, it is as below,

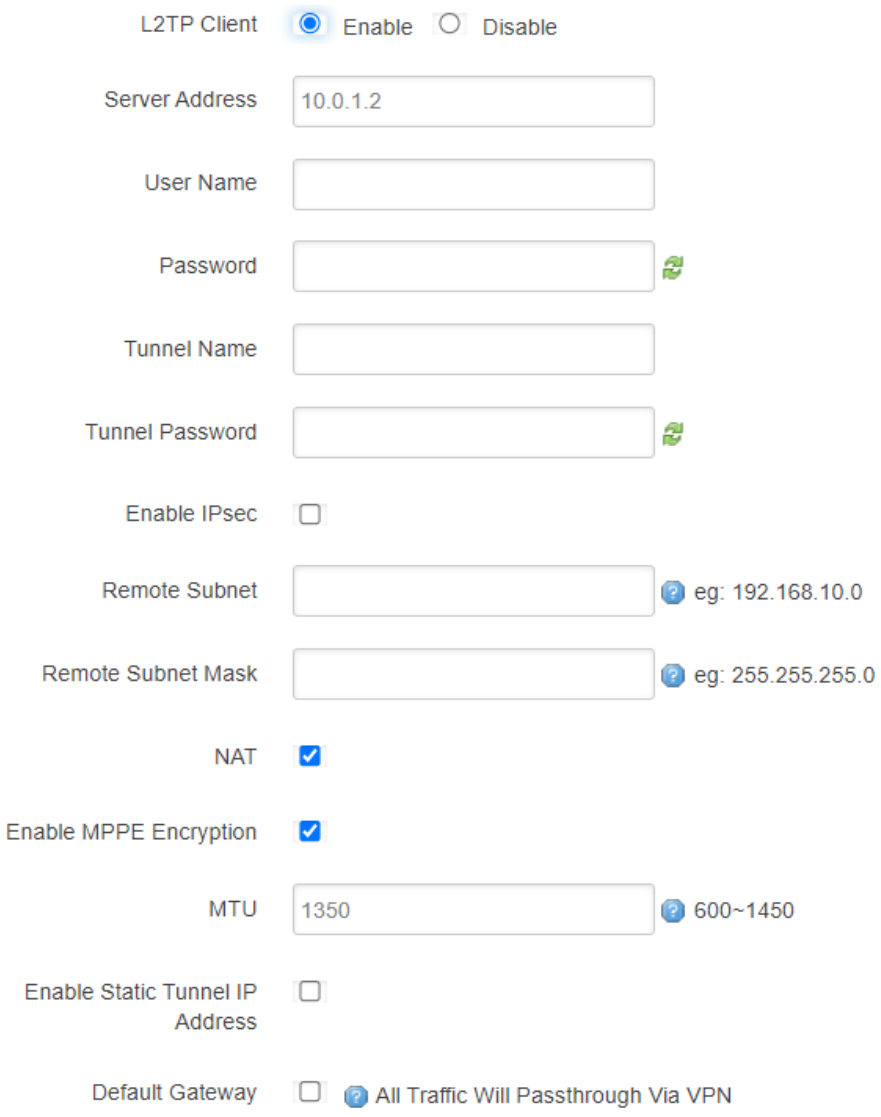
Test * testing *

Please ask for Bivocom support if you need an example of how to set up the PPTP client and server work mode.

3.4.2 L2TP

You can also configure either L2TP client or L2TP server, but not both of them at the same time, as that may also cause uncertain issues.

1) L2TP



Client

1. L2TP Client

You can enable or disable L2TP client.

2. Server Address

To enter the IP address or Domain Name of L2TP server.

3. User Name and Password

To enter the user name and password provided by server.

4. Remote Subnet

To enter the remote subnet, for example, if LAN of L2TP server is 192.168.2.1, then you can enter remote subnet 192.168.2.0.

5. Remote Subnet Mark

To enter the remote subnet mask, normally it is 255.255.255.0.

6. NAT

If click NAT, all packets come from ppp0, and the source IP of the packets will be replaced as IP of ppp0.

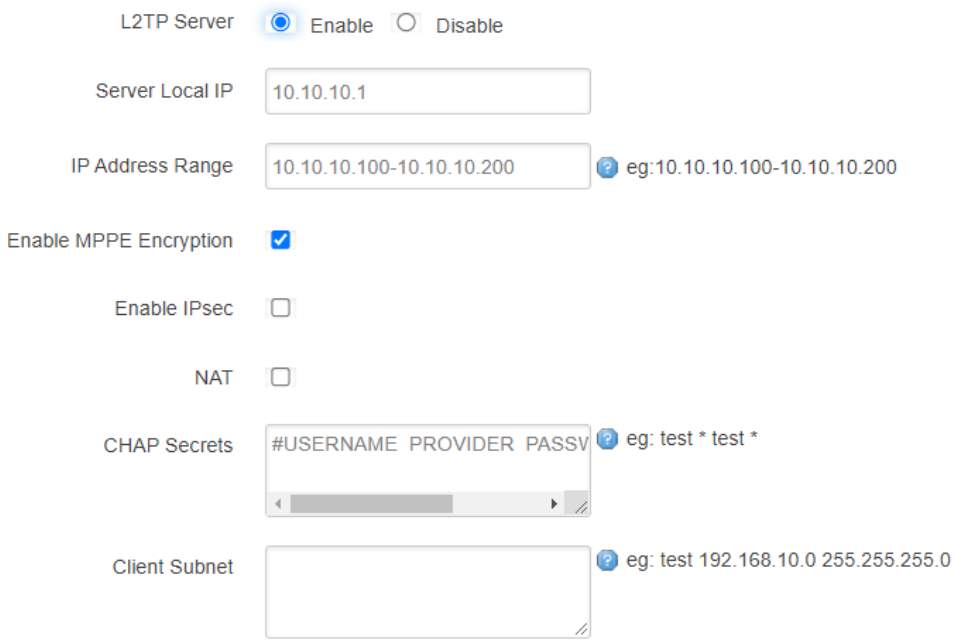
7. Enable MPPE Encryption.

You can enable MPPE encryption here.

8. Default Gateway

Click Default Gateway, then a default route will be established under ppp0, and all the data will go through this route.

2) L2TP Server



1. L2TP Server

You can enable or disable L2TP server.

2. Server Local IP

To enter the server local IP address.

3. IP Address Range

Type the range of assigned IP address.

4. Enable MPPE Encryption.

You can enable MPPE encryption here.

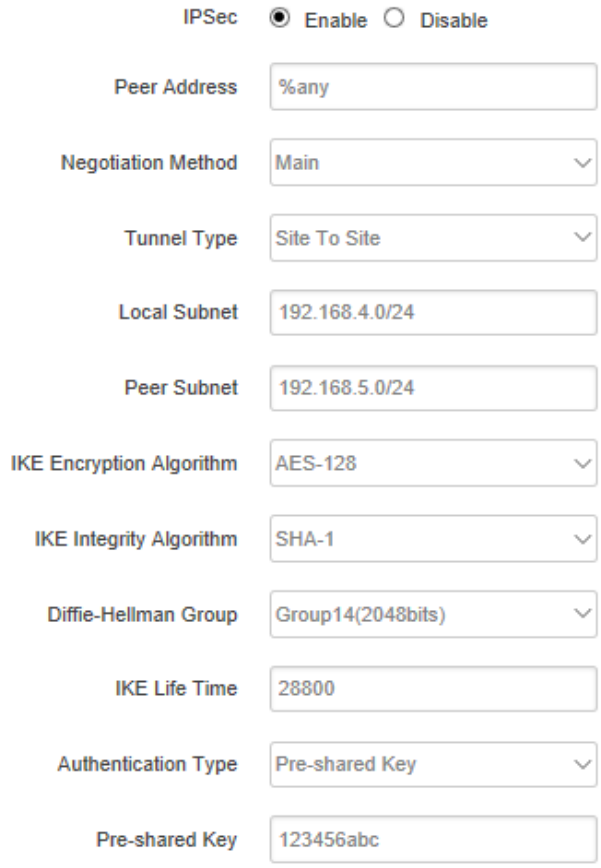
5. CHAP Secrets

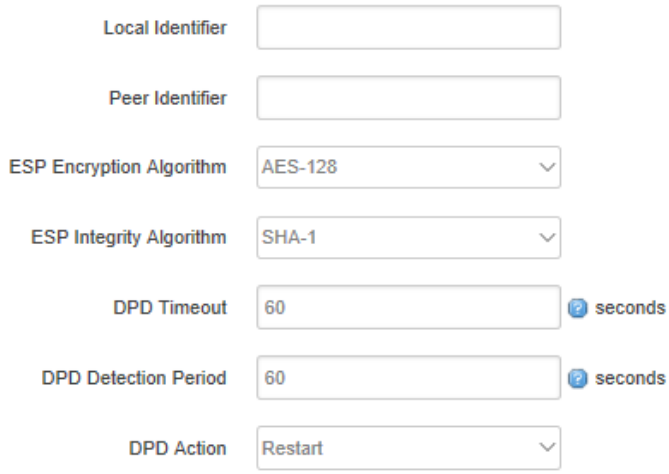
To create an username and password under CHAP Secrets, format as below,
Username<space>*<space>password<space>*
For example, if you want to create a username: test, password: test, it is as below,
Test * test *

Please ask for Bivocom support if you need an example of how to set up the L2TP client and server work mode.

3.4.3 IPSec

On IPSEC page, system will display the IPSEC connection and status.





1) Peer Address

To enter peer IP address or Domain Name, if TG463 chosen as an IPsec server, you don't need to input it.

2) Negotiation Method

You can choose 'Main' or 'Aggressive'.

3) Tunnel Type

You can choose 'Site to Site, 'Site to Host', 'Host to Host', 'Host to Site'.

4) Local Subnet

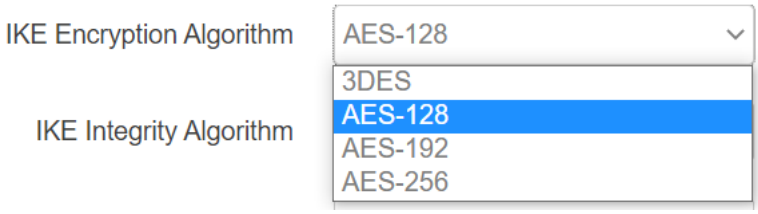
Local subnet and mask, like 192.168.10.0/24.

5) Peer Subnet

Peer subnet and mask, like 192.168.20.0/24.

6) IKE Encryption Algorithm

IKE phase encryption method



7) IKE Lifetime

To set up IKE lifttime.

8) Local Identifier

Local identifier of channel, can be an IP address or domain name.

9) Peer Identifier

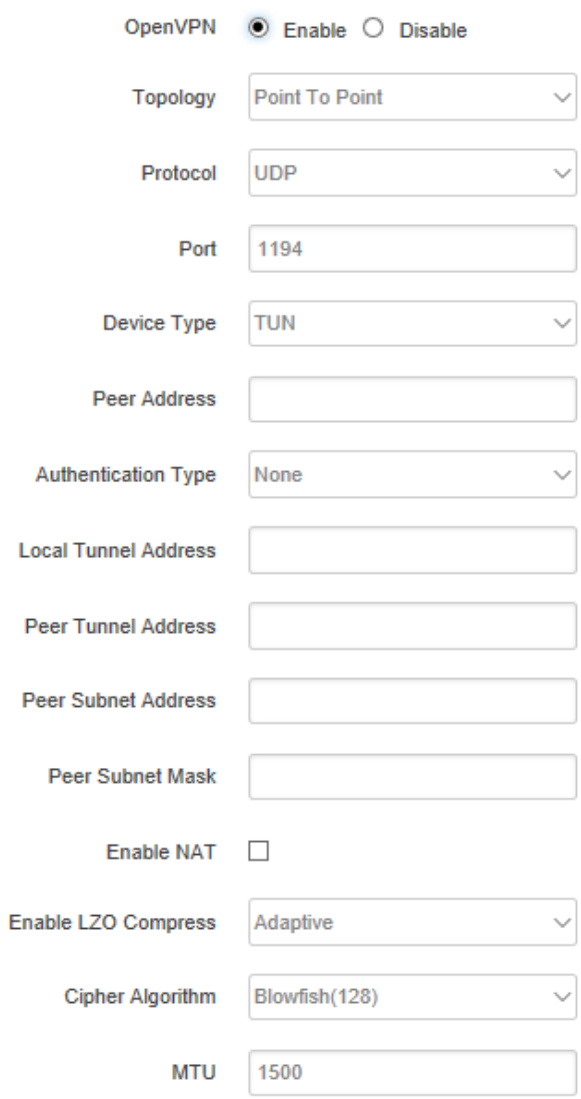
Peer identifier of channel, can be an IP address or domain name.

10) ESP Encryption Algorithm

The encryption method of ESP.

For more info about how to set up IPsec, please contact Bivocom support to get quick guide.

3.4.3 OpenVPN



1) OpenVPN

You can enable or disable OpenVPN.

2) Topology

Choose the topology, it can be point to point or subnet

Note: For point to point, a tunnel will be established between 2 devices.

While for subnet, multi devices will be connected to one server.

3) Role

When topology is subnet, you need to choose you want it be a server or client.

4) Protocol

Choose the protocol, it can be UDP or TCP, default is UDP.

5) Port

Enter the port you want to assign to OpenVPN, default port is 1194.

6) Device Type

Choose device type, there are 2 types to choose, TUN and TAP. TUN is layer 3 data encapsulation, while TAP is layer 2 data encapsulation.

7) OpenVPN Server

When you choose server in 角色, you need to enter an IP address or domain name of server.

8) Authentication Type

If topology is subnet, authentication type is certification. If it is point to point, you can choose none, certificate or static secret.

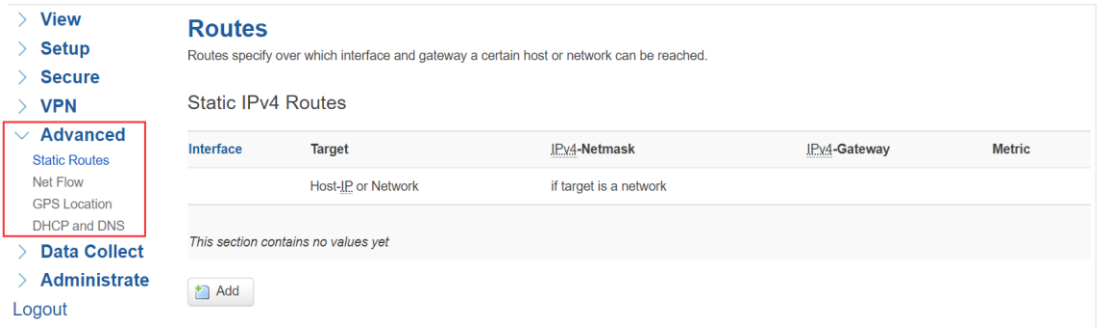
9) TLS Role

When topology is point to point, and authentication type is certification, you need to choose if it is server or client.

For more info, please contact Bivocom support to get quick guide.

3.5 Advanced

You can set up some advanced functions here.



3.5.1 Static Routing

Static routing is used to add a routing table entry.(Currently, only support IPv4)

Interface: To choose which interface you want to add routing, LAN or WAN.

Target: Can be a host IP, or subnet.

IPv4 Netmask: The netmask of subnet, if the target is host, the netmask shall be 255.255.255.255.

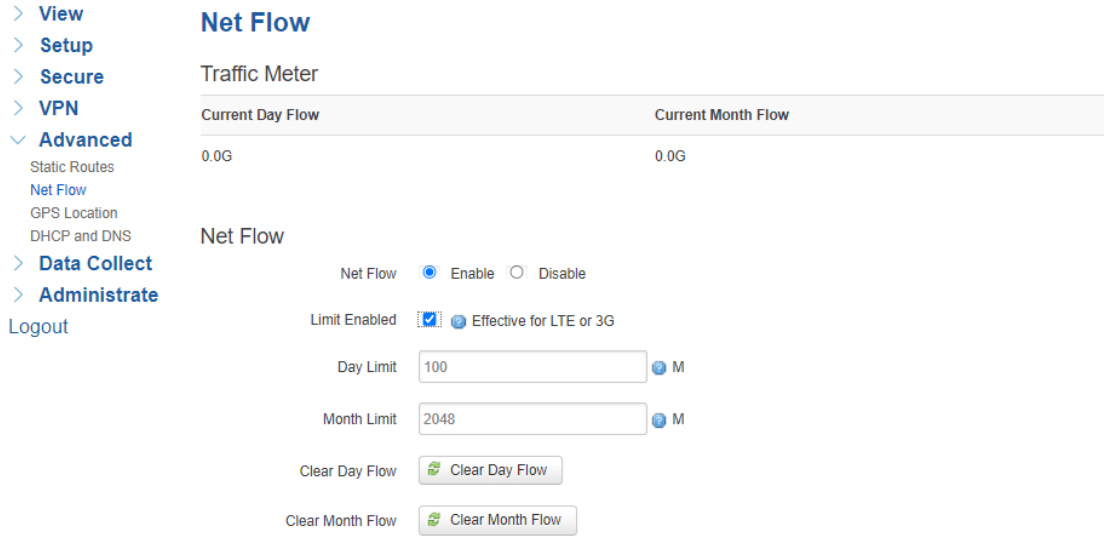
IPv4 Gateway: The address of next-hop gateway address.

Note: this address shall be achievable, or you'll fail to add static routing.

3.5.2 Net Flow

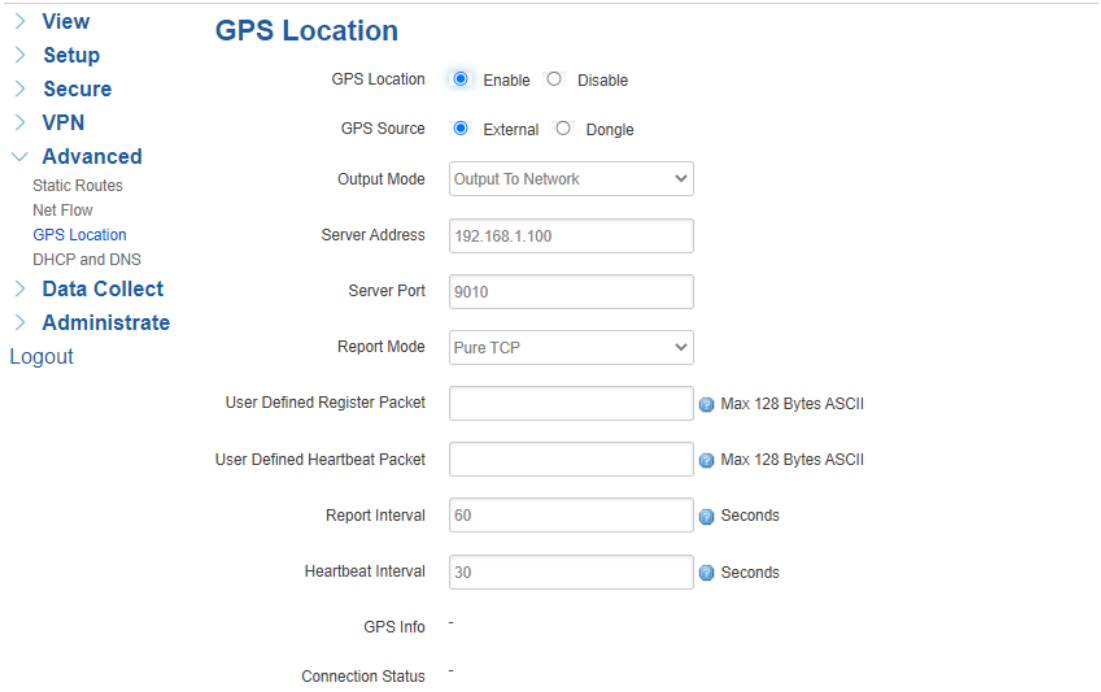
The traffic meter function of TG463 is for traffic statistics from WAN port, meanwhile, it has traffic overflow alarm function. Even if the router is powered off, the traffic statistics

will be saved, and when you power on the router, the traffic will be counted based on your last time traffic.



3.5.3 GPS Location(Option)

GPS location will report GPRMV information regularly, saying longitude and latitude information. And this function is used for accurate location of outdoor open area.



Server Address: The IP address of server that you want the router to report the location, which is based on TCP connection.

Server Port: The port of server.

Report Interval: The interval time for auto report of router location, default value is 60 seconds.

Note: GPS is an optional feature.

3.5.4 DHCP and DNS

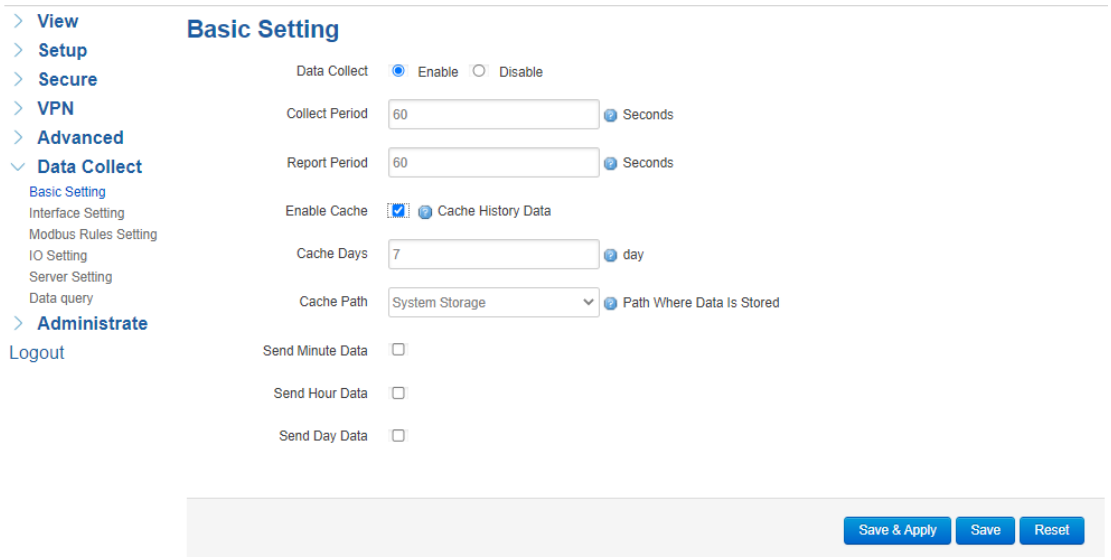
General DHCP and DNS settings base on Dnsmasq tool on TG463. Please refer to Dnsmasq for more information.

3.6 Data Collect

Data Collect settings is for TG463 acquiring data from slave devices in serial ports, Ethernet ports, IO ports, with Modbus protocol and other customized protocols.
Also support customize data display on LCD (only for TG462S).

3.6.1 Basic Setting

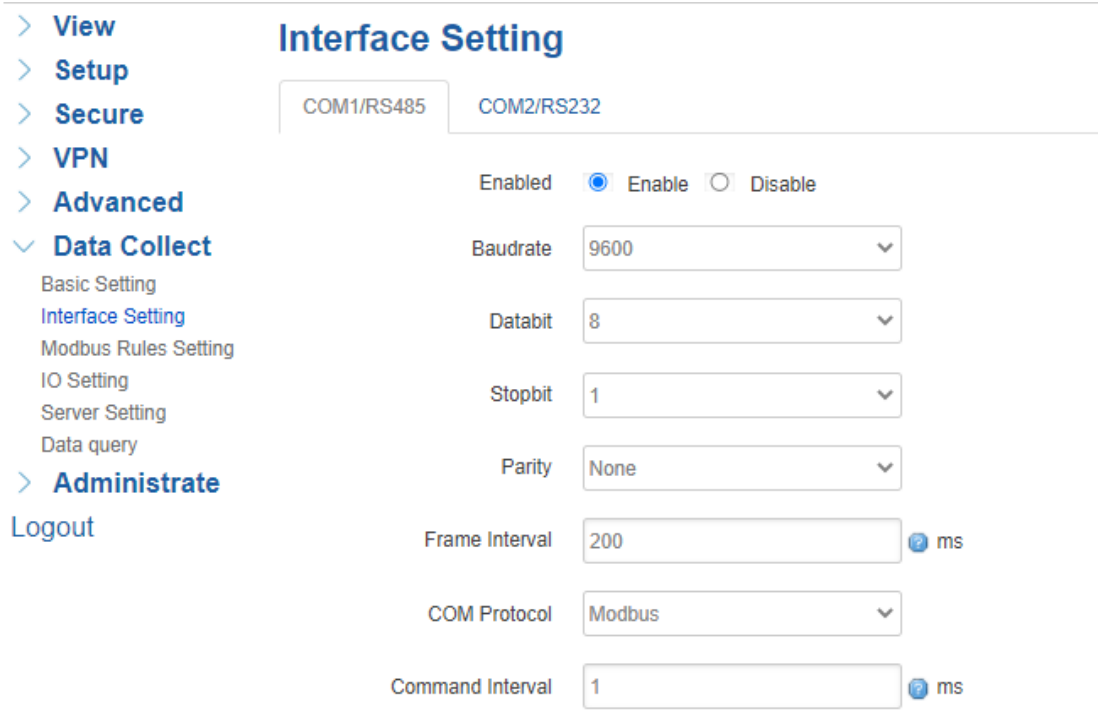
Enable or Disable the data collect feature, setting the data acquire and report period and other related options.



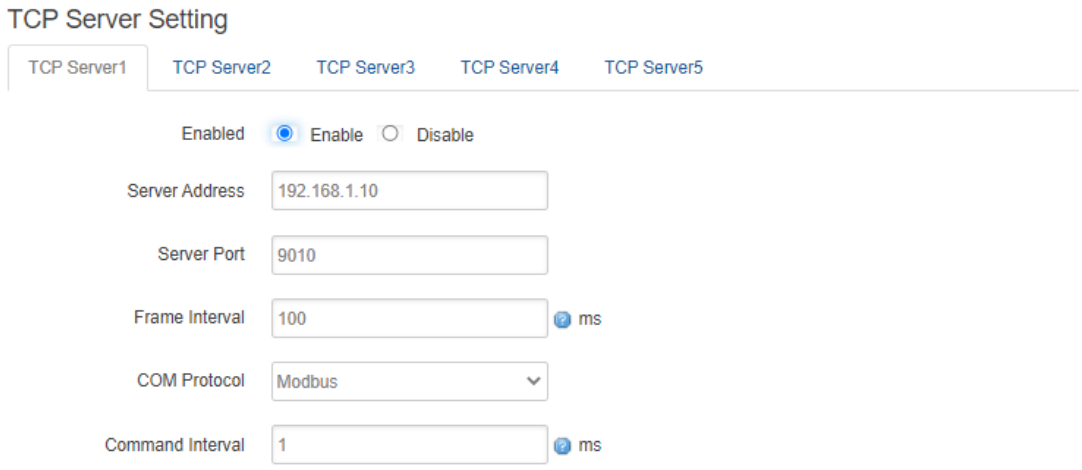
1) Data Collect: Enable or Disable data collect feature.
2) Collect Period: Set the period of data acquire from slave devices.
3) Report Period: Set the Period of data report to server.
4) Enable Cache: Enable or Disable history data cache feature.
5) Related data cache setting if enable the cache feature.

3.6.2 Interface Setting

TG463 has 2 serial ports, COM1(RS232) and COM2(RS485), and below are some parameters to configure, for protocols, it can be configured as Modbus or transparent mode depends on your application need.

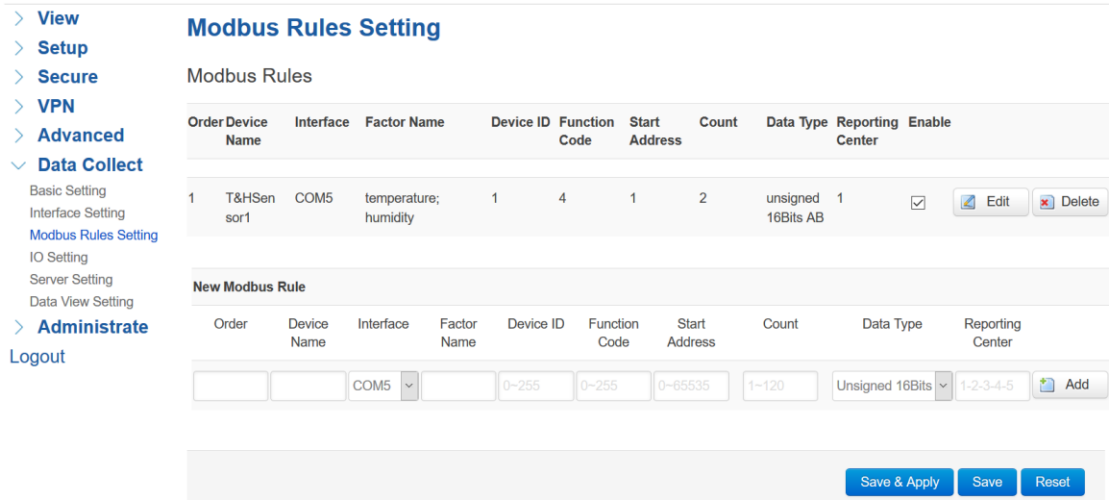


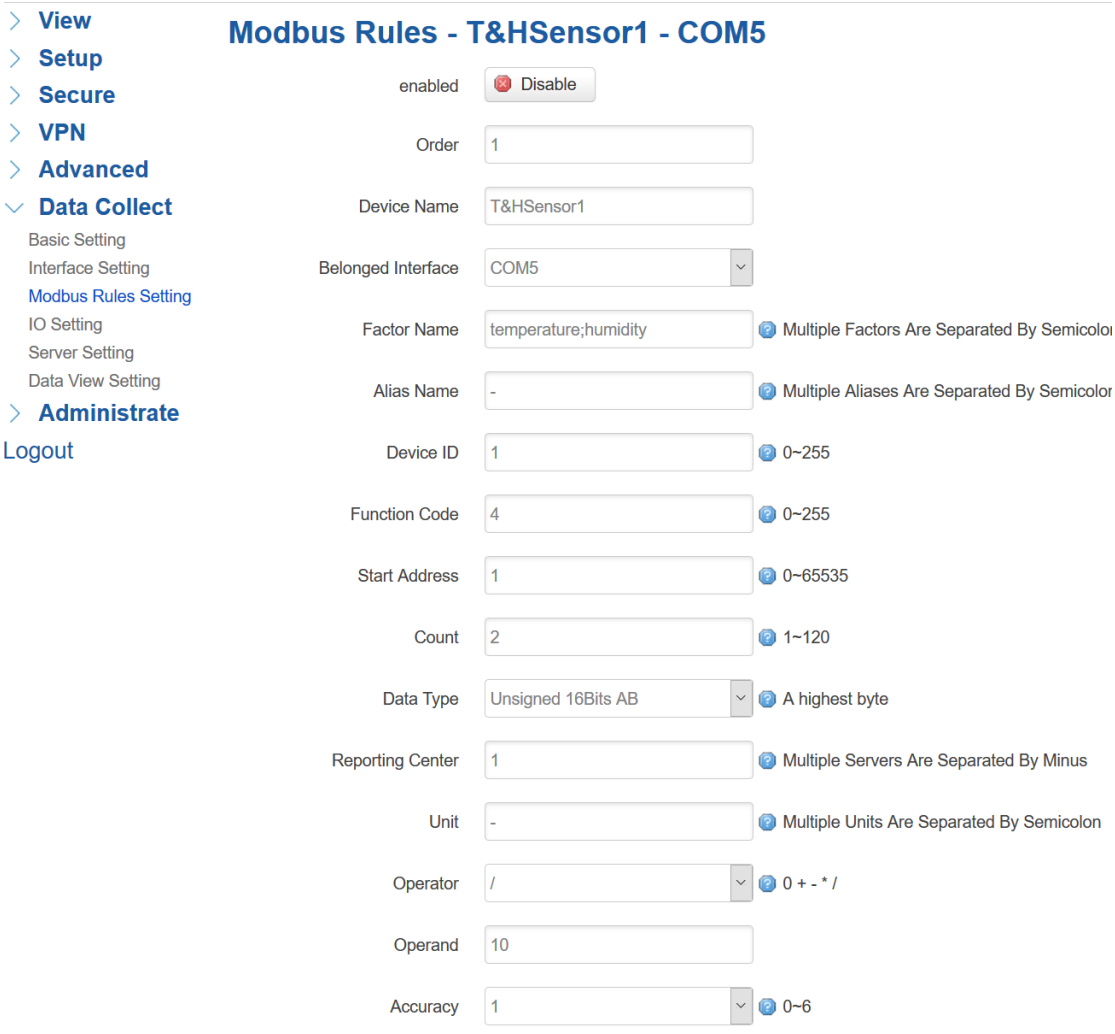
Besides, TG463 can connect up to 5 TCP server, which means you can receive the data from remote sites in different server, it's also backup solution for data storage at server.



3.6.3 Modbus Rules Setting

Modbus Rules Setting is for TG463 as a Modbus master to acquire data from slave devices base on Modbus protocol. You can configure Modbus rules on it. TG463 provides the options of definable factor name, device ID, function code, register address and count register number, please follow the slave device datasheet to get the information.
Below is an example of getting data from temperature and humidity sensor.

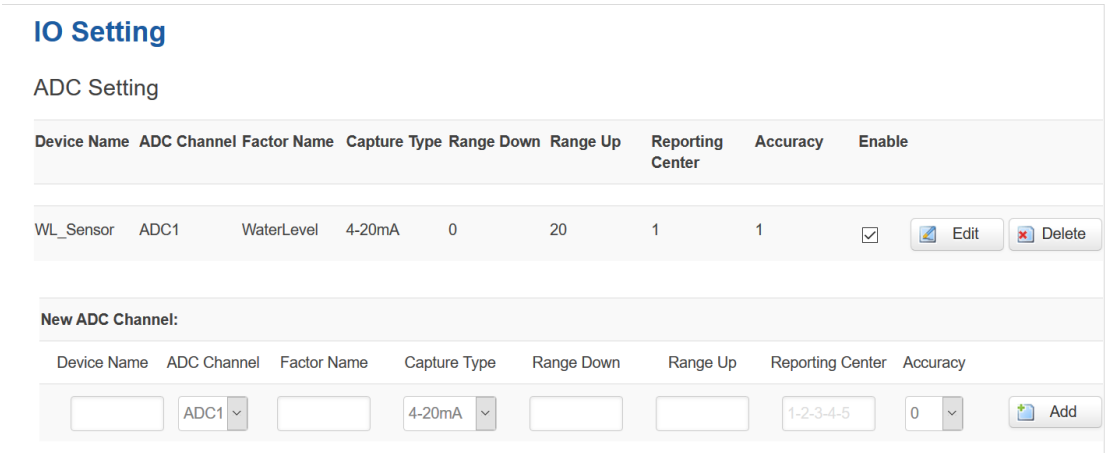


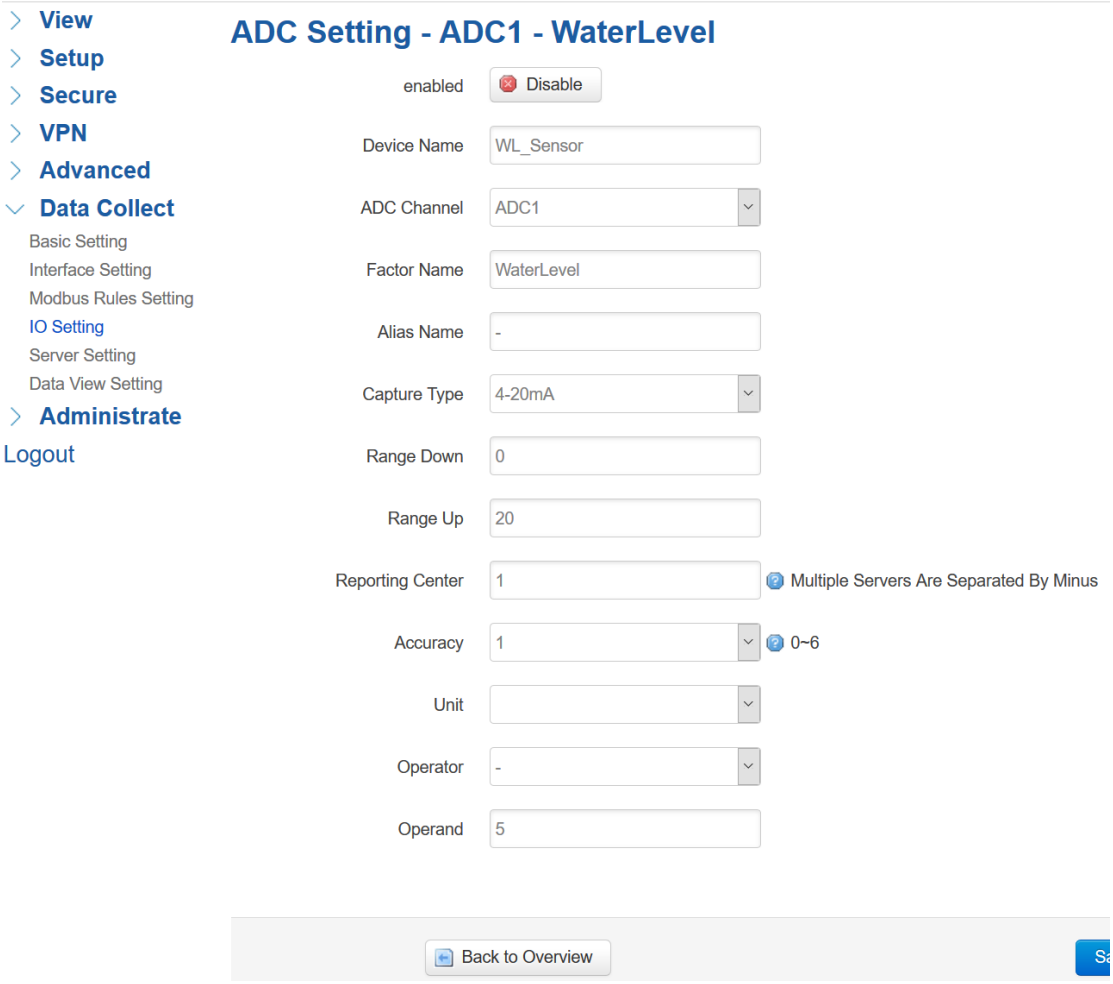


3.6.4 IO Setting

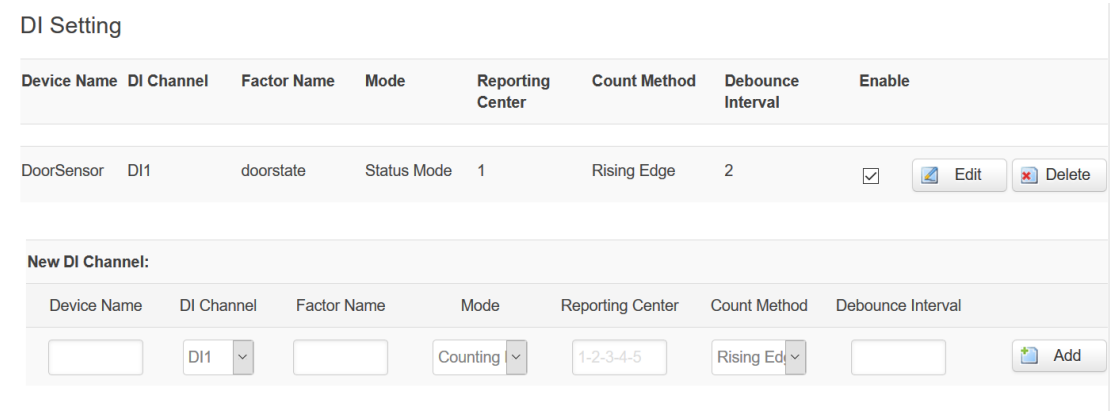
IO Setting menu is for setting ADC ports, DI ports, and Relay ports.

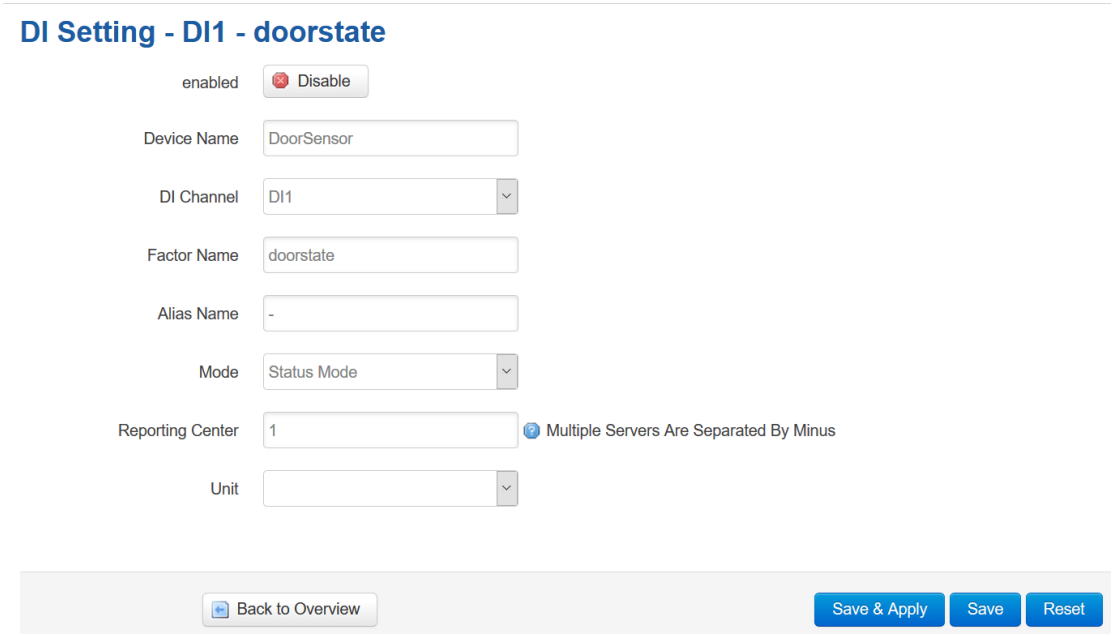
1) ADC ports setting



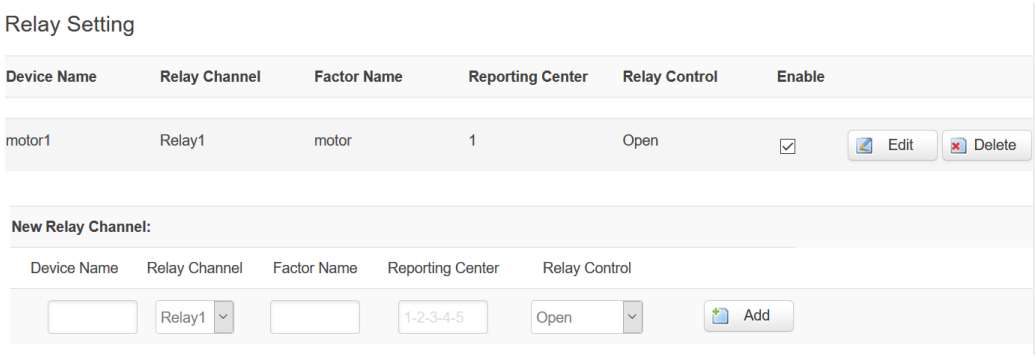


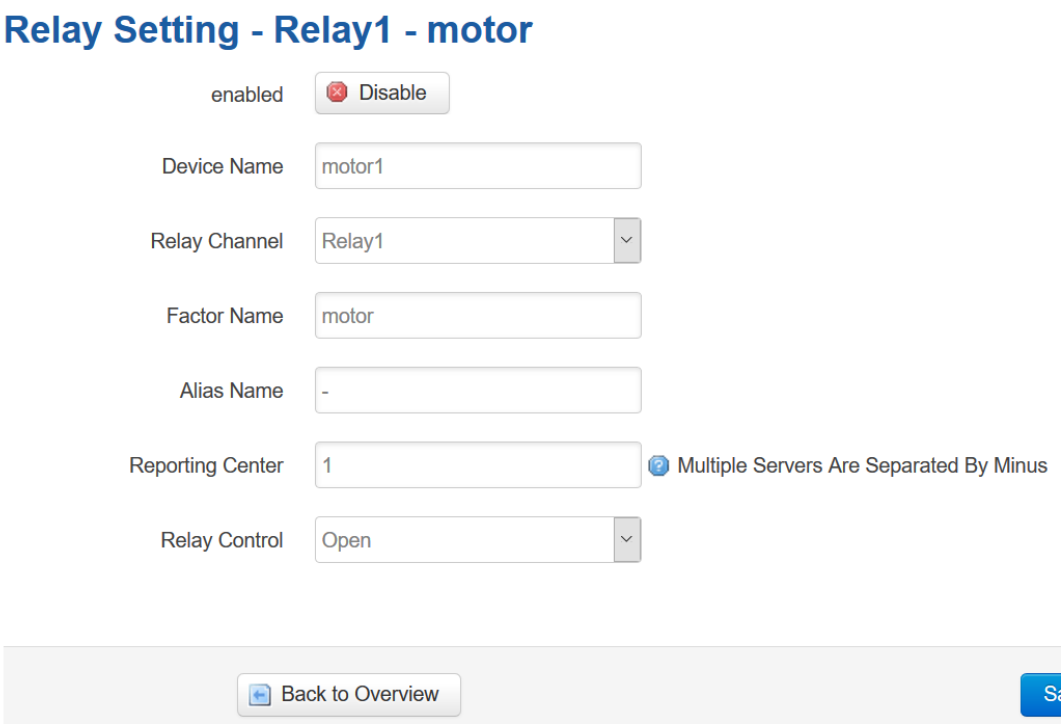
2) DI ports setting





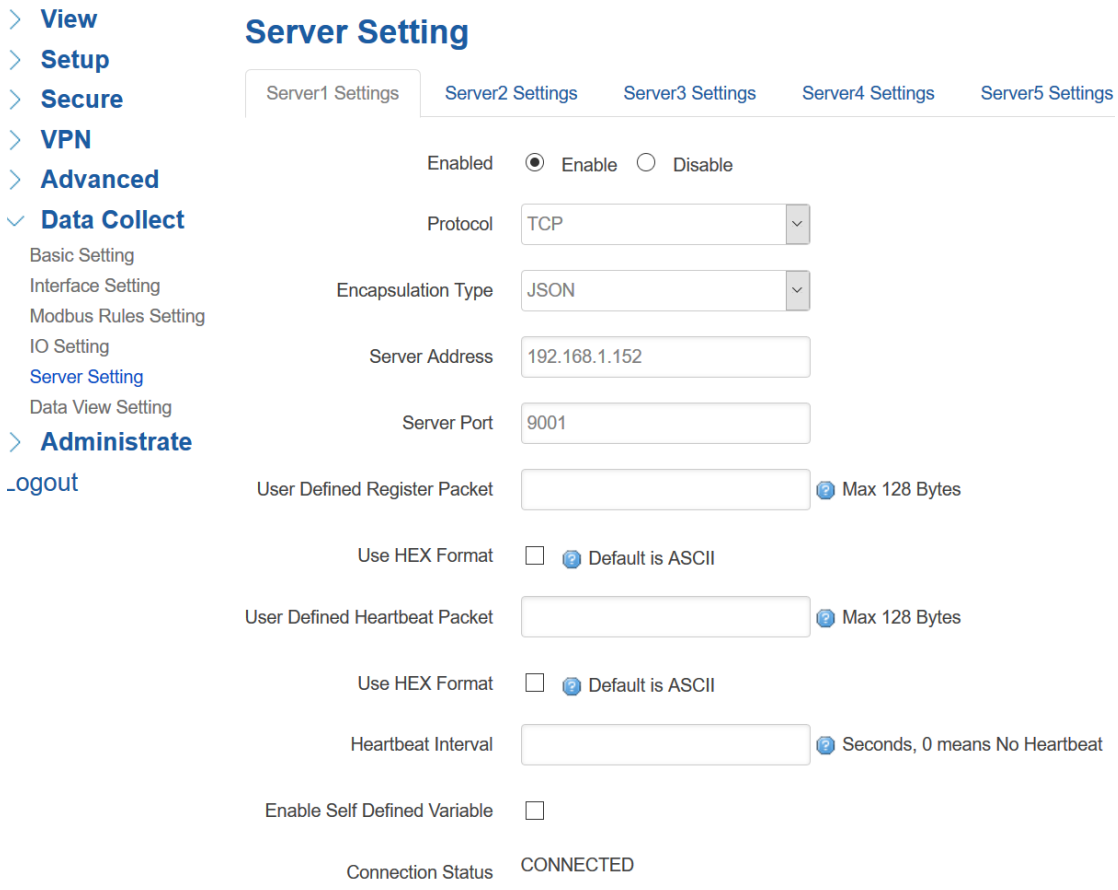
3) Relay Setting





3.6.5 Server Setting

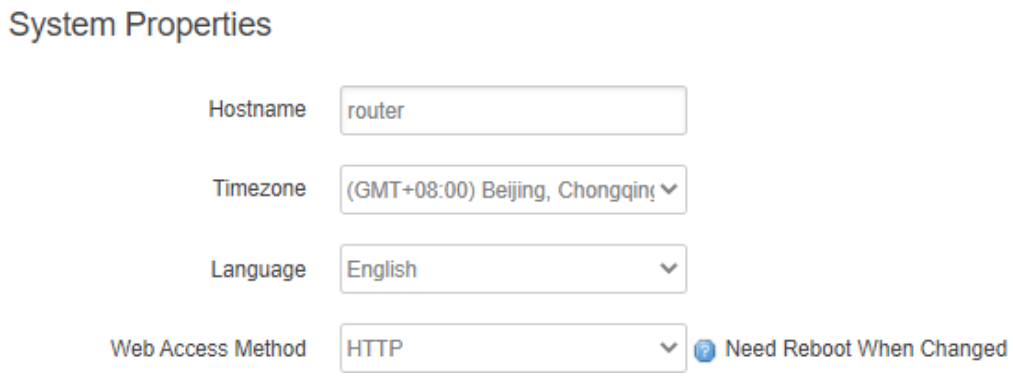
Server setting menu allows user set the data center address with multiple protocols, the standard TG463 support TCP, UDP, HTTP, MQTT, and Modbus TCP. For the data format, TG463 support different Encapsulation type, include “Transparent”, “Json”, and “HJ212” (special for some Environment SCADA in China). Also TG463 accept customize specific protocols for your data center.



3.7 Administrate

In this menu, you can set up time zone, language(English and Chinese only now), time setting, firmware upgrade, etc.

3.7.1 System



1) Host Name

The host name of router, default name is router.

2) Time Zone

Set up the time zone of system, default time zone is GMT8.

3) Language

Change the language of configuration interface, default language is English.

4) \Enable Telnet Access

To enable the telnet server, the default function is enable.

5) Enable SSH Access

To enable the SSH server, the default function is disable.

3.7.2 Password

To revise the password of router.

1) Origin Password

You'll be required to enter your origin password before your revise your new password.

2) Password

Type the new password you want to change.

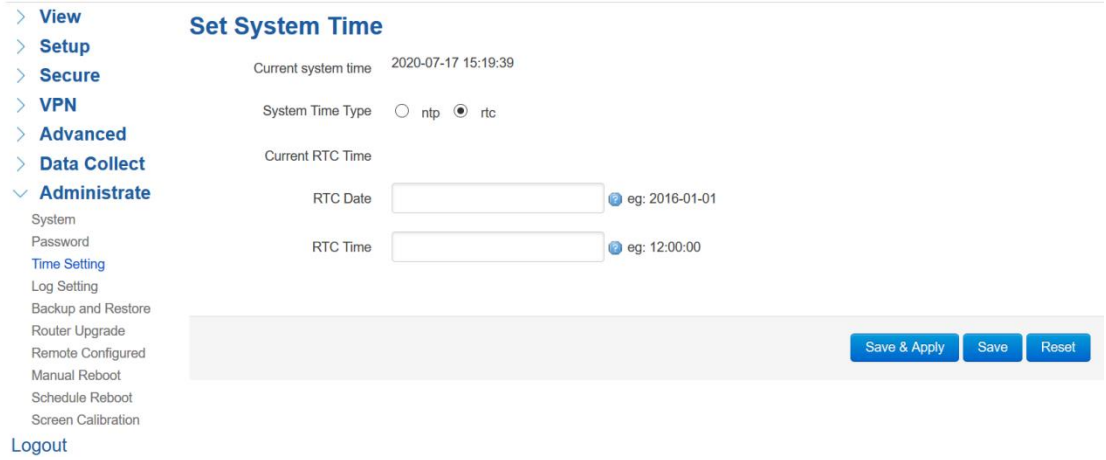
3) Confirmation

Type the new password again to confirm it.

If the new password and confirmation password you type is different, then it fails to revise the password. After password revised, router will return to login page, then you can enter your username and password.

3.7.3 Time Setting

System time type includes RTC (Real Time Clock) and NTP (Network Time Protocol).
RTC will save time even router is powered off, while for NTP, router will connect to NTP server which requires internet connection, time won't be saved once powered off. But NTP will be more accurate than RTC, and you may need to adjust the time manual if it is not accurate.



1) Current System Time

Display the time of router.

2) System Time Type

It includes NTP and RTC mentioned above, and different type has different configuration parameters

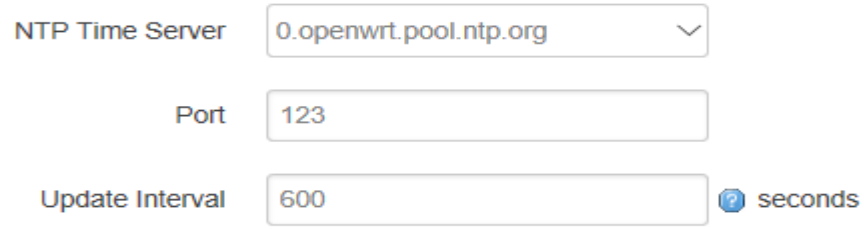
- **RTC**

You can update data and time yourself.

RTC Data
Format must be: 20xx-xx-xx (Year-Month-Day), or you will fail to update it.

RTC Time
Format must be xx: xx: xx (Hour-Min-Second), or you will fail to update it.

- **NTP**



NTP Time Server

You can select the NTP time server through drop-down menu, or you can customize it yourself.

Port

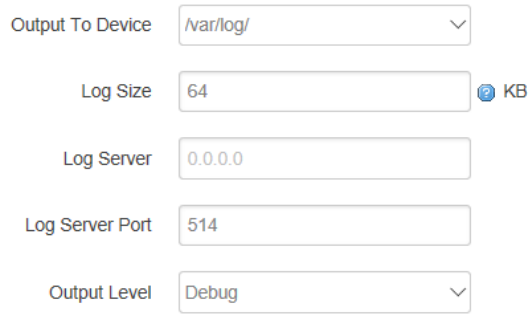
NTP time server port, default port is 123.

Update Interval

How long to sync the time with NTP server, default time is 600 seconds.

3.7.4 Log Settings

Log settings is for configuring the output parameters of system log.



1) Output to Device

You can output the log to serial port, or specified file path, or external storage device, and the default path is:/var/log/

2) Log Size

Set up the size of log, default value is 64KB.

3) Log Server

Set up the IP address of log server.

4) Log Server Port

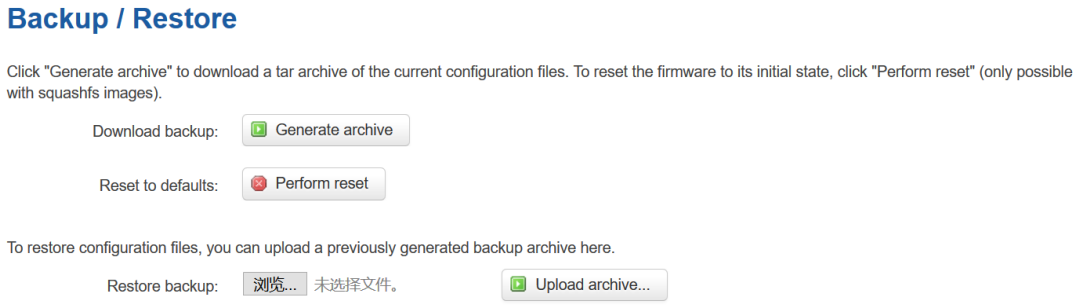
Set up the port of log server, default value is 514

5) Output Level

There are several levels supported, including ‘Debug’, ’Info’, ‘Notice’, ‘Warning’, ‘Error’, and level increased in sequence, the higher level, the less output log.

3.7.5 Backup and Restore

User can either backup the configuration of router, or reset to factory defaults.



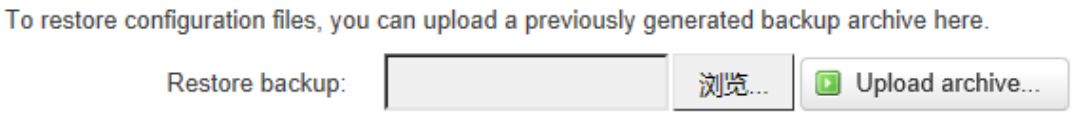
1) Download Backup

Click to generate a configuration file in format of “backup-router-2016-**-**.tar.gz”.

2) Reset to Default

Click ‘Perform Reset’, and a pop-up confirmation box with ‘Really Reset All Changes’ will display, then click ‘OK’ to reset to factory defaults.

3) Restore Backup



After reset to default, you can also upload the saved configuration file to router, to

recover the previous configuration. Click ‘upload archive’, select and upload the backup configuration file, and a pop-up confirmation box with ‘Really Restore’ will display, then click ‘OK’, to recover the configuration.

3.7.6 Router Upgrade

Before you upgrade the firmware for router, make sure the firmware you’re planning to upload is correct. If errors occurs, use serial port and connect the Ethernet cable, upgrade the firmware through u-boot.

1) Keep Settings

Click it, and system configuration will not be changed after firmware upgrade.

2) Choose and Upload Firmware Image

Click ‘browse’ and select the firmware, then click ‘Flash Image’, and firmware will be upload to router. Then you’ll go to below page.

- **Checksum**

MD5 checksum value of firmware.

- **Size**

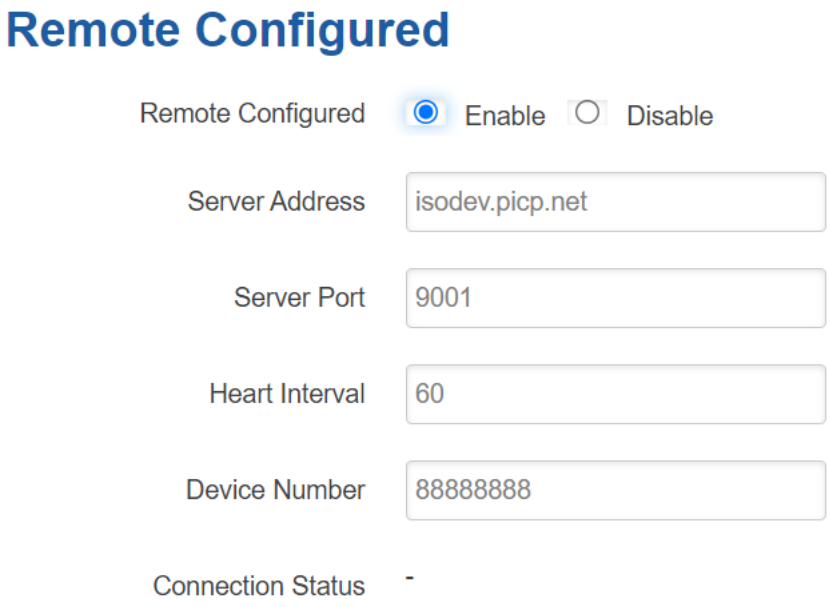
The size of firmware.

- **Proceed**

Click ‘proceed’ to start the firmware upgrade, or click ‘cancel’ to stop the firmware upgrade.

3.7.7 Remote Configured

Remote Configured feature allows TG463 **work with Bivocom Device Management Platform(Option service)** for remote management, like firmware upgrade, configuration change, etc.
You can configure the IP address and port of remote DMP server, device number and phone number of router, etc., as below.



1) Remote Configured

You can enable or disable this function to choose if you want to remote manage the router or not.

2) Server Address

Type the specified login server address you want to remote mange the router, it can be either an IP address or Domain Name.

3) Server Port

The specified login server port.

4) Heart Interval

The heartbeat time interval (Unit: second)

5) Device Number

Device ID of router.

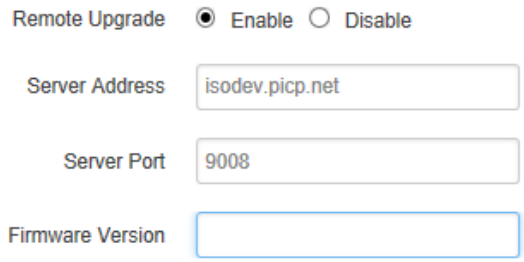
6) Device Phone Number

The phone number of SIM card insert in router.

7) Device Type

Type of the device, default is router.

You can also remote upgrade the firmware for router, as below.



8) Remote Upgrade

Click ‘Enable’ to enable remote firmware upgrade function.

9) Server Address

Type the server IP address or Domain Name for remote upgrade.

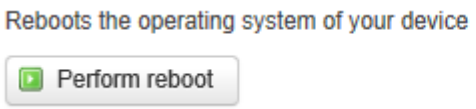
10) Server Port

Type the server port for remote upgrade.

11) Firmware Version

Type the firmware version that you want to upgrade remotely.

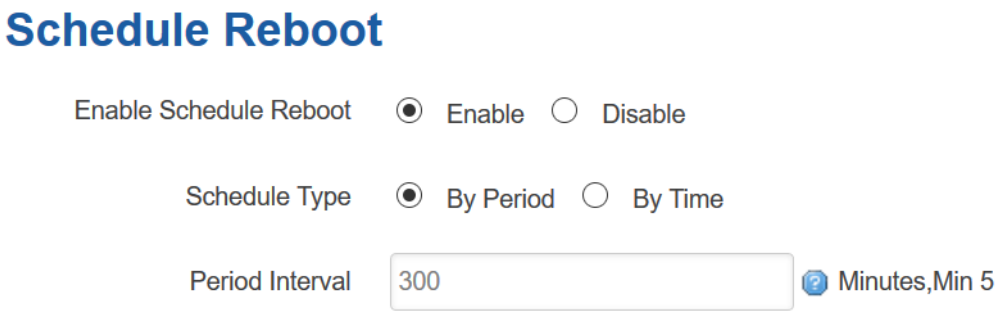
3.7.8 Manual Reboot



Click ‘Perform Reboot’, and a pop-up confirmation box with ‘Really Reboot’ will display, then click ‘OK’ to reboot the router.

3.7.9 Schedule Reboot

Schedule Reboot allows user configure the period or dedicate time for device reboot.



Note: if you have any other questions about Bivocom products, please contact Bivocom support@bivocom.com.

3.8 Logout

Click the Logout menu to logout the web UI of TG463.