ICE COBOTICS | User Guide

ICE1001-S4LC(Global)

4G Cellular Router

ICE COBOTICS

ICE Cobotics EMEA

https://www.icecobotics.com

About This Document

This document provides the software function of the 4G Cellular Router ICE1001-S4LC (Global) embedded in the ICE cleaner.

You can quickly understand how to configure the router by reading the first and second chapters so that it can connect to the network and the i-SYNERGY platform; the details of other chapters can be consulted on demand.

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Important Notice

Due to the nature of wireless communications, transmission and reception of data can never be guaranteed. Data may be delayed, corrupted (i.e., have errors) or be totally lost.

Although significant delays or losses of data are rare when wireless devices such as the router is used in a normal manner with a well-constructed network, the router should not be used in situations where failure to transmit or receive data could result in damage of any kind to the user or any other party, including but not limited to personal injury, death, or loss of property. ICE Cobotics EMEA accepts no responsibility for damages of any kind resulting from delays or errors in data transmitted or received using the router, or for failure of the router to transmit or receive such data.

Safety Precautions

General

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

Using the Router in Vehicle

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

Protecting Your Router

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

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

FCC Statements

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

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

CE Statements

EU Regulatory Conformance

We, “ICE Cobotics EMEA”, hereby declare that this device is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU

RF Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

Note: This product can be used in EU countries without any restrictions.

Regulatory and Type Approval Information

Table 1: Directives

2011/65/EU	The European RoHS2.0 2011/65/EU Directive was issued by the European parliament and the European Council on 1 July 2011 on the restriction of the use of certain Hazardous substances in electrical and electronic equipment. 
	On June 4, 2015, the Official Journal of the European Union published the RoHS2.0 Amendment Directive (EU) In 2015/863, four phthalates (DEHP, BBP, DBP, DIBP) were officially included in the list of restricted substances in Appendix II of RoHS 2.0 (2011/65/EU). From July 22, 2019, all electronic and electrical products exported to Europe (except medical and monitoring equipment) must meet this restriction; from July 22, 2021, medical equipment and monitoring equipment will also be included in the scope of control.
2012/19/EU	The European WEEE 2012/19/EU Directive was issued by the European parliament and the European Council on 24 July 2012 on waste electrical and electronic equipment. 
2013/56/EU	The European 2013/56/EU Directive is a battery Directive which published in the EU official gazette on 10 December 2013. The button battery used in this product conforms to the standard of 2013/56/EU directive.

Table 2: Toxic or Hazardous Substances or Elements with Defined Concentration Limits

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

o:
Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in RoHS2.0.

X:
Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials for this part *might exceed* the limit requirement in RoHS2.0.

-:
Indicates that it does not contain the toxic or hazardous substance.

Document History

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

Date	Firmware Version	Hardware Version	Document Version	Change Description
27 Oct., 2020	V 3.0.0	V2.0.0	v.1.0.0	Initial release
01 Mar., 2022	V 3.0.6	V2.0.0	V1.0.1	• Revised the company name • Revised *Regulatory and Type Approval Information* • Revised *Disclaimer*

Contents

Chapter 1 Product Overview

1.1 Key Features

The ICE1001-S4LC (Global) by ICE Cobotics EMEA is an industrial 4G router. It meets ordinary industrial-grade application sites through enhanced EMC design and structural design.

The ICE1001-S4LC (Global) product (also known as 4G cellular router) is embedded in the ICE cleaning machine. Through the agreed communication protocol, the communication board module collects information such as the working time and battery capacity of the cleaning machine, and uploads it to the i-SYNERGY platform through the 4G wireless network. The i-SYNERGY platform can manage ICE cleaners and related customer information and equipment materials.

1.2 Specifications

Kernel Parameters

- CPU: NUC976, maximum is up to 300MHz
- FLASH: 32M Byte, SPI FLASH
- DDR2: Built-in CPU, rate 150MHz, capacity 64MB
- Support modules: EG25-G, EC20

Cellular Interface

- Number of antennas: 1
- Connector: SMA-K
- SIM: 1 (3.0 V / 1.8 V), compatible with eSIM card
- Support modules: EG25-G, EC20
- Frequency bands: LTE FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B20/B25/B26/B28
  LTE TDD: B41
  WCDMA: B1/B8
  GSM: B3/B5
- Output power: Class 3 (23dBm +2/-3dB) for LTE FDD bands
  Class 3 (23dBm +2/-3dB) for LTE TDD bands
  Class 3 (24dBm+1/-3dB) for WCDMA bands
  Class E2 (27dBm±3dB) for EGSM900 8-PSK
  Class E2 (26dBm±3dB) for DCS1800 8-PSK
  Class 4 (33dBm±2dB) for EGSM900
  Class 1 (30dBm±2dB) for DCS1800

WLAN Interface

- Number of antennas: 1

- Connector: RP-SMA-K
- Standards: 802.11b/g/n, supports STA modes
- Frequency bands: 2.412-2.472 GHz for Europe, 2.412-2.462 GHz for North America (2.4 GHz ISM band)
- Data speed: Max 24.8Mbps UDP && 15.8Mbps TCP / IP
- Number of channels: 11 for North America, 13 for Europe
- Max. RF Output Power: Less than 23dBm for North America, 20dBm for Europe.

R232 Serial Port

- Quantity and Data speed: 1 x Maximum speed is up to 115200bps
- Socket form: Socket Molex559592430
- Magnet isolation protection: Air ± 8kV, contact 4kV
- Signal definition: 18 : TXD 20 : RXD

R485 Serial Port

- Quantity and Data speed: 1 x Maximum speed is up to 115200bps
- Socket form: Socket Molex559592430
- Magnet isolation protection: Air ± 8kV, contact 4kV
- Signal definition: 3: VIN 7: GND 22: RS485-B 24: RS485-A

DI Interface

- Socket form: Socket Molex559592430;
- Signal definition: 21 : DI 23 : DI

CAN Serial Port

- Socket form: Socket Molex559592430
- Magnet isolation protection: Air ± 8kV, contact 4kV
- Signal definition: 5 : CANH 6 : CANL

I2C Serial Port

- Quantity and Data speed: 1 x Maximum speed is up to 1Mbps
- Socket form: Socket Molex559592430
- Signal definition: 12: I2C_DATA 14: I2C_CLK

Positioning

- Support mode: GPS; QZSS; GLONASS; Galileo
- Positioning sensitivity: -146 Bm
- Horizontal positioning accuracy: 2.5 meters
- Antenna configuration: 1 * SMA-K external antenna interface

Power Supply and Consumption

- Power supply: DC power supply

- Input voltage: Min 12 to max 48V DC
- Power interface form: Socket Molex559592430;
- Signal definition: 2 : VIN- 4 : VIN +
- Protection function: Overcurrent protection; overvoltage protection
- Magnet isolation protection: Air 8kV, contact 4kV
- Power consumption: Maximum is 10 W
- Power switch button type: No switch

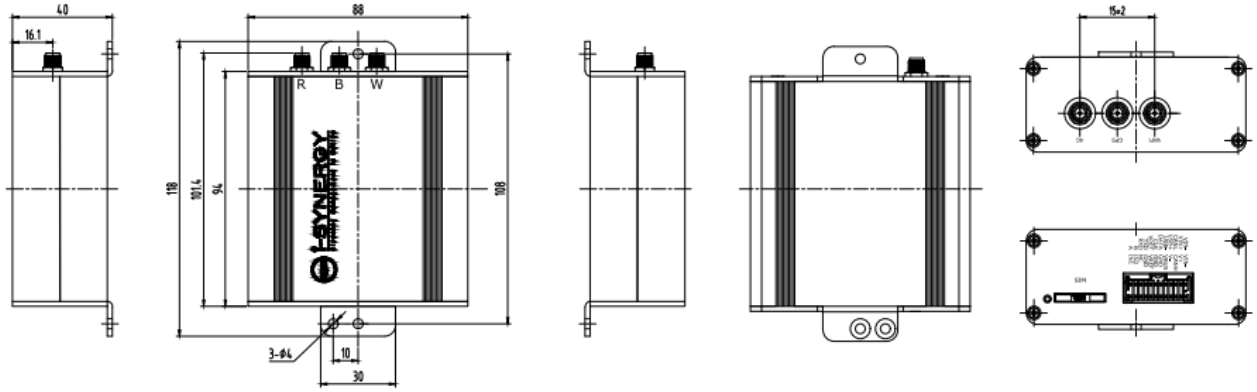
Physical Characteristics

- Ingress protection: IP30
- Housing : Aluminum shell
- Weight: 256g
- Dimensions: 88 x 118 x 40 mm
- Installations: Wall mounting

Operating Environment

- Operating Temperature: -20 to +60 °C
- Storage Temperature : -40 to +85 °C
- Relative Humidity: 5 to 95% RH

1.3 Dimensions



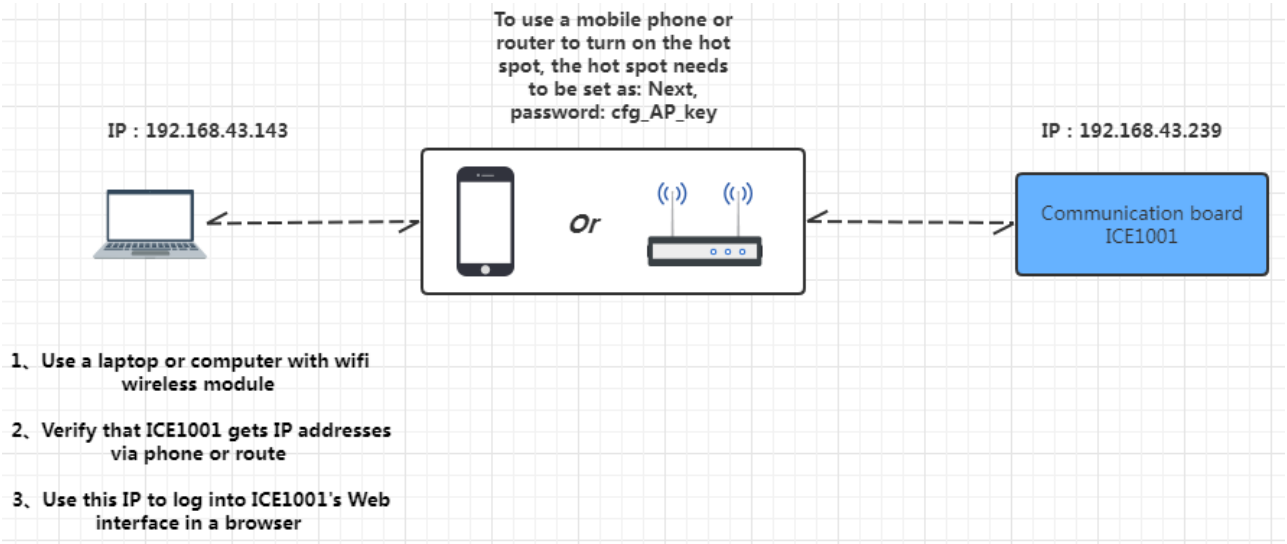
Right View Front View Left View Rear View Top&Bottom View

Chapter 2 Initial Configuration

The 4G Cellular Router ICE1001-S4LC (Global) can be configured through your web browser that including IE 8.0 or above, Chrome and Firefox, etc. A web browser is included as a standard application in the following operating systems: Linux, Mac OS, Windows 98/NT/2000/XP/Me/Vista/7/8, etc. It provides an easy and user-friendly interface for configuration. There are various ways to connect the 4G Cellular Router ICE1001-S4LC (Global), either through an external repeater or hub. For example, we can consider turning on hotspots on mobile phones:

SSID is: Next

Password is：cfg_ap_key

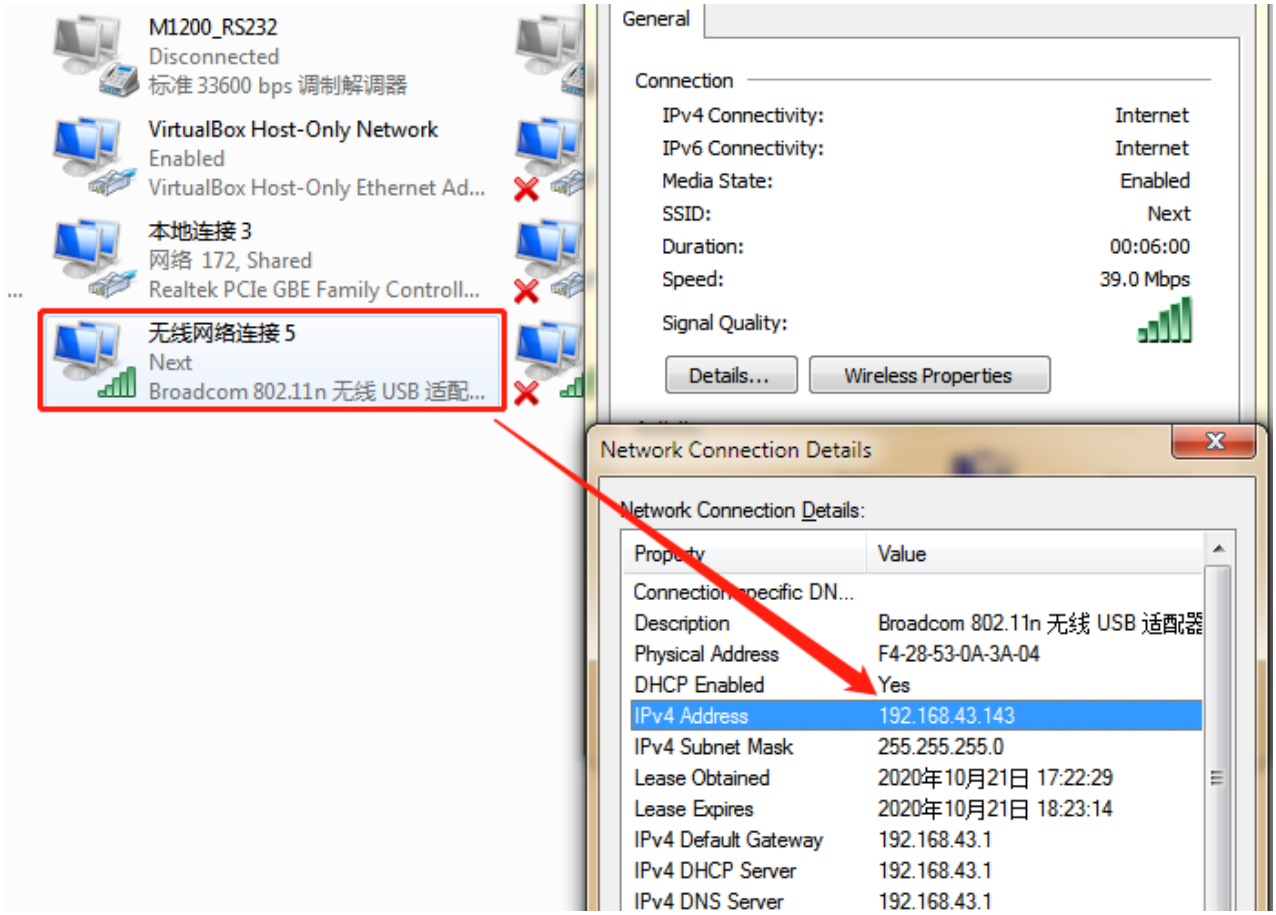


The above hotspot is consistent with the hotspot information configured through the mobile APP; we need to connect both the PC and the router to this hotspot, so that the PC and the router are in the same network, so that you can log in to the WEB interface of the router through the PC; Various configurations will be described in detail below.

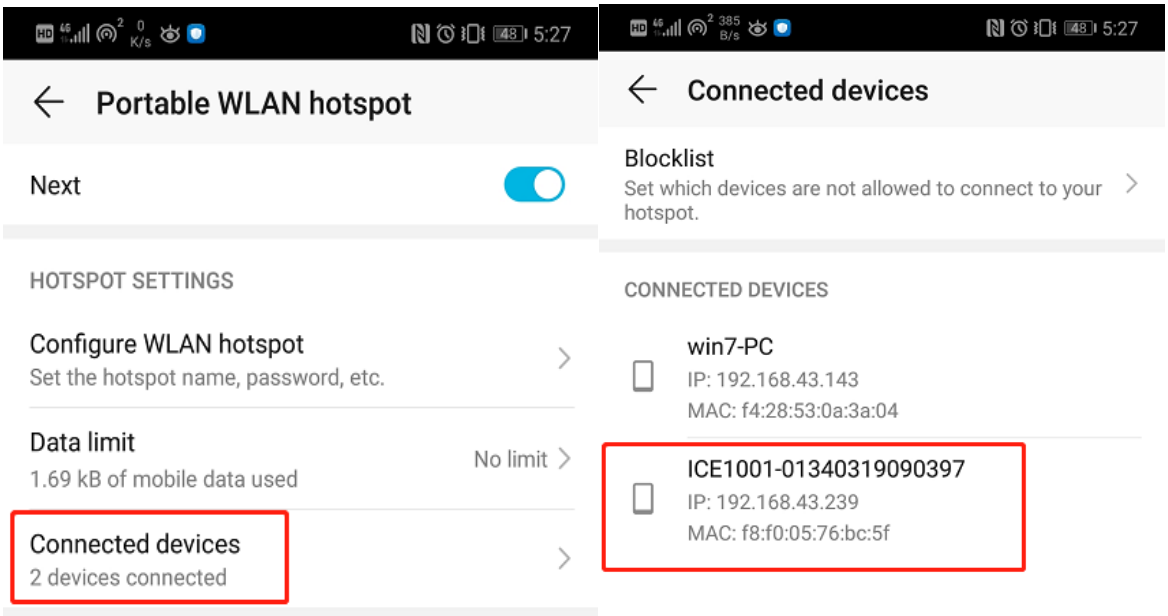
2.1 Configure the PC

Please prepare a laptop or a computer with a WIFI wireless network card (hereinafter described as a laptop); after turning on the hotspot on the mobile phone, click Network Settings on the laptop, scan to the configured hotspot Next, and configure the connection configuration password

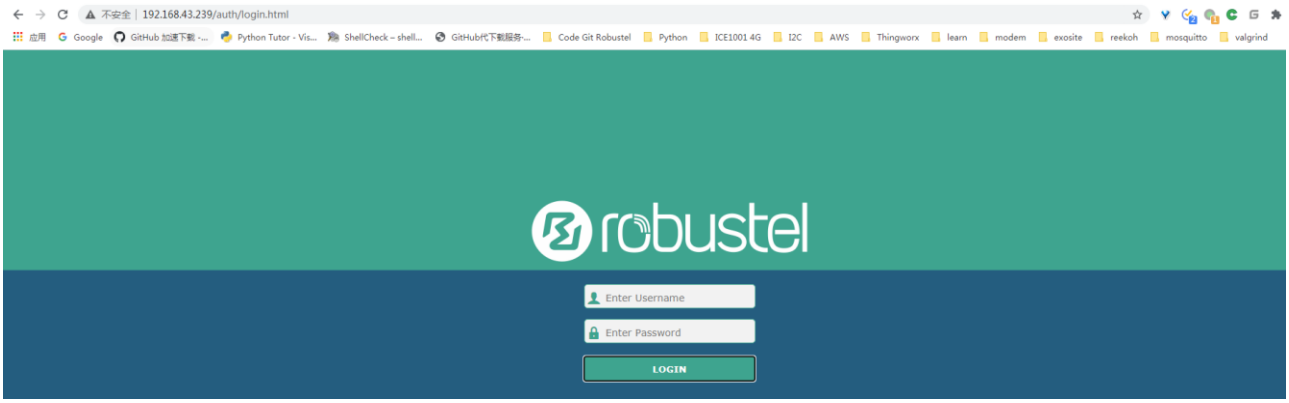
After the password verification is passed, we can see on this laptop that the hotspot is connected, and the IP is 192.168.43.143 (the IP network segment of different mobile phones may be different):



When the main hotspot and backup hotspot have not been configured for the communication board, or a non-existent hotspot is configured; the router will try to connect to the hotspot Next used to configure the wifi parameters of the mobile phone APP; after our mobile phone hotspot is turned on, after connecting, We can see on the mobile phone that there are currently two devices connected. For example, the display name of the router is: ICE1001-router SN code, and you can see that the IP is 192.168.43.239:



At this point, we can log in to the parameter configuration page of the router through a PC connected to the hotspot, and enter the IP of the router on the browser to log in:



2.2 Factory Default Settings

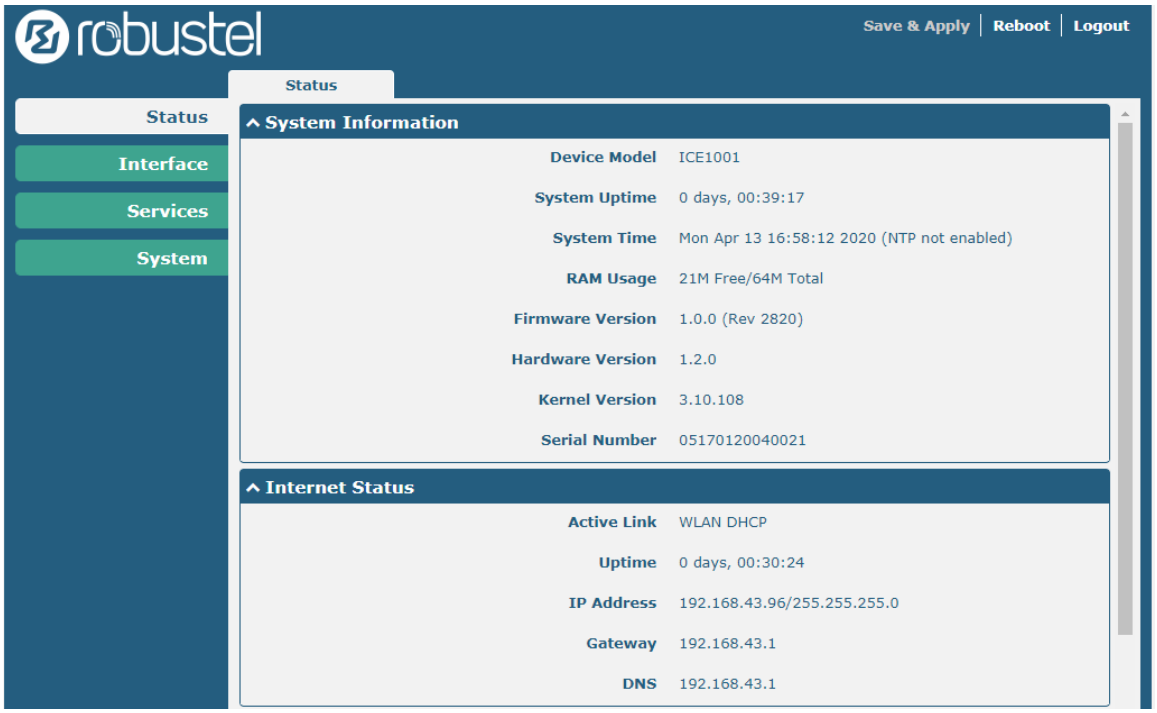
Before configuring your router, you need to know the following default settings.

Item	Description
Username	admin
Password	admin

Note: If you enter the wrong username or password for 6 consecutive times, the login page will be locked for 5 minutes.

2.3 Control Panel

After logging in, the home page of the ICE1001-S4LC (Global)'s web interface is displayed, for example.



From the home page, users can perform operations such as saving configuration, restarting the router, and logging out.

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

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

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

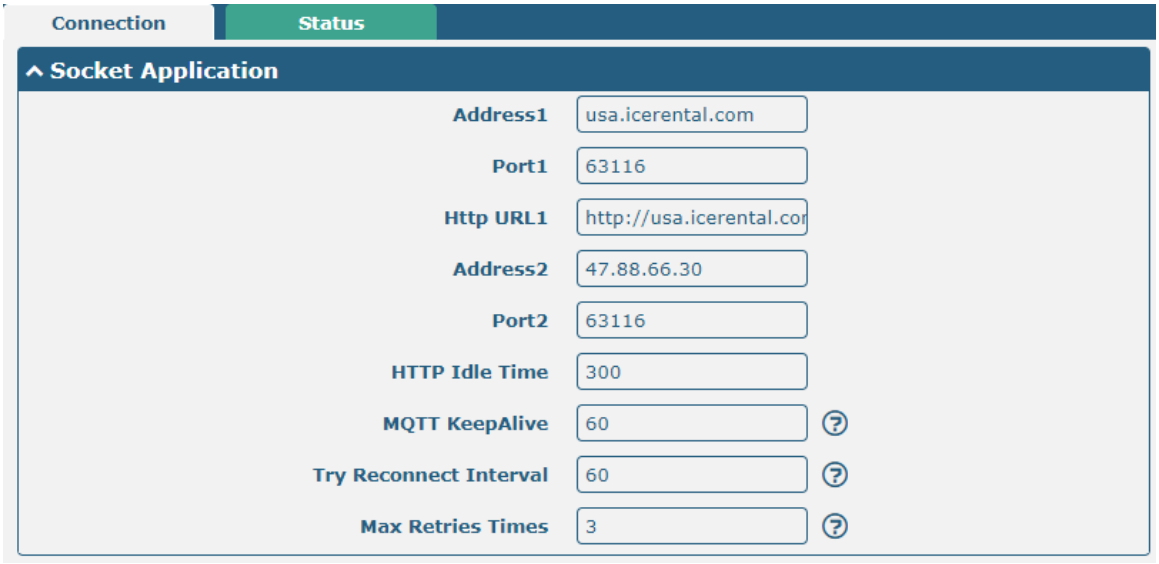
Chapter 3 Concise Configuration of Communication Board

This chapter mainly describes the minimum configuration required for normal use of the router; After chapter 1, the Web interface of the router can be logged in normally. Next, the basic configuration of the router can be completed as long as the network parameters of the router and parameters connecting to i-SYNERGY platform are configured according to actual requirements. After the router is connected to the cleaning machine, i-SYNERGY platform can be automatically connected. Other configurations needed later can also be configured through the platform; The following details:

3.1 Platform Connection Parameters of i-SYNERGY

To connect to the correct platform environment, you need to configure the corresponding parameters; you can configure the platform connection parameters through Service> ICE_Connection. The following example directly connects to the configuration parameters of the US environment:

	Socket Application	Socket Application2
Platform to address	usa.icerental.com	47.88.66.30
Destination port(default)	63116	63116
HTTP URL	http://usa.icerental.com/ice	http://47.88.66.30/ice
Connected Control		
Work Mode		
Idle Time(second)	300	
Reconnection time(second)	20	
Reconnection number	3	
MQTT reconnection time(second)	20	

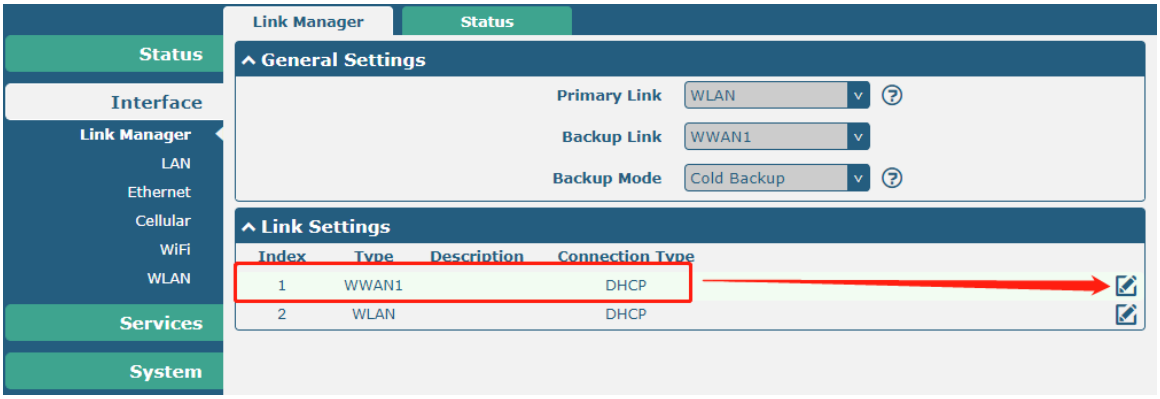


After the configuration is complete, click Submit and then click Save & Apply to take effect.

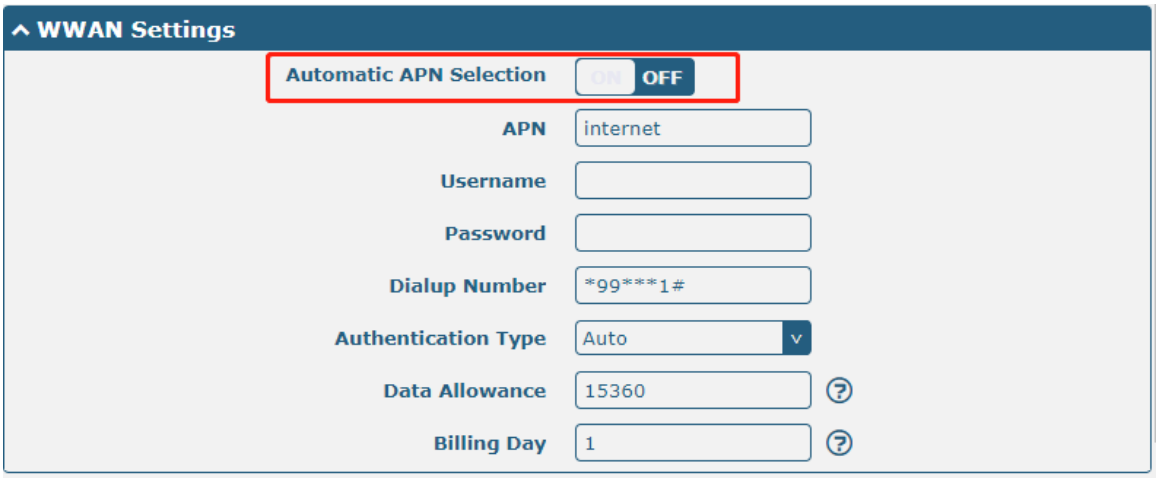
3.2 Network parameters

This section allows you to configure the network according to your needs.

1. When you have inserted a SIM card and need to configure APN and other parameters; you can configure it through the WWAN1 configuration item in Interface> Link Manager> Link Settings, click to open the detailed configuration:



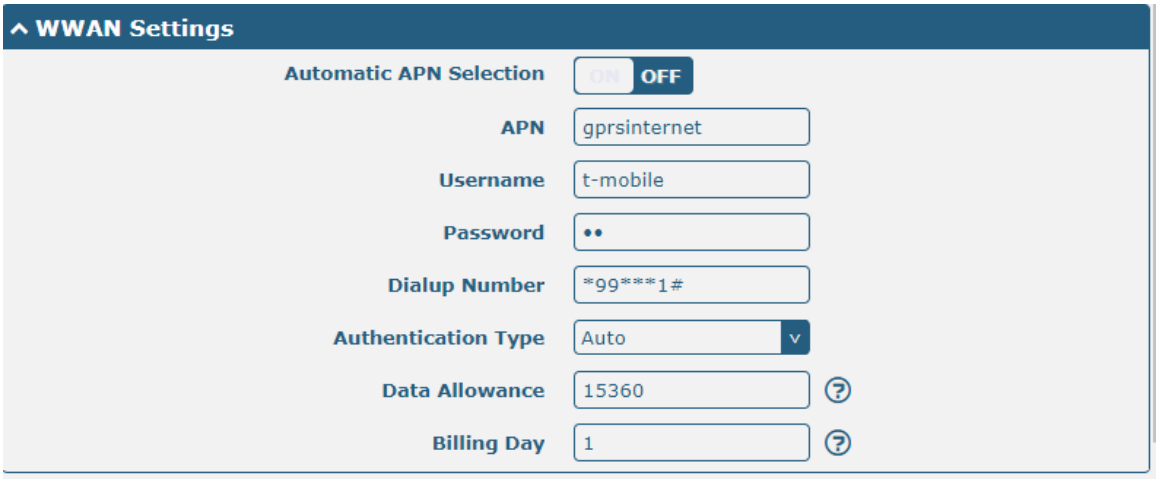
Configure APN in WWAN Settings, select "Automatic APN Selection" as OFF; you can manually configure APN, authentication method, user name and password, etc.;



The specific explanation of each parameter item is as follows:

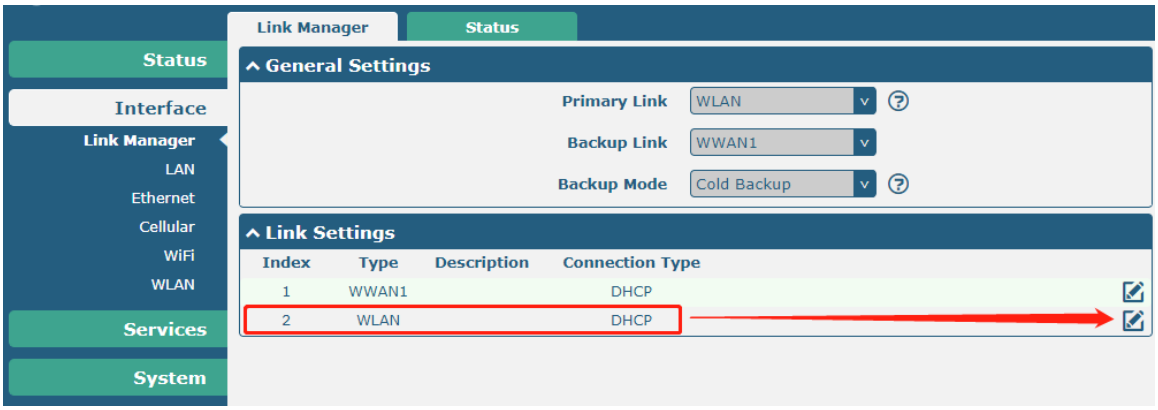
Automatic APN Selection	Click the toggle button to enable/disable the automatic selection of APN option. After turning on the automatic selection of APN, the device will automatically obtain the APN of the current network without manual input; after turning off this function, you need to manually add the APN.	ON
APN	Enter the access point for the cellular dial-up connection provided by the local Internet service provider.	internet
Username	Enter the username for the cellular dial-up connection provided by the local Internet service provider.	Null
Password	Enter the password for the cellular dial-up connection provided by the local Internet service provider.	Null
Dialup Number	Enter the network dial-up number provided by the local operator.	*99***1#
Authentication Type	Select from "Auto", "PAP" or "CHAP" according to your local ISP.	Auto

e.g.
Configure the APN of T-Mobile AT:
APN: gprsinternet
Username: t-mobile
Password: tm

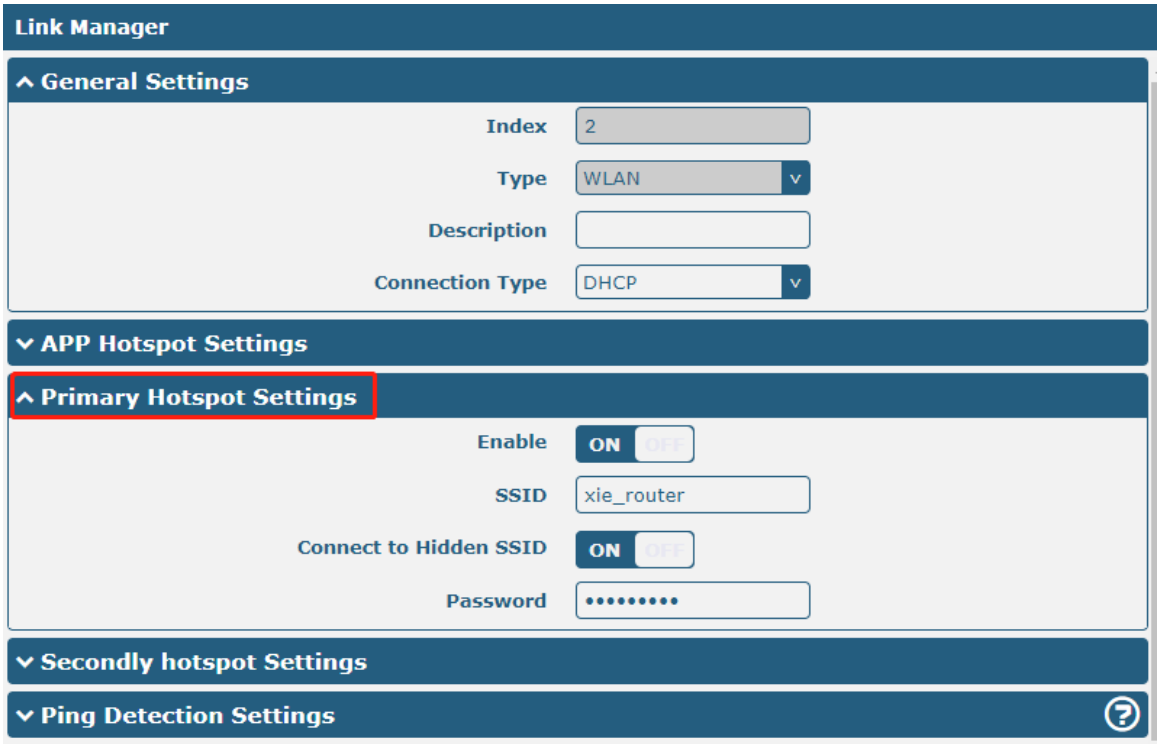


After the configuration is complete, click Submit and then click Save & Apply to take effect; then, note that after saving the Link Manager configuration, the system link will restart and the device will reconnect to WIFI;

2. You can also choose to directly configure the WIFI hotspot information that will be used later, through the WLAN configuration item in Interface> Link Manager> Link Settings, and click to open the detailed configuration:



You can configure only the main hotspot with the highest priority. Generally, you only need to fill in the SSID and Password; if you have multiple available hotspots, you can consider configuring one more alternative hotspot to Secondly hotspot;



APP Setting SSID	Enter the SSID of the hotspot where the device configures the communication board parameters through the mobile APP. SSID (Service Set Identifier) refers to the network name of the WLAN. Please enter 1~32 characters.	Next
Connect to Hidden SSID	Click the toggle button to enable/disable the "Connect to hidden SSID" function. When the device is in client mode and needs to connect to any access point that has hidden SSID, this function must be enabled here.	OFF
Password	Enter the password of the access point that the device wants to access. Please enter 8~63 characters.	cfg_ap_key

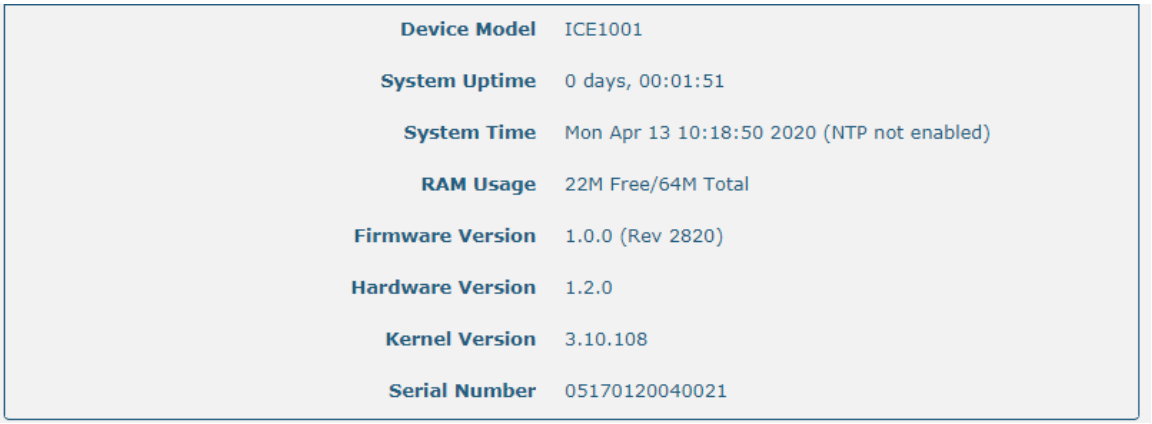
After the configuration is complete, click Submit and then click Save & Apply to take effect; you can, note that after saving the Link Manager configuration, the system link will restart and the device will reconnect to WIFI

Chapter 4 Router Configuration

4.1 Status

4.1.1 System Information

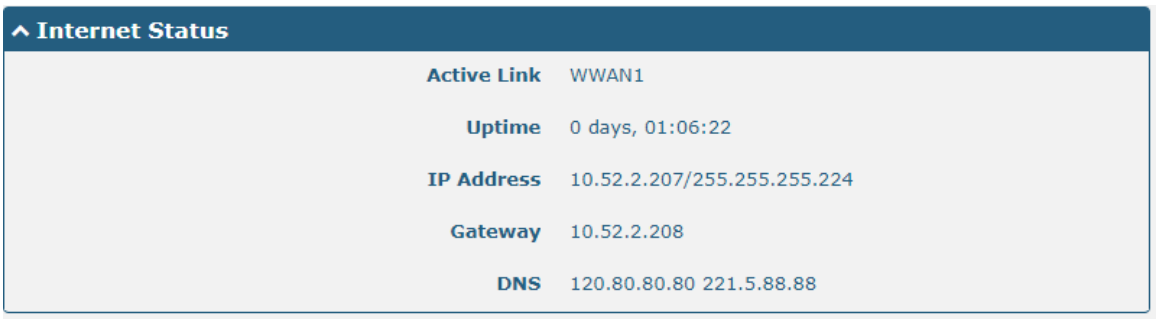
This section allows you to view the System Information of your router.



System Information	
Item	**Description**
Device Model	Show the model of the device.
System Uptime	Show the working time from the start of the system to the current time.
System Time	Show the current system time.
RAM Usage	Show the current memory usage and total memory capacity.
Firmware Version	Show the current firmware version.
Hardware Version	Show the current hardware version.
Kernel Version	Show the current kernel version.
Serial Number	Show the factory serial number of the router, and the factory time and other information of the router can be obtained from the serial number.

4.1.2 Internet Status

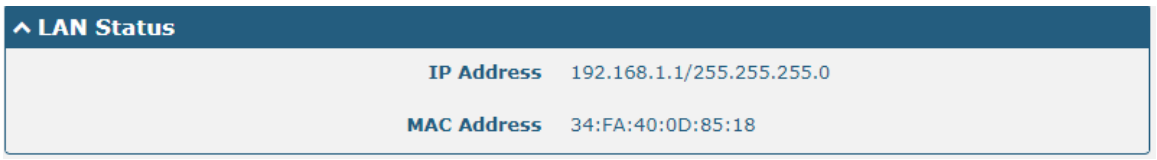
This section allows you to view the Internet status of your router.



Internet Status	
Item	**Description**
Active Link	Show the currently online link: WWAN1 or WLAN.
Uptime	Show the current amount of time the link has been connected.
IP Address	Show the IP address of current link.
Gateway	Show the gateway of the current link.
DNS	Show the current DNS server.

4.1.3 LAN Status

This section allows you to view the LAN status of your router.



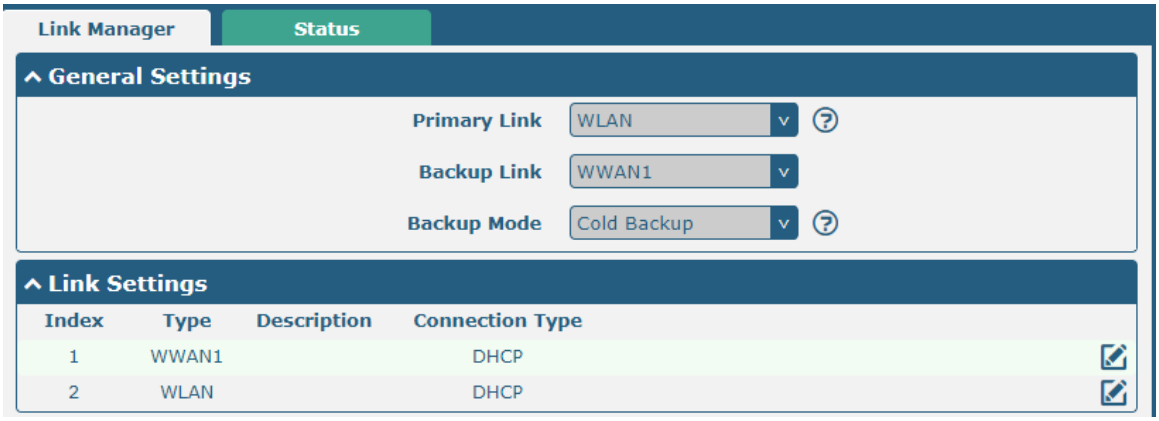
LAN Status	
Item	**Description**
IP Address	Show the IP address and the Netmask of the router.
MAC Address	Show the MAC address of the router.

4.2 Interface

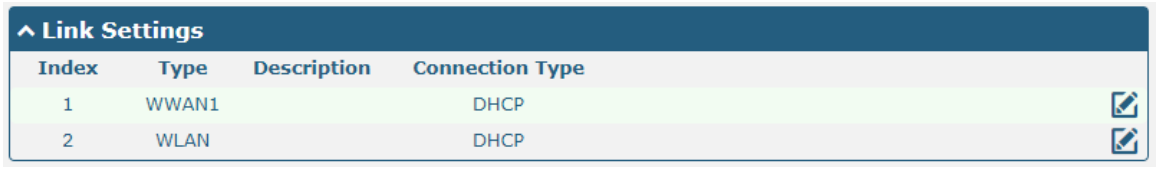
4.2.1 Link Manager

This section allows you to setup the link connection. Link management is a network link backup function, which

provides mobile network and Wifi link backup.

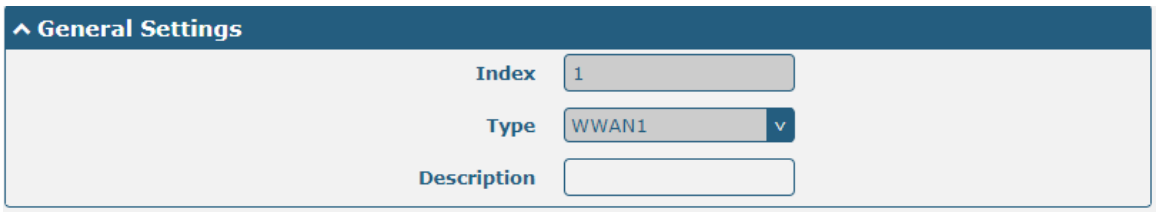


Link settings are used to configure the parameters of the link connection, including WWAN1 and WLAN.
It is recommended to enable Ping detection to keep the router always online. Ping detection improves reliability while saving data traffic.

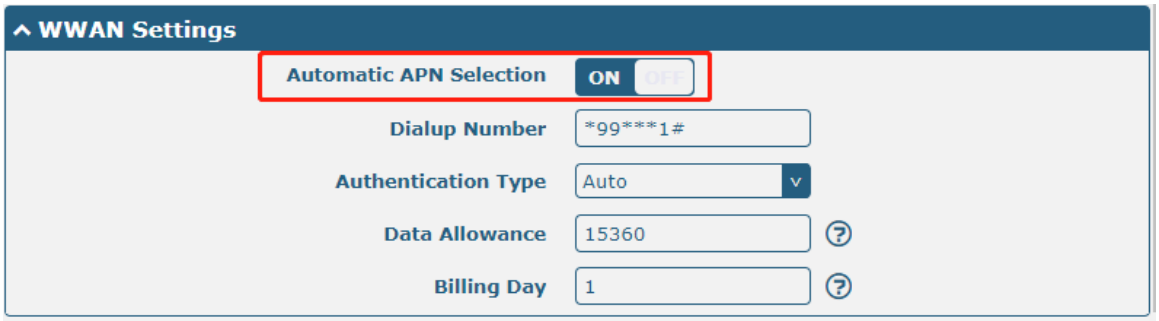


Click on the right-most of WWAN1/WWAN2 to enter the configuration window.

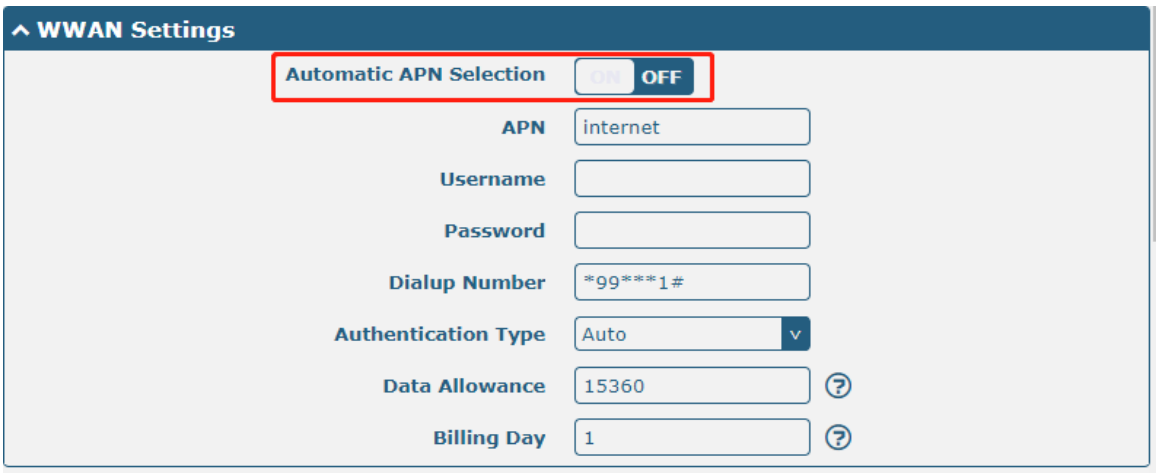
WWAN1

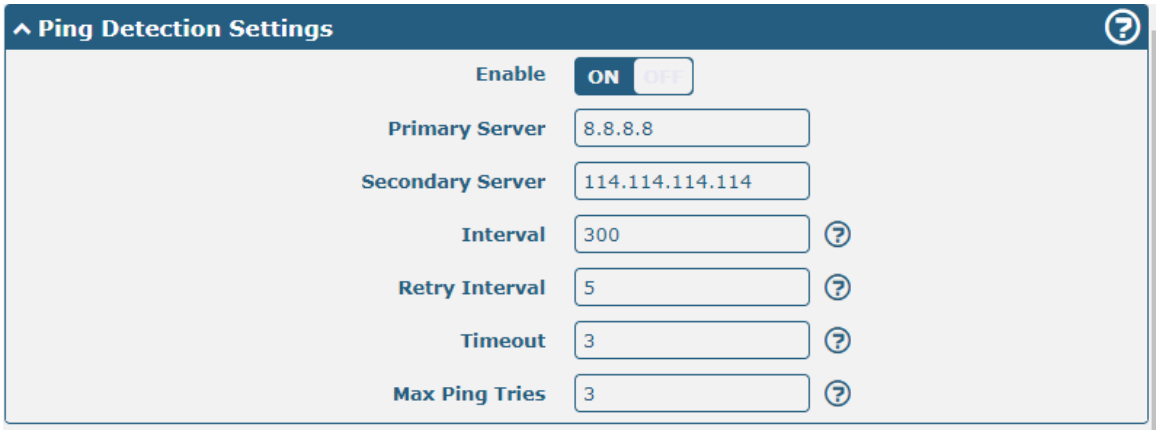


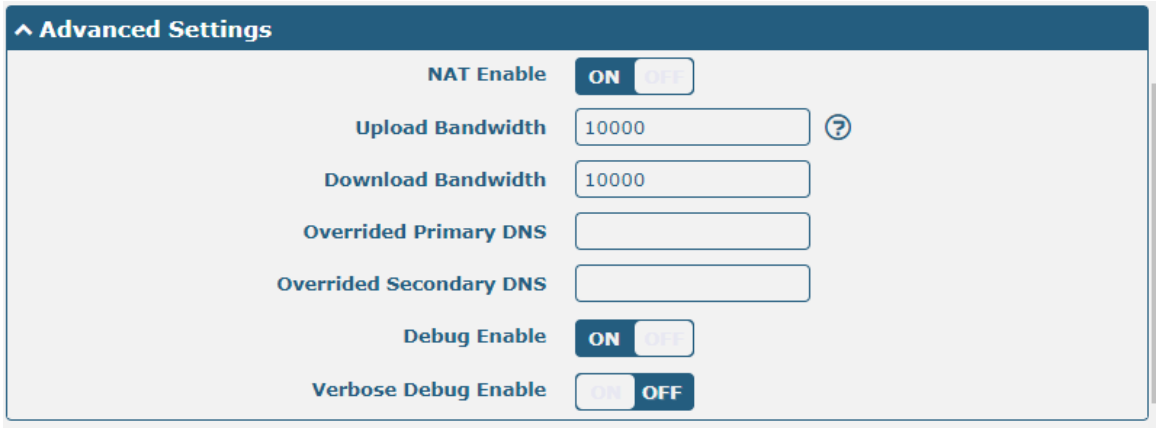
The window is displayed as below when enabling the “Automatic APN Selection” option.



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







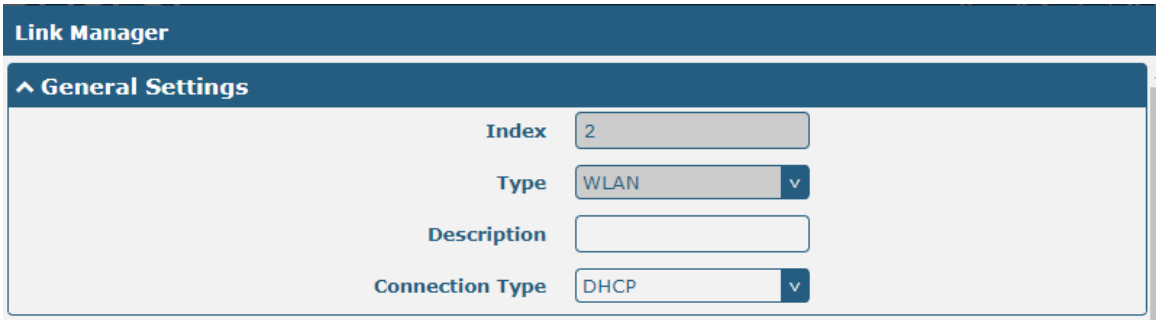
Link Manager（WWAN）		
Item	**Description**	**Default**
General Setting		
Index	Indicate the ordinal of the list.	--
Type	Show the type of the link.	WWAN1
Description	Enter a description for this link, it can be null.	Null

Link Manager（WWAN）		
Item	**Description**	**Default**
WWAN Setting		
Automatic APN Selection	Click the toggle button to enable/disable the “Automatic APN Selection” option. After enabling, the device will recognize the access point name automatically. Alternatively, you can disable this option and manually add the access point name.	ON
APN	Enter the Access Point Name for cellular dial-up connection, provided by local ISP.	internet
Username	Enter the username for cellular dial-up connection, provided by local ISP.	Null
Password	Enter the password for cellular dial-up connection, provided by local ISP.	Null
Dialup Number	Enter the dialup number for cellular dial-up connection, provided by local ISP.	*99***1#
Authentication Type	Select from “Auto”, “PAP” or “CHAP” as the local ISP required.	Auto
Data Allowance	Set the monthly data traffic limitation. The system will record the data traffic statistics when data traffic limitation (MiB) is specified. The traffic record will be displayed in **Interface > Link Manager > Status > WWAN Data Usage Statistics**. 0 means disable data traffic record.	15360
Billing Day	Specify the monthly billing day. The data traffic statistics will be recalculated from that day.	1
Ping Detection Setting		
Enable	Click the toggle button to enable/disable the ping detection mechanism, a keep-alive policy of the router.	ON
Primary Server	Router will ping this primary address/domain name to check that if the current IP connectivity is active.	8.8.8.8
Secondly Server	Router will ping this secondary address/domain name to check that if the current IP connectivity is active.	114.114.114.114
Interval	Set the ping interval, measured in seconds	300
Retry Interval	Set the ping retry interval. When ping failed, the router will ping again every retry interval.	5
Timeout	Set the ping timeout, measured in seconds.	3
Max Ping Tries	Set the max ping tries. Switch to another link or take emergency action if the max continuous ping tries reached.	3
Advanced Setting		
Nat Enable	Click the toggle button to enable/disable the NAT functions. NAT is Network Address Translation option.	ON
Upload Bandwidth	Set the upload bandwidth used for QoS, measured in kbps.	10000

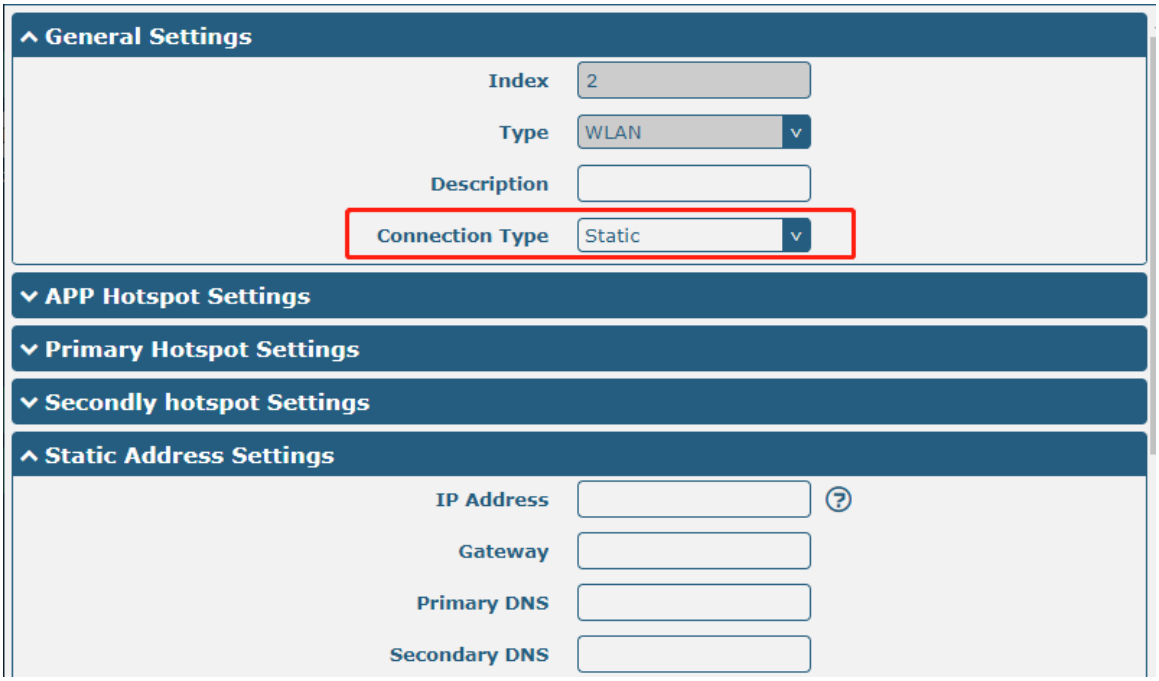
Link Manager（WWAN）		
Item	**Description**	**Default**
Download Bandwidth	Set the download bandwidth used for QoS, measured in kbps.	10000
Override Primary DNS	Defines the primary DNS server assigned by the DHCP server to the client.	Null
Override Secondly DNS	Defines the Secondary DNS server assigned by the DHCP server to the client.	Null
Debug Enable	Click the toggle button to enable/disable this option. Enable for debugging information output.	ON
Verbose Debug Enable	Click the toggle button to enable/disable this option. Enable for verbose debugging information output.	OFF

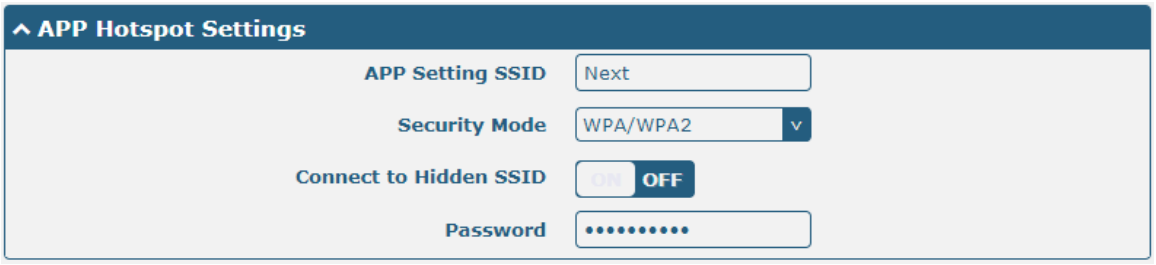
WLAN

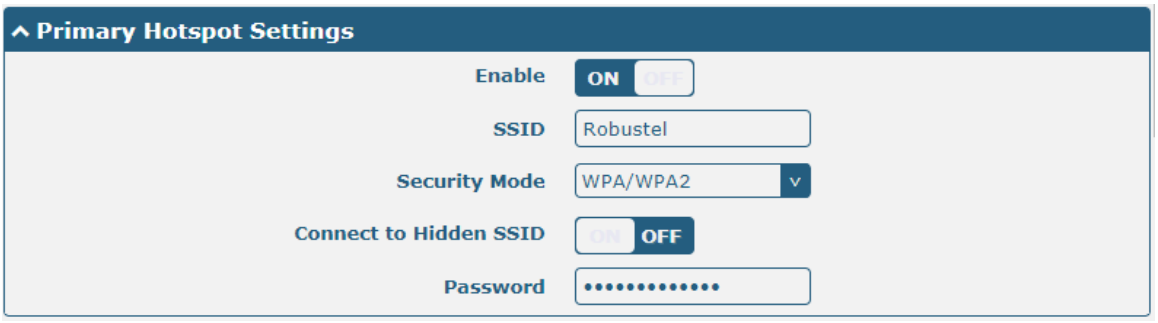
Router will obtain IP automatically from the WLAN AP if choosing “DHCP” as the Connection Type. The specific parameter configuration of SSID is shown as below.

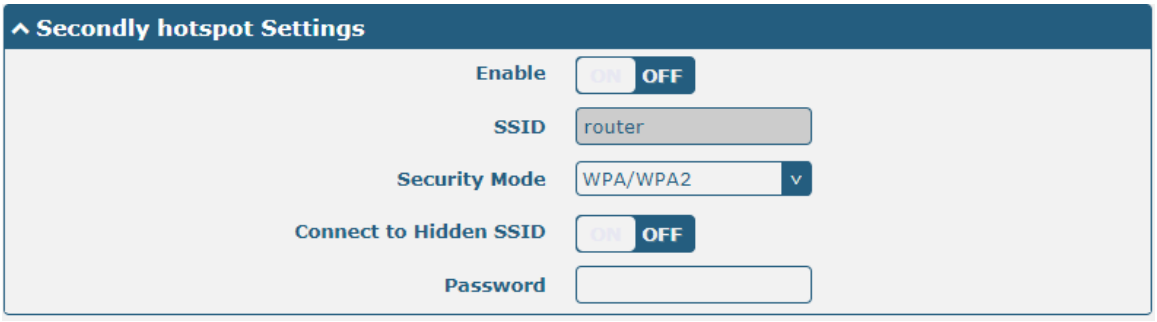


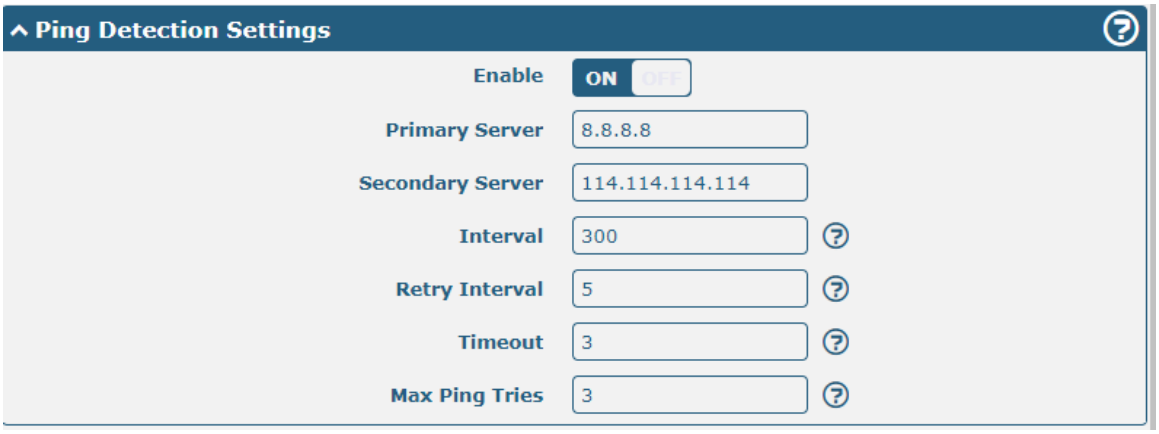
The window is displayed as below when choosing “**Static**” as the **“Connection type”**.

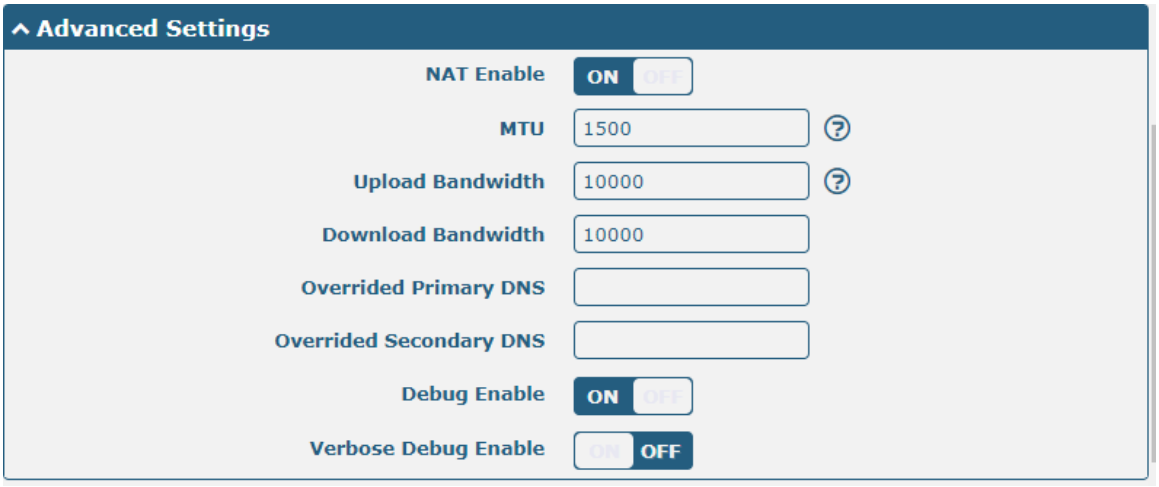

General Settings
Index
2
Type
WLAN
Description
Connection Type
Static
APP Hotspot Settings
Primary Hotspot Settings
Secondly hotspot Settings
Static Address Settings
IP Address
Gateway
Primary DNS
Secondary DNS


APP Hotspot Settings
APP Setting SSID
Next
Security Mode
WPA/WPA2
Connect to Hidden SSID
OFF
Password


Primary Hotspot Settings
Enable
ON
SSID
Robustel
Security Mode
WPA/WPA2
Connect to Hidden SSID
OFF
Password


Secondly hotspot Settings
Enable
OFF
SSID
router
Security Mode
WPA/WPA2
Connect to Hidden SSID
OFF
Password





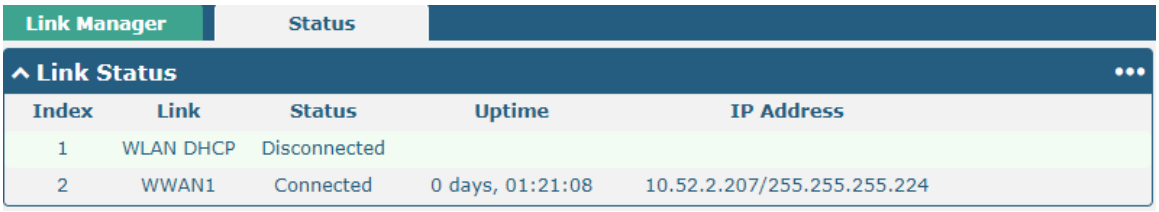
Link Settings (WLAN)		
Item	**Description**	**Default**
General Settings		
Index	Indicate the ordinal of the list.	--
Type	Show the type of the link.	WLAN
Description	Enter a description for this link, it can be null.	Null
Connection Type	Select from “DHCP” or “Static”.	DHCP
APP Hotspot Settings		
APP Setting SSID	Enter the SSID of the hotspot where the device configures the router parameters through the mobile APP. SSID (Service Set Identifier) refers to the network name of the WLAN. Please enter 1~32 characters.	Next
Security Mode	Select the security authentication method, the options include: OPEN, WEP, WPA/WPA2. When the authentication method is WPA/WPA2, it also means automatic matching (that is, all three modes can be supported);	WPA/WPA2

Link Settings (WLAN)		
Item	**Description**	**Default**
Connect to Hidden SSID	Click the toggle button to enable/disable the "Connect to hidden SSID" function. When the device is in client mode and needs to connect to any access point that has hidden SSID, this function must be enabled here.	OFF
Password	Enter the password of the access point that the device wants to access. Please enter 8~63 characters.	cfg_ap_key
Primary Hotspot Settings		
Enable	Click the toggle button to enable/disable, the preferred hotspot for the configuration of the router wifi connection.	Disable
Security Mode	Select the security authentication method, the available options include: OPEN, WEP, WPA/WPA2. When the authentication method is selected as WPA/WPA2, it also means automatic matching (that is, all three modes can be supported);	WPA/WPA2
SSID	The SSID parameters of the preferred hotspot for the wifi connection of the router	router
Connect to Hidden SSID	Click the toggle button to enable/disable the "Connect to hidden SSID" function. When the device is in client mode and needs to connect to any access point that has hidden SSID, this function must be enabled here.	OFF
Password	Enter the password of the access point that the device wants to access. Please enter 8~63 characters.	Null
Secondly hotspot Settings		
Enable	Click the toggle button to enable/disable, an alternative hotspot for the configuration of the router wifi connection	Disable
Security Mode	Select the security authentication method, the options include: OPEN, WEP, WPA/WPA2. When the authentication method is WPA/WPA2, it also means automatic matching (that is, all three modes can be supported);	WPA/WPA2
SSID	SSID parameters of the alternative hotspot connected to the router wifi	router
Connect to Hidden SSID	Click the toggle button to enable/disable the "Connect to hidden SSID" function. When the device is in client mode and needs to connect to any access point that has hidden SSID, this function must be enabled here.	OFF
Password	Enter the password of the access point that the device wants to access. Please enter 8~63 characters.	Null
Static Address Settings		
IP Address	Set the IP plus mask that can access the Internet, eg.,192.168.1.1/24.	Null
Gateway	Enter the IP address of the WiFi AP.	Null

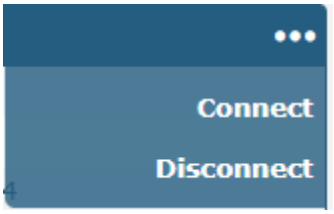
Link Settings (WLAN)		
Item	**Description**	**Default**
Primary Server	Set the preferred DNS server.	Null
Secondary Server	Set the primary DNS server.	Null
Ping Detection Settings		
Enable	Click the toggle button to enable/disable the ping detection mechanism, a keep alive policy of the router.	ON
Primary Server	Router will ping this primary address/domain name to check that if the current connectivity is active.	8.8.8.8
Secondly Server	Router will ping this secondary address/domain name to check that if the current connectivity is active.	114.114.114.114
Interval	Set the ping interval, measured in seconds.	300
Retry Interval	Set the ping retry interval. When ping failed, the router will ping again every retry interval.	5
Timeout	Set the ping timeout, measured in seconds.	3
Max Ping Tries	Set the max ping tries. Switch to another link or take emergency action if the max continuous ping tries reached.	3
Advance Settings		
Nat Enable	Click the toggle button to enable/disable the NAT function. NAT is Network Address Translation.	ON
MTU	Enter the Maximum Transmission Unit.	1500
Upload Bandwidth	Enter the upload bandwidth used for QoS, measured in kbps.	10000
Download Bandwidth	Enter the download bandwidth used for QoS, measured in kbps.	10000
Override Primary DNS	Defines the primary DNS server assigned by the DHCP server to the client.	Null
Override Secondly DNS	Defines the Secondary DNS server assigned by the DHCP server to the client.	Null
Debug Enable	Click the toggle button to enable/disable this option. Enable for debugging information output.	ON
Verbose Debug Enable	Click the toggle button to enable/disable this option. Enable for verbose debugging information output.	OFF

Status

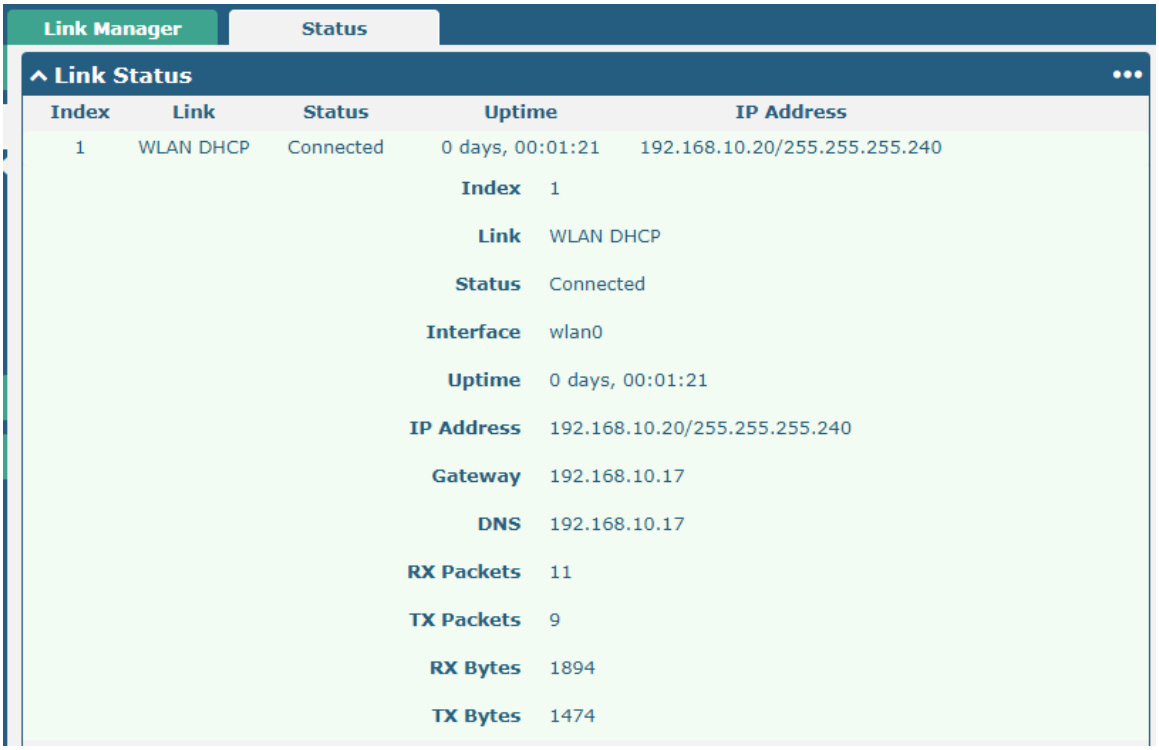
This section allows you to view the status of link connection.

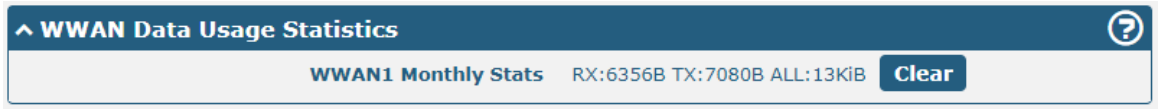


Click the right-most button ••• to select the connection status of the current link.



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



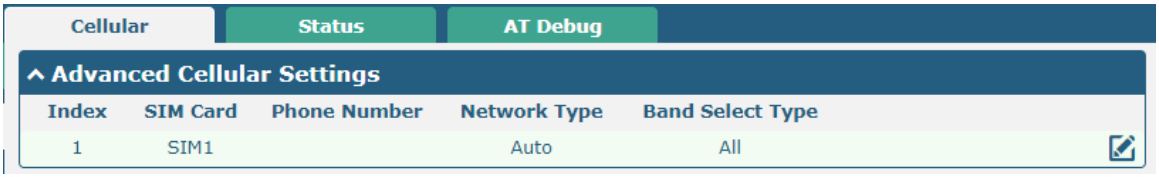


Click the Clear button to clear SIM1 monthly data traffic usage statistics. Data statistics will be displayed only if enable the Data Allowance function in **Interface > Link Manager > Link Settings > WWAN Settings > Data Allowance**.

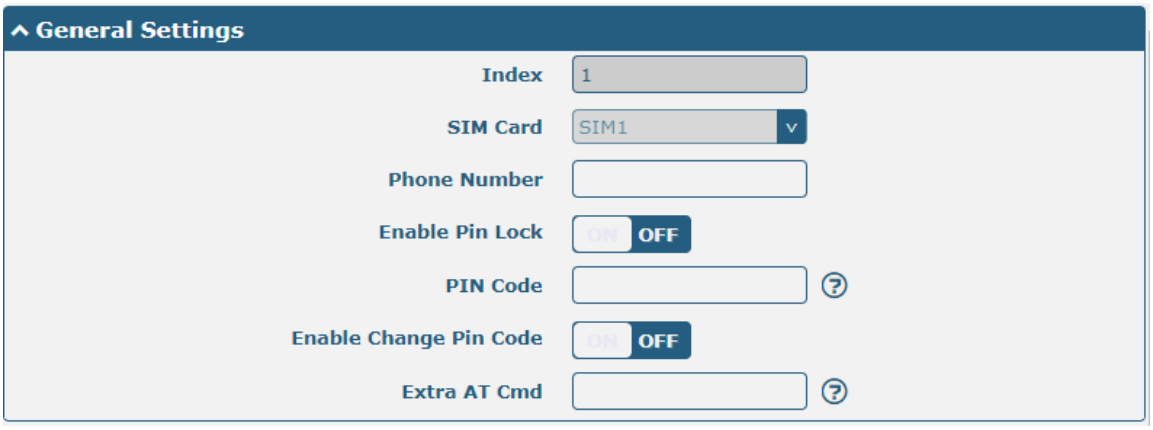
4.2.2 Cellular

This section allows you to set the related parameters of Cellular. The ICE1001-S4LC (Global) Router has one SIM card

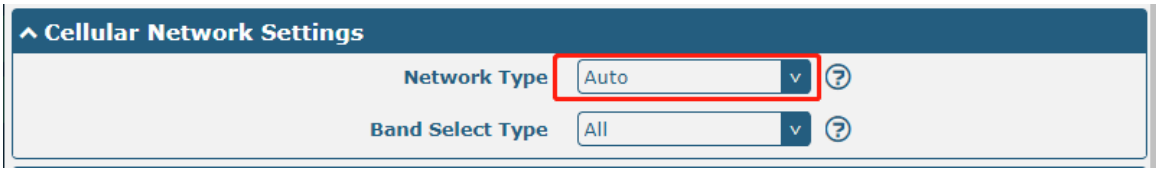
slot.



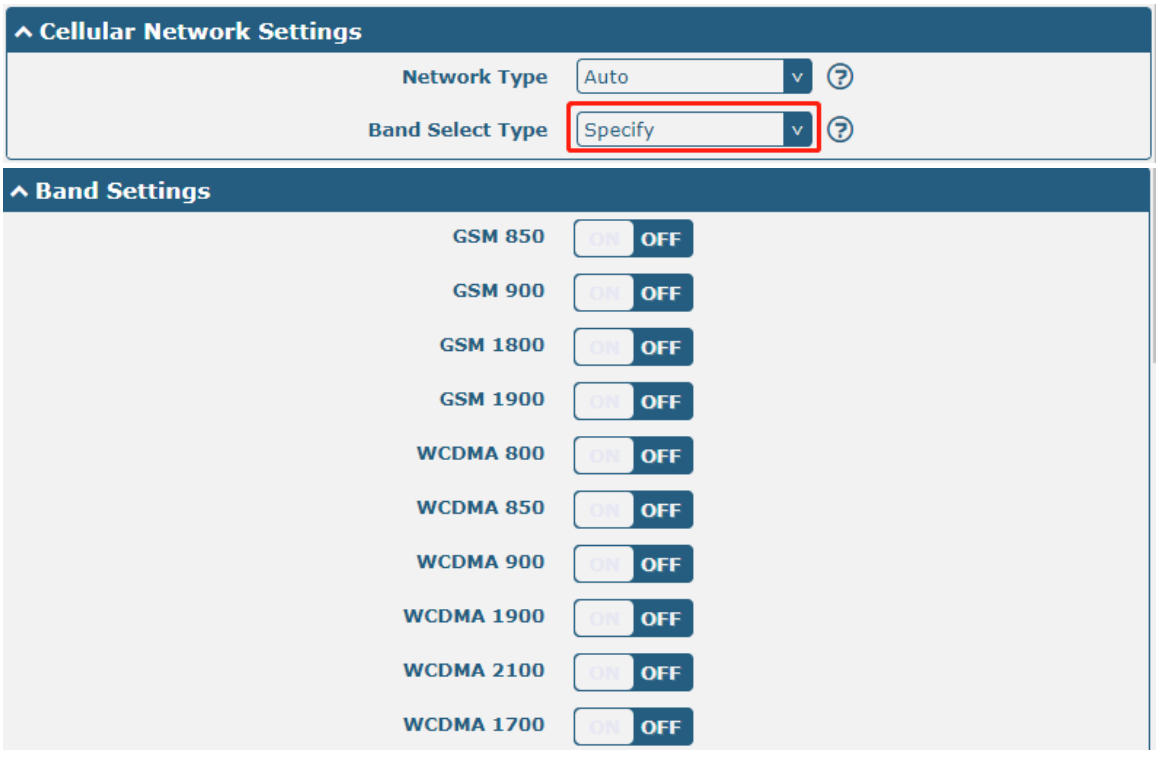
Click the button of SIM 1 to edit the parameters.



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

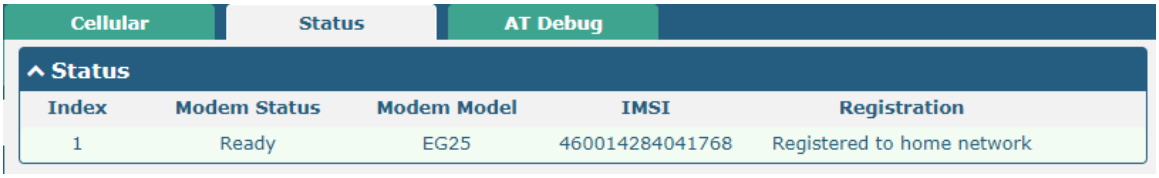


The window is displayed as below when choosing “Specify” as the band select type.

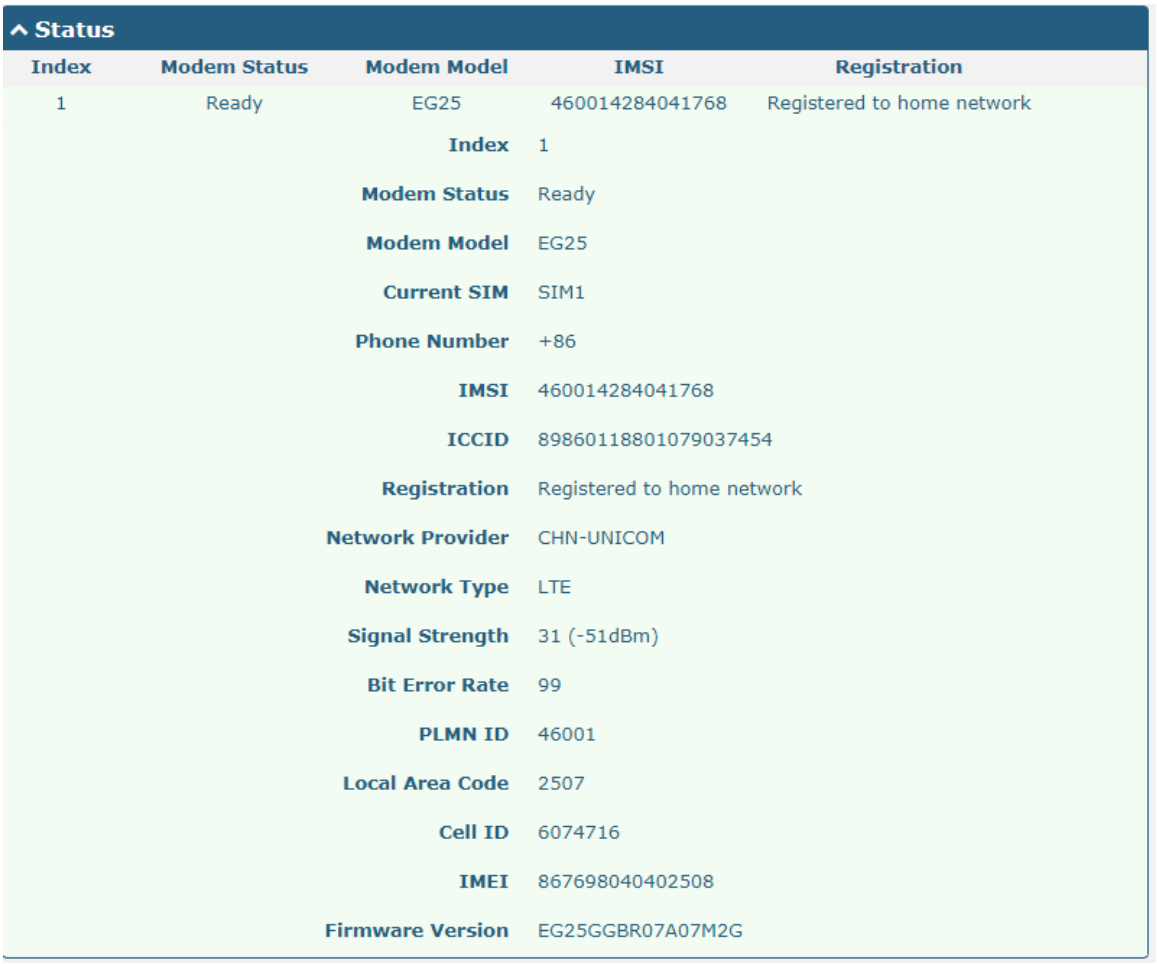


Cellular		
Item	**Description**	**Default**
General Settings		
Index	Indicate the ordinal of the list.	--
SIM Card	Set the currently editing SIM card.	SIM1
Phone Number	Enter the phone number of the SIM card.	Null
Enable Pin Lock	Enable or disable Pin codes.	
PIN Code	Enter a 4-8 characters PIN code used for unlocking the SIM.	Null
Enable change Pin Code	Is it allowed to change the Pin code.	
Extra AT cmd	Enter additional AT commands for wireless module initialization for expert use only.	Null
Cellular Network Settings		
Network Type	Select the cellular network type, that is, the network access sequence. Select from “Auto”, “2G Only”, “2G First”, “3G Only”, “3G First”, “4G Only”, “4G First”.	Auto
Band Select Type	Select from “All” or “Specify”. You may choose certain bands if choosing “Specify”.	All
Advanced Settings		
Debug Enable	Click the toggle button to enable/disable this option. Enable for debugging information output.	ON
Verbose Debug Enable	Click the toggle button to enable/disable this option. Enable for verbose debugging information output.	OFF

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



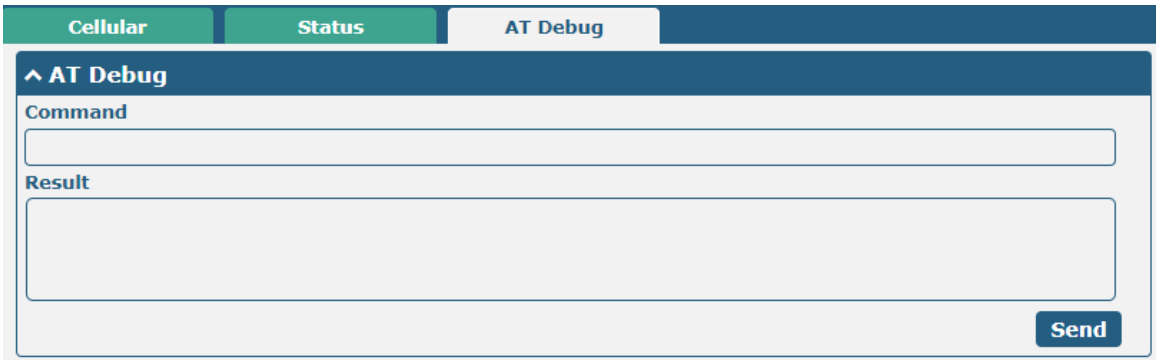
Click the row of status, the details status information will be displayed under the row.



Cellular Status	
Item	**Description**
Index	Indicate the ordinal of the list.
Modem Status	Show the operating status of the wireless module.
ModemModel	Show the model of the wireless module.
Current SIM	Show the SIM card that your router is using: SIM1.
Phone Number	Show the phone number of the current SIM. **Note:** This option will be displayed if enter manually in **Cellular > Advanced Cellular Settings > SIM1/SIM2 > Phone Number**.
IMSI	Show the IMSI number of the current SIM.
ICCID	Show the ICCID number of the current SIM.
Registration	Show the current network status.
Network Provider	Show the name of Network Provider.
Network Type	Show the current network service type, e.g. GPRS.
Signal Strength	Show the current signal strength detected by the mobile.

Cellular Status	
Item	**Description**
Bit Error Rate	Show the current bit error rate.
PLMN ID	Show the current PLMN ID.
Local Area Code	Show the current local area code used for identifying different area.
Cell ID	Show the current cell ID used for locating the router.
IMEI	Show the IMEI (International Mobile Equipment Identity) number of the radio module.
Firmware Version	Show the current firmware version of the radio module.

Click the "AT Debug" column to check AT Debug.

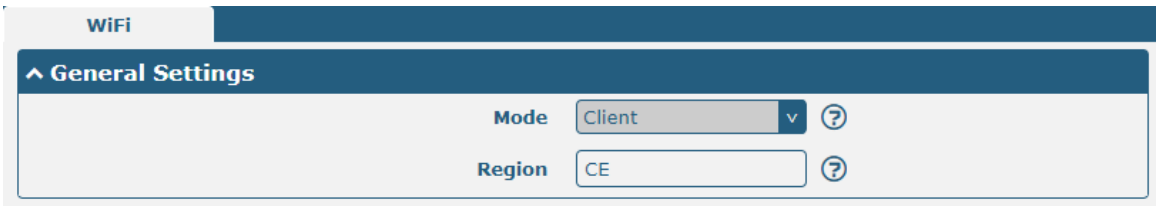


AT Debug		
项目	说明	默认
Command	Enter the AT command that you want to send to cellular module in this text box.	Null
Result	Show the AT command responded by cellular module in this text box.	Null
Send	Click the button to send AT command.	--

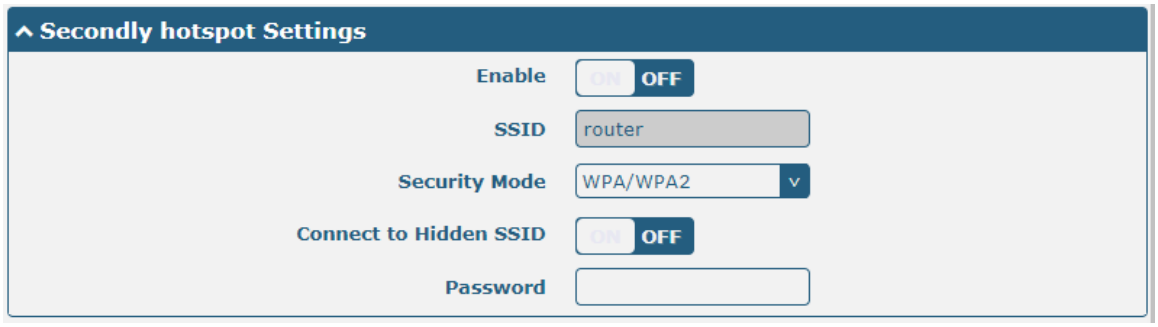
4.2.3 WiFi

This section allows you to configure the parameters of WiFi clients. Router supports WiFi Client mode, and default as WiFi mode.

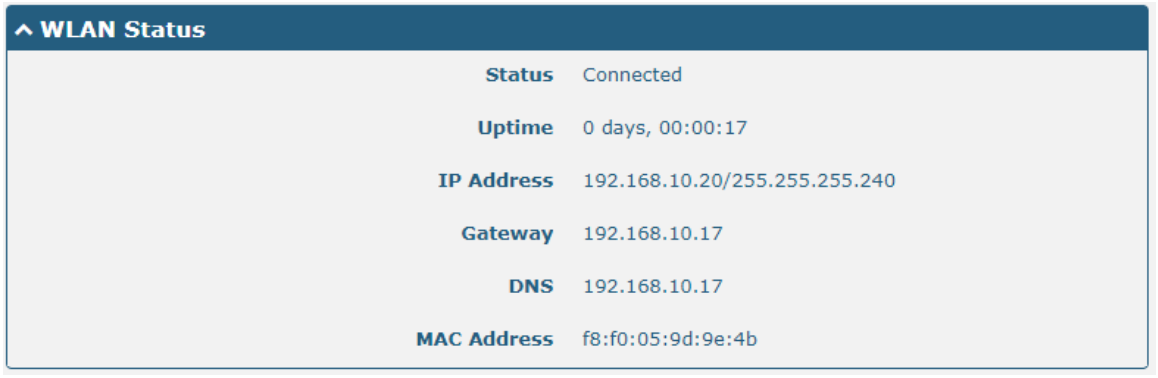
WiFi Client



Click "**Interface> Link Manager> Link Settings**" and click the WLAN edit button to configure the parameters of the WiFi client in the pop-up "WLAN Settings" window. There can be three configurations, namely the APP Hotspot for the mobile phone APP to set the wifi/Primary Hotspot/Secondly Hotspot.



Click "Interface> WLAN" to view the parameters of the WiFi client.



Link Status

Signal	-39 dBm
Noise	9999 dBm
TX Bitrate	72.0 MBit/s

WPA Status

WPA State	COMPLETED
Frequency	2472
BSSID	34:fa:40:06:1e:16
SSID	xie_router
Mode	station
Key Management	WPA2-PSK
Pairwise Cipher	CCMP
Group Cipher	CCMP

This window allows you to scan for all the available SSIDs in your area. Please click ••• and "Scan" on the "Scan Results" list.

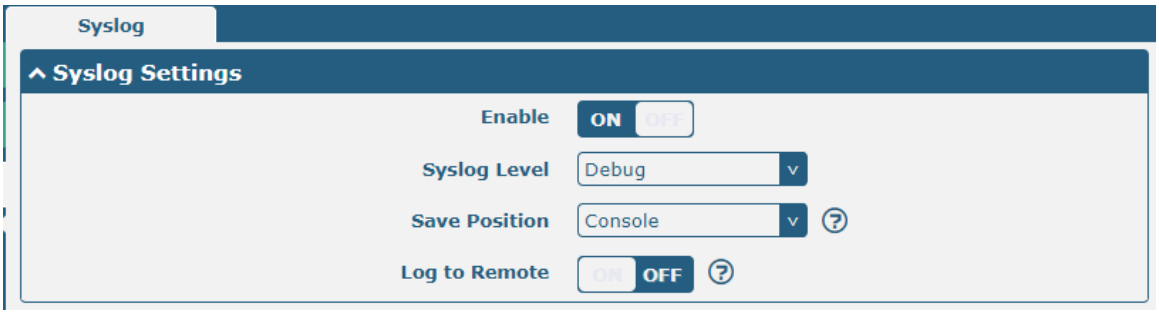
Scan Results

Index	SSID	MAC Address	Frequency	Signal
1	xie_router	34:FA:40:06:1E:16	2472	-28 dBm
2	MikroTik-21C1CE	4C:5E:0C:21:C1:CE	2412	-36 dBm
3	Robustel	20:65:8E:BA:56:60	2412	-43 dBm
4	Robustel-Visitor	20:65:8E:BA:56:61	2412	-43 dBm
5	AndroidAP	10:D0:7A:C3:E3:15	2462	-46 dBm
6	OpenWrt	B8:27:EB:B6:C8:75	2462	-59 dBm
7	LieBaoWiFi821	F2:EC:38:0C:E1:EB	2437	-24 dBm
8	HiWiFi_3F208	D4:EE:07:3F:2C:86	2442	-73 dBm
9	ChinaNet-1nQ4	CA:50:E9:20:33:36	2437	-76 dBm
10	ChinaNet-yz5q	D4:76:EA:68:C6:00	2437	-77 dBm
11	HROffice2.4G	E8:FC:AF:F7:62:C5	2452	-79 dBm
12	Tenda501	E8:65:D4:63:20:68	2432	-81 dBm
13	Robustel-Visitor	20:65:8E:BA:58:41	2462	-81 dBm

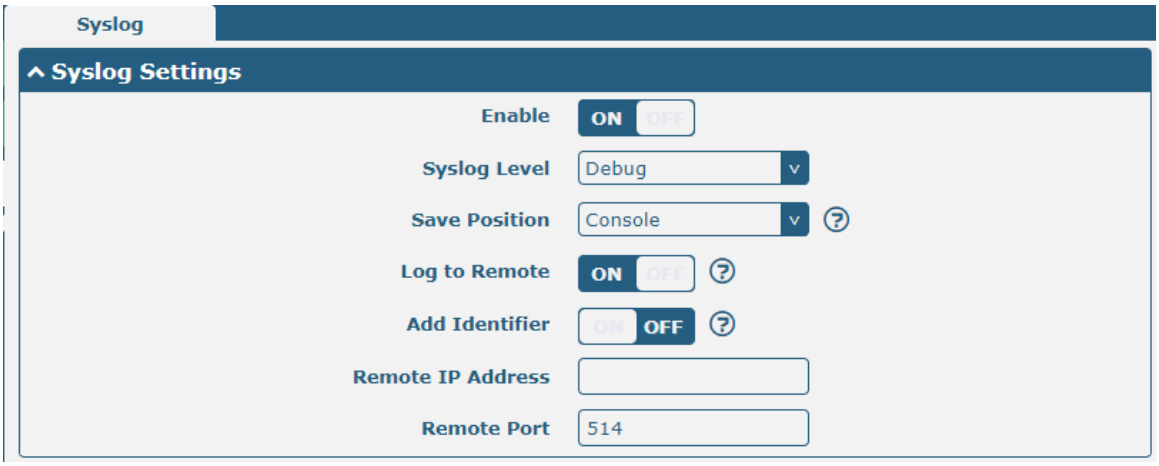
4.3 Services

4.3.1 Syslog

This section allows you to set the syslog parameters. By default, the "Log to Remote" option is disabled. The system log of the router can be saved in the local, also supports to be sent to remote log server and specified application debugging.



The window is displayed as below when enabling the “Log to Remote” option.



Syslog Settings		
Item	**Description**	**Default**
Enable	Click the toggle button to enable/disable the Syslog settings option.	ON
Syslog Level	Select from “Debug”, “Info”, “Notice”, “Warning” or “Error”, which from low to high. **Note:** The lower level will output more syslog in detail.	Debug
Save Position	Select the save position from “RAM”, “NVM” or “Console”. Choose “RAM”, the data will be cleared after reboot. **Note**: It's not recommended that saving syslog to NVM (Non-Volatile Memory) for a long time.	RAM
Log to Remote	Click the toggle button to enable/disable this option. Enable to allow router sending syslog to the remote syslog server. You need to enter the IP and Port of the syslog server.	OFF
Add Identifier	Click the toggle button to enable/disable this option. When enabled, you can add serial number to syslog message.	OFF
Remote IP Address	Enter the IP address of syslog server when enabling the “Log to Remote” option.	Null
Remote Port	Enter the port of syslog server when enabling the “Log to Remote” option.	514

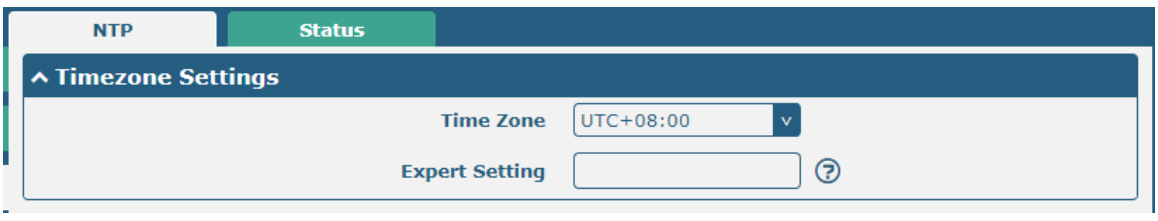
4.3.2 TCP Advanced

This section allows you to configure the ping detection:

TCP Advanced		
Item	**Description**	**Default**
General Setting		
Idle	The system configuration cannot be changed when the Tcp connection fails; it is mainly used for the parameter configuration of the i-SYNERGY platform.	60
Interval	The reconnection attempt interval after Tcp disconnection has not been actually increased; it is mainly used for the parameter configuration of the i-SYNERGY platform.	60
Retry time	The number of Tcp reconnection attempts has not been actually increased; it is mainly used for the parameter configuration of the i-SYNERGY platform.	3
Ping Control（ICMP）		
Ping Address	Ping attempted detection address; when it is empty, no detection.	Null
Ping Interval	Ping detection interval, measured in seconds.	120
Max Retry	Maximum number of failed ping attempts.	5

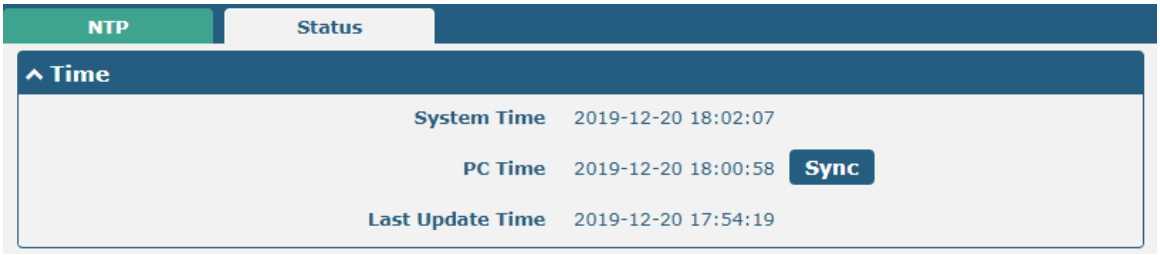
4.3.3 NTP

This section allows you to set the related NTP (Network Time Protocol) parameters, including Time zone, NTP Client and NTP Server.



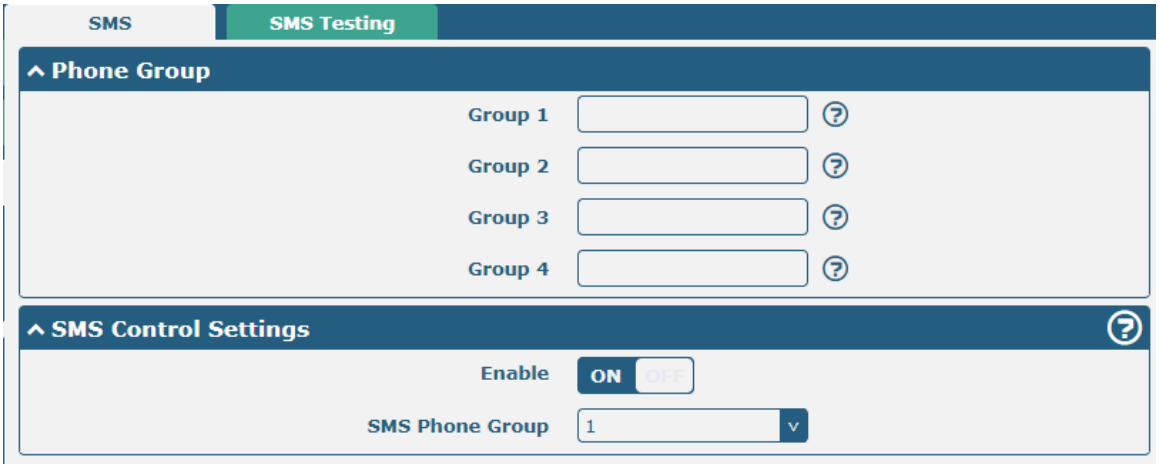
NTP		
Item	**Description**	**Default**
Timezone Settings		
Time Zone	Click the drop down list to select the time zone you are in. e.g. China: UTC+08:00.	UTC+08:00
Expert Setting	Specify the time zone with Daylight Saving Time in TZ environment variable format. The Time Zone option will be ignored in this case.	Null

This window allows you to view the current time of router and also synchronize the router time. Click **Sync** button to synchronize the router time with PC's.



4.3.4 SMS

This section allows you to set SMS parameters. Router supports SMS management, and user can control and configure their routers by sending SMS. For more details about SMS control, refer to **5.1.2 SMS Remote Control**.



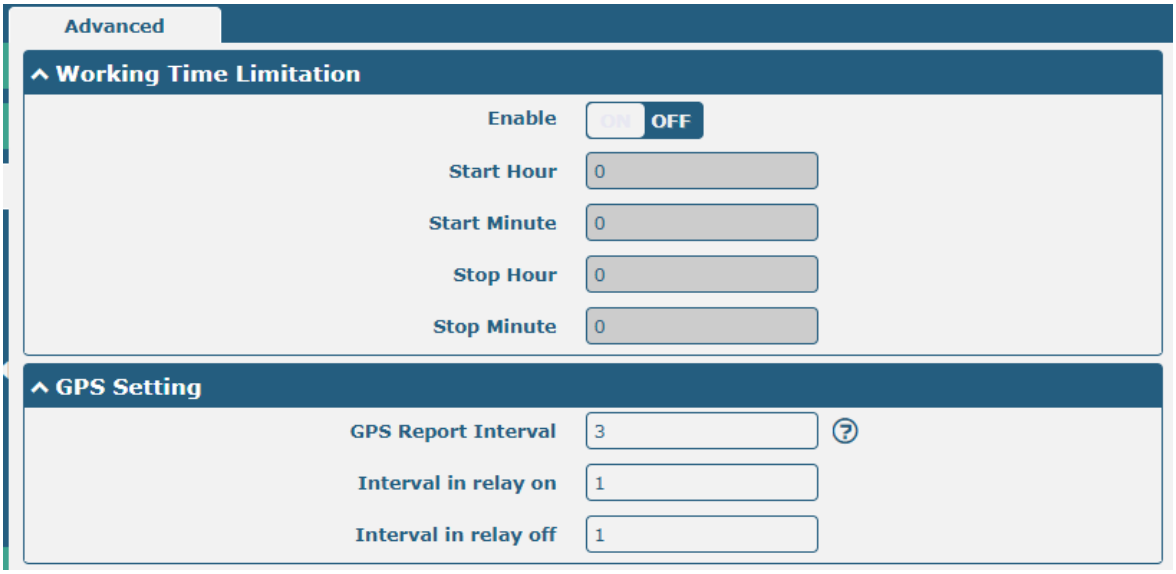
SMS Management Settings		
Item	**Description**	**Default**
Group1~Group4	Telephone directory	Null
Enable	Whether to enable SMS function	ON
SMS Phone Group	Choose which phone number to use	1

User can test the current SMS service whether it is available in this section.

SMS Testing		
Item	**Description**	**Default**
Phone Number	Enter the specified phone number which can receive the SMS from router.	Null
Message	Enter the message that router will send it to the specified phone number.	Null
Result	Show the test result of the SMS. For example, if the SMS is successfully sent, the result box will display "OK".	Null
Send	Click the button to send the test message.	--

4.3.5 ICE Advanced

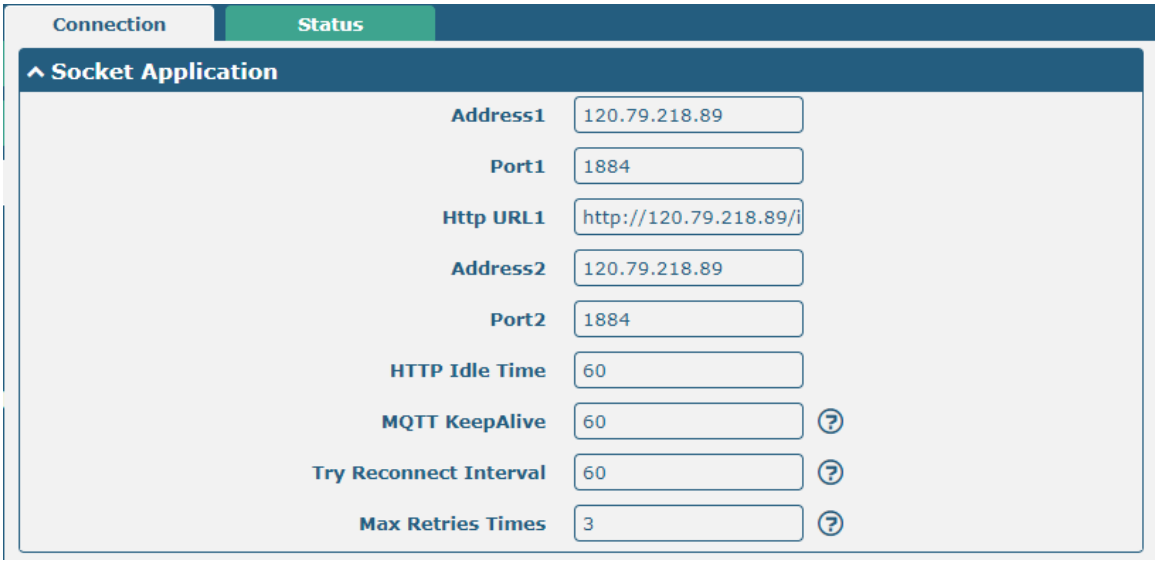
This section is mainly about some advanced configuration of ICE router including working time limit and GPS reporting interval configuration.



Working Time Limitation		
Item	**Description**	**Default**
Enable	Whether to enable working time limit	OFF
Start Hour	Valid when Enable is enabled, hours allowed to work	0
Start Minute	Valid when Enable is enabled, minutes allowed to work	0
Stop Hour	Valid when Enable is enabled, hours not allowed to work	0
Stop Minute	Valid when Enable is enabled, minutes not allowed to work	0
GPS Setting		
GPS Report Interval	GPS data reporting interval, in minutes	3
Interval in relay on	The reporting interval of the BMS when the relay is off, in seconds	1
Interval in relay off	BMS reporting interval when the relay is closed, in seconds	1

4.3.6 ICE Connection

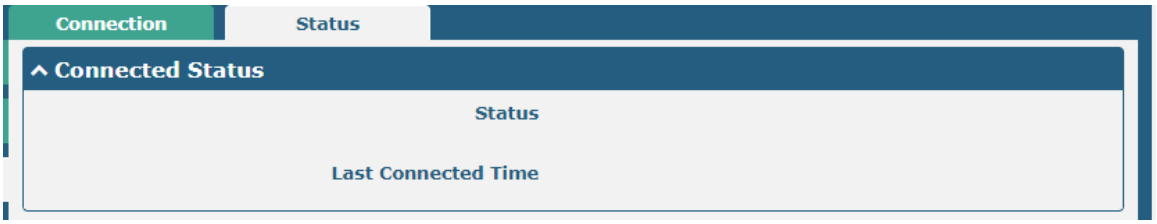
This section allows you to set some parameters of the router connected to the i-SYNERGY platform.



Connection		
Item	**Description**	**Default**
Address1	The preferred address for establishing MQTT connection with the platform	Null
Port1	The preferred port for establishing MQTT connection with the platform, which is used in conjunction with the preferred address	Null

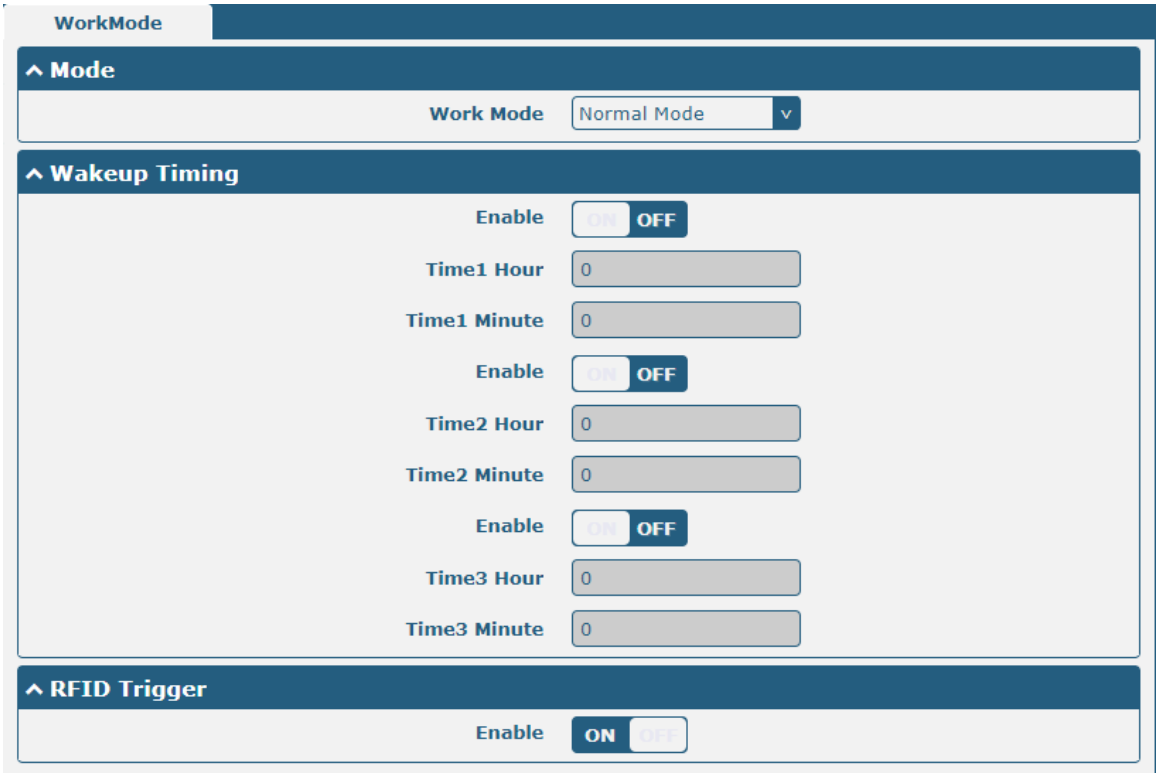
Http URL1	URL address for establishing HTTP connection with the platform	Null
Address2	Primary address for establishing MQTT connection with the platform	Null
Port2	Alternative port for establishing MQTT connection with the platform, bundled with primary address	Null
Http Idle Time	The timeout period for initiating an HTTP connection to the platform, in seconds	60
MQTT KeepAlive	Keepalive time of connection with platform MQTT, in seconds	60
Try Reconnect Interval	When the MQTT connection with the platform is disconnected, the time between retrying to connect, in seconds	60
Max Retries Times	The maximum number of attempts to reconnect, when it reaches three times, try to change the connection address to reconnect	3

Status shows whether the connection status with the platform and the last connection time;



4.3.7 Work Mode

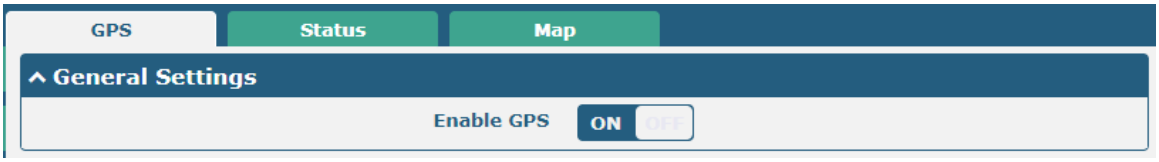
This section is used to configure the current working mode, whether to enter the power saving mode; and configure the wake-up time point. When the power-saving mode is entered and the wake-up time point is enabled, the wake-up time point is reached, and the power-saving mode is exited for 30 minutes;

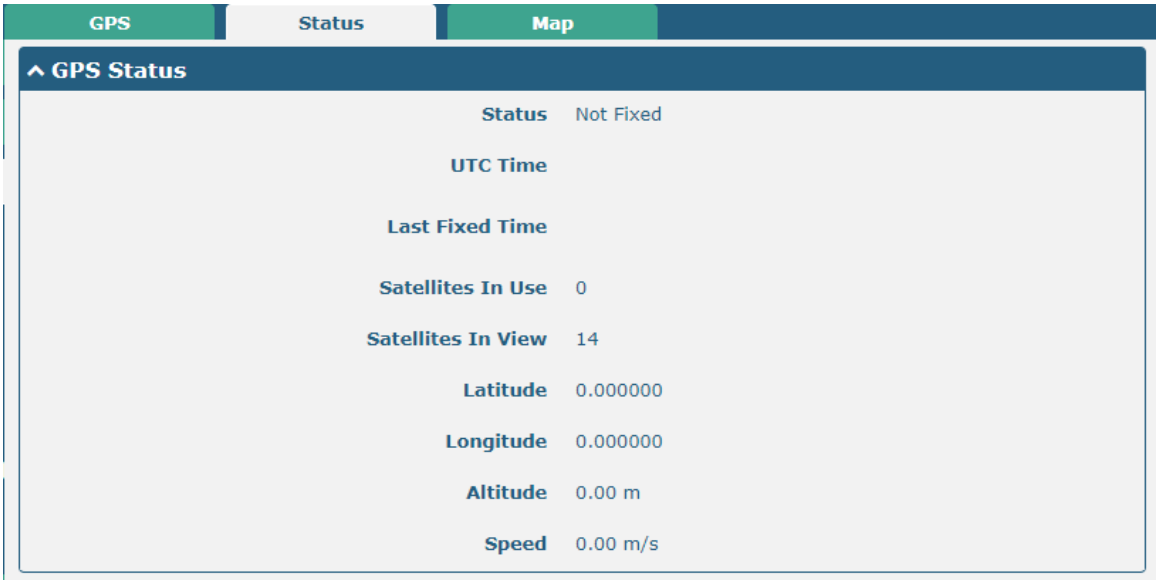


Mode		
Item	**Description**	**Default**
Work Mode	Current working mode, normal mode/power saving mode	Normal Mode
Wakeup Timing		
Item	**Description**	**Default**
Enable	Whether to enable wake-up time point	OFF
Time1 Hour	The hour of the first wake-up time point that can be set	0
Time1 Minute	Minutes of the first wake-up time that can be set	0
Time2 Hour	The hour of the second wake-up time point that can be set	0
Time2 Minute	Minutes of the second wake-up time point that can be set	0
Time3 Hour	The hour of the third wake-up time point that can be set	0
Time3 Minute	Minutes of the third wake-up time point that can be set	0
RFID Trigger		
Item	**Description**	**Default**
Enable	Whether to enable RFID to wake up the device and exit the power saving mode	ON

4.3.8 GPS

This section allows you to set the GPS setting parameters.

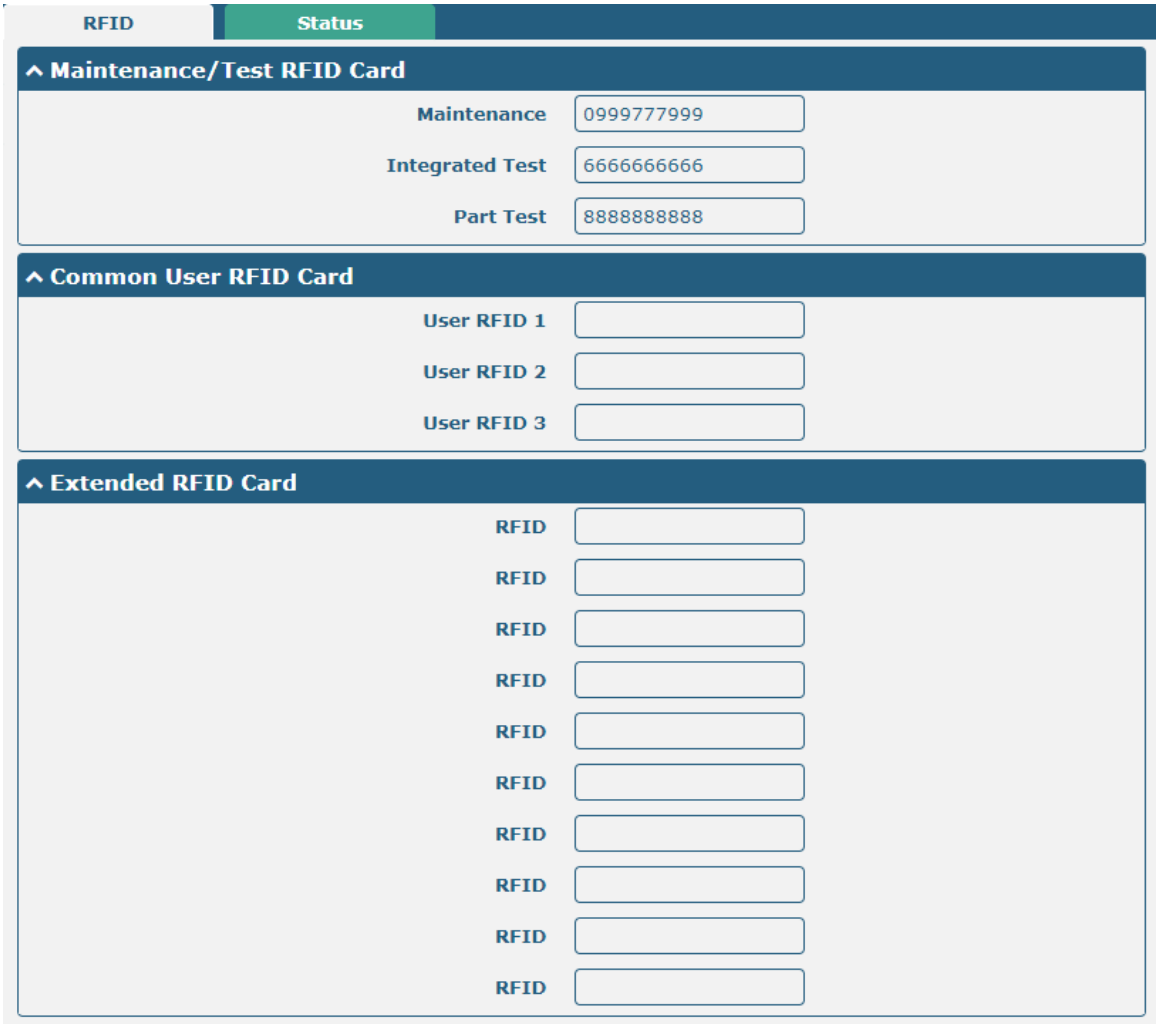




GPS		
Item	**Description**	**Default**
Time Zone setting		
Enable GPS	Whether to enable GPS, when closed, GPS information cannot be obtained	ON

4.3.9 RFID

This section allows you to configure and view the RFID card number. View by clicking "Service> RFID":



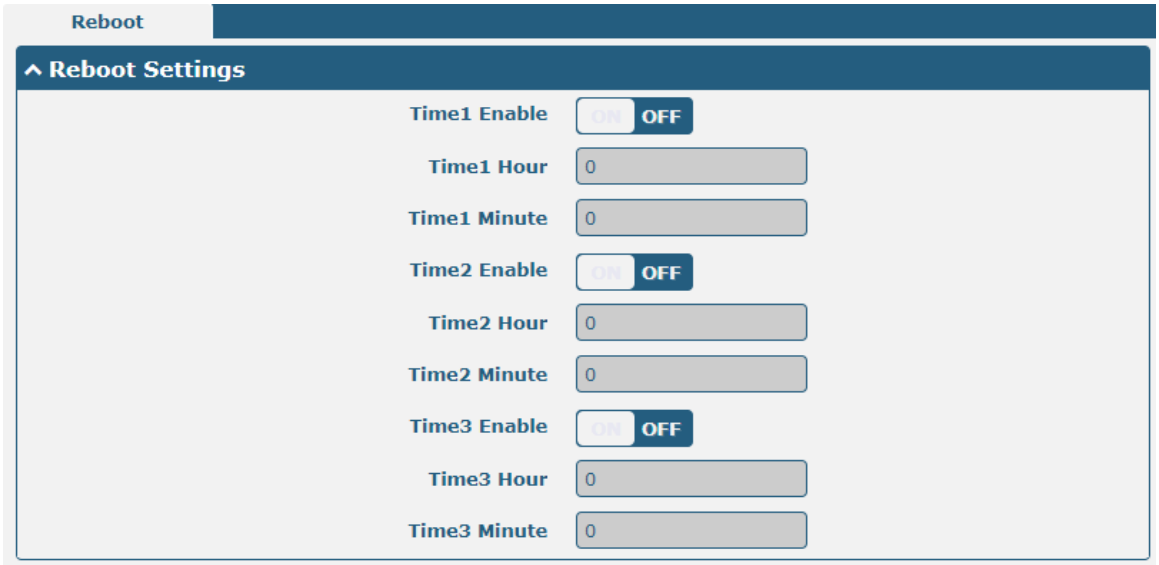
RFID		
Item	**Description**	**Default**
Maintenance/Test RFID Card		
Maintenance	Card number setting of universal card	0999777999
Integrated Test	Card number setting of the whole machine test	6666666666
Part Test	Card number setting of component test card	8888888888
Common User RFID Card		
User RFID 1	Card number setting of user card 1	Null
User RFID 2	Card number setting of user card 2	Null
User RFID 3	Card number setting of user card 3	Null
Extended RFID Card		
RFID	Card number configuration of additional RFID card	Null

The Status part shows the card number information read from RFID:

You can restore the default configuration of the RFID card number through the Default button of Status> RFID Default Setting, and click Default to restore. (PS: When restoring the RFID card number default configuration, the waiting time will take about 10 seconds)

4.3.10 Reboot

This section allows you to configure the system to restart regularly. By configuring the time to restart the system, when the system reaches that point in time, the system will restart itself;



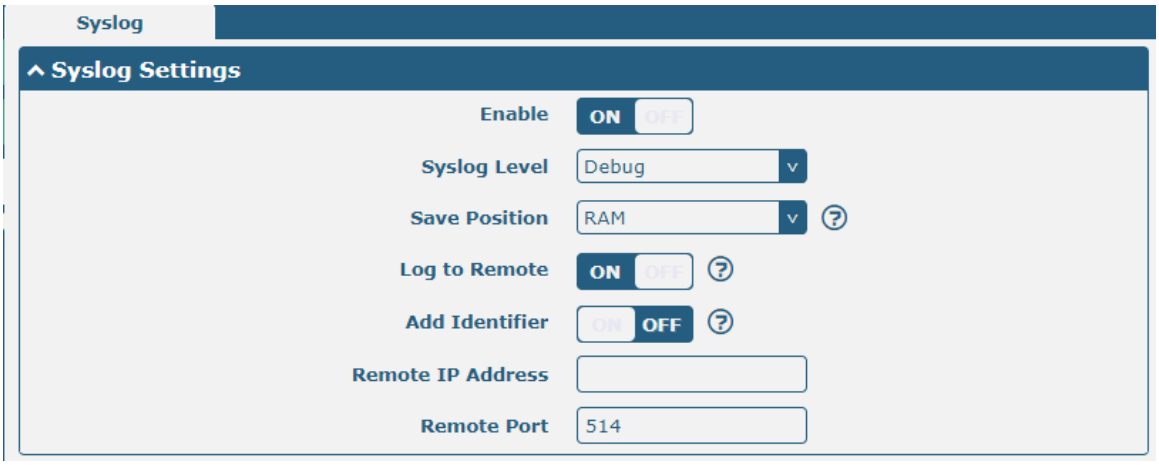
Reboot		
Item	**Description**	**Default**
Reboot Settings		
Time1 Enable	Enable the first set restart time point	OFF
Time1 Hour	The hour of the first restart time that can be set	0

Reboot		
Item	**Description**	**Default**
Time1 Minute	The minutes of the first restart time that can be set	0
Time2 Hour	The hour of the second restart time that can be set	0
Time2 Minute	The minutes of the second restart time that can be set	0
Time3 Hour	The hour of the third restart time that can be set	0
Time3 Minute	The minutes of the third restart time that can be set	0

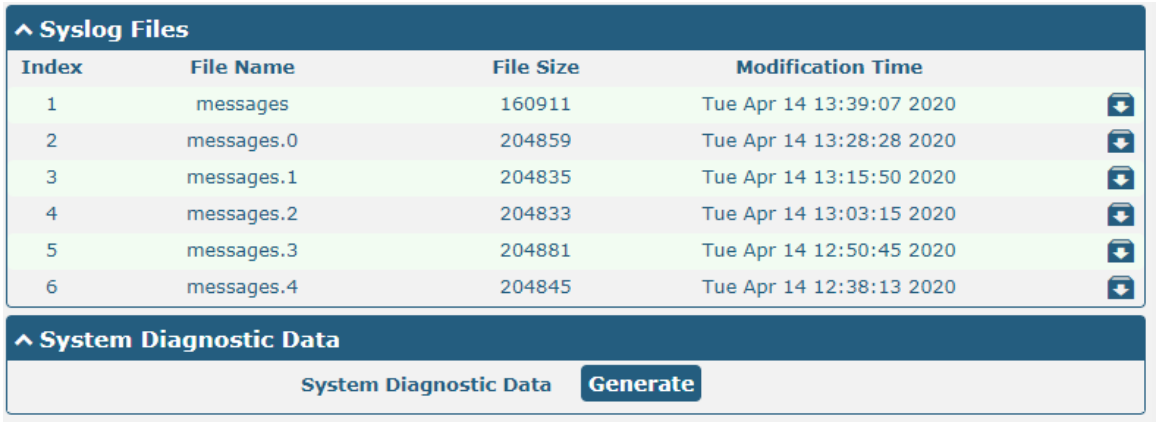
4.4 System

4.4.1 Debug

This section allows you to view and generate the system operation log and diagnostic data of the communication board. Click "Service> Syslog> Syslog Settings" to enable the system log.



By clicking "System> Deubg", you can view the system log on the web interface:



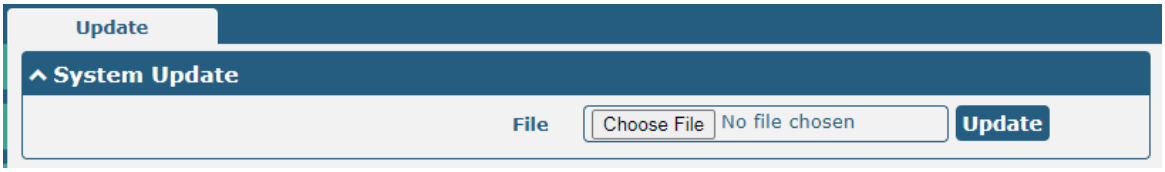
Syslog	
Item	**Description**
Syslog Details	
Log Level	Select from “Debug”, “Info”, “Notice”, “Warn”, “Error” which from low to high. The lower level will output more syslog in detail.

Filtering	Enter the filtering message based on the keywords. Use “&” to separate more than one filter message, such as “keyword1&keyword2”.
Manual Refresh	Select from “Manual Refresh”, “5 Seconds”, “10 Seconds”, “20 Seconds” or “30 Seconds”. You can select these intervals to refresh the log information displayed in the follow box.
Clear	Click the button to clear the syslog.
Refresh	Click the button to refresh the syslog.
Syslog Files	
Syslog Files	Only after logging is enabled in "Service> Syslog> Syslog Settings" will there be log files displayed in this list. The log generates a file with a size of about 200k, which can display up to 6 system log files, with file names 1~6, and the latest system log file will be on top.
System Diagnosing Data	
Generate	Click to generate the syslog diagnosing file.

4.4.2 Update

This section allows you to upgrade the firmware of your router and realize the system update by importing and updating firmware files. Import a firmware file from the computer to the router. Click Update and restart the device according to the system prompts to complete the firmware update.

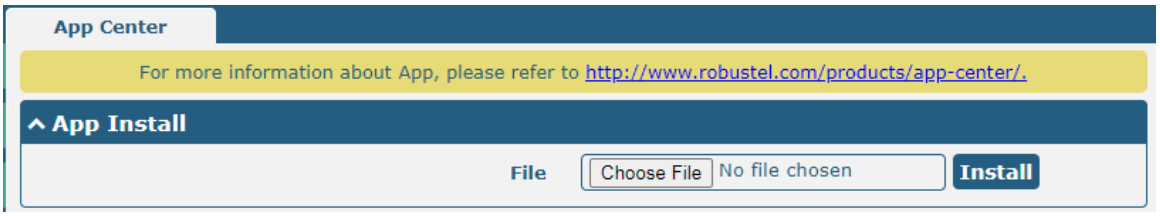
Note: To access the latest firmware file, please contact your technical support engineer.



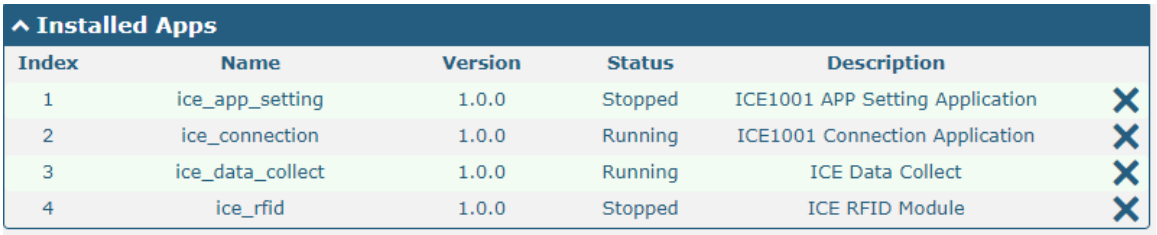
4.4.3 App Center

This section allows you to add some required or customized applications to the router. Import and install your applications to the App Center, and reboot the device according to the system prompts. Each installed application will be displayed under the “Services” menu.

Note: After importing the applications to the router, the page display may have a slight delay due to the browser cache. It is recommended that you clear the browser cache first and log in the router again.



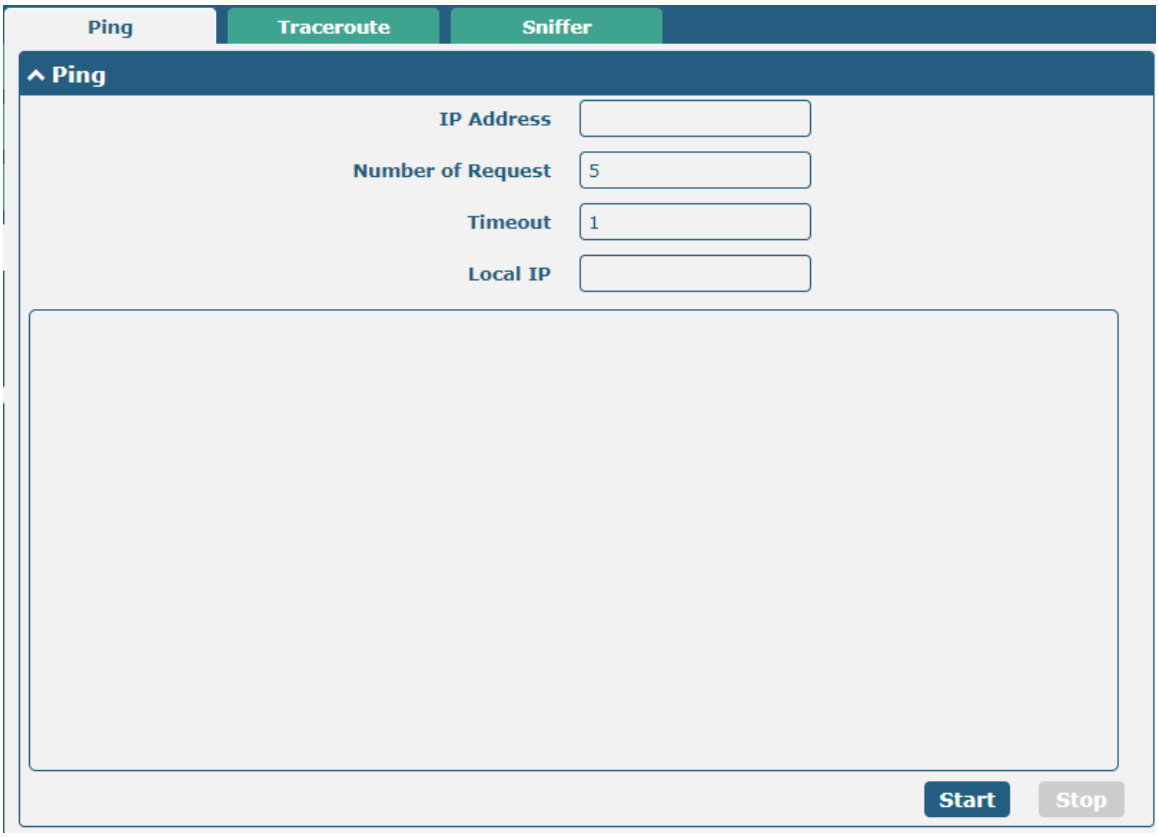
The successfully installed app will be displayed in the following list. Click ✕ to uninstall the app.



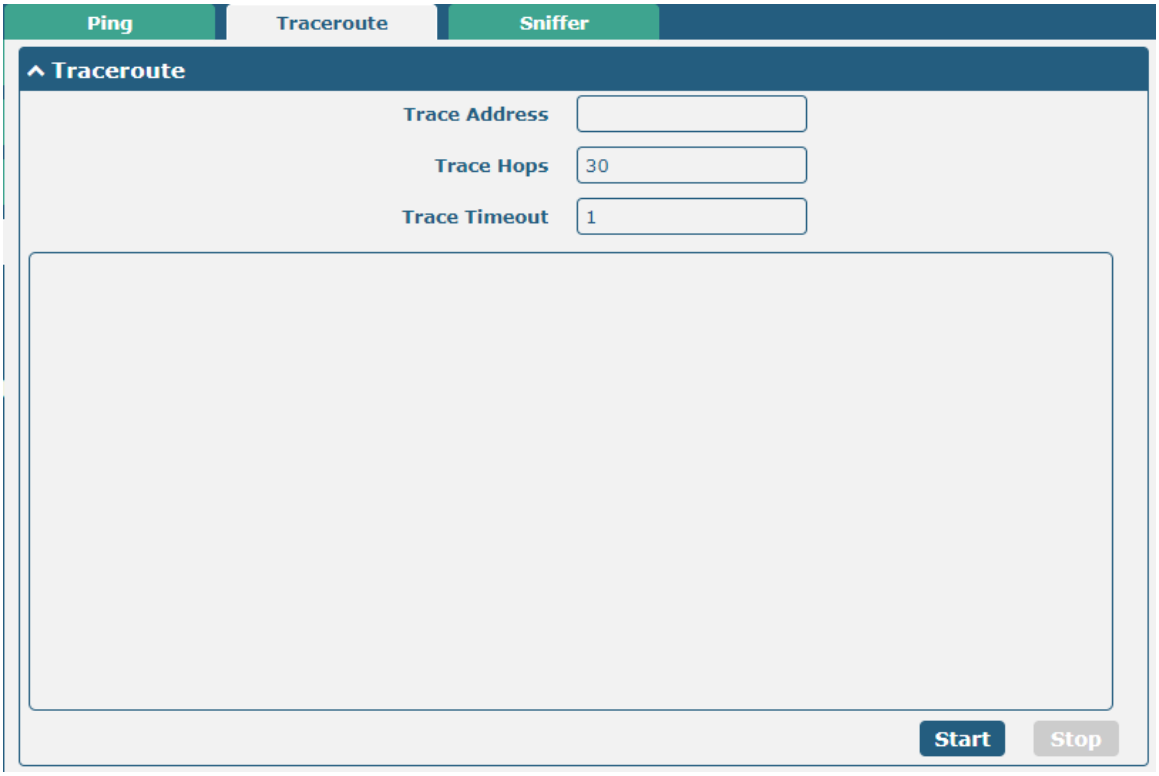
App Center		
Item	**Description**	**Default**
App Install		
File	Click on "Choose File" to locate the App file from your computer, and then click Install to import this file into your router. **Note**: File format should be *xxx.rpk*.	--
Installed Apps		
Index	Indicate the ordinal of the list.	--
Name	Show the name of the App.	Null
Version	Show the version of the App.	Null
Status	Show the status of the App.	Null
Description	Show the description for this App.	Null

4.4.4 Tools

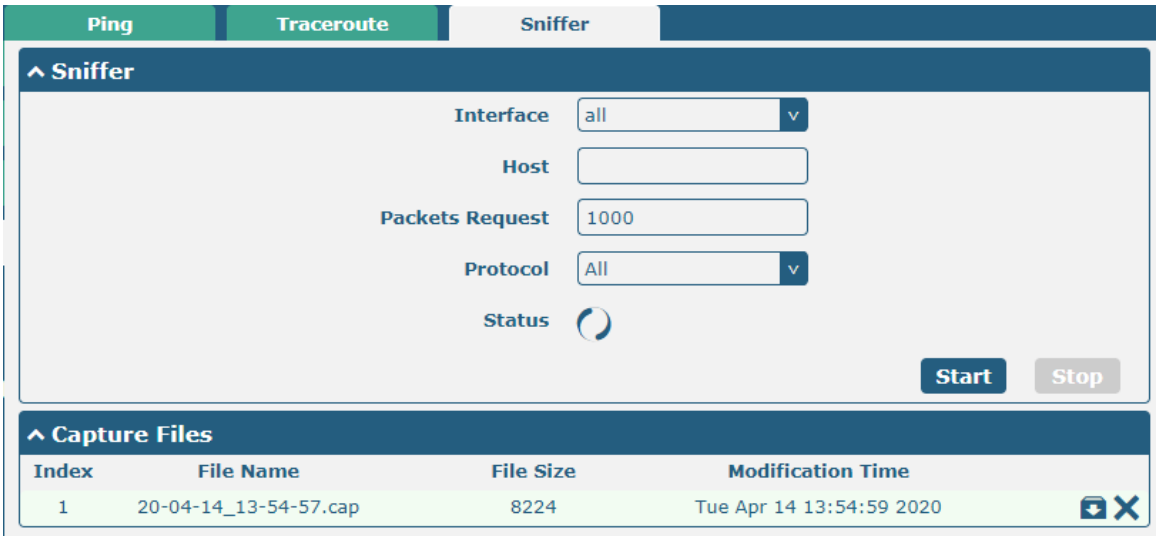
This section provides users three tools: Ping, Traceroute and Sniffer. Ping tool is used to detect the network connectivity of the router.



Ping		
Item	**Description**	**Default**
IP Address	Enter the ping's destination IP address or destination domain.	Null
Number Of Request	Specify the number of ping requests.	5
Timeout	Specify the timeout of ping request.	1
Local Ip	Specify the local IP from cellular WAN, Ethernet WAN or Ethernet LAN. Null stands for selecting local IP address from these three automatically.	Null
Start	Click this button to start ping request, and the log will be displayed in the follow box.	--
Stop	Click this button to stop ping request.	--



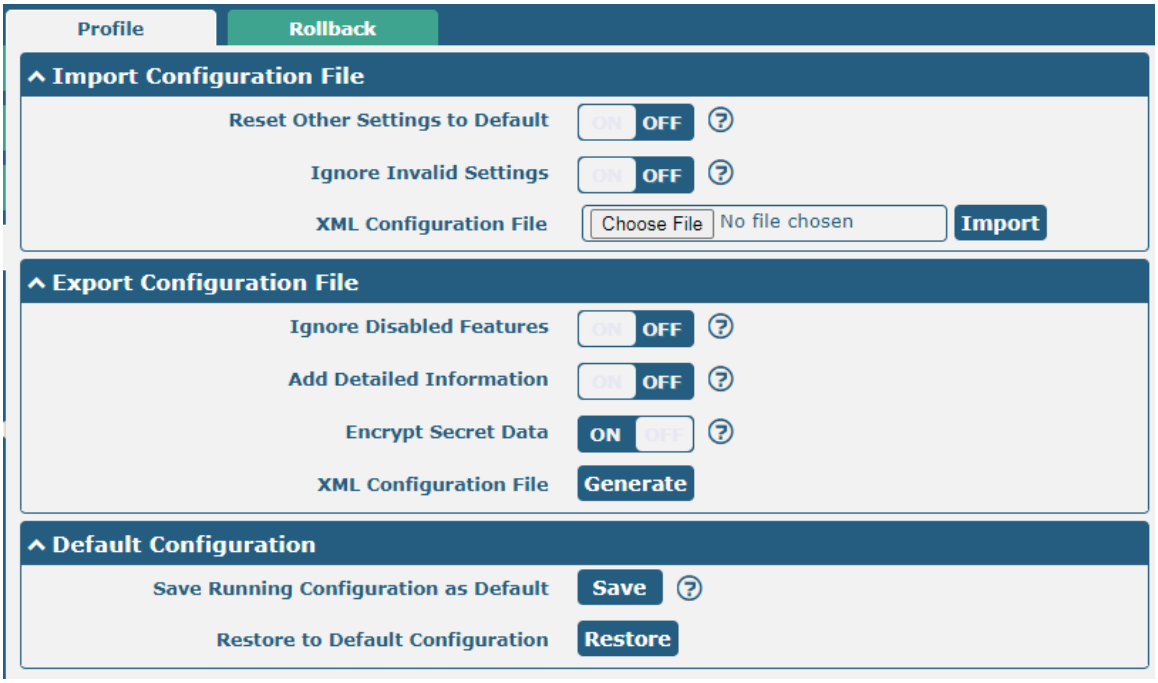
Traceroute		
Item	**Description**	**Default**
Trace Address	Enter the trace's destination IP address or destination domain.	Null
Trace Hops	Specify the max trace hops. Router will stop tracing if the trace hops has met max value no matter the destination has been reached or not.	30
Trace Timeout	Specify the timeout of Traceroute request.	1
Start	Click this button to start Traceroute request, and the log will be displayed in the follow box.	--
Stop	Click this button to stop Traceroute request.	--



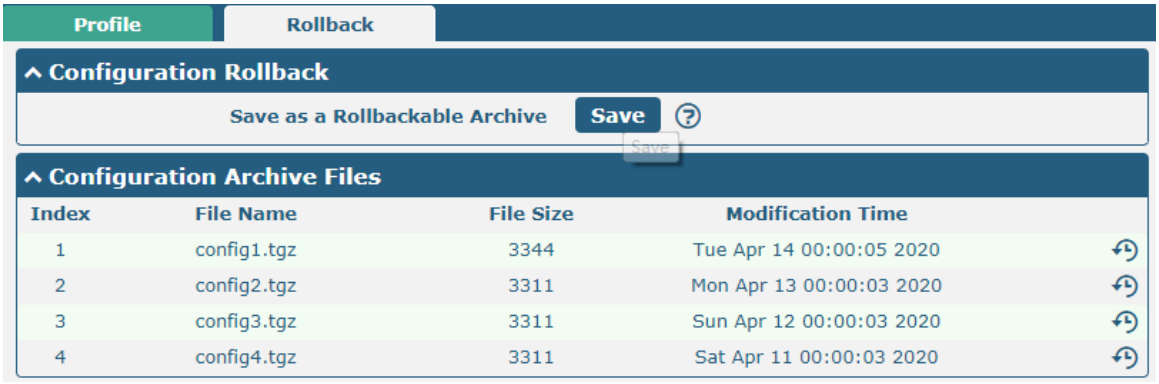
Sniffer		
Item	**Description**	**Default**
Interface	Choose the interface according to your Ethernet configuration.	all
Host	Filter the packet that contain the specify IP address.	Null
Packets Request	Set the packet number that the router can sniffer at a time, the value range is from 10 to 40,000.	1000
Protocol	Select from “All”, “IP”, “TCP”, “UDP” and “ARP”.	All
Status	Show the current status of sniffer.	--
Start	Click this button to start the sniffer. The captured file will be displayed in the window, click to download the captured file, and click to delete the captured file.	--
Stop	Click this button to stop the sniffer. Once you click this button, a new log file will be displayed in the following List.	--
Capture Files	Every times of sniffer log will be saved automatically as a new file. You can find the file from this Sniffer Traffic Data List and click to download the log, click to delete the log file. It can cache a maximum of 5 files.	--

4.4.5 Profile

This section allows you to import or export the configuration file, and restore the router to factory default setting.



Profile		
Item	**Description**	**Default**
Import Configuration File		
Reset Other Settings to Default	Click the toggle button as “ON” to return other parameters to default settings.	OFF
Ignore Invalid Settings	Click the toggle button as “ON” to ignore invalid settings.	ON
XML Configuration File	Click Import to import XML configuration file into your router.	--
Export Configuration File		
Ignore Disabled Features	Click "ON" to ignore the parameters that are not enabled.	OFF
Add Detailed Information	Click "ON" to add detailed information.	OFF
Encrypt Secret Data	Click "ON" to encrypt private data.	ON
XML Configuration File	Click Generate to generate XML configuration file; click Export to export XML configuration file.	--
Default Configuration		
Save Running Configuration as Default	Click Save to save the current running parameters as default	--
Restore to Default Configuration	Click Restore to restore the factory defaults.	--



Rollback		
Item	**Description**	**Default**
Configuration Rollback		
Save as a Rollbackable	Create a save point manually. Additionally, the system will create a save point every day automatically if configuration changes.	--

Archive		
Configuration Archive Files		
Configuration Archive Files	View the related information about configuration archive files, including name, size and modification time.	--

4.4.6 Special Note

This section mainly explains some special precautions:

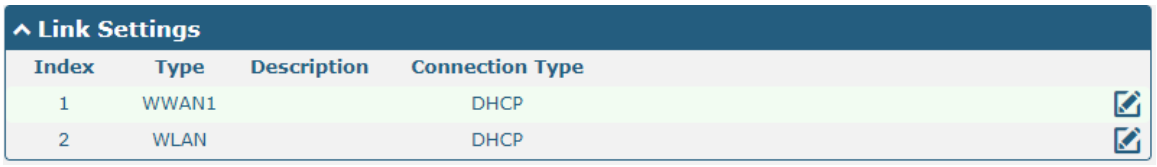
1. Please do not hot-plug the terminal line of the communication board when it is not used with the cleaning machine (for example, when using the adapter); to avoid damage to the equipment!

Chapter 5 Configuration Examples

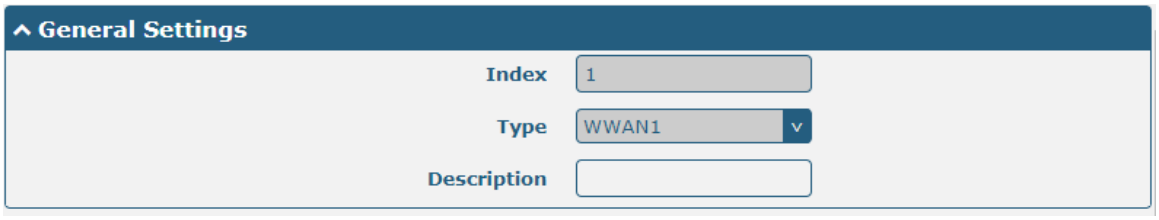
5.1 Cellular

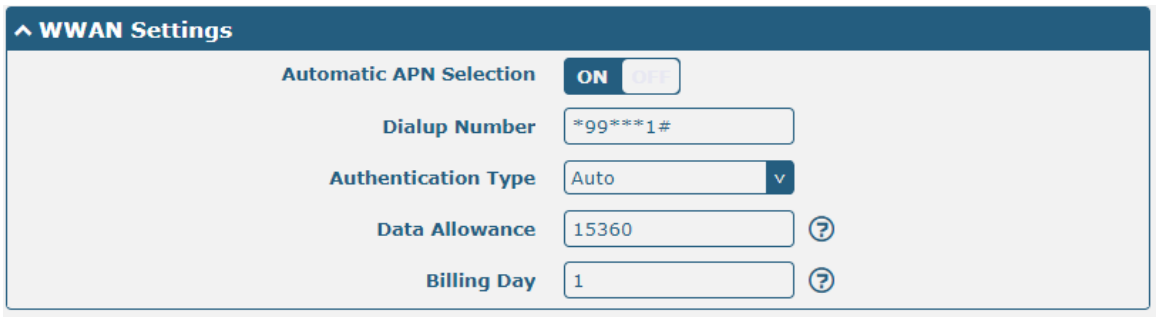
5.1.1 Cellular Dial-Up

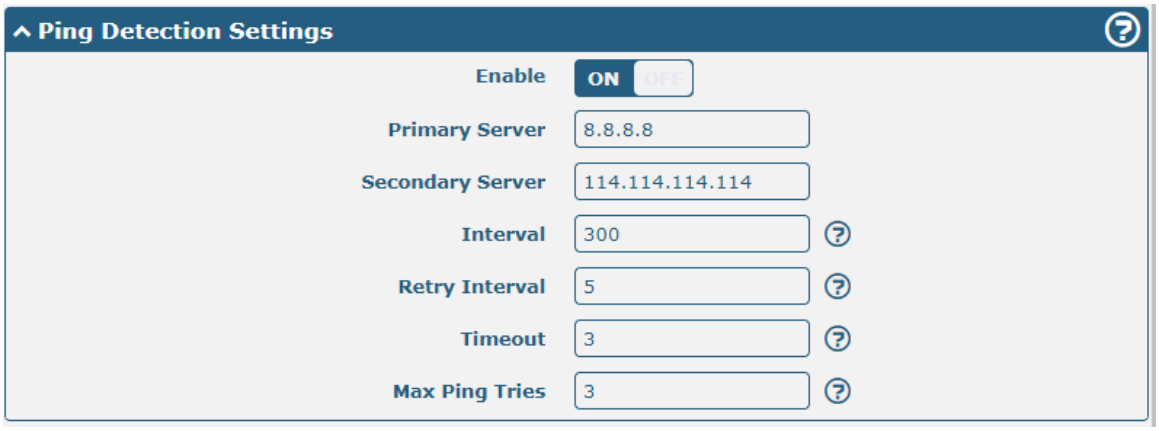
This section shows you how to configure the primary and backup SIM card for Cellular Dial-up. Connect the router correctly and insert two SIM, then open the configuration page.

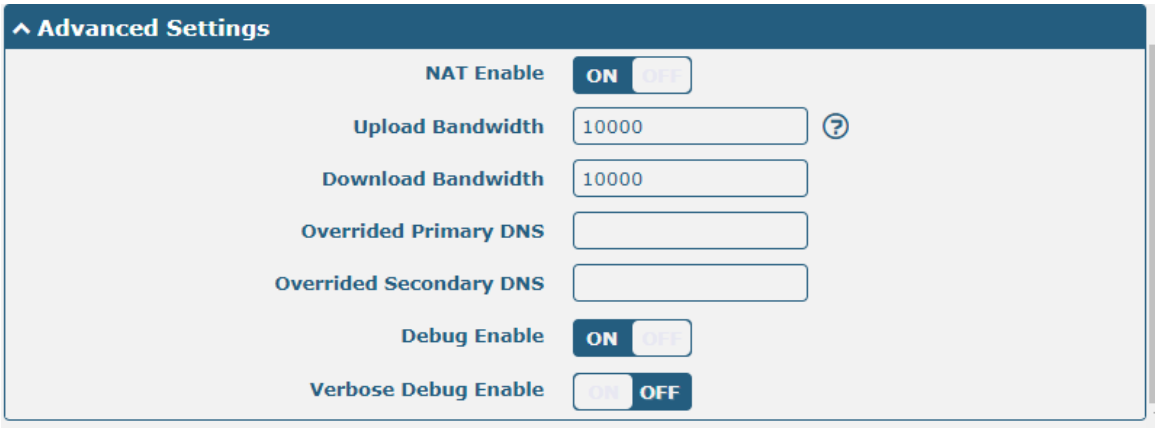


Click the right-most button of WWAN1 to set its parameters according to the current ISP.



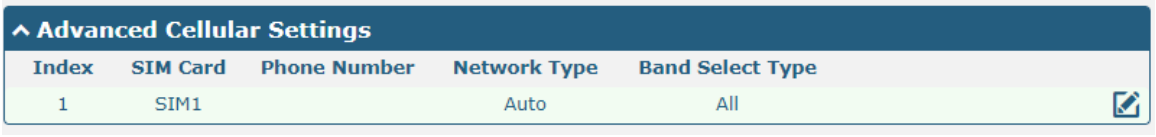




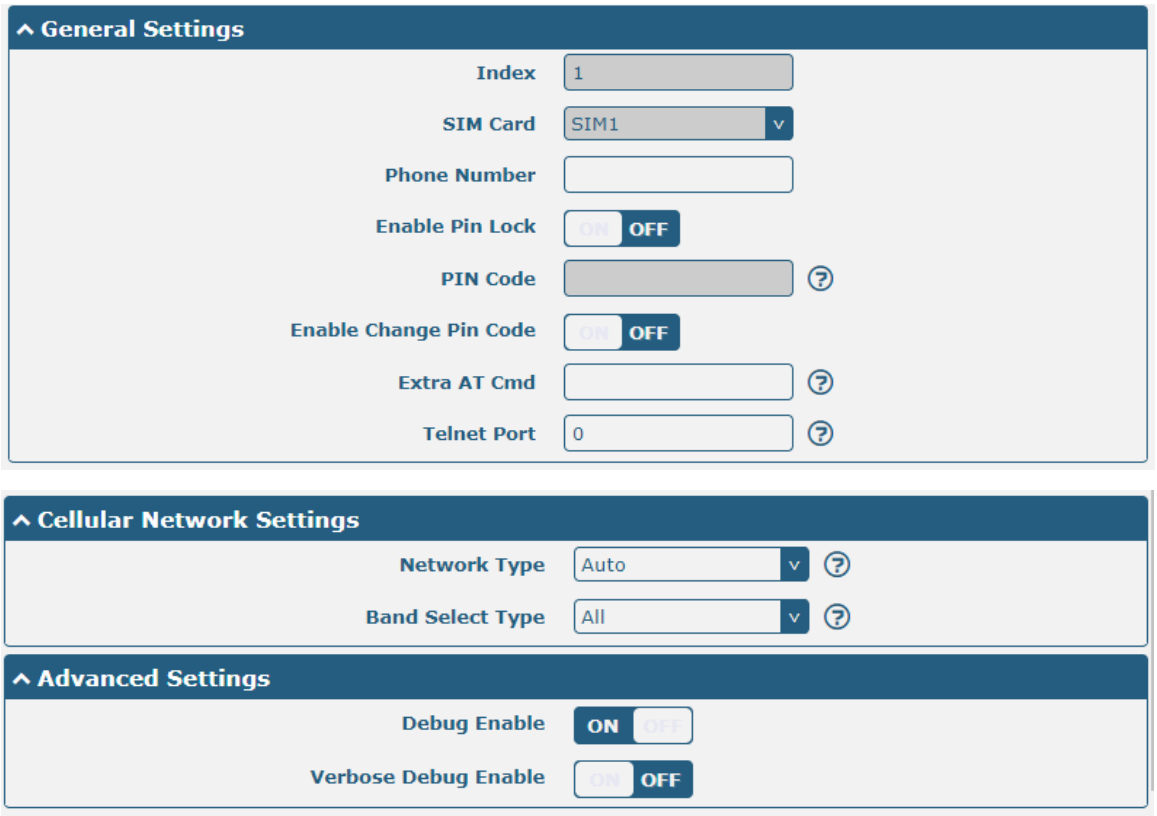


When finished, click **Submit > Save & Apply** for the configuration to take effect.

Click "Interface> Cellular> Cellular", the window is displayed as follows:



Click the right-most button of WWAN1 to set its parameters according to the current ISP.



When finished, click **Submit > Save & Apply** for the configuration to take effect.

5.1.2 SMS Remote Control

The router supports remote control via SMS. You can use following commands to get the status of the router, and set all the parameters.

An SMS command has the following structure:

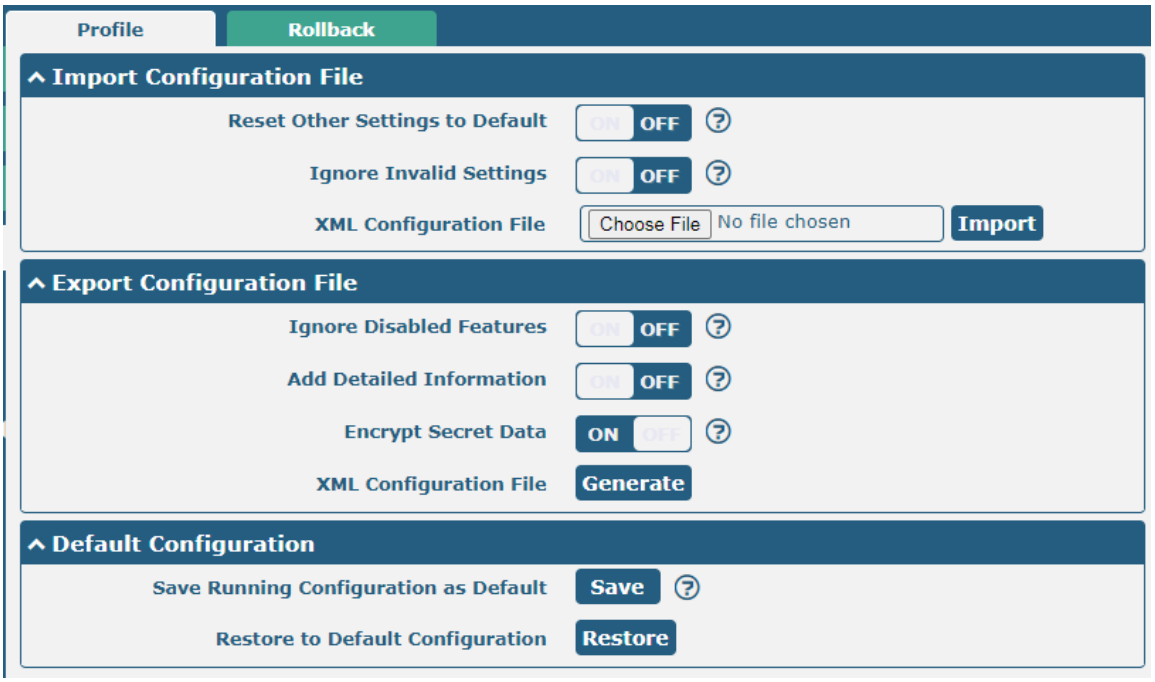
1. Phonenum mode—**cmd1; cmd2; cmd3; … cmdn** (When there is a set group and there is a phone number in the group, the specified phone number is valid).

Note: All command symbols must be entered in the half-width mode of the English input method.

SMS command Explanation:

1. **cmd1, cmd2, cmd3 to cmdn**, the command format is the same as the CLI command, more details about CLI cmd please refer to **Chapter 6 Introductions for CLI**.

   Note: Download the configure XML file from the configured web browser. The format of SMS control command can refer to the data of the XML file. Go to **System > Profile > Export Configuration File**, Select the export type as "Complete", click Generate to generate the XML file and click Export to export the XML file.



XML command:

```
<lan>
<network max_entry_num="2">
<id>1</id>
<interface>lan0</interface>
<ip>172.16.24.24</ip>
<netmask>255.255.0.0</netmask>
<mtu>1500</mtu>
```

SMS cmd:

set lan network 1 interface lan0

set lan network 1 ip 172.16.24.24

set lan network 1 netmask 255.255.0.0
set lan network 1 mtu 1500

2. The semicolon character (';') is used to separate more than one command packed in a single SMS.
3. E.g.

status system

In this command, the control command is status system, and you can get the system status by sending this message to the communication board.

SMS received:

firmware_version = 1.0.0
firmware_version_full = "1.0.0 (Rev 2820)"
hardware_version = 1.2.0
kernel_version = 3.10.108
device_model = ICE1001-S4LC (Global)
serial_number = 05170120040021
uptime = "1 day, 00:55:30"
system_time = "Tue Apr 14 20:18:44 2020 (NTP not enabled)"
ram_usage = "9M Free/64M Total"

reboot

In this command, the command is to reboot the Router.

SMS received:

OK

show ice_connection all

In this command, the command is to get all the configuration of ice_connection

SMS received:

addr1 = 120.79.218.89
port1 = 1884
http1 = http://120.79.218.89/ice
addr2 = 120.79.218.89
port2 = 1884
http2 = ""
idle = 60
mqtt_keepalive = 60
retry_interval = 60
max_retry = 3

Chapter 6 Introductions for CLI

6.1 What Is CLI

The command-line interface (CLI) is a software interface providing another way to set the parameters of equipment from the SSH or through a telnet network connection. To configure it with CLI commands. After establishing a Telnet or SSH connection with the communication board, enter the login account and password (default admin/admin) to enter the configuration mode of the communication board, as shown below.

```
router login: admin
Password:
#
  !              Comments
  add            Add a list entry of configuration
  clear          Clear statistics
  config         Configuration operation
  debug          Output debug information to the console
  del            Delete a list entry of configuration
  exit           Exit from the CLI
  help           Display an overview of the CLI syntax
  ovpn_cert_get  Download OpenVPN certificate file via http or ftp
  ping           Send messages to network hosts
  reboot         Halt and perform a cold restart
  set            Set system configuration
  show           Show system configuration
  status         Show running system information
  tftpupdate     Update firmware or configuration file using tftp
  traceroute     Print the route packets trace to network host
  trigger        Trigger action
  urlupdate      Update firmware via http or ftp
  ver            Show version of firmware

#
```

Route login:

Router login: admin

Password: admin

#

CLI commands:

?

!	Comments
add	Add a list entry of configuration
clear	Clear statistics
config	Configuration operation
debug	Output debug information to the console
del	Delete a list entry of configuration
exit	Exit from the CLI
help	Display an overview of the CLI syntax
ping	Send messages to network hosts
reboot	Halt and perform a cold restart

route	Static route modify dynamically， this setting will not be saved
set	Set system configuration
show	Show system configuration
status	Show running system information
tftpupdate	Update firmware using tftp
traceroute	Print the route packets trace to network host
urlupdate	Update firmware using http or ftp
ver	Show version of firmware

6.2 How to Configure the CLI

Following is a table about the description of help and the error should be encountered in the configuring program.

Commands /tips	Description
?	Typing a question mark "?" will show you the help information. eg. # config（Press '?'） config Configuration operation # config（Press spacebar +'?'） commit Save the configuration changes and take effect changed configuration save_and_apply Save the configuration changes and take effect changed configuration loaddefault Restore Factory Configuration
Ctrl+c	Press these two keys at the same time, except its "copy" function but also can be used for "break" out of the setting program.
Syntax error: The command is not completed	The current command is not completed.
Tick space key+ Tab key	It can help you finish you command. Example: # config (tick Enter key) Syntax error: The command is not completed # config (tick space key+ Tab key) commit save_and_apply loaddefault
#config commit # config save_and_apply	When your setting finished, you should enter those commands to make your setting take effect on the device. **Note:** Commit and save_and_apply plays the same role.

6.3 Commands Reference

Commands	Syntax	Description
Debug	Debug *parameters*	Turn on or turn off debug function
Show	Show *parameters*	Show current configuration of each function , if we need to see all please using "show running "
Set	Set *parameters*	All the function parameters are set by commands set and add, the difference is that set is for the single parameter and add is for the list parameter
Add	Add *parameters*	

Note: Download the config.XML file from the configured web browser. The command format can refer to the config.XML file format.

6.4 Quick Start with Configuration Examples

The best and quickest way to master CLI is firstly to view all features from the webpage and then read all CLI commands at a time, finally learn to configure it with some reference examples.

Example 1: Show current version

```
# status system
firmware_version = 1.0.0
firmware_version_full = "1.0.0 (Rev 2820)"
hardware_version = 1.2.0
kernel_version = 3.10.108
device_model = ICE1001-S4LC (Global)
serial_number = 05170120040021
uptime = "1 day, 00:55:30"
system_time = "Tue Apr 14 20:18:44 2020 (NTP not enabled)"
ram_usage = "9M Free/64M Total"
```

Example 2: Update firmware via tftp

```
# tftpupdate （space+?）
  firmware    New firmware
   config       New configuration file
# tftpupdate firmware （space+?）
  filename    New file
# tftpupdate firmware filename ice1001-firmware-sysupgrade-unknown.ruf host 192.168.100.99 //enter a new
firmware name
Downloading
Download success.
Upgrading
Upgrade success.              //update success
# reboot                      // take effect after restart
Rebooting...
OK
```

Example 3: Set link-manager

```
# set
# set (space+?)
   cellular                Cellular
   ddns                    DDNS
   dido                    DIDO
   email                   Email
   ethernet                Ethernet
   event                   Event Management
```

```
   firewall                Firewall
   gre                     GRE
   ip_passthrough          IP Passthrough
   ipsec                   IPSec
   lan                     Local Area Network
   link_manager            Link Manager
   ntp                     NTP
   openvpn                 OpenVPN
   reboot                  Automatic Reboot
   route                   Route
   sms                     SMS
   ssh                     SSH
   syslog                  Syslog
   system                  System
   user_management         User Management
   web_server              Web Server
   wifi                    WiFi AP

# set link_manager（space+?）
   primary_link            Primary Link
   backup_link             Backup Link
   backup_mode             BackSup Mode
   revert_interval         Revert Interval
   emergency_reboot        Emergency Reboot
   link                    Link Settings
# set link_manager primary_link（space+?）
Enum    Primary Link （wwan1/wan/wlan）
# set link_manager primary_link wwan1                    //select “wwan1” as primary_link
OK                                                       //setting succeed
#set link_manager link 1（space+?）
   type                    Type
   desc                    Description
   connection_type         Connection Type
   wwan                    WWAN Settings
   static_addr             Static Address Settings
   pppoe                   PPPoE Settings
   ping                    Ping Settings
   nat_enable              NAT Enable
   mtu                     MTU
   weight                  Weight
   upload_bandwidth        Upload Bandwidth
   download_bandwidth      Download Bandwidth
   dns1_overrided          Overrided Primary DNS
   dns2_overrided          Overrided Secondary DNS
   debug_enable            Debug Enable
   verbose_debug_enable    Verbose Debug Enable
```

```
# set link_manager link 1 type wwan1
OK
# set link_manager link 1 wwan（space+?）
   auto_apn                Automatic APN Selection
   apn                     APN
   username                Username
   password                Password
   dialup_number           Dialup Number
   auth_type               Authentication Type
   data_allowance          Data Allowance
   billing_day             Billing Day
# set link_manager link 1 wwan data_allowance 100          //open cellular switch_by_data_traffic
OK                                                         //setting succeed
# set link_manager link 1 wwan billing_day 1               //setting specifies the day of month for billing
OK                                                         //setting succeed
…
# config save_and_apply
OK                                  // save and apply current configuration, make you configuration effect
```

Example 4: Set Cellular

```
# show cellular all
sim {
    id = 1
    card = sim1
    phone_number = ""
    pin_code = ""
    extra_at_cmd = ""
    telnet_port = 0
    network_type = auto
    band_select_type = all
    band_settings {
        gsm_850 = false
        gsm_900 = false
        gsm_1800 = false
        gsm_1900 = false
        wcdma_800 = false
        wcdma_850 = false
        wcdma_900 = false
        wcdma_1900 = false
        wcdma_2100 = false
        wcdma_1700 = false
        wcdma_band19 = false
        lte_band1 = false
        lte_band2 = false
```

```
            lte_band3 = false
            lte_band4 = false
            lte_band5 = false
            lte_band7 = false
            lte_band8 = false
            lte_band13 = false
            lte_band17 = false
            lte_band18 = false
            lte_band19 = false
            lte_band20 = false
            lte_band21 = false
            lte_band25 = false
            lte_band28 = false
            lte_band31 = false
            lte_band38 = false
            lte_band39 = false
            lte_band40 = false
            lte_band41 = false
        }
        telit_band_settings {
            gsm_band = 900_and_1800
            wcdma_band = 1900
        }
        debug_enable = true
        verbose_debug_enable = false
}
# set(space+?)
cellular            ddns                dido                email               ethernet
event               firewall            gre                 ip_passthrough      ipsec
l2tp                lan                 link_manager        ntp                 openvpn
pptp                reboot              route               sms                 ssh
syslog              system              user_management     web_server          wifi
# set cellular(space+?)
  sim    SIM Settings
# set cellular sim(space+?)
  Integer    Index (1..1)

# set cellular sim 1(space+?)
    card                        SIM Card
    phone_number                Phone Number
    pin_code                    PIN Code
    extra_at_cmd                Extra AT Cmd
    telnet_port                 Telnet Port
    network_type                Network Type
    band_select_type            Band Select Type
    band_settings               Band Settings
```

```
    telit_band_settings          Band Settings
    debug_enable                 Debug Enable
    verbose_debug_enable      Verbose Debug Enable
# set cellular sim 1 phone_number 18620435279
OK
…
# config save_and_apply
OK                                        // save and apply current configuration, make you configuration effect
```

Glossary

Abbr.	Description
AC	Alternating Current
APN	Access Point Name of GPRS Service Provider Network
ASCII	American Standard Code for Information Interchange
CE	Conformité Européene (European Conformity)
CHAP	Challenge Handshake Authentication Protocol
CLI	Command Line Interface for batch scripting
CSD	Circuit Switched Data
CTS	Clear to Send
dB	Decibel
dBi	Decibel Relative to an Isotropic radiator
DC	Direct Current
DCD	Data Carrier Detect
DCE	Data Communication Equipment (typically modems)
DCS 1800	Digital Cellular System, also referred to as PCN
DI	Digital Input
DO	Digital Output
DSR	Data Set Ready
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi-frequency
DTR	Data Terminal Ready
EDGE	Enhanced Data rates for Global Evolution of GSM and IS-136
EMC	Electromagnetic Compatibility
EMI	Electro-Magnetic Interference
ESD	Electrostatic Discharges
ETSI	European Telecommunications Standards Institute
FDD LTE	Frequency Division Duplexing Long Term Evolution
GND	Ground
GPRS	General Packet Radio Service
GRE	generic route encapsulation
GSM	Global System for Mobile Communications
HSPA	High Speed Packet Access
ID	identification data
IMEI	International Mobile Equipment Identification
IP	Internet Protocol
IPSec	Internet Protocol Security
kbps	kbits per second
L2TP	Layer 2 Tunneling Protocol
LAN	local area network

Abbr.	Description
LED	Light Emitting Diode
M2M	Machine to Machine
MAX	Maximum
Min	Minimum
MO	Mobile Originated
MS	Mobile Station
MT	Mobile Terminated
OpenVPN	Open Virtual Private Network
PAP	Password Authentication Protocol
PC	Personal Computer
PCN	Personal Communications Network, also referred to as DCS 1800
PCS	Personal Communication System, also referred to as GSM 1900
PDU	Protocol Data Unit
PIN	Personal Identity Number
PLCs	Program Logic Control System
PPP	Point-to-point Protocol
PPTP	Point to Point Tunneling Protocol
PSU	Power Supply Unit
PUK	Personal Unblocking Key
R&TTE	Radio and Telecommunication Terminal Equipment
RF	Radio Frequency
RTS	Request to Send
RTU	Remote Terminal Unit
Rx	Receive Direction
SDK	Software Development Kit
SIM	subscriber identification module
SMA antenna	Stubby antenna or Magnet antenna
SMS	Short Message Service
SNMP	Simple Network Management Protocol
TCP/IP	Transmission Control Protocol / Internet Protocol
TE	Terminal Equipment, also referred to as DTE
Tx	Transmit Direction
UART	Universal Asynchronous Receiver-transmitter
UMTS	Universal Mobile Telecommunications System
USB	Universal Serial Bus
USSD	Unstructured Supplementary Service Data
VDC	Volts Direct Current
VLAN	Virtual Local Area Network
VPN	Virtual Private Network
VSWR	Voltage Stationary Wave Ratio
WAN	Wide Area Network

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