# InHand VG814 User’s Manual V1.2

Declaration

Thank you for choosing our product. Before using the product, read this manual carefully.

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Conventions

| Symbol | Indication |
|---|---|
| > | Indicates a button name, for example, the OK button. |
| ″″ | Indicates a window name or menu name, for example, the pop-up window ″New User″. |
| >> | Separates a multi-level menu. For example, the multi-level menu File >> New >> Folder indicates the menu item ″Folder″ under the sub-menu ″New″, which is under the menu ″File″. |

| | |
|---|---|
| ⚠ 注意 | Reminds readers to be careful. Improper action may result in loss of data or device damage. |
| ✎ 说明 | Notes contain detailed descriptions and helpful suggestions. |

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Contents

# 1 Overview

InHand VG814 is a new-generation 4G in-vehicle gateway oriented at the Internet of Vehicles (IoV). It provides fast and safe networks for automobiles and transport service vehicles, meeting the requirements of police vehicles, emergency command vehicles, engineering vehicles, medical vehicles, and logistics vehicles for fast mobile networks. It is used with a cloud-based remote vehicle management platform to provide ubiquitous accessible networks and uninterrupted operation supervision for logistics management, asset tracking, mobile office, and government security.

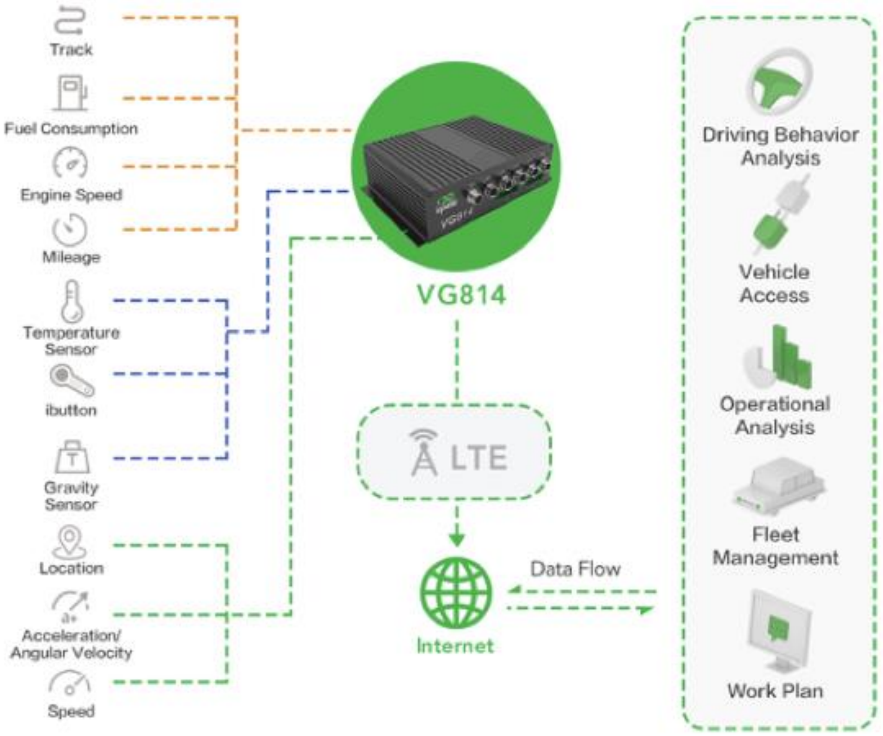


Fig. 1 Application case

# 2 Hardware

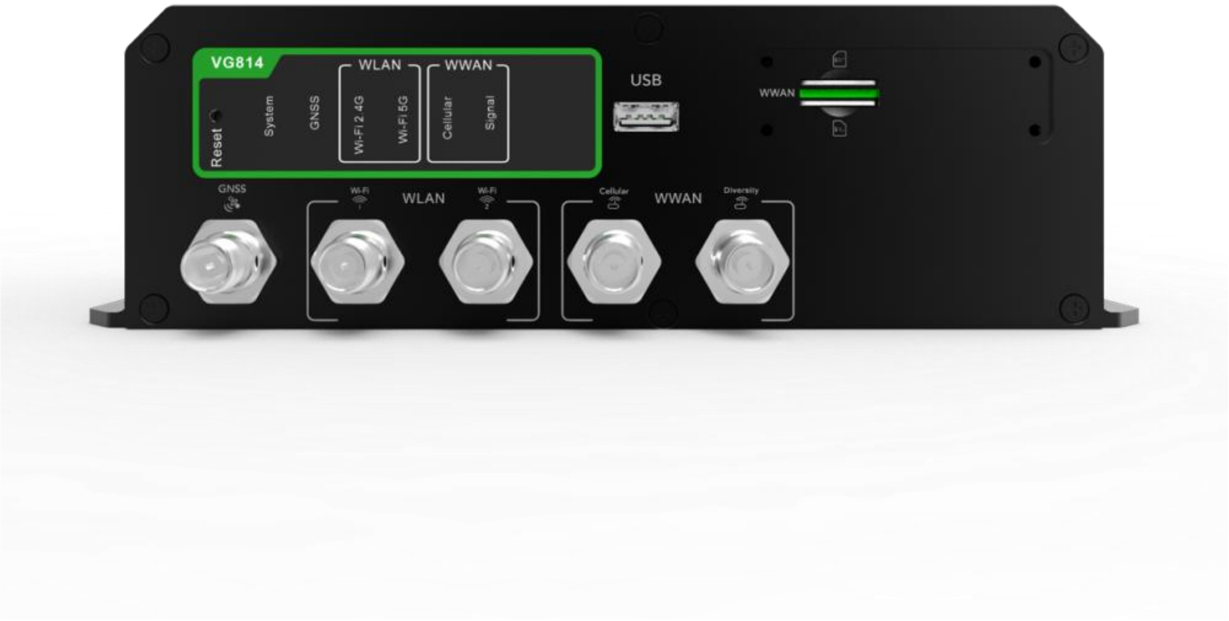
## 2.1 Indicator Description

| VG814 Indicator | Status and Definition |
|---|---|
| System | Steady off --- The device is powered off.<br>Steady red --- The system is starting.<br>Steady blue --- IGT is not correctly installed.<br>Blinking green --- The system operates properly.<br>Blinking red --- The system is faulty.<br>Blinking blue --- The system is being upgraded. |
| Cellular | Steady off --- The dialup function is disabled.<br>Blinking green --- Dialup is in progress.<br>Steady green --- Dialup succeeds.<br>Blinking red --- Dialup fails (no module or SIM card is detected). |
| Signal | Steady off --- The current dialup card has no signal. |

| | |
|---|---|
| | Steady red --- The current dialup card has weak signals (signal strength: ≤ 9 asu).<br>Steady blue --- The current dialup card has moderate signals (signal strength: 10–19 asu).<br>Steady green --- The current dialup card has strong signals (signal strength: ≥ 20 asu). |
| GNSS | Steady off --- GNSS is disabled.<br>Blinking green --- Positioning is in progress.<br>Steady green --- Positioning is completed. |
| Wi-Fi 2.4G | Used as an AP:<br>Steady off --- The AP is disabled.<br>Blinking green --- The AP operates properly.<br>Used as a STA:<br>Steady off --- The STA is disabled, or no AP is associated.<br>Steady green --- Connection fails due to a wrong password after an AP is associated. |

| | |
|---|---|
| | Blinking green --- An AP is associated. |
| Wi-Fi 5G | Used as an AP:<br>Steady off --- The AP is disabled.<br>Blinking blue --- The AP operates properly.<br>Used as a STA:<br>Steady off --- The STA is disabled, or no AP is associated.<br>Steady blue --- Connection fails due to a wrong password after an AP is associated.<br>Blinking blue --- An AP is associated. |

# 2.2 Restoring Default Settings via the Reset Button



To restore default settings via the Reset button, perform the following steps:

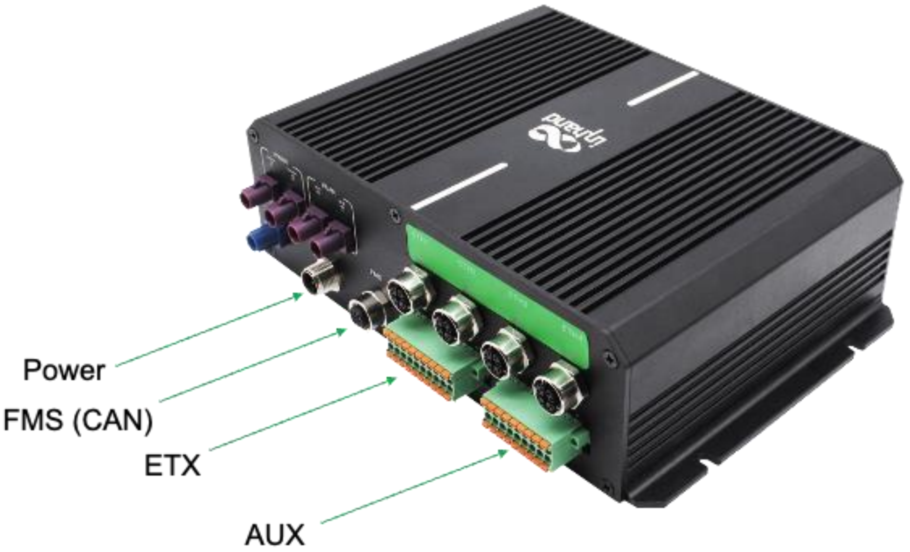
1. Power on the device and immediately press and hold the Reset button. After about 15s, only the System indicator is steady red.

2. When the System indicator turns off and becomes red again, immediately release the Reset button.

3. When the System indicator turns off, press the Reset button (ensure that it blinks red twice) and then release it. The device is restored to the default settings.

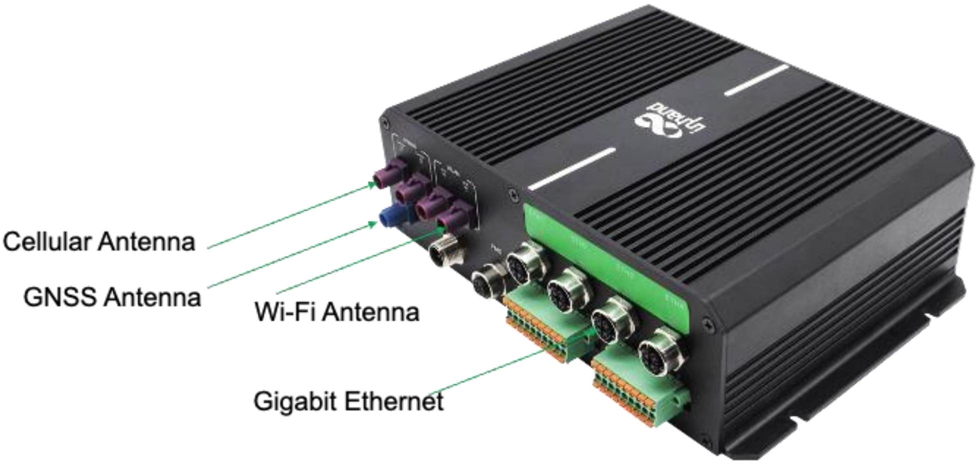
# 2.3 Panel interface introduction

## 2.3.1 VG814 Road / Bus version



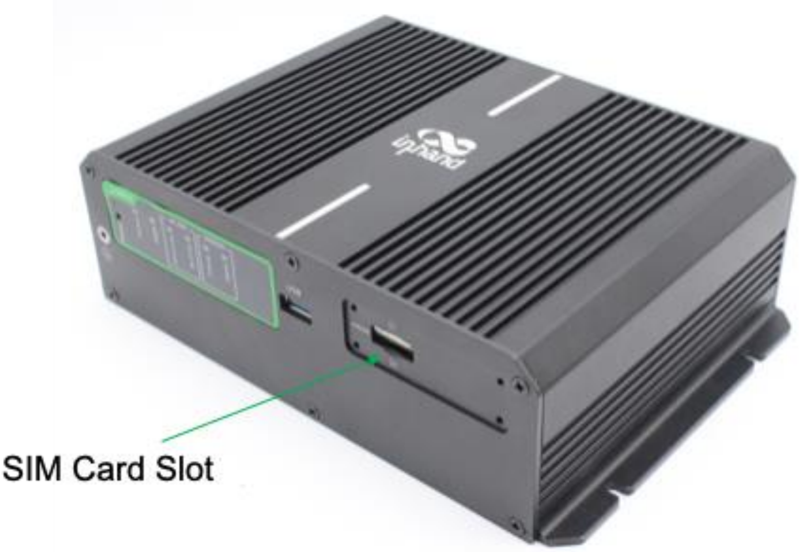
Antenna Panel

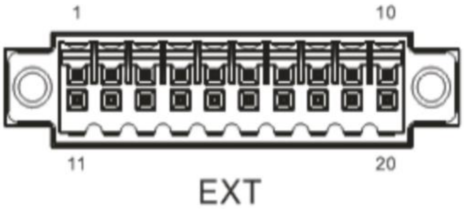
| Antenna and SIM | |
|---|---|
| GNSS Connector | FAKRA C-coded male |
| Wi-Fi Connector | FAKRA I-coded male |
| Cellular Connector | 4G version 2* FAKRA D-coded male<br>5G version 4* FAKRA D-coded male |
| SIM | 2* Mini SIM 2FF |



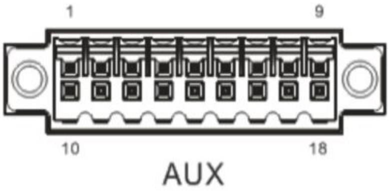
Interface Panel

| Interface Info | |
|---|---|
| Gigabit Ethernet | M12 X-Coded female |
| FMS | M12 A-Coded female |
| Power | M12 A-Coded male |
| ETX | 20 Pin industrial segment |
| AUX | 18 Pin industrial segment |



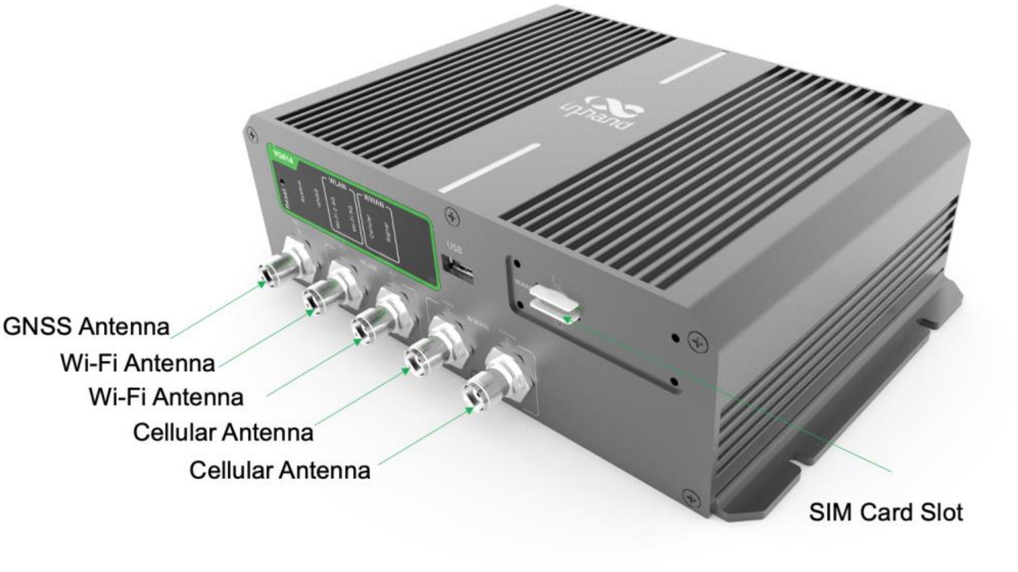


| PIN | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Signal | GND | DO2 | DO4 | WHEELTICK | GND | RS232_RX1 | L- Channel | GND | CAN1_L | RS485_A |
| PIN | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| Signal | GND | DO3 | PPS | FWD | GND | RS232_TX1 | R- Channel | Mic In | CAN1_H | RS485_B |



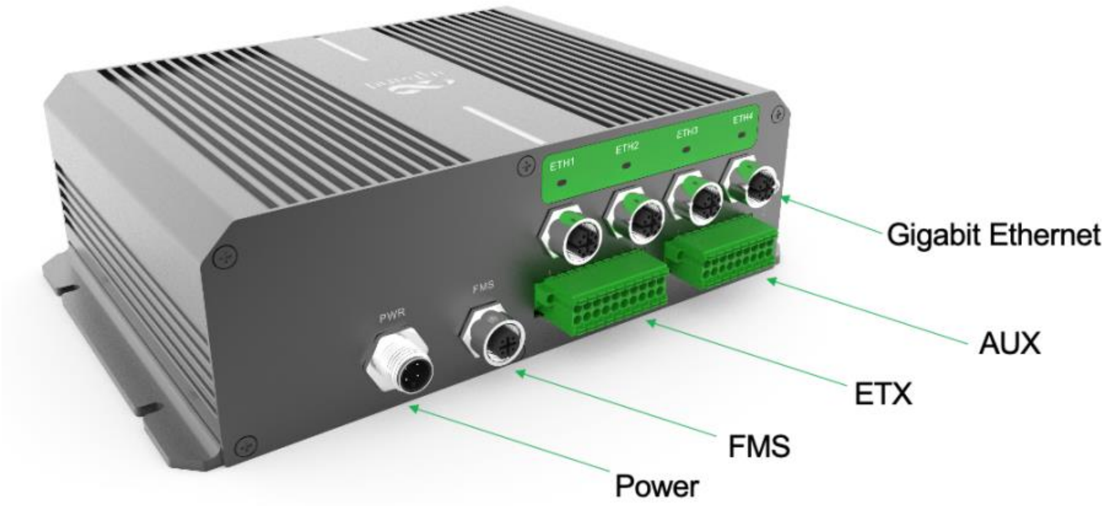
| PIN | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| Signal | DI1 | DI2 | DI3 | DI4 | DI5 | DI6 | DI7 | DI8 | GND |
| PIN | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| Signal | GND | GND | GND | GND | DI9 | DO1 | DI10 | DI11 | GND |

### 2.3.2 VG814 railway version



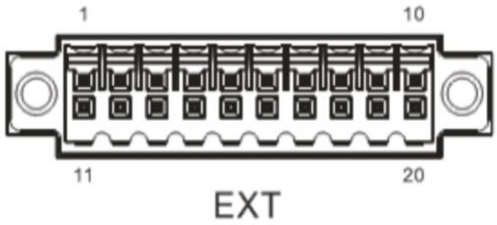
Antenna Panel

| Antenna and SIM | |
|---|---|
| GNSS Connector | TNC Female |
| Wi-Fi Connector | TNC Female |
| Cellular Connector | TNC Female |
| SIM | 2* Mini SIM 2FF |



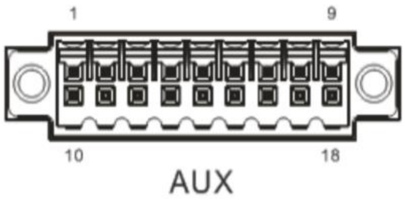
Interface Panel

| Interface Info | |
|---|---|
| Gigabit Ethernet | M12 X-Coded female |
| FMS | M12 A-Coded female |
| Power | M12 A-Coded male |
| ETX | 20 Pin industrial segment |
| AUX | 18 Pin industrial segment |



| PIN | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Signal | GND | DO2 | DO4 | DO6 | GND | RS232_RX1 | RS232_RX2 | GND | CAN_L | RS485_A |
| PIN | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Signal | GND | DO3 | DO5 | DO7 | GND | RS232_TX1 | RS232_TX2 | GND | CAN_H | RS485_B |

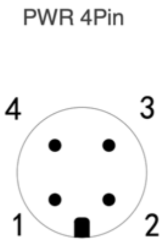


| PIN | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| Signal | DI1 | DI2 | DI3 | DI4 | DI5 | DI6 | DI7 | DI8 | GND |
| PIN | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| Signal | GND | GND | GND | GND | DI9 | DO1 | DI10 | DI11 | GND |

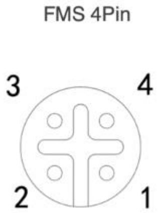
## 2.3.3 Power and FMS

VG814 Road / Bus version and Railway verion Power connector and FMS are same.

Power Connector



| PWR | PIN | Signal |
|---|---|---|
| | 1 | VIN+ |
| | 2 | NC |
| | 3 | VIN- |
| | 4 | NC |



FMS Connector

| FMS | PIN | Signal |
|---|---|---|
| | 1 | CAN_H |
| | 2 | CAN_L |
| | 3 | GND |
| | 4 | NC |

# 3 Default Settings

| No. | Function | Default Settings |
|---|---|---|
| 1 | Dialup over the cellular network | - Enabled (The Cellular indicator is steady green after dialup succeeds.)<br>By default, the dual-SIM function is disabled, and SIM1 is enabled. |
| 2 | Satellite positioning and inertial navigation service | - Enabled (The GNSS indicator is steady green after positioning succeeds.)<br>- The inertial navigation function is enabled. |
| 3 | On-board diagnostics (OBD) | - Enabled<br>- The CANbus baud rate is automatically detected.<br>- The OBD protocol is automatically detected.<br>- OBD data is automatically scanned. |
| 4 | Default settings of Wi-Fi | - The Wi-Fi 2.4G AP is enabled. The SSID starts with VG814-, followed by six digits. |

| | | |
|---|---|---|
| | | — The Wi-Fi 5G AP is enabled. The SSID starts with VG814-5G-, followed by six digits.<br>— WPA2-PSK is used for authentication.<br>— The password contains the last eight digits of the SN. |
| 5 | Default settings of Ethernet | — Four LAN ports are enabled.<br>— The IP address is 192.168.2.1.<br>— The subnet mask is 255.255.255.0.<br>— The DHCP server is enabled. The IP address pool is 192.168.2.2–192.168.2.100, and IP addresses can be automatically allocated to downstream devices. |
| 6 | Network access control for the gateway | — HTTP and HTTPS are enabled, with the port numbers of 80 and 443 respectively.<br>— Telnet is disabled.<br>— SSH is disabled.<br>— Access from the cellular network is allowed only over |

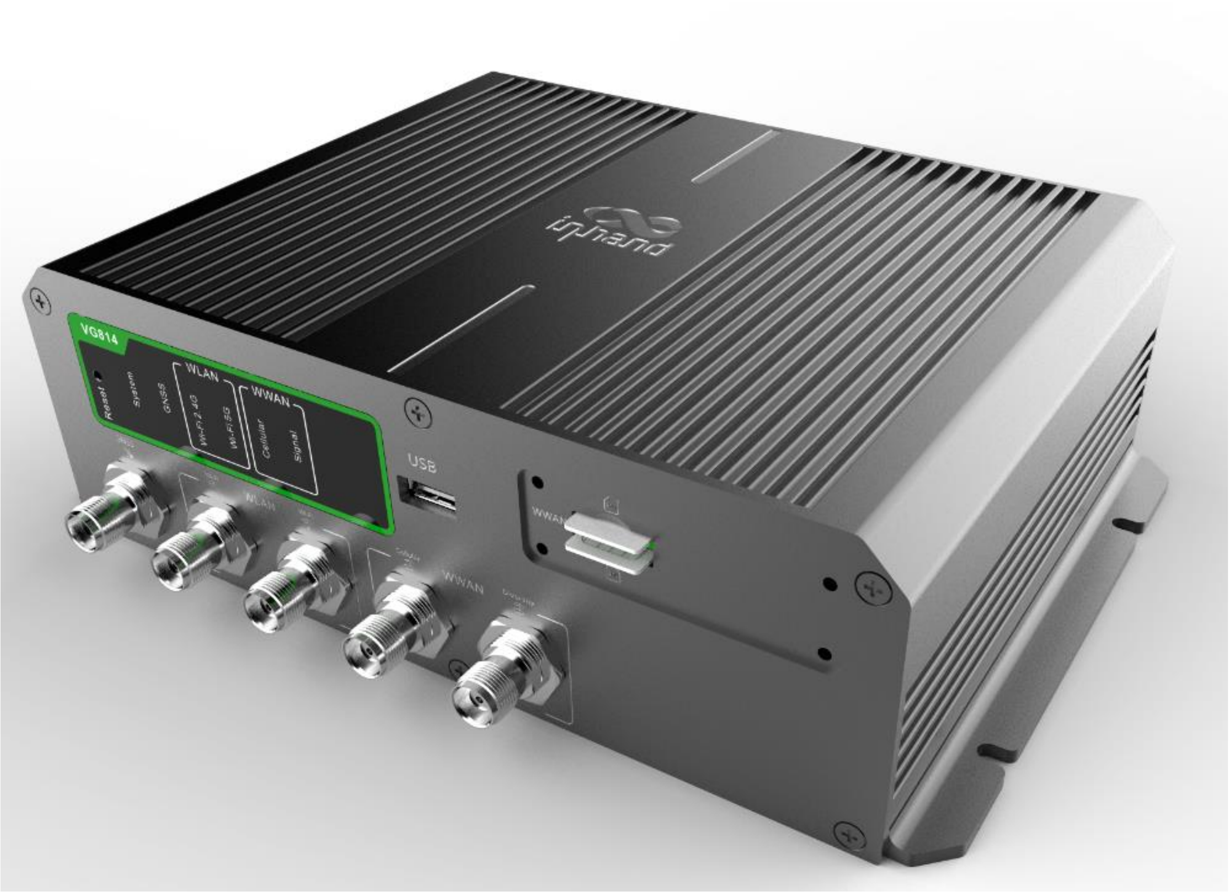
| | | |
|---|---|---|
| | | HTTPS. |
| 7 | Username and password | - adm/123456 (super administrator) |
| 8 | Power management | - shutdown-delay 30: The power-off delay is 30s.<br>- standby-mode 1: The power-off function is enabled.<br>- standby-check-interval 20 indicates the power check interval in standby mode.<br>- standby-voltage 90: The standby threshold voltage is 9 V.<br>- standby-resume-voltage 105: The threshold voltage for resuming normal operating in standby mode is 10.5 V. |
| 9 | IO | - Four digital output channels generate output at low level by default, and the pull-up resistor is disabled.<br>- The pull-up resistor for six digital input channels is disabled. |
| 10 | Serial port | - RS232 |

| | | |
|---|---|---|
| | | Baud rate: 9600<br>Data bits: 8 bits<br>Parity bit: none<br>Stop bit: 1 bit<br>- RS485<br>Baud rate: 9600<br>Data bits: 8 bits<br>Parity bit: none<br>Stop bit: 1 bit |

# 4 Login and Network Access

## 4.1 Network Access via the Dialup Card

1. Insert the SIM card, connect the GNSS and cellular antennas, and connect the power supply and PC. Insert the diversity dialup antenna when the dialup card has poor signals.



VG814 railway version, appearance drawing of single cellular network module

注意 Note:

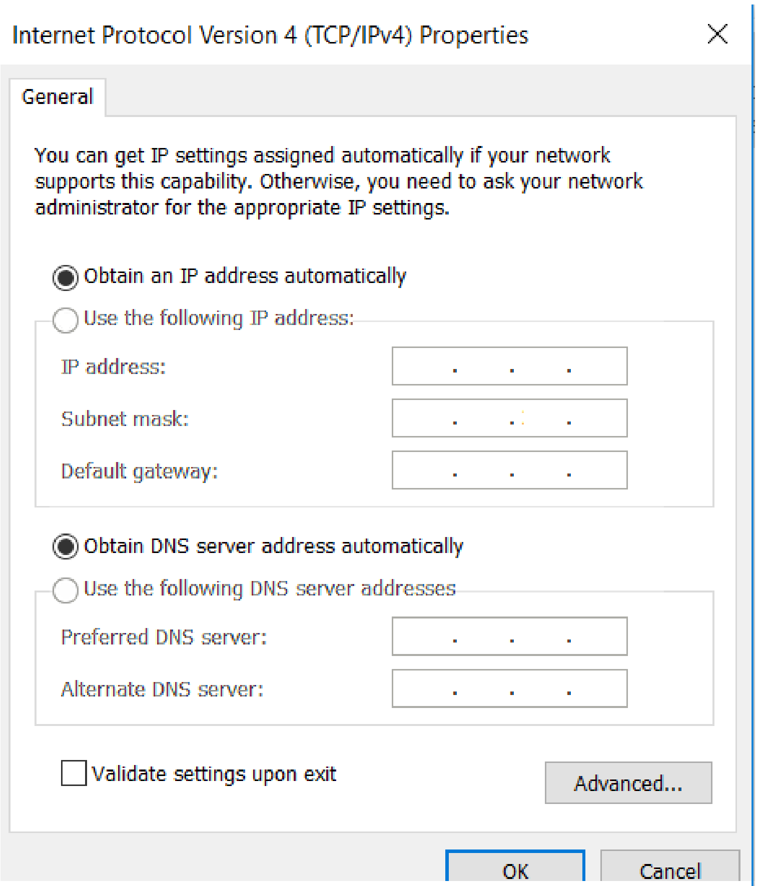
Before inserting or removing the SIM card, unplug the power cable; otherwise, the operation will cause data loss or damage the gateway.

2. Assign an IP address to the PC, which is on the same network segment as the IP address of the gateway.

Method 1: Enable the PC to obtain an IP address automatically (recommended).

Method 2: Configure a fixed IP address on the same network segment as the gateway address for the PC.

Step: Select "Use the following IP address", enter any IP address in the range of 192.168.2.2 to 192.168.2.254 (different from the initial IP address 192.168.2.1 of the gateway), the subnet mask 255.255.255.0, and the default gateway address 192.168.2.1, and then click OK.



Internet Protocol Version 4 (TCP/IPv4) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

● Obtain an IP address automatically

○ Use the following IP address:

IP address: . . .

Subnet mask: . . .

Default gateway: . . .

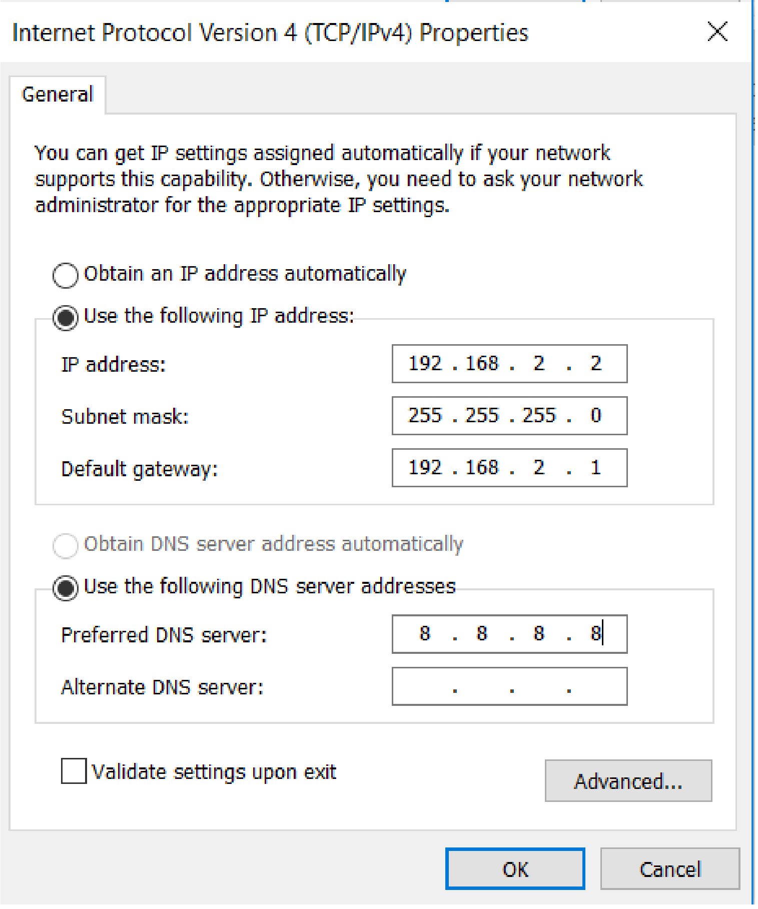
● Obtain DNS server address automatically

○ Use the following DNS server addresses

Preferred DNS server: . . .

Alternate DNS server: . . .

□ Validate settings upon exit



Internet Protocol Version 4 (TCP/IPv4) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically

● Use the following IP address:

IP address: 192 . 168 . 2 . 2

Subnet mask: 255 . 255 . 255 . 0

Default gateway: 192 . 168 . 2 . 1

○ Obtain DNS server address automatically

● Use the following DNS server addresses

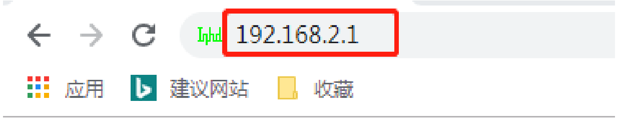
Preferred DNS server: 8 . 8 . 8 . 8

Alternate DNS server: . . .

□ Validate settings upon exit

Obtain an IP address automatically Use a fixed IP address

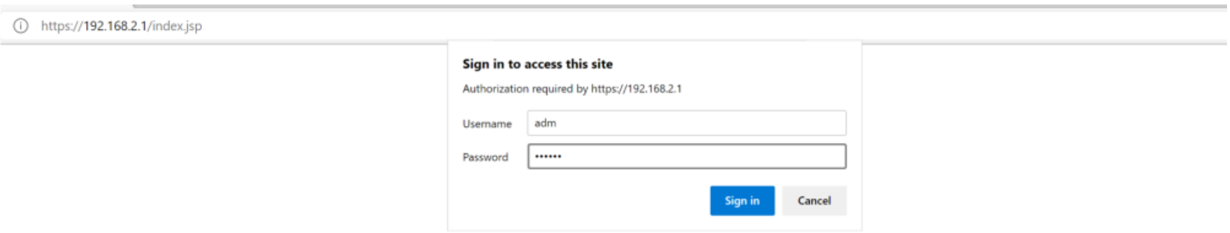
3. Open the browser, enter the default IP address 192.168.2.1 of the gateway in the address bar, and press Enter.



192.168.2.1

4. Log in (if a blocking prompt is displayed, click "Advanced >> Continue").

Default Username adm Password 123456



https://192.168.2.1/index.jsp

**Sign in to access this site**

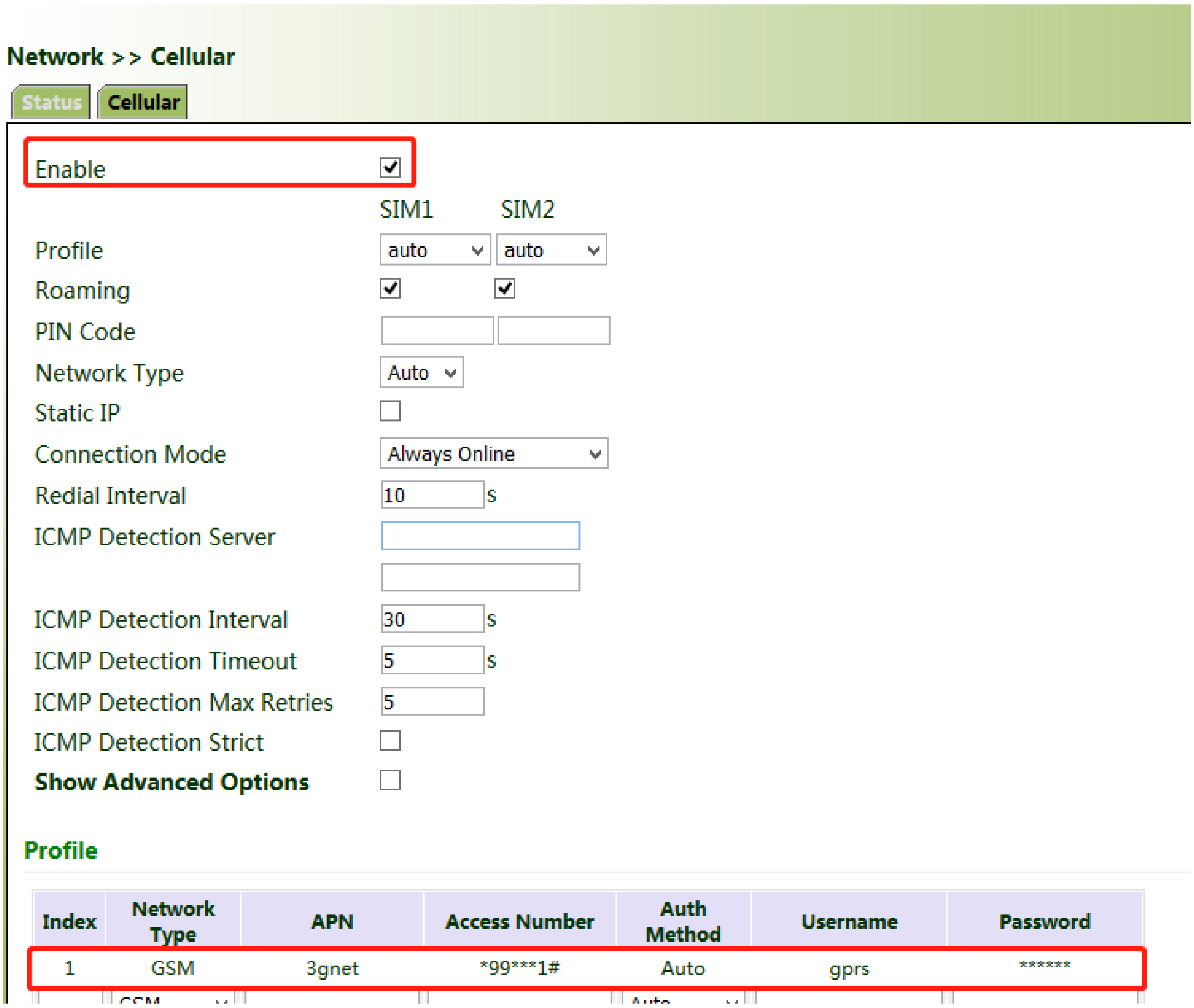
Authorization required by https://192.168.2.1

Username adm

Password ••••••

5. Click "Network >> Cellular", check "Enable", and click Apply & Save. If the network connection status is "Connected" and an IP address has been allocated, the SIM card has been connected to the network.

(Set the APN parameters for a private-network card.)

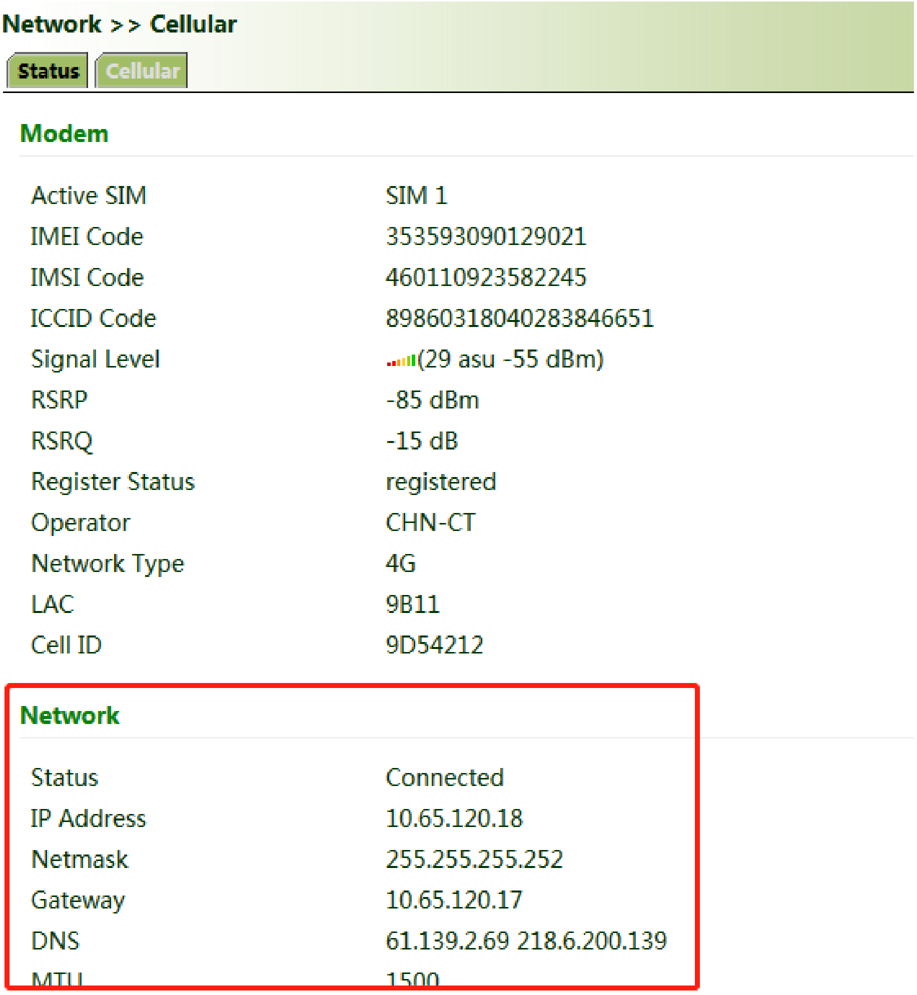


Network >> Cellular

| | | |
|---|---|---|
| Enable | ☑ | |
| | SIM1 | SIM2 |
| Profile | auto | auto |
| Roaming | ☑ | ☑ |
| PIN Code | | |
| Network Type | Auto | |
| Static IP | □ | |
| Connection Mode | Always Online | |
| Redial Interval | 10 s | |
| ICMP Detection Server | | |
| ICMP Detection Interval | 30 s | |
| ICMP Detection Timeout | 5 s | |
| ICMP Detection Max Retries | 5 | |
| ICMP Detection Strict | □ | |
| **Show Advanced Options** | □ | |

**Profile**

| Index | Network Type | APN | Access Number | Auth Method | Username | Password |
|---|---|---|---|---|---|---|
| 1 | GSM | 3gnet | *99***1# | Auto | gprs | ****** |



Network >> Cellular

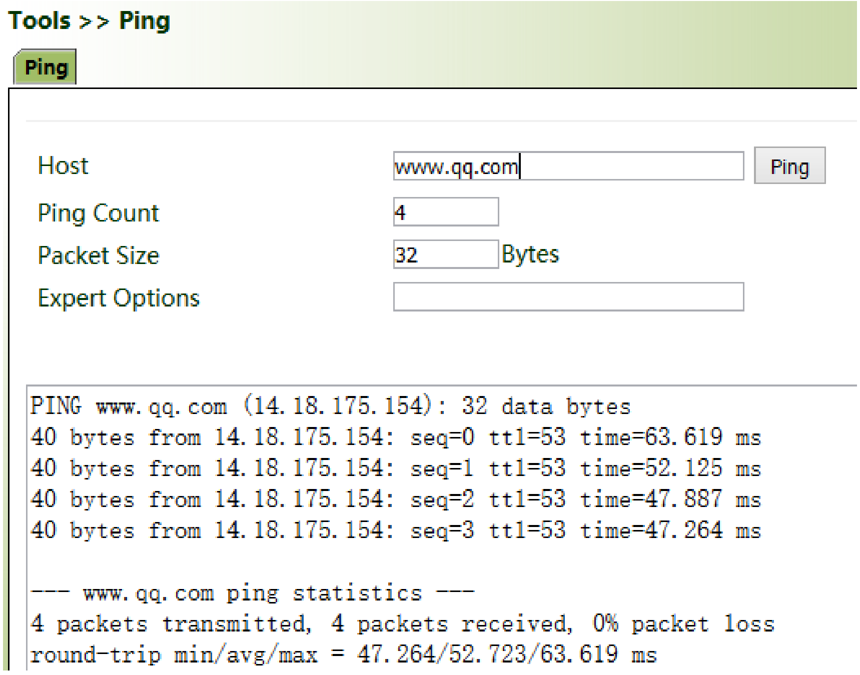
**Modem**

| | |
|---|---|
| Active SIM | SIM 1 |
| IMEI Code | 353593090129021 |
| IMSI Code | 460110923582245 |
| ICCID Code | 89860318040283846651 |
| Signal Level | (29 asu -55 dBm) |
| RSRP | -85 dBm |
| RSRQ | -15 dB |
| Register Status | registered |
| Operator | CHN-CT |
| Network Type | 4G |
| LAC | 9B11 |
| Cell ID | 9D54212 |

**Network**

| | |
|---|---|
| Status | Connected |
| IP Address | 10.65.120.18 |
| Netmask | 255.255.255.252 |
| Gateway | 10.65.120.17 |
| DNS | 61.139.2.69 218.6.200.139 |
| MTU | 1500 |

6. Ping a common website in China with a ping detection tool. If there is data transmission, the device has been successfully connected to the network.

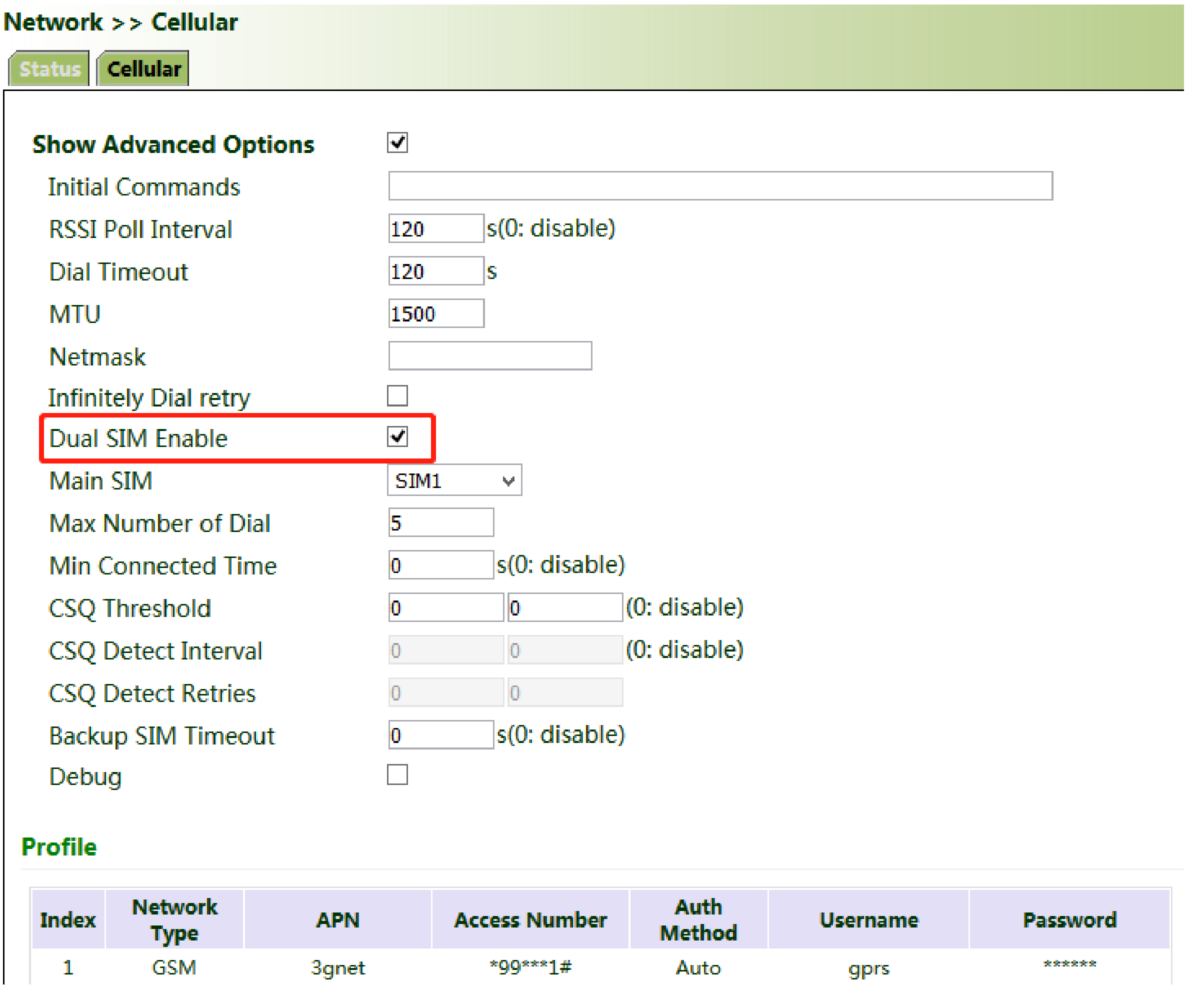


Tools >> Ping

| | |
|---|---|
| Host | www.qq.com |
| Ping Count | 4 |
| Packet Size | 32 Bytes |
| Expert Options | |

```
PING www.qq.com (14.18.175.154): 32 data bytes
40 bytes from 14.18.175.154: seq=0 ttl=53 time=63.619 ms
40 bytes from 14.18.175.154: seq=1 ttl=53 time=52.125 ms
40 bytes from 14.18.175.154: seq=2 ttl=53 time=47.887 ms
40 bytes from 14.18.175.154: seq=3 ttl=53 time=47.264 ms

--- www.qq.com ping statistics ---
4 packets transmitted, 4 packets received, 0% packet loss
round-trip min/avg/max = 47.264/52.723/63.619 ms
```

7. Enable the dual-SIM function when two SIM cards are used.



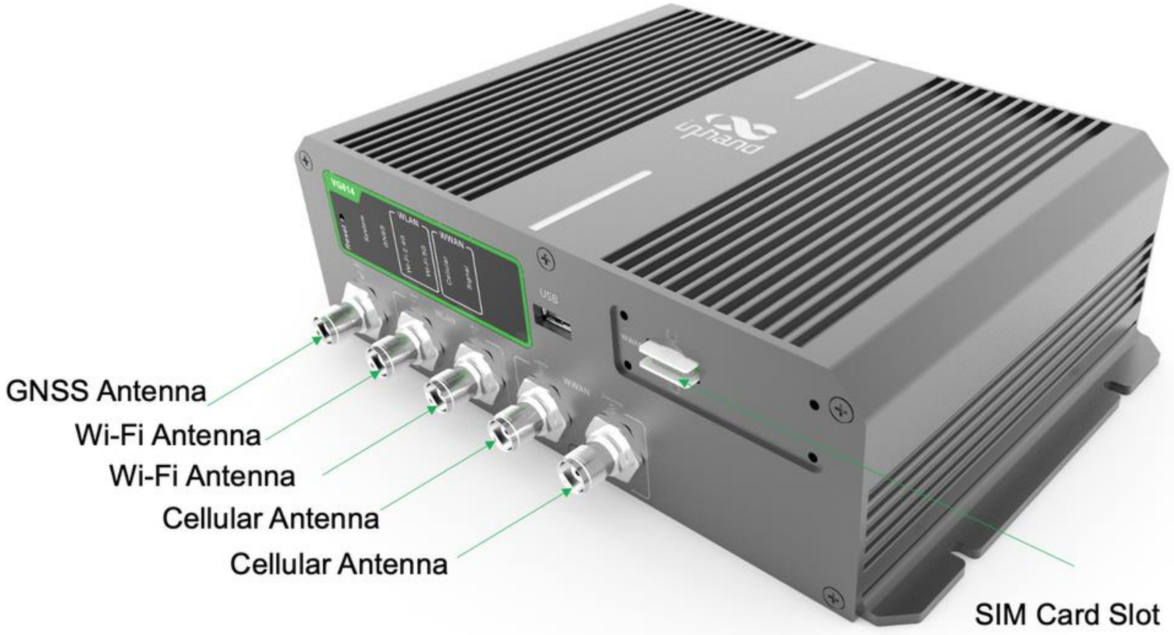
Show Advanced Options ☑
Initial Commands
RSSI Poll Interval 120 s(0: disable)
Dial Timeout 120 s
MTU 1500
Netmask
Infinitely Dial retry □
Dual SIM Enable ☑
Main SIM SIM1
Max Number of Dial 5
Min Connected Time 0 s(0: disable)
CSQ Threshold 0 0 (0: disable)
CSQ Detect Interval 0 0 (0: disable)
CSQ Detect Retries 0 0
Backup SIM Timeout 0 s(0: disable)
Debug □

Profile

| Index | Network Type | APN | Access Number | Auth Method | Username | Password |
|---|---|---|---|---|---|---|
| 1 | GSM | 3gnet | *99***1# | Auto | gprs | ****** |

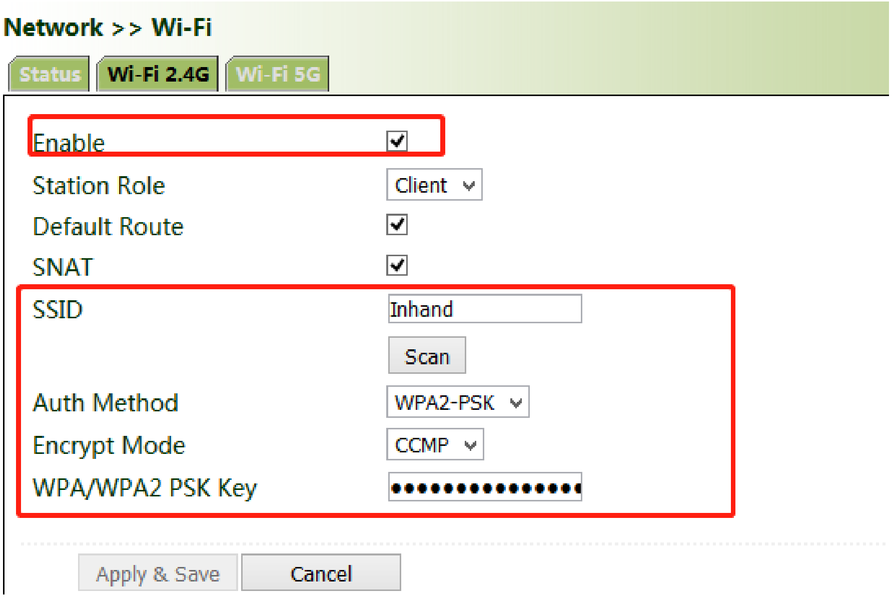
## 4.2 Network Access via Wi-Fi

1. Complete the connection shown in the following figure. Please connect the Wi-Fi antenna before logging in to the device.



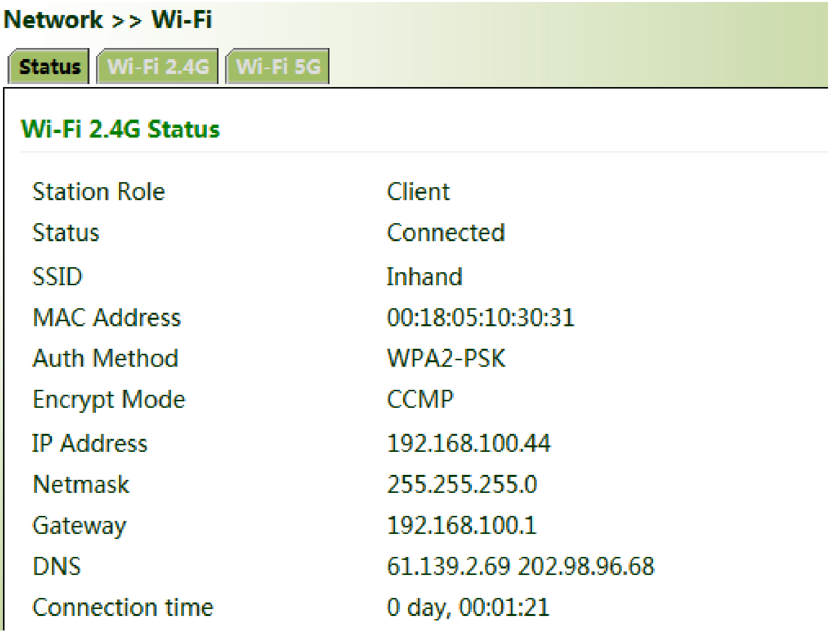
2. Assign an IP address to the PC, which is on the same network segment as the IP address of the gateway. Log in to the web page. For details, see 4.1 Network Access via the Dialup Card.

3. Click " Network >> Wi-Fi" and select Wi-Fi 2.4G or Wi-Fi 5G as a client. Enter the name, authentication method, and key of an available wireless access point (AP). Click Apply & Save.



| | |
|---|---|
| Enable | ☑ |
| Station Role | Client |
| Default Route | ☑ |
| SNAT | ☑ |
| SSID | Inhand |
| Auth Method | WPA2-PSK |
| Encrypt Mode | CCMP |
| WPA/WPA2 PSK Key | ●●●●●●●●●●●●●●●● |

4. Click "Status". The current network status is "Connected", and an IP address is obtained successfully, indicating that the device has been successfully connected to the network via Wi-Fi.



Wi-Fi 2.4G Status

| | |
|---|---|
| Station Role | Client |
| Status | Connected |
| SSID | Inhand |
| MAC Address | 00:18:05:10:30:31 |
| Auth Method | WPA2-PSK |
| Encrypt Mode | CCMP |
| IP Address | 192.168.100.44 |
| Netmask | 255.255.255.0 |
| Gateway | 192.168.100.1 |
| DNS | 61.139.2.69 202.98.96.68 |
| Connection time | 0 day, 00:01:21 |

# 5 Network Management

In parameter settings, a green text box 🟩 indicates a mandatory item, and a pure white text box □ indicates an optional item.

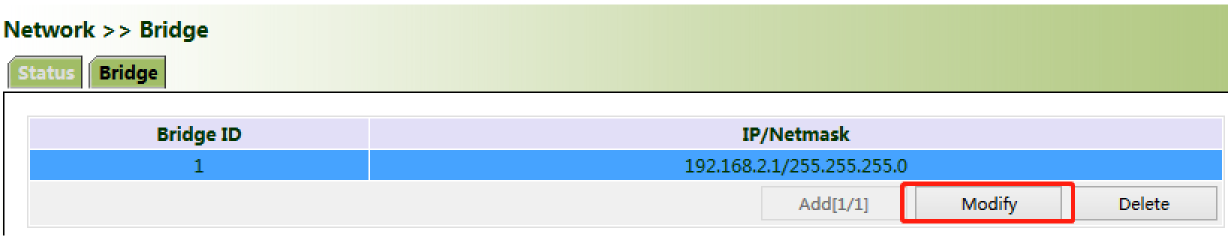
## 5.1 Network

### 5.1.1 Bridge Port

A bridge port is intended to connect two different physical LANs over a bridge, to enable storage and forwarding across LANs at the link layer.

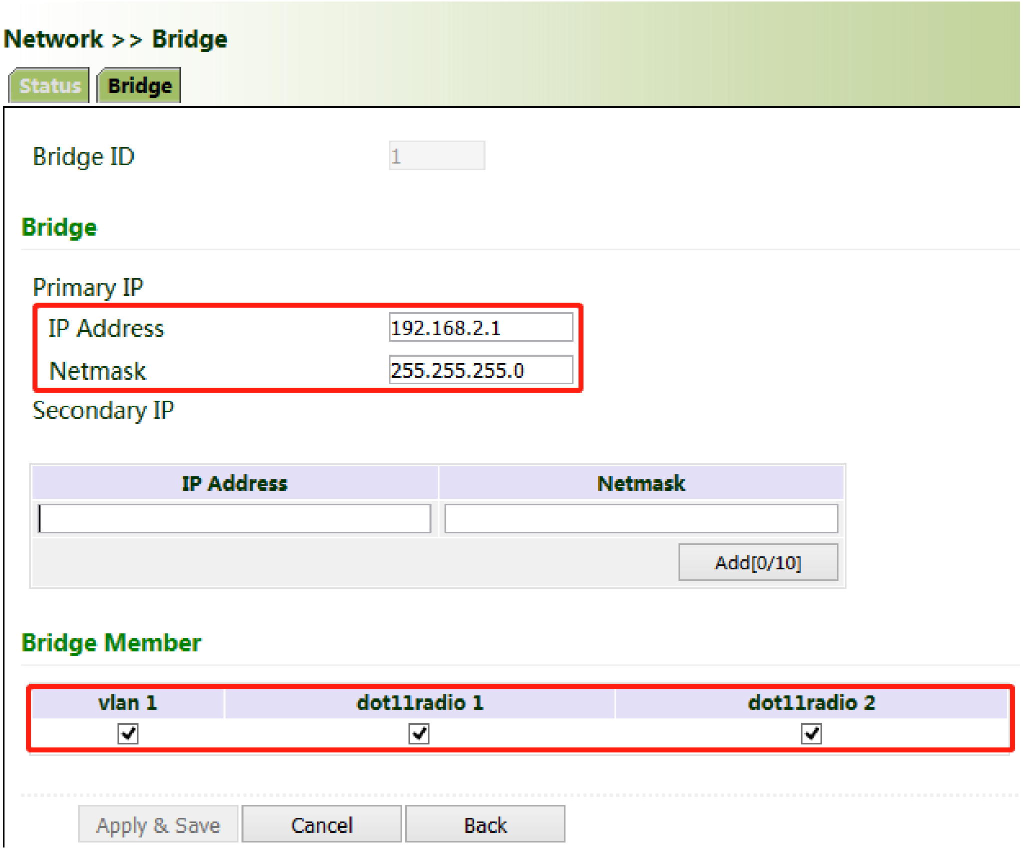
Method for modifying the IP address of a bridge port and bridge members:

1. Click "Network >> Bridge" and select "Bridge >> Modify".



| Bridge ID | IP/Netmask |
|---|---|
| 1 | 192.168.2.1/255.255.255.0 |

2. Modify the IP address of the bridge port or bridge members. Among the bridge members, dot11radio1 and dot11radio2 are Wi-Fi 2.4G and Wi-Fi 5G ports respectively.



Bridge ID 1

Bridge

Primary IP

IP Address 192.168.2.1

Netmask 255.255.255.0

Secondary IP

| IP Address | Netmask |
|---|---|
|  |  |

Bridge Member

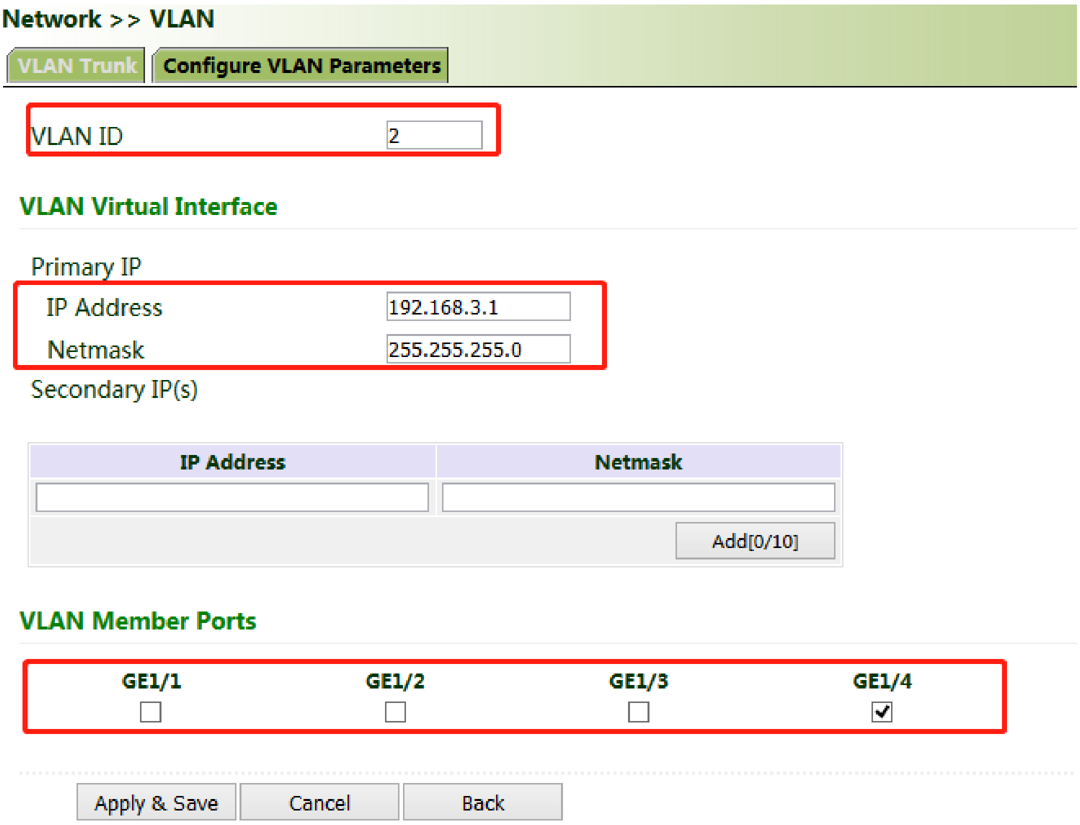
| vlan 1 | dot11radio 1 | dot11radio 2 |
|---|---|---|
| ☑ | ☑ | ☑ |

## 5.1.2 VLAN Port

A virtual LAN (VLAN) comprises a group of logical devices and users. These devices and users are not limited by physical locations, but can be organized based on functions, departments, applications, and other factors. They communicate with each other as if they are on the same network segment, which contributes to the name of VLAN.

Method for adding a port of VLAN 2:

1. Click "Network >> VLAN >> Configure VLAN Parameters >> Add". Set the virtual IP address of the port of VLAN 2 and select the member port of VLAN 2 as required. Click Apply & Save.



Network >> VLAN

VLAN Trunk | Configure VLAN Parameters

VLAN ID: 2

**VLAN Virtual Interface**

Primary IP

IP Address: 192.168.3.1

Netmask: 255.255.255.0

Secondary IP(s)

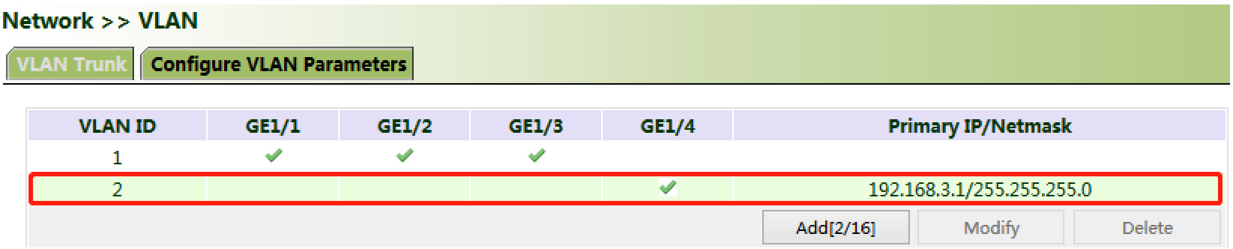
| IP Address | Netmask |
|---|---|
| | |

Add[0/10]

**VLAN Member Ports**

| GE1/1 | GE1/2 | GE1/3 | GE1/4 |
|---|---|---|---|
| ☐ | ☐ | ☐ | ☑ |

2. Return to the VLAN list. The port of VLAN 2 has been successfully added.

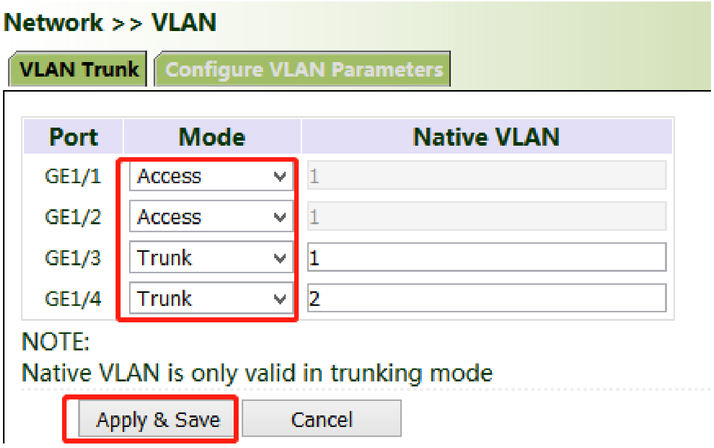


Network >> VLAN

VLAN Trunk | Configure VLAN Parameters

| VLAN ID | GE1/1 | GE1/2 | GE1/3 | GE1/4 | Primary IP/Netmask |
|---|---|---|---|---|---|
| 1 | ✓ | ✓ | ✓ | | |
| 2 | | | | ✓ | 192.168.3.1/255.255.255.0 |

Currently, VLAN ports of the device support two link types: access and trunk. An access port belongs to only one VLAN and is generally connected to a computer. A trunk port can be used for multiple VLANs and can receive messages from or send messages to multiple VLANs. It can be connected to a switch or a user's computer. You can select the link type as required on the "VLAN Trunk" page.



| Port | Mode | Native VLAN |
|---|---|---|
| GE1/1 | Access | 1 |
| GE1/2 | Access | 1 |
| GE1/3 | Trunk | 1 |
| GE1/4 | Trunk | 2 |

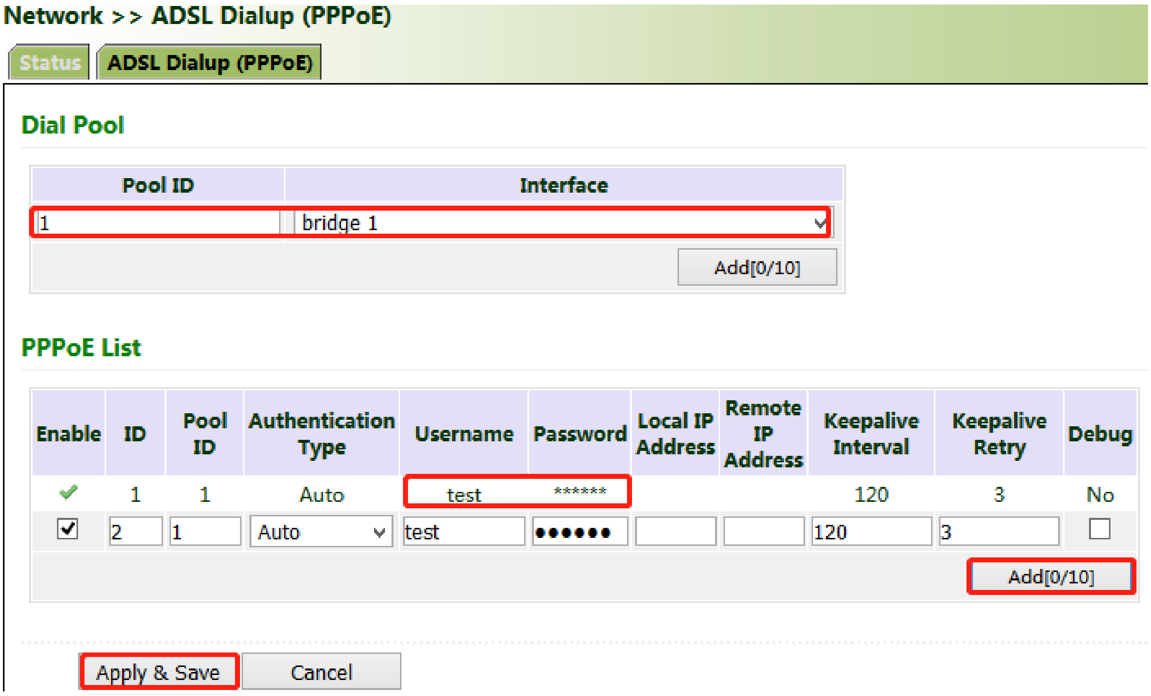
NOTE:
Native VLAN is only valid in trunking mode

## 5.1.3 ADSL Dialup (PPPoE)

Method for connecting the gateway to the PPPoE server:

1. Click "Network > > ADSL Dialup (PPPoE)", select the VG814 interface for connecting to the PPPoE server in the "Dial Pool" bar, and click Add.

2. Enter the user name, password, and pool ID of the PPPoE server in the "PPPoE List" bar. The pool ID must be the same as that in the "Dial Pool" bar. Click Add, and then click Apply & Save.



Dial Pool

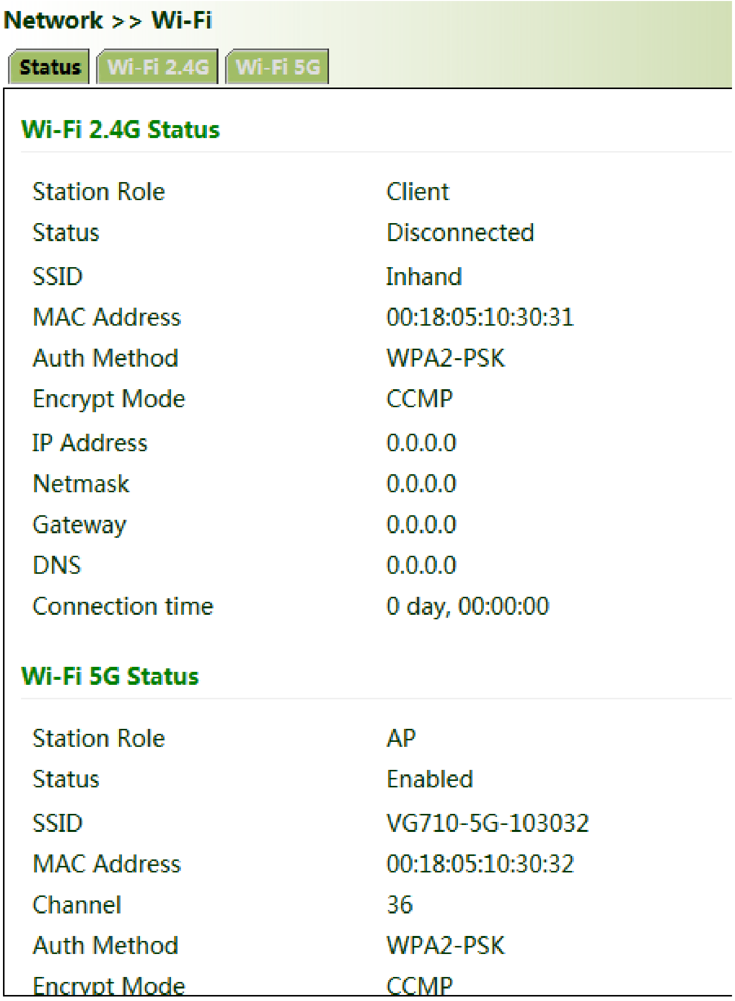
| Pool ID | Interface |
|---|---|
| 1 | bridge 1 |

PPPoE List

| Enable | ID | Pool ID | Authentication Type | Username | Password | Local IP Address | Remote IP Address | Keepalive Interval | Keepalive Retry | Debug |
|---|---|---|---|---|---|---|---|---|---|---|
| ✓ | 1 | 1 | Auto | test | ****** | | | 120 | 3 | No |
| ☑ | 2 | 1 | Auto | test | ●●●●●● | | | 120 | 3 | □ |

## 5.1.4 Wi-Fi

The gateway can be used as an AP or a client. When it is used as an AP, other users can access the Internet through the gateway via Wi-Fi. When it is used as a client, the gateway connects to an AP for Internet access. The status bar shows the current Wi-Fi connection status of the gateway.



Wi-Fi 2.4G Status

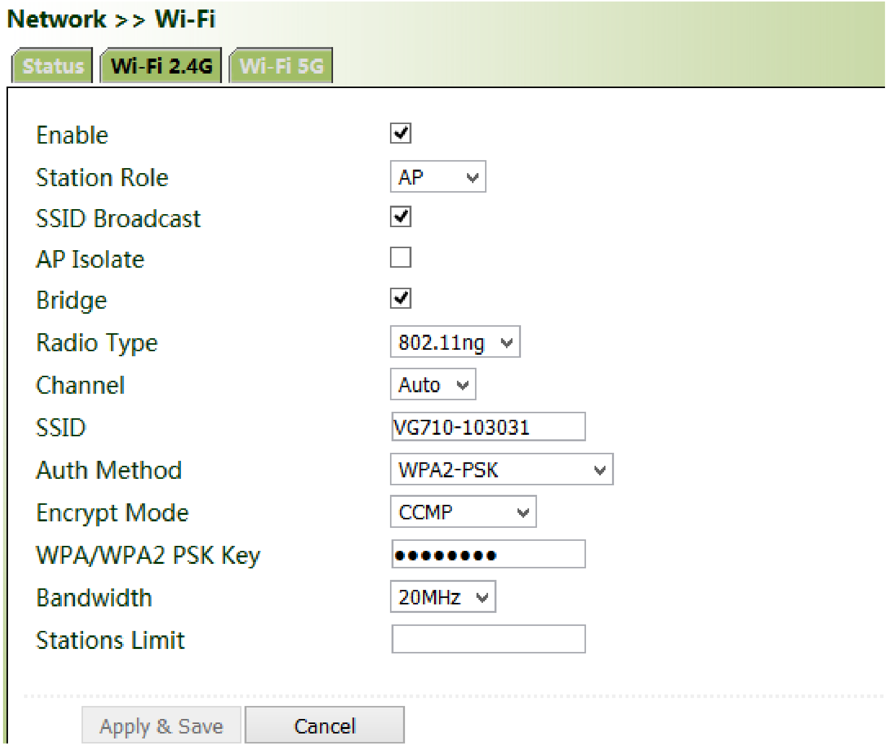
| | |
|---|---|
| Station Role | Client |
| Status | Disconnected |
| SSID | Inhand |
| MAC Address | 00:18:05:10:30:31 |
| Auth Method | WPA2-PSK |
| Encrypt Mode | CCMP |
| IP Address | 0.0.0.0 |
| Netmask | 0.0.0.0 |
| Gateway | 0.0.0.0 |
| DNS | 0.0.0.0 |
| Connection time | 0 day, 00:00:00 |

Wi-Fi 5G Status

| | |
|---|---|
| Station Role | AP |
| Status | Enabled |
| SSID | VG710-5G-103032 |
| MAC Address | 00:18:05:10:30:32 |
| Channel | 36 |
| Auth Method | WPA2-PSK |
| Encrypt Mode | CCMP |

Method for providing network access services for wireless terminals when the gateway is used as an AP:

Click "Wi-Fi >> Wi-Fi 2.4 or Wi-Fi 5G" and select "AP" for "Station Role". Enter the SSID, authentication method, and key consistent with those of the wireless AP. Click Apply & Save.

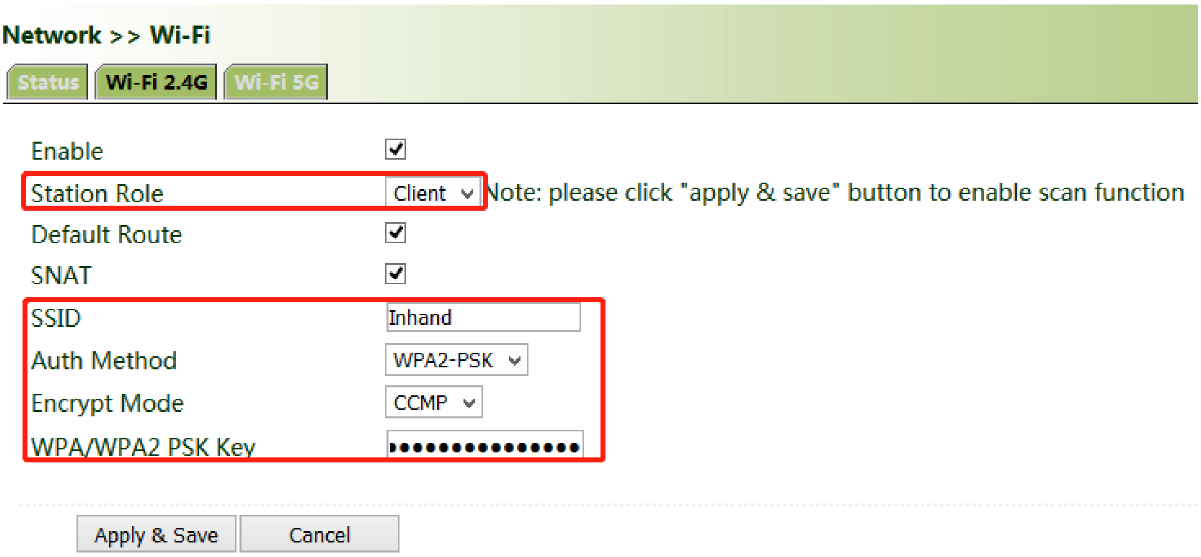


Network >> Wi-Fi

| | |
|---|---|
| Enable | ☑ |
| Station Role | AP |
| SSID Broadcast | ☑ |
| AP Isolate | □ |
| Bridge | ☑ |
| Radio Type | 802.11ng |
| Channel | Auto |
| SSID | VG710-103031 |
| Auth Method | WPA2-PSK |
| Encrypt Mode | CCMP |
| WPA/WPA2 PSK Key | •••••••• |
| Bandwidth | 20MHz |
| Stations Limit | |

Method for connecting to an AP for Internet access when VG814 is used as a client:

Select "Client", enter the Wi-Fi SSID and key, and click Apply & Save.



Network >> Wi-Fi

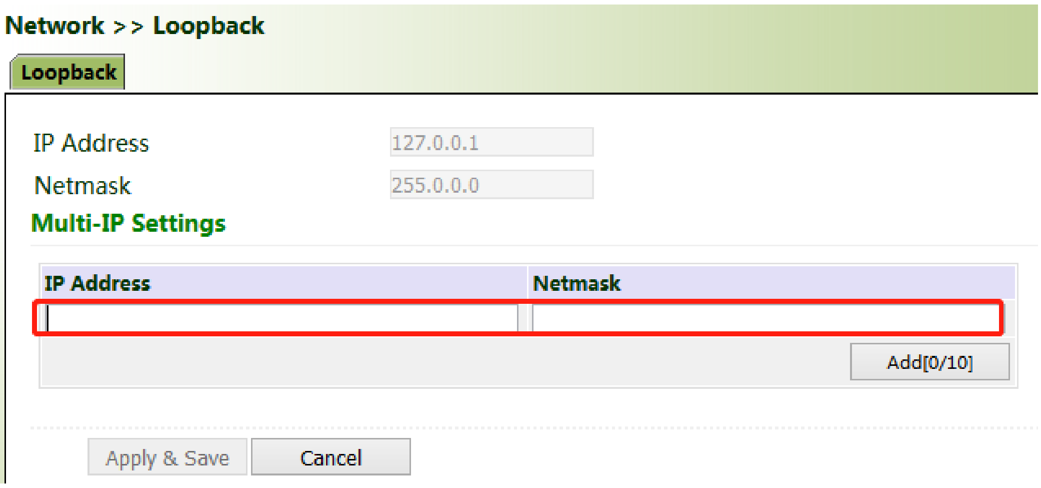
| | |
|---|---|
| Enable | ☑ |
| Station Role | Client |
| Default Route | ☑ |
| SNAT | ☑ |
| SSID | Inhand |
| Auth Method | WPA2-PSK |
| Encrypt Mode | CCMP |
| WPA/WPA2 PSK Key | ••••••••••••••• |

Note: please click "apply & save" button to enable scan function

## 5.1.5 Loopback Port

Method for adding multiple loopback ports:

Click "Network >> Loopback >> Multi-IP Settings", configure any IP address for the gateway, click Add, and then click Apply & Save.



Network >> Loopback

Loopback

IP Address 127.0.0.1

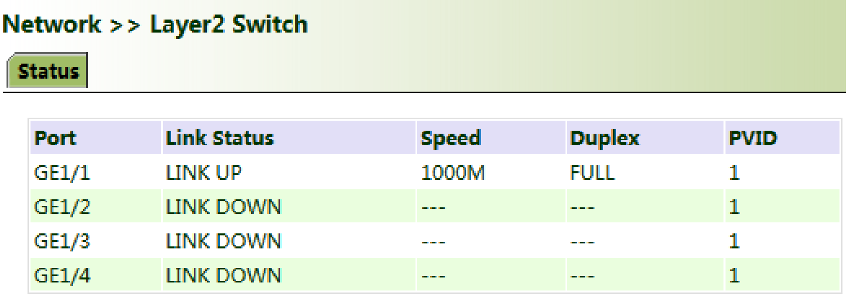
Netmask 255.0.0.0

Multi-IP Settings

| IP Address | Netmask |
|---|---|
| | |

## 5.1.6 Layer 2 Switch

Check the network connection status of GE 1 to GE 4. LINK UP indicates that the network is connected. LINK DOWN indicates that the network is disconnected.



Network >> Layer2 Switch

Status

| Port | Link Status | Speed | Duplex | PVID |
|---|---|---|---|---|
| GE1/1 | LINK UP | 1000M | FULL | 1 |
| GE1/2 | LINK DOWN | --- | --- | 1 |
| GE1/3 | LINK DOWN | --- | --- | 1 |
| GE1/4 | LINK DOWN | --- | --- | 1 |

# 5.2 OBD

OBD is used to collect vehicle condition data, obtain emission information, and perform fault diagnosis in real time. Vehicle condition data includes key parameters such as the fuel level, mileage, driving speed, engine speed, engine load, coolant temperature, and brake pressure. Emission information includes the volume of AdBlue, the operating and monitoring status of various exhaust post-processing sensors (such as the exhaust gas sensor and diesel particle filter) and catalysts, etc. In fault diagnosis, standard fault codes of vehicles and description information can be obtained in real time, so that vehicle maintenance personnel can learn the vehicle health status in time and locate the faults.

To collect vehicle data, the gateway is connected to the diagnostic port of the vehicle through the I/O port of the gateway over the OBD-II or J1939 cable. The cable accessories can be selected or customized during purchasing. For details about the access method, see Section 4.4 in the VG814 Quick Start Guide. After the gateway starts, the OBD service is automatically enabled to collect key vehicle condition data and fault code information.

> ⚠ 注意 Note:
>
> The power supply and OBD cable of the gateway shall be installed when the vehicle is off.

The vehicle status information is displayed on the OBD status page.

OBD Status:

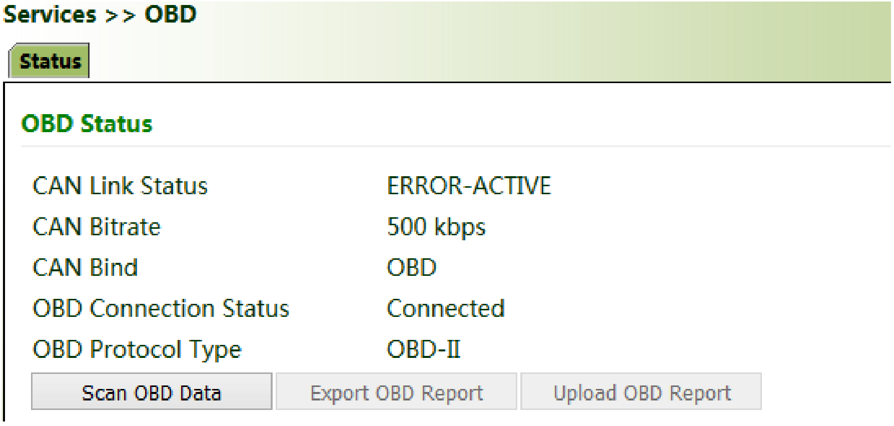
CAN Link Status (ERROR-ACTIVE indicates that the gateway has successfully connected to the diagnostic port of the vehicle. Other status indicates that the connection is abnormal or the diagnostic port of the vehicle is not identified.)

CAN Bitrate (In OBD, the CAN bitrate is automatically adapted, generally 250 kbps or 500 kbps.)

CAN Bind (″OBD″ (default) or ″Custom″)

OBD Connection Status (″Disconnected″, ″Connecting″, or ″Connected″)

OBD Protocol Type (OBD-II or J1939)



Services >> OBD

Status

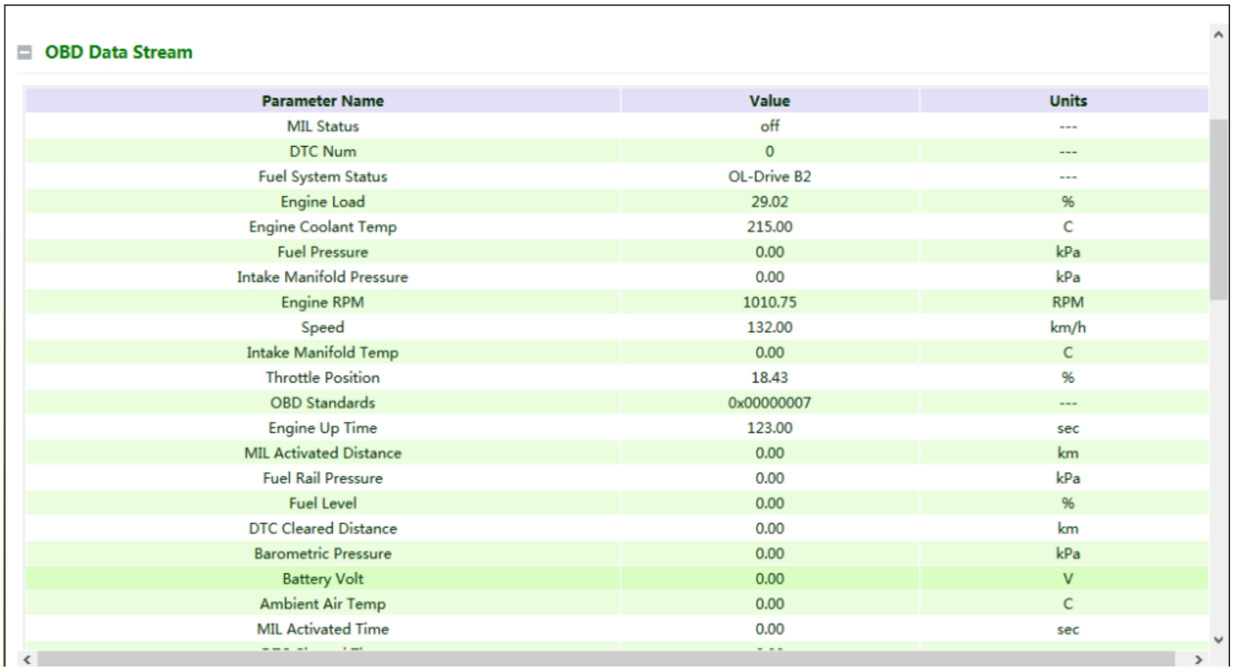
OBD Status

| | |
|---|---|
| CAN Link Status | ERROR-ACTIVE |
| CAN Bitrate | 500 kbps |
| CAN Bind | OBD |
| OBD Connection Status | Connected |
| OBD Protocol Type | OBD-II |

Scan OBD Data and Export OBD Report:

Click the Scan OBD Data button to generate a OBD data report containing detailed vehicle condition data and diagnostic information. Click the Export OBD Report button to save the generated OBD data report to the local storage.

OBD Data Stream: The real-time vehicle condition data is displayed.



OBD Data Stream

| Parameter Name | Value | Units |
|---|---|---|
| MIL Status | off | --- |
| DTC Num | 0 | --- |
| Fuel System Status | OL-Drive B2 | --- |
| Engine Load | 29.02 | % |
| Engine Coolant Temp | 215.00 | C |
| Fuel Pressure | 0.00 | kPa |
| Intake Manifold Pressure | 0.00 | kPa |
| Engine RPM | 1010.75 | RPM |
| Speed | 132.00 | km/h |
| Intake Manifold Temp | 0.00 | C |
| Throttle Position | 18.43 | % |
| OBD Standards | 0x00000007 | --- |
| Engine Up Time | 123.00 | sec |
| MIL Activated Distance | 0.00 | km |
| Fuel Rail Pressure | 0.00 | kPa |
| Fuel Level | 0.00 | % |
| DTC Cleared Distance | 0.00 | km |
| Barometric Pressure | 0.00 | kPa |
| Battery Volt | 0.00 | V |
| Ambient Air Temp | 0.00 | C |
| MIL Activated Time | 0.00 | sec |

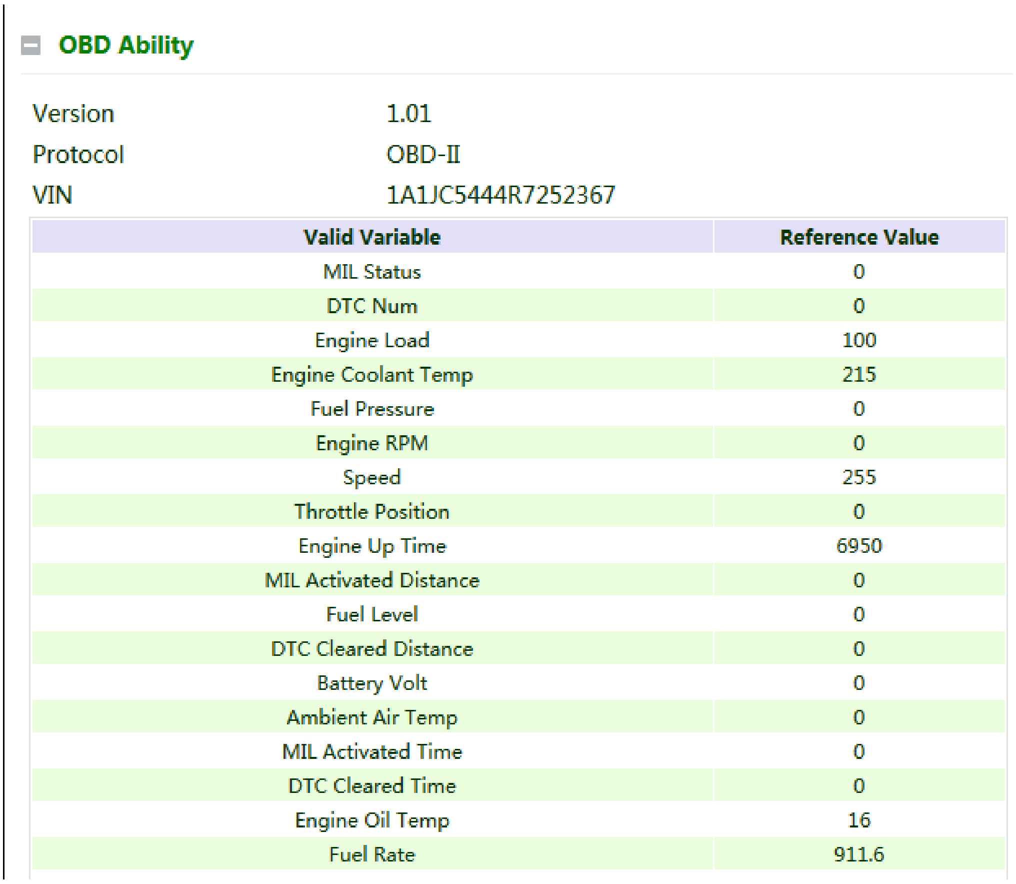
OBD Ability:

Version of the OBD ability;

Type of the OBD protocol;

Vehicle identification number (VIN);

Valid variables and reference values that can be collected by the gateway.



⊟ OBD Ability

| | |
|---|---|
| Version | 1.01 |
| Protocol | OBD-II |
| VIN | 1A1JC5444R7252367 |

| Valid Variable | Reference Value |
|---|---|
| MIL Status | 0 |
| DTC Num | 0 |
| Engine Load | 100 |
| Engine Coolant Temp | 215 |
| Fuel Pressure | 0 |
| Engine RPM | 0 |
| Speed | 255 |
| Throttle Position | 0 |
| Engine Up Time | 6950 |
| MIL Activated Distance | 0 |
| Fuel Level | 0 |
| DTC Cleared Distance | 0 |
| Battery Volt | 0 |
| Ambient Air Temp | 0 |
| MIL Activated Time | 0 |
| DTC Cleared Time | 0 |
| Engine Oil Temp | 16 |
| Fuel Rate | 911.6 |

# 5.3 VPN Application

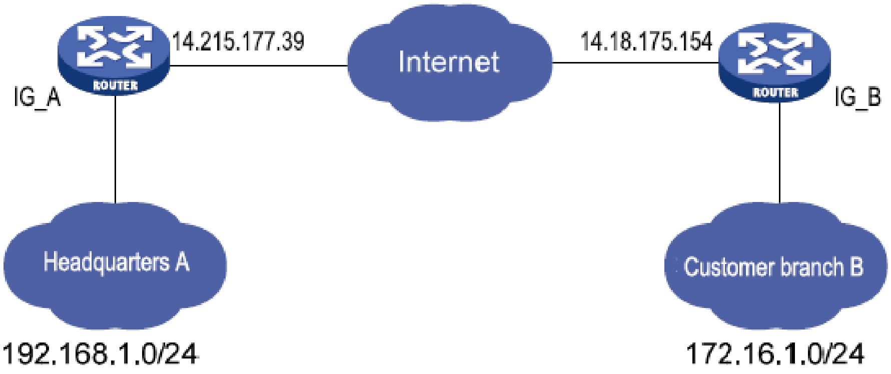
The VPN is intended to establish a private network on the public network for encrypted communication. A VPN gateway enables remote access by encrypting data packets and converting the destination address of data packets. The VPN can be realized by a server, hardware, or software, or in other ways. Compared with the traditional DDN private line or frame relay, the VPN provides a more secure and convenient remote access solution.

Common VPN application scenario: For example, an employee on a business trip accesses the enterprise's intranet. The employee connects to the enterprise's VPN server and then accesses the enterprise's intranet through the VPN server. Communication data between the VPN server and the client is encrypted and can be regarded as being transmitted on a dedicated data network. This ensures data security.

## 5.3.1 IPsec

IPsec is a group of open network security protocols developed by IETF. At the IP layer, the data source authentication, data encryption, data integrity, and anti-replay functions are used to ensure the security of data transmission between communication parties on the Internet. This reduces the risk of leakage and eavesdropping, ensures the integrity and confidentiality of data, and ensures the security of service transmission for users.

Scenario: Data is transmitted between the subnet (192.168.1.0/24) of headquarters A and the subnet (172.16.1.0/24) of customer branch B through gateway A and gateway B. The transmission channels of gateway A and gateway B are encrypted over IPsec, to protect the security of data transmission between headquarters A and customer branch B.



Method for encrypting the transmission channels of gateway A and gateway B over IPsec:

Parameter settings:

| Gateway A | | Gateway B |
|---|---|---|
| Set IKEv1/v2 parameters | | Set IKEv1/v2 parameters |

| | | | | |
|---|---|---|---|---|
| ID | Custom | | ID | Custom |
| Encryption algorithm | AES128 | | Encryption algorithm | Same as that of gateway A |
| Hash algorithm | SHA1 | | Hash algorithm | |
| Diffie-Hellman key exchange | Group2 | | Diffie-Hellman key exchange | |
| Lifecycle | 86400 | | Lifecycle | |
| IPsec policy | | | IPsec policy | |
| Name | Custom | | Name | Custom |
| Encapsulation | ESP | | Encapsulation | Same as that of gateway A |
| Encryption algorithm | AES128 | | Encryption algorithm | |
| Authentication method | SHA1 | | Authentication method | |
| IPsec mode | Tunnel mode | | IPsec mode | |
| IPsec tunnel configuration | | | IPsec tunnel configuration | |
| Peer address | Address where gateway B establishes the IPsec service | | Peer address | Address where gateway A establishes the IPsec service |
| Interface | Interface for | | Interface | Interface for |

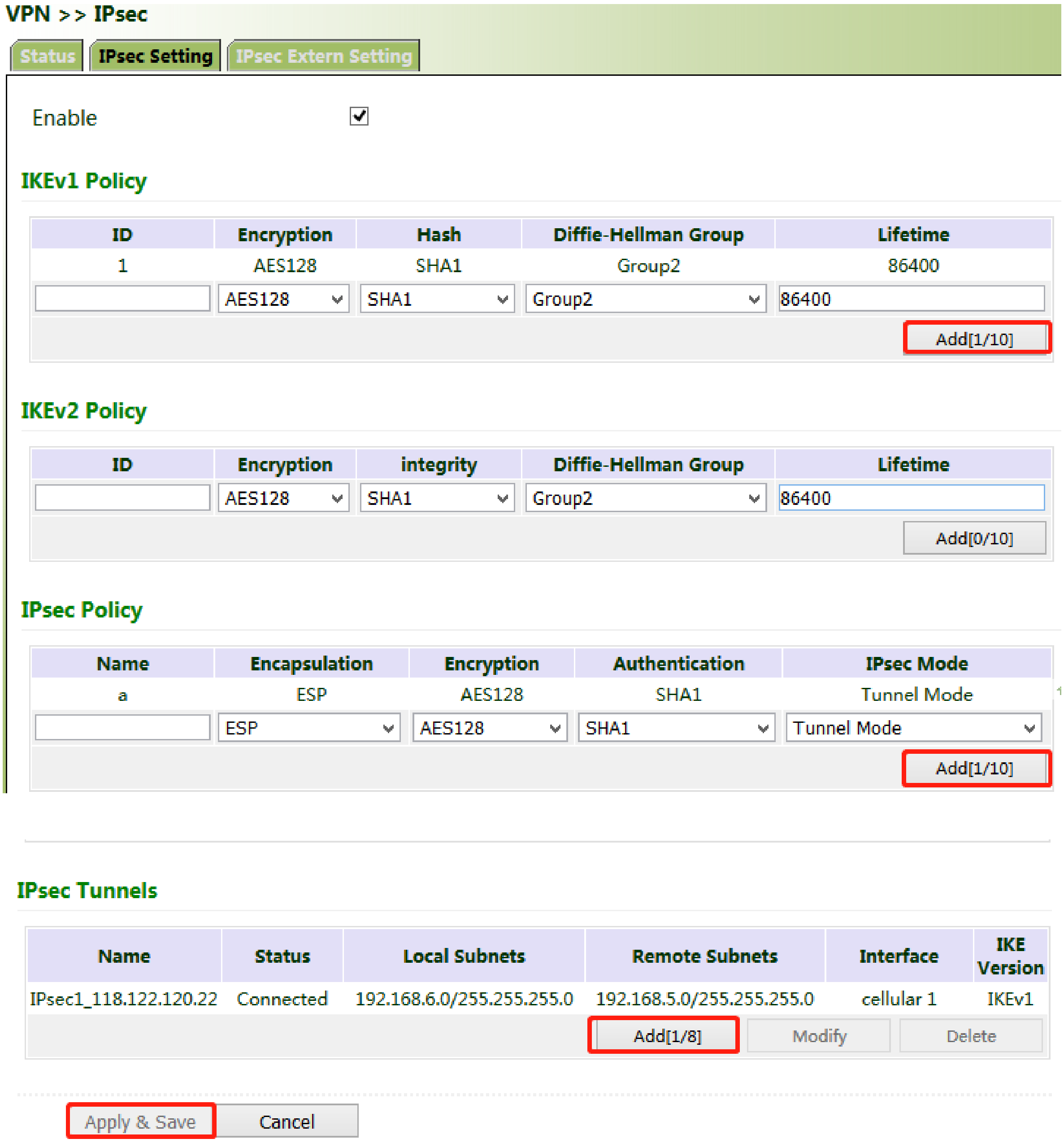
| | | | | |
|---|---|---|---|---|
| | establishing the IPsec service | | | establishing the IPsec service |
| IKE version | IKE version used | | IKE version | Same as that of gateway A |
| Authentication method | Shared key | | Authentication method | |
| Local subnet | IP address of the subnet of gateway A | | Local subnet | IP address of the subnet of gateway B |
| Peer subnet | IP address of the subnet of gateway B | | Peer subnet | IP address of the subnet of gateway A |

Detailed configuration steps:

1. Configure gateway A and gateway B.

(1) Add IKE and IPsec policies, and click Apply & Save.

(2) Add IPsec tunnels and click Apply & Save.



VPN >> IPsec

Enable ☑

**IKEv1 Policy**

| ID | Encryption | Hash | Diffie-Hellman Group | Lifetime |
|---|---|---|---|---|
| 1 | AES128 | SHA1 | Group2 | 86400 |
|  | AES128 | SHA1 | Group2 | 86400 |

**IKEv2 Policy**

| ID | Encryption | integrity | Diffie-Hellman Group | Lifetime |
|---|---|---|---|---|
|  | AES128 | SHA1 | Group2 | 86400 |

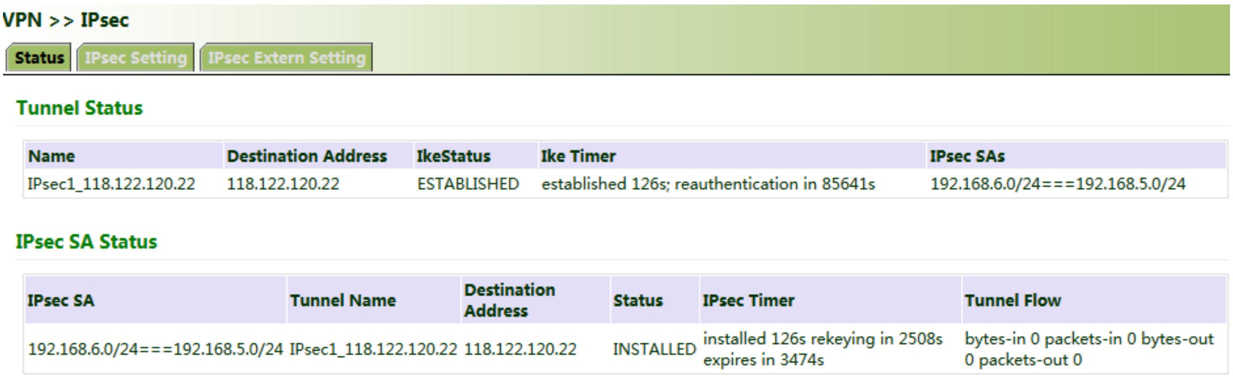
**IPsec Policy**

| Name | Encapsulation | Encryption | Authentication | IPsec Mode |
|---|---|---|---|---|
| a | ESP | AES128 | SHA1 | Tunnel Mode |
|  | ESP | AES128 | SHA1 | Tunnel Mode |

**IPsec Tunnels**

| Name | Status | Local Subnets | Remote Subnets | Interface | IKE Version |
|---|---|---|---|---|---|
| IPsec1_118.122.120.22 | Connected | 192.168.6.0/255.255.255.0 | 192.168.5.0/255.255.255.0 | cellular 1 | IKEv1 |

2. Access the IPsec status page. The IPsec VPN is established successfully if the page is shown as below.



VPN >> IPsec

**Tunnel Status**

| Name | Destination Address | IkeStatus | Ike Timer | IPsec SAs |
|---|---|---|---|---|
| IPsec1_118.122.120.22 | 118.122.120.22 | ESTABLISHED | established 126s; reauthentication in 85641s | 192.168.6.0/24===192.168.5.0/24 |

**IPsec SA Status**

| IPsec SA | Tunnel Name | Destination Address | Status | IPsec Timer | Tunnel Flow |
|---|---|---|---|---|---|
| 192.168.6.0/24===192.168.5.0/24 | IPsec1_118.122.120.22 | 118.122.120.22 | INSTALLED | installed 126s rekeying in 2508s expires in 3474s | bytes-in 0 packets-in 0 bytes-out 0 packets-out 0 |

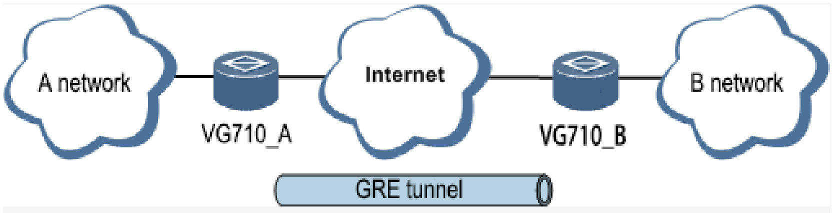
⚠ 注意 Note:

The IPsec profile does not need to be configured for establishing an IPsec VPN, but needs to be configured for establishing a DM VPN.

## 5.3.2 GRE

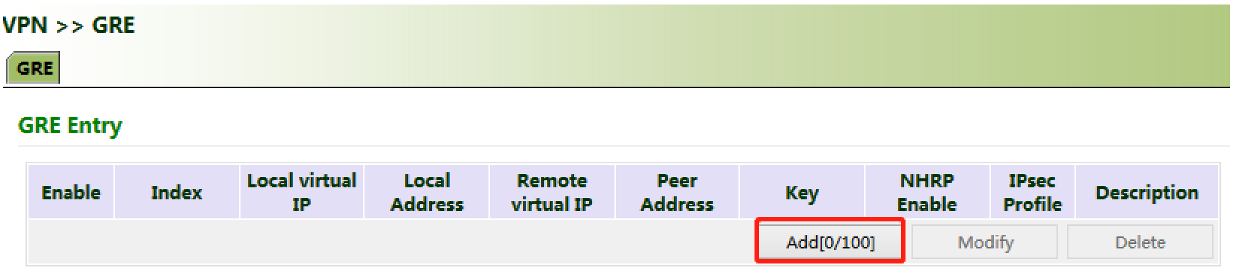
The Generic Routing Encapsulation (GRE) protocol can be used to encapsulate datagrams of some network layer protocols, so that these encapsulated datagrams can be transmitted on the IPv4 network.

Scenario: GRE is enabled for VG814_A and VG814_B through the public network.



Method for enabling GRE for transmission channels of VG814_A and VG814_B:

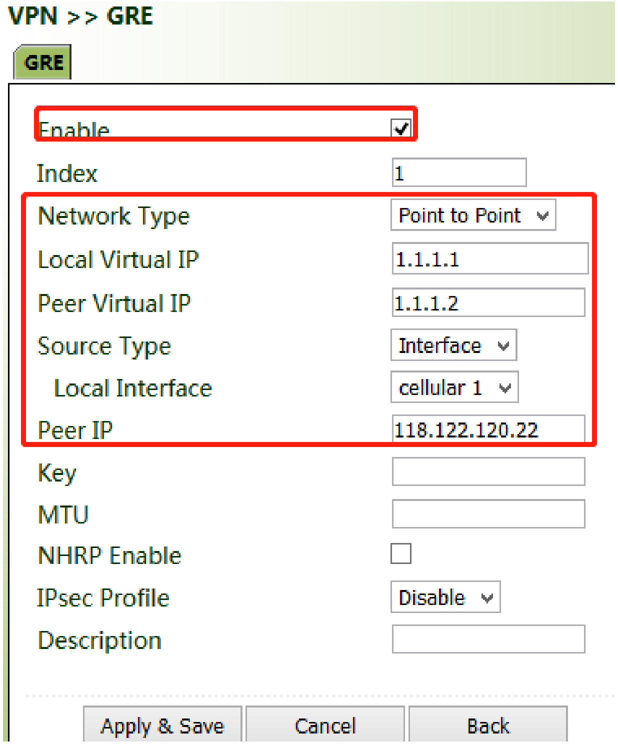
1. Click "VPN >> GRE" and then click Add.



GRE Entry

| Enable | Index | Local virtual IP | Local Address | Remote virtual IP | Peer Address | Key | NHRP Enable | IPsec Profile | Description |
|---|---|---|---|---|---|---|---|---|---|

2. Set "Index" as required. Select "Point to Point" or "Subnet" for "Network Type". Set "Local Virtual IP" and "Peer Virtual IP", ensuring that they are on the same network segment. Enter the source and peer IP addresses or interfaces and the key. Click Apply & Save.



Enable ☑
Index 1
Network Type Point to Point
Local Virtual IP 1.1.1.1
Peer Virtual IP 1.1.1.2
Source Type Interface
Local Interface cellular 1
Peer IP 118.122.120.22
Key
MTU
NHRP Enable □
IPsec Profile Disable
Description

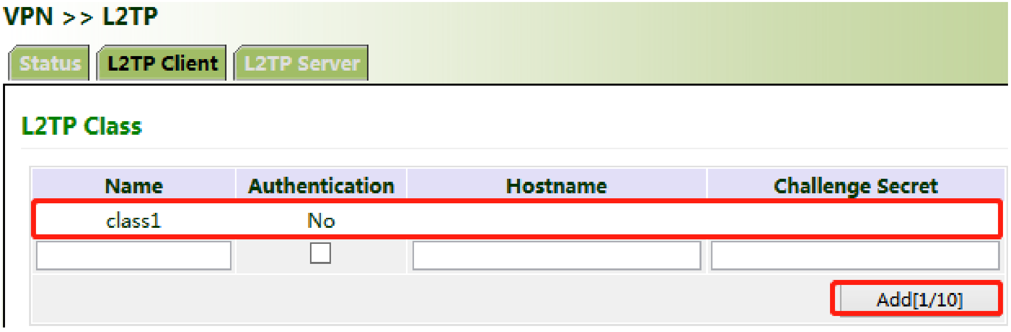
3. Set VG814_B in the same way. The virtual and peer IP addresses of VG814_B must correspond to those of VG814_A, and the key must be the same as that of VG814_A.

## 5.3.3 L2TP

The Layer 2 Tunneling Protocol (L2TP) is an industrial-standard Internet tunneling protocol used to encrypt network data streams.

Method for settings when the gateway is used as an L2TP client:

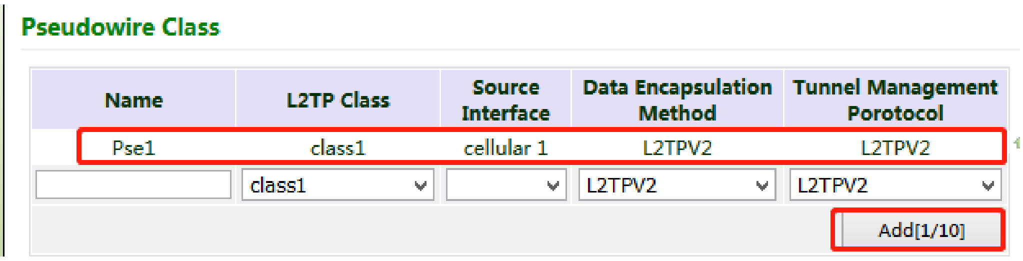
1. Click "VPN >> L2TP >> L2TP Client >> L2TP Class", enter a name of an L2TP class, and click Add.



L2TP Class

| Name | Authentication | Hostname | Challenge Secret |
|---|---|---|---|
| class1 | No | | |
| | □ | | |

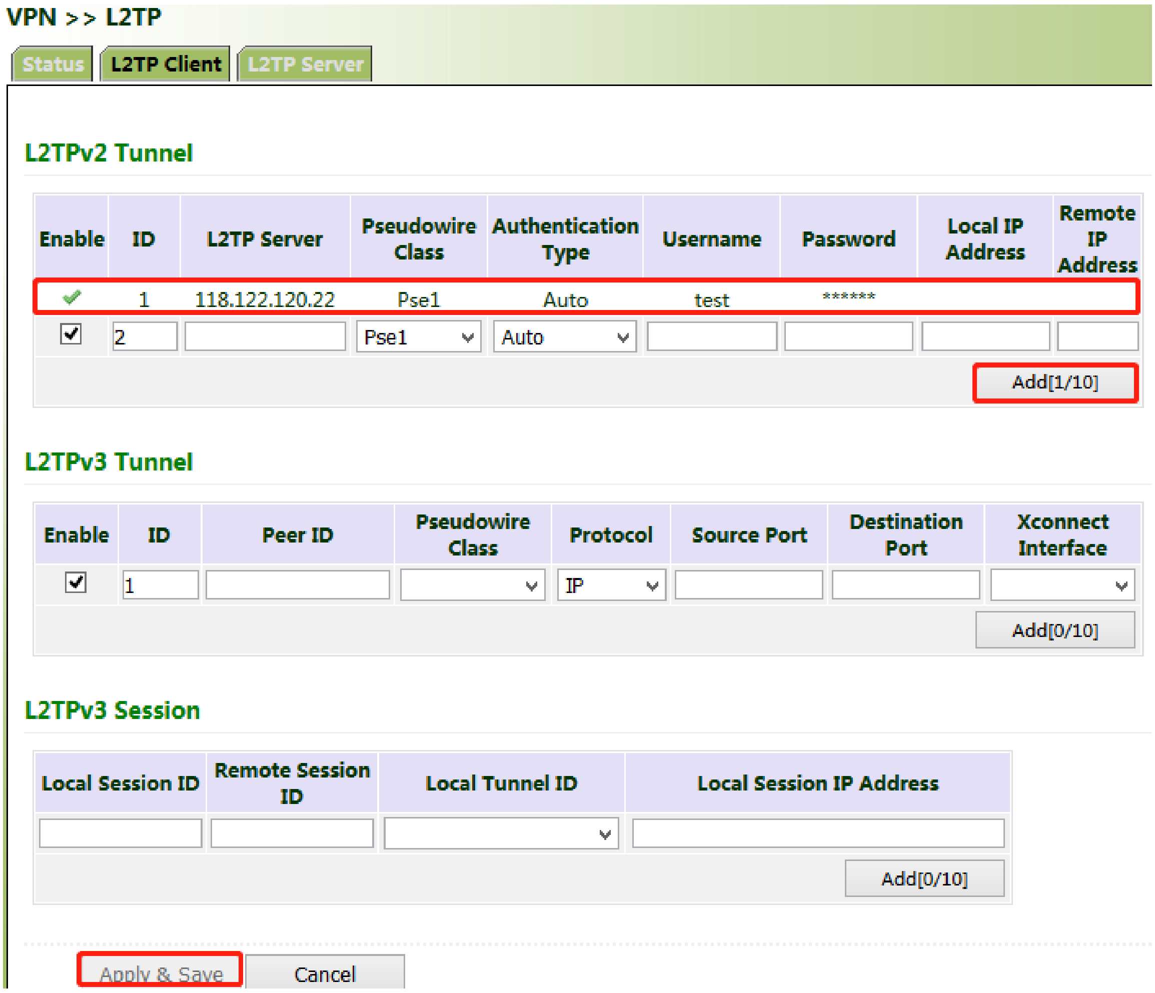
2. Configure the pseudowire class: Enter a name of any pseudowire class. "L2TP Class" is the same as that on the "L2TP Class" page. Set "Source Interface" to the interface connecting to the server. Select L2TPV2 for "Protocol" and click Add.



**Pseudowire Class**

| Name | L2TP Class | Source Interface | Data Encapsulation Method | Tunnel Management Porotocol |
|---|---|---|---|---|
| Pse1 | class1 | cellular 1 | L2TPV2 | L2TPV2 |
|  | class1 |  | L2TPV2 | L2TPV2 |

3. Set L2TPV2 tunnel parameters: Enter the server's domain name or IP address for "L2TP Server". "Pseudowire Class" is the same as that on the "Pseudowire Class" page. Enter the user name and password created on the server. Set other parameters as required. Click Apply & Save.



**L2TPv2 Tunnel**

| Enable | ID | L2TP Server | Pseudowire Class | Authentication Type | Username | Password | Local IP Address | Remote IP Address |
|---|---|---|---|---|---|---|---|---|
| ✓ | 1 | 118.122.120.22 | Pse1 | Auto | test | ****** |  |  |
| ☑ | 2 |  | Pse1 | Auto |  |  |  |  |

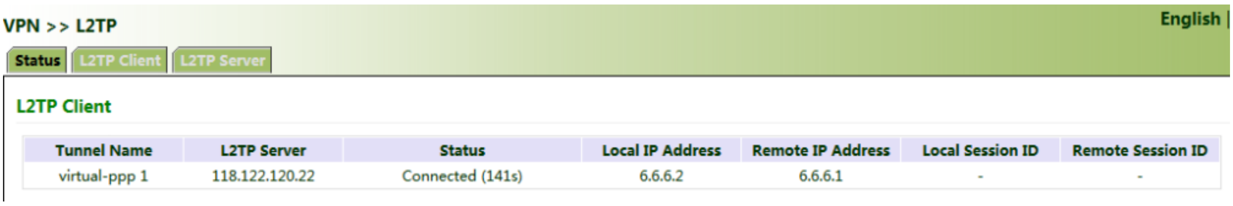
**L2TPv3 Tunnel**

| Enable | ID | Peer ID | Pseudowire Class | Protocol | Source Port | Destination Port | Xconnect Interface |
|---|---|---|---|---|---|---|---|
| ☑ | 1 |  |  | IP |  |  |  |

**L2TPv3 Session**

| Local Session ID | Remote Session ID | Local Tunnel ID | Local Session IP Address |
|---|---|---|---|
|  |  |  |  |

4. After gateway A and gateway B are configured, access the L2TP status page to view the L2TP connection status.



L2TP Client

| Tunnel Name | L2TP Server | Status | Local IP Address | Remote IP Address | Local Session ID | Remote Session ID |
|---|---|---|---|---|---|---|
| virtual-ppp 1 | 118.122.120.22 | Connected (141s) | 6.6.6.2 | 6.6.6.1 | - | - |

## 5.3.4 OpenVPN

OpenVPN is realized based on the application-layer VPN of the OpenSSL library. It supports multiple authentication methods such as the certificate, key, and user name/password. Compared with the traditional VPN, it is simpler and easier to use.

Authentication methods:

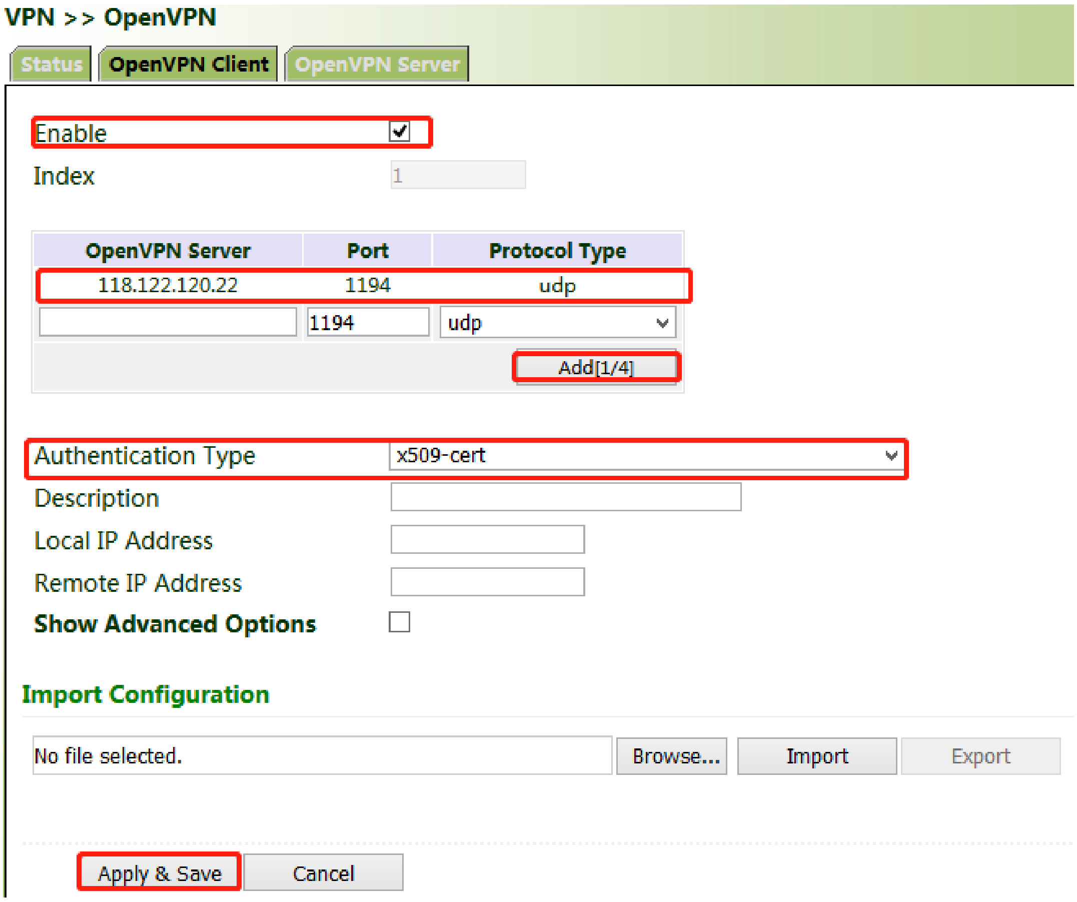
| Authentication method | Operation on the web page |
|---|---|
| None | No authentication is required. |
| User name/password | Enter the user name and password created on the OpenVPN server, click "VPN >> Certificate Management", and import the CA certificate, public key, and private key for authentication. |
| Pre-shared key | Enter the pre-shared key created on the OpenVPN server. |
| Digital certificate | Click "VPN >> Certificate Management" and import the CA certificate, public key, and private key. |
| Digital certificate/user name/password | Enter the user name and password created on the OpenVPN server, click |

| | |
|---|---|
| | ″VPN >> Certificate Management″, and import the CA certificate, public key, and private key for authentication. |
| Digital certificate/TLS authentication | Enter the pre-shared key created on the OpenVPN server, click ″VPN >> Certificate Management″, and import the CA certificate, public key, and private key for authentication. |
| Digital certificate/TLS authentication/user name/password | Enter the pre-shared key, user name, and password created on the OpenVPN server, click ″VPN >> Certificate Management″, and import the CA certificate, public key, and private key for authentication. |

Method for settings when the gateway is connected to the OpenVPN server as a client:

OpenVPN can be configured manually, or OpenVPN configurations can be imported. In the following example, the authentication type is a digital certificate.

1. Set the OpenVPN parameters for the gateway as shown in the figure below, ensuring that the network parameters at both ends of the tunnel are consistent. Click Apply & Save.



Enable ☑

Index 1

| OpenVPN Server | Port | Protocol Type |
|---|---|---|
| 118.122.120.22 | 1194 | udp |
|  | 1194 | udp |

Authentication Type x509-cert

Description

Local IP Address

Remote IP Address

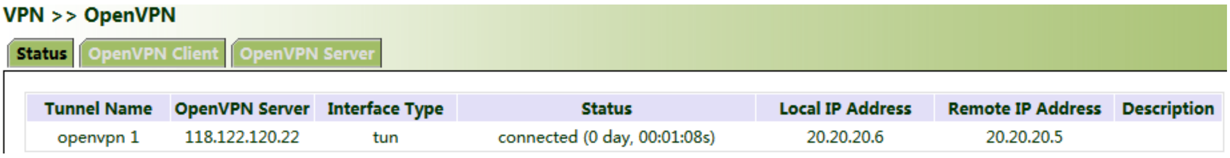
Show Advanced Options □

Import Configuration

No file selected.

2. Select a digital certificate for "Authentication Type", click "VPN >> Certificate Management", and import the CA certificate, public key, and private key.

3. Click Apply & Save. Return to the "Status" page and view the tunnel status.



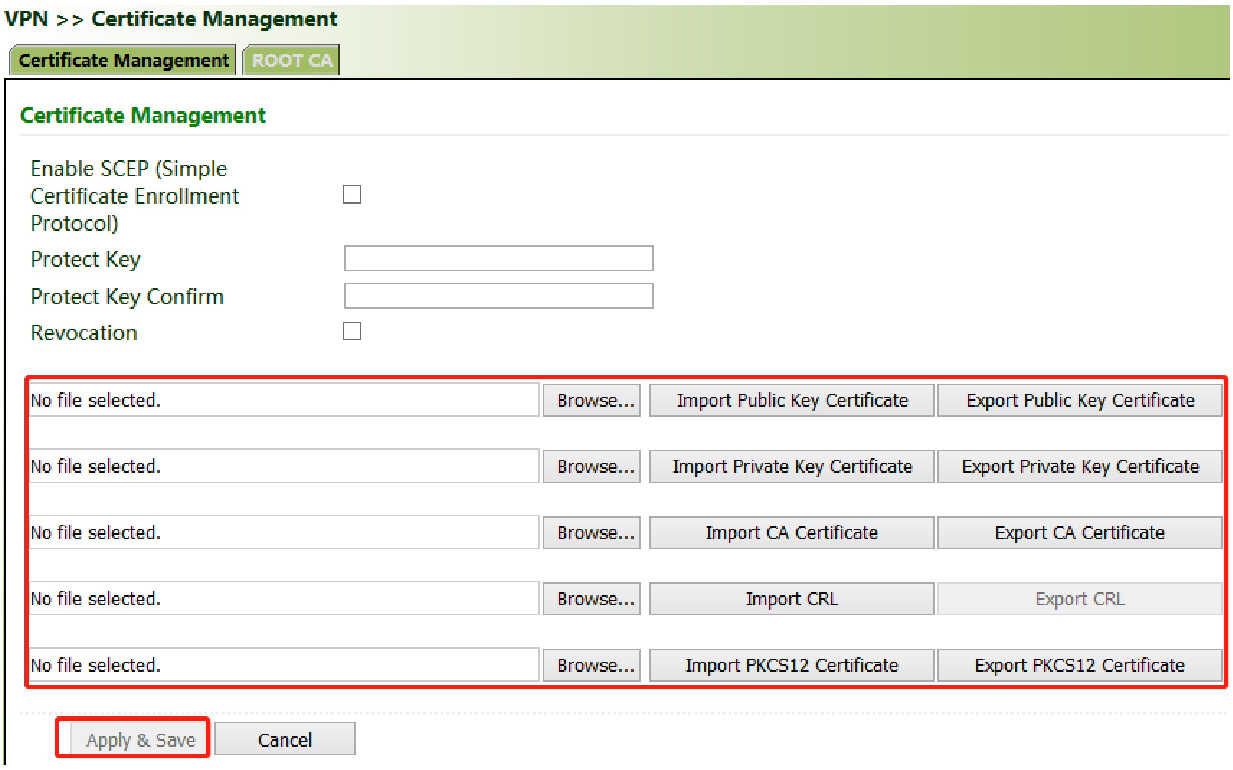
| Tunnel Name | OpenVPN Server | Interface Type | Status | Local IP Address | Remote IP Address | Description |
|---|---|---|---|---|---|---|
| openvpn 1 | 118.122.120.22 | tun | connected (0 day, 00:01:08s) | 20.20.20.6 | 20.20.20.5 |  |

## 5.3.5 Certificate Management

Certificates can be imported or exported on this page. Certificates are used for IPsec and OpenVPN services.

Method for importing a certificate:

Click "VPN >> Certificate Management >> Browse", select the certificate obtained from the certificate server, click Import XX Certificate, and then click Apply & Save.



VPN >> Certificate Management

Certificate Management

Enable SCEP (Simple Certificate Enrollment Protocol) □

Protect Key

Protect Key Confirm

Revocation □

No file selected.

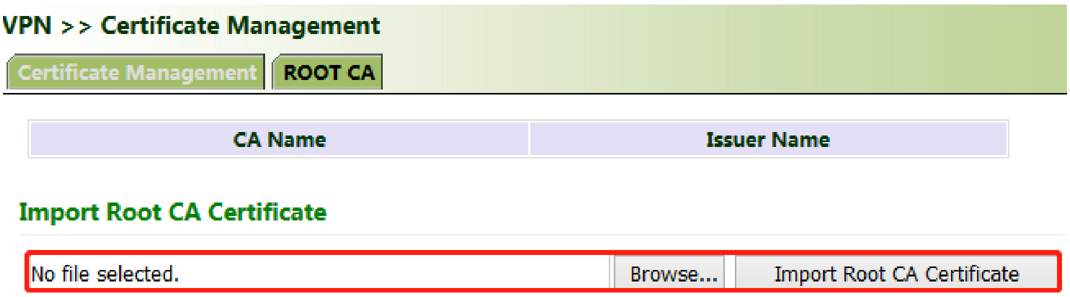
No file selected.

No file selected.

No file selected.

No file selected.

Certificate Management
ROOT CA
Browse...
Import Public Key Certificate
Export Public Key Certificate
Browse...
Import Private Key Certificate
Export Private Key Certificate
Browse...
Import CA Certificate
Export CA Certificate
Browse...
Import CRL
Export CRL
Browse...
Import PKCS12 Certificate
Export PKCS12 Certificate
Apply & Save
Cancel



VPN >> Certificate Management

| CA Name | Issuer Name |
|---|---|

Import Root CA Certificate

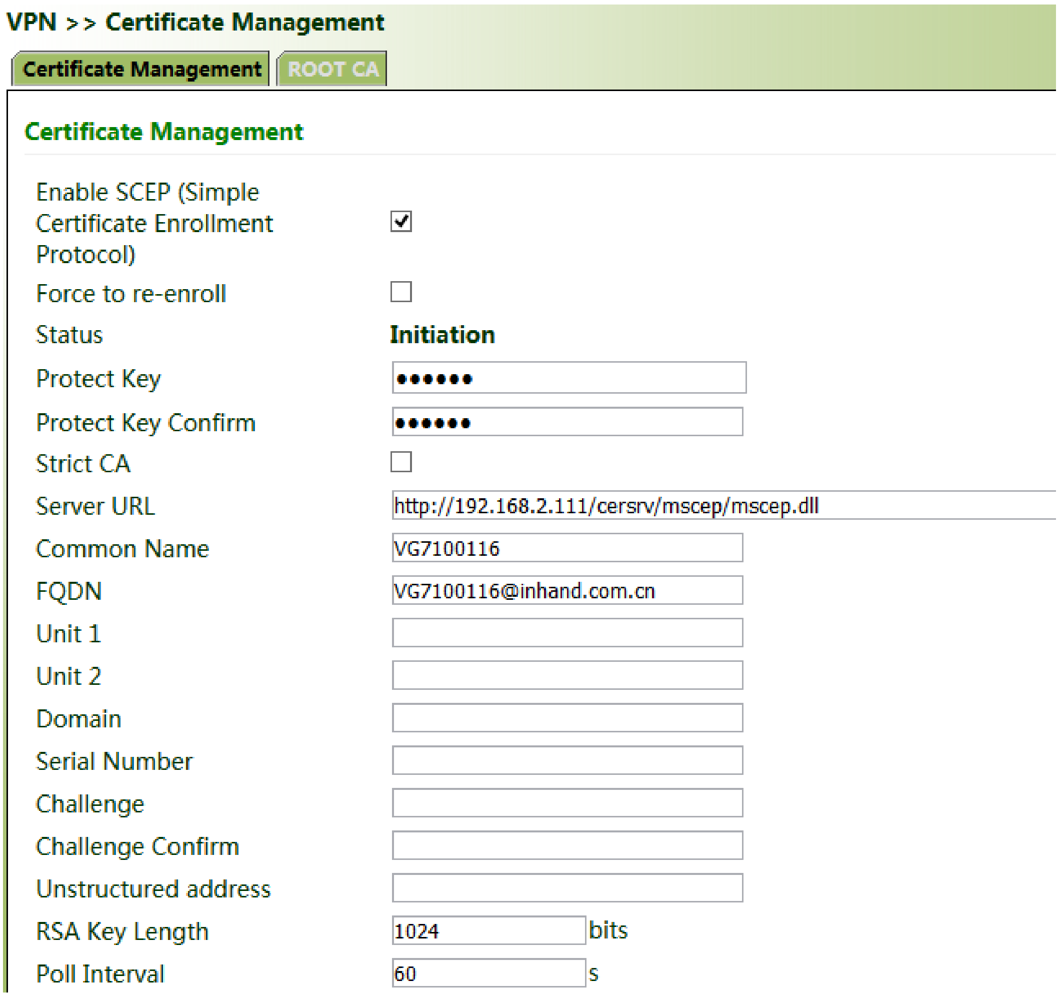
No file selected.

If no local certificate is available, check "Enable SCEP (Simple Certificate Enrollment Protocol)" to apply for a certificate online.

Method for applying for a certificate for the gateway online:

1. Click "VPN >> Certificate Management". Check "Enable SCEP (Simple Certificate Enrollment Protocol)" and "Force to re-enroll". Enter the certificate protection key and confirm it. Enter the URL of the certificate server, the certificate name, and the FQDN. Click Apply & Save.

2. After the server issues the certificate, check the application status. If the application status is "Completion", the certificate application succeeds.



VPN >> Certificate Management

Certificate Management

| | |
|---|---|
| Enable SCEP (Simple Certificate Enrollment Protocol) | ☑ |
| Force to re-enroll | □ |
| Status | **Initiation** |
| Protect Key | •••••• |
| Protect Key Confirm | •••••• |
| Strict CA | □ |
| Server URL | http://192.168.2.111/cersrv/mscep/mscep.dll |
| Common Name | VG7100116 |
| FQDN | VG7100116@inhand.com.cn |
| Unit 1 | |
| Unit 2 | |
| Domain | |
| Serial Number | |
| Challenge | |
| Challenge Confirm | |
| Unstructured address | |
| RSA Key Length | 1024 bits |
| Poll Interval | 60 s |

# 5.4 Services

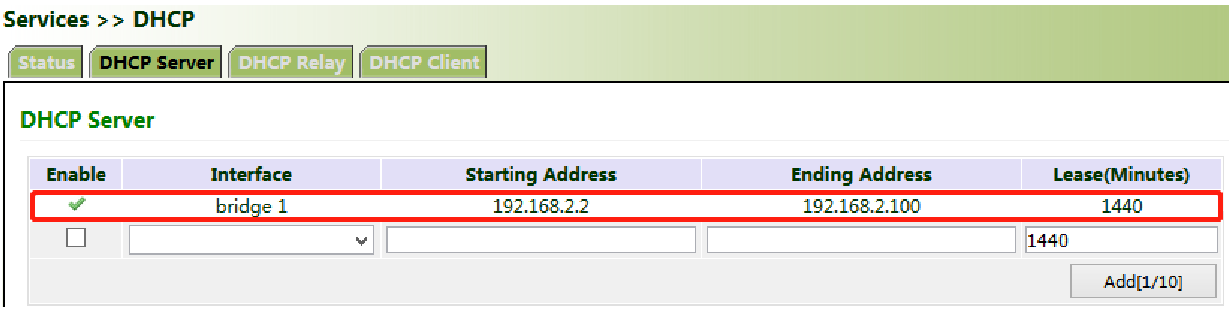
## 5.4.1 DHCP (Automatic IP Address Allocation)

DHCP uses the client/server communication mode. The client submits a configuration application to the server, and the server returns the IP address assigned to the client to realize the dynamic configuration of the IP address.

The DHCP server and DHCP forwarding function are mutually exclusive.

Method for settings when the gateway is used as a DHCP server:

Click "Services >> DHCP >> DHCP Server". In the "DHCP Server" bar, check "Enable", select an interface, set the start and end IP addresses, click Add, and then click Apply & Save.

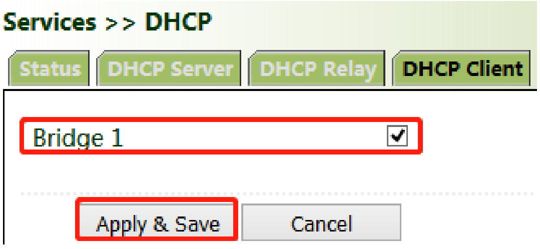


DHCP Server

| Enable | Interface | Starting Address | Ending Address | Lease(Minutes) |
|---|---|---|---|---|
| ✓ | bridge 1 | 192.168.2.2 | 192.168.2.100 | 1440 |
| □ | | | | 1440 |

Method for settings when the gateway is used as a DHCP client:

Click "Services >> DHCP >> DHCP Client", select the gateway interface, and click Apply & Save.

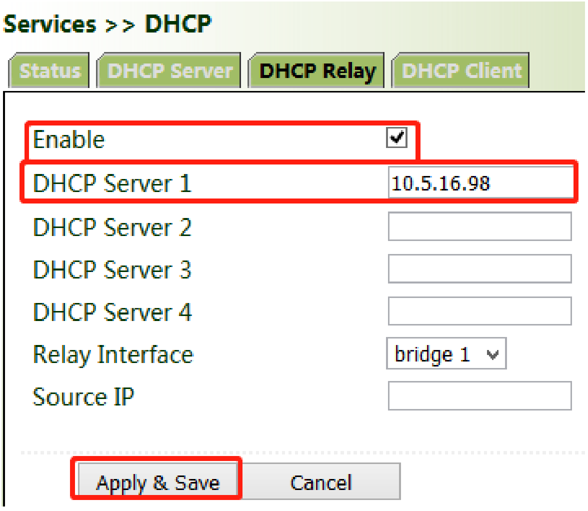


Bridge 1 ☑

Method for enabling DHCP forwarding for the gateway:

DHCP forwarding is also referred to as a DHCP relay agent. It can process and forward DHCP information between different subnets and physical network segments.

Click "Services >> DHCP >> DHCP Relay", check "Enable", enter the server address, select the gateway interface, and click Apply & Save.



Services >> DHCP

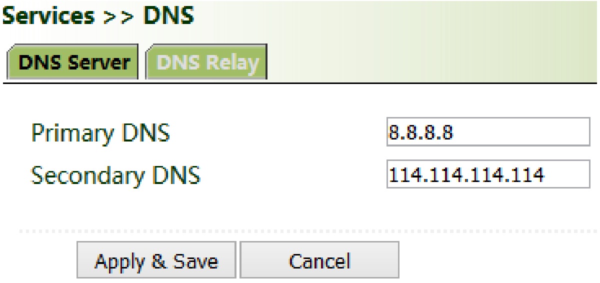
| | |
|---|---|
| Enable | ☑ |
| DHCP Server 1 | 10.5.16.98 |
| DHCP Server 2 | |
| DHCP Server 3 | |
| DHCP Server 4 | |
| Relay Interface | bridge 1 |
| Source IP | |

## 5.4.2 DNS

The domain name service (DNS) is a distributed network directory service mainly used for mutual conversion between a domain name and an IP address.

Method for enabling the DNS server for the gateway:

Click "Services >> DNS >> DNS Server", enter the address of the DNS server, and click Apply & Save.



Services >> DNS

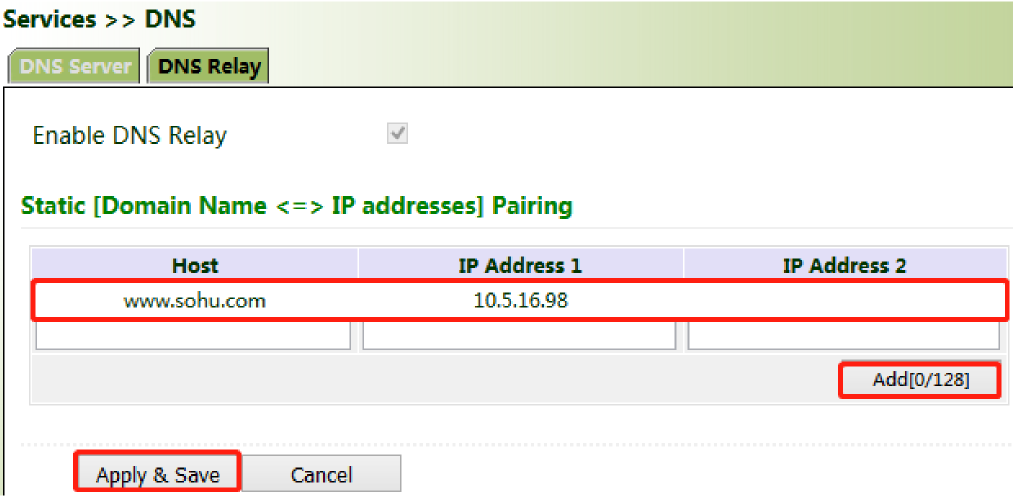
| | |
|---|---|
| Primary DNS | 8.8.8.8 |
| Secondary DNS | 114.114.114.114 |

Method for enabling DNS forwarding for the gateway:

As a DNS agent, the gateway forwards DNS request and response messages between the DNS client and the DNS server, and replaces the DNS client for domain name resolution.

If the DHCP service is enabled for the gateway, DNS forwarding is enabled by default and cannot be disabled.

Click "Services >> DNS >> DNS Relay", check "Enable DNS Relay", set the mapping between the domain name and the IP address, click Add, and then click Apply & Save. After the settings are completed, when a DNS client on the LAN requests a host domain name in the list, the DNS agent server returns the corresponding IP address to the client.



Enable DNS Relay ☑

Static [Domain Name <=> IP addresses] Pairing

| Host | IP Address 1 | IP Address 2 |
|---|---|---|
| www.sohu.com | 10.5.16.98 | |

## 5.4.3 DDNS

The dynamic domain name server (DDNS) maps the dynamic IP address of the gateway to a fixed DNS. Each time a user connects to the Internet, the client program transmits the dynamic IP address of the host to the server program on the server host through information transfer. The server program provides the DDNS service and realizes dynamic domain name resolution. In this way, you can access the Internet by entering the domain name, even if the IP address is changed.

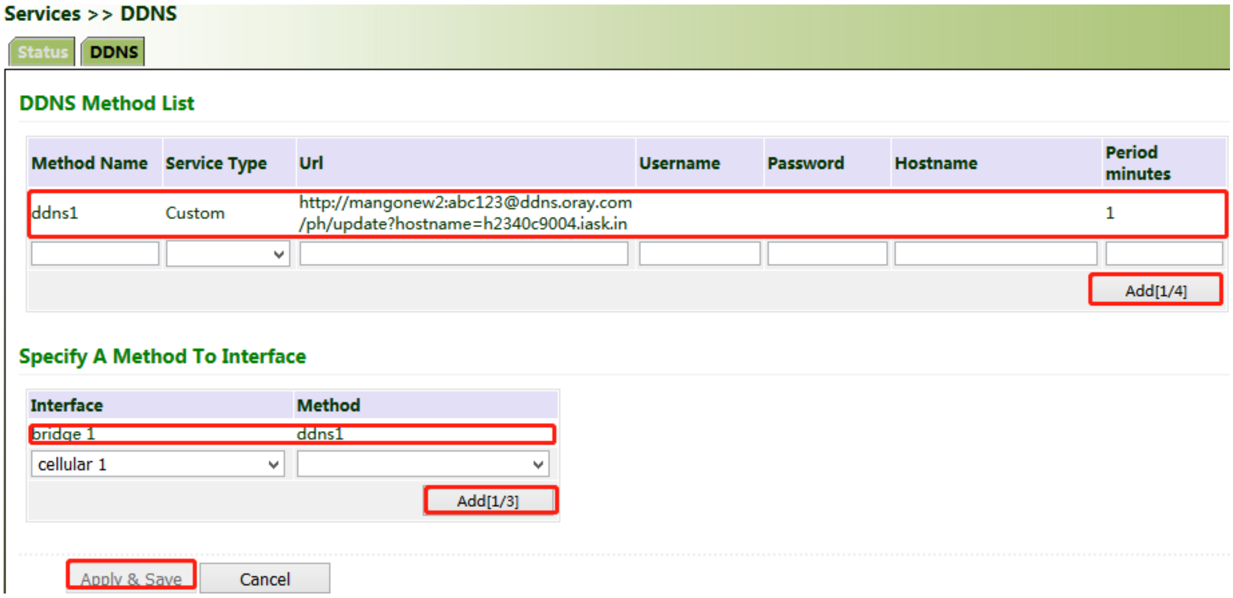
Method for enabling the DDNS service for the gateway:

1. If the Custom service is used, set "Method Name" as required, select "Custom" for "Service Type", and enter the DDNS expression "http://user name:password@ddns.oray.com/ph/update?hostname=host name" of the server for "Url". This expression is only for reference. The actual URL is provided by the service provider (usually available on the official website of the service provider). Click Add.

If a common domain name server other than the Custom service is used, set "Method Name" and "Service Type" as required, enter the user name, password, and host name obtained from the server, and click Add.

If "Disable" is selected, the DDNS service is not used.

2. Select the gateway interface, enter the name of the DDNS update method, click Add, and then click Apply & Save to apply the DDNS update method to the gateway interface.



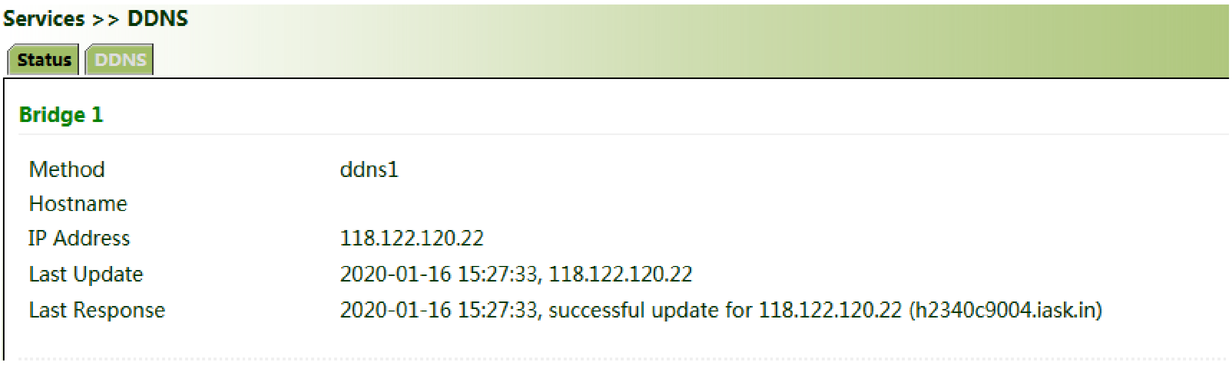
DDNS Method List

| Method Name | Service Type | Url | Username | Password | Hostname | Period minutes |
|---|---|---|---|---|---|---|
| ddns1 | Custom | http://mangonew2:abc123@ddns.oray.com<br>/ph/update?hostname=h2340c9004.iask.in | | | | 1 |

Specify A Method To Interface

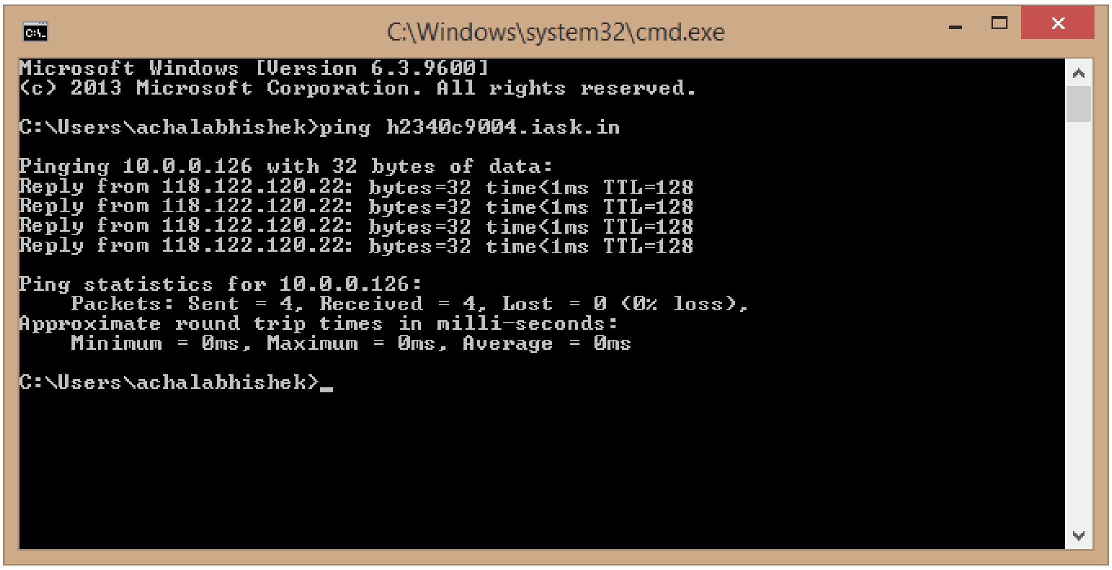
| Interface | Method |
|---|---|
| bridge 1 | ddns1 |
| cellular 1 | |

3. Wait several minutes after the DDNS settings are applied and saved. Then ping the host name (domain name) of the domain name server to confirm the successful application of the DDNS service.



Bridge 1

| | |
|---|---|
| Method | ddns1 |
| Hostname | |
| IP Address | 118.122.120.22 |
| Last Update | 2020-01-16 15:27:33, 118.122.120.22 |
| Last Response | 2020-01-16 15:27:33, successful update for 118.122.120.22 (h2340c9004.iask.in) |



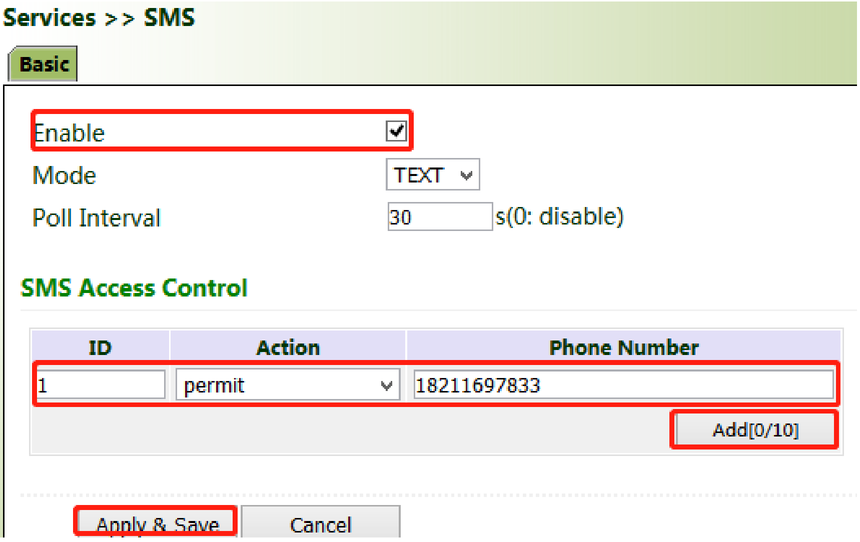
```
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.

C:\Users\achalabhishek>ping h2340c9004.iask.in

Pinging 10.0.0.126 with 32 bytes of data:
Reply from 118.122.120.22: bytes=32 time<1ms TTL=128
Reply from 118.122.120.22: bytes=32 time<1ms TTL=128
Reply from 118.122.120.22: bytes=32 time<1ms TTL=128
Reply from 118.122.120.22: bytes=32 time<1ms TTL=128

Ping statistics for 10.0.0.126:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\achalabhishek>_
```

## 5.4.4 SMS

The short message service (SMS) is enabled for gateway restart and manual dialup via SMS messages. Some gateways can receive alarm information in the SMS whitelist.

Method for controlling gateway restart and manual dialup via SMS messages

Click "Services >> SMS" and check "Enable". In the "SMS Access Control" bar, set "ID" as required, select "permit" for "Action", enter the phone number, and click Apply & Save. When you activate the dialup port via SMS, after the configuration is completed, you can send the reboot command to restart the gateway by using the mobile phone number, or send the cellular 1 ppp up/down command to make the gateway redial or interrupt the dialup.



Enable ☑

Mode TEXT

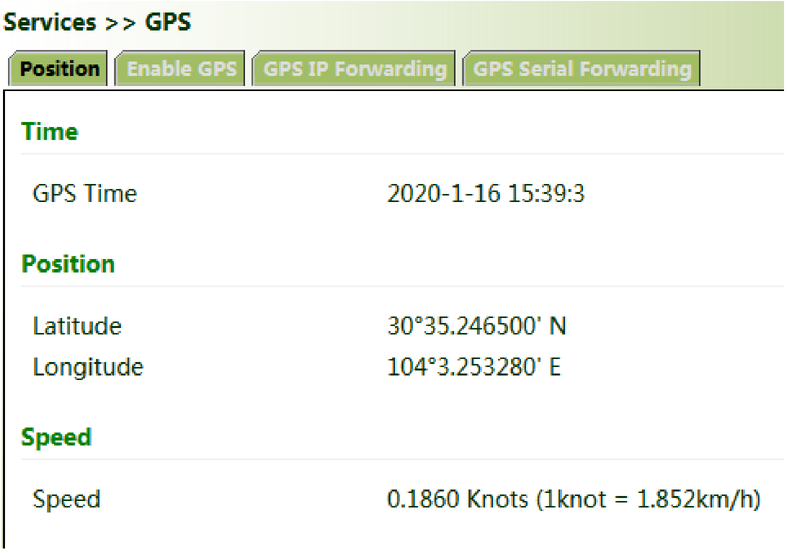
Poll Interval 30 s(0: disable)

SMS Access Control

| ID | Action | Phone Number |
|---|---|---|
| 1 | permit | 18211697833 |

## 5.4.5 GPS

Position: You can view the current positioning information.



Time

GPS Time 2020-1-16 15:39:3

Position

Latitude 30°35.246500' N

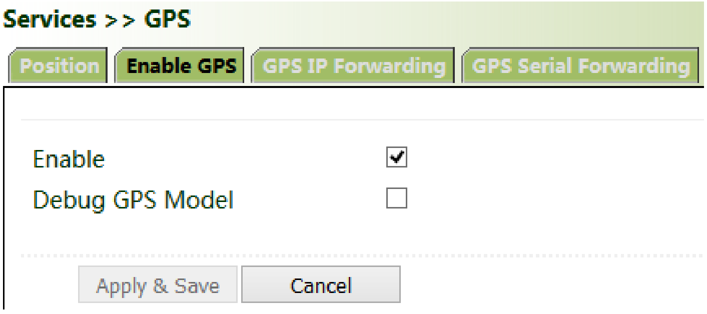
Longitude 104°3.253280' E

Speed

Speed 0.1860 Knots (1knot = 1.852km/h)

Method for enabling GPS for the gateway:

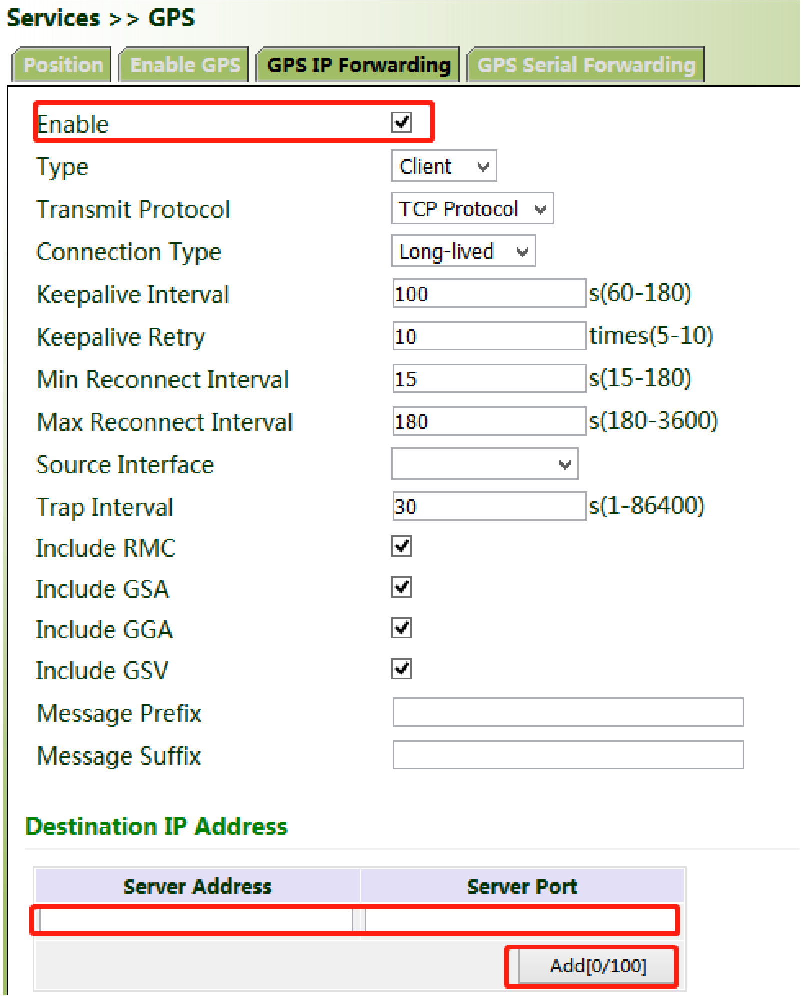
Click "Services >> Enable GPS", check "Enable", and click Apply & Save. By default, GPS is enabled for the gateway.



Enable ☑
Debug GPS Model □

Method for forwarding GPS data to the server over IP when VG814 is used as a client:

Click "Services >> GPS IP Forwarding", check "Enable", select "Client" for "Type", enter the server address and port in the "Destination IP Address" bar, click Add, and then click Apply & Save.



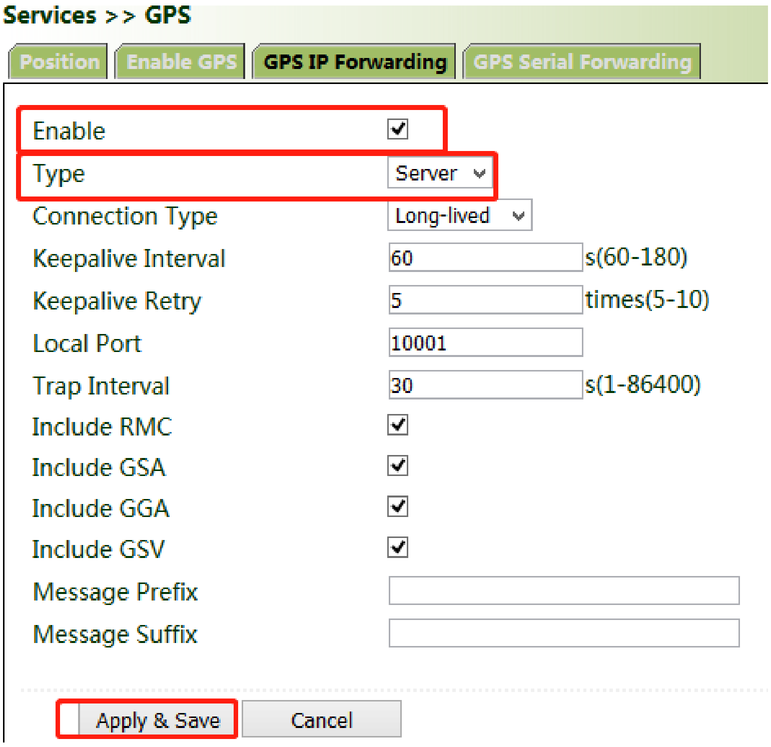
| | |
|---|---|
| Enable | ☑ |
| Type | Client |
| Transmit Protocol | TCP Protocol |
| Connection Type | Long-lived |
| Keepalive Interval | 100 s(60-180) |
| Keepalive Retry | 10 times(5-10) |
| Min Reconnect Interval | 15 s(15-180) |
| Max Reconnect Interval | 180 s(180-3600) |
| Source Interface | |
| Trap Interval | 30 s(1-86400) |
| Include RMC | ☑ |
| Include GSA | ☑ |
| Include GGA | ☑ |
| Include GSV | ☑ |
| Message Prefix | |
| Message Suffix | |

Destination IP Address

| Server Address | Server Port |
|---|---|
| | |

Method for forwarding GPS data over IP when VG814 is used as a server:

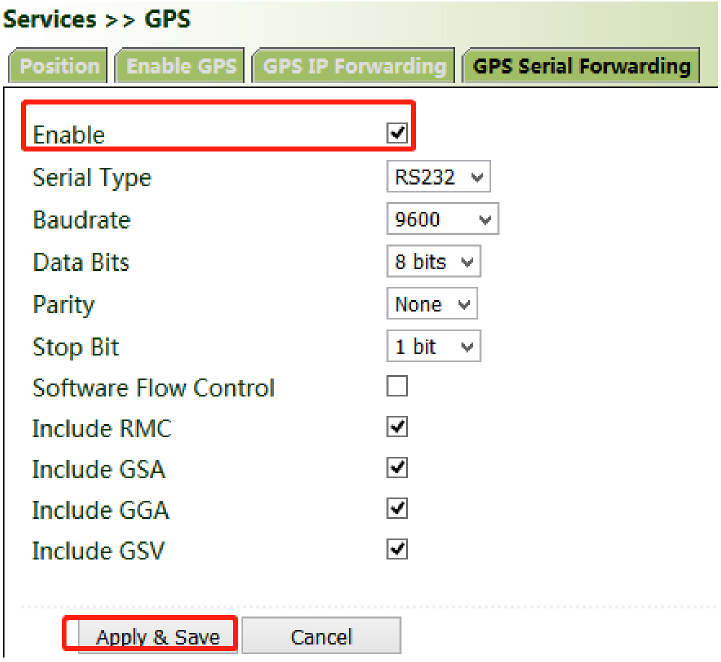
Click "Services >> GPS IP Forwarding", check "Enable", select "Server" for "Type", and click Apply & Save.



| | |
|---|---|
| Enable | ☑ |
| Type | Server |
| Connection Type | Long-lived |
| Keepalive Interval | 60 s(60-180) |
| Keepalive Retry | 5 times(5-10) |
| Local Port | 10001 |
| Trap Interval | 30 s(1-86400) |
| Include RMC | ☑ |
| Include GSA | ☑ |
| Include GGA | ☑ |
| Include GSV | ☑ |
| Message Prefix | |
| Message Suffix | |

Method for forwarding GPS data by VG814 through a serial port:

Click "Services >> GPS Serial Forwarding", check "Enable", and select a serial port type based on the data transmission port used. Ensure that the baud rate, data bits, parity bit, and stop bit are the same as the current settings. Click Apply & Save.



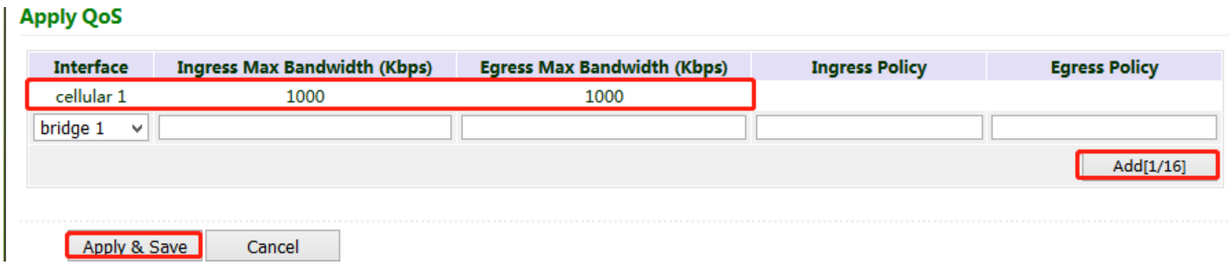
| | |
|---|---|
| Enable | ☑ |
| Serial Type | RS232 |
| Baudrate | 9600 |
| Data Bits | 8 bits |
| Parity | None |
| Stop Bit | 1 bit |
| Software Flow Control | □ |
| Include RMC | ☑ |
| Include GSA | ☑ |
| Include GGA | ☑ |
| Include GSV | ☑ |

## 5.4.6 QoS

Quality of service (QoS) is a network security mechanism that enables a network to provide better services for designated network communication by using various basic technologies. It is a technology for solving problems such as network delays and blocking.

Method for setting the egress maximum bandwidth for the gateway through QoS control:

Click "QoS >> Traffic Control >> Apply QoS", select the gateway interface, enter the egress maximum bandwidth, click Add, and then click Apply & Save.



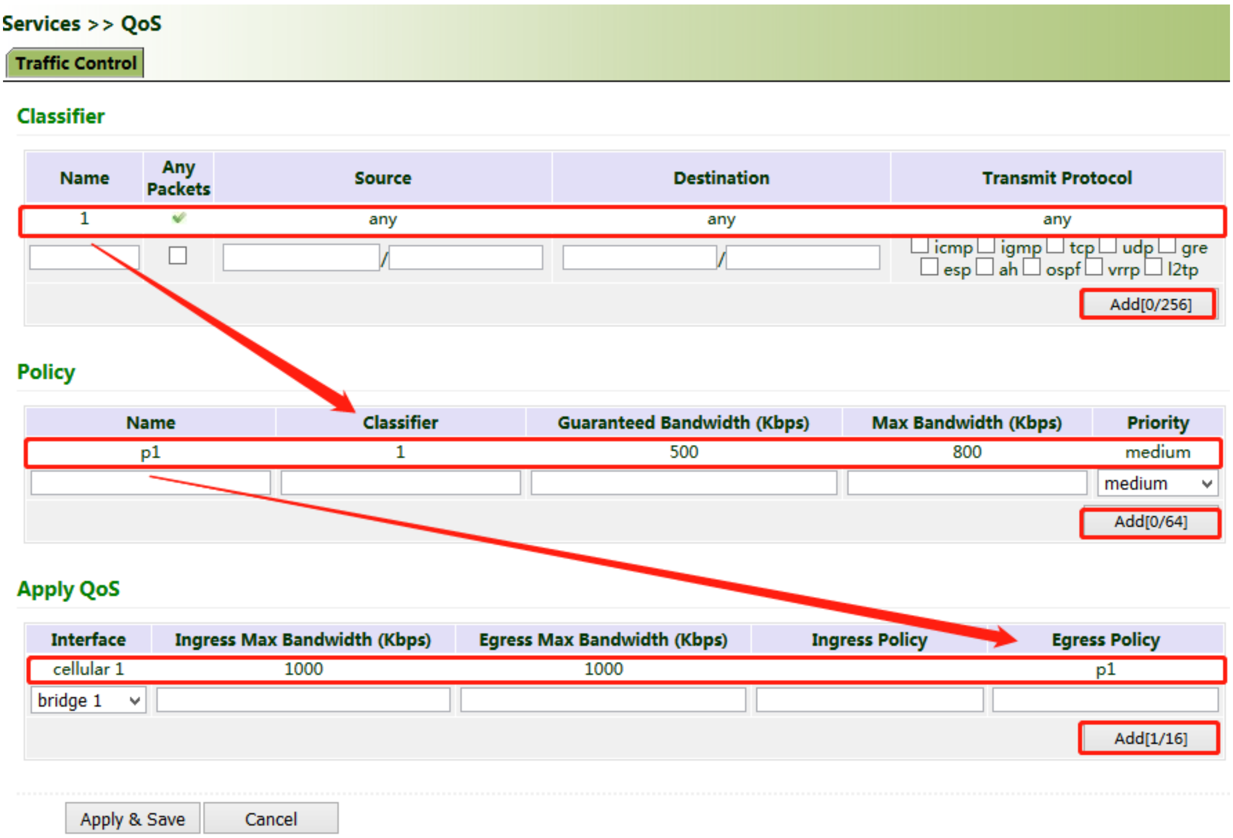
| Interface | Ingress Max Bandwidth (Kbps) | Egress Max Bandwidth (Kbps) | Ingress Policy | Egress Policy |
|---|---|---|---|---|
| cellular 1 | 1000 | 1000 | | |
| bridge 1 | | | | |

Method for applying the ingress and egress policies for the gateway through QoS control:

1. Add a network link classifier. Click "QoS >> Traffic Control >> Classifier", check "Any Packets", set the source and destination addresses of the link, select transmit protocols for QoS control, and click Add.

2. Set transmission policies. Click "QoS >> Traffic Control >> Policy", enter a custom policy name for "Name", enter the classifier name for "Classifier", set the guaranteed bandwidth, maximum bandwidth, and policy priority, and click Add.

3. Click "QoS >> Traffic Control >> Apply QoS", select the gateway interface, enter the policy name for "Ingress Policy" and "Egress Policy", click Add, and then click Apply & Save.



Services >> QoS

Classifier

| Name | Any Packets | Source | Destination | Transmit Protocol |
|---|---|---|---|---|
| 1 | ✓ | any | any | any |
|  | □ | / | / | □ icmp □ igmp □ tcp □ udp □ gre<br>□ esp □ ah □ ospf □ vrrp □ l2tp |

Policy

| Name | Classifier | Guaranteed Bandwidth (Kbps) | Max Bandwidth (Kbps) | Priority |
|---|---|---|---|---|
| p1 | 1 | 500 | 800 | medium |
|  |  |  |  | medium |

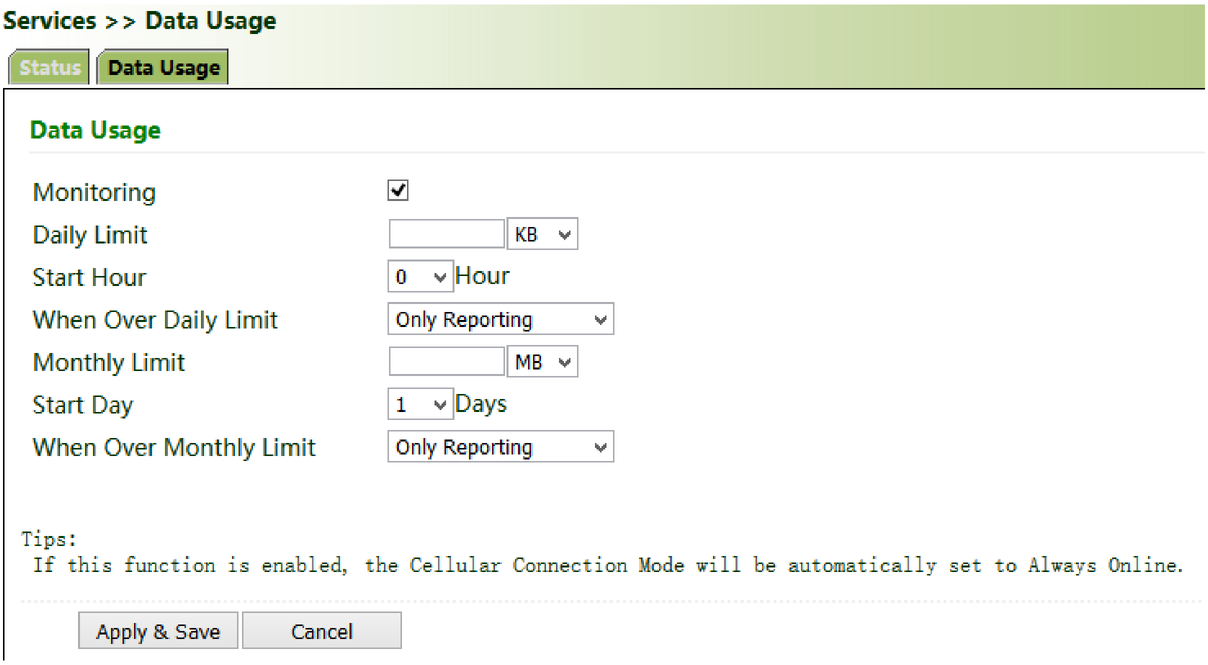
Apply QoS

| Interface | Ingress Max Bandwidth (Kbps) | Egress Max Bandwidth (Kbps) | Ingress Policy | Egress Policy |
|---|---|---|---|---|
| cellular 1 | 1000 | 1000 |  | p1 |
| bridge 1 |  |  |  |  |

## 5.4.7 Traffic Control

Method for enabling traffic control for the gateway:

Click "Services >> Traffic Control", enable traffic control, set traffic control parameters, and click Apply & Save. After the settings are completed, the system generates an alarm, stops forwarding, or disables the interface when the traffic exceeds the limit according to the settings on this page.



Data Usage

| | |
|---|---|
| Monitoring | ☑ |
| Daily Limit | KB |
| Start Hour | 0 Hour |
| When Over Daily Limit | Only Reporting |
| Monthly Limit | MB |
| Start Day | 1 Days |
| When Over Monthly Limit | Only Reporting |

Tips:
If this function is enabled, the Cellular Connection Mode will be automatically set to Always Online.

# 5.5 Firewall

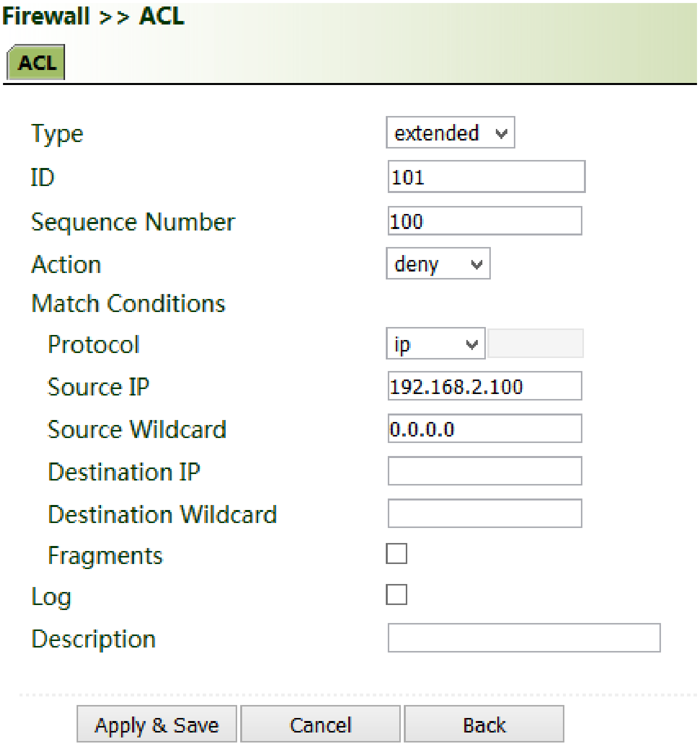
## 5.5.1 ACL

The access control list (ACL) is an access control technology based on packet filtering. It can filter the packets on the interface based on preset conditions and allow them to pass or discard them.

Common scenario: By default, all devices on the LAN (bridge 1) can access the Internet, except the device with the IP address of 192.168.2.100.

Method for setting VG814:

1. Click "Firewall >> ACL >> Add". Enter the ID and sequence number. A smaller sequence number indicates a higher priority. Select "deny" for "Action". Set "Source IP" to "192.168.2.100" and "Source Wildcard" to "0.0.0.0". Leave "Destination IP" empty, which indicates 0.0.0.0/0, that is, all IP addresses. Click Apply & Save.

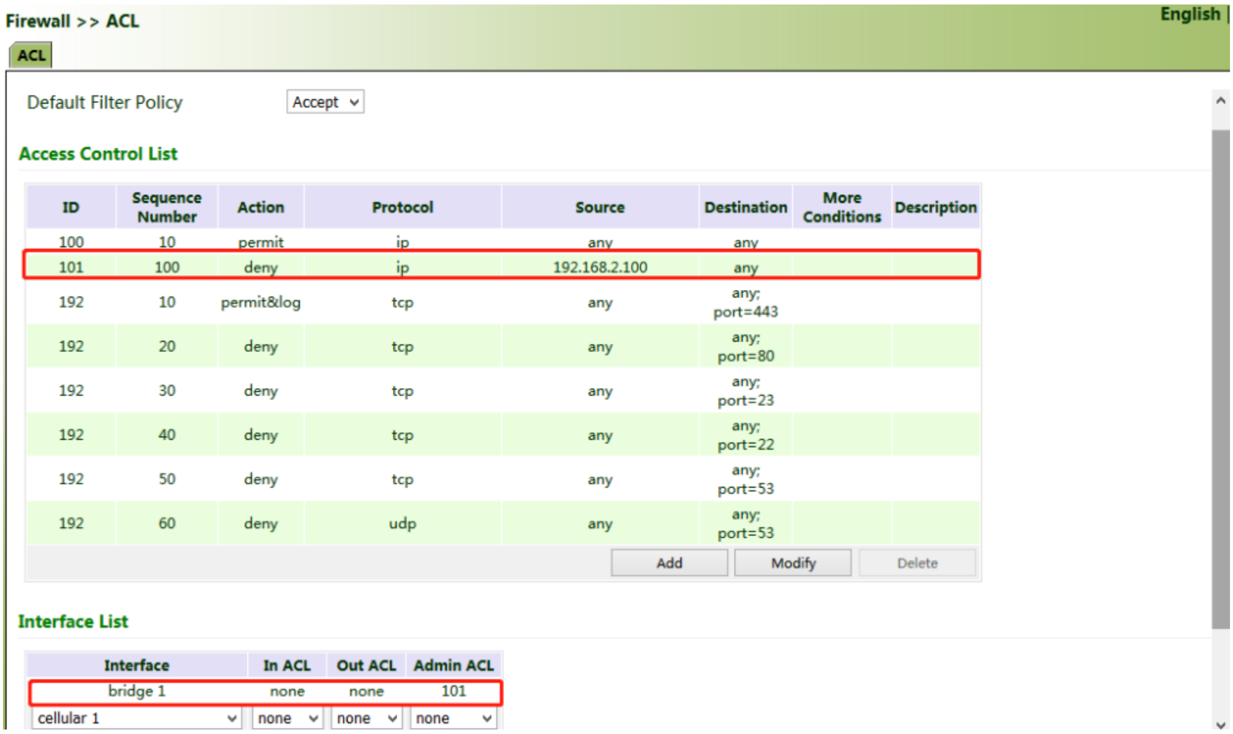


Firewall >> ACL

ACL

| | |
|---|---|
| Type | extended |
| ID | 101 |
| Sequence Number | 100 |
| Action | deny |
| Match Conditions | |
| Protocol | ip |
| Source IP | 192.168.2.100 |
| Source Wildcard | 0.0.0.0 |
| Destination IP | |
| Destination Wildcard | |
| Fragments | □ |
| Log | □ |
| Description | |

2. Return to the ACL page, add the rule with the ID of 101 to the management rule of bridge 1, and click Add. Click Apply & Save.



Firewall >> ACL

ACL

Default Filter Policy: Accept

Access Control List

| ID | Sequence Number | Action | Protocol | Source | Destination | More Conditions | Description |
|---|---|---|---|---|---|---|---|
| 100 | 10 | permit | ip | any | any | | |
| 101 | 100 | deny | ip | 192.168.2.100 | any | | |
| 192 | 10 | permit&log | tcp | any | any;<br>port=443 | | |
| 192 | 20 | deny | tcp | any | any;<br>port=80 | | |
| 192 | 30 | deny | tcp | any | any;<br>port=23 | | |
| 192 | 40 | deny | tcp | any | any;<br>port=22 | | |
| 192 | 50 | deny | tcp | any | any;<br>port=53 | | |
| 192 | 60 | deny | udp | any | any;<br>port=53 | | |

Interface List

| Interface | In ACL | Out ACL | Admin ACL |
|---|---|---|---|
| bridge 1 | none | none | 101 |
| cellular 1 | none | none | none |

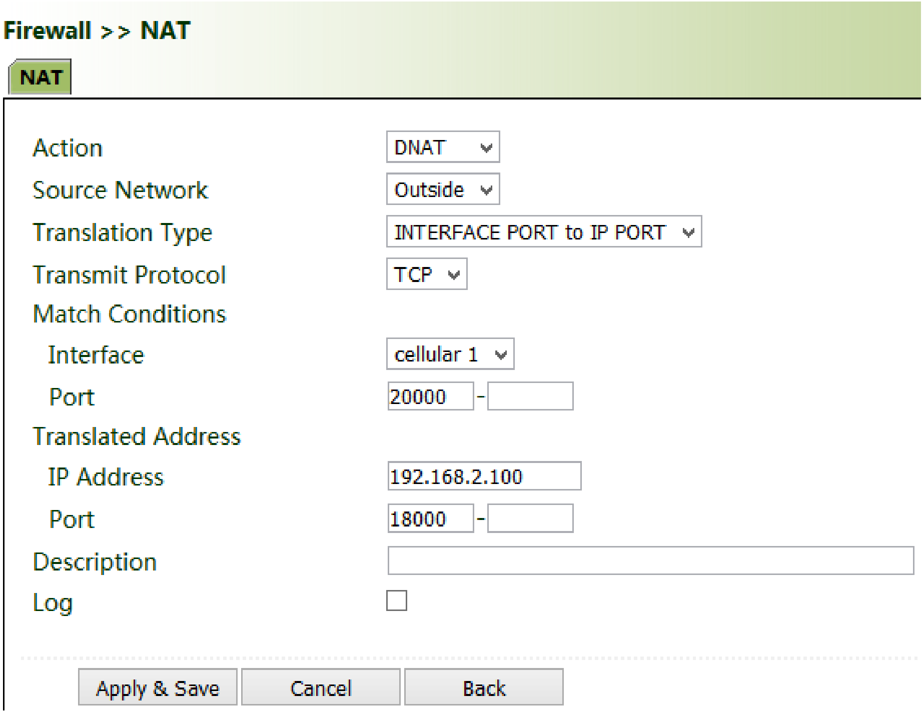
## 5.5.2 NAT

Network address translation (NAT) can be used when some hosts on a private network have been assigned with local IP addresses (that is, private IP addresses used only on the private network), but expect to communicate with hosts on the Internet (without encryption).

Common scenario: A user expects to access a camera on the LAN of the device through the public network to view the current driving conditions of the vehicle. The camera address is 192.168.2.100, and the open port 18000 provides video services.

1. Click "Firewall >> NAT", and select "DNAT" for "Action", and "Outside" for "Source Network". Select "IP PORT to IP PORT" or "INTERFACE PORT to IP PORT" for "Translation Type". The public IP address obtained through dial-up is not fixed, so "INTERFACE PORT to IP PORT" is more convenient. Select "TCP" for "Transmit Protocol" because video services are transmitted over TCP. Select "cellular 1" (dialup interface for the cellular network) for "Interface" and set "Port" to "20000". Set "IP Address" and "Port" under "Translated Address" to "192.168.200" and "18000" respectively. Click Apply & Save.

The gateway redirects the TCP service destined for port 20000 of the cellular 1 interface to the internal IP address 192.168.2.100 and port 18000, to enable access to the internal services.



Firewall >> NAT

NAT

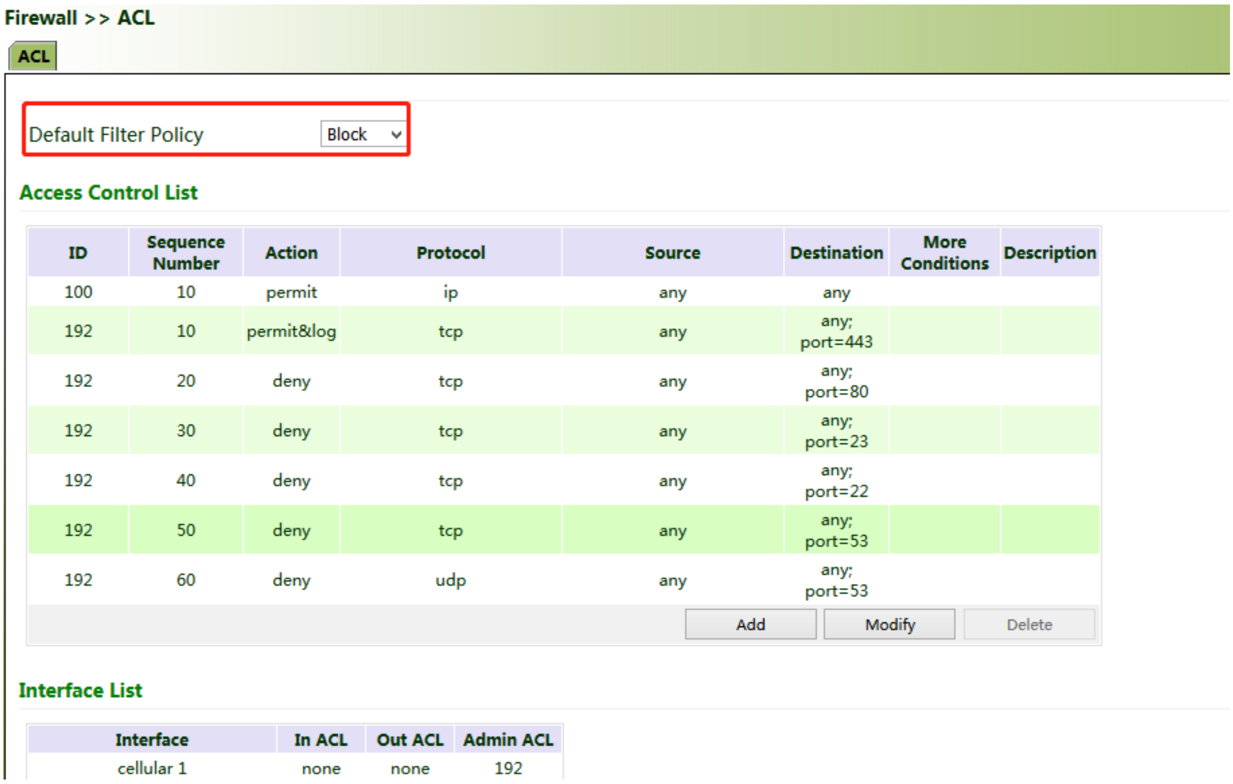
| | |
|---|---|
| Action | DNAT |
| Source Network | Outside |
| Translation Type | INTERFACE PORT to IP PORT |
| Transmit Protocol | TCP |
| Match Conditions | |
| Interface | cellular 1 |
| Port | 20000 - |
| Translated Address | |
| IP Address | 192.168.2.100 |
| Port | 18000 - |
| Description | |
| Log | □ |

## 5.5.3 MAC-IP Binding

After MAC-IP binding, the PC can access the public network through the gateway only by using the IP address bound to the MAC address of the PC.

Method for binding the MAC address and IP address of a connected device:

1. Click "Firewall >> ACL" and select "Block" for "Default Filter Policy".



Default Filter Policy: Block

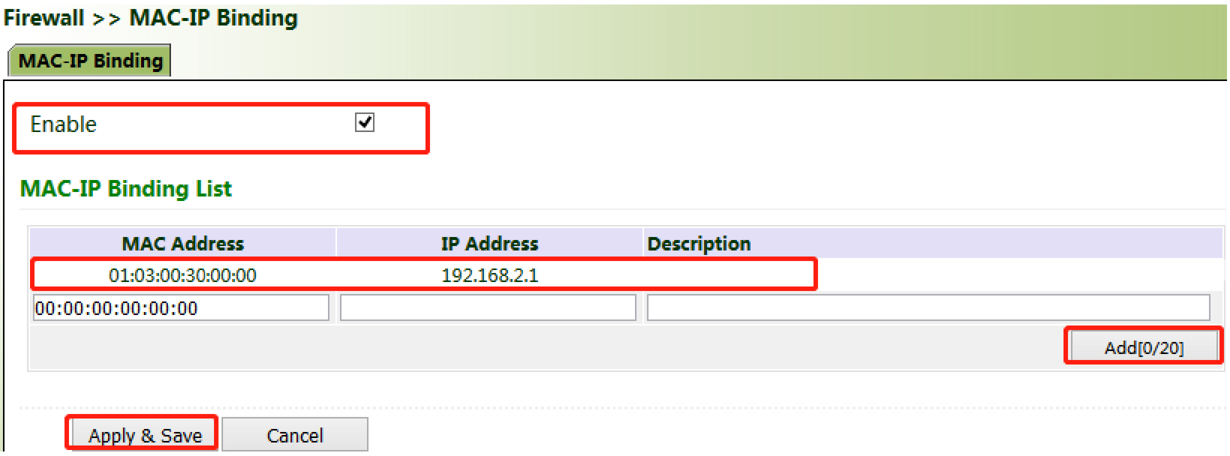
Access Control List

| ID | Sequence Number | Action | Protocol | Source | Destination | More Conditions | Description |
|---|---|---|---|---|---|---|---|
| 100 | 10 | permit | ip | any | any | | |
| 192 | 10 | permit&log | tcp | any | any;<br>port=443 | | |
| 192 | 20 | deny | tcp | any | any;<br>port=80 | | |
| 192 | 30 | deny | tcp | any | any;<br>port=23 | | |
| 192 | 40 | deny | tcp | any | any;<br>port=22 | | |
| 192 | 50 | deny | tcp | any | any;<br>port=53 | | |
| 192 | 60 | deny | udp | any | any;<br>port=53 | | |

Interface List

| Interface | In ACL | Out ACL | Admin ACL |
|---|---|---|---|
| cellular 1 | none | none | 192 |

2. Click "Firewall >> MAC-IP Binding", check "Enable", enter the MAC address and IP address of the connected device, click Add, and click Apply & Save.



Enable ☑

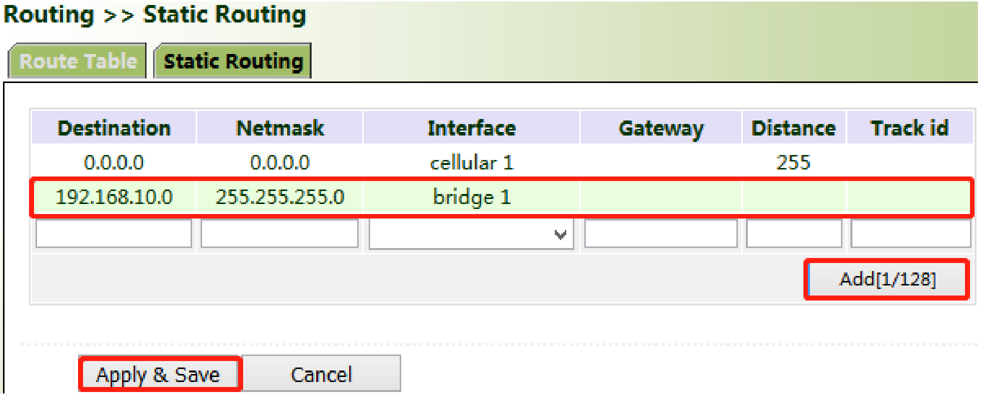
MAC-IP Binding List

| MAC Address | IP Address | Description |
|---|---|---|
| 01:03:00:30:00:00 | 192.168.2.1 | |
| 00:00:00:00:00:00 | | |

# 5.6 Routing

## 5.6.1 Static Routing

Set the destination network, subnet mask, and interface or gateway as required.

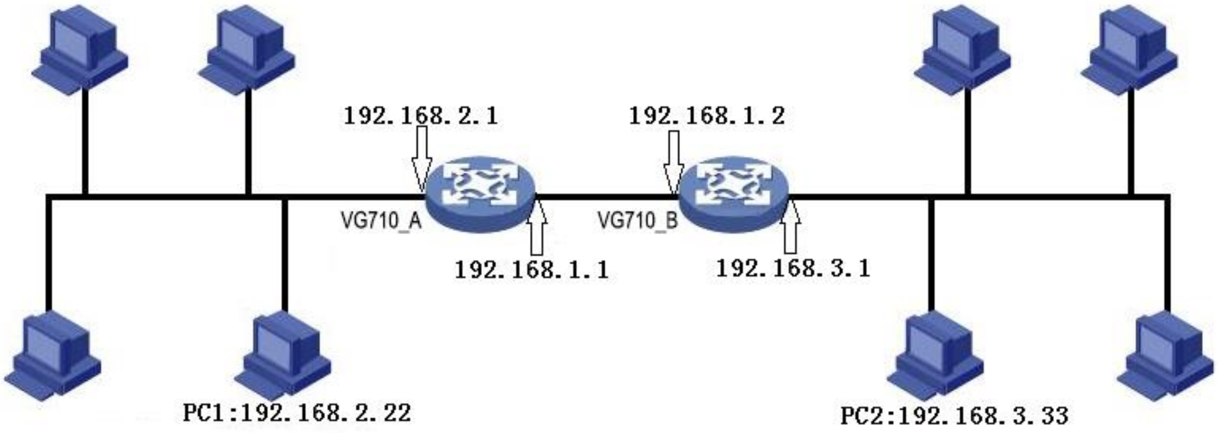


Routing >> Static Routing

| Destination | Netmask | Interface | Gateway | Distance | Track id |
|---|---|---|---|---|---|
| 0.0.0.0 | 0.0.0.0 | cellular 1 | | 255 | |
| 192.168.10.0 | 255.255.255.0 | bridge 1 | | | |

## 5.6.2 Dynamic Routing

Scenario: Enable dynamic routing between two LANs for mutual communication between them. The topology is shown below.

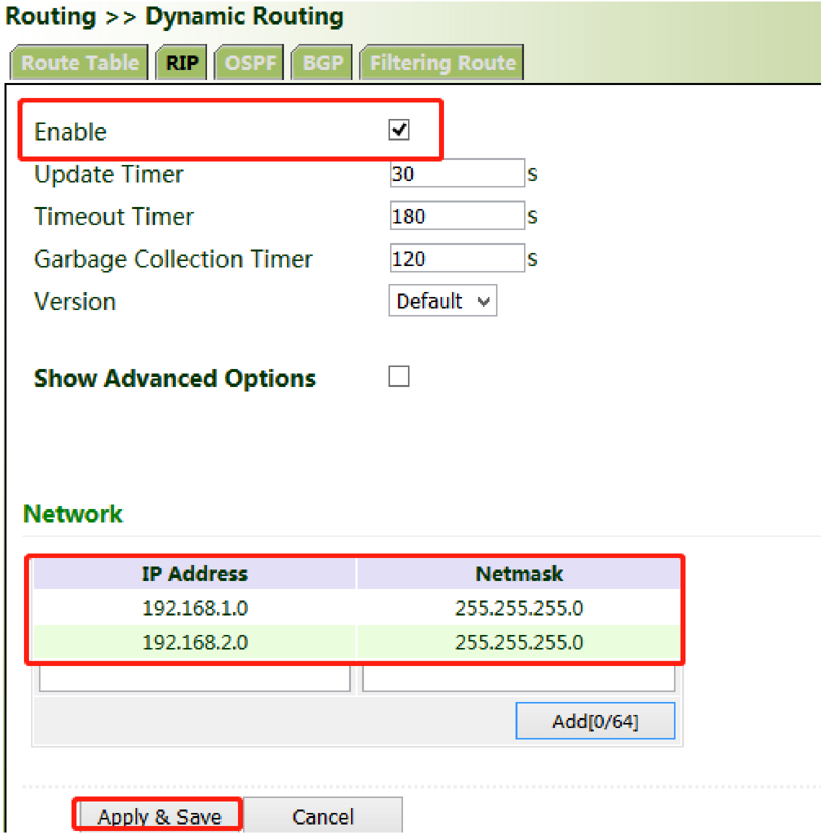


### 5.6.2.1 RIP

The Routing Information Protocol (RIP) is a simple internal dynamic routing protocol mainly used on small-scale networks.

Method for enabling dynamic routing between VG814_A and VG814_B over RIP in the scenario:

1. Configure VG814_A. Click "Routing >> Dynamic Routing >> RIP", check "Enable", and configure VG814_A in the "Network" bar to announce the routing entry of VG814_A.



Enable ☑

Update Timer 30 s

Timeout Timer 180 s

Garbage Collection Timer 120 s

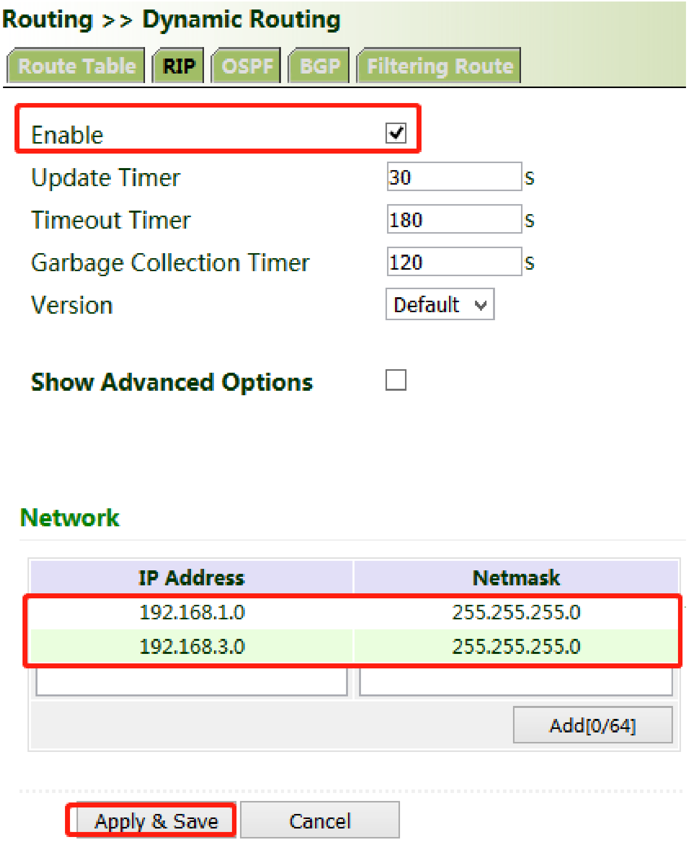
Version Default

Show Advanced Options □

Network

| IP Address | Netmask |
|---|---|
| 192.168.1.0 | 255.255.255.0 |
| 192.168.2.0 | 255.255.255.0 |

2. Configure VG814_B.



Enable ☑

Update Timer 30 s

Timeout Timer 180 s

Garbage Collection Timer 120 s

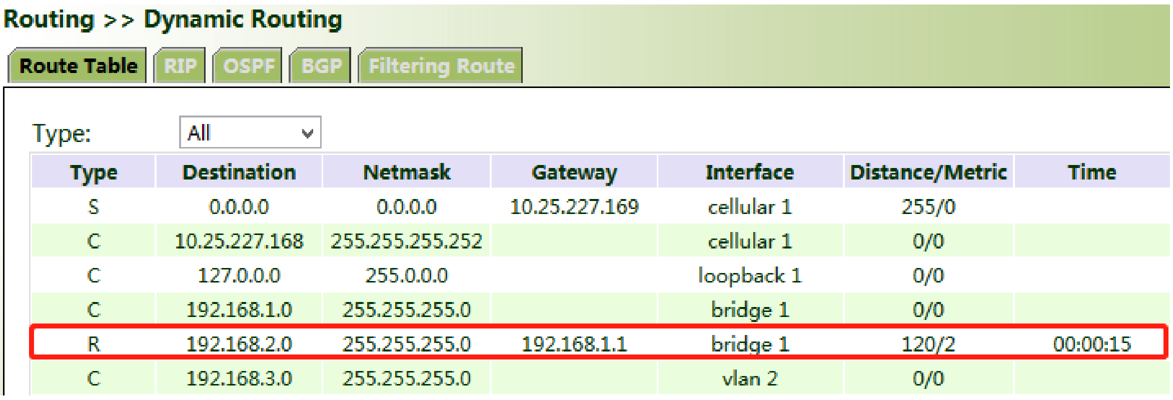
Version Default

Show Advanced Options □

Network

| IP Address | Netmask |
|---|---|
| 192.168.1.0 | 255.255.255.0 |
| 192.168.3.0 | 255.255.255.0 |

3. After the configuration is completed, check whether PC 1 can communicate with PC 2. If yes, the dynamic route is added successfully. The RIP route learned by VG814_B is shown in the figure below.



Type: All

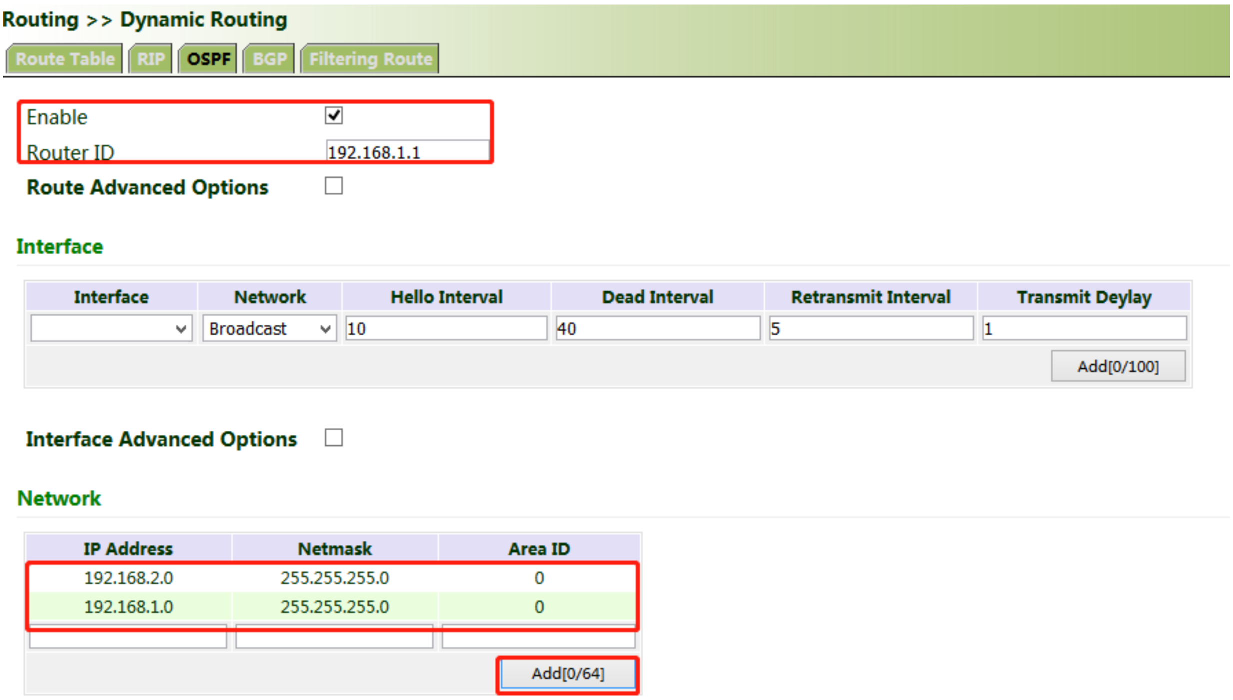
| Type | Destination | Netmask | Gateway | Interface | Distance/Metric | Time |
|---|---|---|---|---|---|---|
| S | 0.0.0.0 | 0.0.0.0 | 10.25.227.169 | cellular 1 | 255/0 | |
| C | 10.25.227.168 | 255.255.255.252 | | cellular 1 | 0/0 | |
| C | 127.0.0.0 | 255.0.0.0 | | loopback 1 | 0/0 | |
| C | 192.168.1.0 | 255.255.255.0 | | bridge 1 | 0/0 | |
| R | 192.168.2.0 | 255.255.255.0 | 192.168.1.1 | bridge 1 | 120/2 | 00:00:15 |
| C | 192.168.3.0 | 255.255.255.0 | | vlan 2 | 0/0 | |

### 5.6.2.2 OSPF

The Open Shortest Path First (OSPF) protocol is a link-status-based internal gateway protocol mainly used on large-scale networks.

Method for enabling dynamic routing between VG814_A and VG814_B over OSPF in the scenario:

1. Configure VG814_A. Click "Routing >> Dynamic Routing >> OSPF", check "Enable", enter a valid IP address for "Router ID", and configure VG814_A in the "Network" bar to announce the routing entry of VG814_A.



Routing >> Dynamic Routing

Enable ☑

Router ID 192.168.1.1

Route Advanced Options □

Interface

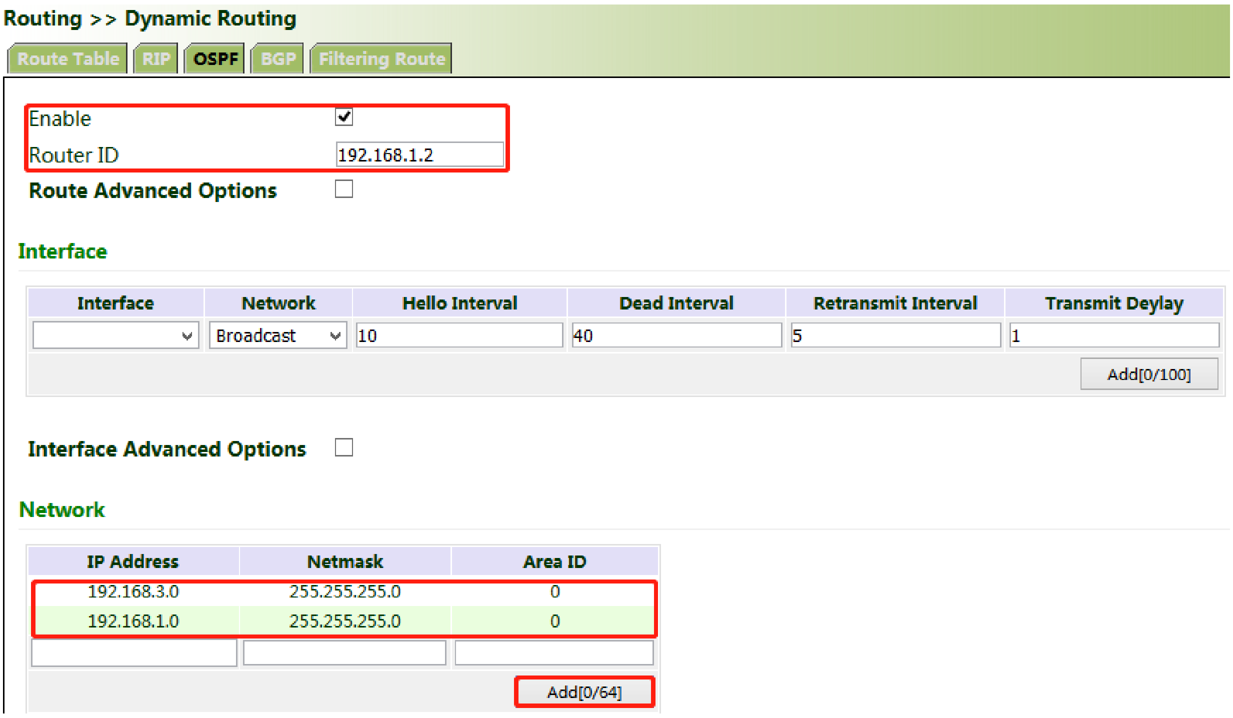
| Interface | Network | Hello Interval | Dead Interval | Retransmit Interval | Transmit Deylay |
|---|---|---|---|---|---|
|  | Broadcast | 10 | 40 | 5 | 1 |

Interface Advanced Options □

Network

| IP Address | Netmask | Area ID |
|---|---|---|
| 192.168.2.0 | 255.255.255.0 | 0 |
| 192.168.1.0 | 255.255.255.0 | 0 |

2. Set parameters for VG814_B.



Routing >> Dynamic Routing

Enable ☑

Router ID 192.168.1.2

Route Advanced Options □

Interface

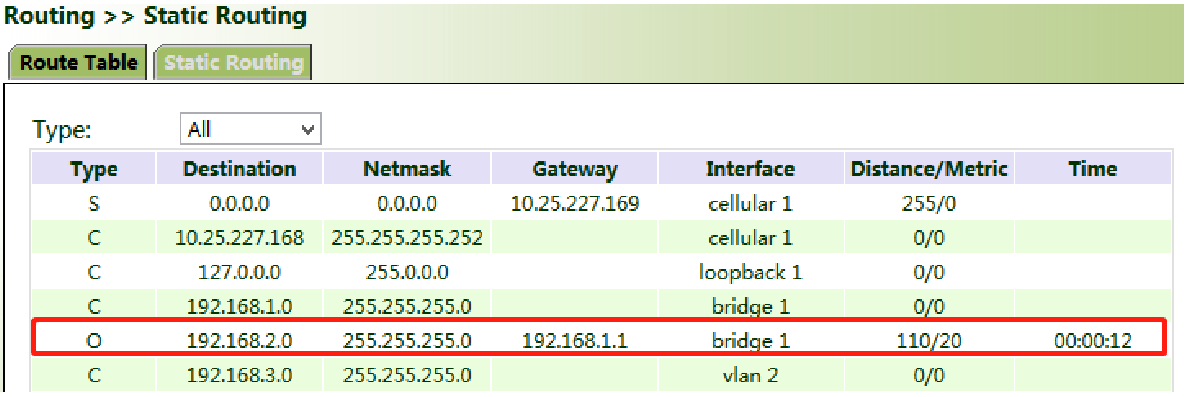
| Interface | Network | Hello Interval | Dead Interval | Retransmit Interval | Transmit Deylay |
|---|---|---|---|---|---|
|  | Broadcast | 10 | 40 | 5 | 1 |

Interface Advanced Options □

Network

| IP Address | Netmask | Area ID |
|---|---|---|
| 192.168.3.0 | 255.255.255.0 | 0 |
| 192.168.1.0 | 255.255.255.0 | 0 |

3. After the configuration is completed, check whether PC 1 can communicate with PC 2. If yes, the dynamic route is added successfully. The OSPF route learned by VG814_B is shown in the figure below.



Routing >> Static Routing

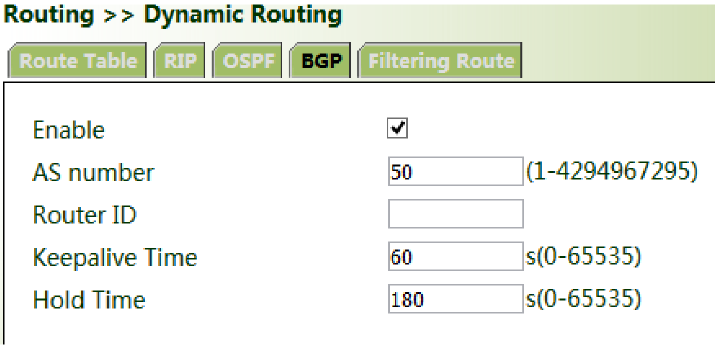
Type: All

| Type | Destination | Netmask | Gateway | Interface | Distance/Metric | Time |
|---|---|---|---|---|---|---|
| S | 0.0.0.0 | 0.0.0.0 | 10.25.227.169 | cellular 1 | 255/0 | |
| C | 10.25.227.168 | 255.255.255.252 | | cellular 1 | 0/0 | |
| C | 127.0.0.0 | 255.0.0.0 | | loopback 1 | 0/0 | |
| C | 192.168.1.0 | 255.255.255.0 | | bridge 1 | 0/0 | |
| O | 192.168.2.0 | 255.255.255.0 | 192.168.1.1 | bridge 1 | 110/20 | 00:00:12 |
| C | 192.168.3.0 | 255.255.255.0 | | vlan 2 | 0/0 | |

### 5.6.2.3 BGP

Method for enabling dynamic routing between VG814_A and VG814_B over BGP in the scenario:

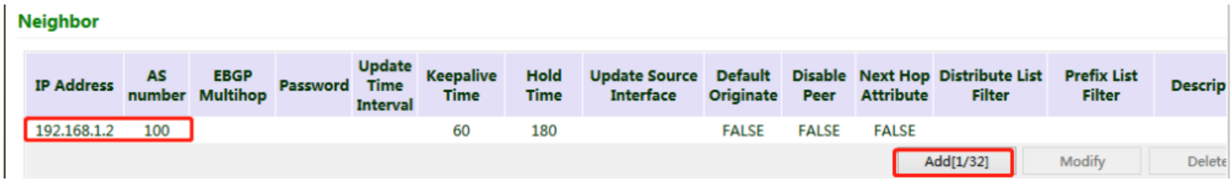
1. Configure VG814_A. Click "Routing >> Dynamic Routing >> BGP", check "Enable", and set "AS number" as required.



Routing >> Dynamic Routing

| | |
|---|---|
| Enable | ☑ |
| AS number | 50 (1-4294967295) |
| Router ID | |
| Keepalive Time | 60 s(0-65535) |
| Hold Time | 180 s(0-65535) |

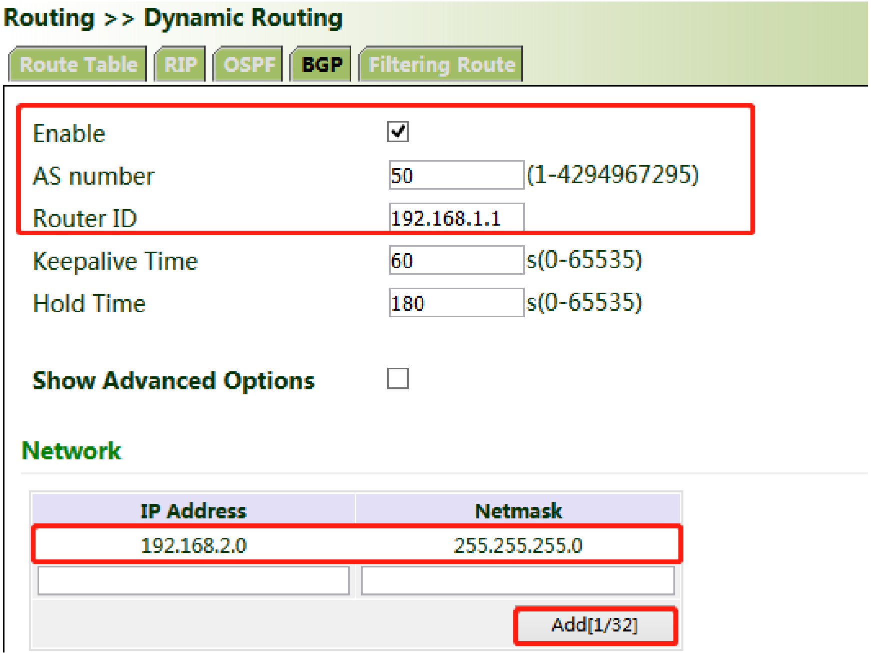
2. In the "Neighbor" bar, click Add, enter the IP address 192.168.1.2 of VG814_B, set "AS number" as required, and click Apply & Save.



Neighbor

| IP Address | AS number | EBGP Multihop | Password | Update Time Interval | Keepalive Time | Hold Time | Update Source Interface | Default Originate | Disable Peer | Next Hop Attribute | Distribute List Filter | Prefix List Filter | Descrip |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 192.168.1.2 | 100 | | | | 60 | 180 | | FALSE | FALSE | FALSE | | | |

3. Enter a valid IP address for "Router ID", configure VG814_A in the "Network" bar, and click Add, to announce the routing entry of VG814_A. Then click Apply & Save.



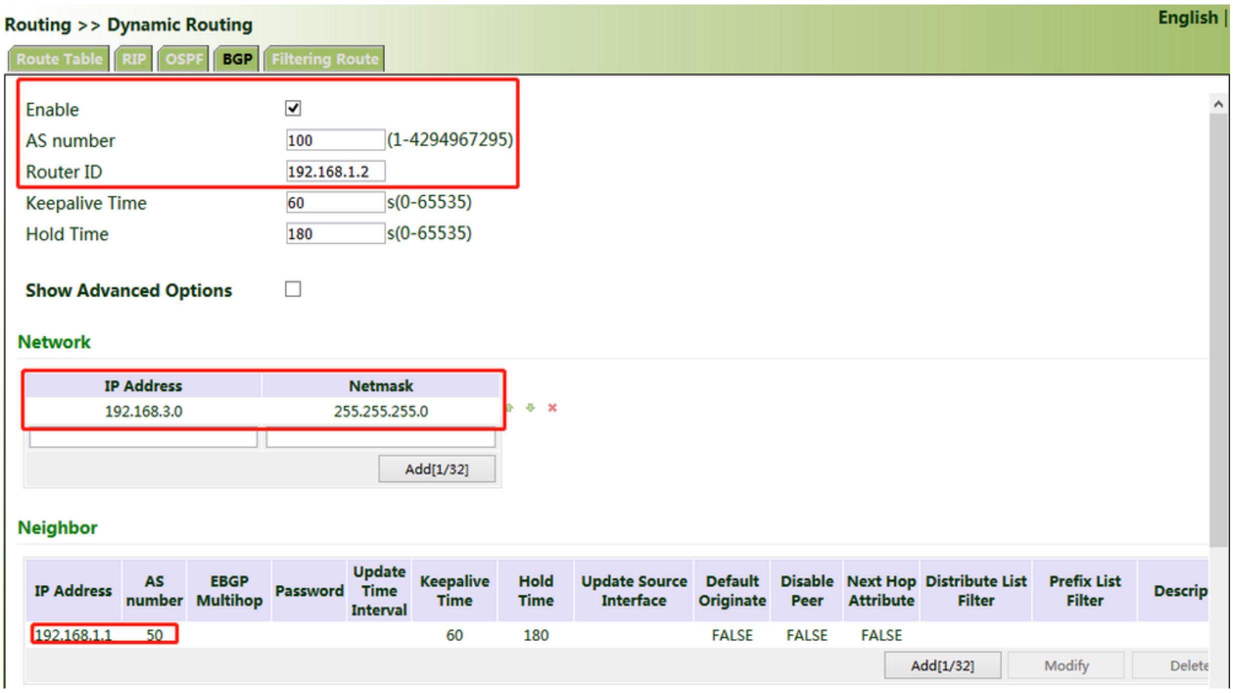
Routing >> Dynamic Routing

| | |
|---|---|
| Enable | ☑ |
| AS number | 50 (1-4294967295) |
| Router ID | 192.168.1.1 |
| Keepalive Time | 60 s(0-65535) |
| Hold Time | 180 s(0-65535) |
| Show Advanced Options | □ |

Network

| IP Address | Netmask |
|---|---|
| 192.168.2.0 | 255.255.255.0 |

4. Set parameters for VG814_B. The parameters are the same as or corresponding to those of VG814_A.



Routing >> Dynamic Routing

| | |
|---|---|
| Enable | ☑ |
| AS number | 100 (1-4294967295) |
| Router ID | 192.168.1.2 |
| Keepalive Time | 60 s(0-65535) |
| Hold Time | 180 s(0-65535) |
| Show Advanced Options | □ |

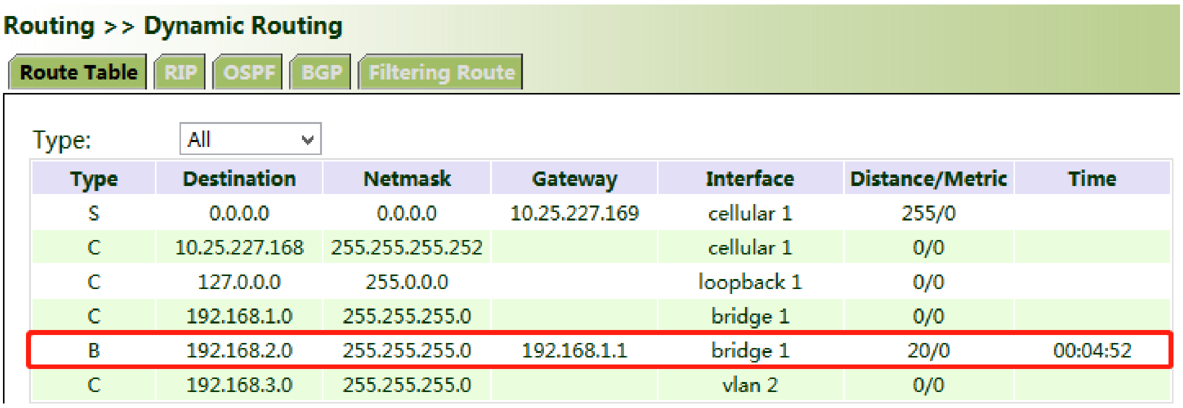
Network

| IP Address | Netmask |
|---|---|
| 192.168.3.0 | 255.255.255.0 |

Neighbor

| IP Address | AS number | EBGP Multihop | Password | Update Time Interval | Keepalive Time | Hold Time | Update Source Interface | Default Originate | Disable Peer | Next Hop Attribute | Distribute List Filter | Prefix List Filter | Descrip |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 192.168.1.1 | 50 | | | | 60 | 180 | | FALSE | FALSE | FALSE | | | |

5. After the configuration is completed, check whether PC 1 can communicate with PC 2. If yes, the dynamic route is added successfully. The BGP route learned by VG814_B is shown in the figure below.



Type: All

| Type | Destination | Netmask | Gateway | Interface | Distance/Metric | Time |
|---|---|---|---|---|---|---|
| S | 0.0.0.0 | 0.0.0.0 | 10.25.227.169 | cellular 1 | 255/0 | |
| C | 10.25.227.168 | 255.255.255.252 | | cellular 1 | 0/0 | |
| C | 127.0.0.0 | 255.0.0.0 | | loopback 1 | 0/0 | |
| C | 192.168.1.0 | 255.255.255.0 | | bridge 1 | 0/0 | |
| B | 192.168.2.0 | 255.255.255.0 | 192.168.1.1 | bridge 1 | 20/0 | 00:04:52 |
| C | 192.168.3.0 | 255.255.255.0 | | vlan 2 | 0/0 | |

# 5.7 Link Backup

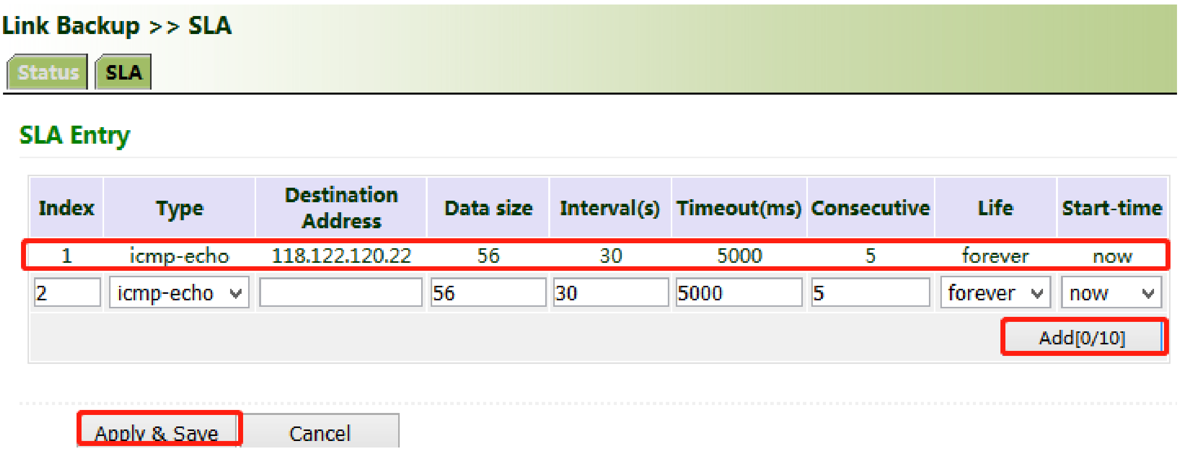
## 5.7.1 SLA

The service level agreement (SLA) is used to detect whether the link between the gateway and the ISP fails.

Method for adding an SLA entry for the gateway:

Click "Link Backup >> SLA >> Add", enter the detected IP address for "Destination Address", set other parameters as required, click Add, and then click Apply & Save.

Timeout (ms) indicates the duration for determining a detection failure. Consecutive indicates the number of detection failures resulting in a link failure.



SLA Entry

| Index | Type | Destination Address | Data size | Interval(s) | Timeout(ms) | Consecutive | Life | Start-time |
|---|---|---|---|---|---|---|---|---|
| 1 | icmp-echo | 118.122.120.22 | 56 | 30 | 5000 | 5 | forever | now |
| 2 | icmp-echo | | 56 | 30 | 5000 | 5 | forever | now |

## 5.7.2 Track

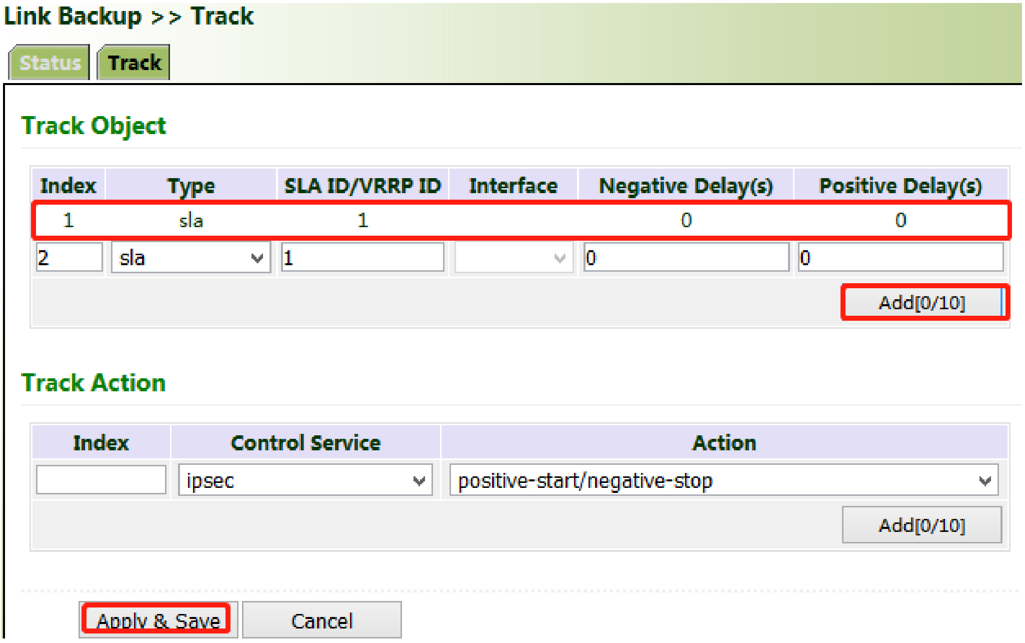
Currently, linkage is enabled between the track module and the following application modules: VRRP, static routing, and interface backup. If detection succeeds, the corresponding track entry is in the Positive state. If detection fails, the corresponding track entry is in the Negative state.

Method for adding a track entry for VG814:

Click "Link Backup >> Track >> Track", set "Index" as required, select "sla", "interface", or "vrrp" for "Type", set "SLA/VRRP ID" based on the ID in the SLA list, set "Negative Delay (s)" and "Positive Delay (s)" as required, click Add, and then click Apply & Save.

Negative Delay (s): In case of an abnormal state, switching can be delayed based on the delay setting (0 indicates immediate switching).

Positive Delay (s): When a failure is recovered, switching can be delayed based on the delay setting (0 indicates immediate switching).



Track Object

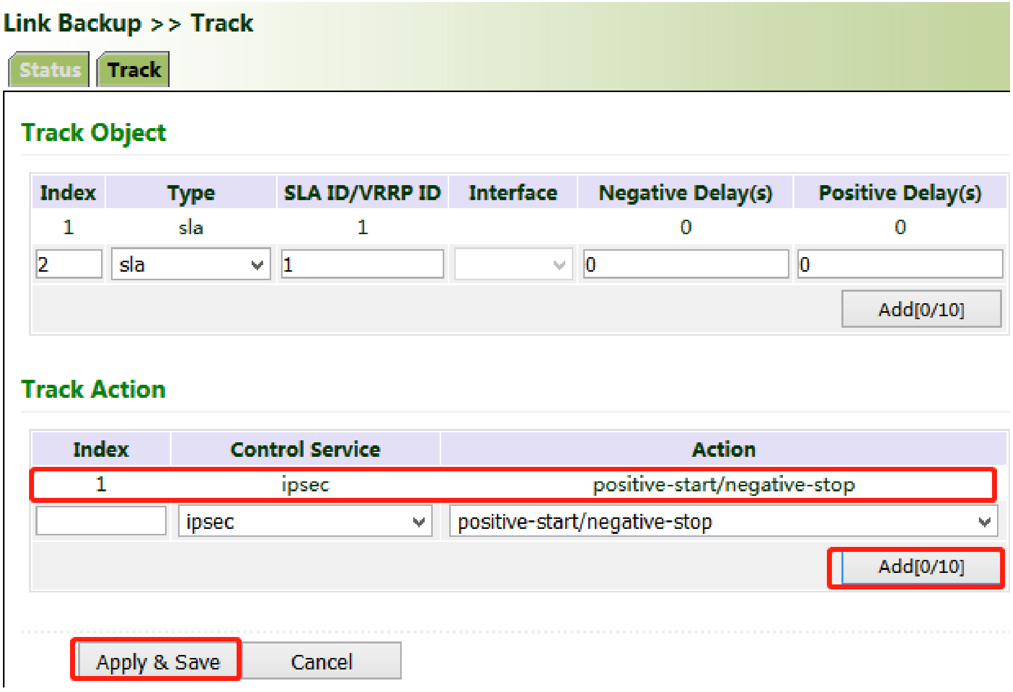
| Index | Type | SLA ID/VRRP ID | Interface | Negative Delay(s) | Positive Delay(s) |
|---|---|---|---|---|---|
| 1 | sla | 1 | | 0 | 0 |
| 2 | sla | 1 | | 0 | 0 |

Track Action

| Index | Control Service | Action |
|---|---|---|
| | ipsec | positive-start/negative-stop |

Method for adding an IPsec track entry for VG814:

Click "Link Backup >> Track >> Track" and set "Index" as required. "positive-start/negative-stop" means starting the IPsec service when the track detection state is Positive and stopping the IPsec service when the track detection state is Negative.



Track Object

| Index | Type | SLA ID/VRRP ID | Interface | Negative Delay(s) | Positive Delay(s) |
|---|---|---|---|---|---|
| 1 | sla | 1 | | 0 | 0 |
| 2 | sla | 1 | | 0 | 0 |

Track Action

| Index | Control Service | Action |
|---|---|---|
| 1 | ipsec | positive-start/negative-stop |
| | ipsec | positive-start/negative-stop |

## 5.7.3 VRRP

Scenario: Multiple gateways are connected to a network at the same time. Gateway A acts as the host, and gateway B acts as a backup for gateway A. When gateway A fails, gateway B temporarily replaces gateway A as the host.

1. Networking requirement

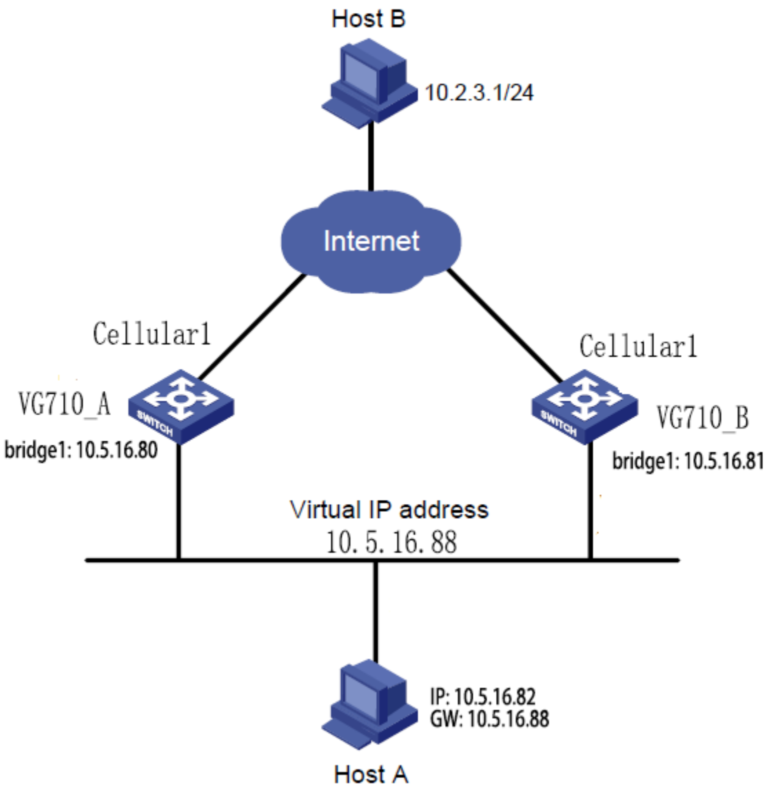
Host A uses the VRRP backup group comprising gateway A and gateway B as its default gateway to access host B on the Internet.

Information of the VRRP backup group:

- The backup group ID is 1.
- The IP address of the virtual gateway of the backup group is 10.5.16.88.
- Gateway A acts as the master gateway.

- Gateway A acts as a backup gateway that can be preempted.

2. Networking diagram

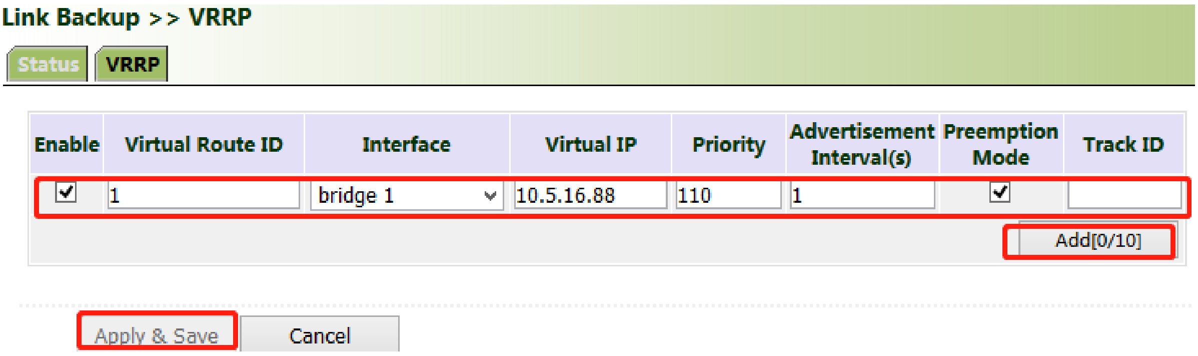


| Gateway | Ethernet port connected to host A | IP address of the port connected to host A | Priority | Work mode |
|---|---|---|---|---|
| VG814_A | bridge 1 | 10.5.16.80 | 110 | Preemption |
| VG814_B | bridge 1 | 10.5.16.81 | 100 | Preemption |

Method for settings when VG814_A acts as the master gateway and VG814_B as a backup gateway:

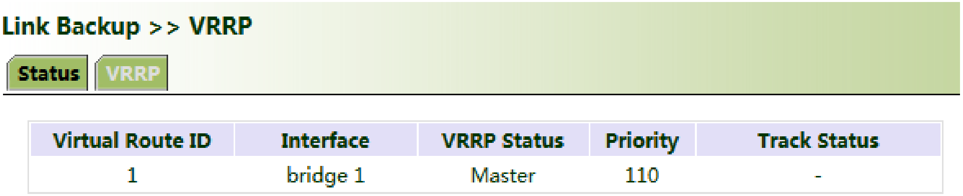
1. Configure VG814_A.

Click "Link Backup >> VRRP", set "Virtual Route ID" as required, select the gateway interface of VG814_A, enter the virtual IP address, set the interface priority to 110, and click Add.



| Enable | Virtual Route ID | Interface | Virtual IP | Priority | Advertisement Interval(s) | Preemption Mode | Track ID |
|---|---|---|---|---|---|---|---|
| ☑ | 1 | bridge 1 | 10.5.16.88 | 110 | 1 | ☑ | |

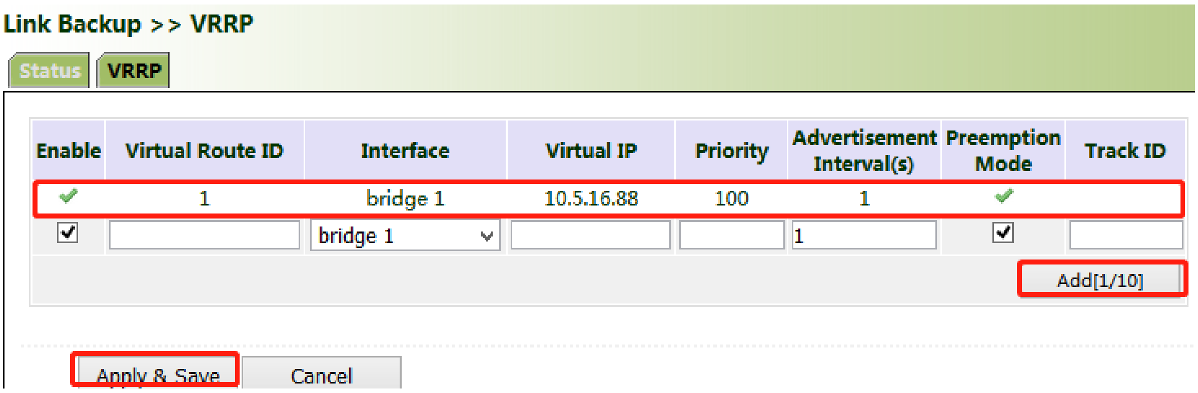
In the navigation tree, click "Link Backup >> VRRP >> Status" and view the VRRP status.



| Virtual Route ID | Interface | VRRP Status | Priority | Track Status |
|---|---|---|---|---|
| 1 | bridge 1 | Master | 110 | - |

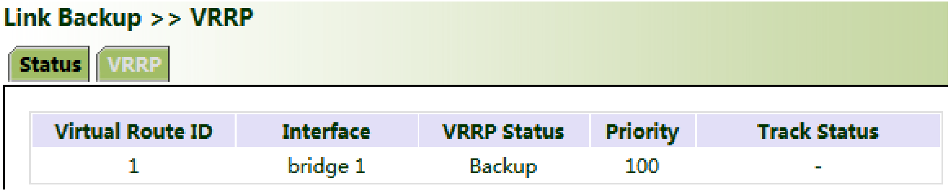
2. Configure VG814_B.

Click "Link Backup >> VRRP", set the interface priority to 100, and click Add.



| Enable | Virtual Route ID | Interface | Virtual IP | Priority | Advertisement Interval(s) | Preemption Mode | Track ID |
|---|---|---|---|---|---|---|---|
| ✓ | 1 | bridge 1 | 10.5.16.88 | 100 | 1 | ✓ | |
| ☑ | | bridge 1 | | | 1 | ☑ | |

In the navigation tree, click "Link Backup >> VRRP >> Status" and view the VRRP status.



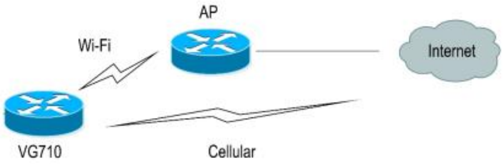
Link Backup >> VRRP

| Virtual Route ID | Interface | VRRP Status | Priority | Track Status |
|---|---|---|---|---|
| 1 | bridge 1 | Backup | 100 | - |

Under normal circumstances, VG814_A performs gateway functions. When VG814_A is shut down or fails, VG814_B performs gateway functions. The preemption mode is intended to enable VG814_A to continue to act as the master gateway after it recovers.

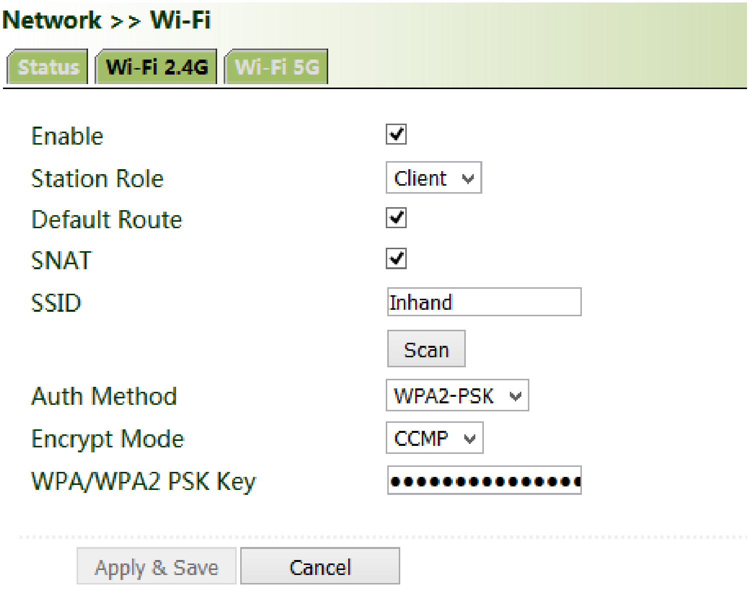
## 5.7.4 Interface Backup

Scenario: VG814 accesses the Internet via Wi-Fi, and an interface backup is created to enable VG814 to access the Internet through dial-up upon Wi-Fi failure. The topology is shown below.



Method for creating an interface backup for the gateway:

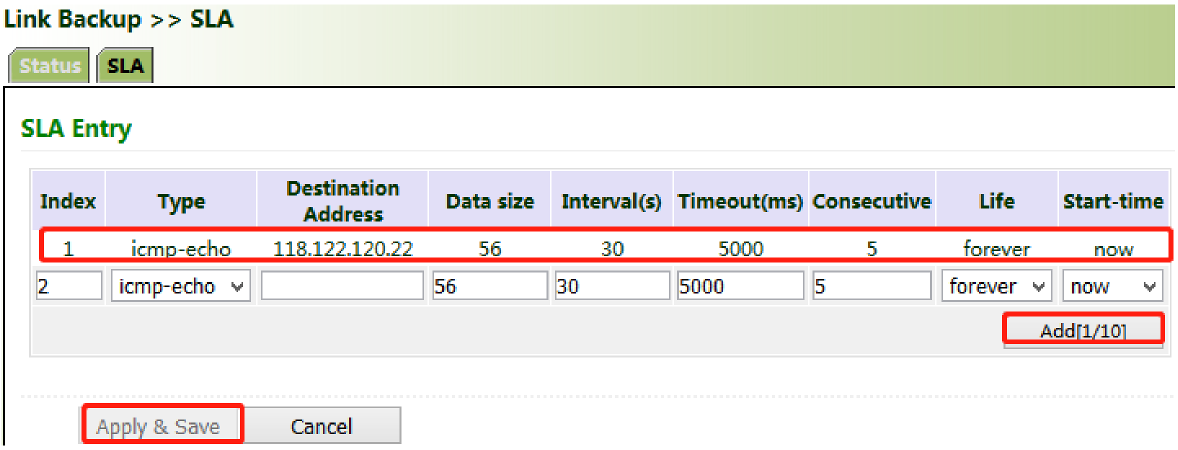
1. Enable VG814 to access the Internet via Wi-Fi.



Network >> Wi-Fi

| | |
|---|---|
| Enable | ☑ |
| Station Role | Client |
| Default Route | ☑ |
| SNAT | ☑ |
| SSID | Inhand |
| | Scan |
| Auth Method | WPA2-PSK |
| Encrypt Mode | CCMP |
| WPA/WPA2 PSK Key | ●●●●●●●●●●●●●●● |

2. Click "Link Backup >> SLA >> SLA >> Add" to add an ICMP detection entry. Set the IP address to the host address that can be detected over ICMP on the public or private network, for example, the public IP address 118.122.120.22. Click Apply & Save.

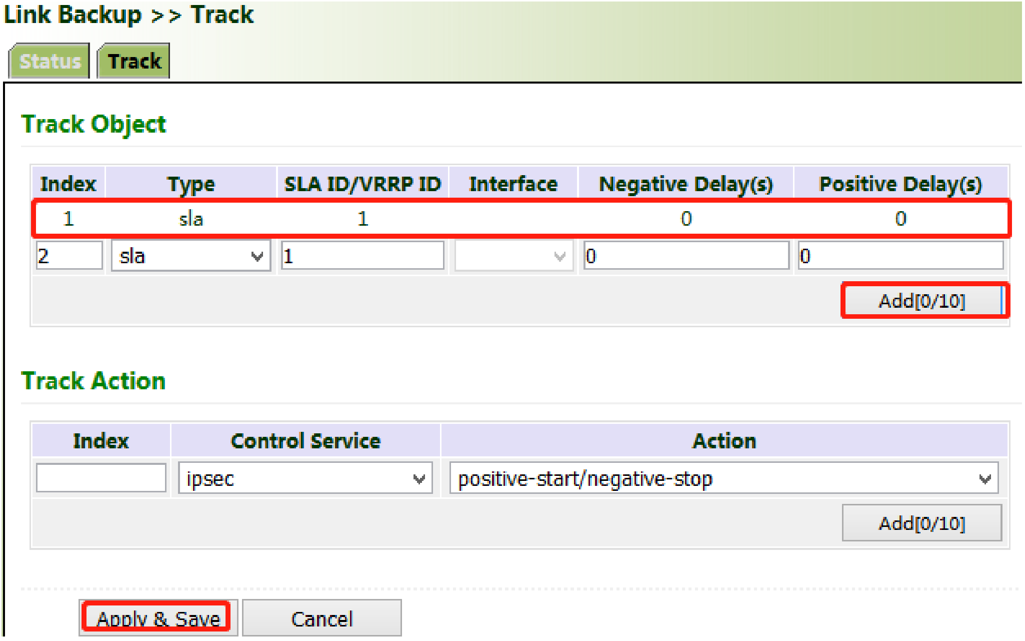


Link Backup >> SLA

SLA Entry

| Index | Type | Destination Address | Data size | Interval(s) | Timeout(ms) | Consecutive | Life | Start-time |
|---|---|---|---|---|---|---|---|---|
| 1 | icmp-echo | 118.122.120.22 | 56 | 30 | 5000 | 5 | forever | now |
| 2 | icmp-echo | | 56 | 30 | 5000 | 5 | forever | now |

3. Click "Link Backup >> Track >> Track >> Add" to add a track entry. Select "sla" for "Type" and "dot11radio1" for "Interface", click Add, and then click Apply & Save.



Link Backup >> Track

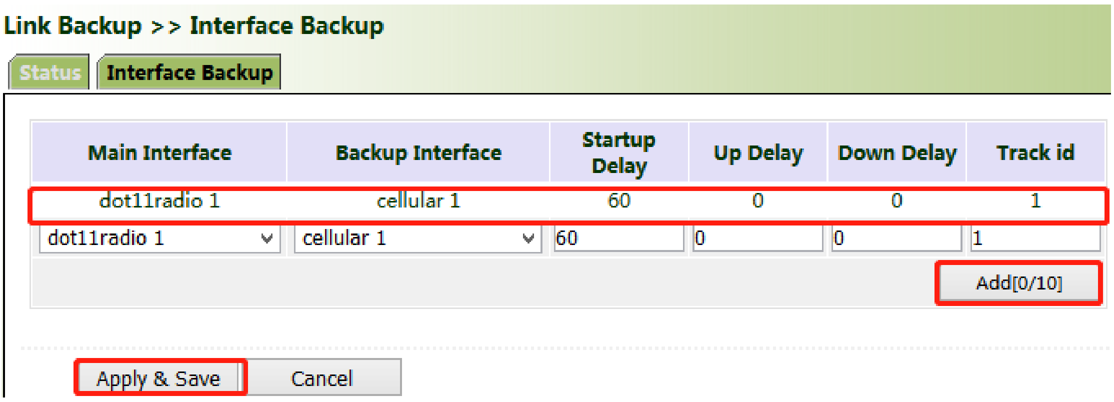
Track Object

| Index | Type | SLA ID/VRRP ID | Interface | Negative Delay(s) | Positive Delay(s) |
|---|---|---|---|---|---|
| 1 | sla | 1 |  | 0 | 0 |
| 2 | sla | 1 |  | 0 | 0 |

Track Action

| Index | Control Service | Action |
|---|---|---|
|  | ipsec | positive-start/negative-stop |

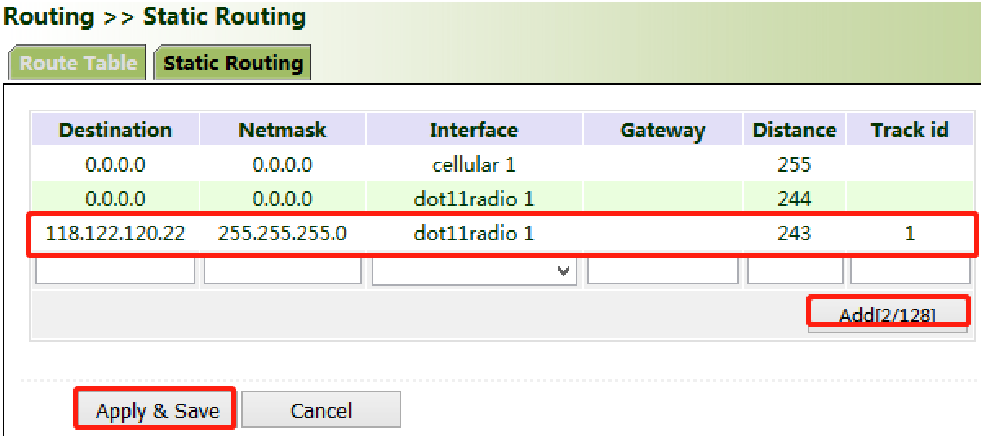
4. Click "Link Backup >> Interface Backup >> Add", select "dot11radio1" for "Main Interface" and "cellular1" for "Backup Interface", and click Apply & Save.



Link Backup >> Interface Backup

| Main Interface | Backup Interface | Startup Delay | Up Delay | Down Delay | Track id |
|---|---|---|---|---|---|
| dot11radio 1 | cellular 1 | 60 | 0 | 0 | 1 |
| dot11radio 1 | cellular 1 | 60 | 0 | 0 | 1 |

5. Click "Routing >> Static Routing >> Add" and add two routes for network access through the "dot11radio1" and "cellular1" interfaces. A smaller value of "Distance" indicates a higher priority.



Routing >> Static Routing

| Destination | Netmask | Interface | Gateway | Distance | Track id |
|---|---|---|---|---|---|
| 0.0.0.0 | 0.0.0.0 | cellular 1 | | 255 | |
| 0.0.0.0 | 0.0.0.0 | dot11radio 1 | | 244 | |
| 118.122.120.22 | 255.255.255.0 | dot11radio 1 | | 243 | 1 |

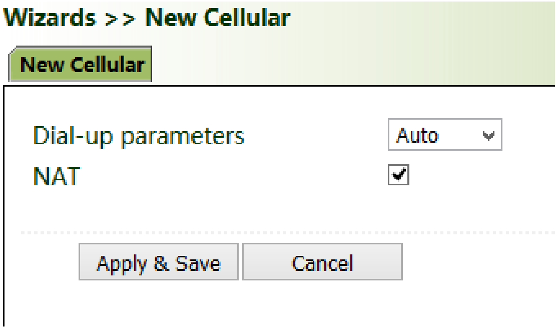
6. Trigger a Wi-Fi failure. According to the preset link detection policy, VG814 accesses the Internet through dial-up via the cellular port, and when Wi-Fi recovers, immediately switches to Wi-Fi for Internet access.

# 5.8 Wizards

The "Wizards" module incorporates some common communication parameters, simplifying the operations.

## 5.8.1 New Cellular

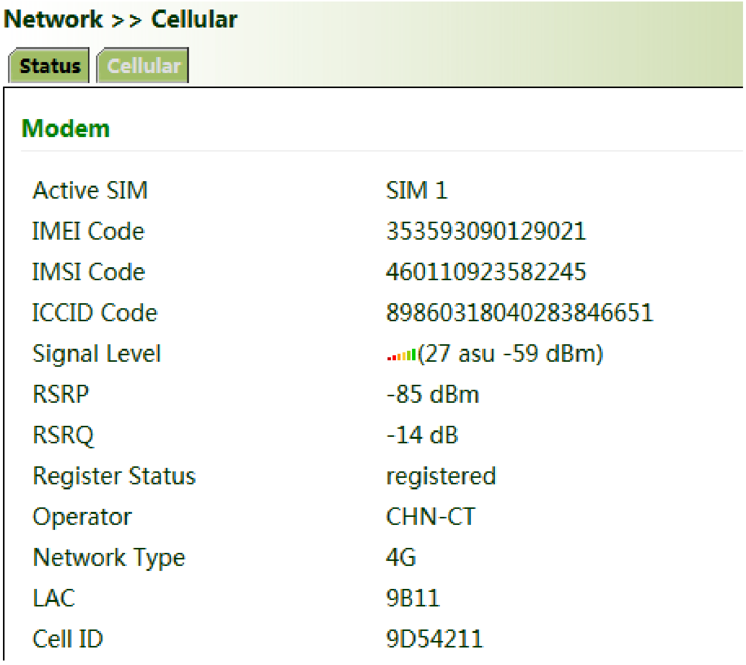
After a common network interface card (NIC) is inserted, click "Wizards >> New Cellular >> Apply & Save" and access the status page to view the network connection status of the device. The device is connected to the network.



Wizards >> New Cellular

Dial-up parameters Auto

NAT ☑



Modem

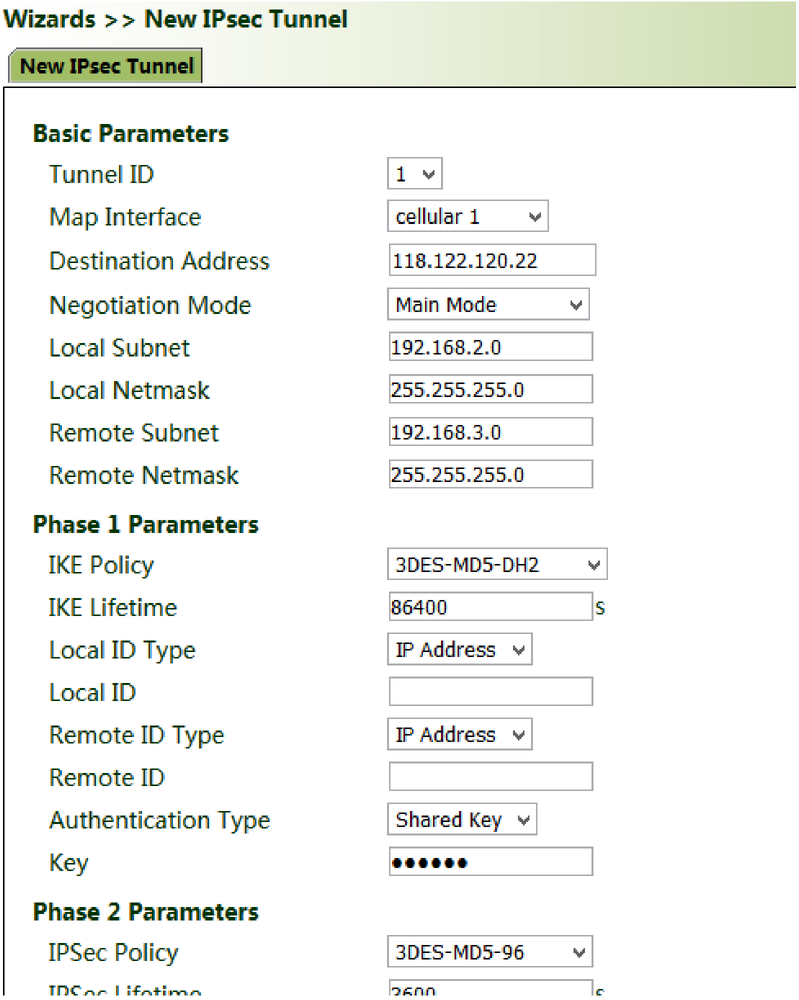
| | |
|---|---|
| Active SIM | SIM 1 |
| IMEI Code | 353593090129021 |
| IMSI Code | 460110923582245 |
| ICCID Code | 89860318040283846651 |
| Signal Level | (27 asu -59 dBm) |
| RSRP | -85 dBm |
| RSRQ | -14 dB |
| Register Status | registered |
| Operator | CHN-CT |
| Network Type | 4G |
| LAC | 9B11 |
| Cell ID | 9D54211 |

## 5.8.2 New IPsec Tunnel

A dedicated virtual tunnel is established between the gateway and other devices or cloud platforms on the network.

Method for establishing an IPsec tunnel for the gateway:

Click "Wizards >> New IPsec Tunnel", set "Map Interface" to an interface ("bridge": bridge interface; "cellular": dialup interface; "dot11radio": Wi-Fi interface) for which you want to establish a tunnel, enter the peer IP address for "Destination Address", and enter the subnet IP addresses and masks at both ends of the tunnel. In Phase 1, enter the IDs at both ends of the tunnel and the connection key, and click Apply & Save.



Wizards >> New IPsec Tunnel

**Basic Parameters**

| | |
|---|---|
| Tunnel ID | 1 |
| Map Interface | cellular 1 |
| Destination Address | 118.122.120.22 |
| Negotiation Mode | Main Mode |
| Local Subnet | 192.168.2.0 |
| Local Netmask | 255.255.255.0 |
| Remote Subnet | 192.168.3.0 |
| Remote Netmask | 255.255.255.0 |

**Phase 1 Parameters**

| | |
|---|---|
| IKE Policy | 3DES-MD5-DH2 |
| IKE Lifetime | 86400 s |
| Local ID Type | IP Address |
| Local ID | |
| Remote ID Type | IP Address |
| Remote ID | |
| Authentication Type | Shared Key |
| Key | •••••• |

**Phase 2 Parameters**

| | |
|---|---|
| IPSec Policy | 3DES-MD5-96 |
| IPSec Lifetime | 3600 s |

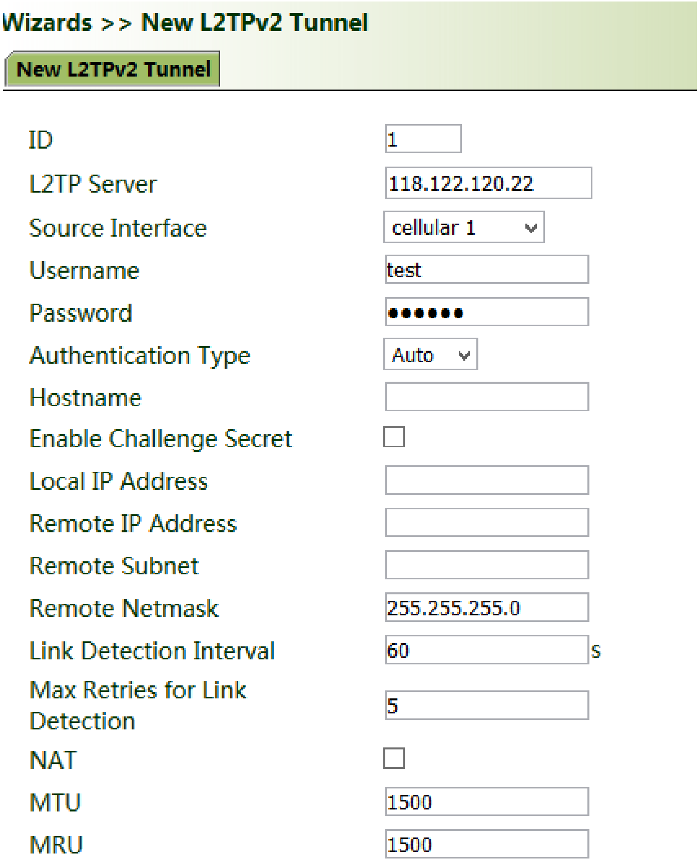
## 5.8.3 IPsec Experts’ Configuration

This function is available only for specific users. To activate this function, contact the technical support personnel.

## 5.8.4 New L2TPv2 Tunnel

Method for creating an L2TPv2 tunnel for the gateway:

Set the parameters of the L2TP server and the local/remote addresses. Click Apply & Save.



Wizards >> New L2TPv2 Tunnel

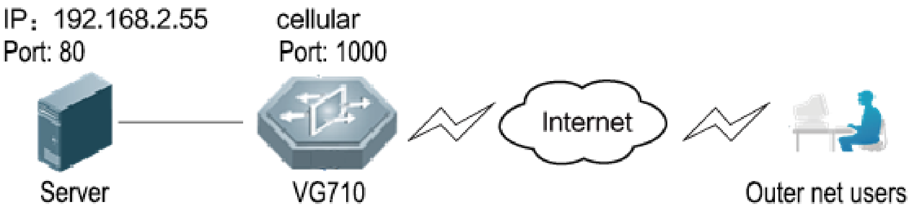
New L2TPv2 Tunnel

| | |
|---|---|
| ID | 1 |
| L2TP Server | 118.122.120.22 |
| Source Interface | cellular 1 |
| Username | test |
| Password | ●●●●●● |
| Authentication Type | Auto |
| Hostname | |
| Enable Challenge Secret | □ |
| Local IP Address | |
| Remote IP Address | |
| Remote Subnet | |
| Remote Netmask | 255.255.255.0 |
| Link Detection Interval | 60 s |
| Max Retries for Link Detection | 5 |
| NAT | □ |
| MTU | 1500 |
| MRU | 1500 |

## 5.8.5 New Port Mapping

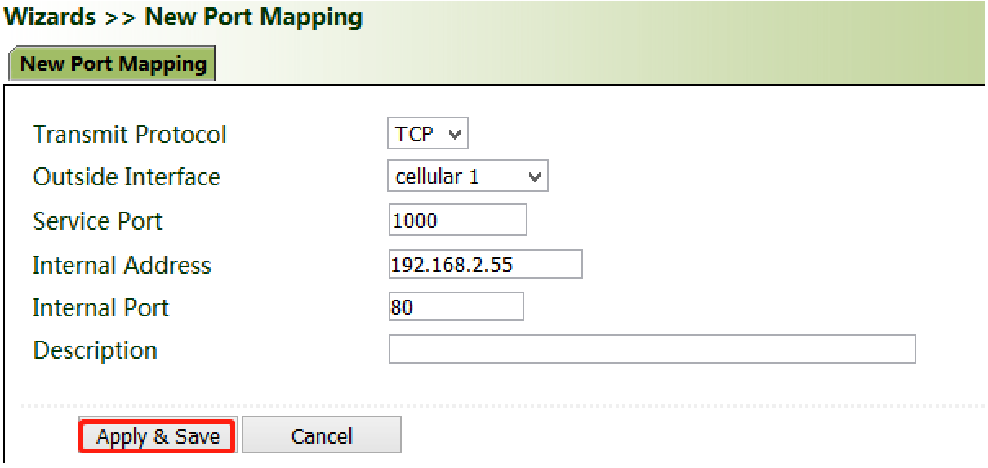
Port mapping is to map a port of a host on the intranet to a port of a host on the extranet to provide corresponding services. When a user accesses the port on the extranet, the server automatically maps the request to the internal machine on the corresponding LAN.

Scenario: Users on the extranet cannot directly access a web server on the intranet. In this case, a port mapping can be created on the gateway so that the gateway automatically transfers the data to port 80 of the web server on the intranet when a user on the extranet accesses port 1000 via the cellular interface of the gateway.



Method for creating a port mapping for the gateway:

Click Wizards >> New Port Mapping". Enter the gateway interface for "Outside Interface", gateway port for "Service Port", IP address of the internal host for "Internal Address", and port ID of the internal host for "Internal Port". Click Apply & Save.



Wizards >> New Port Mapping

New Port Mapping

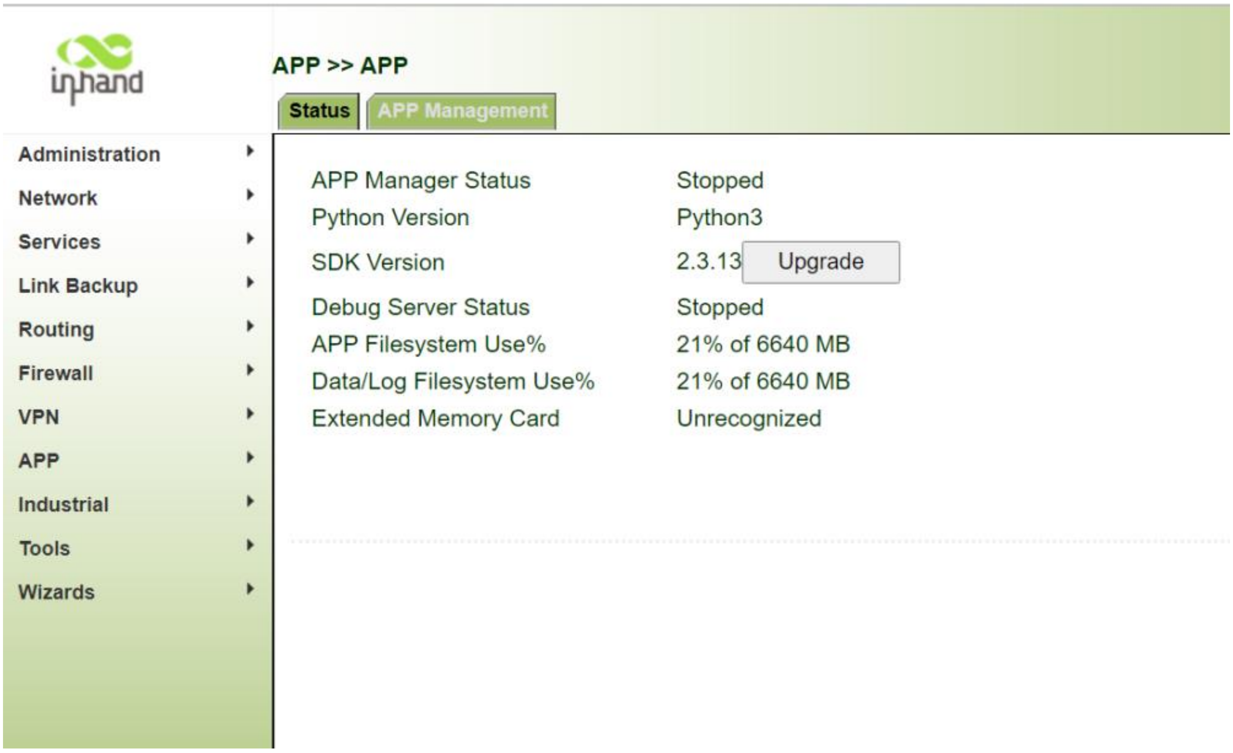
| | |
|---|---|
| Transmit Protocol | TCP |
| Outside Interface | cellular 1 |
| Service Port | 1000 |
| Internal Address | 192.168.2.55 |
| Internal Port | 80 |
| Description | |

# 6 Edge computing and app functions

App function is an important part of the gateway to realize edge computing. The prerequisite for using this feature is to install the python SDK.

## 6.1 APP Status

This page is to upgrade the SDK of Python to view the edge computing environment.



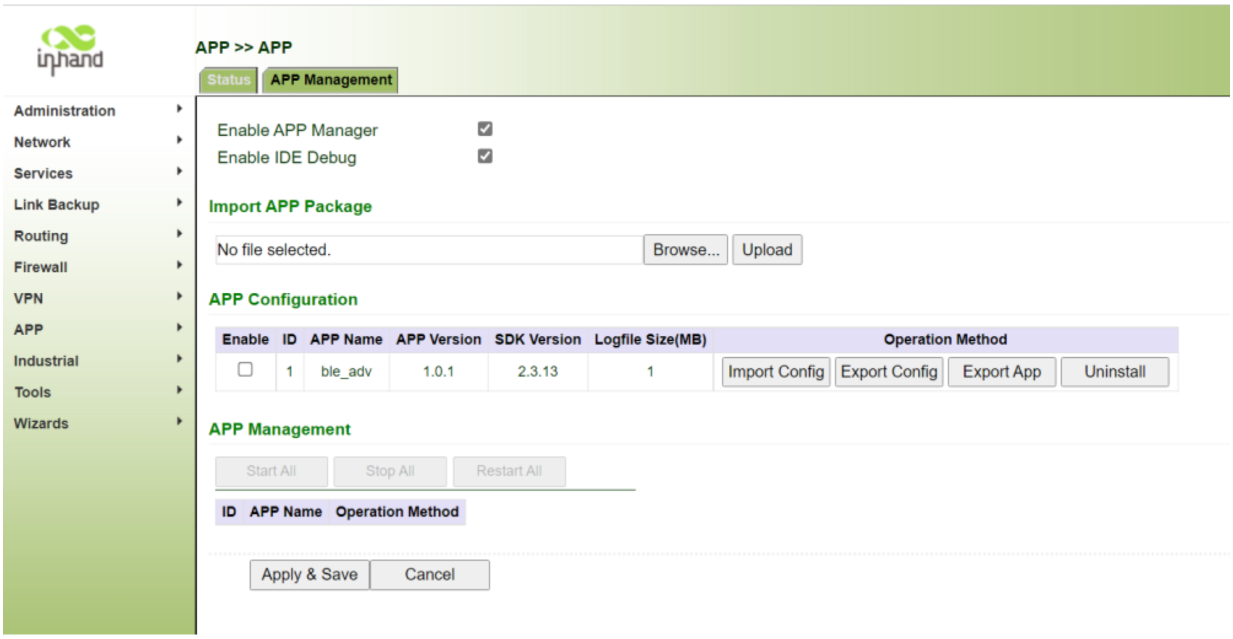
APP >> APP

| | |
|---|---|
| APP Manager Status | Stopped |
| Python Version | Python3 |
| SDK Version | 2.3.13 Upgrade |
| Debug Server Status | Stopped |
| APP Filesystem Use% | 21% of 6640 MB |
| Data/Log Filesystem Use% | 21% of 6640 MB |
| Extended Memory Card | Unrecognized |

### 6.1.2 APP Management

This page opens app management to manage Python apps.

If you need to link the gateway for development, you need to Enable the IDE debug function



APP >> APP

Enable APP Manager ☑
Enable IDE Debug ☑

Import APP Package

No file selected.

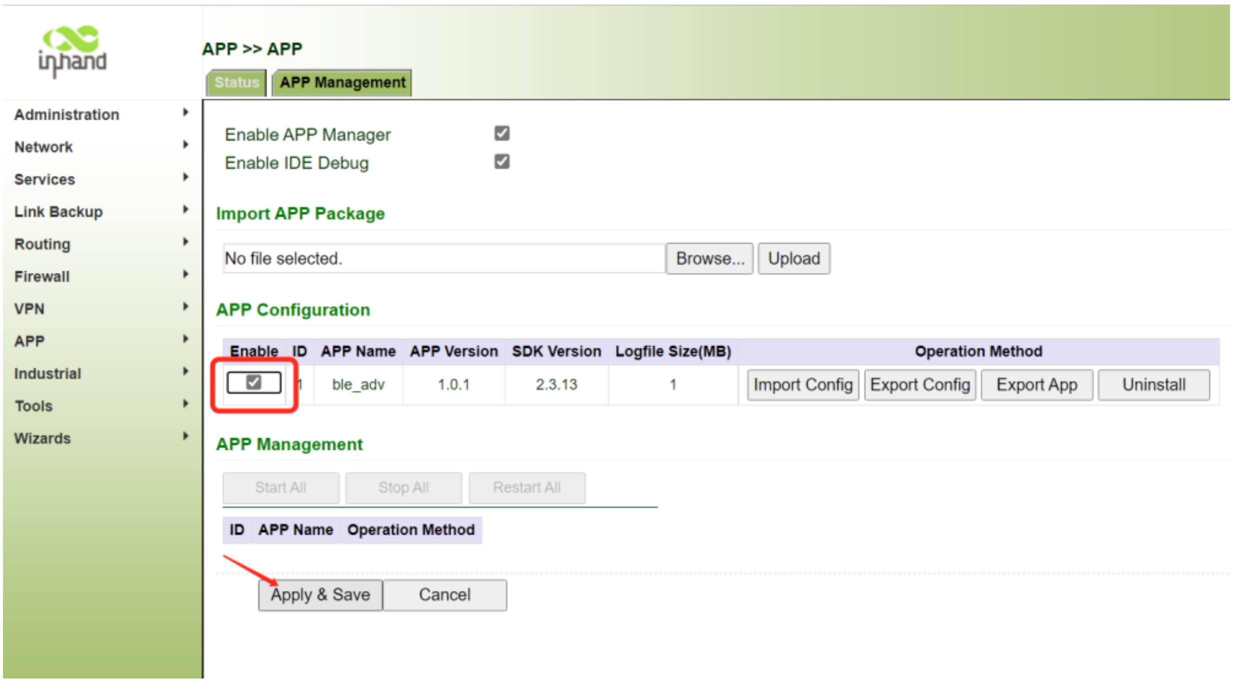
APP Configuration

| Enable | ID | APP Name | APP Version | SDK Version | Logfile Size(MB) | Operation Method |
|---|---|---|---|---|---|---|
| □ | 1 | ble_adv | 1.0.1 | 2.3.13 | 1 | Import Config Export Config Export App Uninstall |

APP Management

| ID | APP Name | Operation Method |
|---|---|---|

Open the imported app, check it in the app list, and then click button Apply & Save button



APP >> APP

Enable APP Manager ☑
Enable IDE Debug ☑

Import APP Package

No file selected.

APP Configuration

| Enable | ID | APP Name | APP Version | SDK Version | Logfile Size(MB) | Operation Method |
|---|---|---|---|---|---|---|
| ☑ | 1 | ble_adv | 1.0.1 | 2.3.13 | 1 | Import Config Export Config Export App Uninstall |

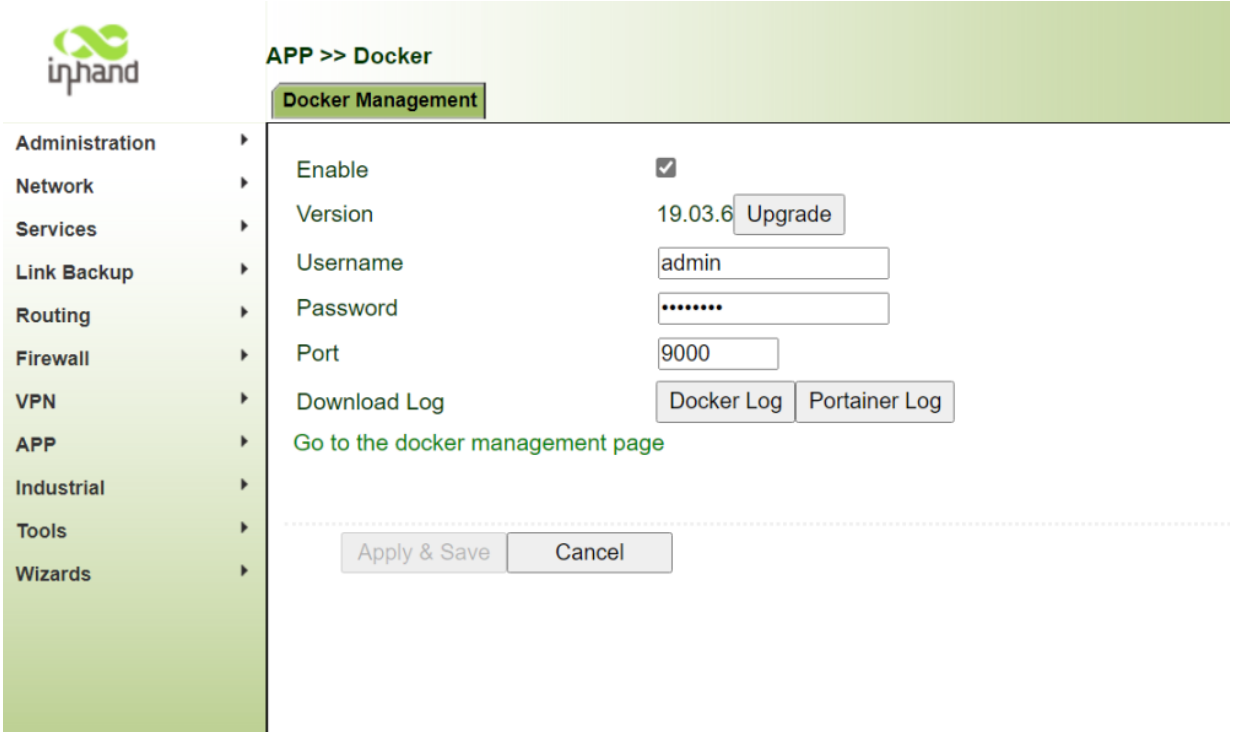
APP Management

| ID | APP Name | Operation Method |
|---|---|---|

For more guidance on app development, please refer to the development documentation. https://www.inhandnetworks.com/downlist/cid-114

## 6.2 APP Docker function

Enable the docker function of the gateway.



Enable ☑

Version 19.03.6

Username admin

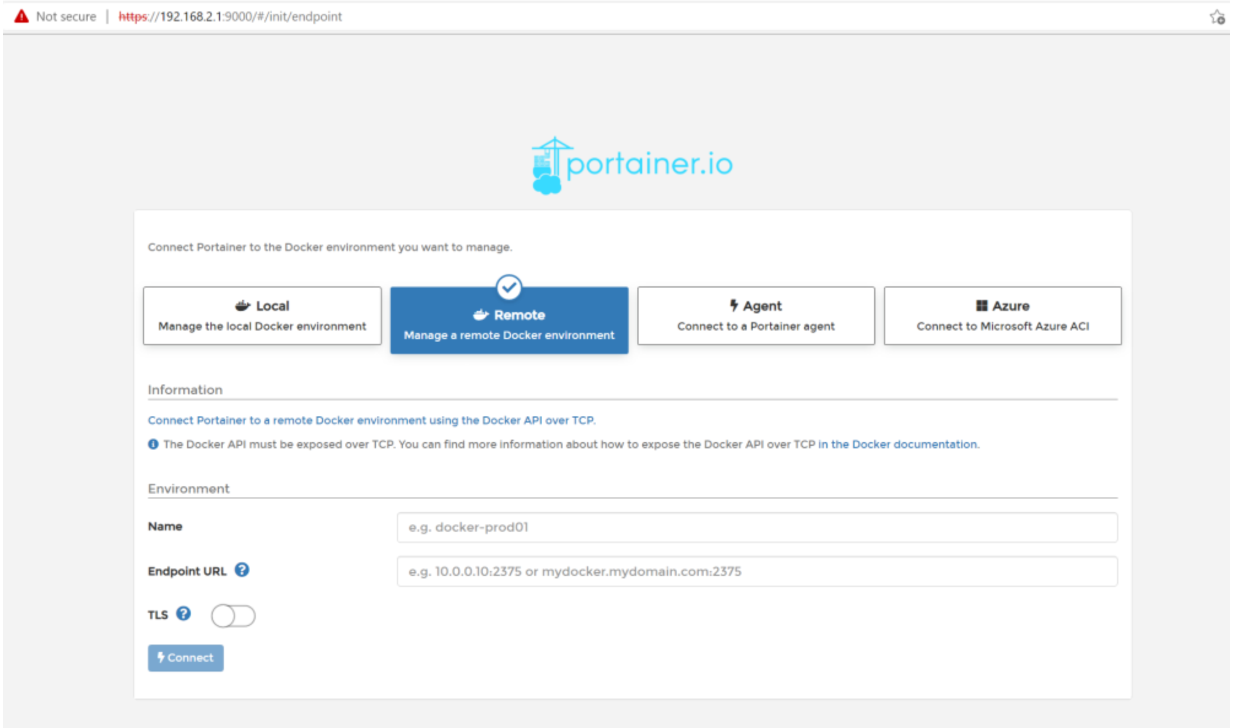
Password ••••••••

Port 9000

Download Log

Click the “Go to the docker management page” default username admin password 12345678

Enter the docker management page.



Not secure | https://192.168.2.1:9000/#/init/endpoint
portainer.io

Connect Portainer to the Docker environment you want to manage.

Local
Manage the local Docker environment
Remote
Manage a remote Docker environment
Agent
Connect to a Portainer agent
Azure
Connect to Microsoft Azure ACI

Information

Connect Portainer to a remote Docker environment using the Docker API over TCP.

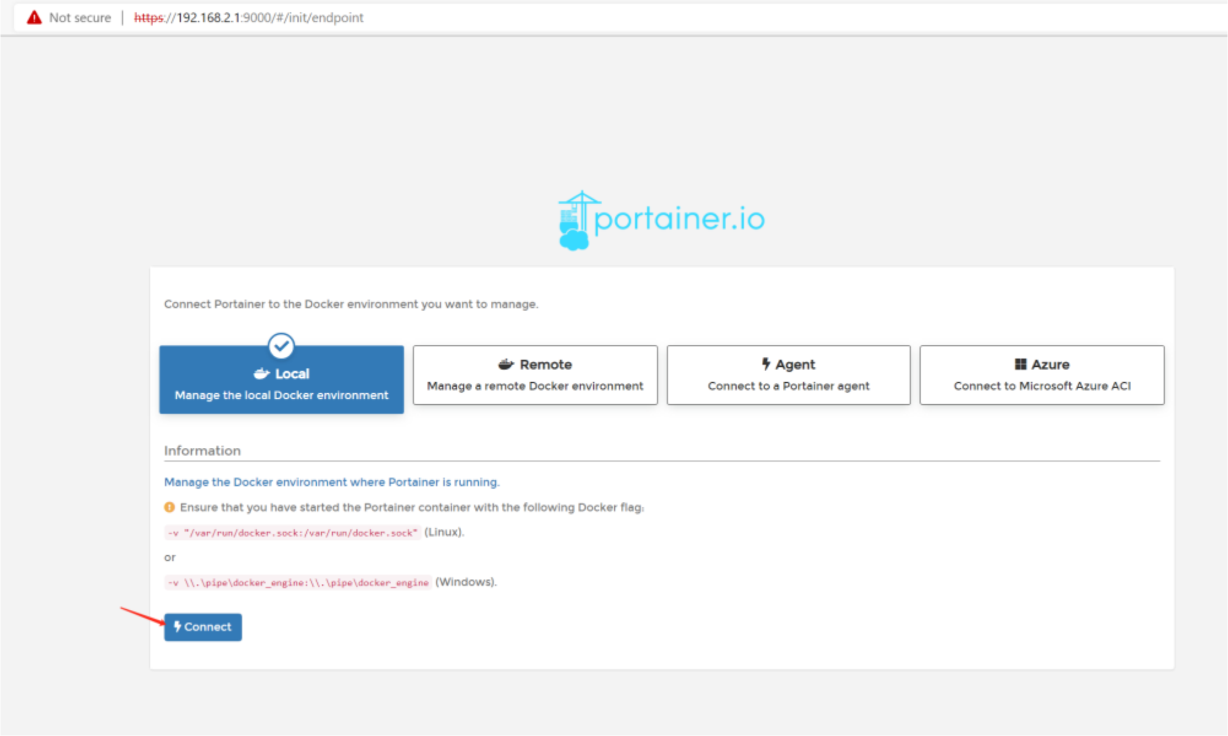
The Docker API must be exposed over TCP. You can find more information about how to expose the Docker API over TCP in the Docker documentation.

Environment

Name: e.g. docker-prod01

Endpoint URL: e.g. 10.0.0.10:2375 or mydocker.mydomain.com:2375

TLS ○



Not secure | https://192.168.2.1:9000/#/init/endpoint
portainer.io

Connect Portainer to the Docker environment you want to manage.

Local
Manage the local Docker environment
Remote
Manage a remote Docker environment
Agent
Connect to a Portainer agent
Azure
Connect to Microsoft Azure ACI

Information

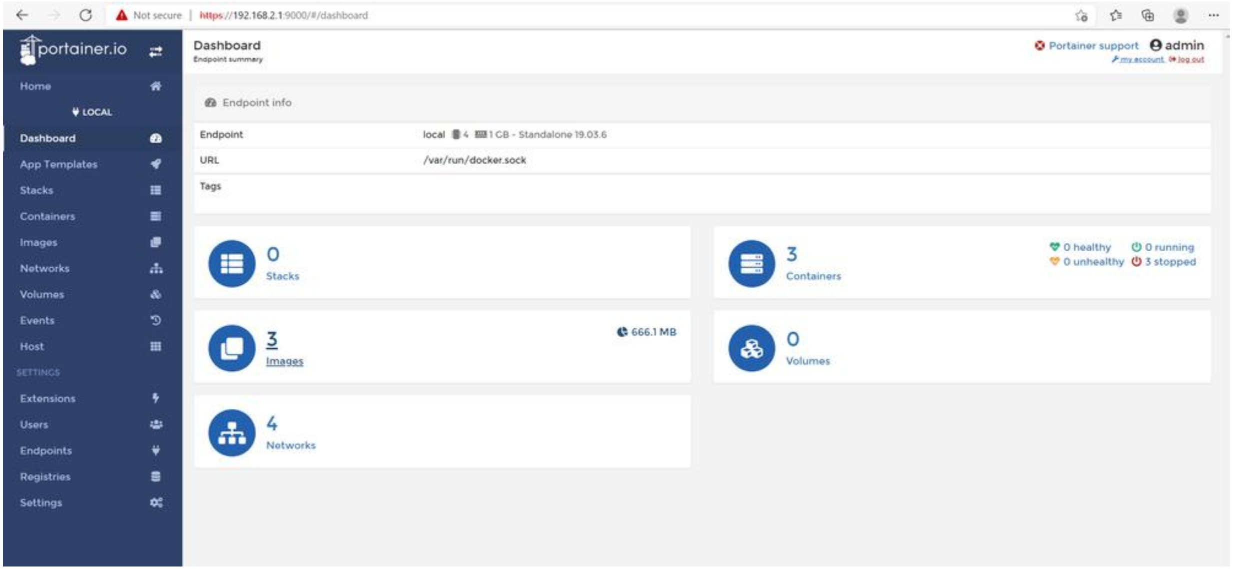
Manage the Docker environment where Portainer is running.

Ensure that you have started the Portainer container with the following Docker flag:

`-v "/var/run/docker.sock:/var/run/docker.sock"` (Linux).

or

`-v \\.\pipe\docker_engine:\\.\pipe\docker_engine` (Windows).



Dashboard
Endpoint summary

Endpoint info

| | |
|---|---|
| Endpoint | local 4 1 GB - Standalone 19.03.6 |
| URL | /var/run/docker.sock |
| Tags | |

0 Stacks

3 Containers — 0 healthy, 0 unhealthy, 0 running, 3 stopped

3 Images — 666.1 MB

0 Volumes

4 Networks

For container management tools, visit: https://www.portainer.io/

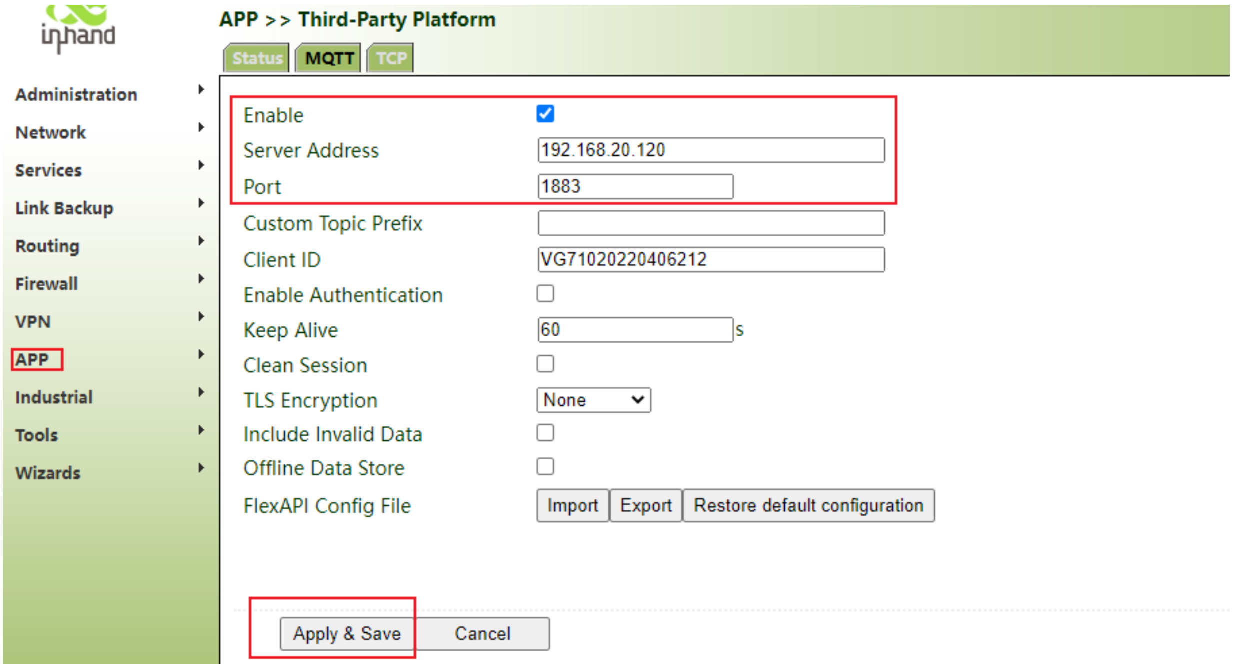
# 6.3 Third party cloud platform

The gateway device connects to the cloud platform as a client to realize communication, and obtains data in real time according to the corresponding configuration of the gateway device to achieve the purpose of data interaction.

## 6.3.1 MQTT protocol connection to cloud platform

Step 1: click "APP>> third party cloud platform > >mqtt>> enable", select the address and port of the cloud platform server, click apply and save.

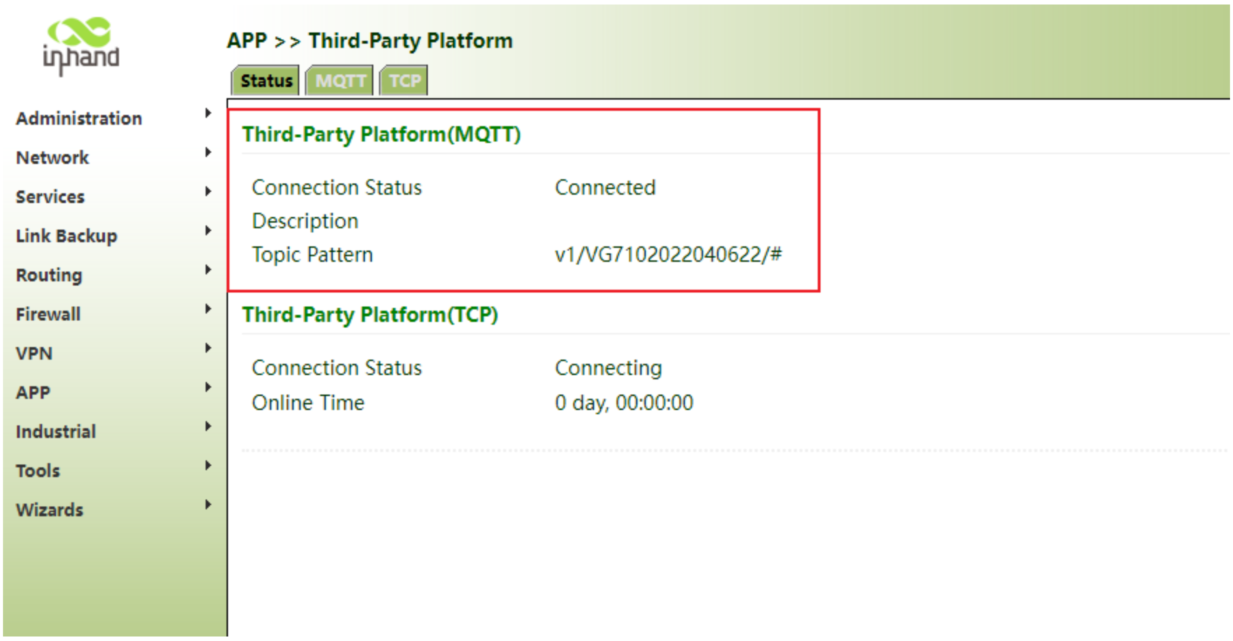
Which fields are sent to the platform by default, and the FlexAPI config can be modified



APP >> Third-Party Platform

| | |
|---|---|
| Enable | ☑ |
| Server Address | 192.168.20.120 |
| Port | 1883 |
| Custom Topic Prefix | |
| Client ID | VG71020220406212 |
| Enable Authentication | ☐ |
| Keep Alive | 60 s |
| Clean Session | ☐ |
| TLS Encryption | None |
| Include Invalid Data | ☐ |
| Offline Data Store | ☐ |
| FlexAPI Config File | Import Export Restore default configuration |

Step 2: click status. If the connection status is connected, the connection is successful.



APP >> Third-Party Platform

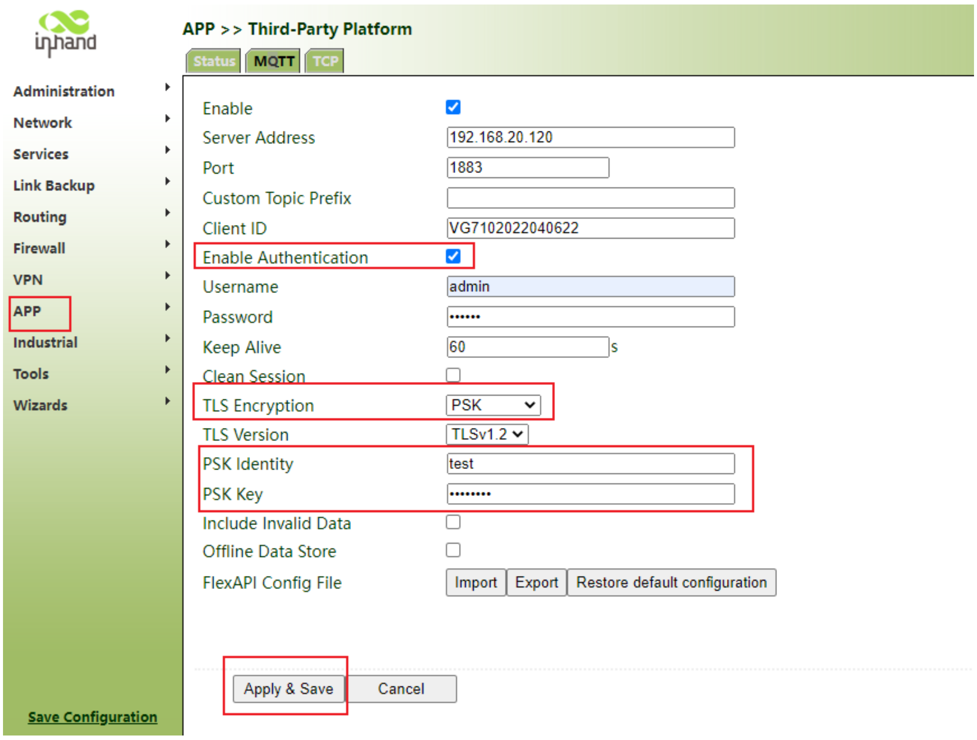
Third-Party Platform(MQTT)

| | |
|---|---|
| Connection Status | Connected |
| Description | |
| Topic Pattern | v1/VG7102022040622/# |

Third-Party Platform(TCP)

| | |
|---|---|
| Connection Status | Connecting |
| Online Time | 0 day, 00:00:00 |

Note: if the server needs authentication and encryption, it needs to be enabled correspondingly. Click "app>> third party cloud platform > >mqtt>> enable", select the address and port of the cloud platform server, and enable mqtt authentication and TLS encryption.



APP >> Third-Party Platform

Enable ☑

Server Address 192.168.20.120

Port 1883

Custom Topic Prefix

Client ID VG7102022040622

Enable Authentication ☑

Username admin

Password ••••••

Keep Alive 60 s

Clean Session □

TLS Encryption PSK

TLS Version TLSv1.2

PSK Identity test

PSK Key ••••••••

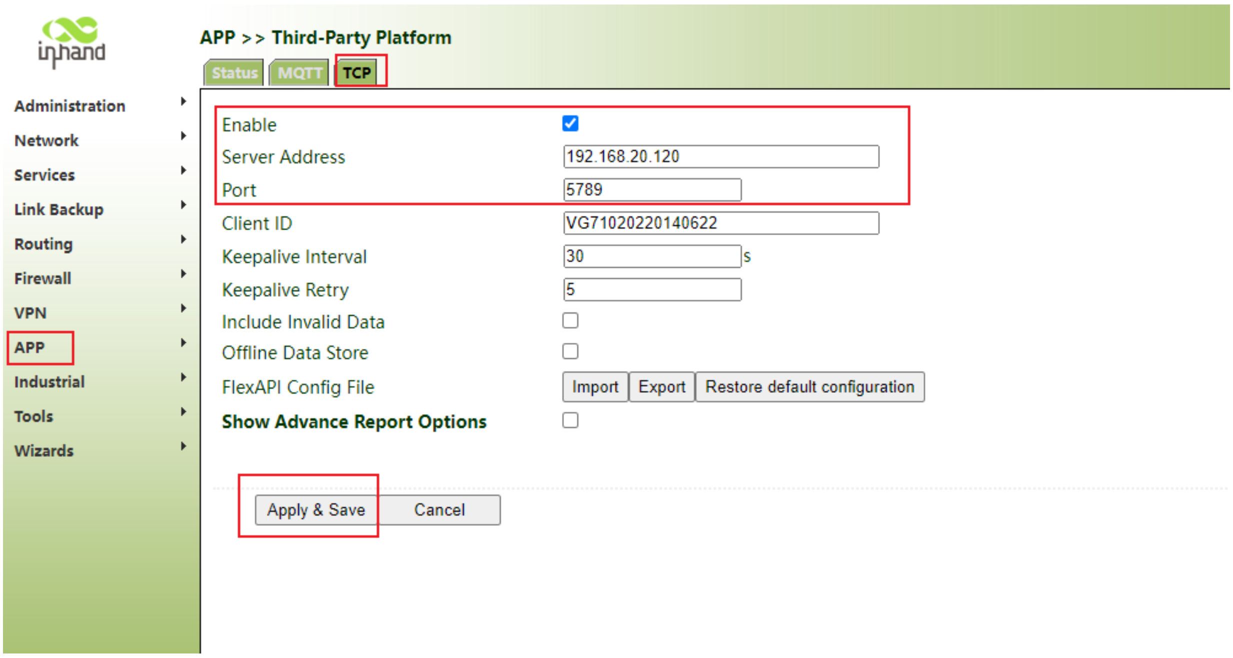
Include Invalid Data □

Offline Data Store □

FlexAPI Config File

## 6.3.2 TCP protocol connection to cloud platform

Step 1: click "app>> third party cloud platform > >tcp>> enable", select the address and port of the cloud platform server, click apply and save



APP >> Third-Party Platform

Enable ☑

Server Address 192.168.20.120

Port 5789

Client ID VG71020220140622

Keepalive Interval 30 s

Keepalive Retry 5

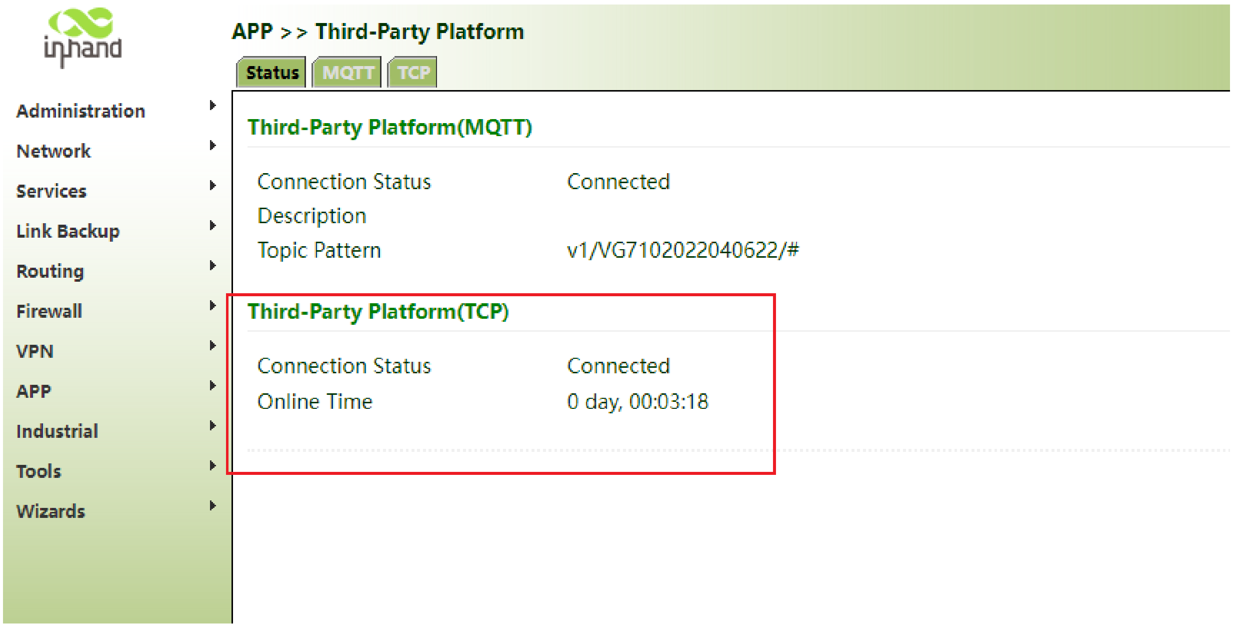
Include Invalid Data □

Offline Data Store □

FlexAPI Config File

Show Advance Report Options □

Step 2: click status. If the connection status is connected, the connection is successful.



APP >> Third-Party Platform

Third-Party Platform(MQTT)

Connection Status Connected

Description

Topic Pattern v1/VG7102022040622/#

Third-Party Platform(TCP)

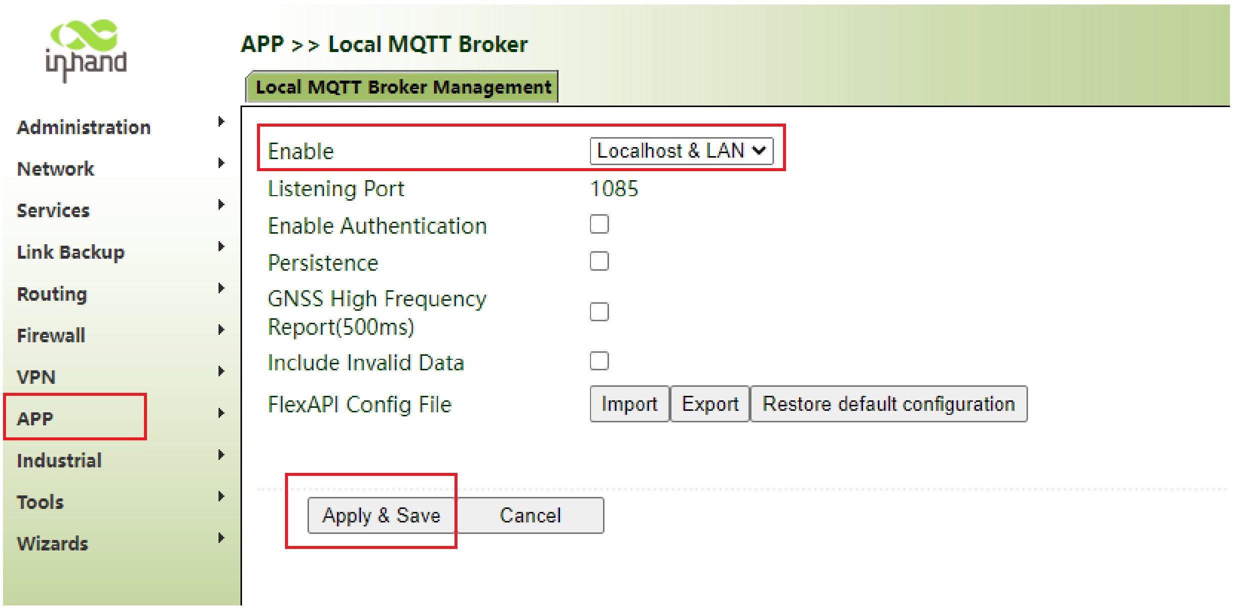
Connection Status Connected

Online Time 0 day, 00:03:18

# 6.4 Local MQTT Agent

The gateway device acts as an mqtt server to proxy messages. When users need messages, they use the mqtt client to subscribe to information. Python App or Doker program use gateway info, Subscribe to messages from the local mqtt agent.

Step 1: click "app>> local mqtt agent > > enable local / local &amp; Lan", click apply and save



APP >> Local MQTT Broker

Enable: Localhost & LAN

Listening Port: 1085

Enable Authentication ☐

Persistence ☐

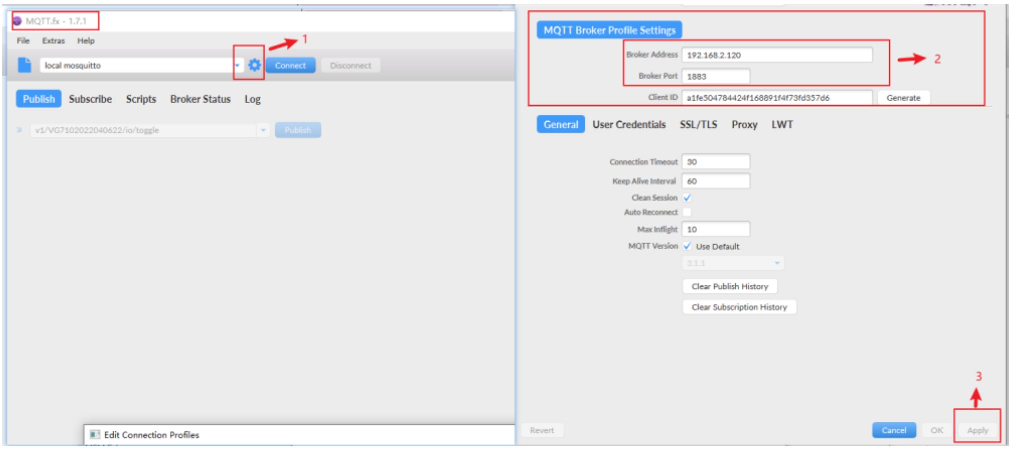
GNSS High Frequency Report(500ms) ☐

Include Invalid Data ☐

FlexAPI Config File

Step 2: use mqtt client information: server address, port, authentication and other information

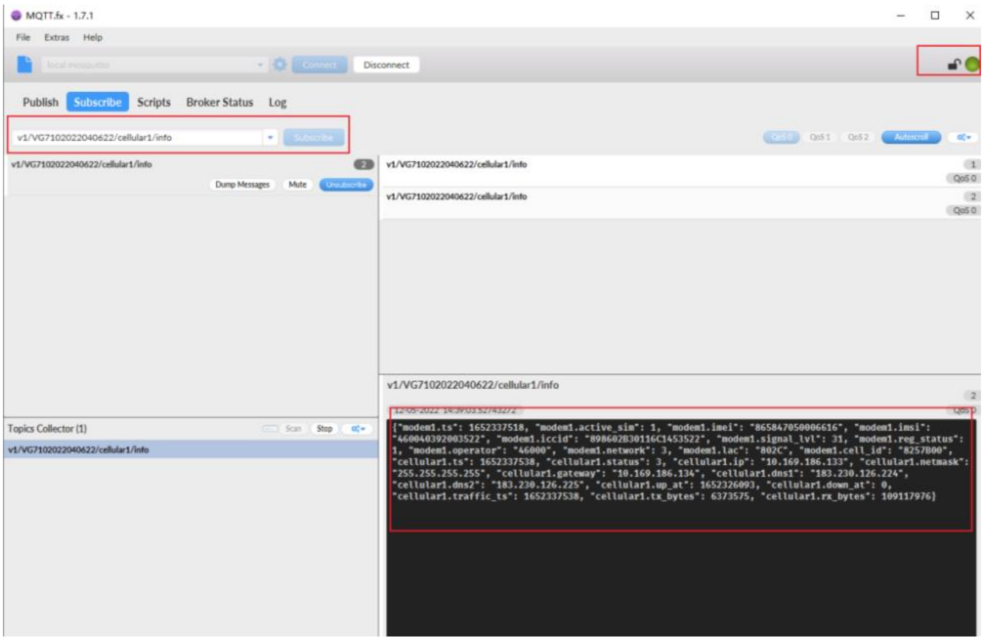
This document uses mqtt Take FX test tool as an example.



Broker Address: 192.168.2.120
Broker Port: 1883
Client ID: a1fe504784424f168891f4f73fd357d6

Connection Timeout: 30
Keep Alive Interval: 60
Clean Session: ✓
Auto Reconnect: □
Max Inflight: 10
MQTT Version: ✓ Use Default 3.1.1

Step 3: click Connect. If the icon turns green, it means the connection is successful. Then subscribe to the information according to the topic document. The gateway will return data in JSON format. For example, subscribe to cellular information



v1/VG7102022040622/cellular1/info

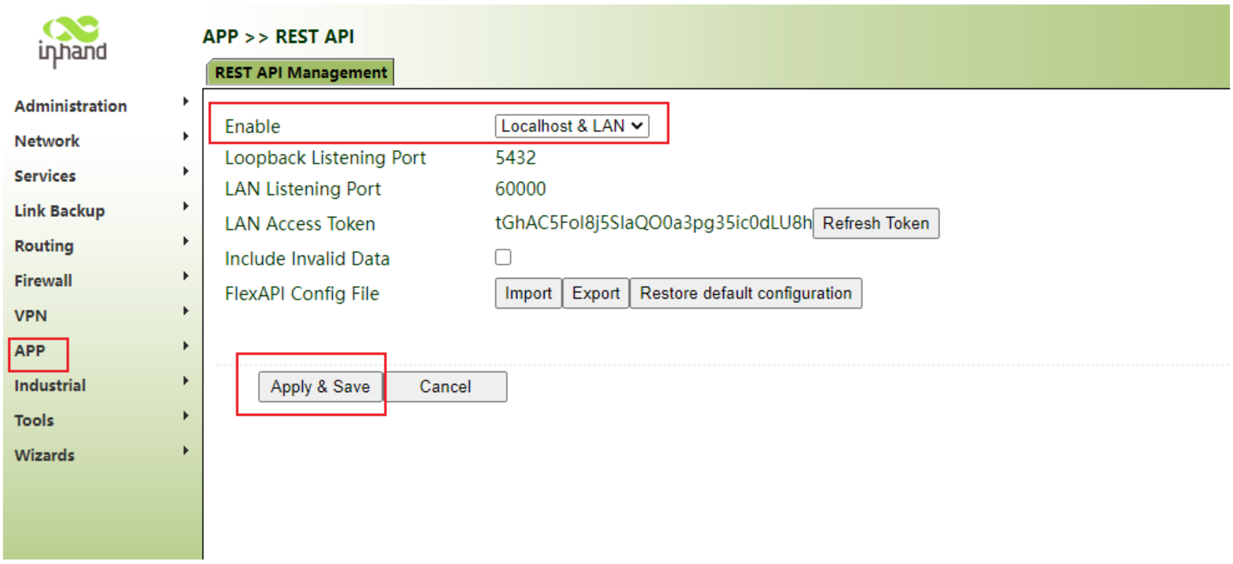
12-05-2022 14:39:03.52743272

```
{"modem1.ts": 1652337518, "modem1.active_sim": 1, "modem1.imei": "865847050006616", "modem1.imsi":
"460040392003522", "modem1.iccid": "898602B30116C1453522", "modem1.signal_lvl": 31, "modem1.reg_status":
1, "modem1.operator": "46000", "modem1.network": 3, "modem1.lac": "802C", "modem1.cell_id": "8257B00",
"cellular1.ts": 1652337538, "cellular1.status": 3, "cellular1.ip": "10.169.186.133", "cellular1.netmask":
"255.255.255.255", "cellular1.gateway": "10.169.186.134", "cellular1.dns1": "183.230.126.224",
"cellular1.dns2": "183.230.126.225", "cellular1.up_at": 1652326093, "cellular1.down_at": 0,
"cellular1.traffic_ts": 1652337538, "cellular1.tx_bytes": 6373575, "cellular1.rx_bytes": 109117976}
```

# 6.5 REST API

In addition to using mqtt and TCP to obtain data, users can also use rest APIs to call data according to interface documents

Step 1: click "app>>rest api>> enable", select the address and port of the cloud platform server, click apply and save



Enable: Localhost & LAN

Loopback Listening Port: 5432

LAN Listening Port: 60000

LAN Access Token: tGhAC5Fol8j5SlaQO0a3pg35ic0dLU8h

Include Invalid Data: □

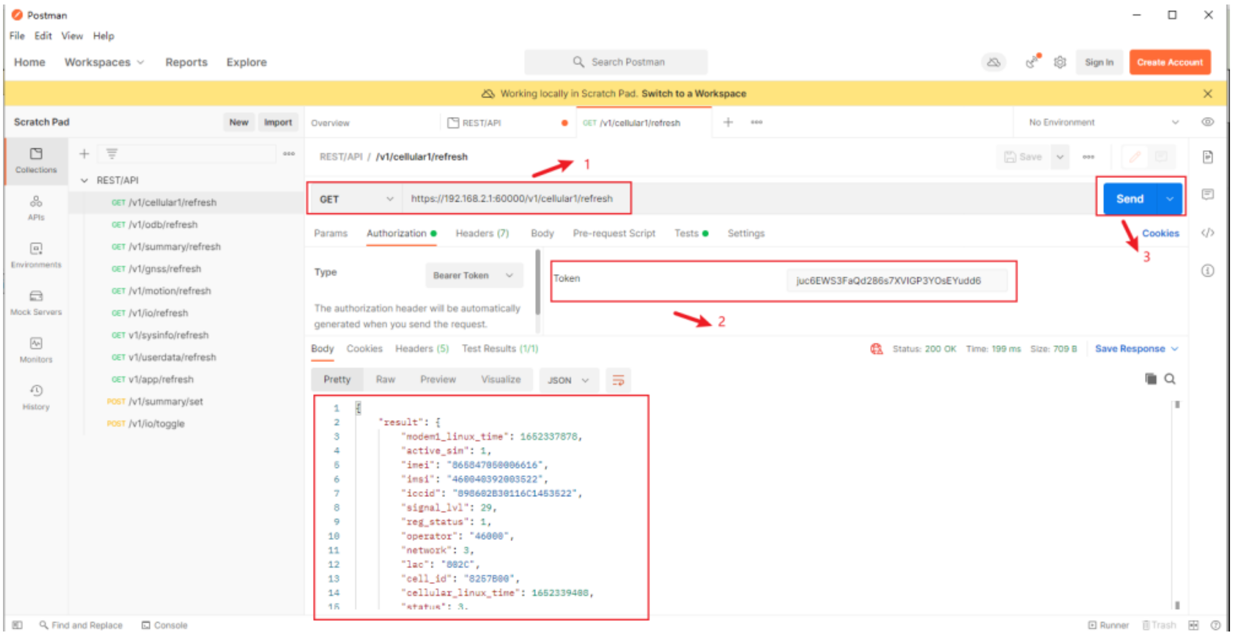
FlexAPI Config File

Step 2: use tools such as postman according to the interface document to call the interface to obtain data.

1. Fill in the URL, token, etc. in the interface document, and note whether it is a get or post request;

2. Click send;

3. Finally, the gateway device will return the corresponding data results in JSON format;



GET https://192.168.2.1:60000/v1/cellular1/refresh

Type: Bearer Token

The authorization header will be automatically generated when you send the request.

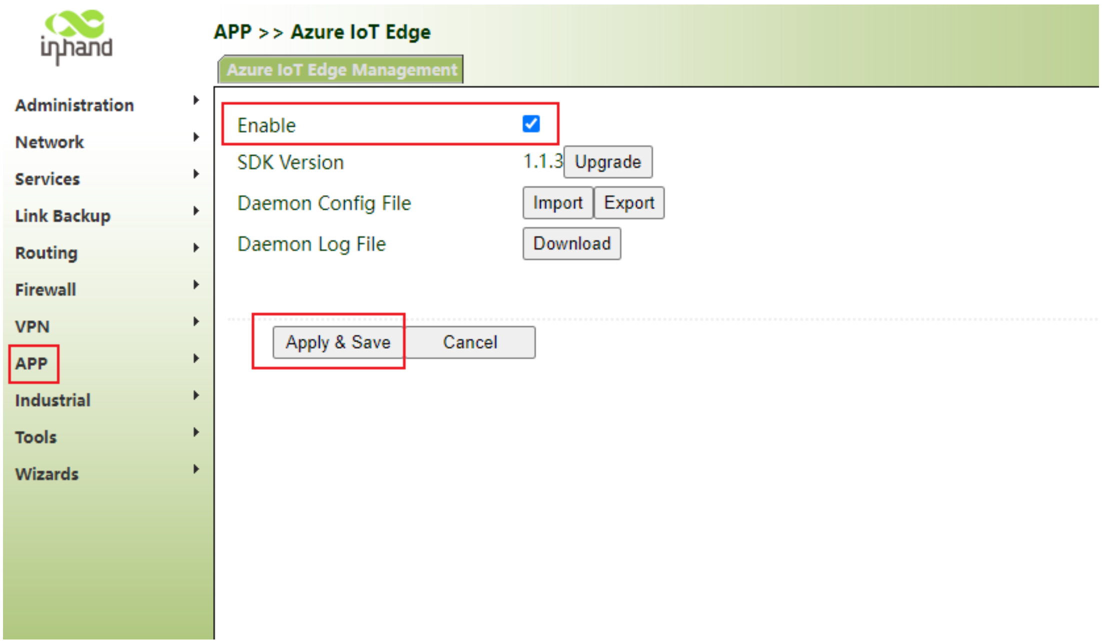
Token: juc6EWS3FaQd286s7XVIGP3YOsEYudd6

Status: 200 OK Time: 199 ms Size: 709 B

```
{
    "result": {
        "modem1_linux_time": 1652337878,
        "active_sim": 1,
        "imei": "865847058006616",
        "imsi": "460040392003522",
        "iccid": "898602B30116C1453522",
        "signal_lvl": 29,
        "reg_status": 1,
        "operator": "46000",
        "network": 3,
        "lac": "082C",
        "cell_id": "8257B00",
        "cellular_linux_time": 1652339408,
        "status": 3,
```

# 6.6 Azure IoT Edge

Click "APP>>Azure IOT edge>> enable", click apply and save



Enable ☑

SDK Version 1.1.3

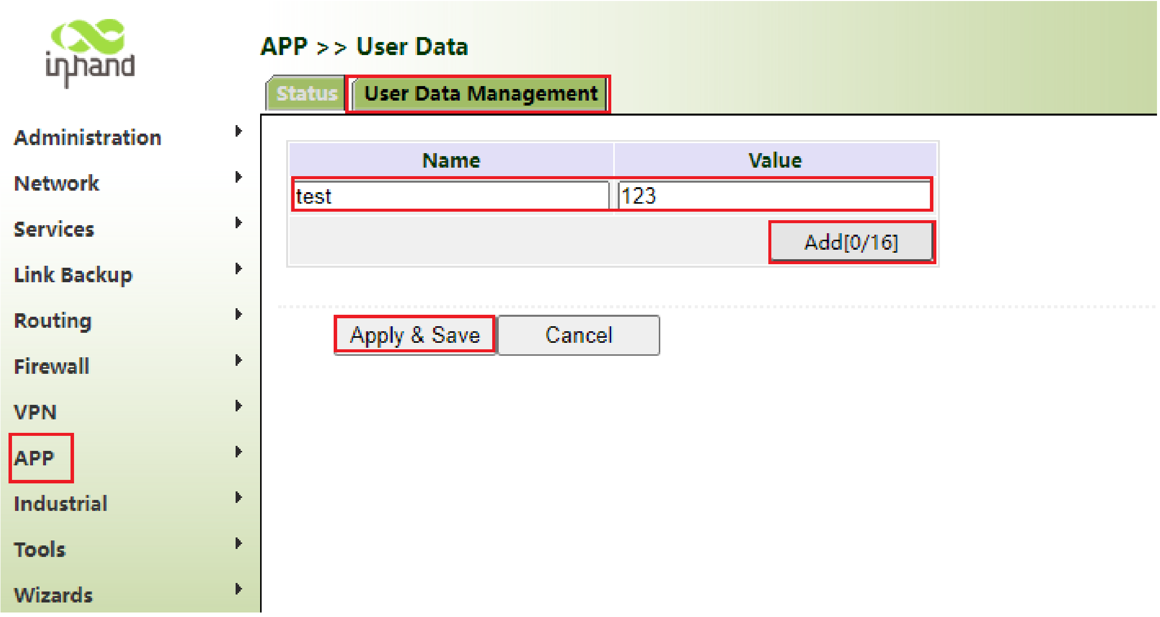
Daemon Config File

Daemon Log File

Note: this function item depends on docker. The docker function should be opened before opening

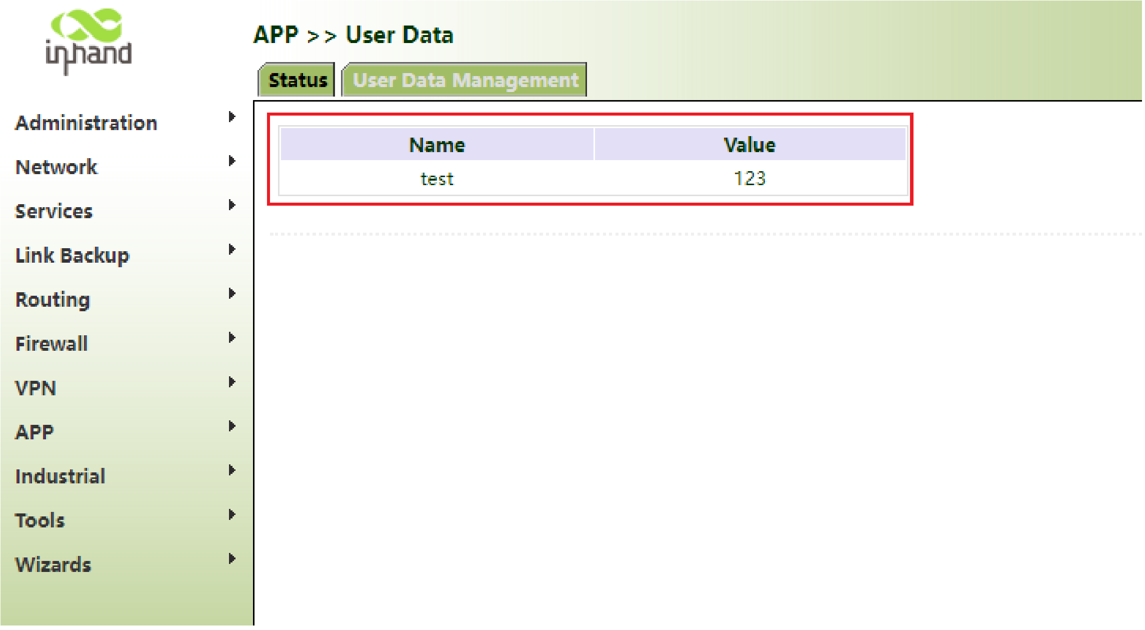
## 6.7 User Data

Step 1: click "APP>> User Data> > User Data Management", then enter the name and corresponding value, click add, and finally click apply and save.



| Name | Value |
|---|---|
| test | 123 |

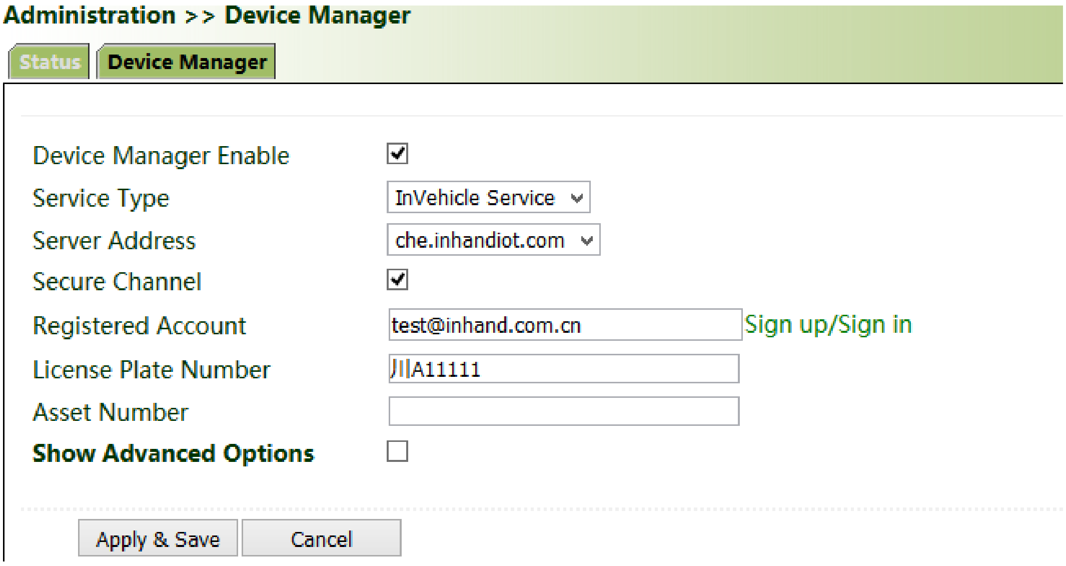
Step 2: click "status". If the data exists in the status bar, it means that the addition is successful.



| Name | Value |
|---|---|
| test | 123 |

# 7 Connecting the Gateway to a Cloud Platform

1. Click "Administration >> Device Manager >> Device Manager", check "Device Manager Enable", select the server address of the cloud platform, enter the registered account and license plate number of the cloud platform, and click Apply & Save.

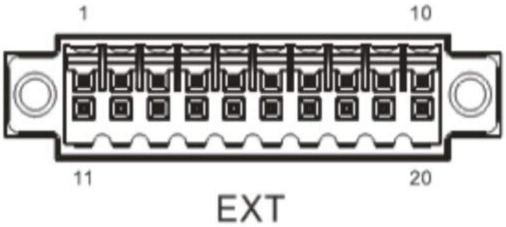


| | |
|---|---|
| Device Manager Enable | ☑ |
| Service Type | InVehicle Service |
| Server Address | che.inhandiot.com |
| Secure Channel | ☑ |
| Registered Account | test@inhand.com.cn |
| License Plate Number | 川A11111 |
| Asset Number | |
| Show Advanced Options | □ |

2. Click "Status". "Connected" indicates that the gateway is successfully connected to the cloud platform.

# 8 Industrial Ports (Serial Ports)

The industrial ports of VG814 include RS232 serial ports, RS485 serial ports, and IO ports.



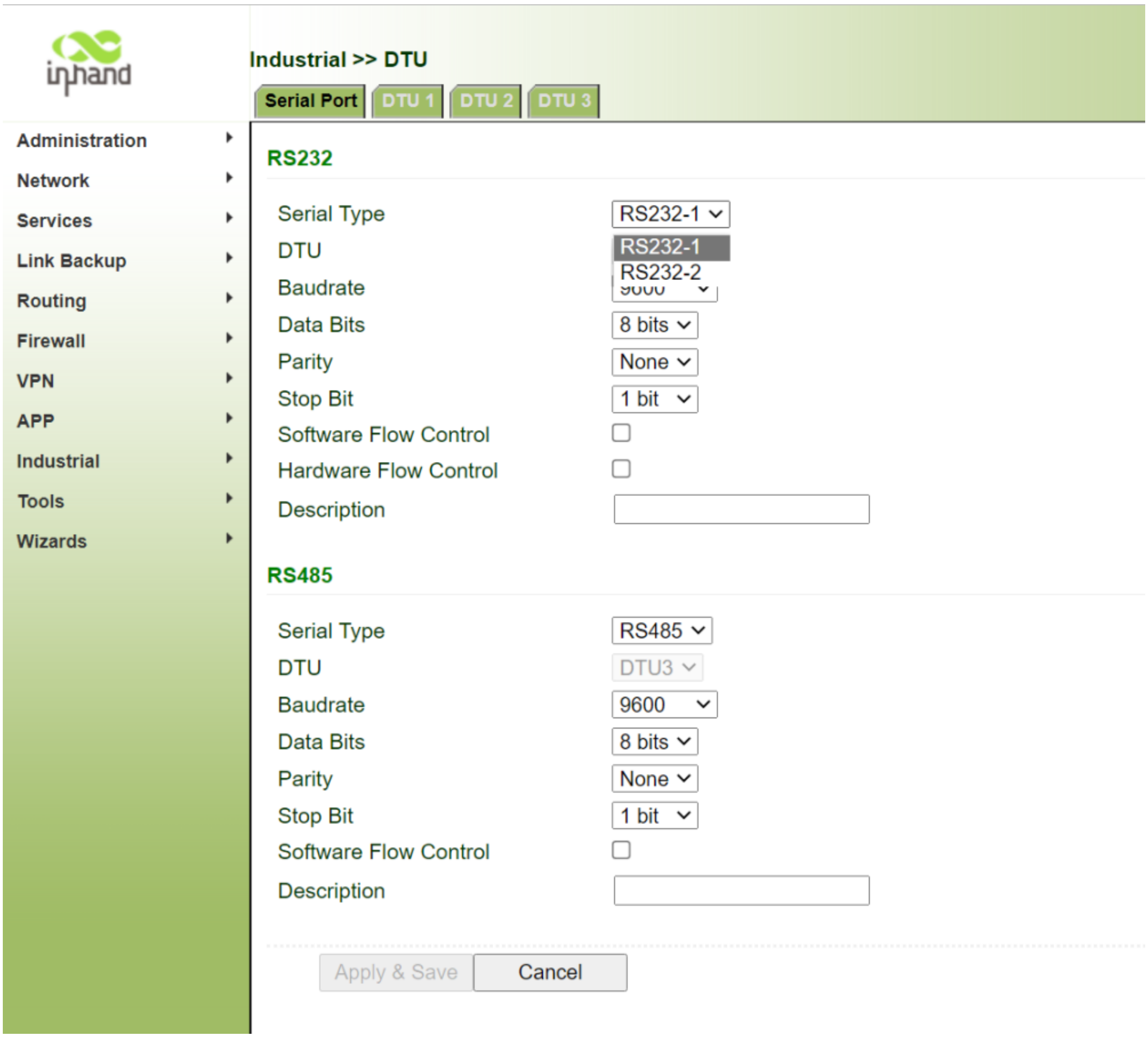
| PIN | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Signal | GND | DO2 | DO4 | DO6 | GND | RS232_RX1 | RS232_RX2 | GND | CAN_L | RS485_A |
| PIN | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| Signal | GND | DO3 | DO5 | DO7 | GND | RS232_TX1 | RS232_TX2 | GND | CAN_H | RS485_B |

## 8.1 DTU

1. Method for setting web pages when the gateway is used as a DTU:

Enable DTU 1 (RS232-1) DTU 2 (RS232-2) or DTU 3 (RS-485). Set the connection parameters of the gateway interface and industrial device.

1. Communication is available only when the parameters at both ends of the network link are consistent.



Industrial >> DTU

RS232

Serial Type: RS232-1

DTU

Baudrate: 9600

Data Bits: 8 bits

Parity: None

Stop Bit: 1 bit

Software Flow Control: □

Hardware Flow Control: □

Description:

RS485

Serial Type: RS485

DTU: DTU3

Baudrate: 9600

Data Bits: 8 bits

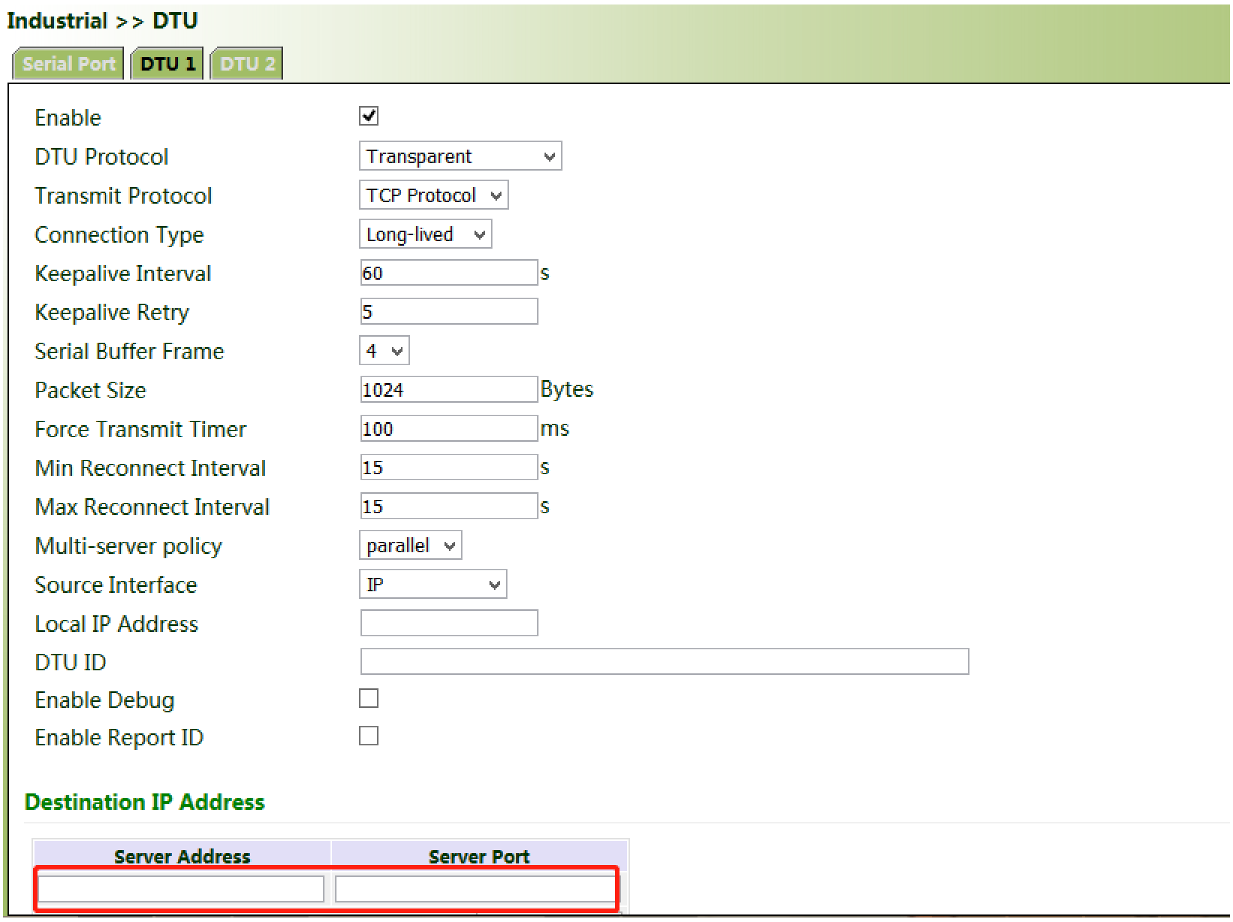
Parity: None

Stop Bit: 1 bit

Software Flow Control: □

Description:

3. Set the IP address and transmit protocol (TCP or UDP) of the server.



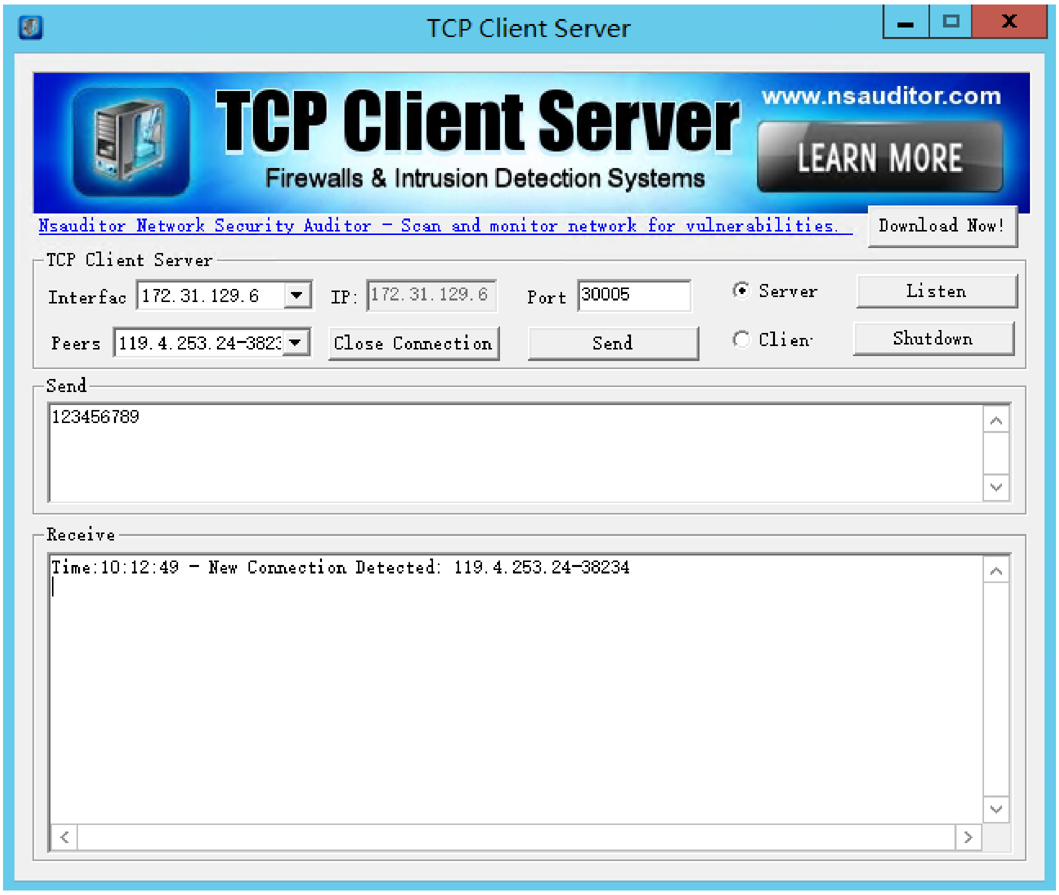
Industrial >> DTU

| | |
|---|---|
| Enable | ☑ |
| DTU Protocol | Transparent |
| Transmit Protocol | TCP Protocol |
| Connection Type | Long-lived |
| Keepalive Interval | 60 s |
| Keepalive Retry | 5 |
| Serial Buffer Frame | 4 |
| Packet Size | 1024 Bytes |
| Force Transmit Timer | 100 ms |
| Min Reconnect Interval | 15 s |
| Max Reconnect Interval | 15 s |
| Multi-server policy | parallel |
| Source Interface | IP |
| Local IP Address | |
| DTU ID | |
| Enable Debug | □ |
| Enable Report ID | □ |

Destination IP Address

| Server Address | Server Port |
|---|---|
| | |

4. Check that the gateway-connected PC and the server exchange data through DTU.


TCP Client Server
TCP Client Server
Firewalls & Intrusion Detection Systems
www.nsauditor.com
LEARN MORE
Nsauditor Network Security Auditor - Scan and monitor network for vulnerabilities.
Download Now!
Listen
Shutdown
Close Connection
Send

TCP Client Server

Interfac 172.31.129.6 IP: 172.31.129.6 Port 30005 ● Server ○ Clien

Peers 119.4.253.24-3823

Send

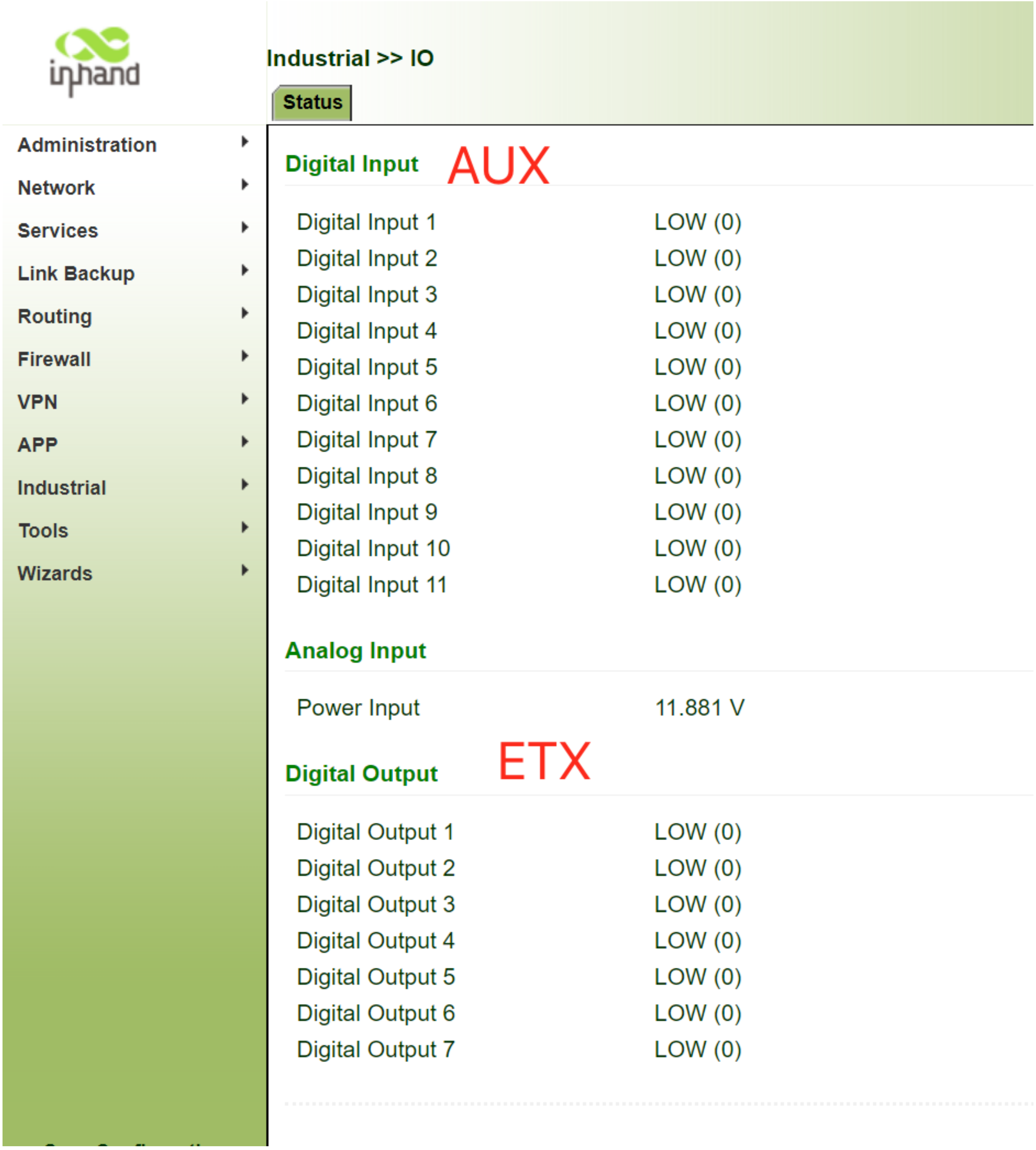
123456789

Receive

Time:10:12:49 - New Connection Detected: 119.4.253.24-38234

## 8.2 IO Ports

The AUX port has 11 digital inputs, ETX port has 7 digital inputs. The digital parameters correspond to two states: HIGH (1) and LOW (0).



Industrial >> IO

Digital Input AUX

| | |
|---|---|
| Digital Input 1 | LOW (0) |
| Digital Input 2 | LOW (0) |
| Digital Input 3 | LOW (0) |
| Digital Input 4 | LOW (0) |
| Digital Input 5 | LOW (0) |
| Digital Input 6 | LOW (0) |
| Digital Input 7 | LOW (0) |
| Digital Input 8 | LOW (0) |
| Digital Input 9 | LOW (0) |
| Digital Input 10 | LOW (0) |
| Digital Input 11 | LOW (0) |

Analog Input

| | |
|---|---|
| Power Input | 11.881 V |

Digital Output ETX

| | |
|---|---|
| Digital Output 1 | LOW (0) |
| Digital Output 2 | LOW (0) |
| Digital Output 3 | LOW (0) |
| Digital Output 4 | LOW (0) |
| Digital Output 5 | LOW (0) |
| Digital Output 6 | LOW (0) |
| Digital Output 7 | LOW (0) |

VG814 railway version:

Power input range: DC 9V ~ 36V.

DI: at present, this version takes the power supply voltage limit as the maximum voltage, that is, the input voltage range is DC 0V ~ 36V; It is determined as low (L) below 5V and high (H) above 7.2V.

DO: at present, this version takes the power supply voltage limit as the maximum voltage, that is, the maximum input voltage is DC 36V; The typical input current can reach 450mA.

Supplement:

1.The above DIis the voltage range given for the external wet contact. At this time, the internal pull-up of VG814 cannot be used.

2. When the di external is connected to the dry contact, the vg814 can provide 12V pull-up level internally, and the pull-up resistance is 20K Ω.

3. When do is used as open drain output, the typical perfusion current can reach 450mA.

4. When do pull-up is used as output, it can output high-level signal. The open circuit test voltage is 12V, and the pull-up resistance is 20K Ω. It has no load capacity.

VG814 vehicle version

Power input range: DC 9V ~ 48V.

DI: at present, this version takes the power supply voltage limit as the maximum voltage, that is, the input voltage range is DC 0V ~ 48V; It is determined as low below 1V and high above 2.7V.

DO: at present, this version takes the power supply voltage limit as the maximum voltage, that is, the maximum input voltage is DC 48V; The typical input current can reach 450mA.

Supplement:

1. The above DI is the voltage range given for the external wet contact. At this time, the internal pull-up of vg814 cannot be used.

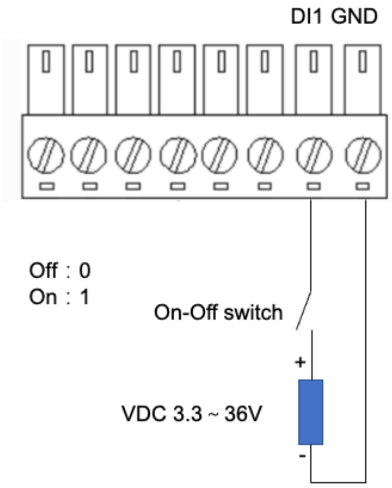
2. When Di external dry contact is connected, vg814 can provide the same pull-up level as the power supply voltage internally, and the pull-up resistance is 20K Ω.

3. When do is used as open drain output, the typical perfusion current can reach 450mA.

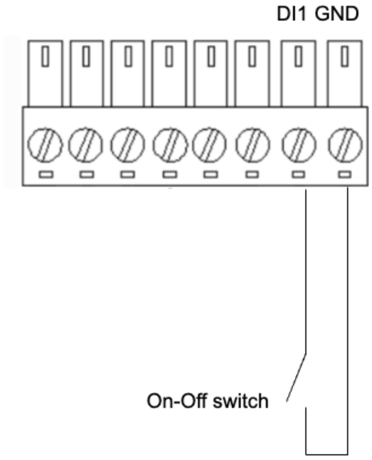
4. When do pull-up is used as output, it can output high-level signal. The open circuit test voltage is the same as the power supply voltage. The pull-up resistance is 20K Ω and has no load capacity.

## 8.2.1 IO link mode

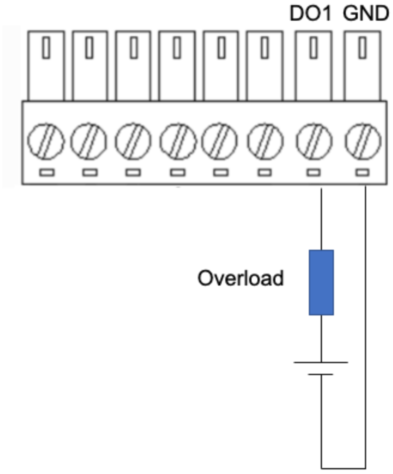
Wet node link mode, need config : DI1 disable pull up use CLI. Off is 0, On is 1.



Dry node link mode, need config : DI1 pull up use CLI. On is 1, Off is 0.



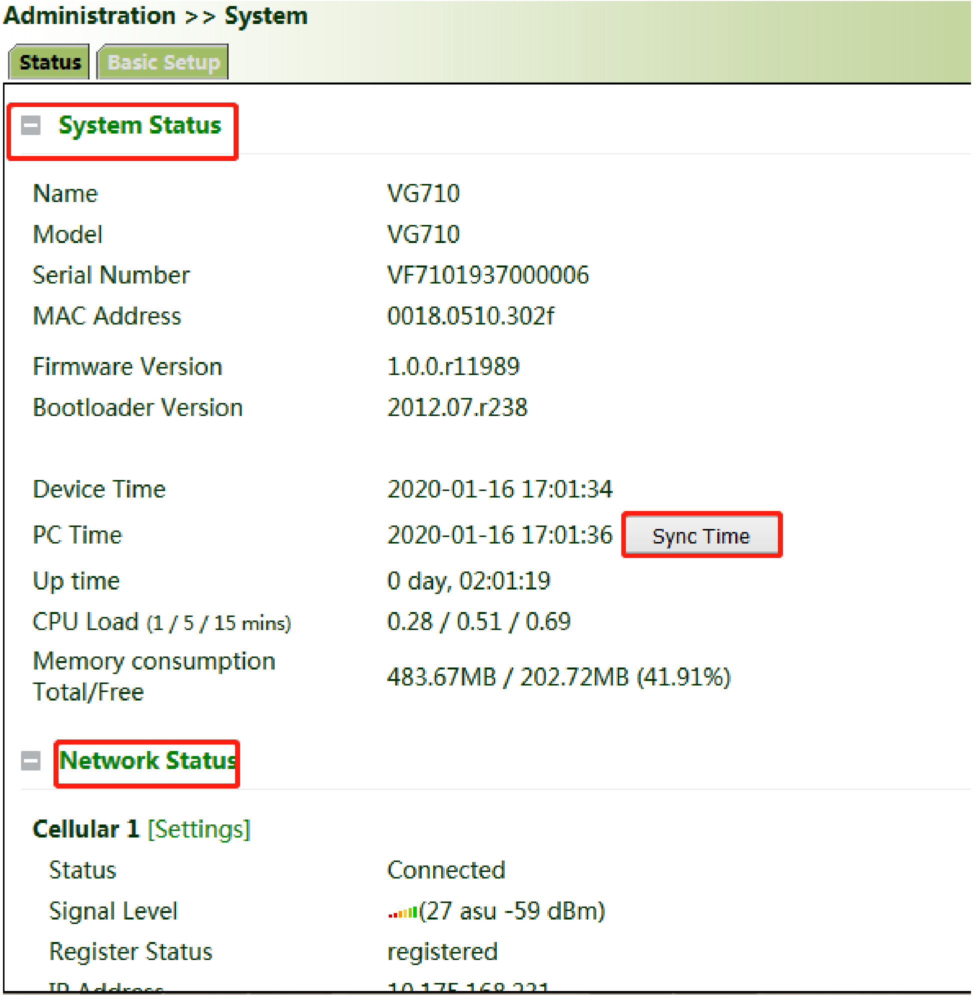
Dry node link mode, need config : DI1 pull up use CLI. On is 1, Off is 0.



# 9 System Management

## 9.1 System

Click "Administration >> System >> Status" and view the current system and network status of the device.



System Status

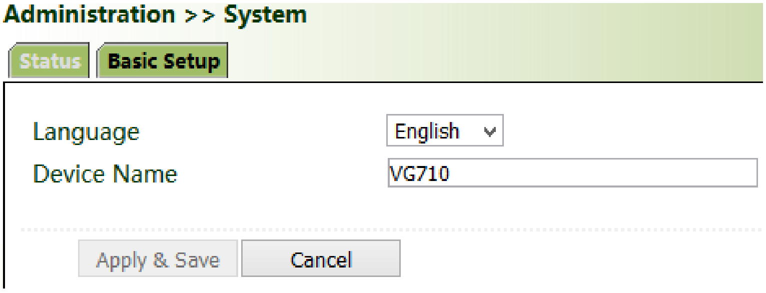
| | |
|---|---|
| Name | VG710 |
| Model | VG710 |
| Serial Number | VF7101937000006 |
| MAC Address | 0018.0510.302f |
| Firmware Version | 1.0.0.r11989 |
| Bootloader Version | 2012.07.r238 |
| Device Time | 2020-01-16 17:01:34 |
| PC Time | 2020-01-16 17:01:36 |
| Up time | 0 day, 02:01:19 |
| CPU Load (1 / 5 / 15 mins) | 0.28 / 0.51 / 0.69 |
| Memory consumption Total/Free | 483.67MB / 202.72MB (41.91%) |

Network Status

Cellular 1 [Settings]

| | |
|---|---|
| Status | Connected |
| Signal Level | (27 asu -59 dBm) |
| Register Status | registered |
| IP Address | 10.175.168.221 |

Click "Basic Setup" and modify the system language and device name.

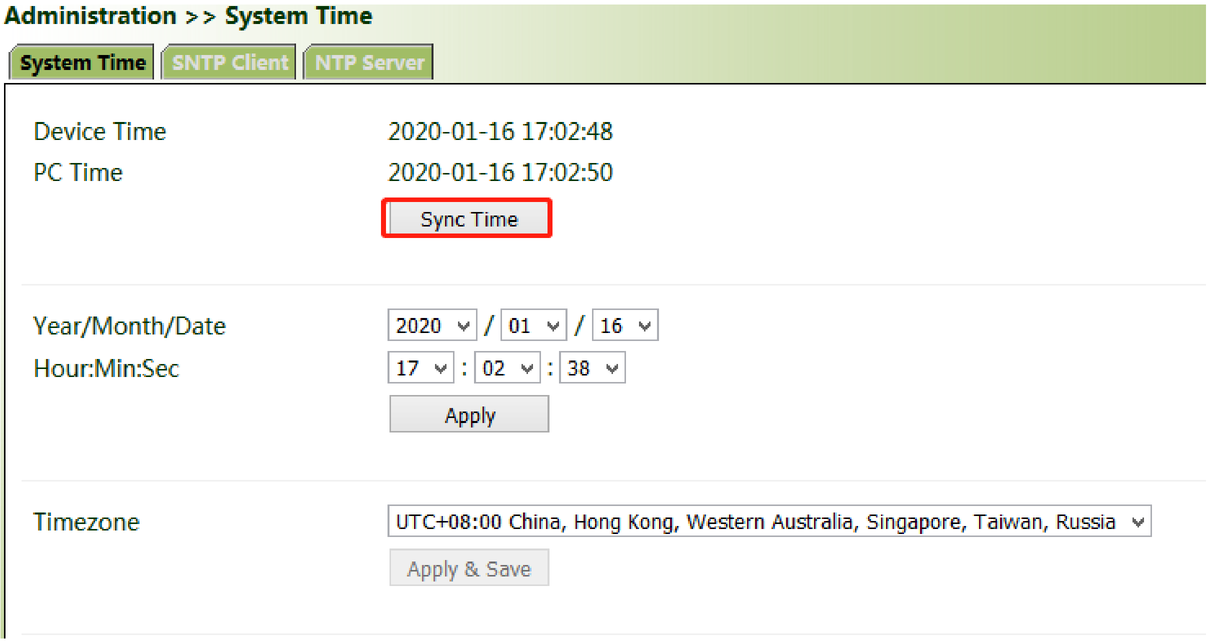


| | |
|---|---|
| Language | English |
| Device Name | VG710 |

## 9.2 System Time

To ensure the coordination between the device and other devices, set the system time accurately.

Manual time synchronization: Click "Administration >> System Time >> System Time >> Sync Time" to ensure consistency between the gateway time and host time.



Administration > > System Time

Device Time 2020-01-16 17:02:48

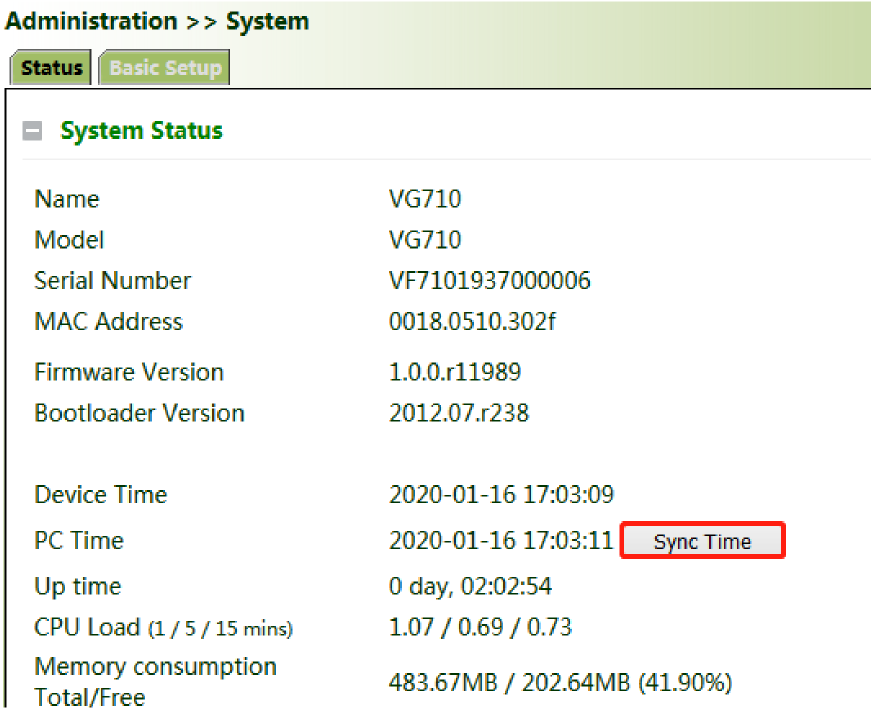
PC Time 2020-01-16 17:02:50

Year/Month/Date 2020 / 01 / 16

Hour:Min:Sec 17 : 02 : 38

Timezone UTC+08:00 China, Hong Kong, Western Australia, Singapore, Taiwan, Russia

Alternatively, click "Administration >> System >> Status" to synchronize the time.



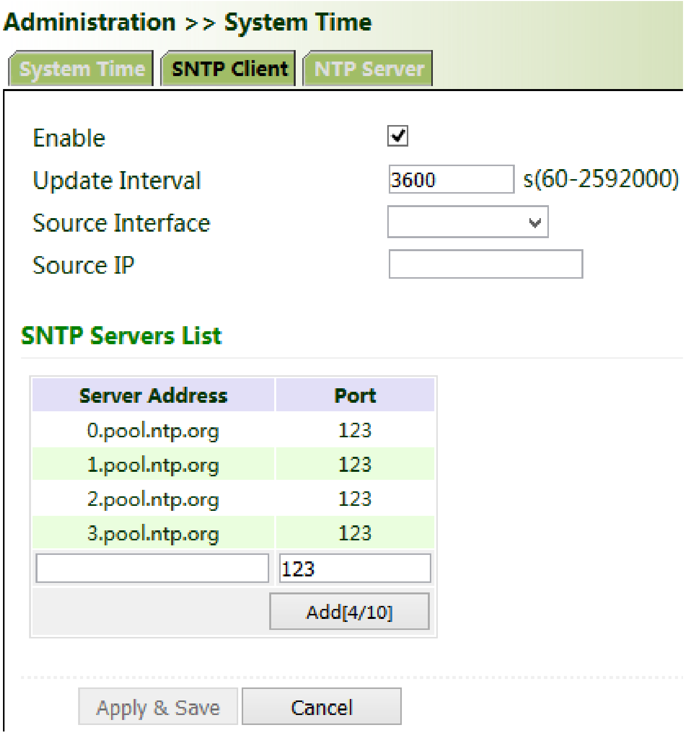
Administration >> System

System Status

| | |
|---|---|
| Name | VG710 |
| Model | VG710 |
| Serial Number | VF7101937000006 |
| MAC Address | 0018.0510.302f |
| Firmware Version | 1.0.0.r11989 |
| Bootloader Version | 2012.07.r238 |
| Device Time | 2020-01-16 17:03:09 |
| PC Time | 2020-01-16 17:03:11 |
| Up time | 0 day, 02:02:54 |
| CPU Load (1 / 5 / 15 mins) | 1.07 / 0.69 / 0.73 |
| Memory consumption Total/Free | 483.67MB / 202.64MB (41.90%) |

Automatic time synchronization: Click "Administration >> System Time >> SNTP Client or NTP Server" and check "Enable" to synchronize the time between the gateway and the SNTP or NTP server.

After NTP is enabled, the gateway can synchronize time for all devices on the network.



Administration >> System Time

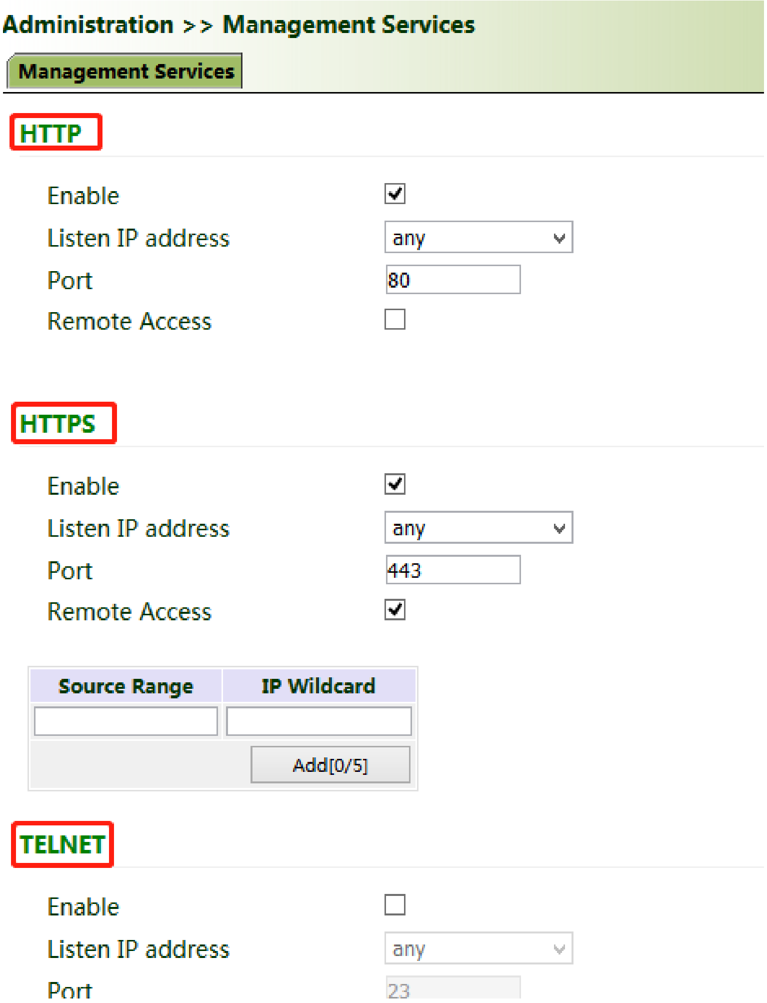
| | |
|---|---|
| Enable | ☑ |
| Update Interval | 3600 s(60-2592000) |
| Source Interface | |
| Source IP | |

SNTP Servers List

| Server Address | Port |
|---|---|
| 0.pool.ntp.org | 123 |
| 1.pool.ntp.org | 123 |
| 2.pool.ntp.org | 123 |
| 3.pool.ntp.org | 123 |
| | 123 |

## 9.3 Management Services

When the gateway requires the HTTP, HTTPS, TELNET, and SSH functions, click "Administration >> Management Services", enable the services, and click Apply & Save.



Administration >> Management Services

Management Services

HTTP

| | |
|---|---|
| Enable | ☑ |
| Listen IP address | any |
| Port | 80 |
| Remote Access | □ |

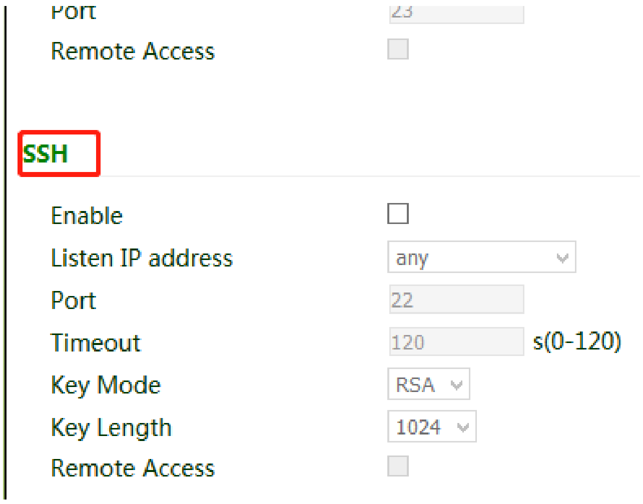
HTTPS

| | |
|---|---|
| Enable | ☑ |
| Listen IP address | any |
| Port | 443 |
| Remote Access | ☑ |

| Source Range | IP Wildcard |
|---|---|
| | |

TELNET

| | |
|---|---|
| Enable | □ |
| Listen IP address | any |
| Port | 23 |



Port 23

Remote Access ☐

SSH

Enable ☐

Listen IP address any

Port 22

Timeout 120 s(0-120)

Key Mode RSA

Key Length 1024

Remote Access ☐

# 9.4 User Management

Click "Administration >> User Management" and create users, modify passwords, or delete users on the user management page.

Superuser and common user:

- Superuser: By default, only one superuser is automatically created by the system, with the username of adm and the default password of 123456. It has full access rights for the gateway.

- Common user: A common user is created by the superuser. It can view or modify gateway configurations.

说明 Note: You cannot delete the superuser (adm) or modify its username, but can modify its password.

# 9.5 AAA

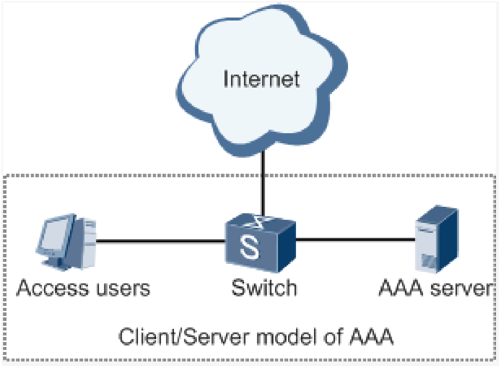
Authentication, authorization, and accounting (AAA) is a security management mechanism for access control in network security, which provides three security services: authentication, authorization, and accounting.

It provides modular methods for the following services:

- Authentication: Verify whether a user has the right for network access.
- Authorization: Authorize a user to use specific services.
- Accounting: Record network resource usage of a user.

You can use only one or two of the security services provided by AAA. For example, if a company only expects to authenticate employees when they access specific resources, the network administrator only needs to configure the authentication server. However, if the company expects to record the network usage of employees, the accounting server must be configured.

AAA usually works in the client/server structure, which is highly scalable and is convenient for centralized management of user information, as shown in the figure below.



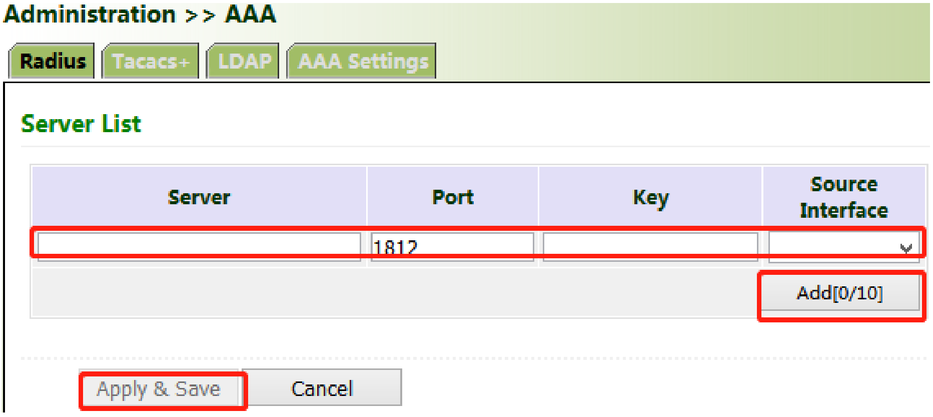
说明 Note: Radius, Tacacs+, and LDAP indicate authentication and authorization servers. Local indicates the local user name and password of the gateway.

## 9.5.1 Radius

The Remote Authentication Dial In User Service (Radius) is a distributed information exchange protocol based on the client/server structure. It protects the network from unauthorized access, and is usually used in various network environments that require high security and allow remote user access.

Method for enabling the Radius server for the gateway:

Click "Administration >> AAA >> Radius". In "Server List", enter the server address (domain name/IP address), port ID, and authentication key, click Add, and then click Apply & Save.



| Server | Port | Key | Source Interface |
|---|---|---|---|
|  | 1812 |  |  |

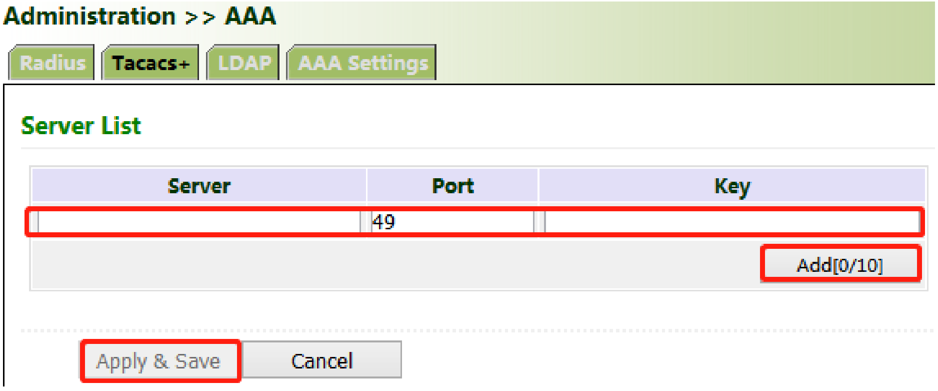
## 9.5.2 Tacacs+

The Terminal Access Controller Access Control System + (Tacacs+) protocol is similar to the Radius protocol. It uses the client/server mode for communication between the network access server (NAS) and the Tacacs+ server. However, Tacacs+ works based on TCP, and Radius works based on UDP.

The Tacacs+ protocol is mainly used for AAA of end users and Point-to-Point Protocol (PPP) and virtual private dial-up network (VPDN) access users. Its typical application is to authenticate, authorize, and perform accounting for an end user who needs to log in to the device for operations. As a Tacacs+ client, the device sends the user name and password to the Tacacs+ server for verification. After authentication and authorization, the user can log in to the device for operations.

Method for enabling the Tacacs+ server for the gateway:

Click "Administration >> AAA >> Tacacs+". In "Server List", enter the server address (domain name/IP address), port ID, and authentication key, click Add, and then click Apply & Save.



Server List

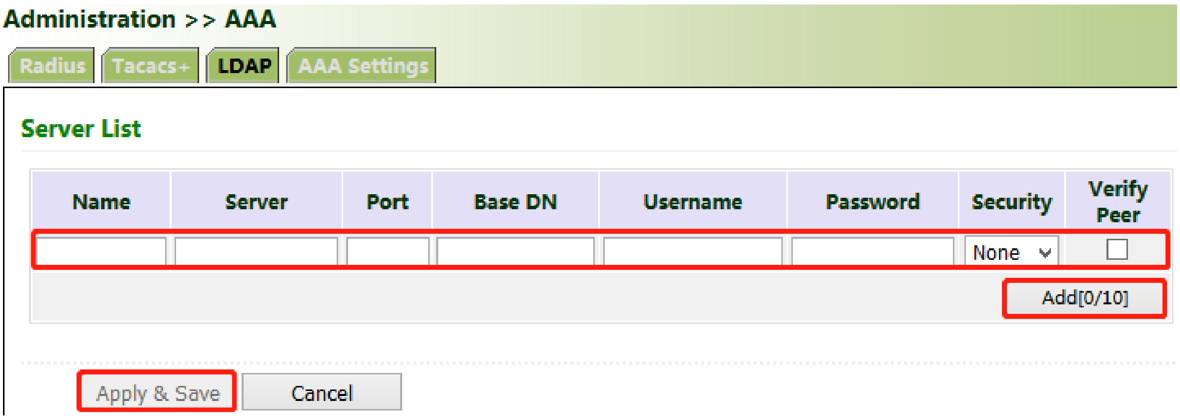
| Server | Port | Key |
|---|---|---|
|  | 49 |  |

## 9.5.3 LDAP

The main advantage of the Lightweight Directory Access Protocol (LDAP) lies in its quick response to users' search operations. For example, massive user authentication operations may be performed concurrently. If a database is used, because the database is divided into various tables, to meet this simple authentication requirement, the database must be searched each time, along with synthesis and filtering. This results in low efficiency. LDAP is equivalent to one table, and requires only the user name and password, with some other parameters, which is quite simple. It can meet the authentication requirement regarding the efficiency and structure.

Method for enabling the LDAP server for the gateway:

Click "Administration >> AAA >> LDAP". In "Server List", enter any name for "Name", enter the server address (domain name/IP address) and port ID, and enter the base DN obtained from the server. Set the user name and password for accessing the server. Select "None", "SSL", or "StartTLS" for "Security". Click Add, and then click Apply & Save.



| Name | Server | Port | Base DN | Username | Password | Security | Verify Peer |
|---|---|---|---|---|---|---|---|
|  |  |  |  |  |  | None | □ |

## 9.5.4 AAA Authentication

AAA authentication methods:

● No authentication (none): No validity check is performed. Generally, this method is not used.

● Local authentication (local): User information is configured on the NAS. Local authentication is fast, which can reduce the operational costs, but the information storage amount is limited by hardware.

● Remote authentication: User information is configured on the authentication server. Remote authentication is supported over Radius, Tacacs+, and LDAP.

AAA authorization methods:

● No authorization (none): No authorization is performed for users.

● Local authorization (local): Authorization is performed based on the properties configured by the NAS for the local account.

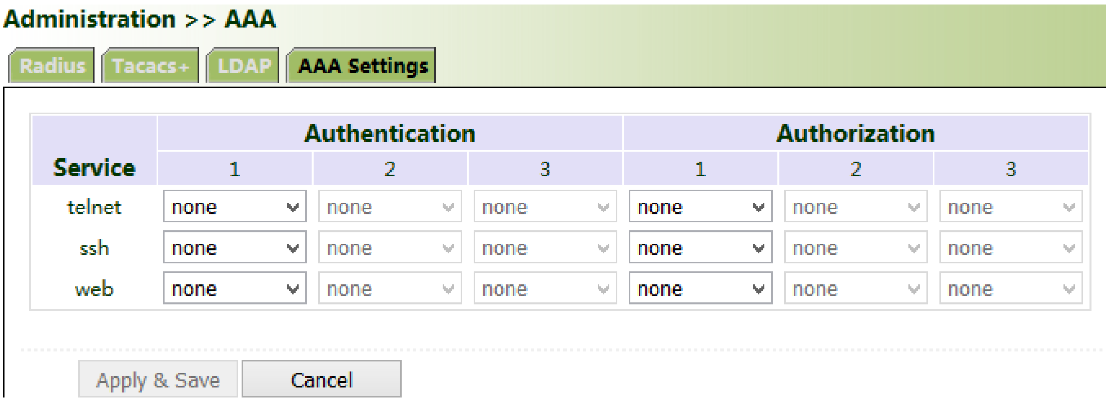
● Tacacs+ authorization: Users are authorized by the Tacacs+ server.

● Authorization after successful Radius authentication: Authorization is bound to authentication, and cannot be performed independently over Radius.

● LDAP authorization

Method for enabling authentication and authorization for the gateway:

Click "Administration >> AAA >> AAA Settings". 1, 2, and 3 are corresponding to Radius, Tacacs, ad LDAP respectively. Authentication entries 1, 2, and 3 must be corresponding to authorization entries 1, 2, and 3 respectively. When all of radius, tacacs+, and local are set, the priority sequence is as follows: 1 > 2 > 3.



| Service | Authentication | | | Authorization | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 1 | 2 | 3 |
| telnet | none | none | none | none | none | none |
| ssh | none | none | none | none | none | none |
| web | none | none | none | none | none | none |

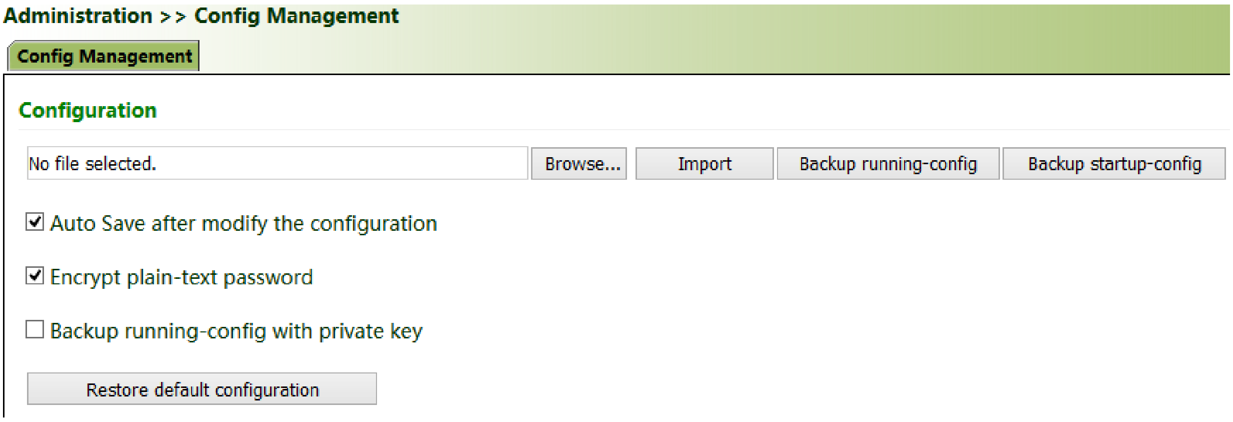
## 9.6 Configuration Management

Method for importing configurations: Click "Administration >> Config Management >> Config Management >> Browse", select a configuration file, and click Import to import the configuration file to the gateway.

Method for backing up current running configurations to the PC (common): Click Backup running-config.

Method for backing up the startup file to the PC: Click Backup startup-config.

Method for restoring default configurations: Click Restore default configuration and then click OK.



☑ Auto Save after modify the configuration

☑ Encrypt plain-text password

□ Backup running-config with private key

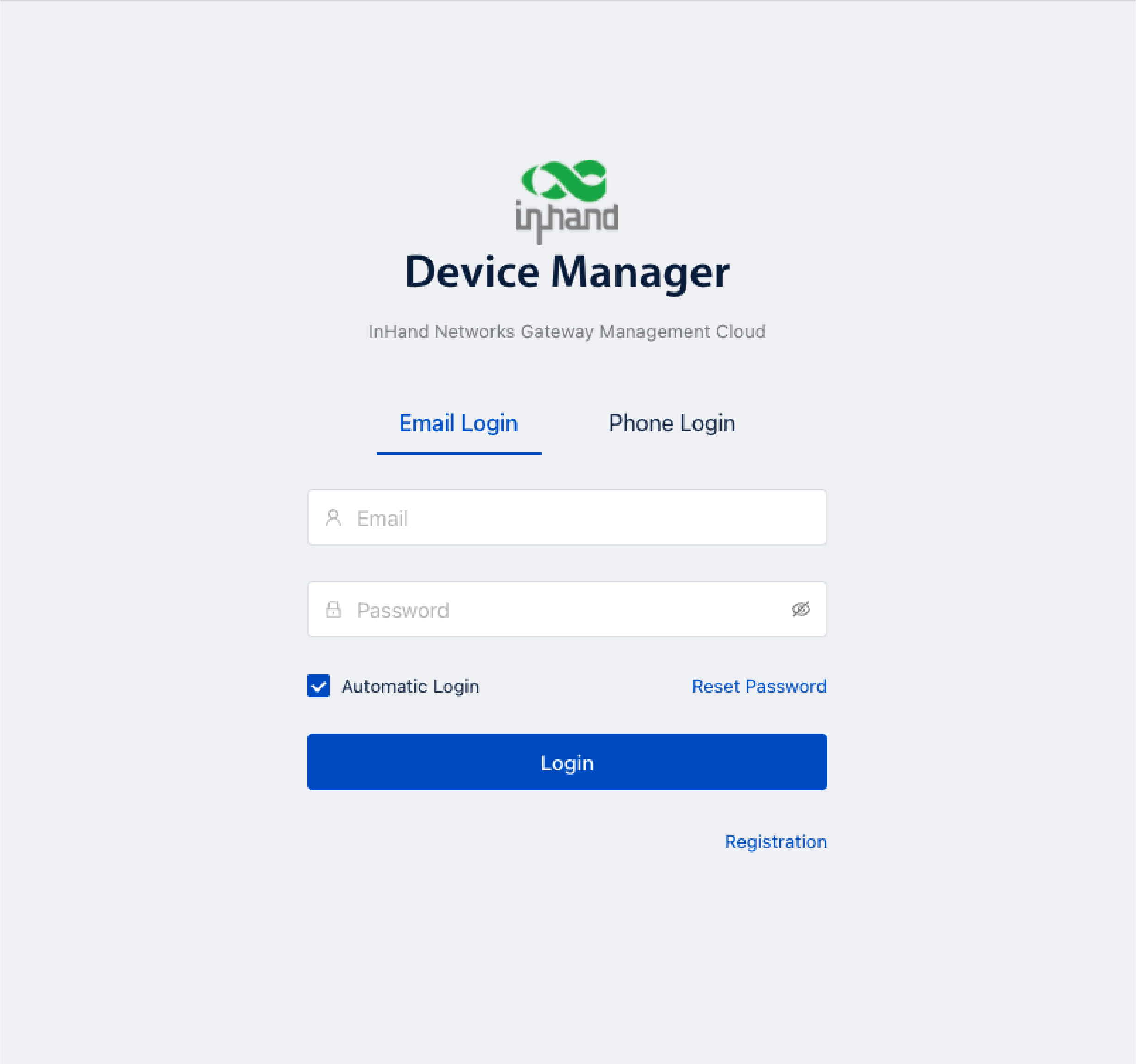
# 9.7 Device Manager of InHand Cloud

Click "Administration >>Device Manger>>Device Manger" config InHand Cloud service.

## 9.7.1 Config DeviceManger

Device ManagerWith a visualization user interface and simple operation steps, the Device Manager platform enables you to manage and monitor InHand's hardware devices, such as routers and gateways with convenience. It can quickly integrate devices and manage them with just a few clicks. The cloud deployment delivers easy-to-use experience, allowing you to focus on your core business and empowering your growth.

Step1: Register a user Global site https://iot.inhandnetworks.com



Device Manager

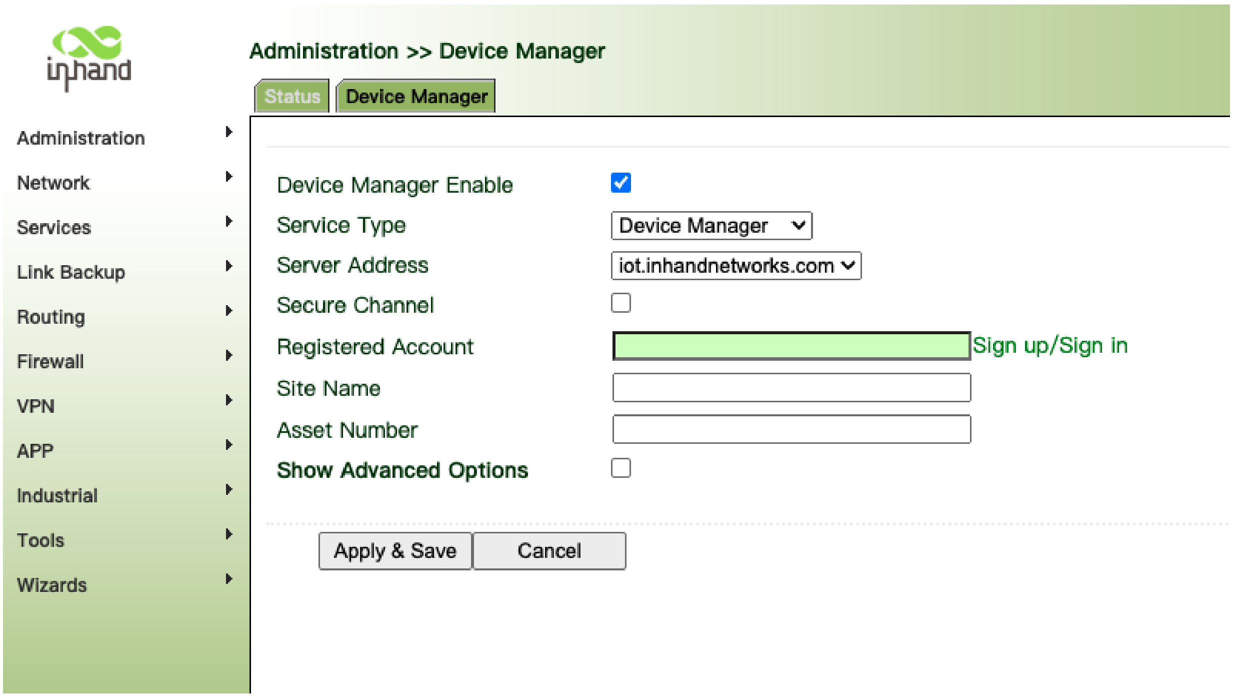
InHand Networks Gateway Management Cloud

☑ Automatic Login

Step2:

- Config Service Type "Device Manager"
- Server Address "iot.inhandnetworks.com" If you have already privatized the deployed Device Manager Cloud, fill in the private deployment server IP or domain name. Server Typy select "Coustomer".
- Secure Channel , After checking, it will be transmitted with SSL encryption.
- Registered Account : Use step 1 registed account email address.
- Site name and Asset Number customer defined.

- Make sure the VG710 is connected to the Internet.



Administration >> Device Manager

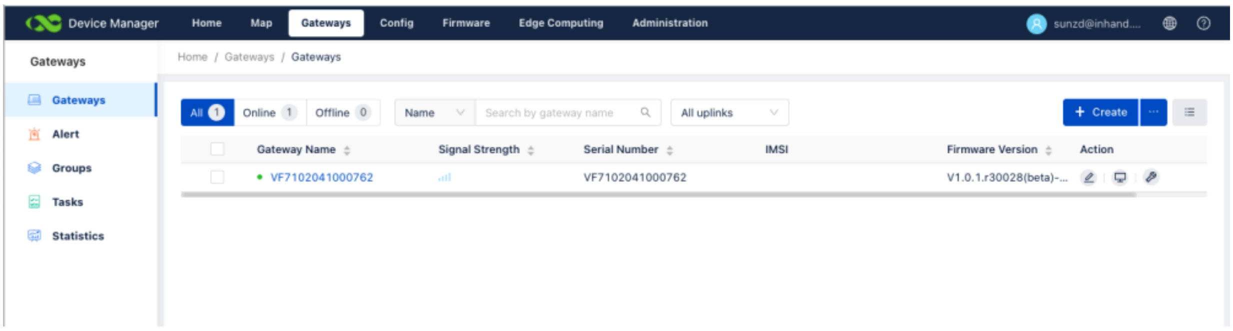
| | |
|---|---|
| Device Manager Enable | ☑ |
| Service Type | Device Manager |
| Server Address | iot.inhandnetworks.com |
| Secure Channel | ☐ |
| Registered Account | |
| Site Name | |
| Asset Number | |
| Show Advanced Options | ☐ |

Step3:

- Login Device Manager cloud.

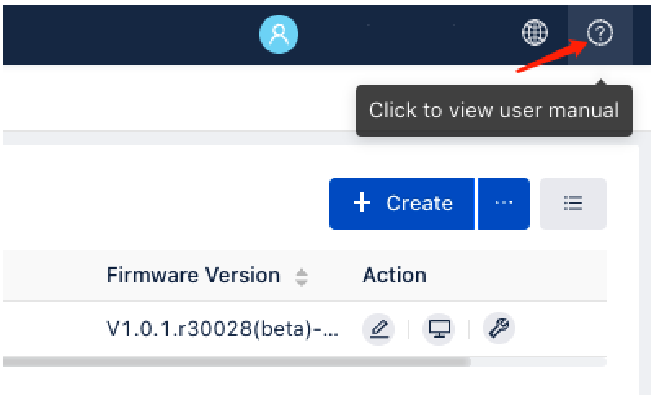
- Check Gateways, VG710 will auto login server.

- For more usage reference manuals:



| ☐ | Gateway Name | Signal Strength | Serial Number | IMSI | Firmware Version | Action |
|---|---|---|---|---|---|---|
| ☐ | ● VF7102041000762 | | VF7102041000762 | | V1.0.1.r30028(beta)-... | |

- For more usage reference manual.



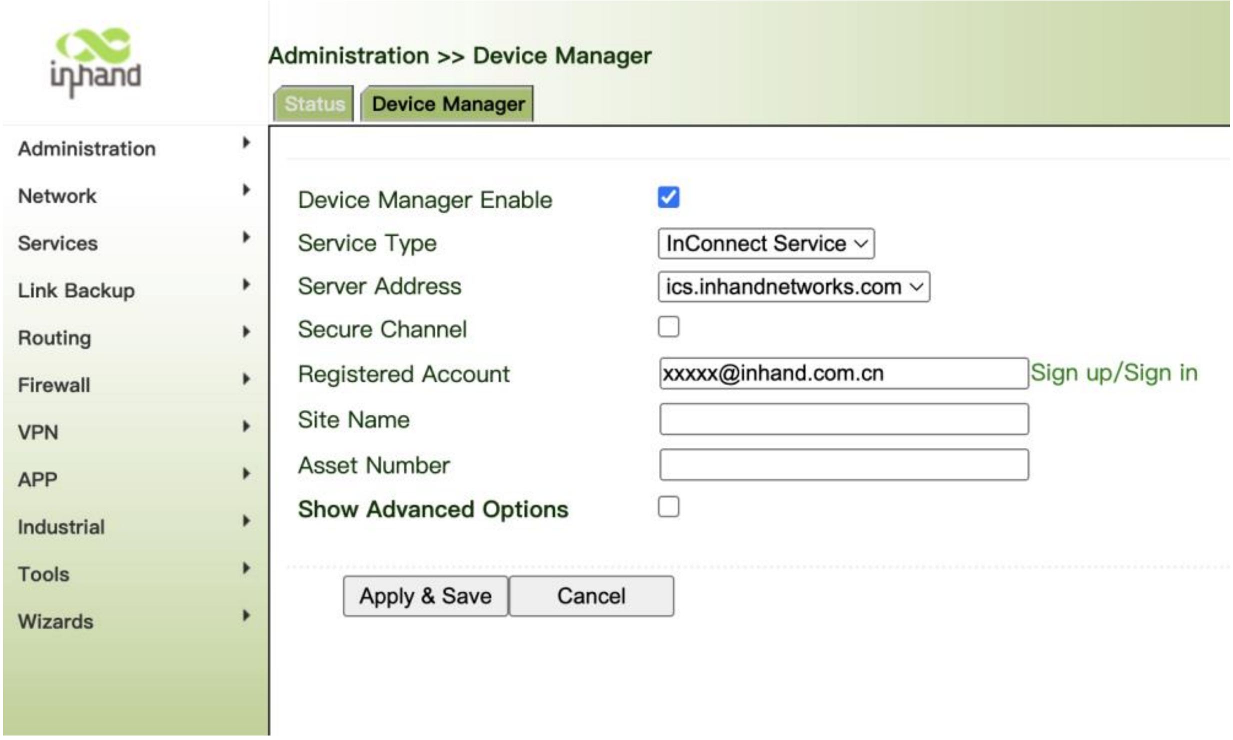
## 9.7.1 InConnect Service

The InConnect is a simple “plug & play” service which builds secure remote networks for your machines (IPCs, servers, IP cameras, PLCs, HMIs, RTUs, controllers, etc.). Featuring user-friendly interfaces and simple operation, the SaaS (Software as a Service) based solution enables you to access your devices anytime from anywhere, and stay connected with your business and with the world – especially in these challenging times when normal working routines have been disrupted. Support VPN networking in the way of subnet to subnet.

Step1: Register a user Global site hthttps://ics.inhandnetworks.com

Step2:

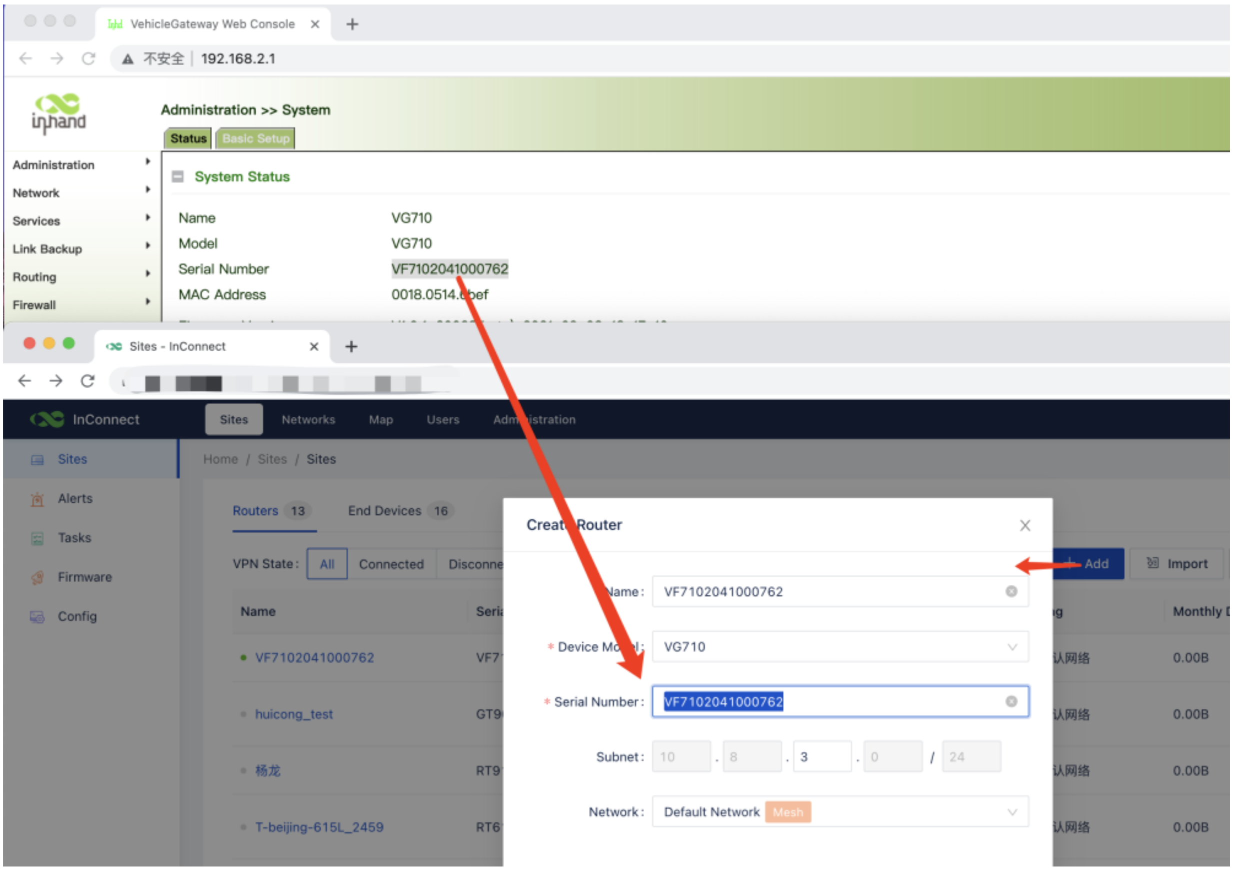
- Config Service Type "InConnect Service"
- Server Address "ics.inhandnetworks.com" If you have already privatized the deployed Device Manager Cloud, fill in the private deployment server IP or domain name. Server Typy select "Coustomer".
- Secure Channel , After checking, it will be transmitted with SSL encryption.
- Registered Account : Use step 1 registed account email address.
- Site name and Asset Number customer defined.
- Make sure the VG710 is connected to the Internet.



| | |
|---|---|
| Device Manager Enable | ☑ |
| Service Type | InConnect Service |
| Server Address | ics.inhandnetworks.com |
| Secure Channel | □ |
| Registered Account | xxxxx@inhand.com.cn |
| Site Name | |
| Asset Number | |
| Show Advanced Options | □ |

Step3:

- Login InConnect service.
- Check Gateways, VG710 will auto login server.
- Add VG710 SN to Server:



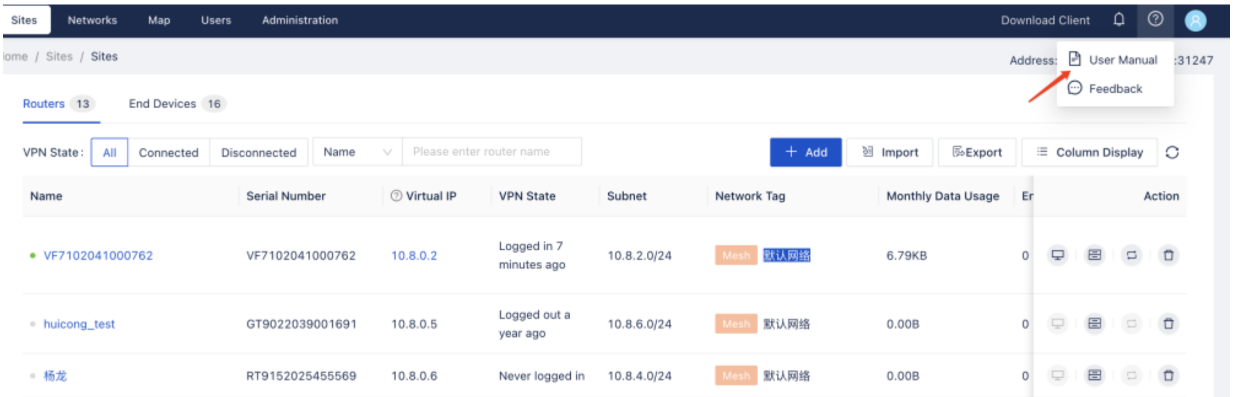
| | |
|---|---|
| Name | VG710 |
| Model | VG710 |
| Serial Number | VF7102041000762 |
| MAC Address | 0018.0514.·bef |

Create Router

- Name: VF7102041000762
- * Device Model: VG710
- * Serial Number: VF7102041000762
- Subnet: 10 . 8 . 3 . 0 / 24
- Network: Default Network Mesh

| Name | Seri | | Monthly |
|---|---|---|---|
| VF7102041000762 | VF7 | 认网络 | 0.00B |
| huicong_test | GT9 | 认网络 | 0.00B |
| 杨龙 | RT9 | 认网络 | 0.00B |
| T-beijing-615L_2459 | RT6 | 认网络 | 0.00B |

- For more usage reference manuals:



| Name | Serial Number | Virtual IP | VPN State | Subnet | Network Tag | Monthly Data Usage | Er | Action |
|---|---|---|---|---|---|---|---|---|
| VF7102041000762 | VF7102041000762 | 10.8.0.2 | Logged in 7 minutes ago | 10.8.2.0/24 | Mesh 默认网络 | 6.79KB | 0 | |
| huicong_test | GT9022039001691 | 10.8.0.5 | Logged out a year ago | 10.8.6.0/24 | Mesh 默认网络 | 0.00B | 0 | |
| 杨龙 | RT9152025455569 | 10.8.0.6 | Never logged in | 10.8.4.0/24 | Mesh 默认网络 | 0.00B | 0 | |

# 9.7.1 Smart Fleet Service

InHand Smart Fleet Cloud Platform, referred to as Smart Fleet, is a business platform that provides enterprise-level vehicle monitoring and management services for enterprise customers. Smart Fleet can help you manage vehicles intelligently and efficiently, break down vehicle data barriers, and realize multi-data joint analysis, vehicle Full life cycle management and control, intelligent vehicle operation and maintenance, help the informatization construction and digital transformation of engineering vehicles.

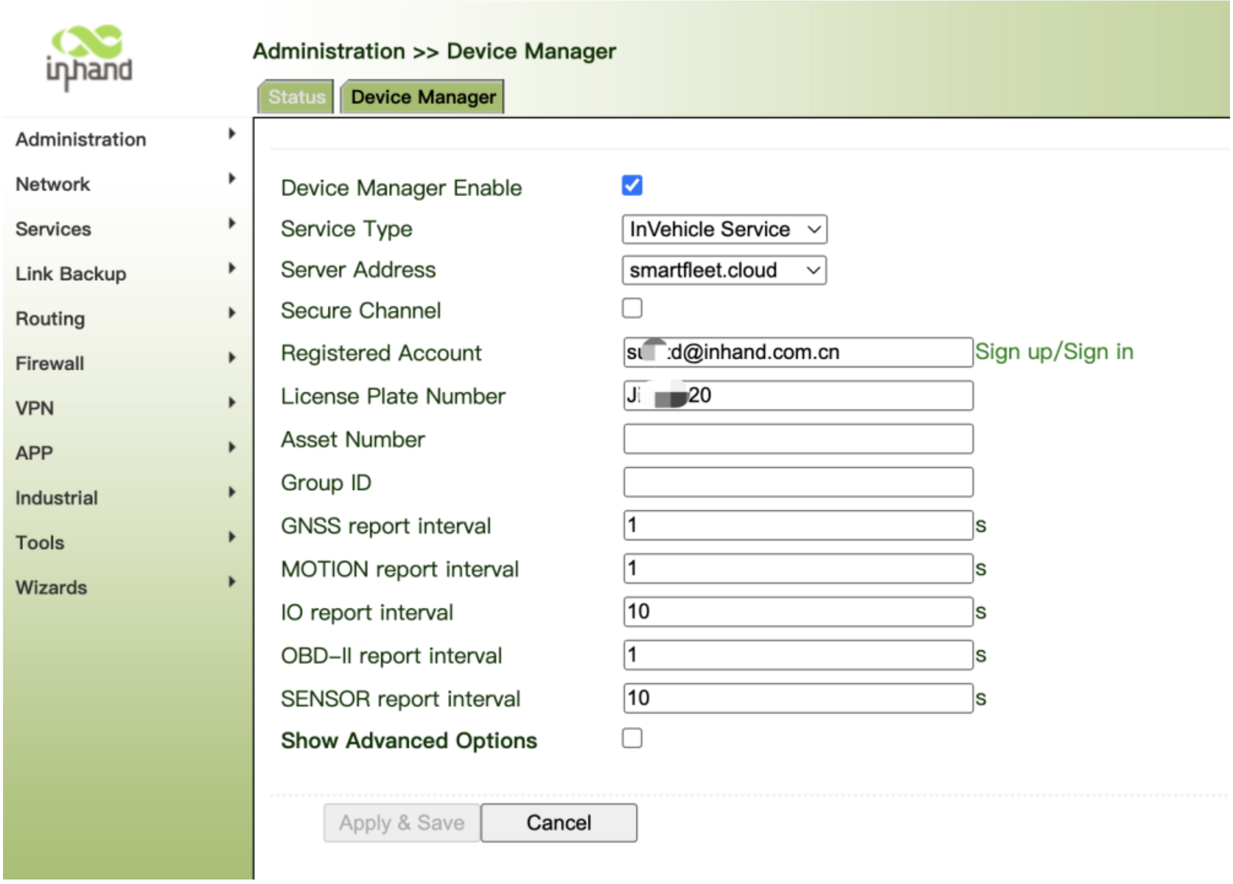
Smart Fleet can connect multiple vehicles to the same network. You can centrally monitor and manage vehicles, issue configurations, and upgrade firmware in a unified manner.

Smart Fleet helps users to quickly build an IoT network and master vehicle operation data in real time, allowing you to easily implement centralized monitoring and management of vehicles and gateways through the cloud platform. Effectively solve the problems of data isolation, collaboration bottlenecks, and lack of management.

Step1: Register a user Global site https://smartfleet.cloud

Step2:

- Config Service Type "InVehicle Service"
- Server Address "smartfleet.cloud" If you have already privatized the deployed Device Manager Cloud, fill in the private deployment server IP or domain name. Server Typy select "Coustomer".
- Secure Channel , After checking, it will be transmitted with SSL encryption.
- Registered Account : Use step 1 registed account email address
- License Plate Number is  required.
- Asset Number Group ID is customer defined.
- Other interface information of the gateway can be reported to the platform in seconds.
- Make sure the VG710 is connected to the Internet.

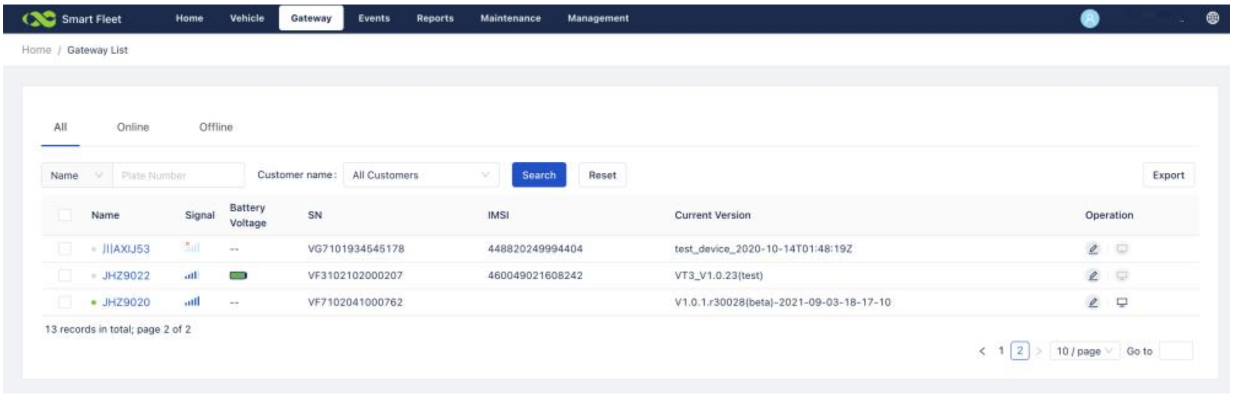


Administration >> Device Manager

| | |
|---|---|
| Device Manager Enable | ☑ |
| Service Type | InVehicle Service |
| Server Address | smartfleet.cloud |
| Secure Channel | □ |
| Registered Account | su[redacted]d@inhand.com.cn Sign up/Sign in |
| License Plate Number | J[redacted]20 |
| Asset Number | |
| Group ID | |
| GNSS report interval | 1 s |
| MOTION report interval | 1 s |
| IO report interval | 10 s |
| OBD–II report interval | 1 s |
| SENSOR report interval | 10 s |
| **Show Advanced Options** | □ |

Step3:

- Login InConnect service.
- Check Gateways, VG710 will auto login server.



| □ | Name | Signal | Battery Voltage | SN | IMSI | Current Version | Operation |
|---|---|---|---|---|---|---|---|
| □ | JIIAXIJ53 | | -- | VG7101934545178 | 448820249994404 | test_device_2020-10-14T01:48:19Z | |
| □ | JHZ9022 | | | VF3102102000207 | 460049021608242 | VT3_V1.0.23(test) | |
| □ | JHZ9020 | | -- | VF7102041000762 | | V1.0.1.r30028(beta)-2021-09-03-18-17-10 | |

13 records in total; page 2 of 2

# 9.8 SNMP

## 9.8.1 SNMP

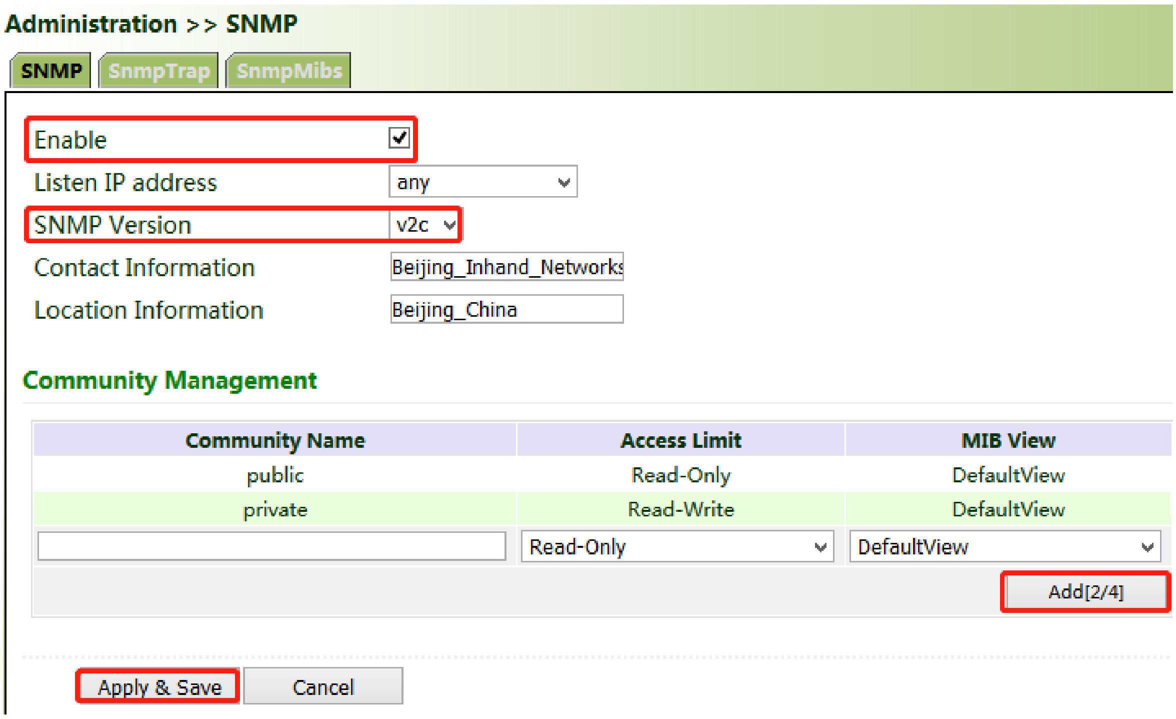
Currently, the SNMP Agent of VG814 supports SNMPv1, SNMPv2c, and SNMPv3.

- SNMPv1 and SNMPv2c use community names for authentication.

- SNMPv3 uses user names and passwords for authentication.

Method for enabling SNMP for VG814:

Click "Administration >> SNMP >> SNMP", check "Enable", select "v1c" for "v2c" for "SNMP Version", and click Apply & Save.

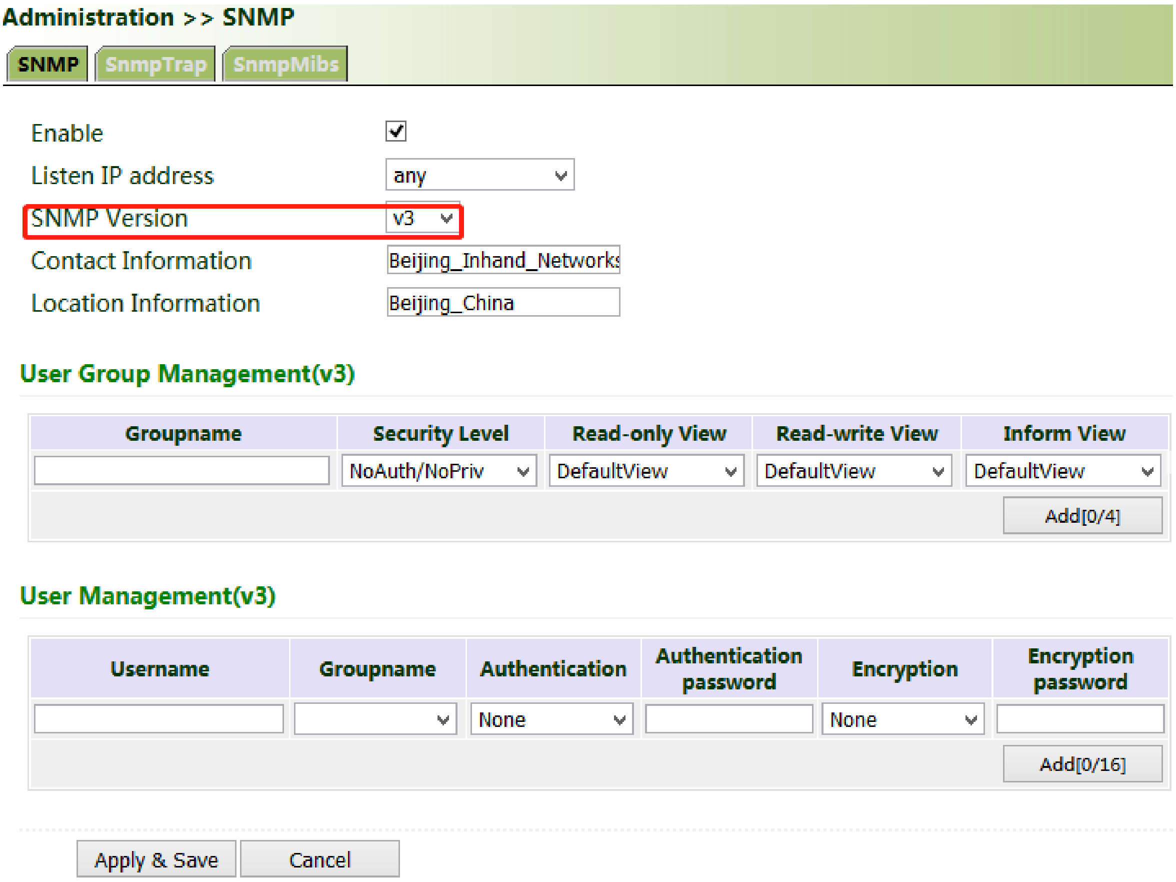


| | |
|---|---|
| Enable | ☑ |
| Listen IP address | any |
| SNMP Version | v2c |
| Contact Information | Beijing_Inhand_Networks |
| Location Information | Beijing_China |

Community Management

| Community Name | Access Limit | MIB View |
|---|---|---|
| public | Read-Only | DefaultView |
| private | Read-Write | DefaultView |
| | Read-Only | DefaultView |

If v3c is selected, the corresponding user and user group need to be configured. Enter any name for "Groupname", select a security level, and click Add. Enter any name for "Username", select the new group name for "Groupname", set "Authentication" and "Authentication password", click Add, and then click Apply & Save.



| | |
|---|---|
| Enable | ☑ |
| Listen IP address | any |
| SNMP Version | v3 |
| Contact Information | Beijing_Inhand_Networks |
| Location Information | Beijing_China |

User Group Management(v3)

| Groupname | Security Level | Read-only View | Read-write View | Inform View |
|---|---|---|---|---|
| | NoAuth/NoPriv | DefaultView | DefaultView | DefaultView |

User Management(v3)

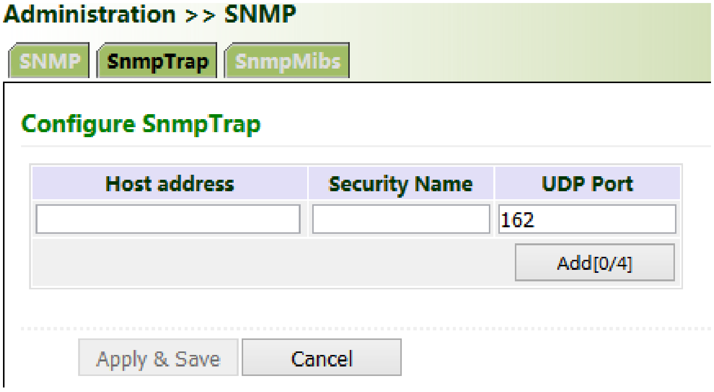
| Username | Groupname | Authentication | Authentication password | Encryption | Encryption password |
|---|---|---|---|---|---|
| | | None | | None | |

## 9.8.2 SnmpTrap (Alarm)

The SNMP trap is a type of entrance. When this entrance is reached, the SNMP managed devices actively notify the NMS, instead of waiting for the polling of NMS. On an SNMP-enabled network, the agents on managed devices can report errors to the NMS anytime, without the need of waiting for the polling of NMS. The errors are reported to the NMS through traps.

Method for enabling SnmpTrap for the gateway:

Click "Administration >> NMP >> SnmpTrap". Enter the IP address of the NMS. Enter the corresponding group name when v1c or v2c is selected, or the corresponding user name when v3c is selected, ensuring that the name consists of 1–32 characters. By default, the UDP port ID ranges from 1 to 65535.

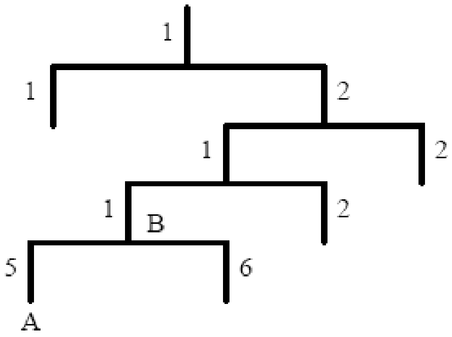


Configure SnmpTrap

| Host address | Security Name | UDP Port |
|---|---|---|
| | | 162 |

## 9.8.3 SnmpMibs

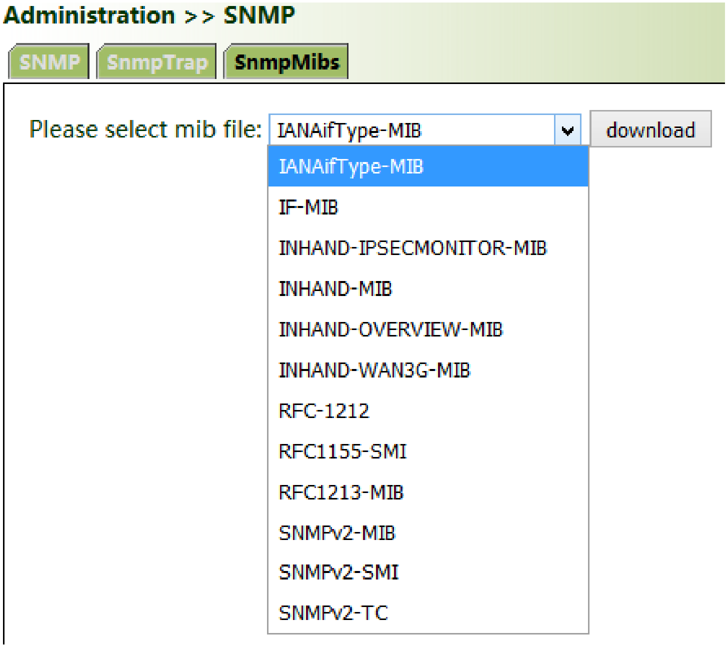
In SNMP messages, management variables are used to describe the managed objects on the device. To uniquely identify the managed objects on the device, SNMP uses a hierarchical naming scheme to identify the managed objects The entire hierarchical structure is like a tree. The nodes of the tree represent the managed objects, as shown in the figure below. Each node can be uniquely identified by a path starting from the root.



The management information base (MIB) is used to describe the hierarchical structure of the tree. It is a set of standard variable definitions for the monitored network device. In the above figure, managed object B can be uniquely determined based on a string of numbers {1.2.1.1}, which form the object identifier (OID) of the managed object.

Method for downloading a SnmpMibs file to the PC via the gateway:

Click "Administration >> SNMP >> SnmpMibs", select a folder, and click download to download it to the PC. Find the folder on the PC and import it to the NMS.



Please select mib file: IANAifType-MIB

- IANAifType-MIB
- IF-MIB
- INHAND-IPSECMONITOR-MIB
- INHAND-MIB
- INHAND-OVERVIEW-MIB
- INHAND-WAN3G-MIB
- RFC-1212
- RFC1155-SMI
- RFC1213-MIB
- SNMPv2-MIB
- SNMPv2-SMI
- SNMPv2-TC

# 9.10 Alarm

The alarm function enables users to identify gateway abnormalities in time. When an abnormality occurs, the gateway reports an alarm. You can select system-defined abnormalities and choose an appropriate notification way to obtain the abnormality information. All alarms are recorded in alarm logs so that users can identify abnormalities and perform troubleshooting in time.

Alarm states:

- Raise: indicates that the alarm has been generated but not been confirmed.
- Confirm: indicates that the alarm cannot be solved currently.
- All: indicates all generated alarms.

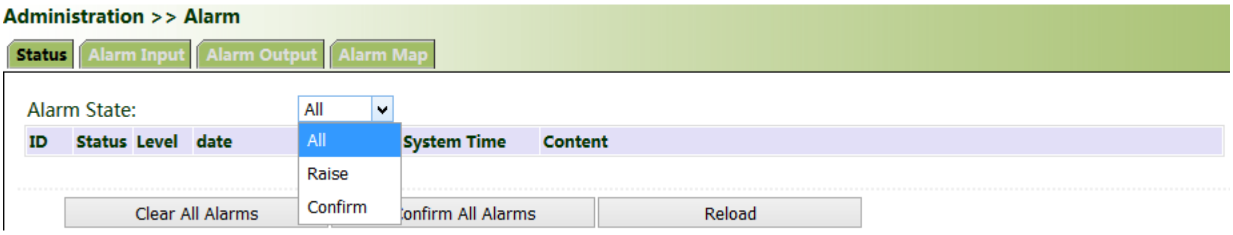
Alarm levels:

- EMERG: The device undergoes a serious error that causes a system reboot.
- CRIT: The device undergoes an unrecoverable error.
- WARN: The device undergoes an error that affects system functions.

- NOTICE: The device undergoes an error that affects system performance.

- INFO: A normal event occurs.

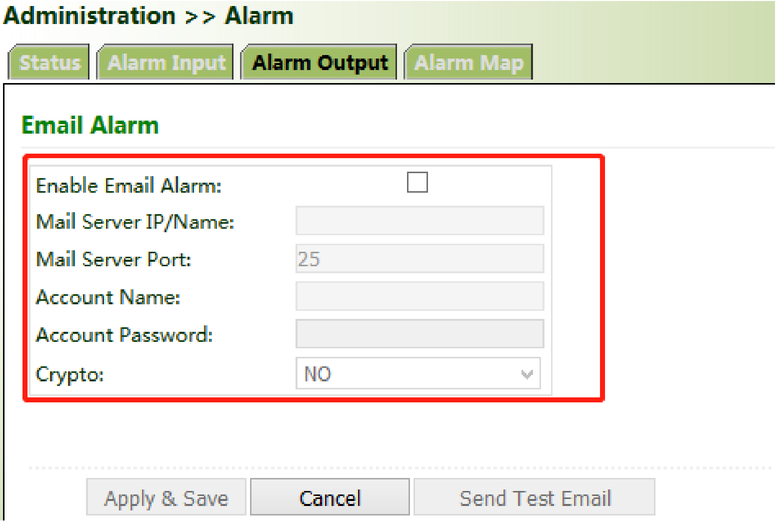
(1) Status: Click "Administration >> Alarm >> Status" and view all alarms generated in the system since power-on.



Alarm State: All

(2) Alarm Input: Select an alarm type as required. When this item is abnormal, an alarm is generated.

(3) Alarm Output: When an alarm is generated, the system automatically sends the alarm content to the destination email address via an email. This function is not available for common users. Set the sender mail address in "Email Alarm" and the receiver mail address in "Mail Address". "Mail Server IP/Name" can be found on the browser (for example, enter "smtp.exmail.qq.com" if you use a Tencent Enterprise mailbox.)



Email Alarm

Enable Email Alarm: □
Mail Server IP/Name:
Mail Server Port: 25
Account Name:
Account Password:
Crypto: NO

(4) Alarm Map: Alarms can be received in two ways: command line interface (CLI) (console interface) and Email. Some devices support SMS alarms. To enable email-based mapping, enable and set the email address on the "Alarm Output" page.

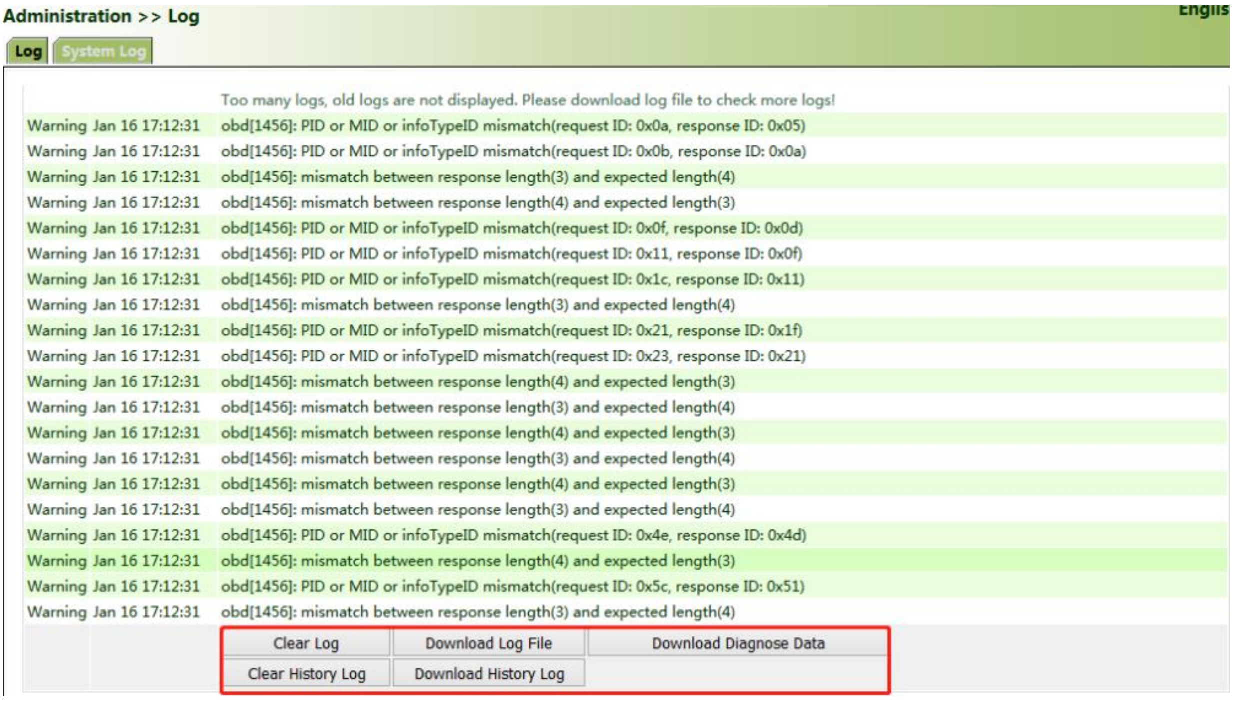
# 9.11 System Logs

Method for viewing system logs:

Click "Administration >> System Log" to view system logs.

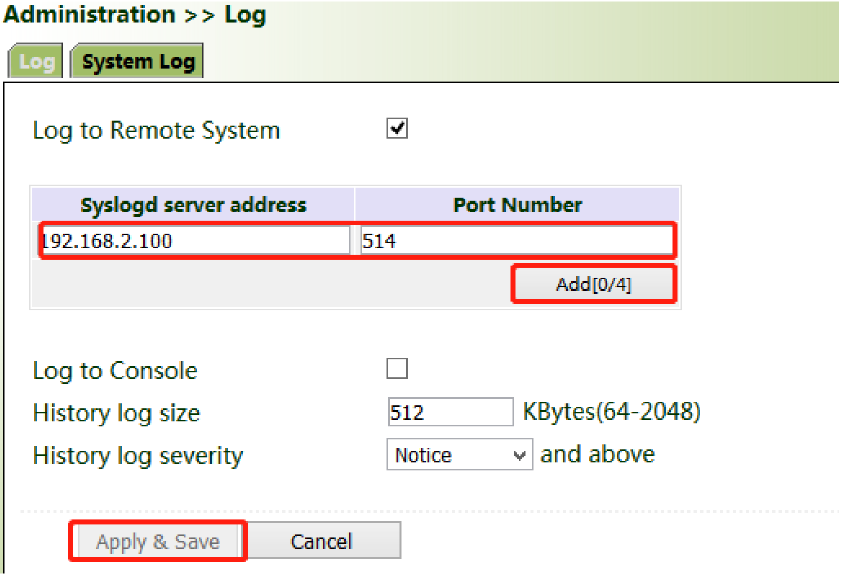
This page also provides the following operations: "Clear Log", "Download Log File", "Download Diagnose Data", "Clear History Log", and "Download History Log". History logs are those stored for extended time as specified on the "System Log" page.

The diagnose data file is encrypted, because the gateway configuration information is downloaded together with the diagnose data. You need to decrypt the file with the decryption tool provided by InHand.



```
                            Too many logs, old logs are not displayed. Please download log file to check more logs!
Warning Jan 16 17:12:31    obd[1456]: PID or MID or infoTypeID mismatch(request ID: 0x0a, response ID: 0x05)
Warning Jan 16 17:12:31    obd[1456]: PID or MID or infoTypeID mismatch(request ID: 0x0b, response ID: 0x0a)
Warning Jan 16 17:12:31    obd[1456]: mismatch between response length(3) and expected length(4)
Warning Jan 16 17:12:31    obd[1456]: mismatch between response length(4) and expected length(3)
Warning Jan 16 17:12:31    obd[1456]: PID or MID or infoTypeID mismatch(request ID: 0x0f, response ID: 0x0d)
Warning Jan 16 17:12:31    obd[1456]: PID or MID or infoTypeID mismatch(request ID: 0x11, response ID: 0x0f)
Warning Jan 16 17:12:31    obd[1456]: PID or MID or infoTypeID mismatch(request ID: 0x1c, response ID: 0x11)
Warning Jan 16 17:12:31    obd[1456]: mismatch between response length(3) and expected length(4)
Warning Jan 16 17:12:31    obd[1456]: PID or MID or infoTypeID mismatch(request ID: 0x21, response ID: 0x1f)
Warning Jan 16 17:12:31    obd[1456]: PID or MID or infoTypeID mismatch(request ID: 0x23, response ID: 0x21)
Warning Jan 16 17:12:31    obd[1456]: mismatch between response length(4) and expected length(3)
Warning Jan 16 17:12:31    obd[1456]: mismatch between response length(3) and expected length(4)
Warning Jan 16 17:12:31    obd[1456]: mismatch between response length(4) and expected length(3)
Warning Jan 16 17:12:31    obd[1456]: mismatch between response length(3) and expected length(4)
Warning Jan 16 17:12:31    obd[1456]: mismatch between response length(4) and expected length(3)
Warning Jan 16 17:12:31    obd[1456]: mismatch between response length(3) and expected length(4)
Warning Jan 16 17:12:31    obd[1456]: PID or MID or infoTypeID mismatch(request ID: 0x4e, response ID: 0x4d)
Warning Jan 16 17:12:31    obd[1456]: mismatch between response length(4) and expected length(3)
Warning Jan 16 17:12:31    obd[1456]: PID or MID or infoTypeID mismatch(request ID: 0x5c, response ID: 0x51)
Warning Jan 16 17:12:31    obd[1456]: mismatch between response length(3) and expected length(4)
```

The storage capacity of the gateway is limited (512 KB by default). To save all the logs, you need to use a remote log server (for example, Kiwi Syslog Daemon). Set the address and port of the log server on the web page. The gateway uploads all the system logs to the remote log server.



Log to Remote System ☑

| Syslogd server address | Port Number |
|---|---|
| 192.168.2.100 | 514 |

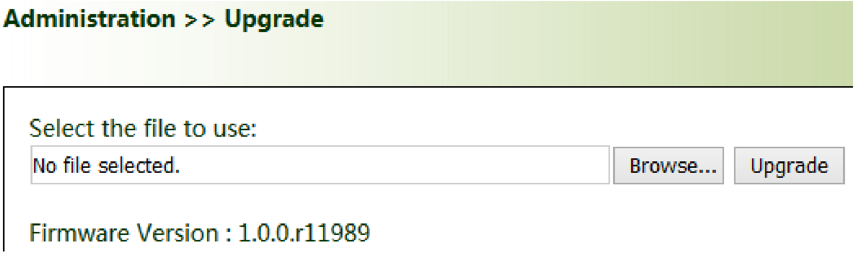
Log to Console □

History log size 512 KBytes(64-2048)

History log severity Notice and above

## 9.12 System Upgrade

Click "Administration >> Upgrade >> Browse", select an upgrade file, and click Upgrade. Restart the system after the upgrade is completed.



Select the file to use:

No file selected.

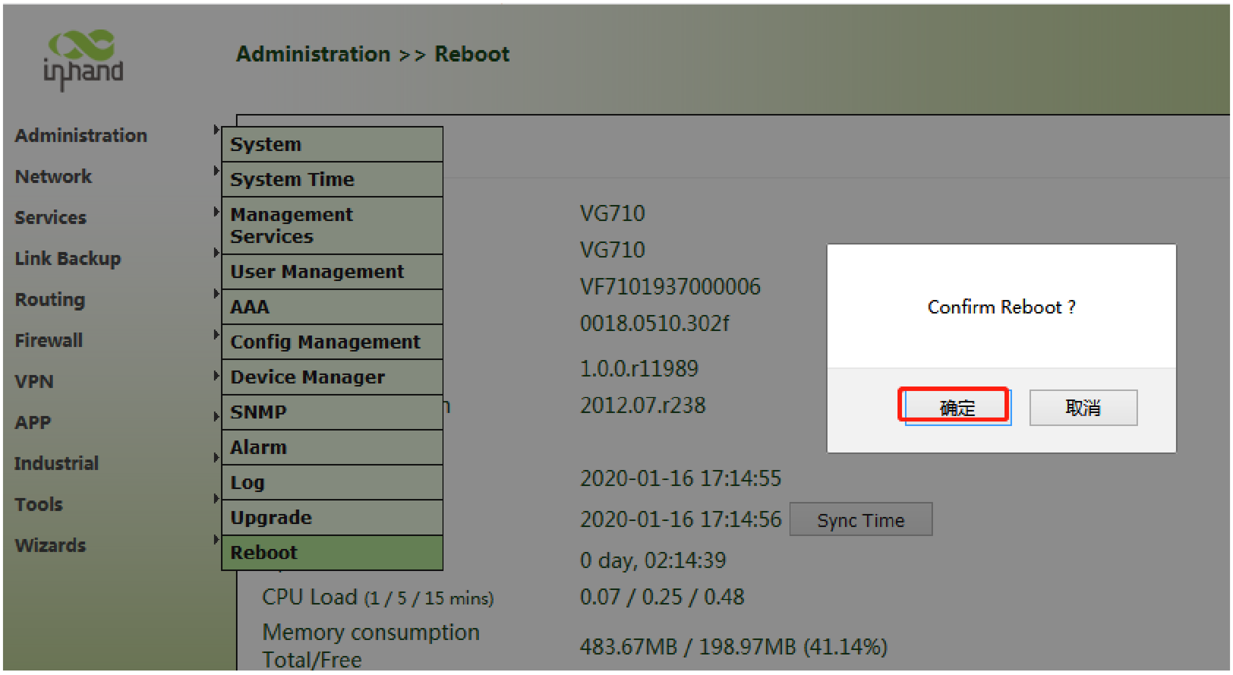
Firmware Version : 1.0.0.r11989

⚠ 注意 Note:

During the software upgrade, do not perform any operation on the web page; otherwise, the software upgrade may be interrupted.

## 9.13 System Reboot

Click "Administration >> Reboot >> OK to reboot the system.



Administration >> Reboot

VG710

VG710

VF7101937000006

0018.0510.302f

1.0.0.r11989

2012.07.r238

2020-01-16 17:14:55

2020-01-16 17:14:56

0 day, 02:14:39

CPU Load (1 / 5 / 15 mins) 0.07 / 0.25 / 0.48

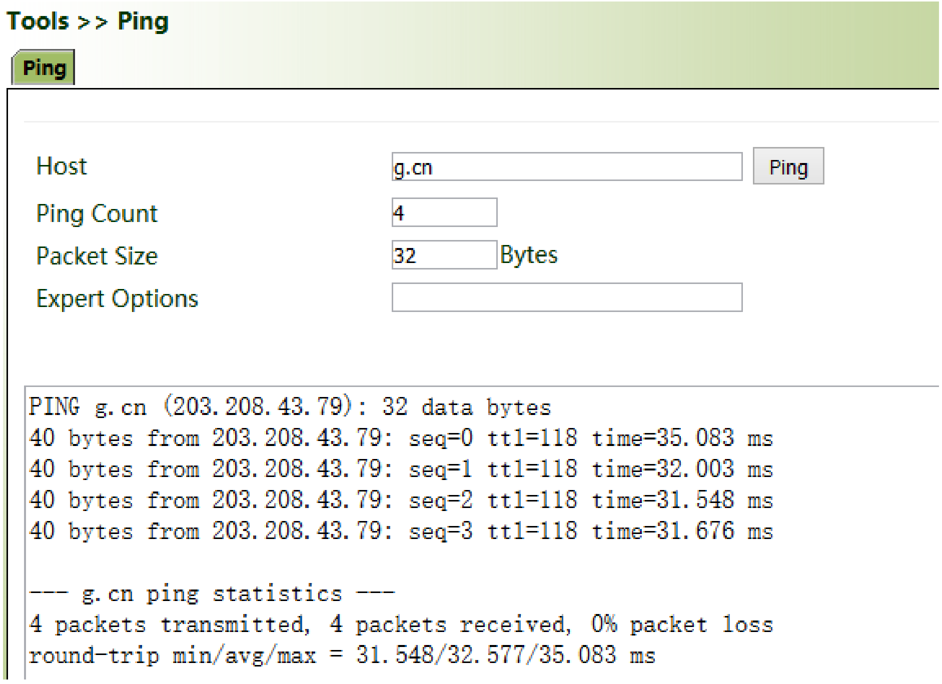
Memory consumption Total/Free 483.67MB / 198.97MB (41.14%)

Confirm Reboot ?

# 10 Diagnostic Tools

Diagnostic tools are used to detect the network connection of the gateway: Ping, Traceroute, Tcpdump, and Link Speed Test.

Ping: It is used to detect the external network connection of the device. Enter any common website in China for "Host" and click "Ping". If data transmission occurs, the network is connected properly.



Host: g.cn

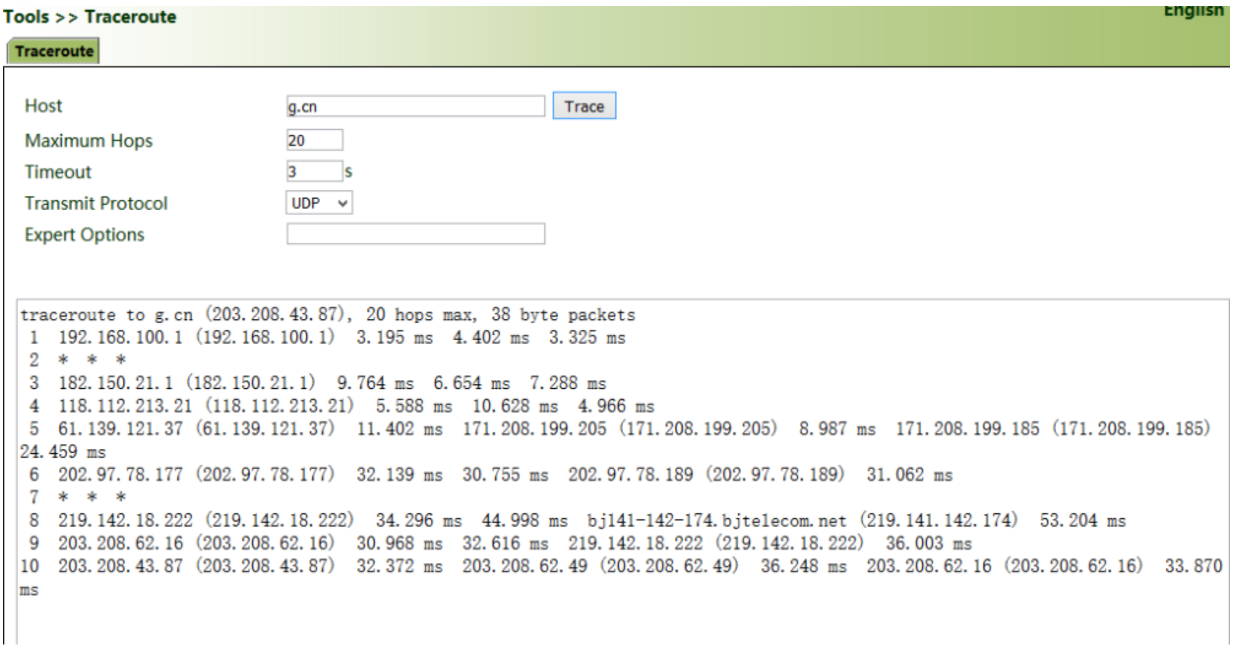
Ping Count: 4

Packet Size: 32 Bytes

Expert Options:

```
PING g.cn (203.208.43.79): 32 data bytes
40 bytes from 203.208.43.79: seq=0 ttl=118 time=35.083 ms
40 bytes from 203.208.43.79: seq=1 ttl=118 time=32.003 ms
40 bytes from 203.208.43.79: seq=2 ttl=118 time=31.548 ms
40 bytes from 203.208.43.79: seq=3 ttl=118 time=31.676 ms

--- g.cn ping statistics ---
4 packets transmitted, 4 packets received, 0% packet loss
round-trip min/avg/max = 31.548/32.577/35.083 ms
```

Traceroute: Enter the IP address of the peer host and click "Trace" to detect the route connection.

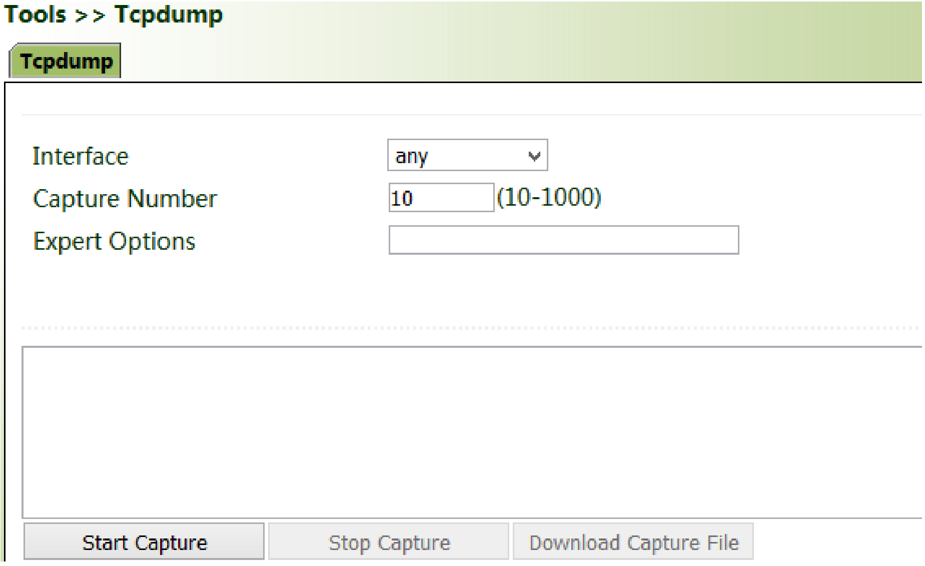


Host: g.cn
Maximum Hops: 20
Timeout: 3 s
Transmit Protocol: UDP
Expert Options:

```
traceroute to g.cn (203.208.43.87), 20 hops max, 38 byte packets
 1  192.168.100.1 (192.168.100.1)  3.195 ms  4.402 ms  3.325 ms
 2  *  *  *
 3  182.150.21.1 (182.150.21.1)  9.764 ms  6.654 ms  7.288 ms
 4  118.112.213.21 (118.112.213.21)  5.588 ms  10.628 ms  4.966 ms
 5  61.139.121.37 (61.139.121.37)  11.402 ms  171.208.199.205 (171.208.199.205)  8.987 ms  171.208.199.185 (171.208.199.185)
24.459 ms
 6  202.97.78.177 (202.97.78.177)  32.139 ms  30.755 ms  202.97.78.189 (202.97.78.189)  31.062 ms
 7  *  *  *
 8  219.142.18.222 (219.142.18.222)  34.296 ms  44.998 ms  bj141-142-174.bjtelecom.net (219.141.142.174)  53.204 ms
 9  203.208.62.16 (203.208.62.16)  30.968 ms  32.616 ms  219.142.18.222 (219.142.18.222)  36.003 ms
10  203.208.43.87 (203.208.43.87)  32.372 ms  203.208.62.49 (203.208.62.49)  36.248 ms  203.208.62.16 (203.208.62.16)  33.870
ms
```

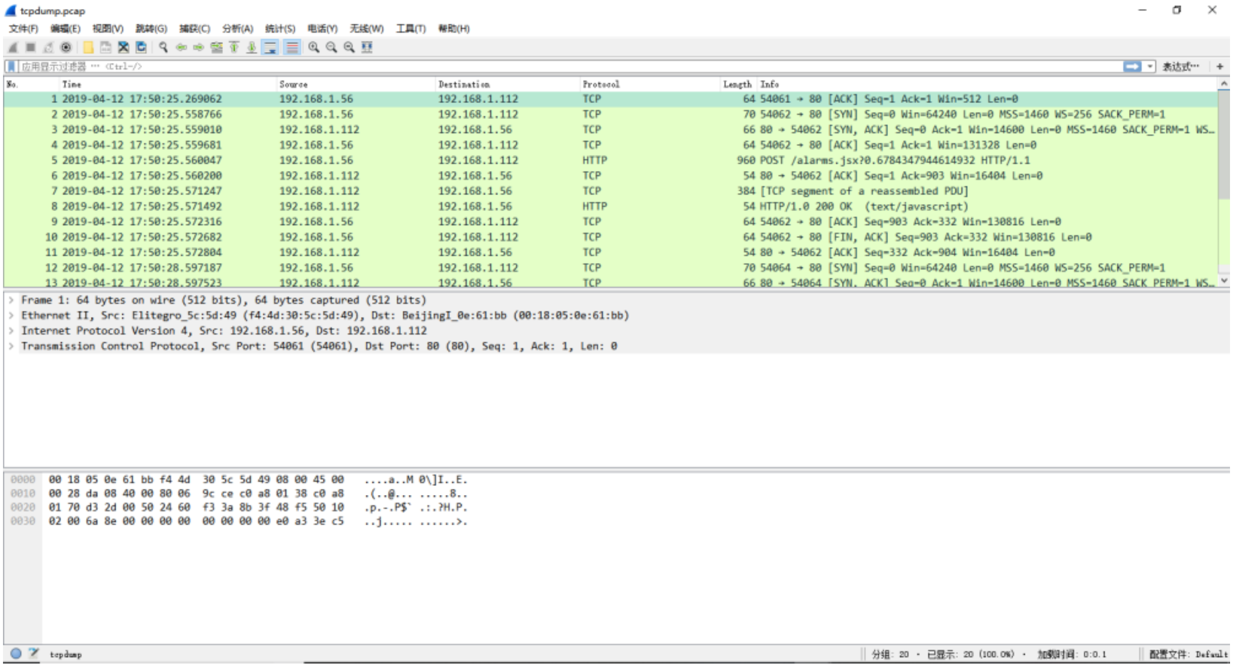
Tcpdump:

Select an interface ("any" or "bridge1"), set "Capture Number", and click Start Capture >> Stop Capture >> Download Capture File.



Interface: any
Capture Number: 10 (10-1000)
Expert Options:

Download wireshark from the browser to open the downloaded file and analyze the messages to understand the network connection of the interface.

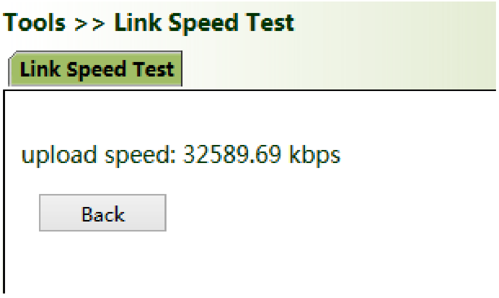

tcpdump.pcap
文件(F) 编辑(E) 视图(V) 跳转(G) 捕获(C) 分析(A) 统计(S) 电话(Y) 无线(W) 工具(T) 帮助(H)
应用显示过滤器 … <Ctrl-/>
表达式…
+

```
No.   Time                        Source          Destination     Protocol  Length Info
    1 2019-04-12 17:50:25.269062  192.168.1.56    192.168.1.112   TCP           64 54061 → 80 [ACK] Seq=1 Ack=1 Win=512 Len=0
    2 2019-04-12 17:50:25.558766  192.168.1.56    192.168.1.112   TCP           70 54062 → 80 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
    3 2019-04-12 17:50:25.559010  192.168.1.112   192.168.1.56    TCP           66 80 → 54062 [SYN, ACK] Seq=0 Ack=1 Win=14600 Len=0 MSS=1460 SACK_PERM=1 WS…
    4 2019-04-12 17:50:25.559681  192.168.1.56    192.168.1.112   TCP           64 54062 → 80 [ACK] Seq=1 Ack=1 Win=131328 Len=0
    5 2019-04-12 17:50:25.560047  192.168.1.56    192.168.1.112   HTTP         960 POST /alarms.jsx?0.6784347944614932 HTTP/1.1
    6 2019-04-12 17:50:25.560200  192.168.1.112   192.168.1.56    TCP           54 80 → 54062 [ACK] Seq=1 Ack=903 Win=16404 Len=0
    7 2019-04-12 17:50:25.571247  192.168.1.112   192.168.1.56    TCP          384 [TCP segment of a reassembled PDU]
    8 2019-04-12 17:50:25.571492  192.168.1.112   192.168.1.56    HTTP          54 HTTP/1.0 200 OK  (text/javascript)
    9 2019-04-12 17:50:25.572316  192.168.1.56    192.168.1.112   TCP           64 54062 → 80 [ACK] Seq=903 Ack=332 Win=130816 Len=0
   10 2019-04-12 17:50:25.572682  192.168.1.56    192.168.1.112   TCP           64 54062 → 80 [FIN, ACK] Seq=903 Ack=332 Win=130816 Len=0
   11 2019-04-12 17:50:25.572804  192.168.1.112   192.168.1.56    TCP           54 80 → 54062 [ACK] Seq=332 Ack=904 Win=16404 Len=0
   12 2019-04-12 17:50:28.597187  192.168.1.56    192.168.1.112   TCP           70 54064 → 80 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
   13 2019-04-12 17:50:28.597523  192.168.1.112   192.168.1.56    TCP           66 80 → 54064 [SYN, ACK] Seq=0 Ack=1 Win=14600 Len=0 MSS=1460 SACK_PERM=1 WS…
```

```
> Frame 1: 64 bytes on wire (512 bits), 64 bytes captured (512 bits)
> Ethernet II, Src: Elitegro_5c:5d:49 (f4:4d:30:5c:5d:49), Dst: BeijingI_0e:61:bb (00:18:05:0e:61:bb)
> Internet Protocol Version 4, Src: 192.168.1.56, Dst: 192.168.1.112
> Transmission Control Protocol, Src Port: 54061 (54061), Dst Port: 80 (80), Seq: 1, Ack: 1, Len: 0
```

```
0000  00 18 05 0e 61 bb f4 4d  30 5c 5d 49 08 00 45 00   ....a..M 0\]I..E.
0010  00 28 da 08 40 00 80 06  9c ce c0 a8 01 38 c0 a8   .(..@... .....8..
0020  01 70 d3 2d 00 50 24 60  f3 3a 8b 3f 48 f5 50 10   .p.-.P$` .:.?H.P.
0030  02 00 6a 8e 00 00 00 00  00 00 00 00 e0 a3 3e c5   ..j..... ......>.
```

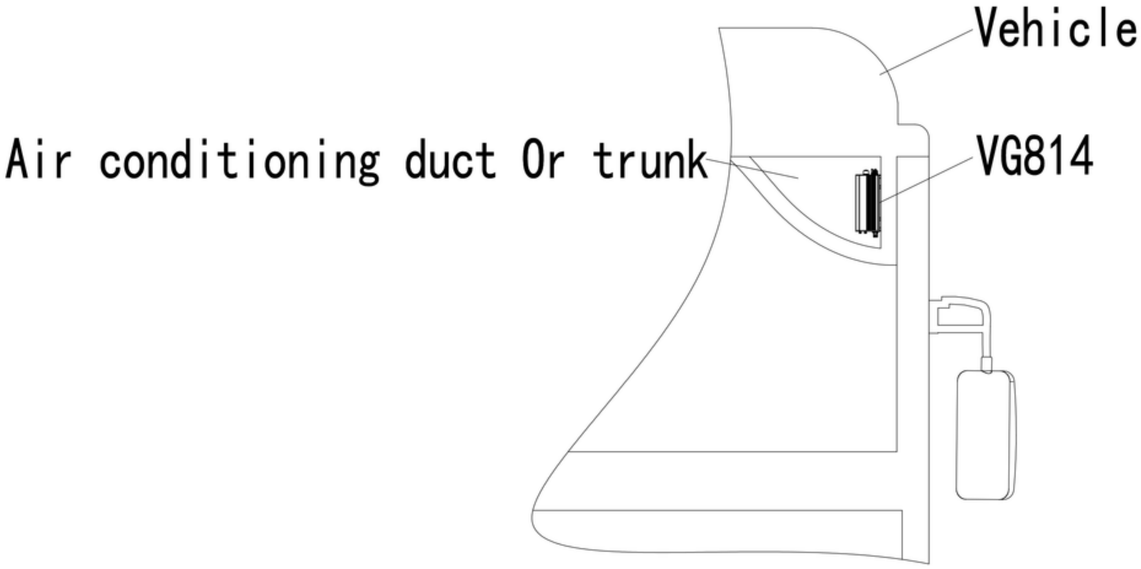
Link Speed Test: Upload and download files to test the link speed.

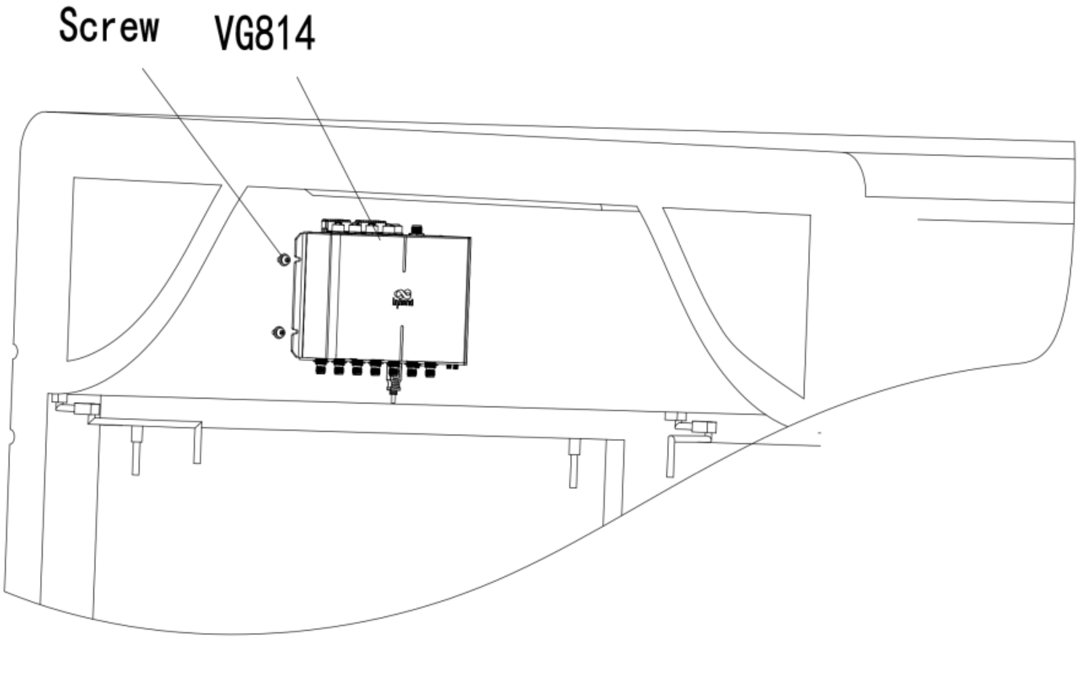

Tools >> Link Speed Test

upload speed: 32589.69 kbps

# 11. Hardware installation

The installation position is recommended to be installed in the air conditioning duct of the vehicle:


Vehicle
Air conditioning duct Or trunk
VG814


Screw
VG814