Industrial Cellular VPN Router

NR300 User Manual

20101171

Guangzhou Navigateworx Technologies Co, Ltd
www.navigateworx.com

REVISION HISTORY

Revision	Date	Firmware version	Revision Details
0	Oct 2019	1.0.0(337913f)	Initial release.
1	Dec 2019		Change home page layout of UM, add 1-to-1 NAT

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Interference Issues

Avoid possible radio frequency (RF) interference by following these guidelines:

- The use of cellular telephones or devices in aircraft is illegal. Use in aircraft may endanger operation and disrupt the cellular network. Failure to observe this restriction may result in suspension or denial of cellular services to the offender, legal action, or both.
- Do not operate in the vicinity of gasoline or diesel fuel pumps unless use has been approved or authorized.
- Do not operate in locations where medical equipment that the device could interfere with may be in use.
- Do not operate in fuel depots, chemical plants, or blasting areas unless use has been approved and authorized.
- Use care if operating in the vicinity of protected personal medical devices, i.e., hearing aids and pacemakers.
- Operation in the presence of other electronic equipment may cause interference if equipment is incorrectly protected. Follow recommendations for installation from equipment manufacturers.

Declaration of Conformity

NR300 Series products are in conformity with the essential requirements and other relevant provisions of the CE and RoHS.

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Chapter 1. Product Overview

1.1 Overview

Navigateworx NR300 series industrial cellular VPN router offers a single, flexible platform to address a variety of wireless communications needs with over-the-air configuration and system monitoring for optimal connectivity. This router enables wireless data connectivity over public and private LTE cellular networks at 4G speeds.

NR300 series router has dual SIM backup, 1 LAN ports. RS232 and RS485 interfaces are provided to support Serial to IP communication.

NR300 series router supports 9 to 36 VDC wide range power inputs, designed with reverse-voltage protection mechanism for greater reliability. It is an advanced choice for universal wireless M2M applications with reliable features for data transmission.

1.2 Features and Benefits

Industrial internet access

- Wireless Mobile Broadband 2G / 3G / 4G Connection
- Remote access to SCADA System for Industrial Automation
- Reduce high costs for on-site maintenance

Designed for industrial usage

- Power Input Range 9 to 36 VDC
- Industrial designed for harsh environment
- Aluminum casing

Secure and reliable remote connection

- Connection manager ensure seamless communication
- Support Multiple VPN tunnels for data encryption
- Firewall prevents unsafe and unauthorized access

Easy to use and easy maintenance

- User-friendly web interface for human interaction
- Easy configuration for deployment
- Support Central Management Platform

1.3 General Specifications

Cellular Interface

- Standards: FDD-LTE, WCDMA/UMTS/HSPA/HSPA+/EDGE/GPRS,
- 2× SMA female antenna connector
- 2 x SIM (3.0V & 1.8V)

Ethernet Interface

- Standard: IEEE 802.3, IEEE 802.3u
- Number of Ports:

  1 LAN x 10/100 Mbps, RJ45 connector
- 1.5KV magnetic isolation protection

Serial Interface

- 1×RS232 (3 PIN): TX, RX, GND
- 1 x RS485 (2 PIN): Data+(A), Data-(B)
- Baud rate: 300 bps to 115200 bps
- Connector: terminal block
- 15KV ESD protection

Other Interfaces

- 1× RST button
- LED instruction: 1 x SYS, 1 x NET, 1 x USR, 3 x RSSI

Software

- Network protocols: DHCP, ICMP, HTTP, HTTPS, DNS, NTP…
- VPN: IPSec, GRE, OpenVPN, DMVPN, L2TP, PPTP
- Policy: RIPv1/RIPv2/OSPF/BGP dynamic route (optional)
- Firewall & Filter: Port forwarding, DMZ, anti-DoS, ACL
- Serial port: TCP server and client, UDP
- Management: Web, Central Management Platform

Power Supply and Consumption

- Connector: 7-pin 3.5 mm female socket
- Input voltage range: 9~36VDC

- Power consumption:

  Idle: 50 mA@12V

  Data link: 200 mA (peak) @12V

Physical Specification

- Ingress Protection: IP30
- Housing & Weight: Metal, 200g
- Dimension: 82.8mm x 93.3mm x 28.8mm (excluding antenna)
- Installations: Din-rail mounting

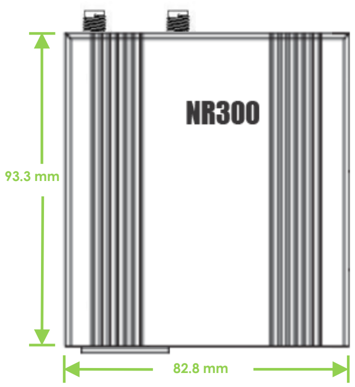
Environmental

- Operation temperature: -40~+75℃
- Store temperature: -40~+85℃
- Operation humidity: 5% to 95% non-condensing

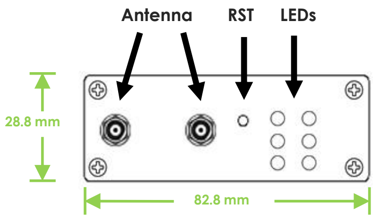
1.4 Mechanical Specifications

Dimension: 82.8mm x 93.3mm x 28.8mm

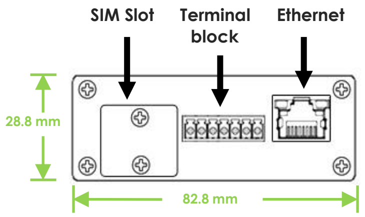
FRONT SIDE



TOP SIDE



BOTTOM SIDE



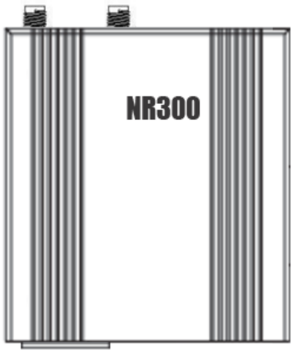
1.5 Package Checklist

NR300 series Router includes the parts shown in below, please verify your components.

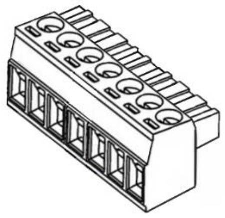
NOTE: if any of the below items is missing or damaged, please contact your sales representative.

Included equipment

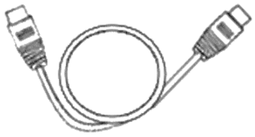
- 1 x Navigateworx NR300 series Industrial Cellular VPN router



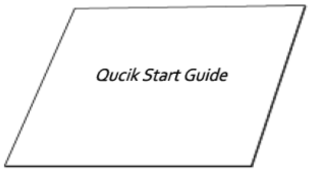
- 1 x 7-pin 3.5 mm male terminal block for Power Input/RS232/RS485



- 1 x Ethernet cable



- 1 x Quick Start Guide

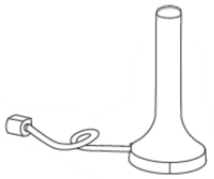


Optional Accessories (sold separately)

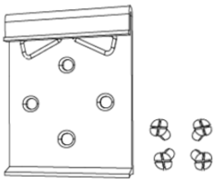
- 3G/4G cellular antenna

Stubby antenna
20101173

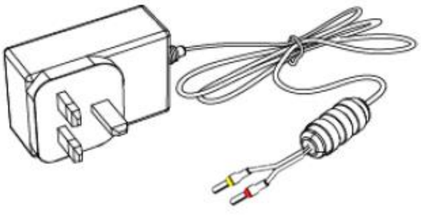
Magnet antenna
20101174



- 35mm Din-rail mounting kit
20101175



- AC/DC power adapter (12VDC, 1.5A; EU/US/UK/AU plug optional)
20101172 EU Plug



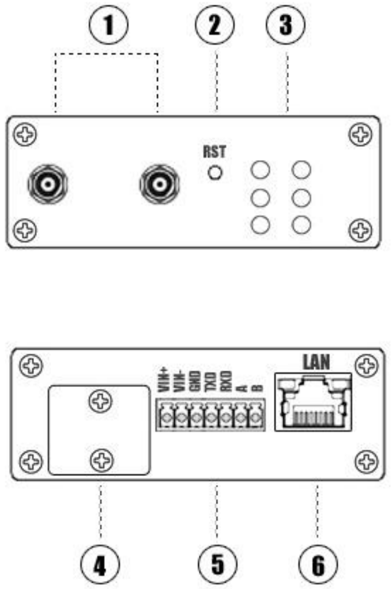
1.6 Order Information

Model	Part Number	Description
NR300-4G	A301430 **20101171**	4G LTE, Dual SIMs, 1 x Eth, 1 x RS232 (3 PIN), 1 x RS485, 9 - 36VDC.

Chapter 2. Installation

2.1 Product Overview

- **Front Panel**



① Cellular Antenna
② RST Button
③ LED Indicator
④ SIM Slot
⑤ Power Input/RS232/RS485
⑥ Ethernet Port

2.2 LED Indicators

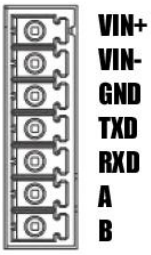
Name	Color	Status	Description
SYS	Green	Slow Blinking (500ms duration)	Operating normally
		Fast Blinking	System initialing
		Off	Power is off
NET	Green	On	Register to Highest priority network service (depend on Radio, e.g. Radio support LTE as Highest priority network).
		Fast Blinking (500ms duration)	Register to Non-Highest priority network service (depend on Radio, e.g. Radio support LTE as Highest priority network, then WCDMA and GPRS is non-highest priority network).
		Off	Register failed
USR: SIM	Green	On	Router is trying cellular connection with SIM1
		Fast Blinking (250ms duration)	Router is trying cellular connection with SIM2
		Off	No SIM detected
		Blinking	Wi-Fi is enabled and data transmission
		Off	Wi-Fi is disable or initialize failed
Signal Strength Indicator 📶	Green	On, 3 LED light up	Signal strength (21-31) is high
		On, 2 LED light up	Signal strength (11-20) is medium
		On, 1 LED light up	Signal strength (1-10) is low
		Off	No signal

2.3 Ethernet Port Indicator

Name	Status	Description
Link indicator	On	Connection is established
	Blinking	Data is being transmitted
	Off	Connection is not established

2.4 PIN Definition of Terminal block

- **Power Input & Serial Port**



PIN	RS232	RS485	Power Input	Direction
1	--	--	VIN+	Positive (Red Line)
2	--	--	VIN-	Negative (Yellow Line)
3	GND	--	--	--
4	TXD	--	--	Router-->Device
5	RXD	--	--	Router<--Device
6	--	A	--	Router<-->Device
7	--	B	--	Router<-->Device

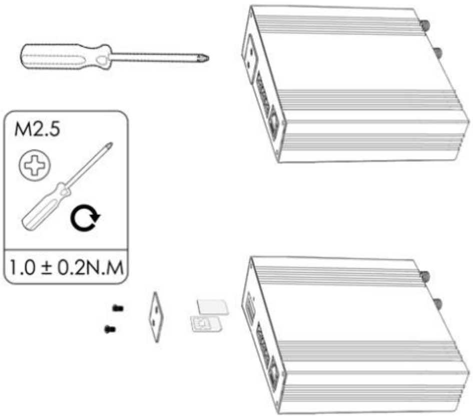
2.5 Reset Button

Function	Action
Reboot	Press the RST button within 3s under operation status
Factory Reset	Press the RST button between 3s to 10s, all LEDs blink few times then reboot the router manually.
Run Normally	Press the RST button more than 10s, router will run normally without reboot or factory reset.

2.6 Insert SIM card

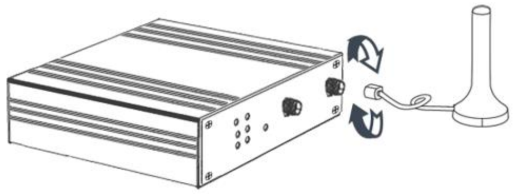
- **Insert / Remove SIM card**

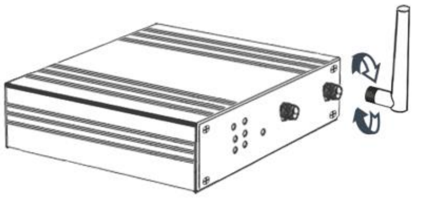
1. Make sure the power is disconnected.
2. Use a Phillips-head screwdriver to remove SIM slot cover.
3. Insert the SIM card(s) in to the SIM sockets.
4. Replace the SIM slot cover.



2.7 Install Antenna

- **Connect the cellular antenna to the MAIN and AUX connector on the unit.**

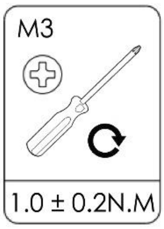


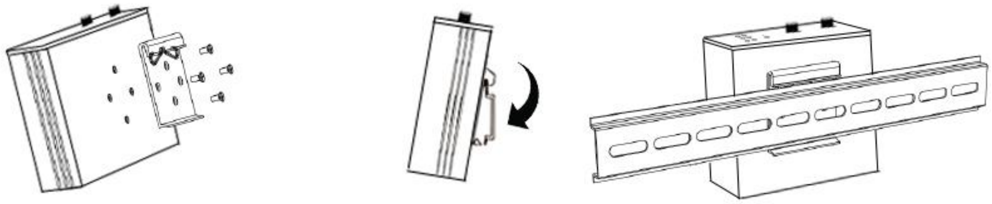


NOTE: NR300 router supports dual antennas with MAIN and AUX connectors. MAIN connector is for data receiving and transmission. AUX connector is for enhancing signal strength, which cannot be used separately.

2.8 DIN-rail Mounting

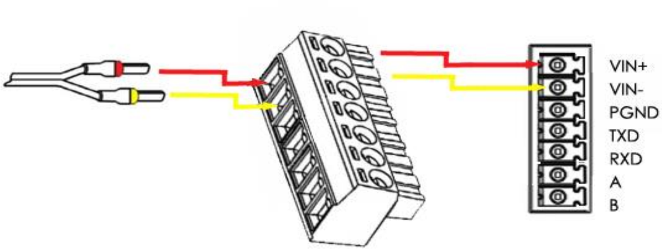
1. Use 4 pcs of M3x6 flat head phillips screws to fix the DIN-rail to the router.
2. Insert the upper lip of the DIN-rail into the DIN-rail mounting kit.
3. Press the router towards the DIN-rail until it snaps into place.





2.9 Power Supply Installation

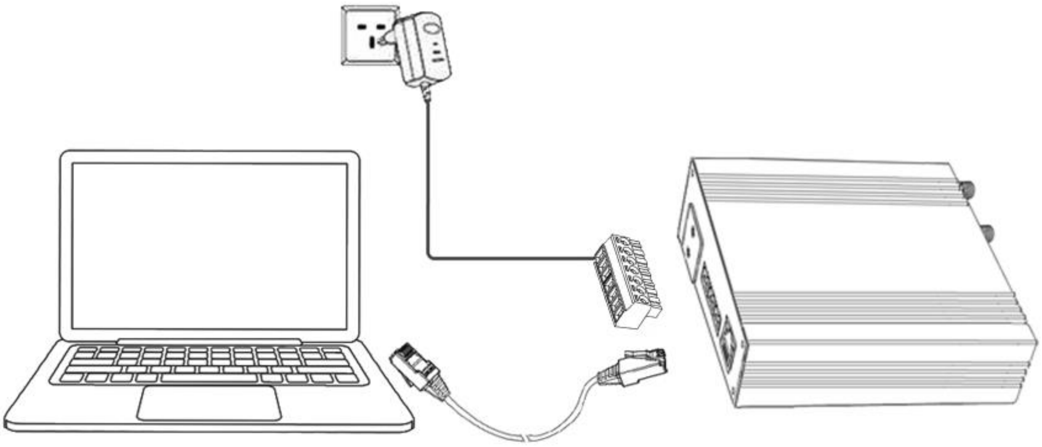
1. Remove the pluggable connector from the unit, then loosen the screws for the locking flanges as needed.
2. Connect the wires of the power supply to the terminals.



COLOR	POLARITY
RED	VIN+
YELLOW	VIN-

2.10 Power On The Router

1. Connect one end of the Ethernet cable to the LAN port on the unit and the other end to a LAN port on a PC.
2. Connect the AC power to a power source.
3. Router is ready when SYS LED is blinking.



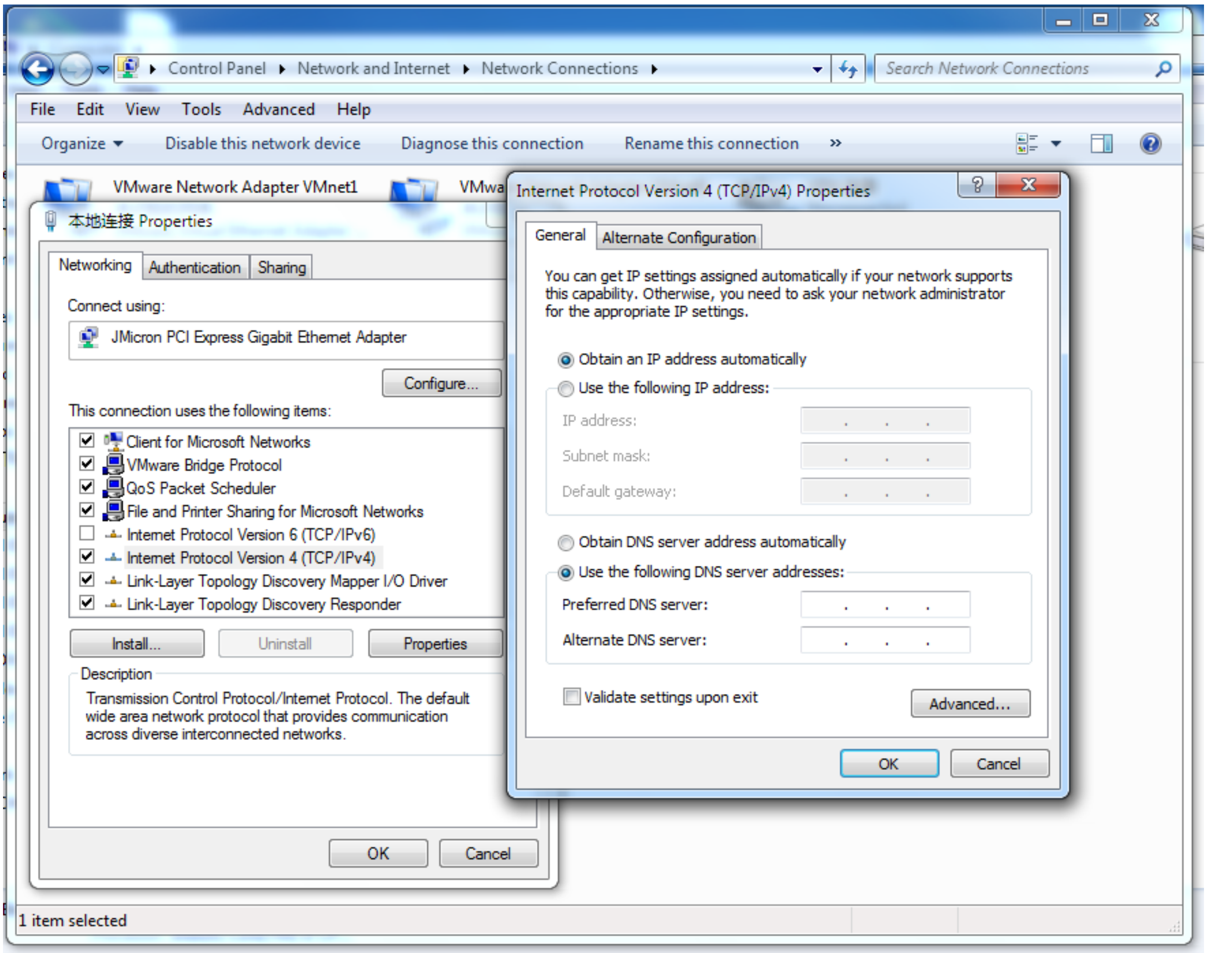
Chapter 3. Access to Web page

3.1 PC Configuration

NR300 router contains a DHCP server which will automatically assign an IP address to your PC, however in some cases the user may need to change the network settings on their PC to accept the IP address from the N300. or you can configure a static IP address manually.

- **Obtain an IP address automatically**

The process required to do this differs depending on the version of Windows you are using.
NOTE: The following steps are based on Windows 7.



Control Panel ▸ Network and Internet ▸ Network Connections ▸
Search Network Connections
File Edit View Tools Advanced Help
Organize ▾ Disable this network device Diagnose this connection Rename this connection »
VMware Network Adapter VMnet1
VMwa
1 item selected

本地连接 Properties

Networking | Authentication | Sharing

Connect using:
JMicron PCI Express Gigabit Ethernet Adapter
Configure...

This connection uses the following items:

- ☑ Client for Microsoft Networks
- ☑ VMware Bridge Protocol
- ☑ QoS Packet Scheduler
- ☑ File and Printer Sharing for Microsoft Networks
- □ Internet Protocol Version 6 (TCP/IPv6)
- ☑ Internet Protocol Version 4 (TCP/IPv4)
- ☑ Link-Layer Topology Discovery Mapper I/O Driver
- ☑ Link-Layer Topology Discovery Responder

Install... Uninstall Properties

Description
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

OK Cancel

Internet Protocol Version 4 (TCP/IPv4) Properties

General | Alternate Configuration

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: . . .

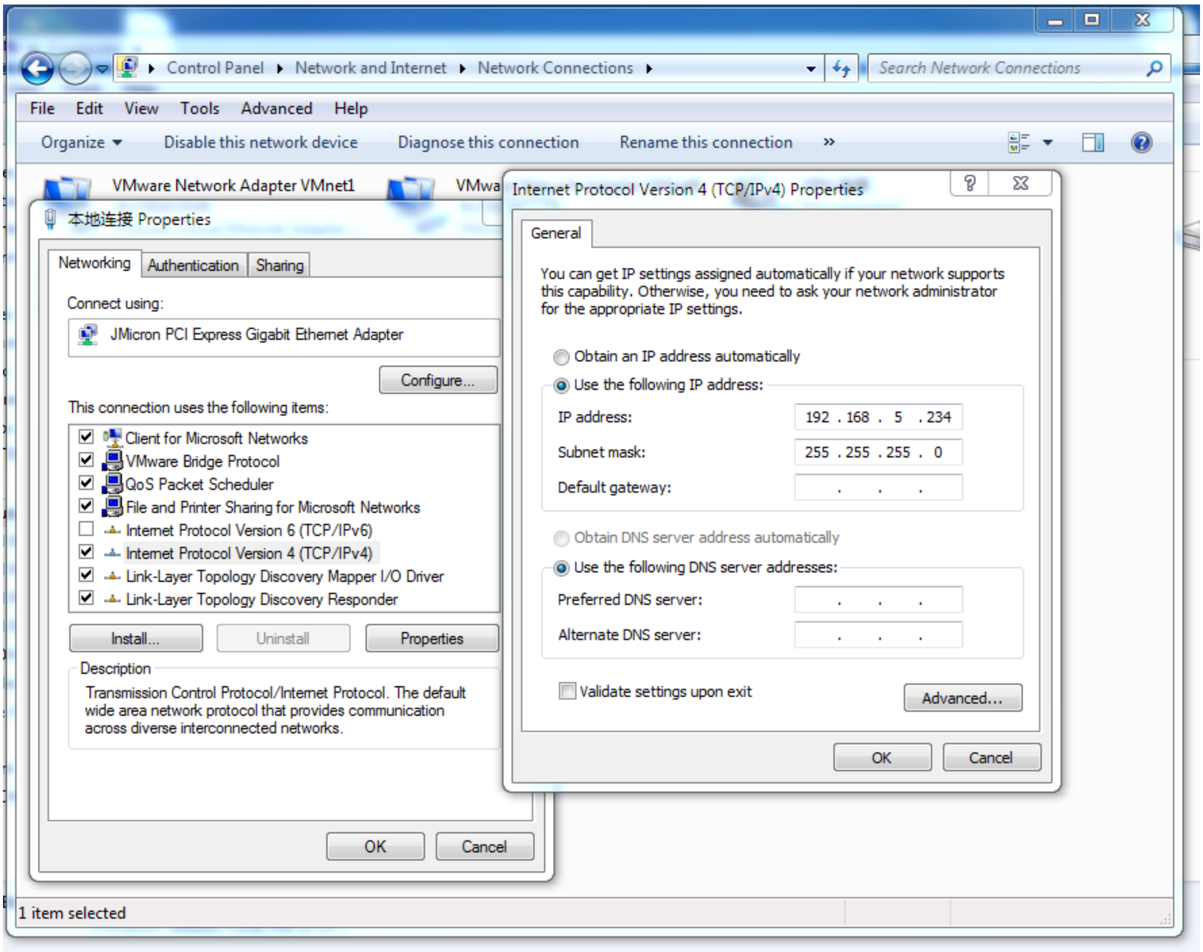
○ Obtain DNS server address automatically
● Use the following DNS server addresses:
Preferred DNS server: . . .
Alternate DNS server: . . .

□ Validate settings upon exit Advanced...

OK Cancel

select **Start » Control Panel » Network Connections**. Right click **Local Area Connection** and select **Properties** to open the configuration dialog box for Local Area Connection. Select **Internet Protocol (TCP/IP)** and click **Properties** to open the TCP/IP configuration window. On the General tab, select **Obtain an IP address automatically** and **Obtain DNS server address automatically**. Click **OK** to complete TCP/IP configuration.

- **Set to a static IP address**


Control Panel ▸ Network and Internet ▸ Network Connections ▸
Search Network Connections
File Edit View Tools Advanced Help
Organize ▾ Disable this network device Diagnose this connection Rename this connection »
VMware Network Adapter VMnet1
VMwa
1 item selected

本地连接 Properties

Networking | Authentication | Sharing

Connect using:

JMicron PCI Express Gigabit Ethernet Adapter

Configure...

This connection uses the following items:

- ☑ Client for Microsoft Networks
- ☑ VMware Bridge Protocol
- ☑ QoS Packet Scheduler
- ☑ File and Printer Sharing for Microsoft Networks
- ☐ Internet Protocol Version 6 (TCP/IPv6)
- ☑ Internet Protocol Version 4 (TCP/IPv4)
- ☑ Link-Layer Topology Discovery Mapper I/O Driver
- ☑ Link-Layer Topology Discovery Responder

Install... Uninstall Properties

Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

OK Cancel

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 . 5 . 234

Subnet mask: 255 . 255 . 255 . 0

Default gateway: . . .

○ Obtain DNS server address automatically

● Use the following DNS server addresses:

Preferred DNS server: . . .

Alternate DNS server: . . .

☐ Validate settings upon exit Advanced...

OK Cancel

click "**Use the following IP address**" to assign a static IP manually within the same subnet of the router.

NOTE: ***Default gateway*** and ***DNS server*** is not necessary if PC not routing all traffic go through NR500 router.

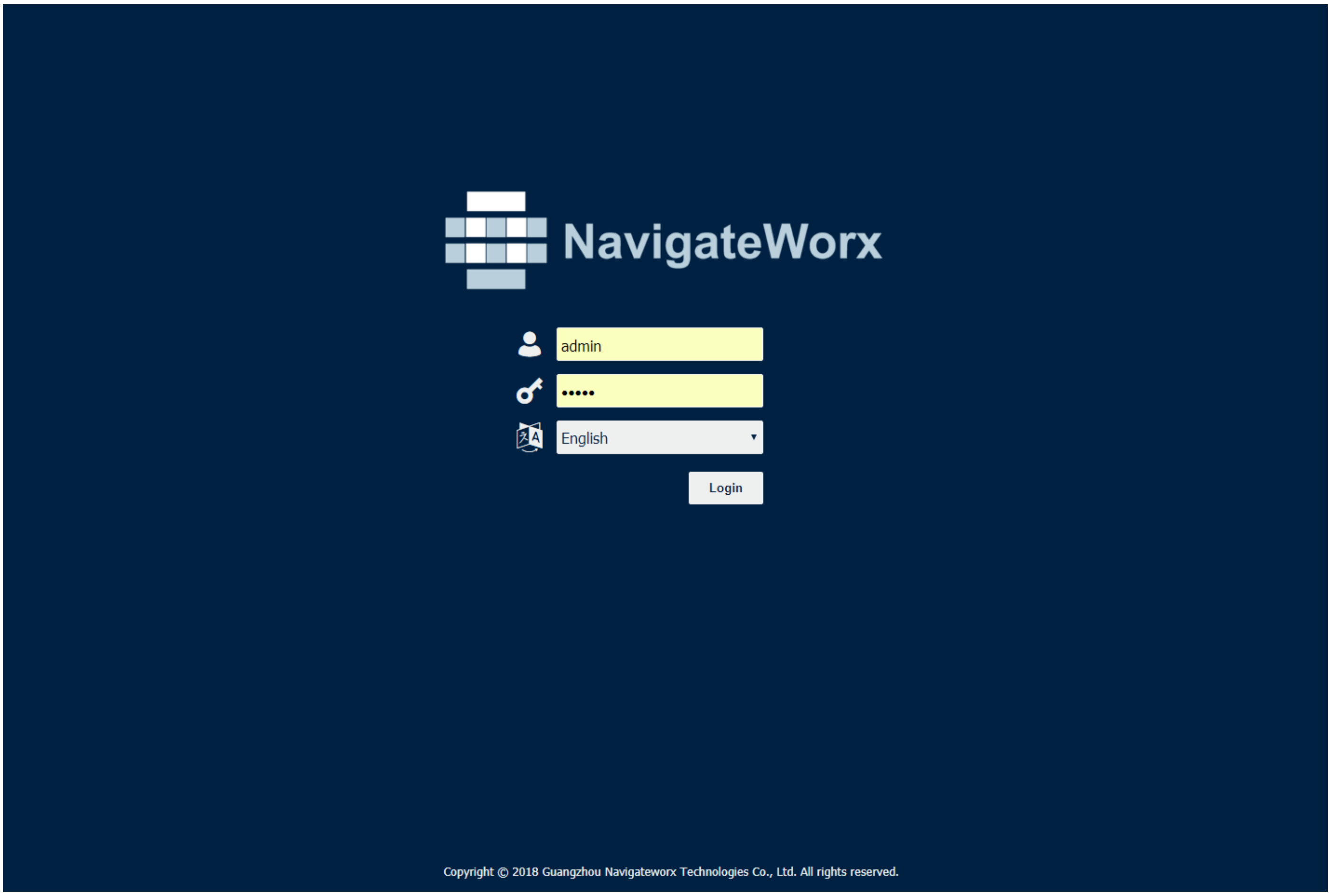
3.2 Factory Default Settings

NR300 router supports Web-based configuration interface for management. If this is the first time for you to configure the router, please refer to below default settings.

Username: **admin**
Password: **admin**
LAN IP Address: **192.168.5.1**
DHCP Server: **Enabled**

3.3 Login to Web Page

1. Start a Web browser on your PC (Chrome and IE are recommended), enter 192.168.5.1 into the address bar of the web browser.
2. Then use the default username and password(admin/admin), to log in to the router.



admin

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English

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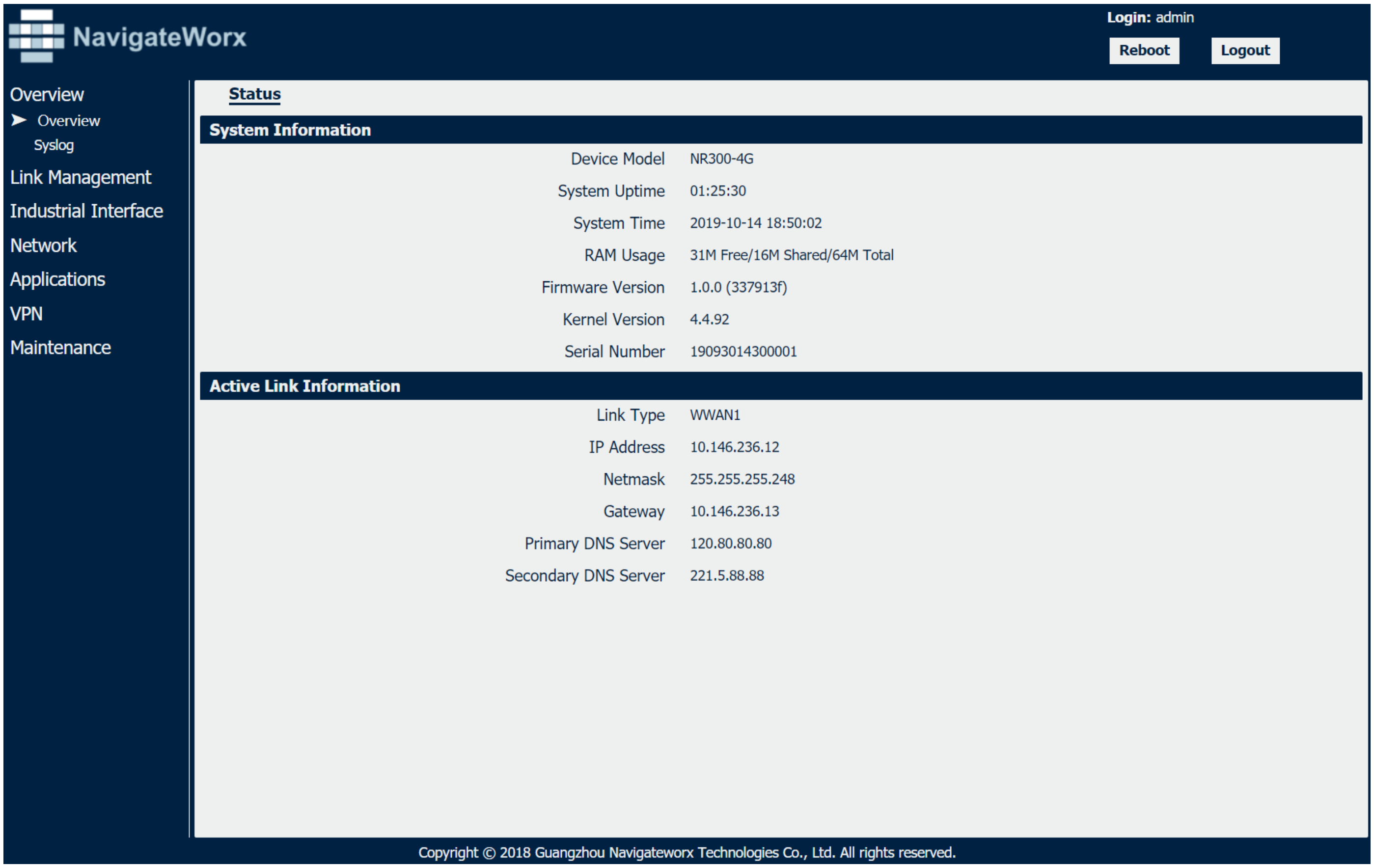
Chapter 4. Web Configuration

4.1 Web Interface

The N300 router Web interface is divided into two sections. In the left pane is the main navigation menu. On the right is the content area for each page.



System Information

Device Model	NR300-4G
System Uptime	01:25:30
System Time	2019-10-14 18:50:02
RAM Usage	31M Free/16M Shared/64M Total
Firmware Version	1.0.0 (337913f)
Kernel Version	4.4.92
Serial Number	19093014300001

Active Link Information

Link Type	WWAN1
IP Address	10.146.236.12
Netmask	255.255.255.248
Gateway	10.146.236.13
Primary DNS Server	120.80.80.80
Secondary DNS Server	221.5.88.88

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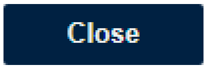
NOTE: The navigation menu may contain fewer sections than shown here depending on which options are installed in your unit.

- **Reboot:** reset the router within power disconnect.
- **Logout:** logout to web authorization page.

- **Save:** save the configuration on current page.
- **Apply:** apply the changes on current page immediately.

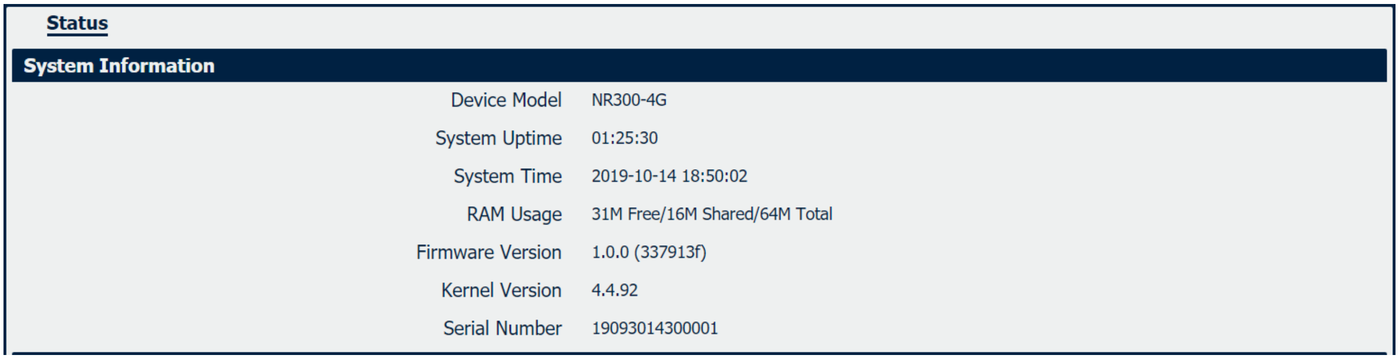
- **Close:** exit without changing the configuration on current page.



4.2 Overview

4.2.1 Status

You can view the system information of the router on this page.



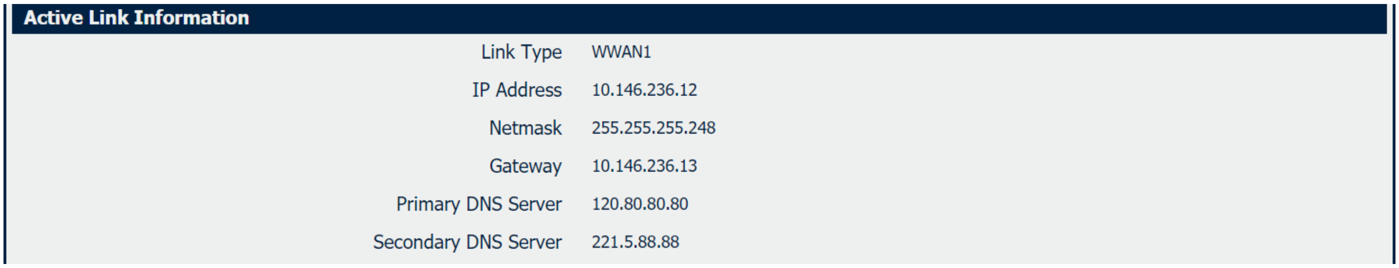
Status

System Information

Device Model	NR300-4G
System Uptime	01:25:30
System Time	2019-10-14 18:50:02
RAM Usage	31M Free/16M Shared/64M Total
Firmware Version	1.0.0 (337913f)
Kernel Version	4.4.92
Serial Number	19093014300001

System Information

- **Device Module**
  Displays the model name of router
- **System Uptime**
  Displays the duration the system has been up in hours, minutes and seconds.
- **System Time**
  Displays the current date and time.
- **RAM Usage**
  Displays the RAM capacity and the available RAM memory.
- **Firmware Version**
  Displays the current firmware version of router.
- **Kernel Version**
  Displays the current kernel version of router.
- **Serial Number**
  Display the serial number of router.



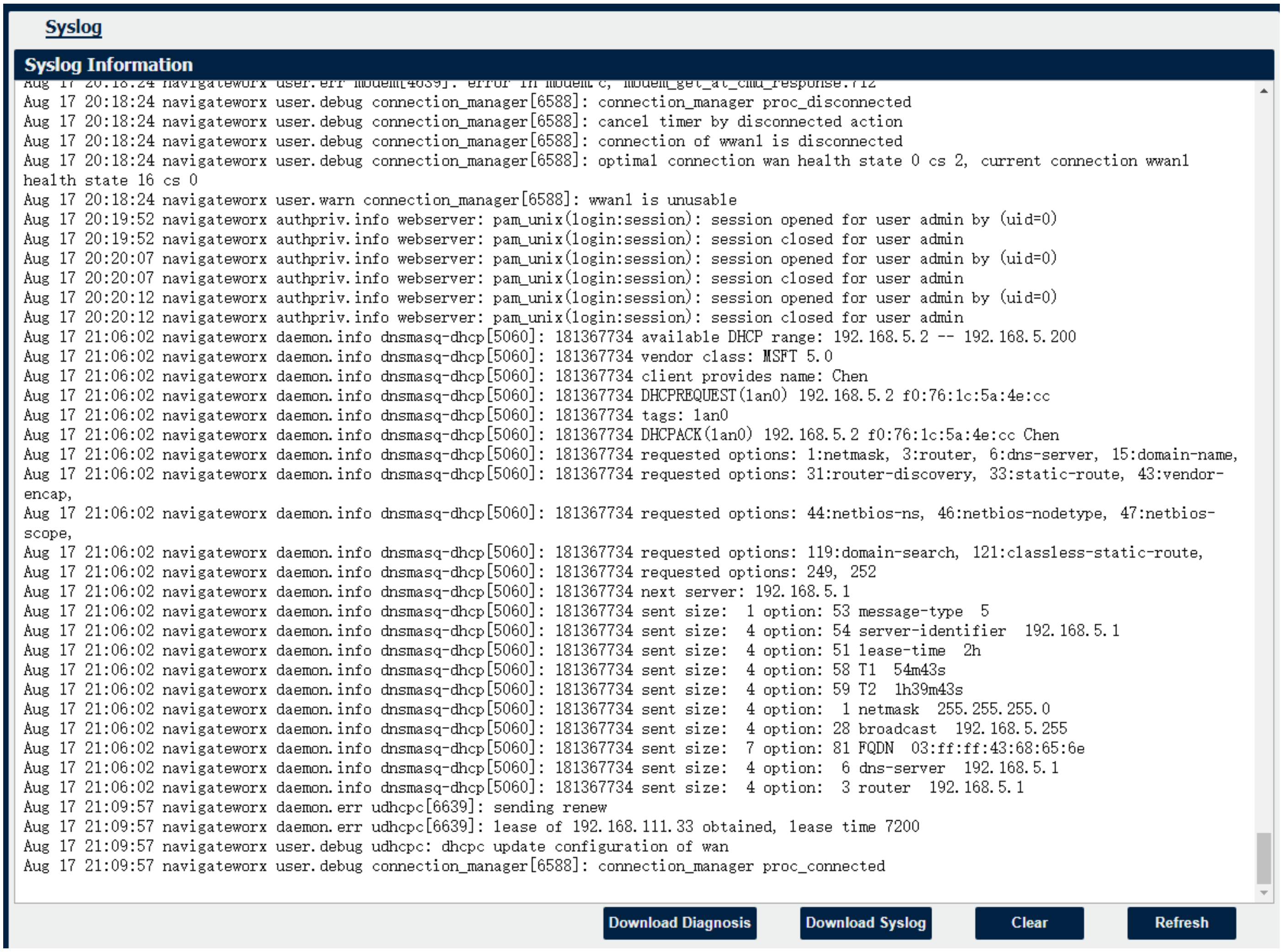
Active Link Information

Link Type	WWAN1
IP Address	10.146.236.12
Netmask	255.255.255.248
Gateway	10.146.236.13
Primary DNS Server	120.80.80.80
Secondary DNS Server	221.5.88.88

Active Link Information

- **Link Type**
  Current interface for internet access.
- **IP Address**
  Displays the IP address assigned to this interface.
- **Netmask**
  Displays the subnet mask of this interface.
- **Gateway**
  Displays the gateway of this interface. This is used for routing packets to remote networks.
- **Primary DNS Server**
  Displays the primary DNS server of this interface.
- **Secondary DNS Server**
  Displays the secondary DNS server of this interface.

4.2.2 Syslog



```
Aug 17 20:18:24 navigateworx user.err modem[4039]: error in modem.c, modem_get_at_cmd_response:712
Aug 17 20:18:24 navigateworx user.debug connection_manager[6588]: connection_manager proc_disconnected
Aug 17 20:18:24 navigateworx user.debug connection_manager[6588]: cancel timer by disconnected action
Aug 17 20:18:24 navigateworx user.debug connection_manager[6588]: connection of wwan1 is disconnected
Aug 17 20:18:24 navigateworx user.debug connection_manager[6588]: optimal connection wan health state 0 cs 2, current connection wwan1
health state 16 cs 0
Aug 17 20:18:24 navigateworx user.warn connection_manager[6588]: wwan1 is unusable
Aug 17 20:19:52 navigateworx authpriv.info webserver: pam_unix(login:session): session opened for user admin by (uid=0)
Aug 17 20:19:52 navigateworx authpriv.info webserver: pam_unix(login:session): session closed for user admin
Aug 17 20:20:07 navigateworx authpriv.info webserver: pam_unix(login:session): session opened for user admin by (uid=0)
Aug 17 20:20:07 navigateworx authpriv.info webserver: pam_unix(login:session): session closed for user admin
Aug 17 20:20:12 navigateworx authpriv.info webserver: pam_unix(login:session): session opened for user admin by (uid=0)
Aug 17 20:20:12 navigateworx authpriv.info webserver: pam_unix(login:session): session closed for user admin
Aug 17 21:06:02 navigateworx daemon.info dnsmasq-dhcp[5060]: 181367734 available DHCP range: 192.168.5.2 -- 192.168.5.200
Aug 17 21:06:02 navigateworx daemon.info dnsmasq-dhcp[5060]: 181367734 vendor class: MSFT 5.0
Aug 17 21:06:02 navigateworx daemon.info dnsmasq-dhcp[5060]: 181367734 client provides name: Chen
Aug 17 21:06:02 navigateworx daemon.info dnsmasq-dhcp[5060]: 181367734 DHCPREQUEST(lan0) 192.168.5.2 f0:76:1c:5a:4e:cc
Aug 17 21:06:02 navigateworx daemon.info dnsmasq-dhcp[5060]: 181367734 tags: lan0
Aug 17 21:06:02 navigateworx daemon.info dnsmasq-dhcp[5060]: 181367734 DHCPACK(lan0) 192.168.5.2 f0:76:1c:5a:4e:cc Chen
Aug 17 21:06:02 navigateworx daemon.info dnsmasq-dhcp[5060]: 181367734 requested options: 1:netmask, 3:router, 6:dns-server, 15:domain-name,
Aug 17 21:06:02 navigateworx daemon.info dnsmasq-dhcp[5060]: 181367734 requested options: 31:router-discovery, 33:static-route, 43:vendor-
encap,
Aug 17 21:06:02 navigateworx daemon.info dnsmasq-dhcp[5060]: 181367734 requested options: 44:netbios-ns, 46:netbios-nodetype, 47:netbios-
scope,
Aug 17 21:06:02 navigateworx daemon.info dnsmasq-dhcp[5060]: 181367734 requested options: 119:domain-search, 121:classless-static-route,
Aug 17 21:06:02 navigateworx daemon.info dnsmasq-dhcp[5060]: 181367734 requested options: 249, 252
Aug 17 21:06:02 navigateworx daemon.info dnsmasq-dhcp[5060]: 181367734 next server: 192.168.5.1
Aug 17 21:06:02 navigateworx daemon.info dnsmasq-dhcp[5060]: 181367734 sent size:  1 option: 53 message-type  5
Aug 17 21:06:02 navigateworx daemon.info dnsmasq-dhcp[5060]: 181367734 sent size:  4 option: 54 server-identifier  192.168.5.1
Aug 17 21:06:02 navigateworx daemon.info dnsmasq-dhcp[5060]: 181367734 sent size:  4 option: 51 lease-time  2h
Aug 17 21:06:02 navigateworx daemon.info dnsmasq-dhcp[5060]: 181367734 sent size:  4 option: 58 T1  54m43s
Aug 17 21:06:02 navigateworx daemon.info dnsmasq-dhcp[5060]: 181367734 sent size:  4 option: 59 T2  1h39m43s
Aug 17 21:06:02 navigateworx daemon.info dnsmasq-dhcp[5060]: 181367734 sent size:  4 option:  1 netmask  255.255.255.0
Aug 17 21:06:02 navigateworx daemon.info dnsmasq-dhcp[5060]: 181367734 sent size:  4 option: 28 broadcast  192.168.5.255
Aug 17 21:06:02 navigateworx daemon.info dnsmasq-dhcp[5060]: 181367734 sent size:  7 option: 81 FQDN  03:ff:ff:43:68:65:6e
Aug 17 21:06:02 navigateworx daemon.info dnsmasq-dhcp[5060]: 181367734 sent size:  4 option:  6 dns-server  192.168.5.1
Aug 17 21:06:02 navigateworx daemon.info dnsmasq-dhcp[5060]: 181367734 sent size:  4 option:  3 router  192.168.5.1
Aug 17 21:09:57 navigateworx daemon.err udhcpc[6639]: sending renew
Aug 17 21:09:57 navigateworx daemon.err udhcpc[6639]: lease of 192.168.111.33 obtained, lease time 7200
Aug 17 21:09:57 navigateworx user.debug udhcpc: dhcpc update configuration of wan
Aug 17 21:09:57 navigateworx user.debug connection_manager[6588]: connection_manager proc_connected
```

Syslog Information

- **Download Diagnosis**
  Download the Diagnosis file for analysis.

- **Download Syslog**
  Download the complete syslog since last reboot.

- **Clear**

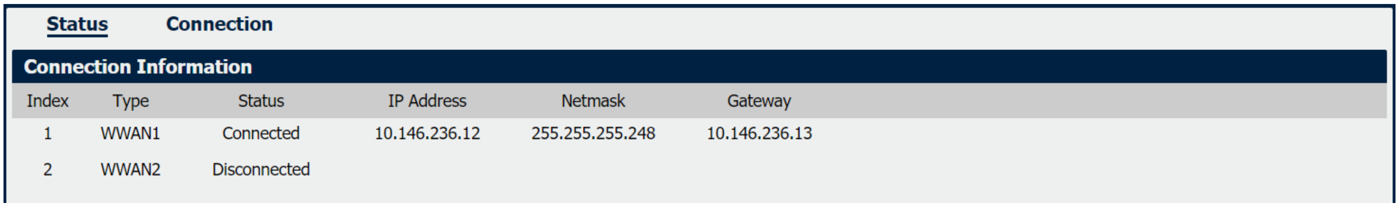
  Clear the current page syslog printing.

- **Refresh**
  Reload the current page with latest syslog printing.

4.3 Link Management

This section shows you the setup of link management.

4.3.1 Connection Manager

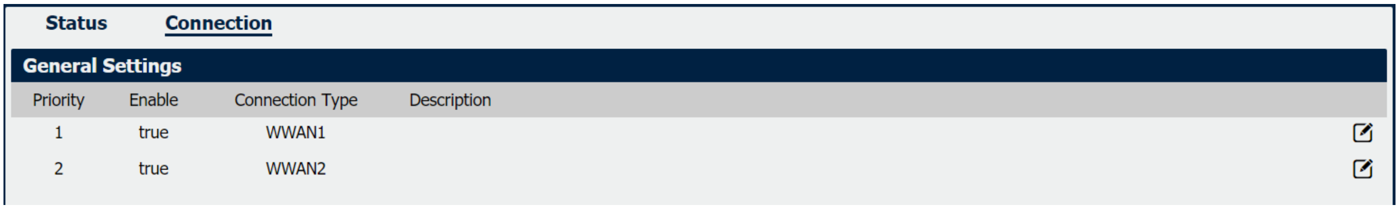


Connection Information

Index	Type	Status	IP Address	Netmask	Gateway
1	WWAN1	Connected	10.146.236.12	255.255.255.248	10.146.236.13
2	WWAN2	Disconnected			

Connection Manager->Status

- **Type**
  Displays the connection interface
- **Status**
  Displays the connection status of this interface.
- **IP Address**
  Displays the IP Address of this interface.
- **Netmask**
  Displays the subnet mask of this interface.
- **Gateway**
  Displays the gateway of this interface. This is used for routing packets to remote networks.



General Settings

Priority	Enable	Connection Type	Description	
1	true	WWAN1		✎
2	true	WWAN2		✎

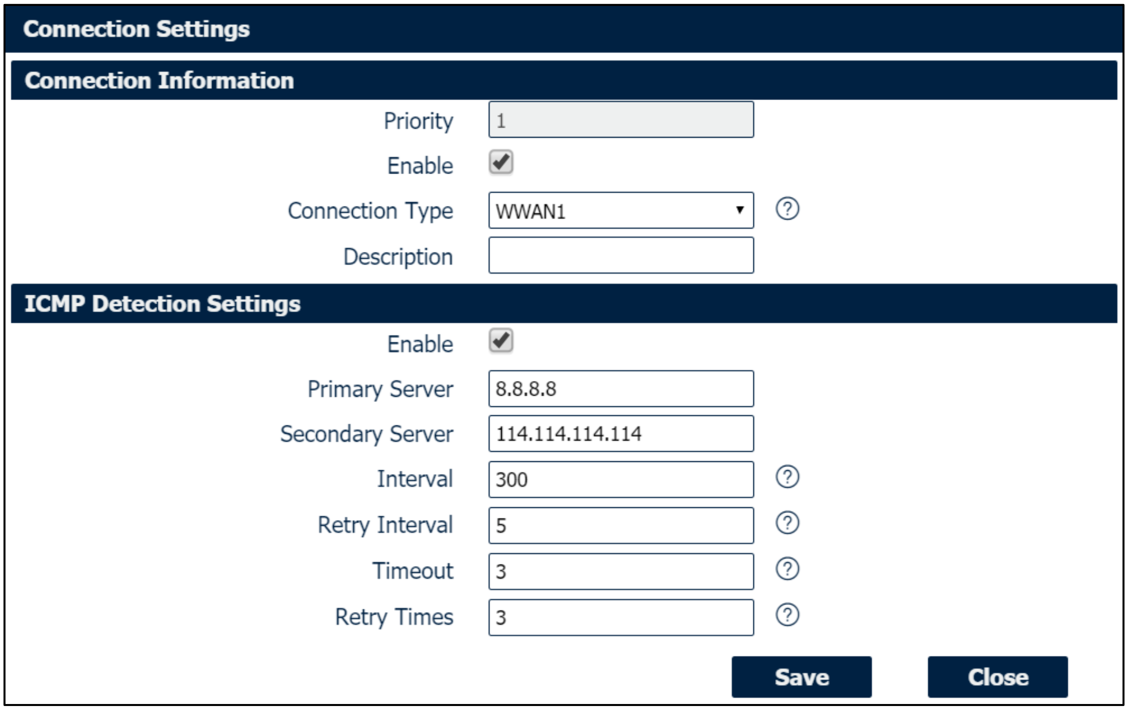
Click ⊕ to add a new priority interface.

Click ✎ to edit current interface settings.

Click ⊗ to delete current interface.

Connection Manager->Connection

- **Priority**
  Displays the priority list of default routing selection.
- **Enable**
  Displays the connection enable status.
- **Connection Type**
  Displays the name of this interface.
- **Description**
  Displays the description of this connection.



Connection Settings

Connection Information

Priority	1
Enable	☑
Connection Type	WWAN1
Description	

ICMP Detection Settings

Enable	☑
Primary Server	8.8.8.8
Secondary Server	114.114.114.114
Interval	300
Retry Interval	5
Timeout	3
Retry Times	3

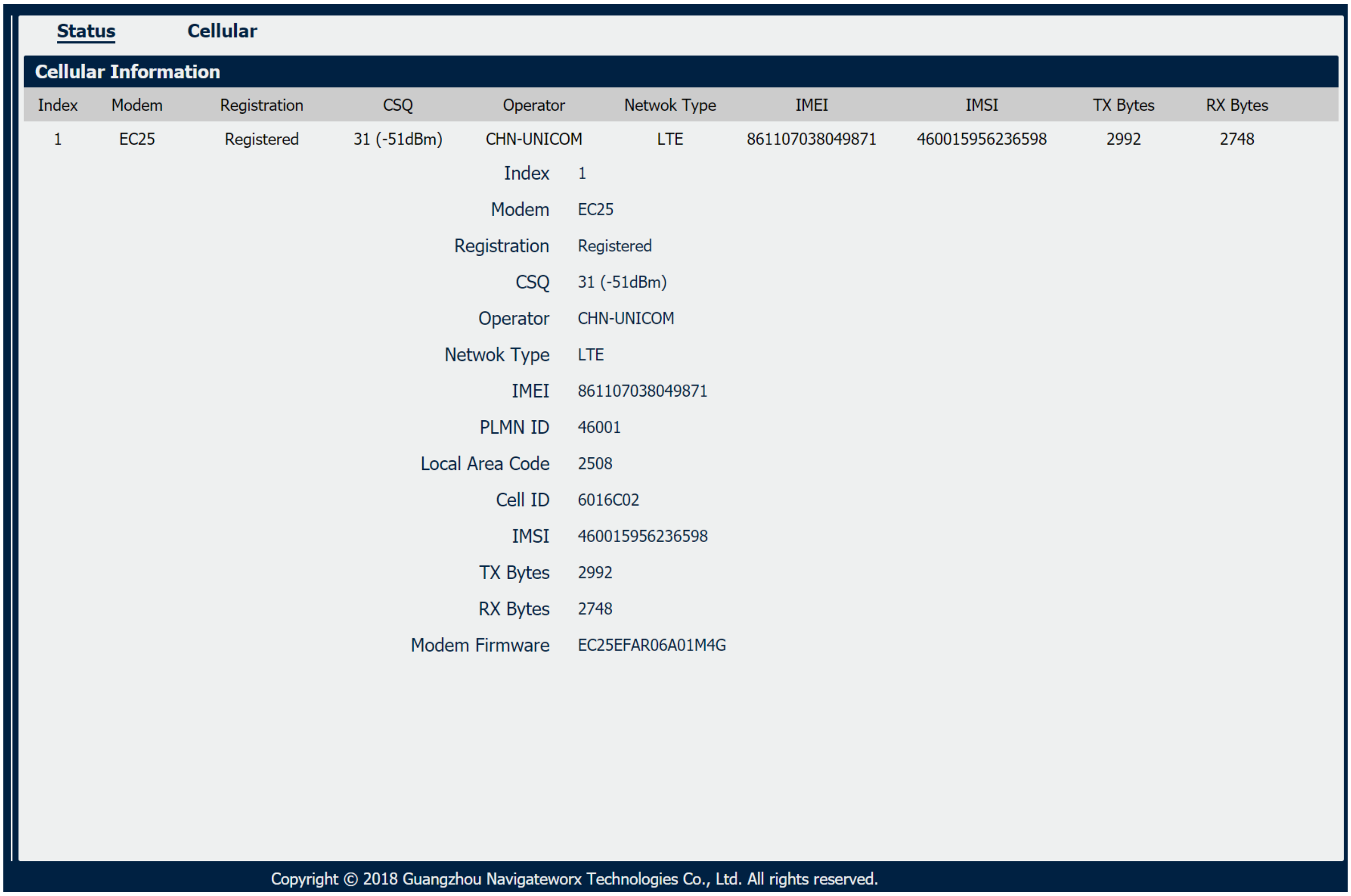
Connection Settings

- **Priority**
  Displays current index on priority list.
- **Connection Type**
  Select the available interface as outbound link.
  NOTE: specify SIM1 carrier link as WWAN1, SIM2 carrier link as WWAN2.
- **ICMP Detection Settings->Enable**
  Check this box to detect link connection status based on pings to a specified IP address.
- **Primary Server**
  Enter the primary IP address that pings will be sent to, to detect the link state. Recommend entering the IP address of known external reachable server or network (e.g. 8.8.8.8).
- **Secondary Server**
  Enter the secondary IP address that pings will be sent to, when the primary server is ping failed, router would try to ping the secondary server.

- **Interval**
  The duration of each ICMP detection in seconds.
- **Retry Interval**
  The interval in seconds between each ping if no packets have been received.
- **Timeout**
  Enter timeout for received ping reply to determine the ICMP detection failure.
- **Retry Times**
  Specify the retry times for ICMP detection.

4.3.2 Cellular

NR300 Router main function is connecting to Internet by cellular modem.



Cellular Information

Index	Modem	Registration	CSQ	Operator	Netwok Type	IMEI	IMSI	TX Bytes	RX Bytes
1	EC25	Registered	31 (-51dBm)	CHN-UNICOM	LTE	861107038049871	460015956236598	2992	2748

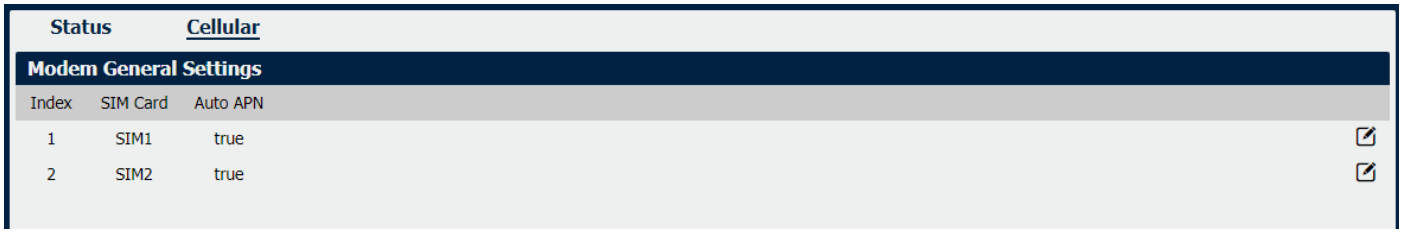
Index	1
Modem	EC25
Registration	Registered
CSQ	31 (-51dBm)
Operator	CHN-UNICOM
Netwok Type	LTE
IMEI	861107038049871
PLMN ID	46001
Local Area Code	2508
Cell ID	6016C02
IMSI	460015956236598
TX Bytes	2992
RX Bytes	2748
Modem Firmware	EC25EFAR06A01M4G

Cellular->Status

- **Modem**
  Displays the module of the modem used by this WWAN interface.
- **Registration**
  Displays the registration status of SIM card.
- **CSQ**
  Displays the signal strength of the carrier network.
- **Operator**
  Displays the wireless network provider.
- **Network Type**
  Displays the RF technology currently active. Example: LTE, UMTS, or CDMA.
- **IMEI**
  International Mobile Electronic Identifier. Depending on the carrier and technology used, this may be required for the carrier when activating the data contract. In some cases this will be blank.

- **PLMN ID**

  Displays the current PLMN ID, including MCC, MNC, LAC and Cell ID.
- **Local Area Code**
  Displays the location area code of the SIM card.
- **Cell ID**
  Displays the Cell ID of the SIM card location.
- **IMSI**
  International Mobile Subscriber Identity, as read from the SIM. This is the user's network subscription.
- **TX Bytes**
  Displays the total bytes transmitted since the time the unit was connected. NR300 router would record this data with same SIM card, reboot would not erase this data.
- **RX Bytes**
  Displays the total bytes received since the time the unit was connected. NR300 router would record this data with same SIM card, reboot would not erase this data.
- **Modem Firmware**
  Displays firmware version of the module used by the WWAN interface.

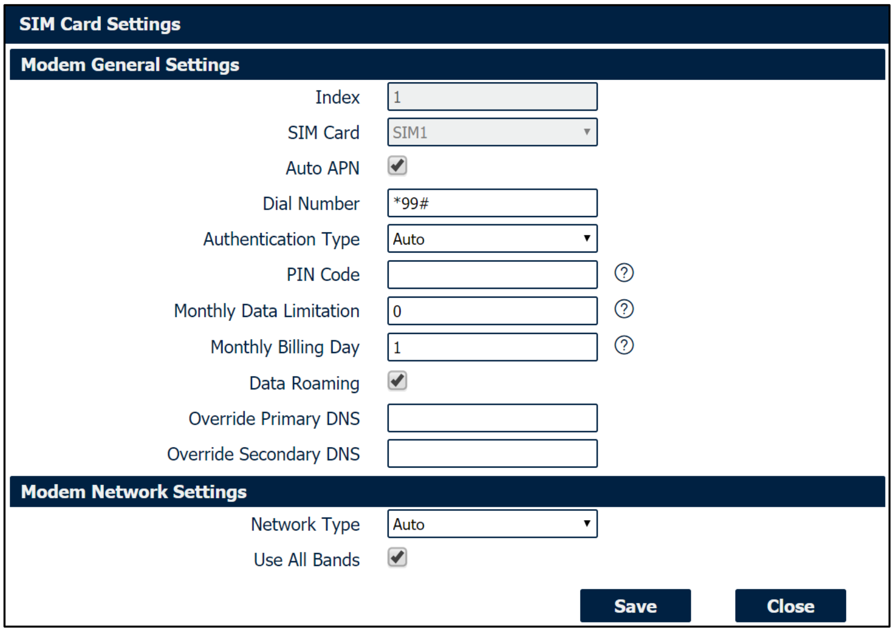


Modem General Settings

Index	SIM Card	Auto APN	
1	SIM1	true	✎
2	SIM2	true	✎

Cellular

- **SIM Card**
  Displays the SIM card support on this unit.
- **Auto APN**
  Displays the Enable status of auto APN function.



SIM Card Settings

Modem General Settings

Index	1
SIM Card	SIM1
Auto APN	☑
Dial Number	*99#
Authentication Type	Auto
PIN Code	
Monthly Data Limitation	0
Monthly Billing Day	1
Data Roaming	☑
Override Primary DNS	
Override Secondary DNS	

Modem Network Settings

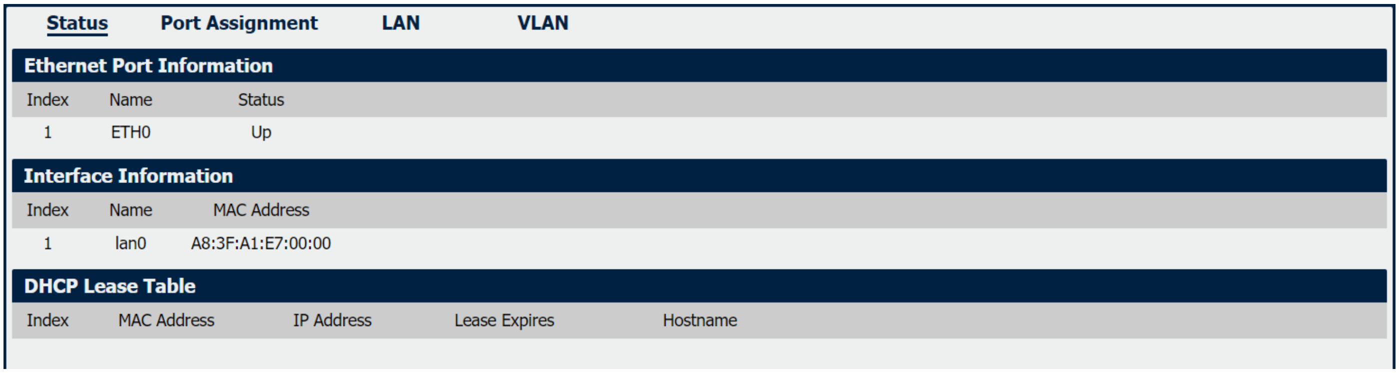
Network Type	Auto
Use All Bands	☑

SIM Card Settings

- **SIM Card**
  Displays the current SIM card settings.
- **Auto APN**
  Check this box enable auto checking the Access Point Name provided by the carrier.
- **Dial Number**
  Enter the dial number of the carrier.
- **Authentication Type**
  Authentication method used by the carrier. Possible selections are Auto, PAP, CHAP.
- **PIN Code**
  Enter a 4-8 characters PIN code to unlock the SIM.
- **Monthly Data Limitation**
  Enter the data total amount for SIM card, SIM card switchover when data reach limitation.
- **Monthly Billing Day**
  Enter the date of renew data amount every month.
- **Data Roaming**
  Enable or disable the data roaming function on the router.
- **Override Primary DNS**
  Enter the primary DNS server will override the automatically obtained DNS.
- **Override Secondary DNS**
  Enter the secondary DNS server will override the automatically obtained DNS.
- **Network Type**
  Select the mode of operation of the cell module (Auto, 4G Firstly, 4G Only, etc.).
- **Use All Bands**
  Check this box to enable all bands selection or choose specified bands.

4.3.3 Ethernet

The same instructions apply to settings for all Ethernet interfaces.



Ethernet Port Information

Index	Name	Status
1	ETH0	Up

Interface Information

Index	Name	MAC Address
1	lan0	A8:3F:A1:E7:00:00

DHCP Lease Table

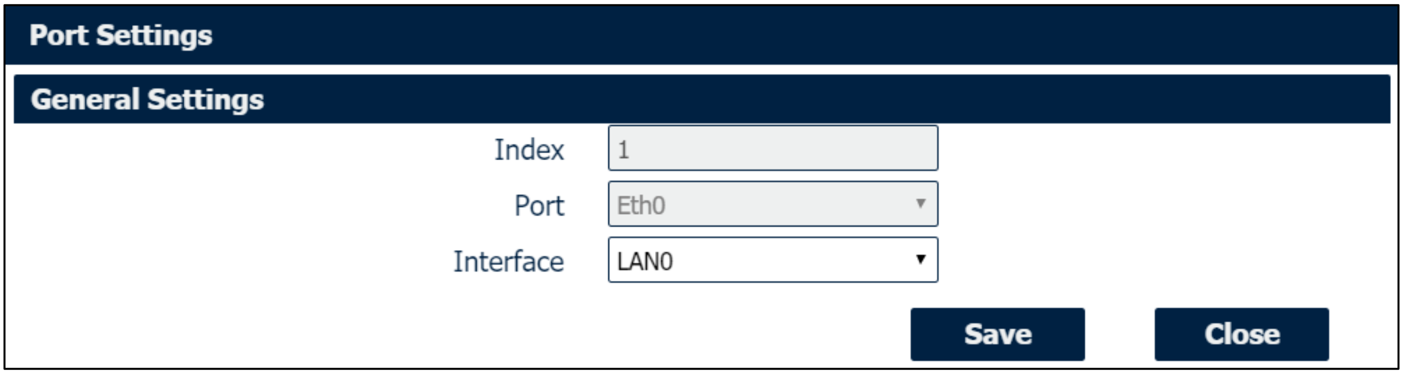
Index	MAC Address	IP Address	Lease Expires	Hostname

Ethernet->Status

- **Ethernet Port Information**
  Displays the port physical connected states.
- **Interface Information**
  Displays the name and MAC address of Ethernet interface.
- **DHCP Lease Table**
  Displays the current IP address assigned to DHCP client.

Ethernet->Port Assignment

- **Port**
  Displays the port states and numbers of this unit.
- **Interface**
  Displays the port states of belong subnet.



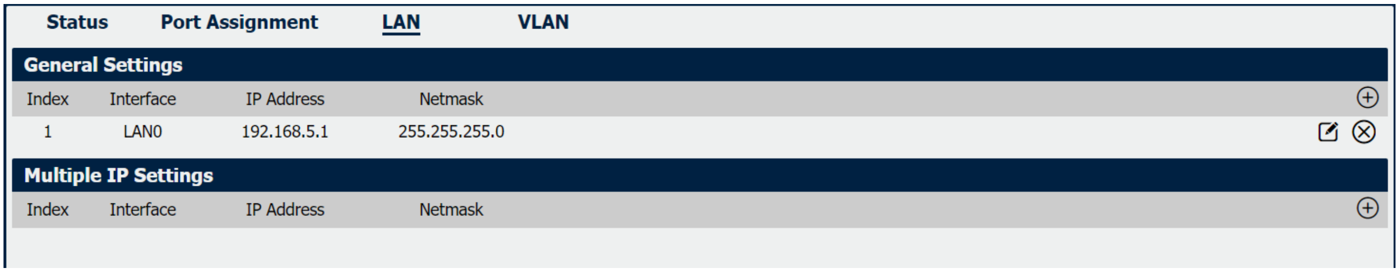
Port Settings

General Settings

Index	1
Port	Eth0
Interface	LAN0

Ethernet->Port Settings

- **Port**
  Indicate the current configurate port.
- **Interface**
  Select belong subnet for current configurate port.



General Settings

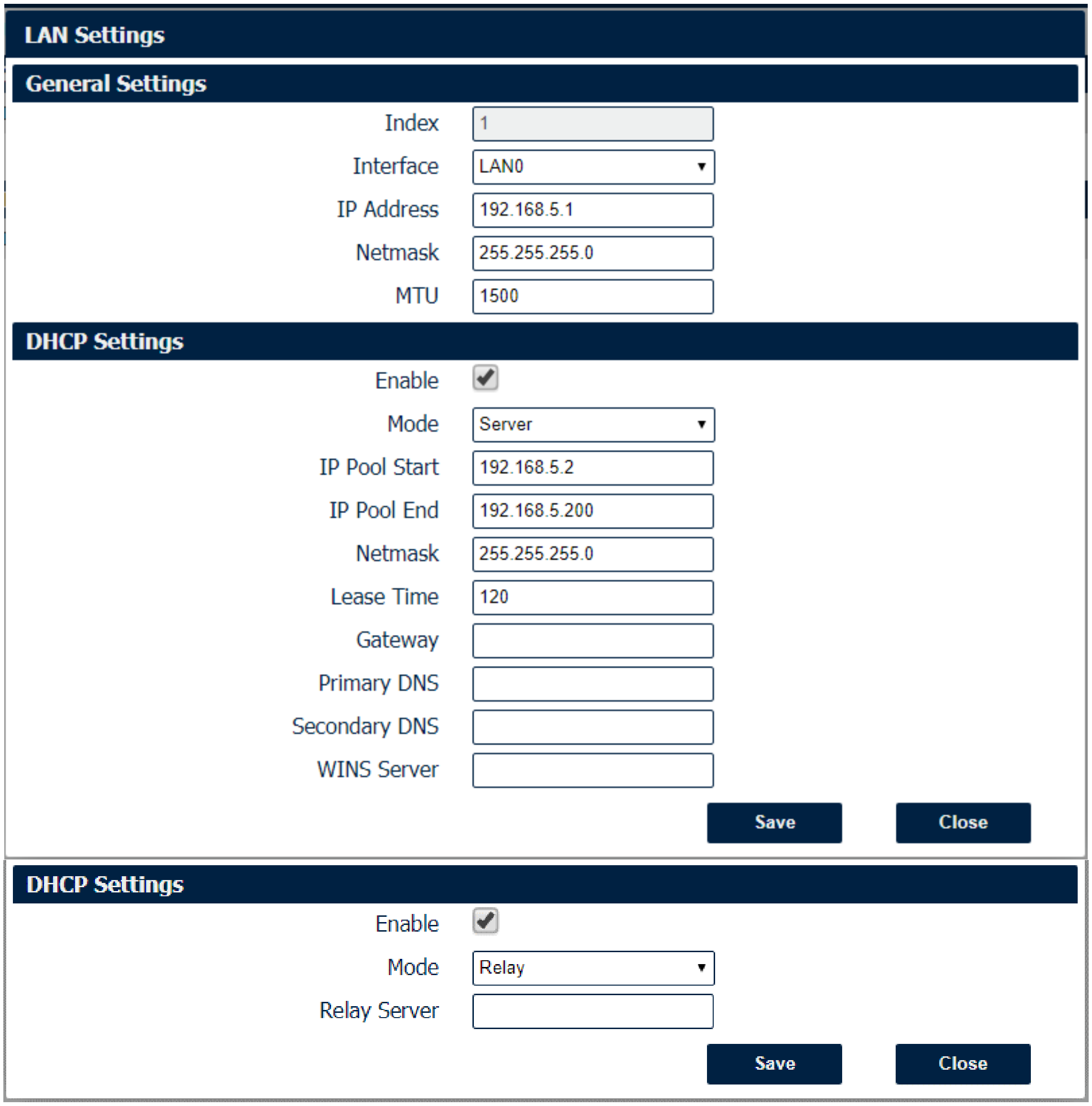
Index	Interface	IP Address	Netmask
1	LAN0	192.168.5.1	255.255.255.0

Multiple IP Settings

Index	Interface	IP Address	Netmask

Ethernet->LAN

- **Interface**
  Displays current name of LAN subnet.
- **IP Address**
  Displays LAN IP address of this subnet.
- **Netmask**
  Displays subnet mask for this subnet.



LAN Settings

General Settings

Index	1
Interface	LAN0 ▾
IP Address	192.168.5.1
Netmask	255.255.255.0
MTU	1500

DHCP Settings

Enable	☑
Mode	Server ▾
IP Pool Start	192.168.5.2
IP Pool End	192.168.5.200
Netmask	255.255.255.0
Lease Time	120
Gateway	
Primary DNS	
Secondary DNS	
WINS Server	

DHCP Settings

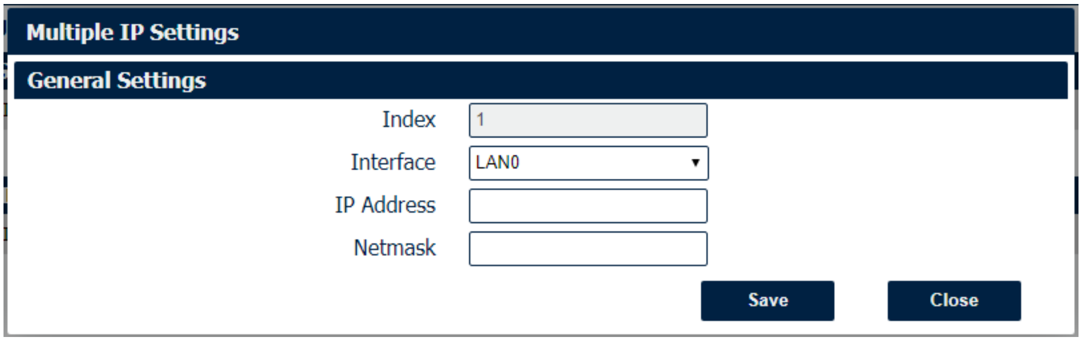
Enable	☑
Mode	Relay ▾
Relay Server	

Ethernet->LAN

- **Interface**
  Select the configurate LAN port of this subnet.
- **IP Address**
  Enter LAN IP address for this interface.
- **Netmask**
  Enter subnet mask for this subnet.
- **MTU**
  Maximum Transmission Unit, maximum packet size allowed to be transmitted. Should be left as default value of 1500 in most cases.
- **Enable**
  Check this box to enable DHCP feature on current LAN port.
- **Mode**

Select the DHCP working mode from “Server” or “Relay”.

- **Relay Server**
  Enter the IP address of DHCP relay server.
- **IP Pool Start**
  External LAN devices connected to this unit will be assigned IP address in this range when DHCP is enabled. This is the beginning of the pool of IP addresses.
- **IP Pool End**
  This is the end of the pool of IP addresses.
- **Netmask**
  Subnet mask of the IP address obtained by DHCP clients from DHCP server.
- **Lease Time**
  The lease time of the IP address obtained by DHCP clients from DHCP server.
- **Gateway**
  The gateway address obtained by DHCP clients from DHCP server.
- **Primary DNS**
  Primary DNS server address obtained by DHCP clients from DHCP server.
- **Secondary DNS**
  Secondary DNS server address obtained by DHCP clients from DHCP server.
- **WINS Server**
  Windows Internet Naming Service obtained by DHCP clients from DHCP server.



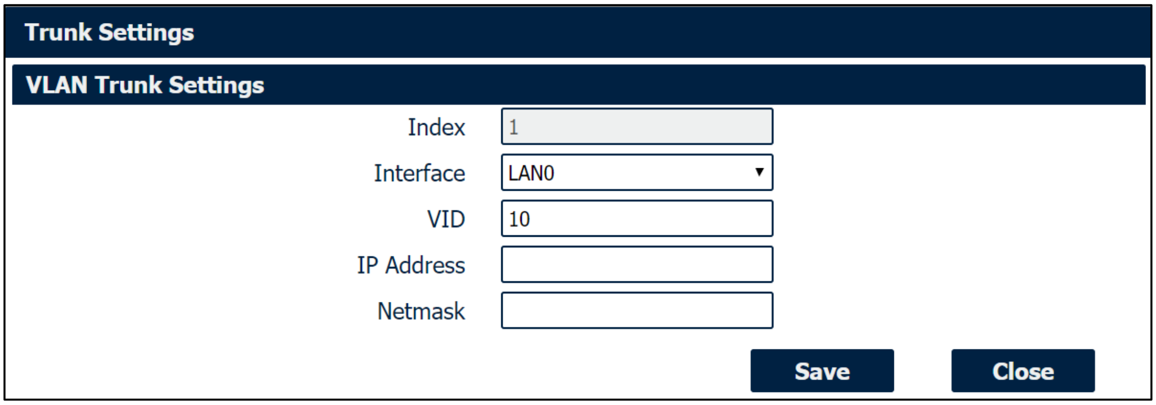
Multiple IP Settings

General Settings

Index	1
Interface	LAN0
IP Address	
Netmask	

Ethernet->LAN->Multiple IP Settings

- **Interface**
  Select the configurate LAN port of this subnet.
- **IP Address**
  Enter multiple IP address for this interface.
- **Netmask**
  Enter subnet mask for this subnet.


Trunk Settings

VLAN Trunk Settings

Index	1
Interface	LAN0
VID	10
IP Address	
Netmask	

Ethernet->VLAN->VLAN Trunk Settings

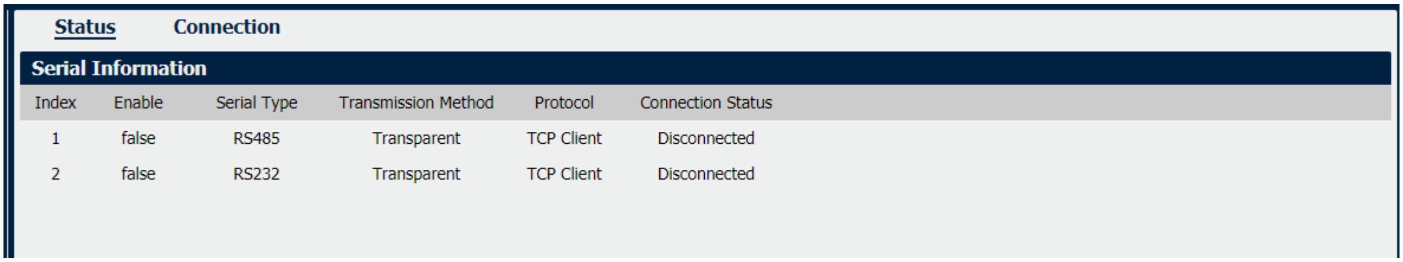
- **Interface**
  Select the LAN port for VLAN trunk.
- **VID**
  Specify the VLAN ID for VLAN trunk.
- **IP Address**
  Enter IP address for this VLAN trunk.
- **Netmask**
  Enter subnet mask for this VLAN trunk.

4.4 Industrial Interface

The Industrial page contains tabs for making configuration settings for Serial RS232 and RS485. Select Serial from the main navigation menu to navigate to this page.

4.4.1 Serial

You could review the status of serial connection.

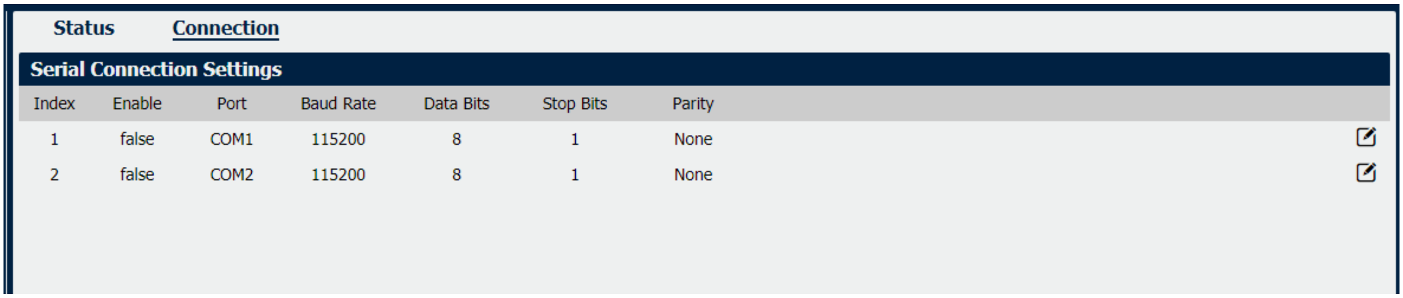


Serial Information

Index	Enable	Serial Type	Transmission Method	Protocol	Connection Status
1	false	RS485	Transparent	TCP Client	Disconnected
2	false	RS232	Transparent	TCP Client	Disconnected

Serial->Status

- **Enable**
  Displays status of current serial function.
- **Serial Type**
  Displays the serial type of COM port.
- **Transmission Method**
  Displays the transmission method of this serial port.
- **Protocol**
  Displays the protocol used by this serial port.
- **Connection Status**
  Displays the connection status of this serial port.



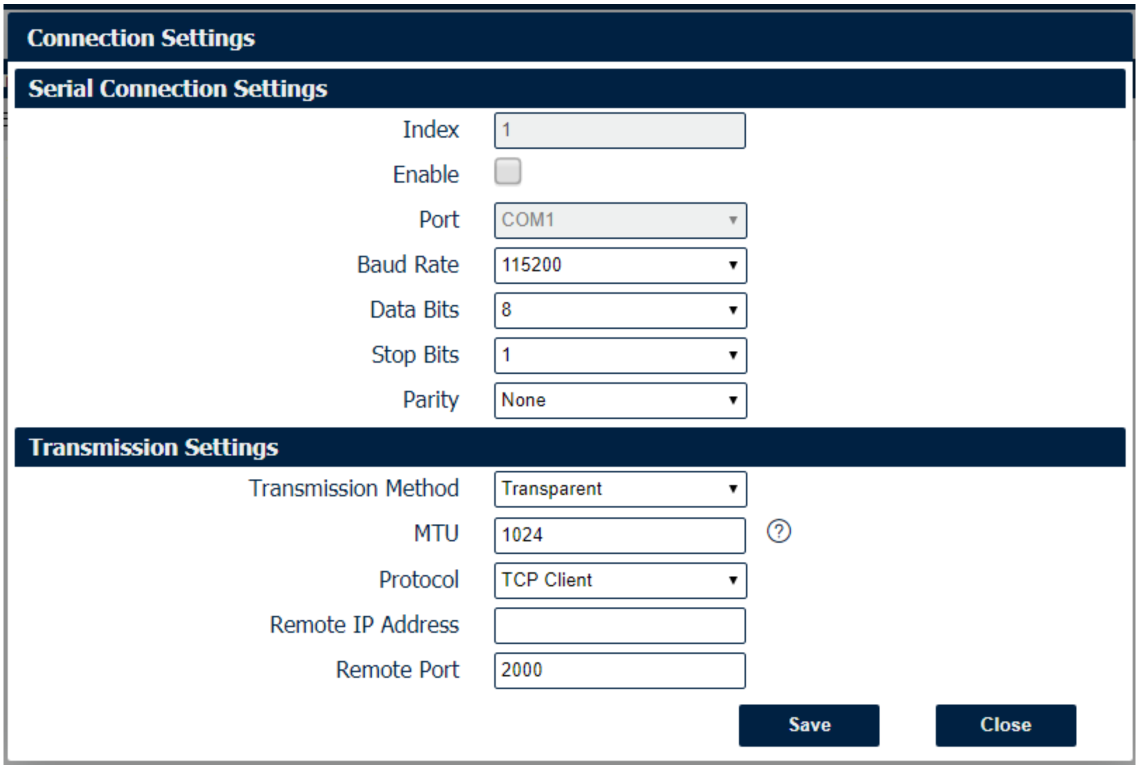
Status Connection

Serial Connection Settings

Index	Enable	Port	Baud Rate	Data Bits	Stop Bits	Parity
1	false	COM1	115200	8	1	None
2	false	COM2	115200	8	1	None

Serial->Connection

- **Enable**
  Displays status of current serial function.
- **Port**
  Displays the serial type of COM port.
- **Baud Rate**
  Displays the serial port baud rate.
- **Data Bits**
  Displays the serial port Data Bits.
- **Stop Bits**
  Displays the serial port Stop Bits.
- **Parity**
  Displays the serial port parity.



Connection Settings

Serial Connection Settings

Index	1
Enable	□
Port	COM1
Baud Rate	115200
Data Bits	8
Stop Bits	1
Parity	None

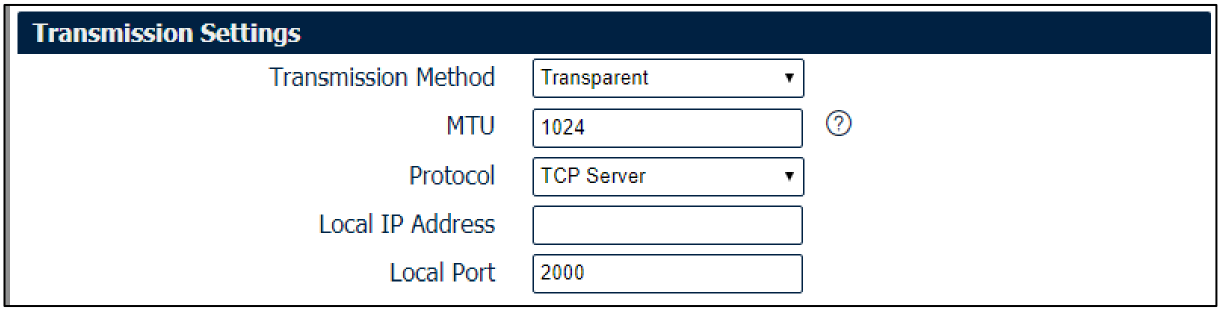
Transmission Settings

Transmission Method	Transparent
MTU	1024
Protocol	TCP Client
Remote IP Address	
Remote Port	2000

Serial->Connection Settings

- **Baud Rate**
  Select the serial port baud rate. Supported values are 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, or 115200.
- **Data Bits**
  Select the values from 7 or 8.
- **Stop Bits**
  Select the values from 1 or 2.
- **Parity**
  Select values from none, even, odd.
- **Transmission Method**
  Select the transmission method for serial port. Optional for "Transparent", "Modbus RTU Gateway" and "Modbus ASCII Gateway".
- **MTU**
  Maximum Transmission Unit, maximum packet size allowed to be transmitted. Should be left as default value of 1024 in most cases.
- **Protocol**
  Select the mode for Serial IP communication. Supported modes are UDP, TCP Server, or TCP Client.
- **Remote IP Address**
  Enter the IP address of the remote server.
- **Remote Port**
  Enter the port number of the remote server.

Below window displays different settings when you select **TCP Server** on Protocol.



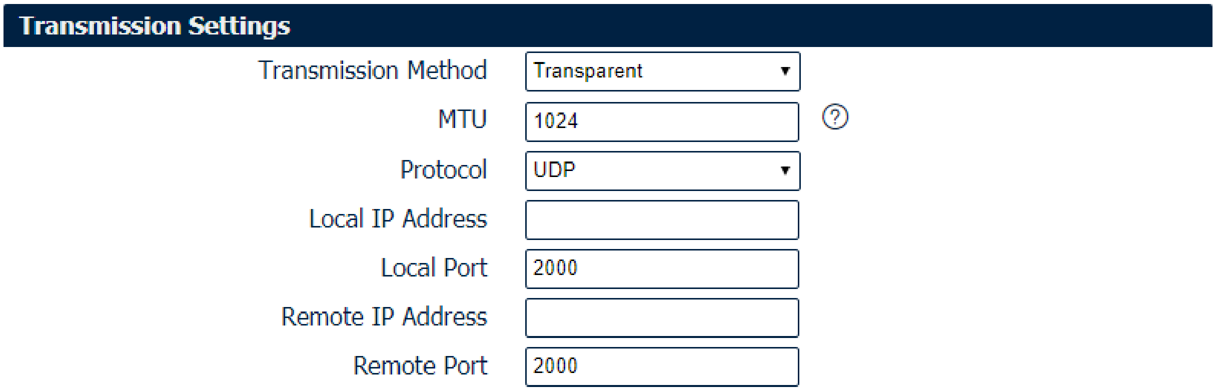
Transmission Settings

Transmission Method	Transparent
MTU	1024
Protocol	TCP Server
Local IP Address	
Local Port	2000

Serial->Connection Settings

- **Local IP Address**
  Enter the IP Address of the local endpoint.
- **Local Port**
  The port number assigned to the serial IP port on which communications will take place.

Below window displays different settings when you select **UDP** on Protocol.



Transmission Settings

Transmission Method	Transparent
MTU	1024
Protocol	UDP
Local IP Address	
Local Port	2000
Remote IP Address	
Remote Port	2000

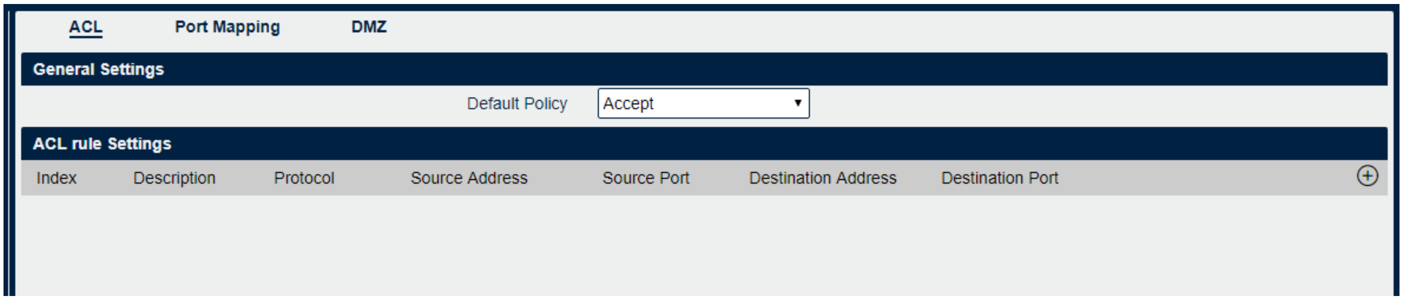
Serial->Connection Settings

- **Local IP Address**
  Enter the IP Address of the local endpoint.
- **Local Port**
  The port number assigned to the serial IP port on which communications will take place.
- **Remote IP Address**
  Enter the IP address of the remote server.
- **Remote Port**
  Enter the port number of the remote server.

4.5 Network

4.5.1 Firewall

Firewall rules are security rule-sets to implement control over users, applications or network objects in an organization. Using the firewall rule, you can create blanket or specialized traffic transit rules based on the requirement.



General Settings

Default Policy: Accept

ACL rule Settings

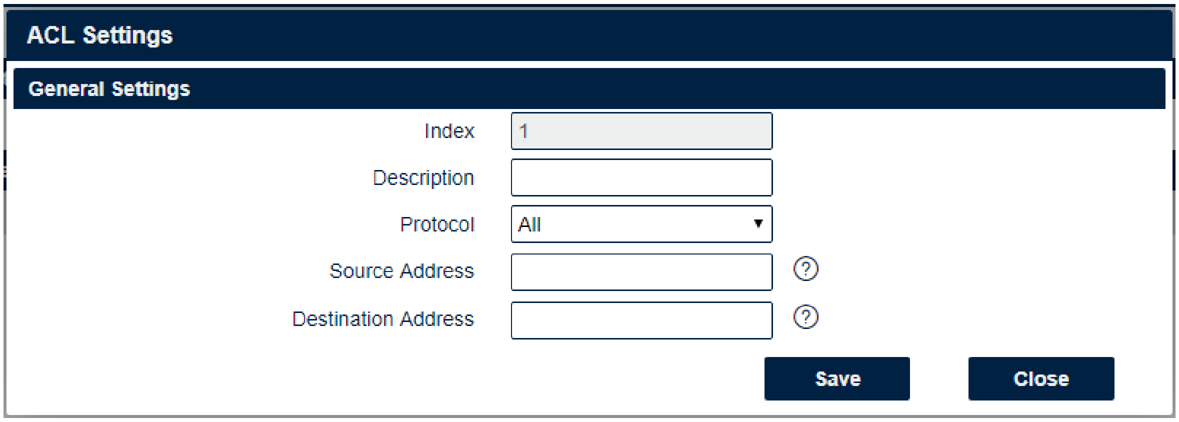
Index	Description	Protocol	Source Address	Source Port	Destination Address	Destination Port

Firewall->ACL

- **Default Policy**

Select the "Accept" or "Drop" from the list, the packets which are not included in the access control list will be processed by the default filter policy.

An access control list (ACL), with respect to a computer file system, is a list of permissions attached to an object. An ACL specifies which users or system processes are granted access to objects, as well as what operations are allowed on given objects.



ACL Settings

General Settings

Index: 1

Description:

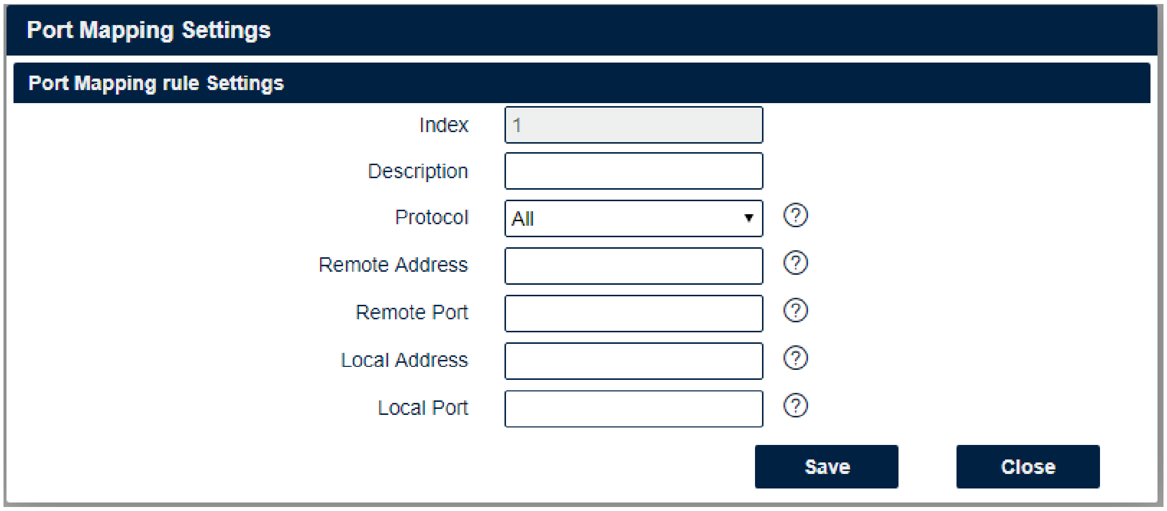
Protocol: All

Source Address:

Destination Address:

Firewall->ACL

- **Description**
  Add a description for this rule.
- **Protocol**
  All: Any protocol number.
  TCP: The TCP protocol.
  UDP: The UDP protocol.
  TCP & DUP: both TCP and UDP protocol
  ICMP: The ICMP protocol.
- **Source Address**
  A specific host IP address can also be specified, or a range of IP addresses via a bitmask (the box following the /).
- **Destination Address**
  A specific IP address can also be specified, or a range of IP addresses via a bitmask (the box following the /).



Port Mapping Settings

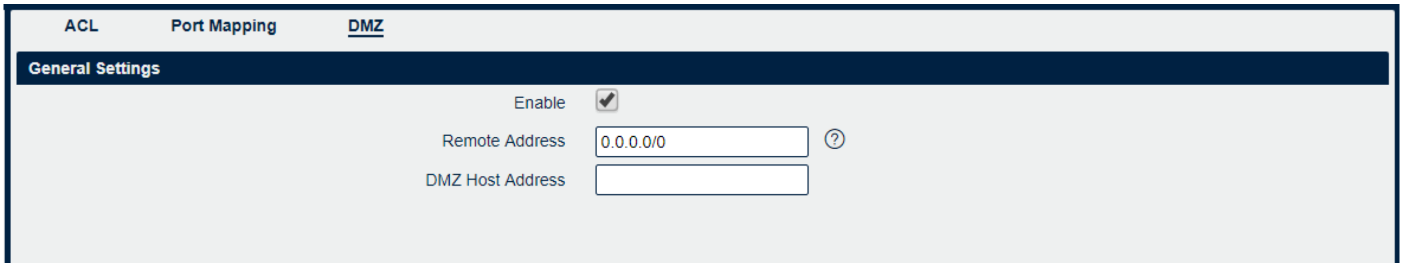
Port Mapping rule Settings

Index	1
Description	
Protocol	All
Remote Address	
Remote Port	
Local Address	
Local Port	

Firewall->Port Mapping

- **Description**
  Add a description for this rule.
- **Protocol**
  All: Any protocol number.
  TCP: The TCP protocol.
  UDP: The UDP protocol.
- **Remote Address**
  Enter a WAN IP address that is allowed to access the unit.
- **Remote Port**
  Enter the external port number range for incoming requests.
- **Local Address**
  Sets the LAN address of a device connected to one of the Fusion’s LAN interfaces. Inbound requests will be forwarded to this IP address.

- **Local Port**
  Sets the LAN port number range used when forwarding to the destination IP address.



General Settings

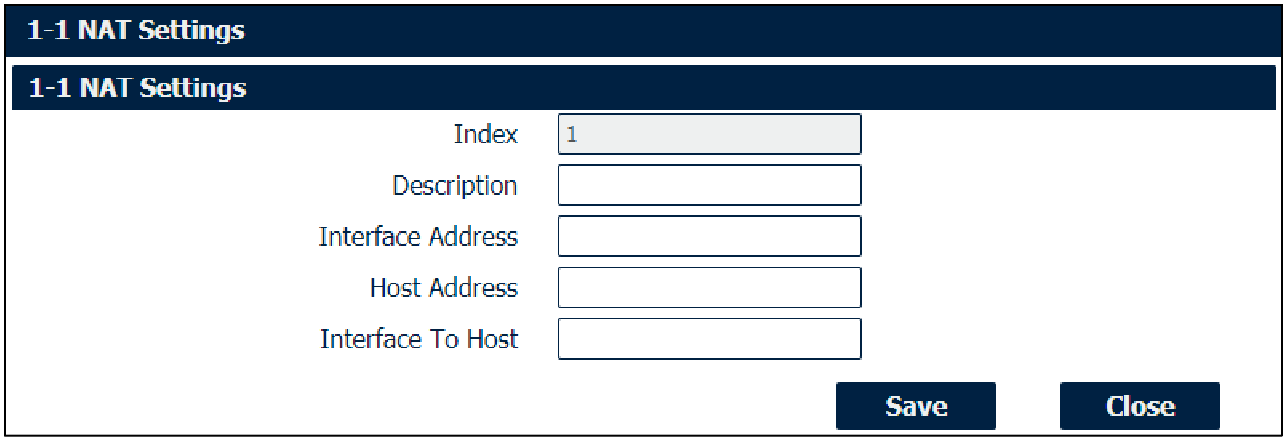
Enable ☑

Remote Address 0.0.0.0/0

DMZ Host Address

Firewall->DMZ

- **Enable**
  Check this box to enable DMZ function.
- **Remote Address**
  Optionally restricts DMZ access to only the specified WAN IP address.
  NOTE: If set to 0.0.0.0/0, the DMZ is open to all incoming WAN IP addresses.
- **DMZ Host Address**
  The WAN IP address which has all ports exposed except ports defined in the Port Forwarding configuration.



1-1 NAT Settings

1-1 NAT Settings

Index 1

Description

Interface Address

Host Address

Interface To Host

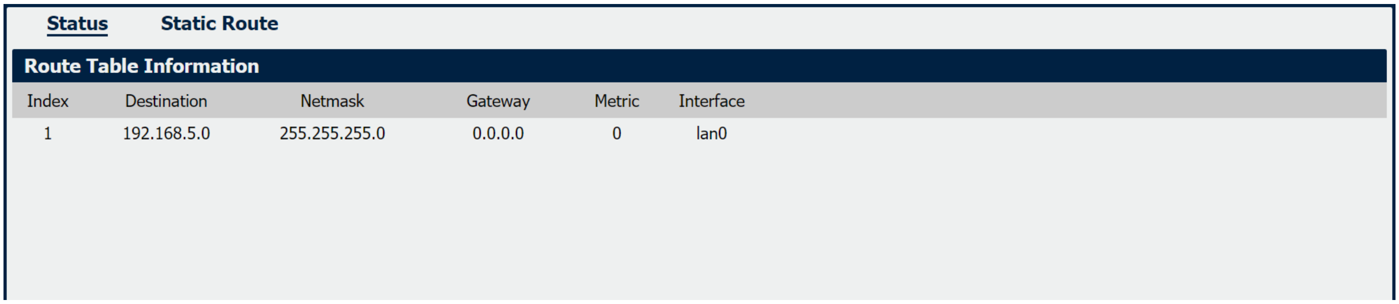
Firewall->NAT

- **Description**
  Enter a description of 1-to-1 NAT setting.
- **Interface Address**
  Specify the interface address that need to be accessed before NAT.
- **Host Address**
  Specify the host address that need to be accessed after NAT.
- **Interface To Address**
  Specify the interface that connected to host, like lan0, lan1, lan2, lan3.

4.5.2 Route

Static Routing refers to a manual method of setting up routing between networks. Select the Static Routing tab to add static routes to the Static Route Table.

Please refer current route table as below.



Route Table Information

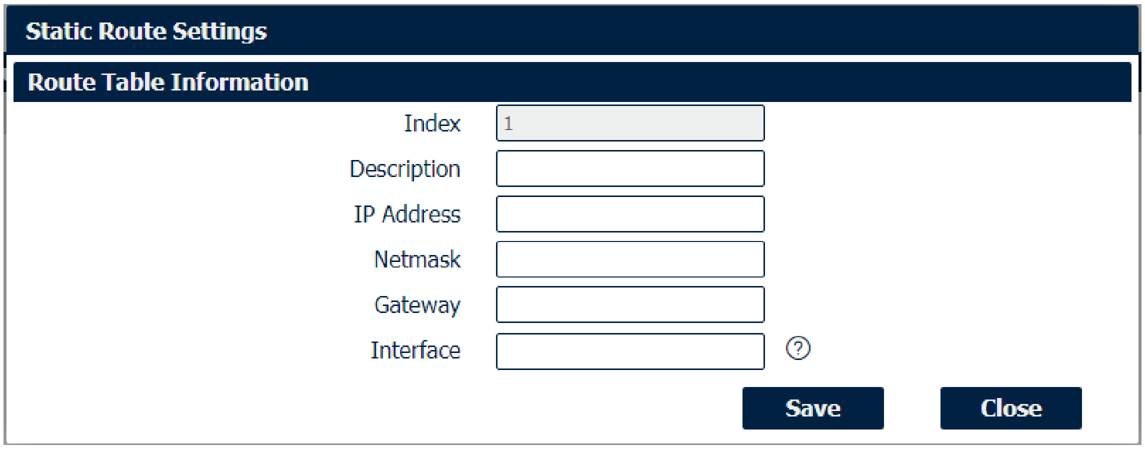
Index	Destination	Netmask	Gateway	Metric	Interface
1	192.168.5.0	255.255.255.0	0.0.0.0	0	lan0

Route->Route Table Information

- **Destination**
  Displays the destination of routing traffic.
- **Netmask**
  Displays the subnet mask of this routing.
- **Gateway**

  Displays the gateway of this interface. This is used for routing packets to remote networks.
- **Metric**

  Displays the metric value of this interface.
- **Interface**
  Displays the outbound interface of this route.



Static Route Settings

Route Table Information

Index	1
Description	
IP Address	
Netmask	
Gateway	
Interface	

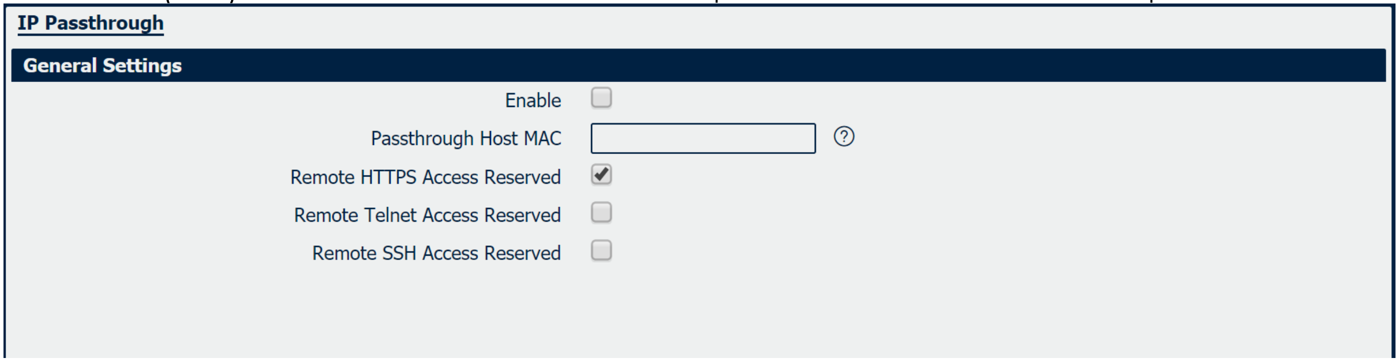
Route->Static Route Settings

- **Description**
  Enter the description of current static route rule.

- **IP Address**
  Enter the IP address of the destination network.
- **Netmask**
  Enter the subnet mask of the destination network.
- **Gateway**
  Enter the IP address of the local gateway.
- **Interface**
  Please refer to the Network->Route->Status interface.

4.5.3 IP Passthrough

IP Passthrough mode, disables NAT and routing and passes the WAN IP address from the WAN interface to the device connected on the local Interface. It is used instead of Network Address Translation (NAT) in order to make the router "transparent" in the communication process.



IP Passthrough

General Settings

Enable	□
Passthrough Host MAC	
Remote HTTPS Access Reserved	☑
Remote Telnet Access Reserved	□
Remote SSH Access Reserved	□

Network->IP Passthrough

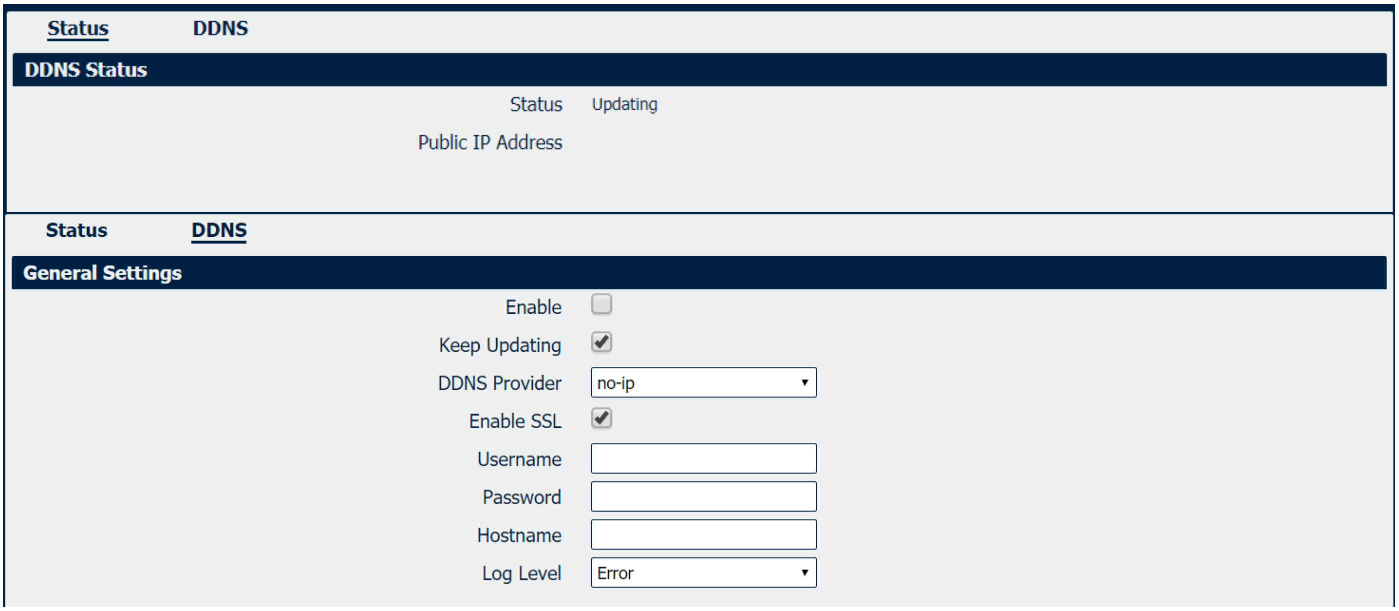
- **Enable**
  Check this box will enable IP Passthrough.
- **Passthrough Host MAC**
  Enter the MAC of passthrough host to receive the WAN IP address.
- **Remote HTTPS Access Reserved**
  Check this box to allow to remote access the router via https while enable IP Passthrough mode.
- **Remote Telnet Access Reserved**
  Check this box to allow to remote telnet to the router while enable IP Passthrough mode.
- **Remote SSH Access Reserved**
  Check this box to allow to remote SSH to the router while enable IP Passthrough mode.

4.6 Applications

4.6.1 DDNS

DDNS is a system that allows the domain name data of a computer with a varying (dynamic) IP addresses held in a name server to be updated in real time in order to make it possible to establish connections to that machine without the need to track the actual IP addresses at all times. A number of providers offer Dynamic DNS services (DDNS), free or for a charge.

You could review the status of DDNS as below.



Status DDNS

DDNS Status

Status: Updating

Public IP Address:

Status DDNS

General Settings

Enable □

Keep Updating ☑

DDNS Provider: no-ip

Enable SSL ☑

Username:

Password:

Hostname:

Log Level: Error

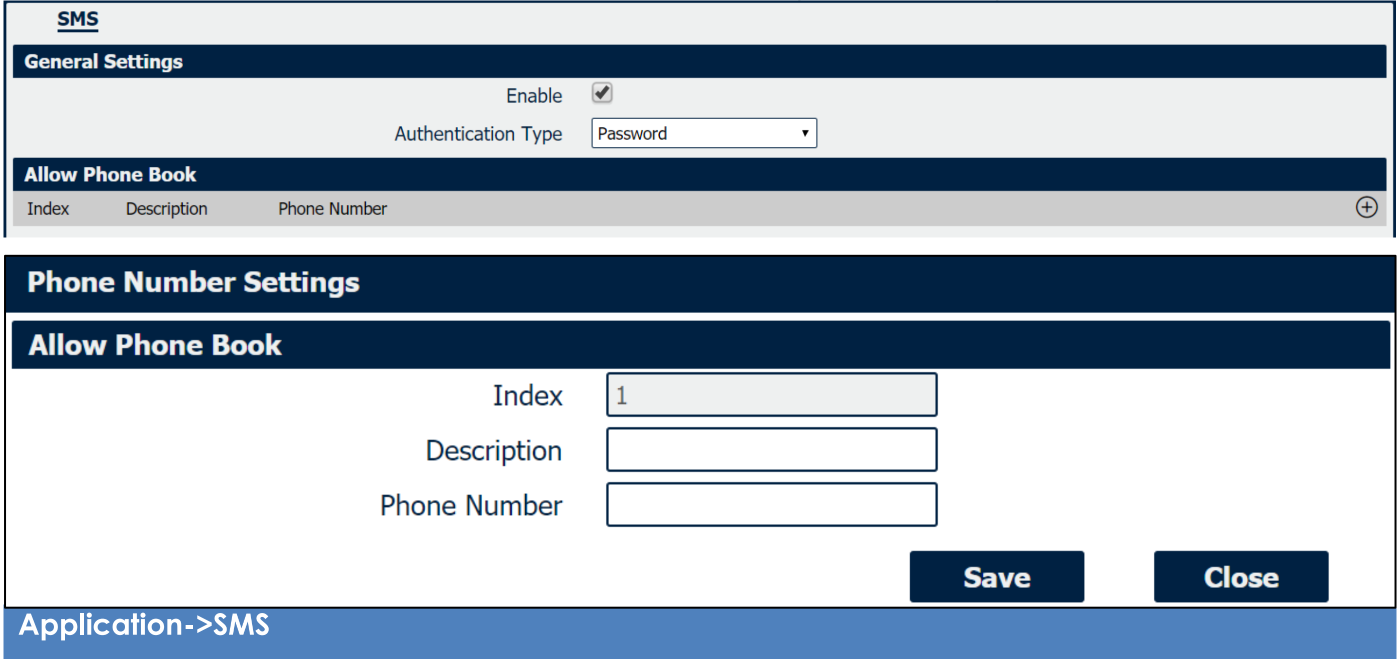
DDNS

- **Enable**
  Check this box to enable the DDNS service.
- **Keep Updating**
  Check this box to keep updating the IP address to the DDNS server.
- **DDNS Provider**
  Select the DDNS provider from the list, options from “DynDNS”, “no-ip”,”3322” and custom.
- **DDNS Server**
  The internet address to communicate the Dynamic DNS information to. This option is available after you select **custom** on DDNS Provider.
- **DDNS Path**
  DDNS path for custom type.
- **Check IP Server**
  Check IP Server for custom type

- **Check IP Path**
  Check IP Path for custom type.
- **Enable SSL**
  Enable SSL for connection.
- **Username**
  Enter the user name used when setting up the account. Used to login to the Dynamic DNS service.
- **Password**
  Enter the password associated with the account.
- **Hostname**
  Enter the hostname associated with the account.
- **Log Level**
  Select the log output level from “none”, “Debug”, “Notice”, ”Info” and “Error”.

4.6.2 SMS

SMS allows user to send the SMS to control the router or get the running status of the router.



SMS

General Settings

Enable ☑

Authentication Type: Password

Allow Phone Book

Index	Description	Phone Number

Phone Number Settings

Allow Phone Book

Index: 1

Description:

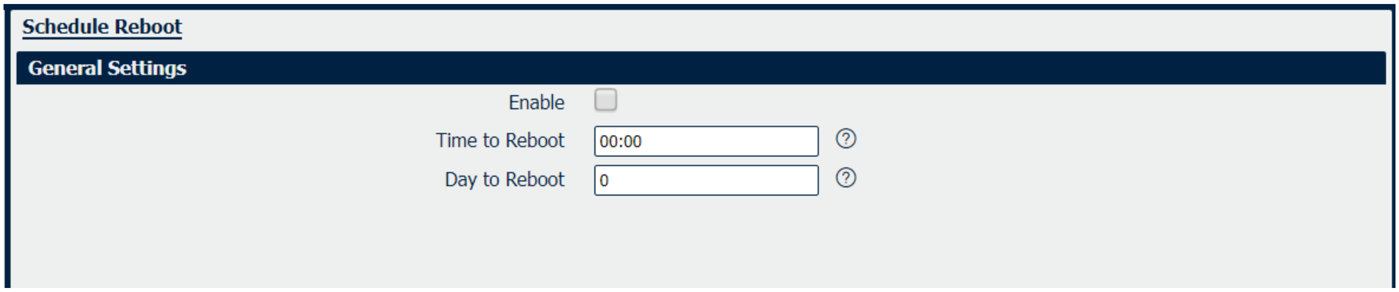
Phone Number:

Application->SMS

- **Enable**
  Check this box to enable SMS feature.
- **Authentication Type**
  Specify the authentication mode for SMS, optional for “None” and “Password”.
- **Description**
  Enter the description of the Phone Book
- **Phone Number**
  Enter the special phone number and only allow this phone number to send SMS to the router

4.6.3 Schedule Reboot

Schedule reboot allows user to define the time for router reboot itself.



Schedule Reboot

General Settings

Enable □

Time to Reboot 00:00

Day to Reboot 0

Application->Schedule Reboot

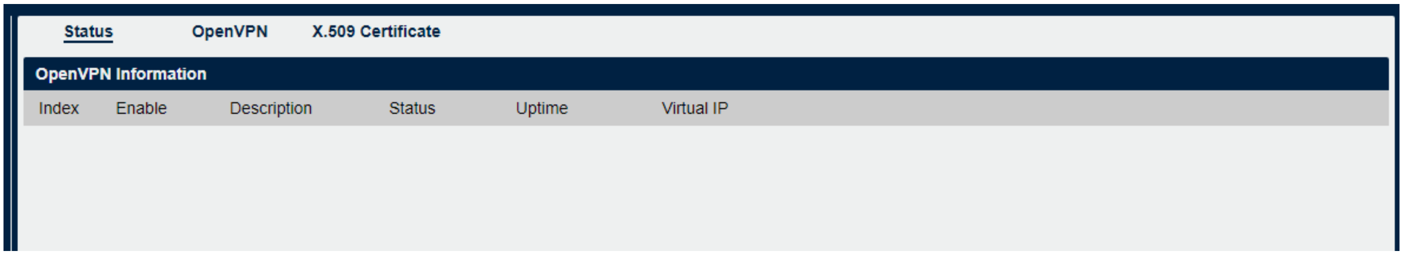
- **Enable**
  Check this box to enable schedule reboot feature.
- **Time to Reboot**
  Enter the time of each day to reboot device. Format: HH(00-23):MM(00-59).
- **Day to Reboot**
  Enter the day of each month to reboot device. 0 means every day.

4.7 VPN

4.7.1 OpenVPN

OpenVPN is an open source virtual private network (VPN) product that offers a simplified security framework, modular network design, and cross-platform portability.

You could review all OpenVPN connection as below.

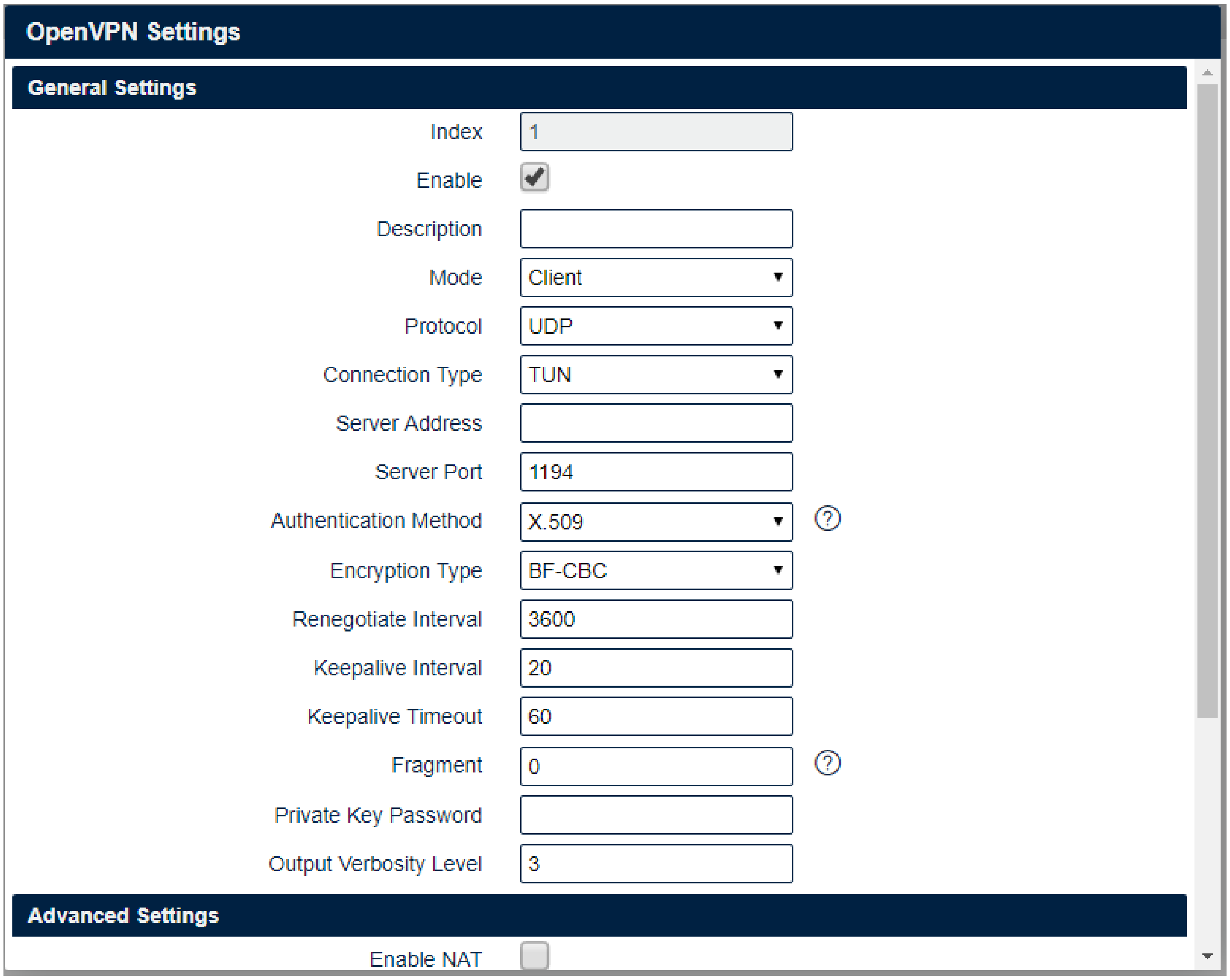


OpenVPN Information

Index	Enable	Description	Status	Uptime	Virtual IP

VPN->OpenVPN->Status

- **Enable**
  Displays current OpenVPN settings is enable or disable.
- **Status**
  Displays the current VPN connection status.
- **Uptime**
  Displays the connection time since VPN is established.
- **Virtual IP**
  Displays the virtual IP address obtain from remote side.



OpenVPN Settings

General Settings

Index	1
Enable	☑
Description	
Mode	Client
Protocol	UDP
Connection Type	TUN
Server Address	
Server Port	1194
Authentication Method	X.509
Encryption Type	BF-CBC
Renegotiate Interval	3600
Keepalive Interval	20
Keepalive Timeout	60
Fragment	0
Private Key Password	
Output Verbosity Level	3

Advanced Settings

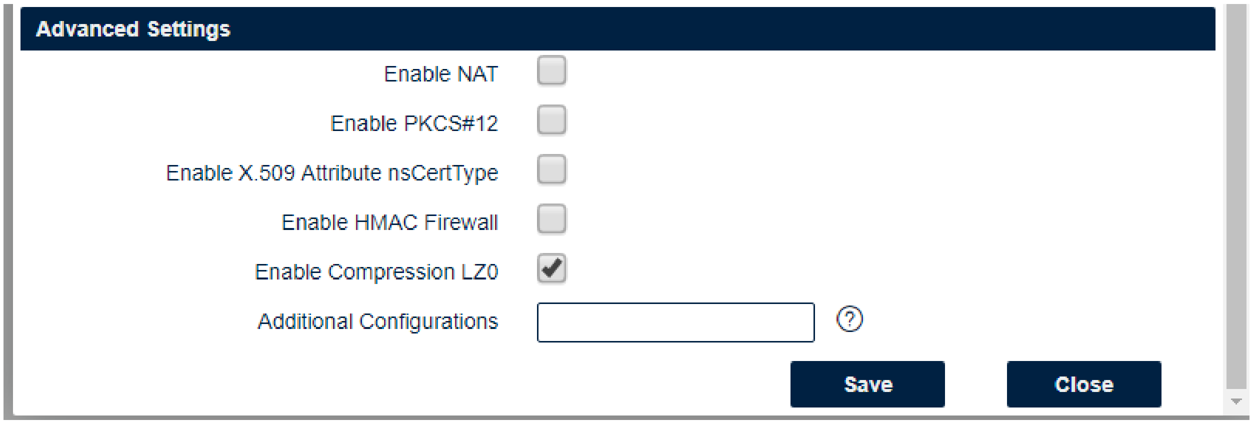
Enable NAT	☐

VPN->OpenVPN

- **Enable**
  Check this box to enable OpenVPN tunnel.
- **Description**
  Enter a description for this OpenVPN tunnel.
- **Mode**
  Select from “Client” or “P2P”.
- **Protocol**
  Select from “UDP” or “TCP Client”.
- **Connection Type**
  Select from “TUN”, “TAP” which are two different kinds of device interface for OpenVPN. The difference between TUN and TAP device is that a TUN device is a point-to-point virtual device on network while a TAP device is a virtual device on Ethernet.
- **Server Address**
  Enter the IP address or domain of remote server.
- **Server Port**

Enter the negotiate port on OpenVPN server.

- **Authentication Method**
  Select from "X.509", "Pre-shared", "Password", and "X.509 And Password".
- **Encryption Type**
  Select from "BF-CBC", "DES-CBC", "DES-EDE-CBC", "DES-EDE3-CBC", "AES-128-CBC", "AES-192-CBC" and "AES-256-CBC".
- **Username**
  Enter the username for authentication when selection from “Password” or “X.509 And Password”.
- **Password**
  Enter the password for authentication when selection from “Password” or “X.509 And Password”.
- **Local IP Address**
  Enter the local virtual IP address when select “P2P” mode.
- **Remote IP Address**
  Enter the remote virtual IP address when select “P2P” mode.
- **Local Netmask**
  Enter the local netmask when select “TAP” connection type.
- **TAP Bridge**
  Select the specified LAN that bridge with OpenVPN tunnel when select “TAP” connection type.
- **Renegotiate Interval**
  Enter the renegotiate interval if connection is failed.
- **Keepalive Interval**
  Enter the keepalive interval to check the tunnel is active or not.
- **Keepalive Timeout**
  Enter the keepalive timeout, once connection is failed it will trigger the OpenVPN reconnect.
- **Fragment**
  Enter the fragment size, 0 means disable.
- **Private Key Password**
  Enter the private key password for authentication when selection from “X.509” or “X.509 And Password”.
- **Output Verbosity Level**
  Enter the level of the output log and values.



Advanced Settings

Enable NAT □

Enable PKCS#12 □

Enable X.509 Attribute nsCertType □

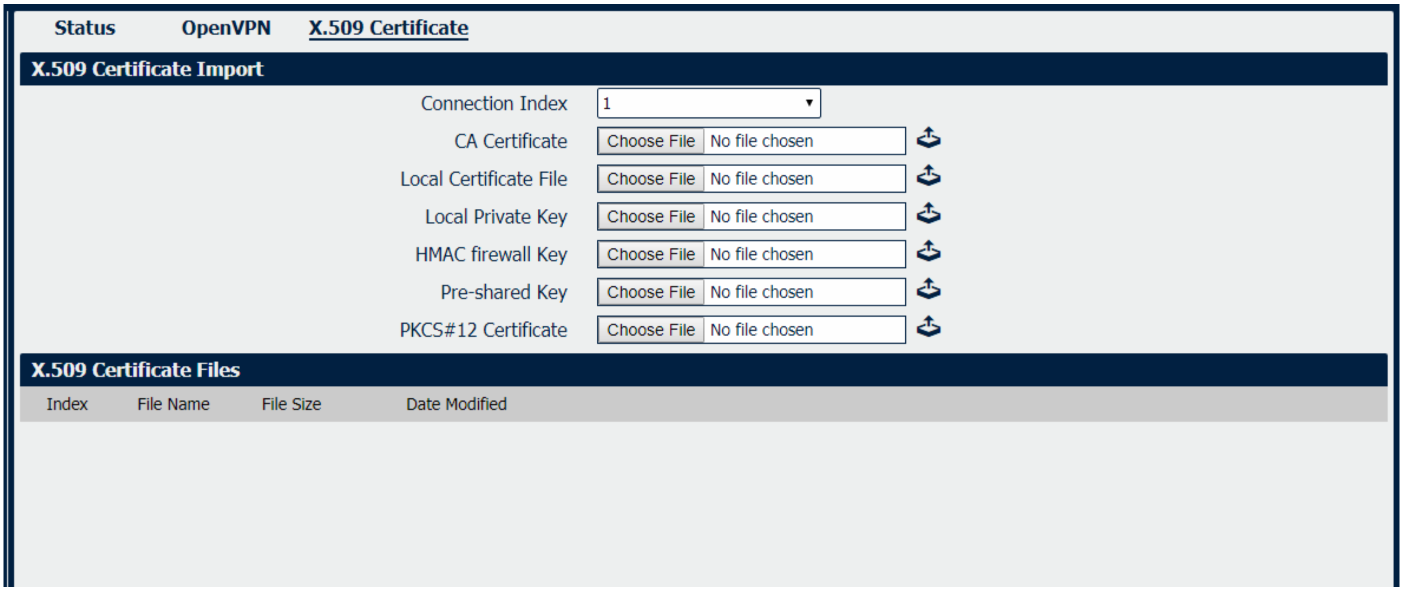
Enable HMAC Firewall □

Enable Compression LZ0 ☑

Additional Configurations

VPN->OpenVPN->Advanced Settings

- **Enable NAT**
  Check this box to enable NAT, the source IP of host behind router will be disguised before accessing the remote end.
- **Enable PKCS#12**
  It is an exchange of digital certificate encryption standard, used to describe personal identity information.
- **Enable X.509 Attribute nsCertType**
  Require that peer certificate was signed with an explicit nsCertType designation of "server".
- **Enable HMAC Firewall**
  Add additional layer of HMAC authentication on the top of the TLS control channel to protect against DoS attacks.
- **Enable Compression LZO**
  Compress the data.
- **Additional Configurations**
  Enter some other options of OpenVPN in this field. Each expression can be separated by a ';'.



X.509 Certificate Import

Connection Index	1
CA Certificate	Choose File No file chosen
Local Certificate File	Choose File No file chosen
Local Private Key	Choose File No file chosen
HMAC firewall Key	Choose File No file chosen
Pre-shared Key	Choose File No file chosen
PKCS#12 Certificate	Choose File No file chosen

X.509 Certificate Files

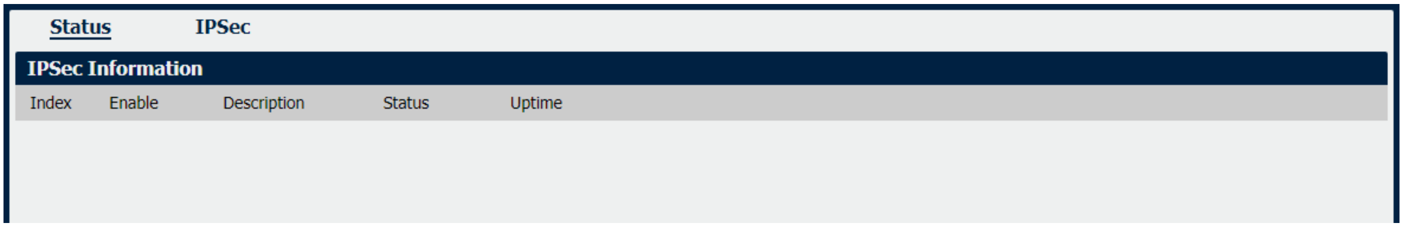
Index	File Name	File Size	Date Modified

VPN->OpenVPN->X.509 Certificate

- **Connection Index**
  Displays the current connection index for OpenVPN channel.
- **CA Certificate**
  Import CA certificate file.
- **Local Certificate File**
  Import Local Certificate file.
- **Local Private Key**
  Import Local Private Key file.
- **HMAC Firewall Key**
  Import HMAC Firewall Key file.
- **Pre-shared Key**
  Import the pre-shared key file.
- **PKCS#12 Certificate**
  Import PKCS#12 Certificate

4.7.2 IPSec

IPSec facilitates configuration of secured communication tunnels. The various tunnel configurations will be displayed in the Tunnel Table at the bottom of the page. All tunnels are create using the ESP (Encapsulating Security Payload) protocol.

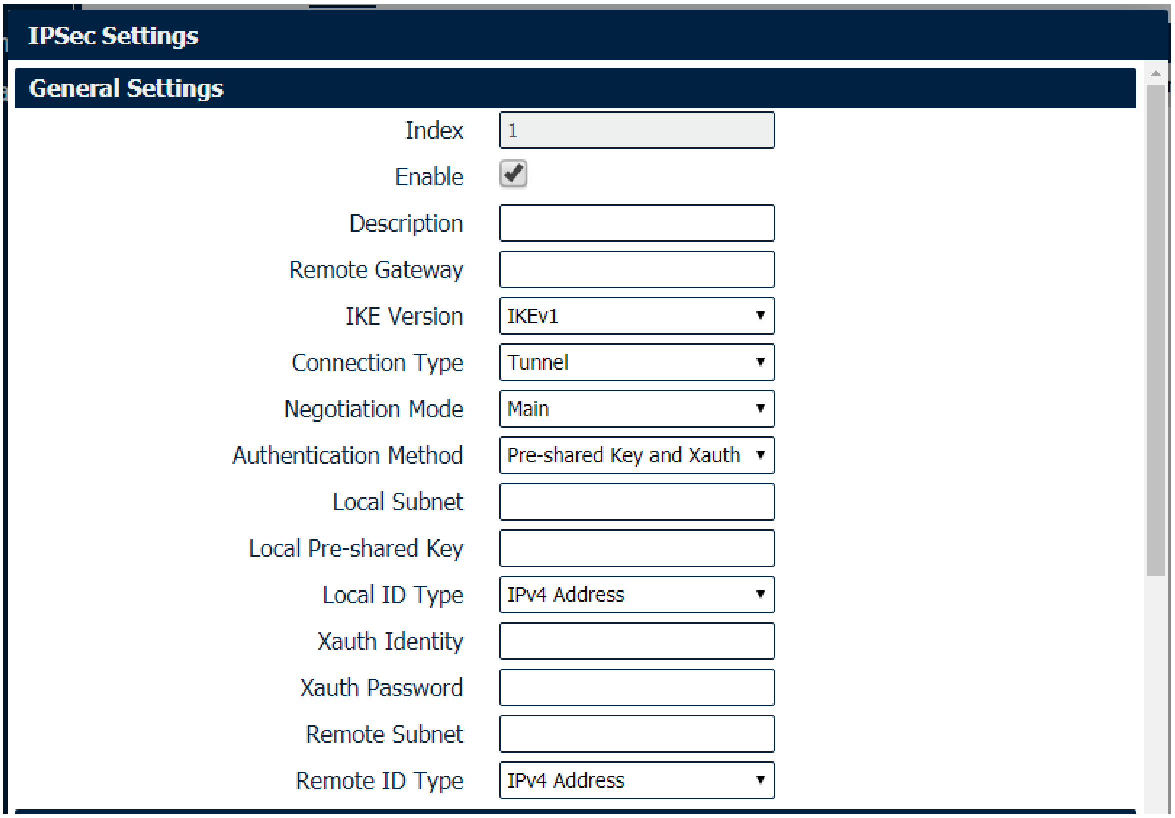


IPSec Information

Index	Enable	Description	Status	Uptime

VPN->IPSec->Status

- **Enable**
  Displays current IPSec settings is enable or disable.
- **Description**
  Displays the description of current VPN channel.
- **Status**
  Displays the current VPN connection status.
- **Uptime**
  Displays the connection time since VPN is established.



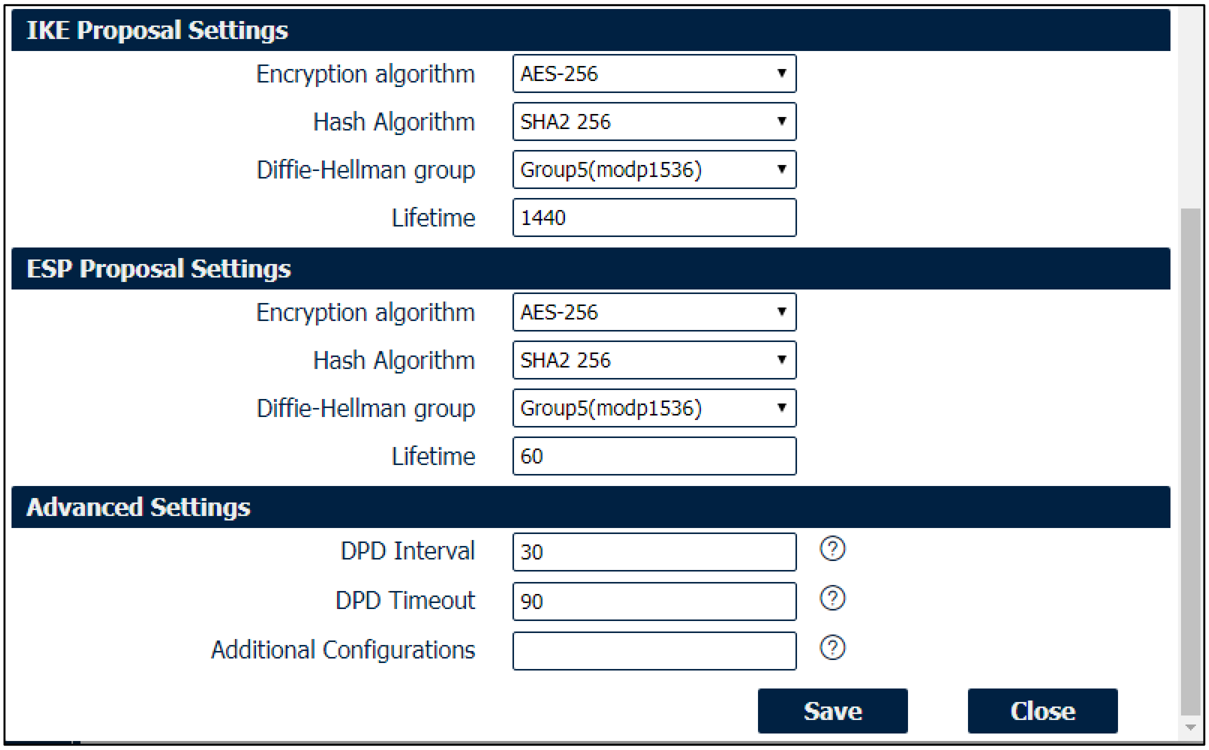
IPSec Settings

General Settings

Index	1
Enable	☑
Description	
Remote Gateway	
IKE Version	IKEv1 ▾
Connection Type	Tunnel ▾
Negotiation Mode	Main ▾
Authentication Method	Pre-shared Key and Xauth ▾
Local Subnet	
Local Pre-shared Key	
Local ID Type	IPv4 Address ▾
Xauth Identity	
Xauth Password	
Remote Subnet	
Remote ID Type	IPv4 Address ▾

VPN->IPSec

- **Enable**
  Select Enable will launch the IPSec process.
- **Description**
  Enter a description for this IPSec VPN tunnel.
- **Remote Gateway**
  Enter the IP address of the remote endpoint of the tunnel.
- **IKE Version**
  Internet Key Exchange, select from “IKEv1” or “IKEv2”.
- **Connection Type**
  Select from “Tunnel” or “Transport”.
  Tunnel: In tunnel mode, the entire IP packet is encrypted and authenticated. It is then encapsulated into a new IP packet with a new IP header. Tunnel mode is used to create virtual private networks for network-to-network communications.
  Transport: In transport mode, only the payload of the IP packet is usually encrypted or authenticated. The routing is intact, since the IP header is neither modified nor encrypted.
- **Negotiation Mode**
  Select from “Main” or “Aggressive”.
- **Authentication Method**
  Select from “Pre-shared Key” or “Pre-shared Key and Xauth”.
- **Local Subnet**
  Ener the IP address with mask if a network beyond the local LAN will be sending packets through the tunnel.
  NOTE: The Remote subnet and Local subnet addresses must not overlap!
- **Local Pre-shared Key**
  Enter the pre-shared key which match the remote endpoint.
- **Local ID Type**
  The local endpoint's identification. The identifier can be a host name or an IP address.
- **Xauth Identity**
  Enter Xauth identity after “Pre-shared Key and Xauth” on authentication Method is enabled.
- **Xauth Password**
  Enter Xauth password “Pre-shared Key and Xauth” on authentication Method is enabled.
- **Remote Subnet**
  Enter an IP address with mask if encrypted packets are also destined for the specified network that is beyond the Remote IP Address.
  NOTE: The Remote subnet and Local subnet addresses must not overlap!
- **Remote ID Type**
  The authentication address of the remote endpoint.



IKE Proposal Settings

Encryption algorithm: AES-256

Hash Algorithm: SHA2 256

Diffie-Hellman group: Group5(modp1536)

Lifetime: 1440

ESP Proposal Settings

Encryption algorithm: AES-256

Hash Algorithm: SHA2 256

Diffie-Hellman group: Group5(modp1536)

Lifetime: 60

Advanced Settings

DPD Interval: 30

DPD Timeout: 90

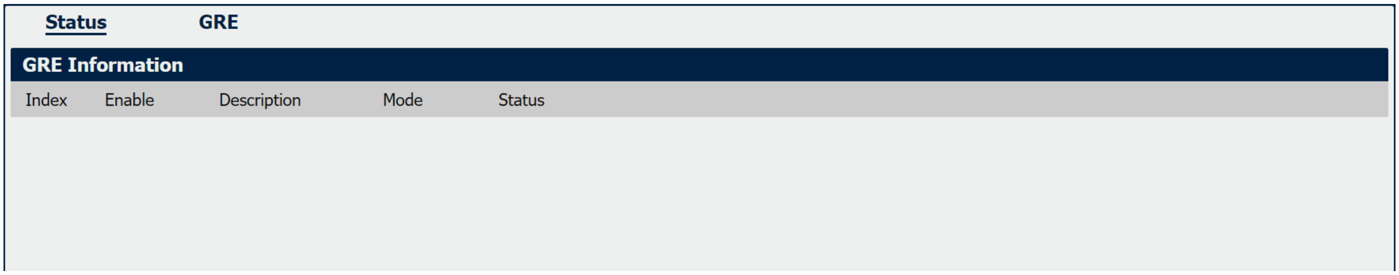
Additional Configurations:

VPN->IPSec

- **Encryption Algorithm (IKE)**
  Select 3DES AES-128, AES-192, or AES-256 encryption.
- **Hash Algorithm (IKE)**
  Select from MD5, SHA1, SHA2 256, SHA2 384 or SHA2 512 hashing.
- **Diffie-Hellman Group (IKE)**
  Negotiate (None) or use 768 (Group 1), 1024 (Group 2), 1536 (Group 5) or 2048 (Group 14) etc.
- **Lifetime (IKE)**
  How long the keying channel of a connection should last before being renegotiated.
- **Encryption Algorithm (ESP)**
  Select 3DES AES-128, AES-192, or AES-256 encryption.
- **Hash Algorithm (ESP)**
  Select from MD5, SHA1, SHA2 256, SHA2 384 or SHA2 512 hashing.
- **Diffie-Hellman Group (ESP)**
  Negotiate (None) or use 768 (Group 1), 1024 (Group 2), 1536 (Group 5) or 2048 (Group 14) etc.
- **Lifetime (ESP)**
  How long a particular instance of a connection should last, from successful negotiation to expiry.
- **DPD Interval**
  Enter the interval after which DPD is triggered if no IPsec protected packets is received from the peer.
- **DPD Timeout**
  Enter the remote peer probe response timer.
- **Additional Configurations**
  Enter some other options of IPSec in this field. Each expression can be separated by a ';'.

4.7.3 GRE

Generic Routing Encapsulation (GRE) is a protocol that encapsulates packets in order to route other protocols over IP networks. It's a tunneling technology that provides a channel through which encapsulated data message could be transmitted and encapsulation and decapsulation could be realized at both ends.

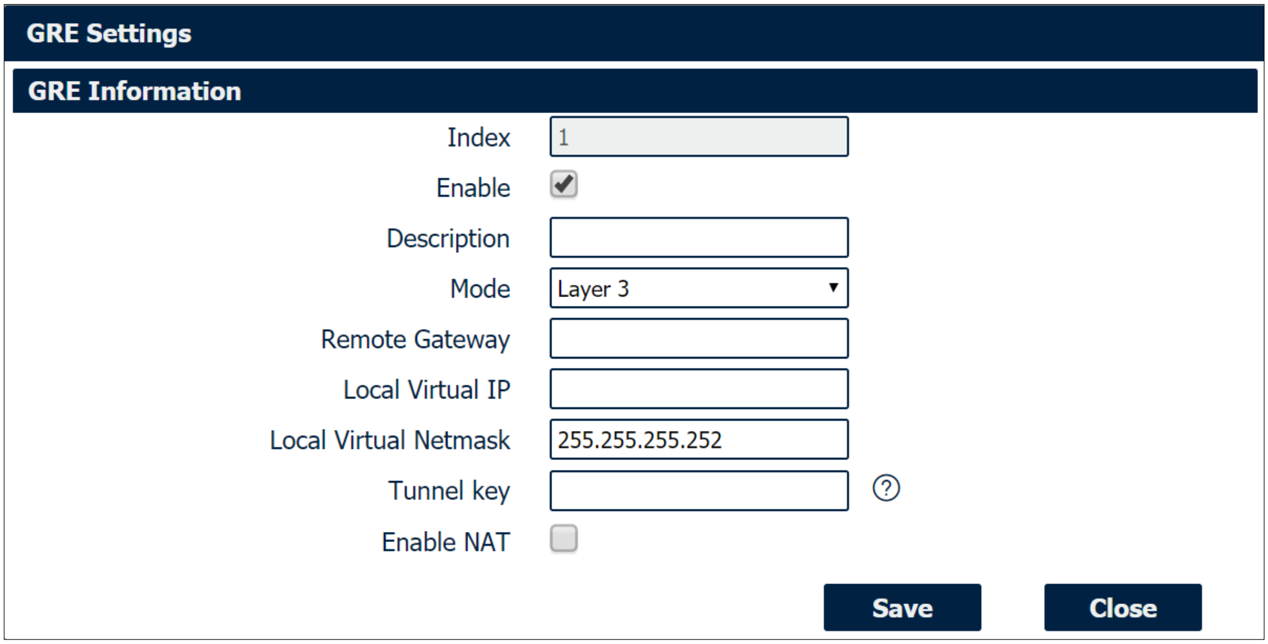


GRE Information

Index	Enable	Description	Mode	Status

VPN->GRE->Status

- **Enable**
  Displays current GRE settings is enable or disable.
- **Description**
  Displays the description of current VPN channel.
- **Mode**
  Displays the current VPN mode.
- **Status**
  Displays the current VPN connection status.



GRE Settings

GRE Information

Index	1
Enable	☑
Description	
Mode	Layer 3
Remote Gateway	
Local Virtual IP	
Local Virtual Netmask	255.255.255.252
Tunnel key	
Enable NAT	☐

VPN->GRE

- **Enable**
  Check this box to enable GRE.
- **Description**
  Enter the description of current VPN channel.
- **Mode**
  Specify the running mode of GRE, optional are “Layer 2” and “Layer 3”.
- **Remote Gateway**
  Enter the remote IP address of peer GRE tunnel.
- **Local Virtual IP**
  Enter the local tunnel IP address of GRE tunnel.
- **Local Virtual Netmask**
  Enter the local virtual netmask of GRE tunnel.
- **Tunnel Key**
  Enter the authentication key of GRE tunnel.
- **Enable NAT**
  Check this box to enable NAT function.
- **Bridge Interface**
  Specify the bridge interface work with Layer 2 mode.

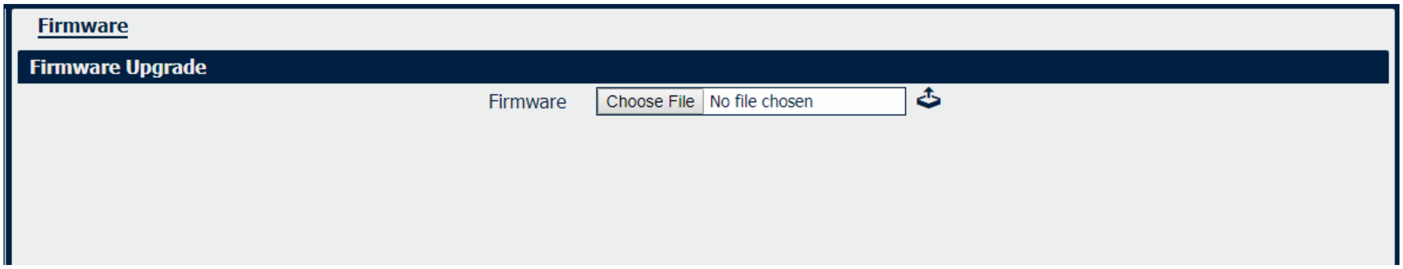
4.8 Maintenance

4.8.1 Upgrade

When newer versions of NR300 firmware become available, the user can manually update the unit by uploading a package to the unit.

NOTE: The unit need manually reboots once the upload completes, thus taking the NR300 router out of service during approximately 1 minute. Unless otherwise stated, the user is not expected to take any special precautions.

CAUTION: It is important to have a stable power source and ensure that power to the Fusion is not interrupted during a firmware upgrade.



Firmware

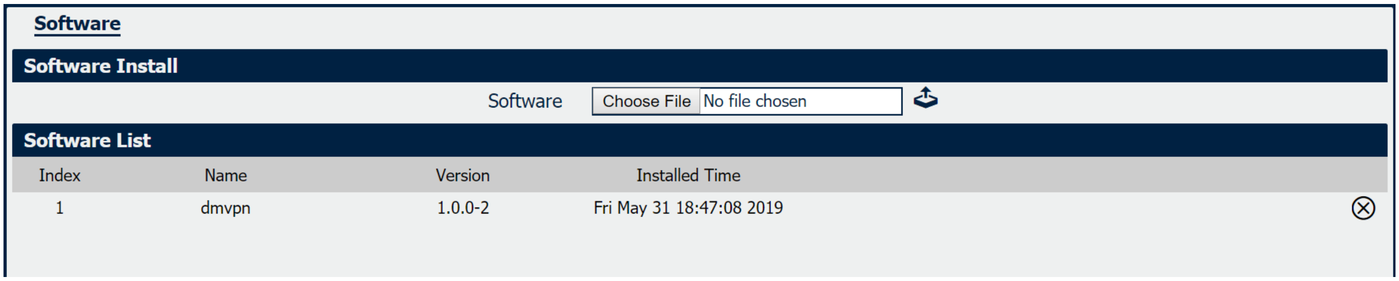
Firmware Upgrade

Firmware [Choose File] No file chosen ⇪

4.8.2 Software

When release a new feature(APP Package) of NR300 router, the user can manually install to the unit by uploading a package. Or user can uninstall this feature(APP Package) from router.

NOTE: The unit need manually reboots once the upload/uninstall completes, thus taking the NR300 router out of service during approximately 1 minute. Unless otherwise stated, the user is not expected to take any special precautions.



Software

Software Install

Software [Choose File] No file chosen ⇪

Software List

Index	Name	Version	Installed Time	
1	dmvpn	1.0.0-2	Fri May 31 18:47:08 2019	⊗

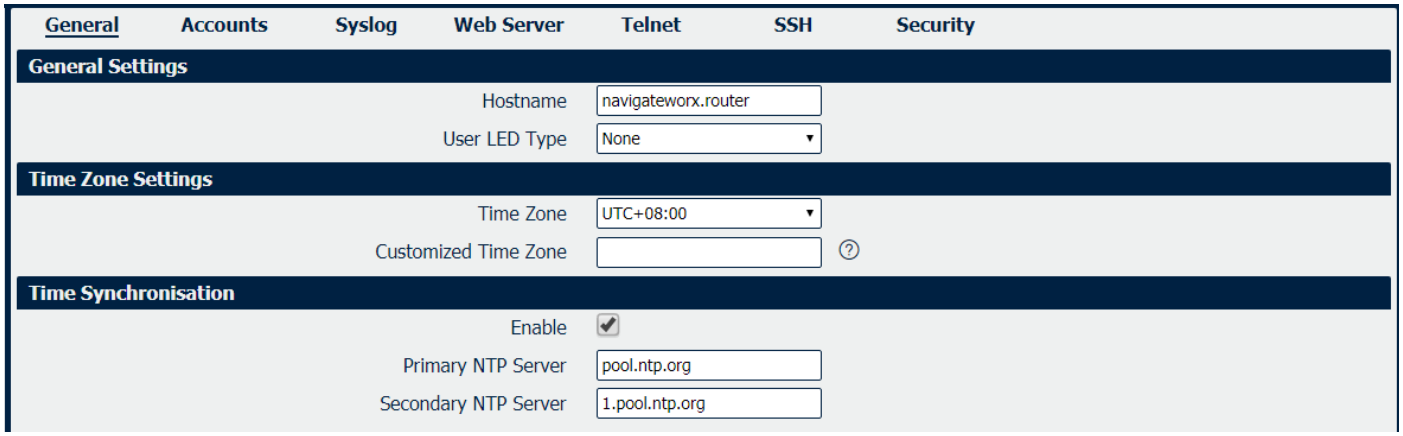
Click ⇪ to upload the APP Package.

Click ⊗ to delete the APP Package.

Note: We are working different kinds of the APP Packages. Please contact us to get them in case of you would like to test.

4.8.3 System

This section allows you to review the device system settings.



General Settings

Hostname	navigateworx.router
User LED Type	None

Time Zone Settings

Time Zone	UTC+08:00
Customized Time Zone	

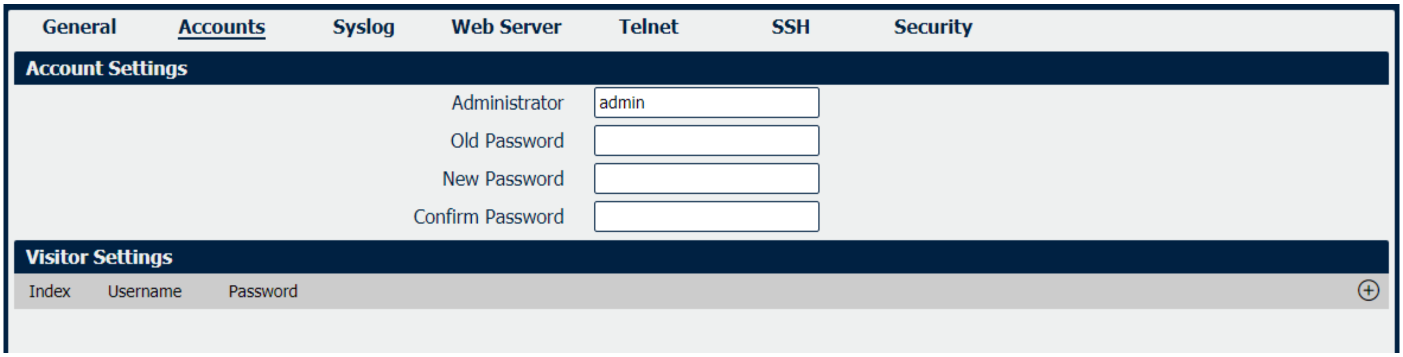
Time Synchronisation

Enable	☑
Primary NTP Server	pool.ntp.org
Secondary NTP Server	1.pool.ntp.org

System->General

- **Hostname**
  User-defined router name, which might be use for IPSec local ID identify.
- **User LED Type**
  Defined the User LED behavior.
- **Time Zone**

  Select the zone where the device is in use.
- **Customized Time Zone**
  Customized the zone where the device is in use.
- **Enable (NTP Client)**
  Selected Enabled to utilize the NTP client to synchronize the device clock over the network using a time server (NTP server).
- **Primary NTP Server**
  Enter the IP address (or host name) of the primary time server.
- **Secondary NTP Server**
  Enter the IP address (or host name) of the secondary time server.



Account Settings

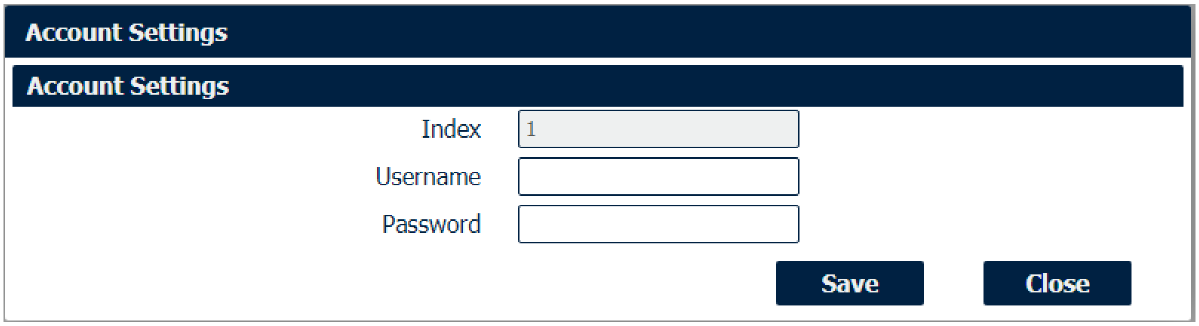
Administrator	admin
Old Password	
New Password	
Confirm Password	

Visitor Settings

Index	Username	Password

System->Account

- **Administrator**
  Displays the name of current administrator, default as “admin”.
- **Old Password**
  Enter the old password of administrator.
- **New Password**
  Enter the new password of administrator.
- **Confirm Password**
  Confirm the new password of administrator.



Account Settings

Account Settings

Index 1

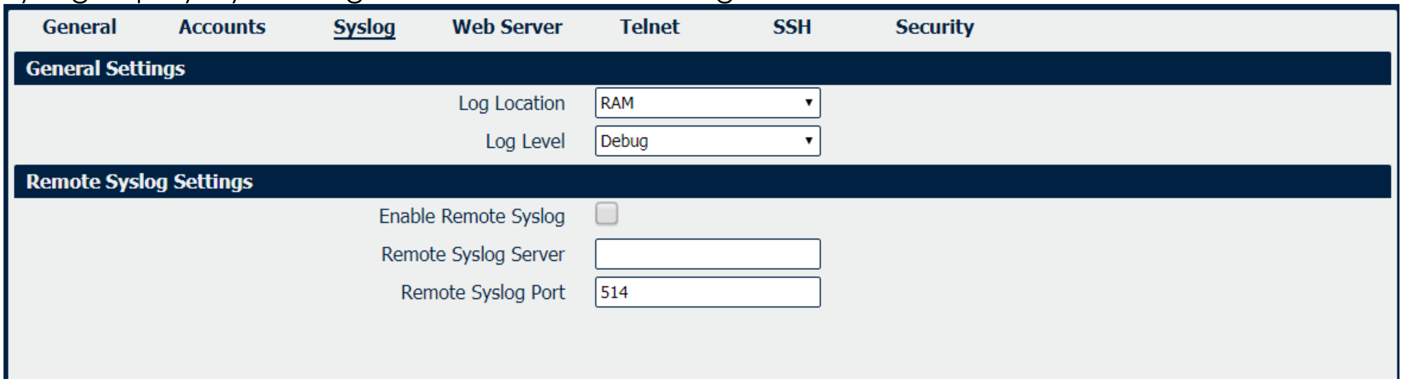
Username

Password

System->Account

- **Username**
  Enter a username of visitor privilege
- **Password**
  Enter the new password of current visitor account.

Syslog displays system logs that are stored in the log buffers.



General Settings

Log Location: RAM

Log Level: Debug

Remote Syslog Settings

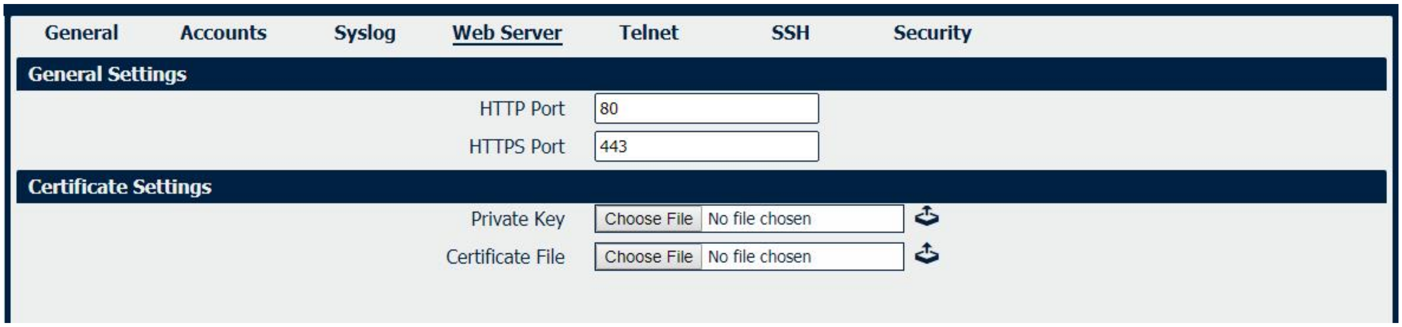
Enable Remote Syslog: □

Remote Syslog Server:

Remote Syslog Port: 514

System->Syslog

- **Log Location**
  Select the log store location to "RAM".
- **Log Level**
  Select the log output level from "Debug", "Notice", "Info", "Warning" or "Error".
- **Enable Remote Syslog**
  Check this box to enable remote syslog connection.
- **Remote Syslog Server**
  Enter the IP address of remote syslog server.
- **Remote Syslog Port**
  Enter the port for remote syslog server listening.



General Settings

HTTP Port: 80

HTTPS Port: 443

Certificate Settings

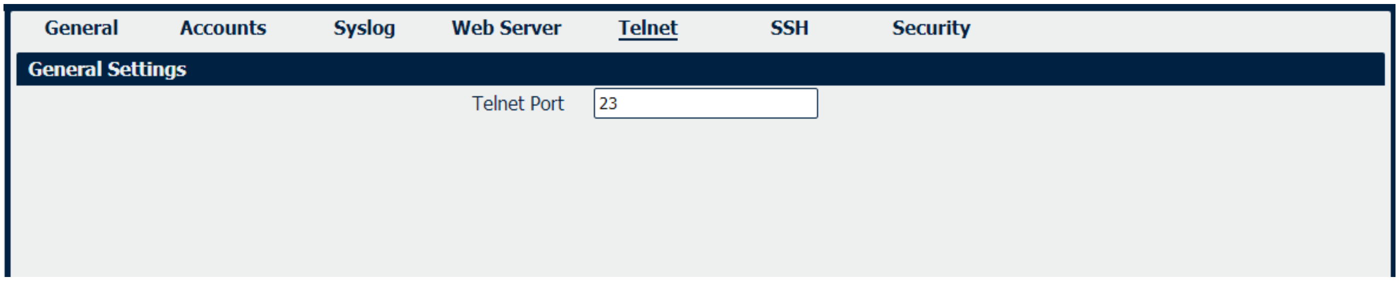
Private Key: No file chosen

Certificate File: No file chosen

System->Web Server

- **HTTP Port**
  Enter the port for Hypertext Transfer Protocol. A well-known port for HTTP is port 80.
- **HTTPS Port**

  Enter the port for HTTPS Protocol. A well-known port for HTTPS is port 443.
- **Private Key**
  Import private Key file for HTTPS connection.
- **Certificate File**
  Import certificate file for HTTPS connection.

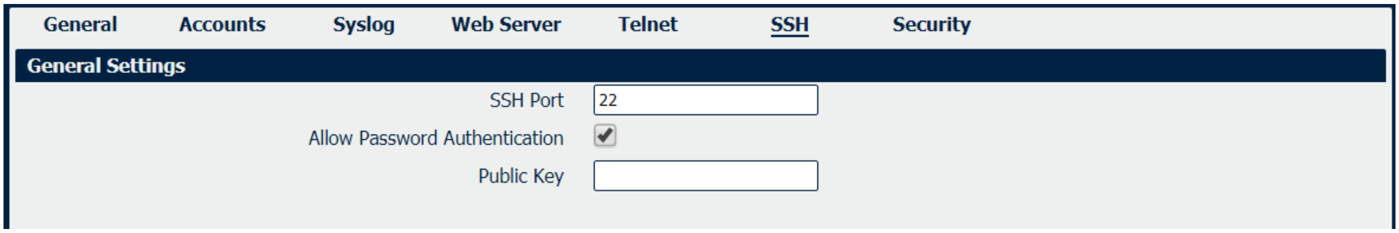


General Settings

Telnet Port: 23

System->Telnet

- **Telnet Port**
  Enter the port for telnet access. A well-known port for HTTP is port 23.



General Settings

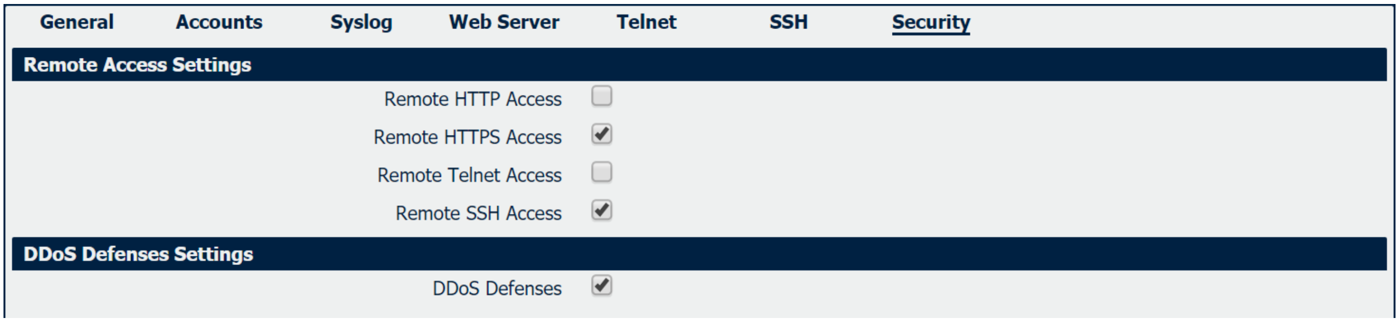
SSH Port: 22

Allow Password Authentication: ☑

Public Key:

System->SSH

- **SSH Port**
  Enter the port for SSH access. A well-known port for HTTP is port 22.
- **Allow Password Authentication**
  Check this box to enable SSH authentication.
- **Public Key**
  Enter the public Key SSH authentication.



Remote Access Settings

Remote HTTP Access: □

Remote HTTPS Access: ☑

Remote Telnet Access: □

Remote SSH Access: ☑

DDoS Defenses Settings

DDoS Defenses: ☑

System->Security

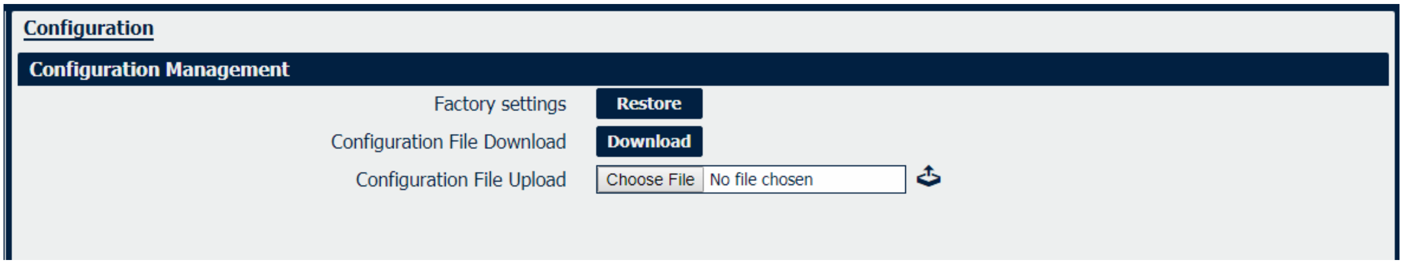
- **Remote HTTP Access**
  Check this box to allow remote HTTP access.
- **Remote HTTPS Access**
  Check this box to allow remote HTTPS access.

- **Remote Telnet Access**

  Check this box to allow remote Telnet access.
- **Remote SSH Access**
  Check this box to allow remote SSH access.
- **DDoS Defenses**
  Check this box to enable DDoS defenses

4.8.4 Configuration

The Unit Configuration tab allows you to save parameters (settings in the Web interface) to a file. Conversely, if you have saved settings from the NR300 router to a file, you can Import these previously-saved configuration settings to the NR300 router as well.



Factory settings

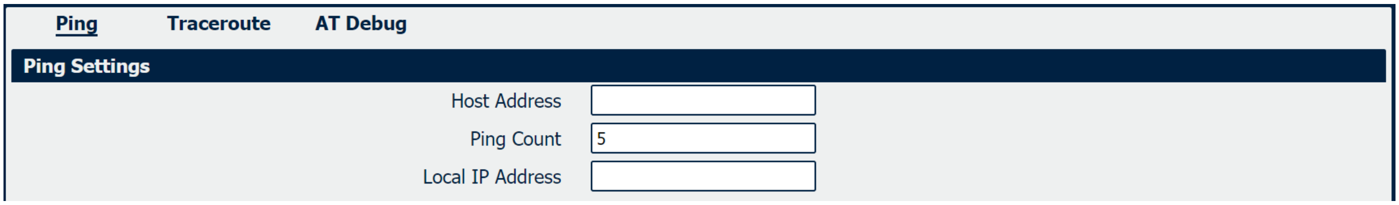
Configuration File Download

Configuration File Upload: No file chosen

System->Configuration

- **Restore**
  Reset the unit to factory default settings.
- **Download**
  Download the configuration file from NR300 router.
- **Configuration File Upload**
  Import previously-saved configuration file.

4.8.5 Debug Tools



Host Address:

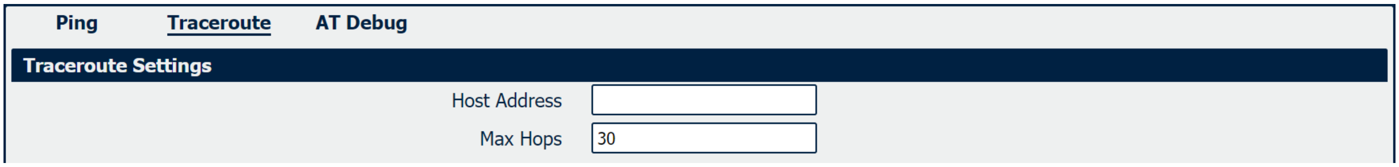
Ping Count: 5

Local IP Address:

Debug Tools->Ping

- **Host Address**
  Enter a host IP address or domain name for ping.

- **Ping Count**
  Enter the ping times.
- **Local IP Address**
  Enter the ping source IP address or leave it blank.



Ping Traceroute AT Debug

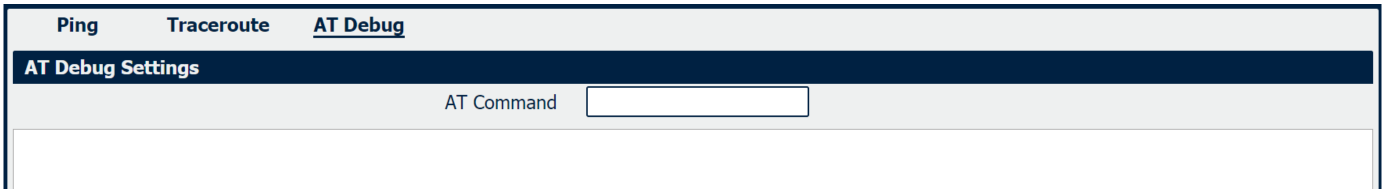
Traceroute Settings

Host Address

Max Hops 30

Debug Tools->Traceroute

- **Host Address**
  Enter a host IP address or domain name for traceroute.
- **Max Hops**
  Enter the max hops for traceroute.



Ping Traceroute AT Debug

AT Debug Settings

AT Command

Debug Tools->AT Debug

- **AT Command**
  Enter the AT command of the module.

Appendix A -Glossary

APN:	Access Point Name
GPRS:	General Packet Radio Service
HSPA:	High Speed Packet Access
HSDPA:	High-Speed Downlink Packet Access
HSUPA:	High-Speed Uplink Packet Access
LTE:	3GPP Long Term Evolution
IMEI:	International Mobile Equipment Identity
ICCID:	Integrated Circuit Card Identifier
PIN:	Personal Identification Number
PPP:	Point-to-Point Protocol
RSSI:	Received Signal Strength Indication
SIM:	Subscriber Identity Module
SMS:	Short Message Service
DHCP:	Dynamic Host Configuration Protocol
LAN:	Local Area Network
LED:	Light-Emitting Diode
NTP:	Network Time Protocol
SMA:	SubMiniature version A (connector)
SSID:	Service Set Identifier
TCP/IP:	Transmission Control Protocol / Internet Protocol
UDP:	User Datagram Protocol
VPN:	Virtual Private Network
VDC:	Voltage, Direct Current

Appendix B -Q&A

No Signal

Phenomenon

NR300 Router modem status show no signal.

Possible Reason

- Antenna installation is wrong.
- Modem failure.

Solution

- Check the LTE antenna or replace with new one.
- Check the cellular page confirm modem is detected correctly or not.

Cannot detect SIM card

Phenomenon

NR300 Router cannot detect SIM card, cellular is not failed to connect to base station.

Possible Reason

- SIM card damage.
- SIM bad contact.

Solution

- Replace SIM card.
- Re-install SIM card.

Poor Signal

Phenomenon

NR300 Router no signal or poor signal.

Possible Reason

- Antenna installation is wrong.
- Area signal weak.

Solution

- Check the antenna and re-connect it.
- Contact Telecom Operator to confirm signal problem.
- Change to high-gain antenna.

IPSec VPN established, but LAN to LAN cannot communicate

Phenomenon

IPSec VPN established, but LAN to LAN cannot communicate

Possible Reason

- Both subnets are not match the interested traffic.
- IPSec second phase (ESP) settings is not match.

Solution

- Check the both subnet settings.
- Check IPSec second phase (ESP) setting.

Forget Router Password

Phenomenon

Forget router login password.

Possible Reason

User has changed the password.

Solution

After router power on, press RESET button between 3 to 10 seconds then release, router need manually reboot and reset to factory default settings (Username/Password is admin/admin).

Appendix D - CLI

Command-line interface (CLI) is a software interface that provide another configurable way to set parameters on our router. We could use Telnet or SSH connect to our router for CLI input.

NR300 CLI Access

```
navigateworx.router login: admin
Password: admin
>
```

CLI reference commands

```
>?
   config          Change to the configuration mode
   exit            Exit this CLI session
   help            Display an overview of the CLI syntax
   ping            Ping
   reboot          Reboot system
   show            Show running configuration or running status
   telnet          Telnet Client
   traceroute      TraceRoute
   upgrade         Upgrade firmware
   version         Show firmware version
```

e.g.

```
> version
1.0.0 (337913f)


> ping www.baidu.com
PING www.baidu.com (14.215.177.38): 56 data bytes
64 bytes from 14.215.177.38: seq=0 ttl=54 time=10.826 ms
64 bytes from 14.215.177.38: seq=1 ttl=54 time=10.284 ms
64 bytes from 14.215.177.38: seq=2 ttl=54 time=10.073 ms
64 bytes from 14.215.177.38: seq=3 ttl=54 time=10.031 ms
64 bytes from 14.215.177.38: seq=4 ttl=54 time=10.347 ms

--- www.baidu.com ping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
round-trip min/avg/max = 10.031/10.312/10.826 ms.
>
```

How to Configure the CLI

CONTEXT SENSITIVE HELP

[?] - Display context sensitive help. This is either a list of possible command completions with summaries, or the full syntax of the current command. A subsequent repeat of this key, when a command has been resolved, will display a detailed reference.

AUTO-COMPLETION

The following keys both perform auto-completion for the current command line. If the command prefix is not unique then the bell will ring and a subsequent repeat of the key will display possible completions.

[enter] - Auto-completes, syntax-checks then executes a command. If there is a syntax error then offending part of the command line will be highlighted and explained.

[space] - Auto-completes, or if the command is already resolved inserts a space.

MOVEMENT KEYS

[CTRL-A] - Move to the start of the line
[CTRL-E] - Move to the end of the line.
[up] - Move to the previous command line held in history.
[down] - Move to the next command line held in history.
[left] - Move the insertion point left one character.
[right] - Move the insertion point right one character.

DELETION KEYS

[CTRL-C] - Delete and abort the current line
[CTRL-D] - Delete the character to the right on the insertion point.
[CTRL-K] - Delete all the characters to the right of the insertion point.
[CTRL-U] - Delete the whole line.
[backspace] - Delete the character to the left of the insertion point.

ESCAPE SEQUENCES

!! - Subsitute the the last command line.
!N - Substitute the Nth command line (absolute as per 'history' command)
!-N - Substitute the command line entered N lines before (relative)