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Outdoor Wi-Fi6 AX3000 AP

AP520X Series

User Manual

V2.0

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Content

1. Introduction

1.1. Overview

AP/NR520X is an outdoor AX3000 Wi-Fi 6 dual-band AP. It can be optionally equipped with 5G NR module. The product is based on the powerful Qualcomm wireless core. With a transmission power of 27dBm and external antennas, it can achieve a larger coverage range. It supports IEEE 802.11a/b/g/n/ac/ax protocol, and the maximum WiFi access rate reaches 3000Mbps.

NR520X is equipped with a 5G Sub-6GHz M.2 module designed for IoT/eMBB applications. It adopts 3GPP Release 16 technology, and can automatically adapt to 5G NR NSA and SA networking, and is downward compatible with 4G/3G. It can achieve backup of wired broadband and cellular broadband networks, and can provide network access for WiFi users through 5G broadband in scenarios where wired broadband access is lacking.

The excellent performance and stability not only come from the high-end Qualcomm core platform but also rely on our professional R&D team's hardware and software design. The product can be widely used in industries and scenarios such as park coverage, energy mines, smart harbour, warehousing and logistics, smart cities, exhibition halls, and venues.

1.2. Features

- AX3000 Wi-Fi 6, M.2 5G SA/NSA Sub 6GHz Router(NR520X).
- 5G NR Router employs 3GPP Rel. 16 technology, it supports both 5G NSA and SA modes, covers all the main stream carriers worldwide.
- Supports the Wi-Fi 6(802.11ax) standard,2.4GHz and 5GHz dual-frequency UL/DL MU-MIMO, enabling AP to send data to multiple terminals at the same time.
- Fat and Fit AP in one, Fit AP mode managed uniformly by the wireless controller (AC), Fat AP mode independent web page management.
- 2.5G Ethernet port. Using 2.5Gbps Ethernet port, compared with Gigabit port, the speed is greatly improved.
- Set WAN/LAN port as WAN to enable NR520X use the landline internet from WAN, and 4G/5G connection works as a backup to provide a sustained and reliable internet connection for you.
- Automated failover/failback back up among Ethernet, Cellular and Wi-Fi.
- Multiple SSID.

1.3. Specification

Table 1. Parameters table

Mobile(Optional)	
5G NR Module	Qualcomm Snapdragon X62
Frequency Bands	5G NR SA: n1/n2/n3/n5/n7/n8/n12/n13/n14/n18/n20/n25/n26/n28/n29/n30/n38/n40/n41/n48/n66/n70/n71/n75/n76/n77/n78/n79
	5G NR NSA: n1/n2/n3/n5/n7/n8/n12/n13/n14/n18/n20/n25/n26/n28/n29/n30/n38/n40/n41/n48/n66/n70/n71/n75/n76/n77/n78/n79
	LTE FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29/ B30/B32/B66/B71

	LTE TDD: B34/B38/B39/B40/B41/B42/B43//B48
	LAA:B46
	WCDMA:B1/B2/B4/B5/B8/B19
Data Transmission Rates	5G SA Sub-6: Max. 2.4 Gbps (DL)/Max. 900 Mbps (UL)
	5G NSA Sub-6: Max. 3.4 Gbps (DL)/Max. 550 Mbps (UL)
	5G NSA mmWave: Max. 4.0 Gbps (DL)/Max. 1.4 Gbps (UL)
	LTE-FDD: Max. 1.6 Gbps (DL)/Max. 200 Mbps (UL)
	HSPA+ : Max. 42Mbps (DL)/Max. 5.76Mbps (UL)
Antennas	Internal 4 high gain antennas
SIM Card	1 x Mini SIM(2FF), Push-push type
Wi-Fi Interface	
Wi-Fi Chipsets	2.4GHz: Qualcomm IPQ5018 (Dual-core ARM Cortex-A53@1GHz)
	5GHz: Qualcomm QCN6102
Memory	Flash:SPI NAND 128MB + SPI NOR 8MB
	RAM:512MB DDR3L SDRAM
Wi-Fi Standards	2.4 GHz: IEEE802.11b/g/n/ax
	5.8 GHz: IEEE 802.11a/n/ac/ax
Frequency	2.4 GHz(2.412GHz - 2.484GHz)
	5 GHz(5.15GHz～5.85GHz)
Antennas	2.4GHz: 2 × N type Connectors
	5GHz: 2 × N type Connectors
Wi-Fi Security	Open, WPA, WPA2PSK_TKIPAES,WAP2_EAP, WPA3
Operating Modes	Wireless router mode Access point mode Repeater mode
End Users	256
Wi-Fi Data Rates	802.11a : up to 54 Mbps 802.11b : up to 11 Mbps 802.11g : up to 54 Mbps WiFi 4 (802.11n) : up to 300 Mbps WiFi 5 (802.11ac) (1024QAM) : up to 1733 Mbps WiFi 6 (802.11ax) (2.4GHz) : up to 574 Mbps WiFi 6 (802.11ax) (5GHz) : up to 2402 Mbps
TX Power	27dBm
Ethernet Interface	
WAN/LAN Port	1 x Gigabit WAN (can be configured as LAN) RJ45, 10/100/1000 Mbps, auto MDI/MDIX
Mode	Full or Half Duplex (Auto-Sensing)
Power Supply	
Power Input	48V PoE input over WAN
Power Consumption	15W
Standard	IEEE 802.3at standard

Physical Characteristics	
Housing	Metal
Dimension	245*200*90mm(L*W*H)
Installation	Wall or Bracket mounting
Operating Temperature	-40℃ ~ +70℃
Storage Temperature	-40℃ ~ +85℃
Ingress Protection	IP67
Weight	1800g
Software	
VPN Client	IPSec Client, PPTP VPN Client, L2TP VPN Client
Others	
Button	Press and hold 5s to restore factory Settings
Console	RJ45
Indicators LED	PWR,ETH, 5G , 2.4G, 5.8G.

1.4. Button & Indicator

Table 2. Button & Indicator

Item	Description
WPS button	Holding for 5s to reset to factory settings.
Indicator	Blue: Can access Internet successfully. Red: Can’ t access Internet successfully.

1.5. Dimension

Unit: mm

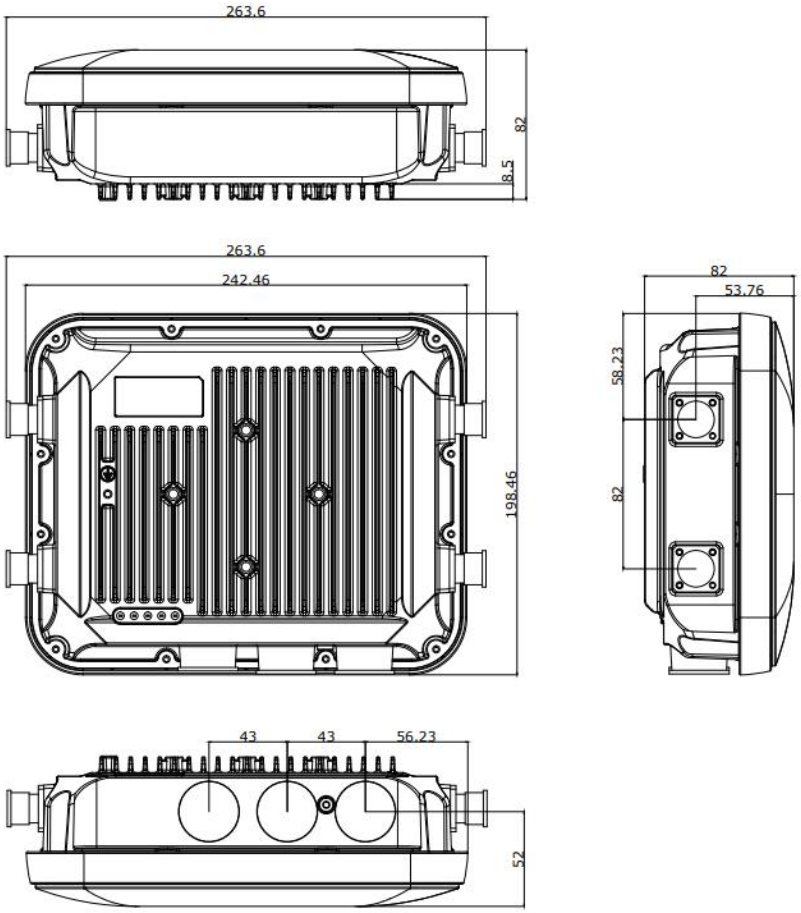

Figure 1. Dimension of AP/NR520X

2. Get Started

2.1. Login setting page

Connect PC to the LAN port of the AP controller, and set the IP to static IP, such as 192.168.1.101. The IP should be on the same network segment as the AP device.

You can test whether the network is connected by ping 192.168.1.1.

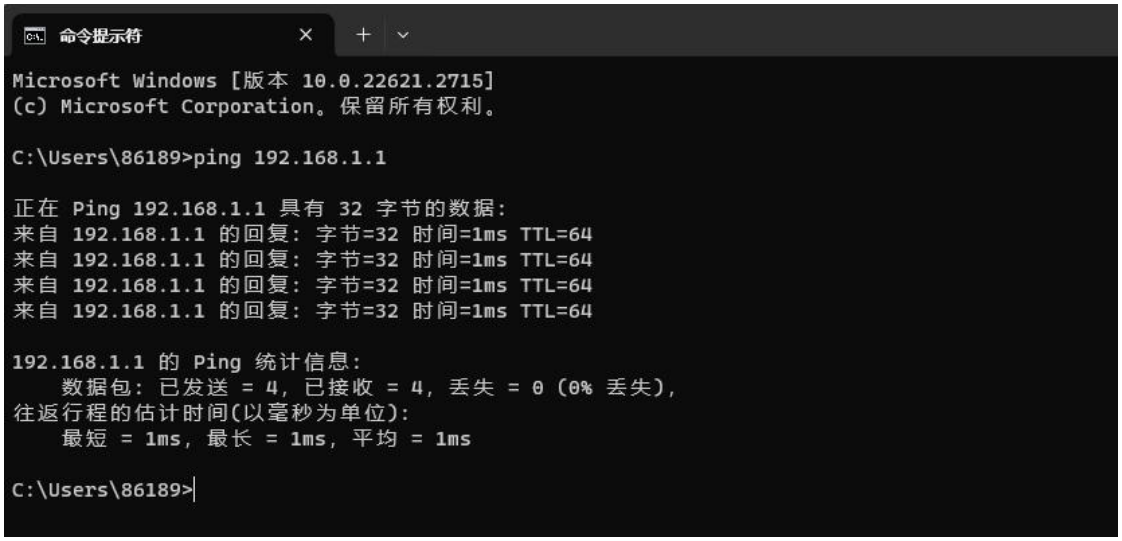

Figure 2. Ping command

Enter the default IP address of the AP 192.168.1.1 in the browser, and the browser will navigate to

login page. The username and password are both admin.

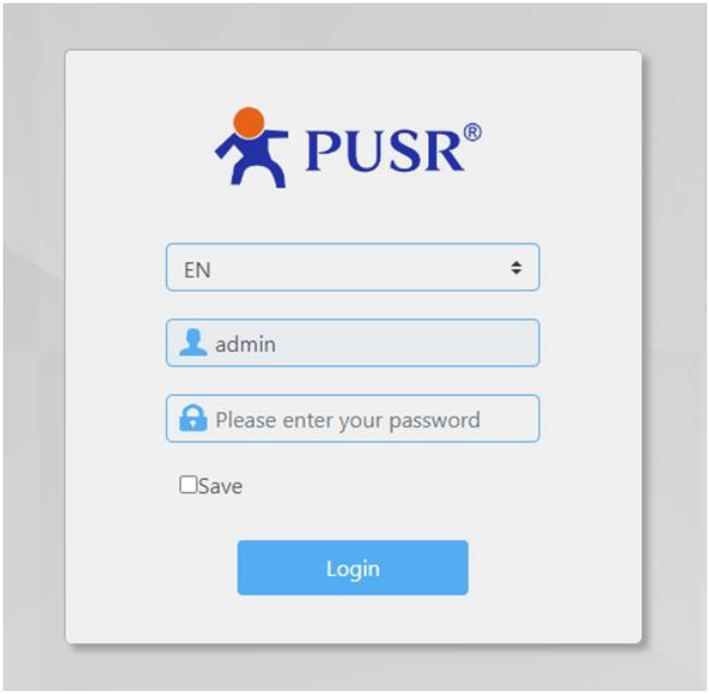

Figure 3. Login page

2.2. Briefs introduce of the webpage

The left column is divided into 9 menu pages: System status, mobile network, Internet accessing settings, WLAN settings, LAN settings, Login settings, client list, upgrade and system log.

There are three auxiliary options in the upper right corner: PUSR cloud, Luci, language, as shown in the following figure.

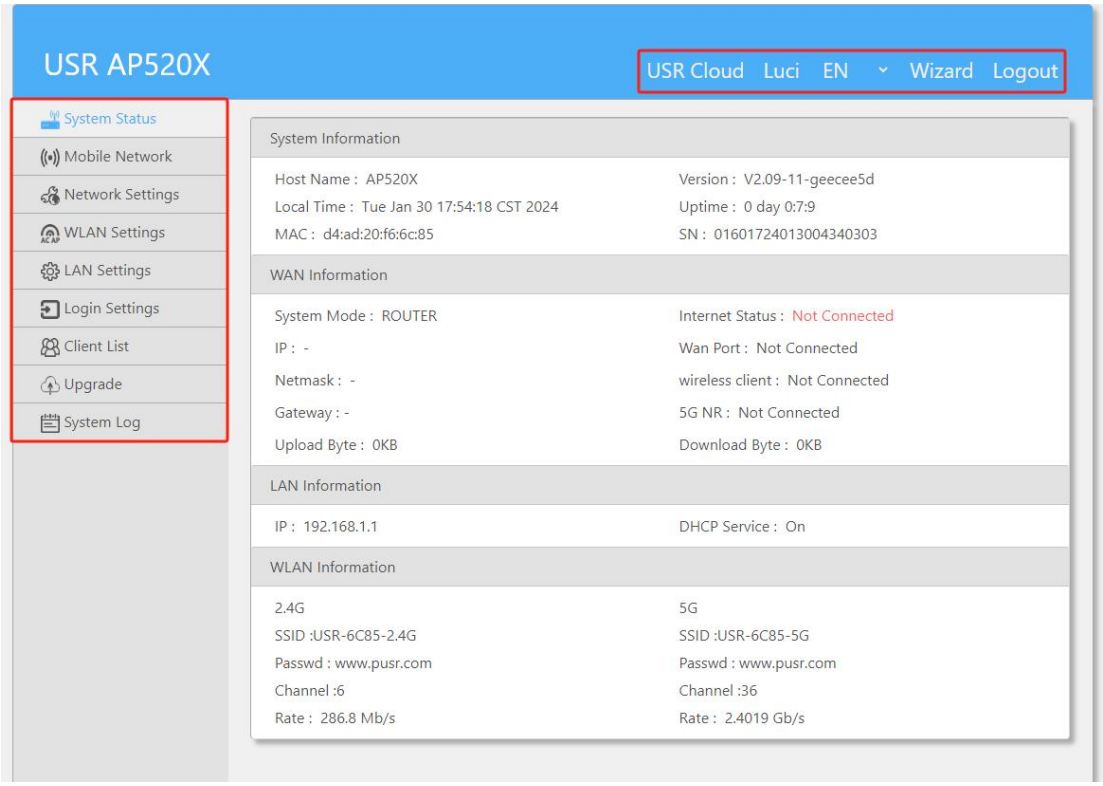

Figure 4. Function page

3. Configuration and parameter details

3.1. System status

This interface displays the basic information of the router, including 4 major blocks: system information, WAN port information, LAN port information, WLAN information. The specific information is shown in the figure below.

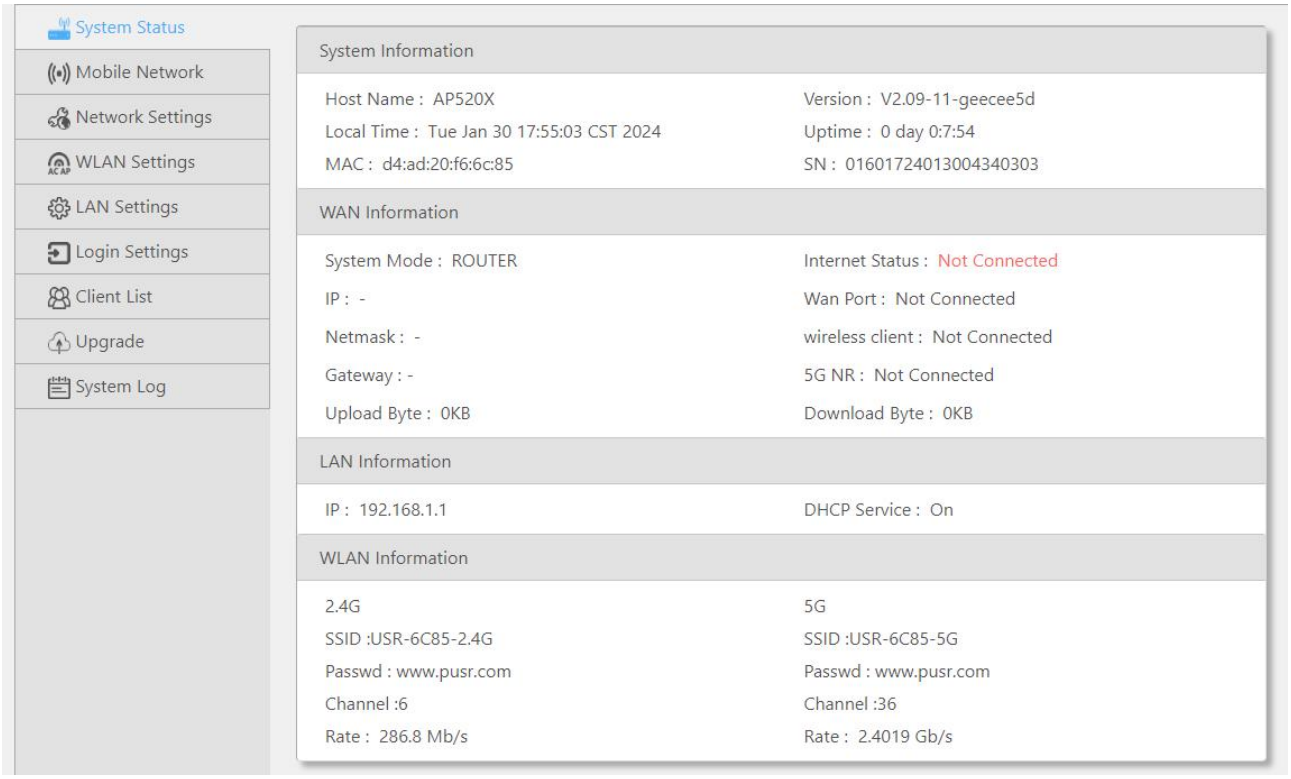

Figure 5. Router mode

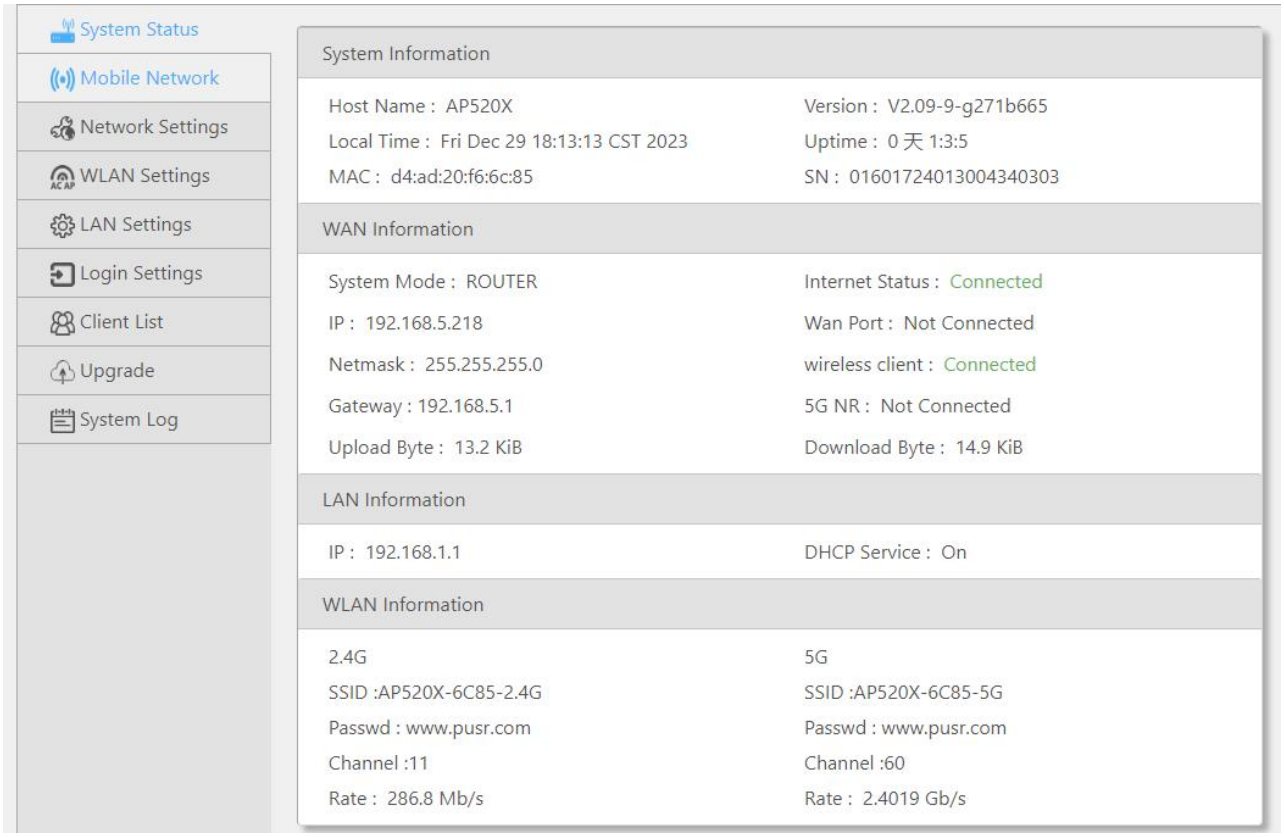

Figure 6. Repeater mode

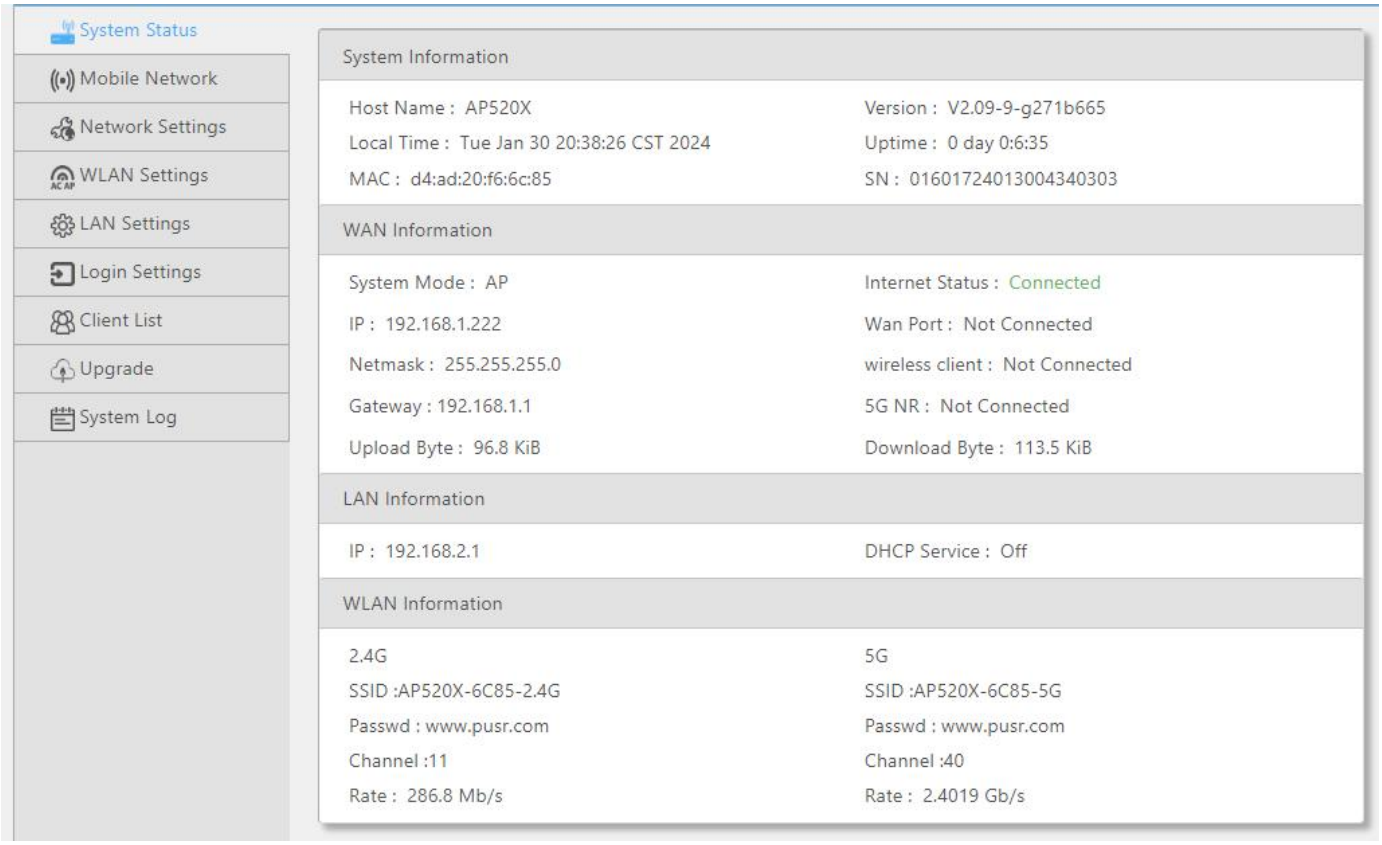

Figure 7. AP mode information

3.2. Mobile network

This function block displays the basic information of mobile network, including: SIM information, 5G model information, 5G band, 4G LTE band, 3G WCDMA band.

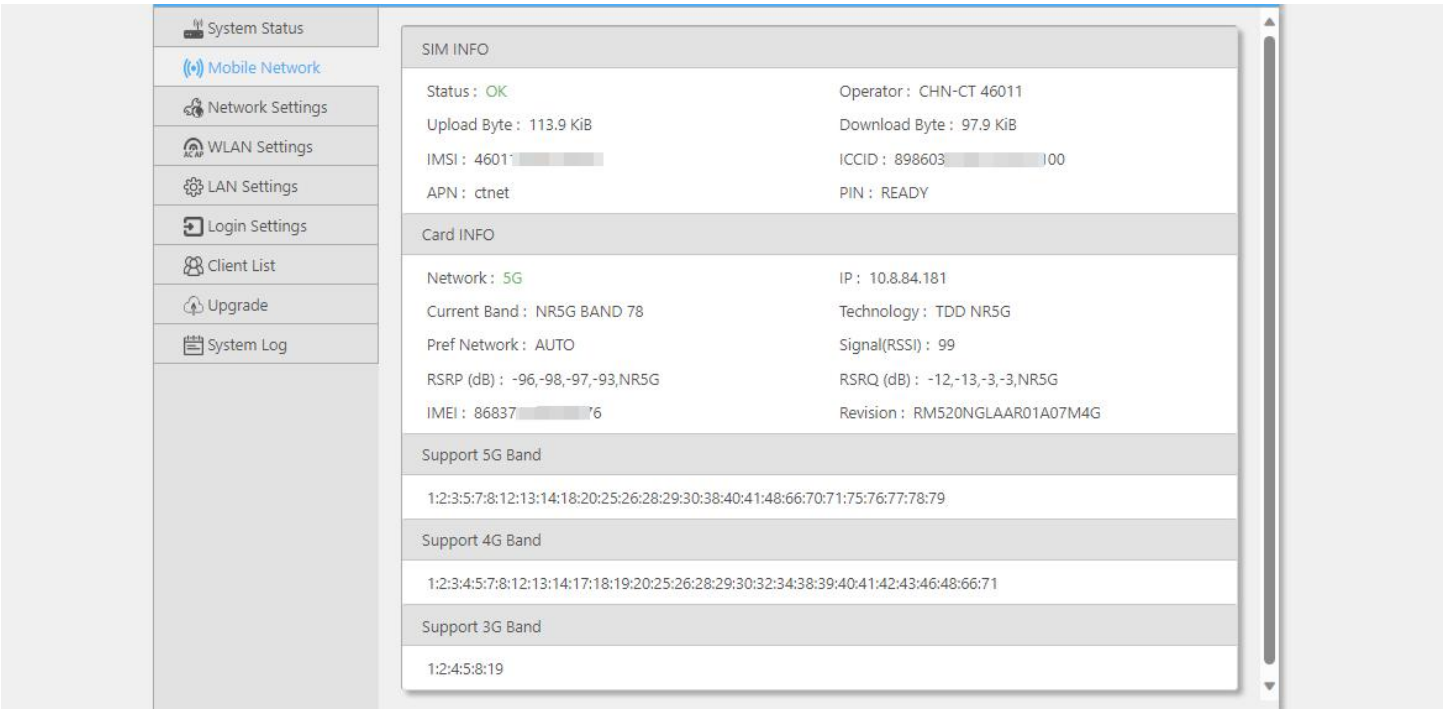

Figure 8. Mobile network

3.3. Internet accessing settings

Users can set the router: Mode selecting, Ethernet settings, WAN settings, Wireless repeater.

3.3.1. Mode selecting

There are 2 modes that can be selected: Router mode and AP mode.

Router mode: In this mode, the WAN port supports DHCP client, static IP, PPPoE. For LAN port, it supports DHCP service to assign IP addresses to terminal network devices.

AP mode: In this mode, WAN and LAN are bridged together, and DHCP service is turned off.

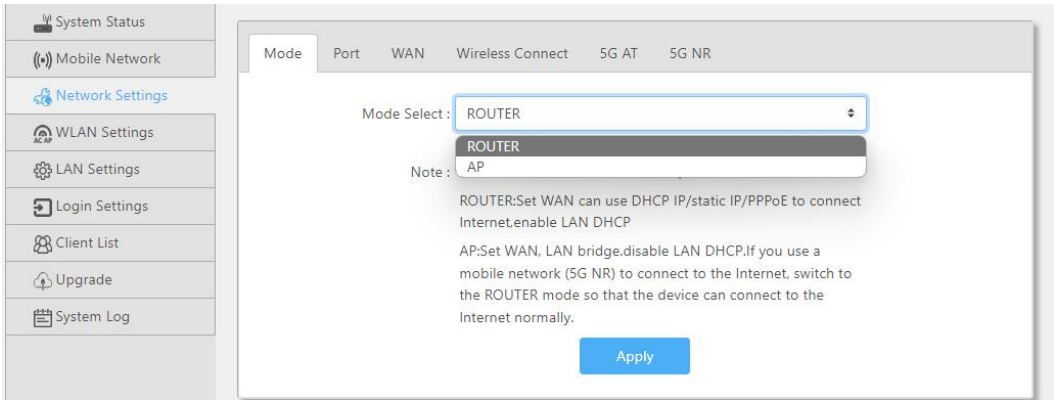

Figure 9. Mode selecting

3.3.2. Ethernet port setting

In this function block, users can implement WAN/LAN switching, and can monitor whether the Ethernet port is connected to a device.

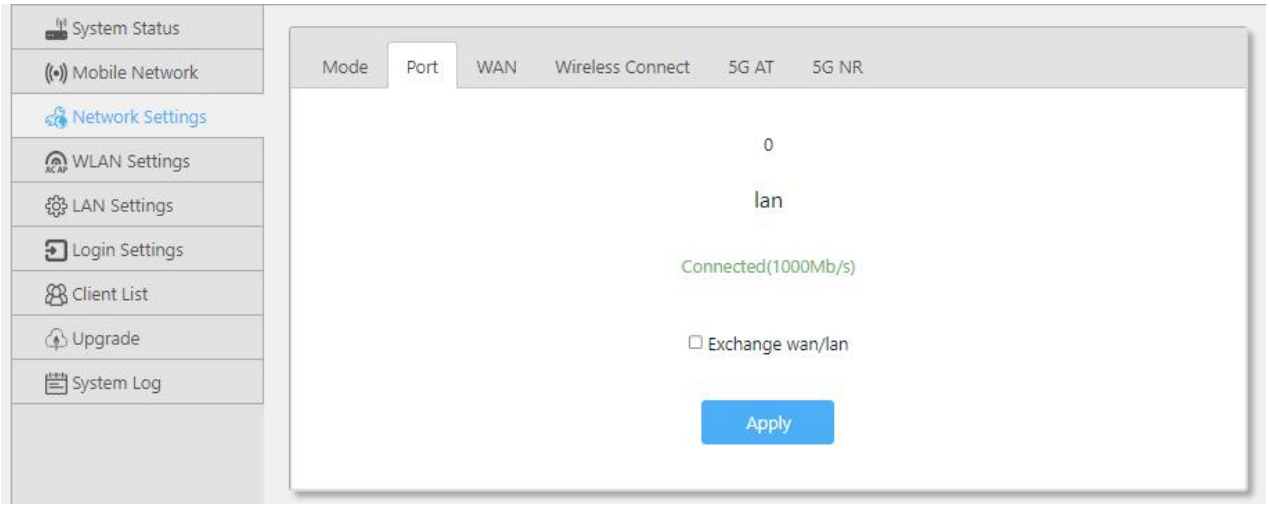

Figure 10. Ethernet port settings

3.3.3. WAN settings

On this page, users can set parameters of WAN port to get access to Internet, including DHCP client, static IP, and PPPoE.

MAC clone: Replace the AC's MAC address with this MAC.

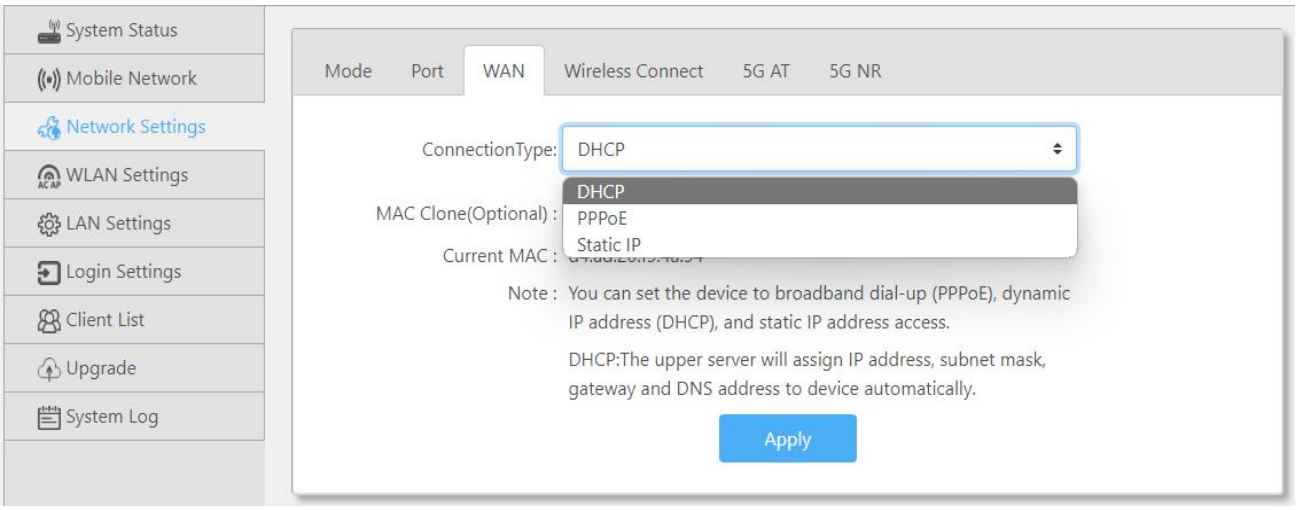

Figure 11. WAN port settings

3.3.4. Wireless repeater

Click <SCAN>, it will display the Wi-Fi SSID nearby, check the needed SSID, enter the password, select the needed frequency, check "Turn on", then click "Apply".

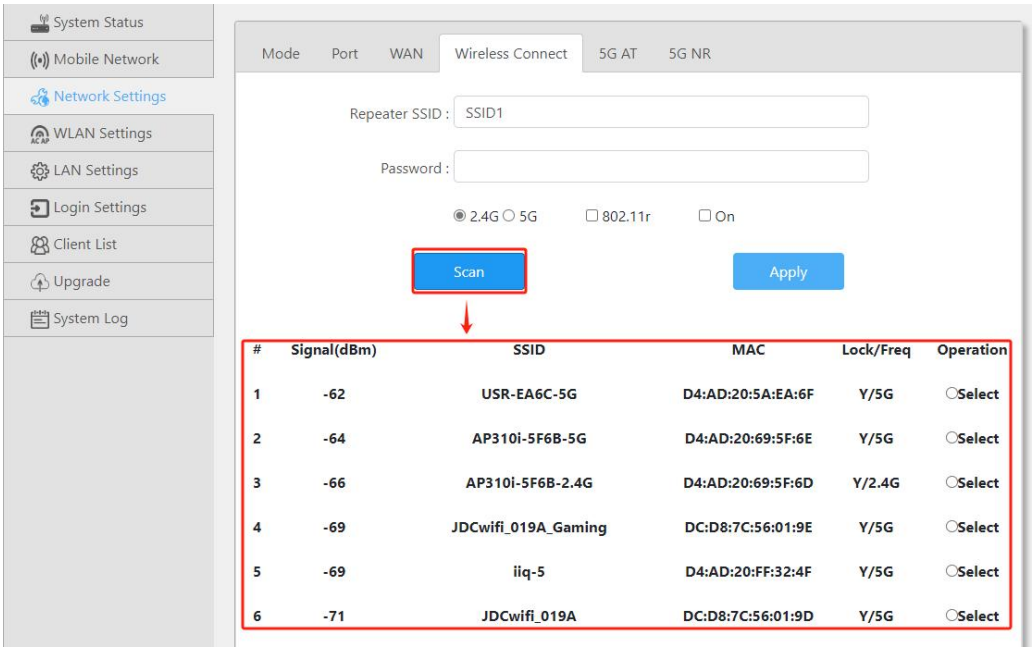

Figure 12. Wireless repeater settings

3.3.5. 5G AT

To get information or settings of 5G module via sending AT command.

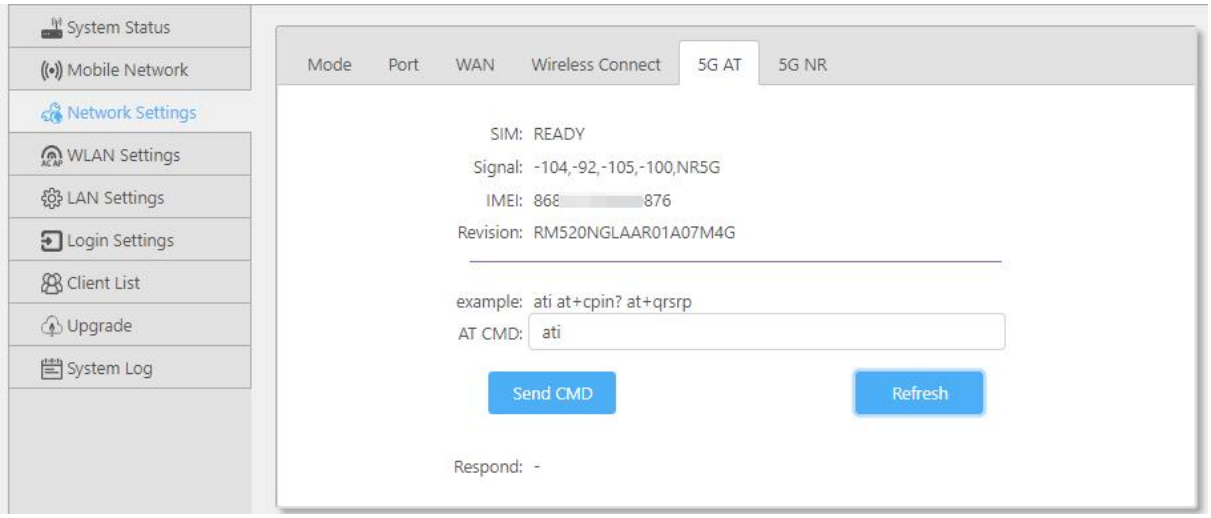

Figure 13. 5G AT command settings

3.3.6. 5G NR

Settings of 5G module.

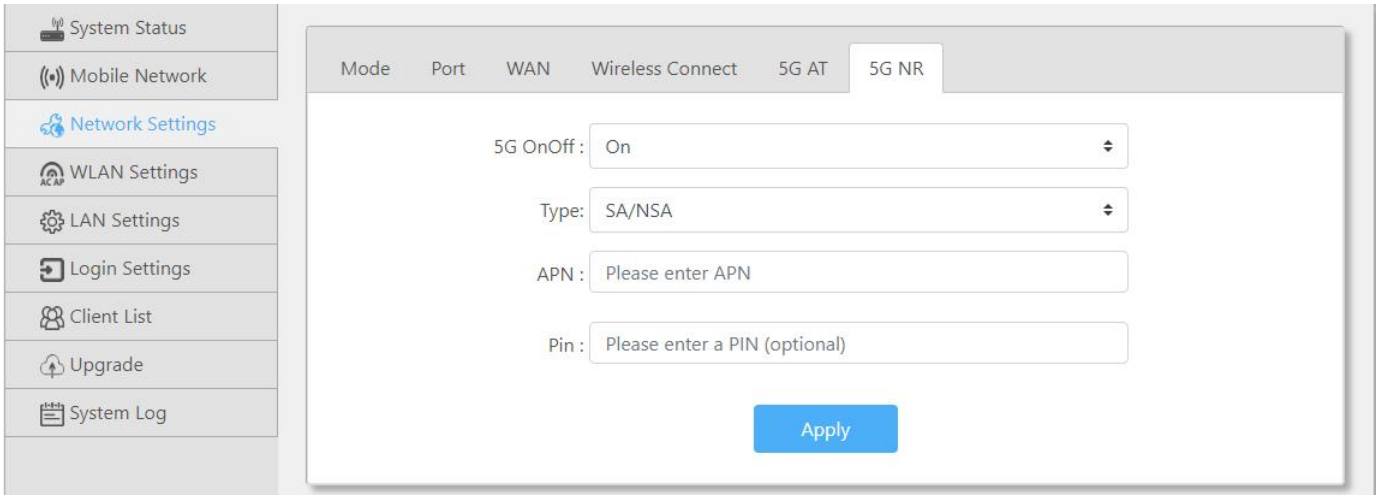

Figure 14. 5G NR settings

Table 3. Parameters details of 5G NR settings

Items	Description
5G enable	Turn on/Turn off 5G NR.
Station selecting	Select the right base station.
APN	Enter the APN of the SIM card.
Pin code	If a PIN code has been set on the card, please enter the correct PIN code.

3.4. WLAN settings

It includes 3 parts in this function block: 2.4G settings, 5.8G settings, Signal selecting.

3.4.1. 2.4G settings

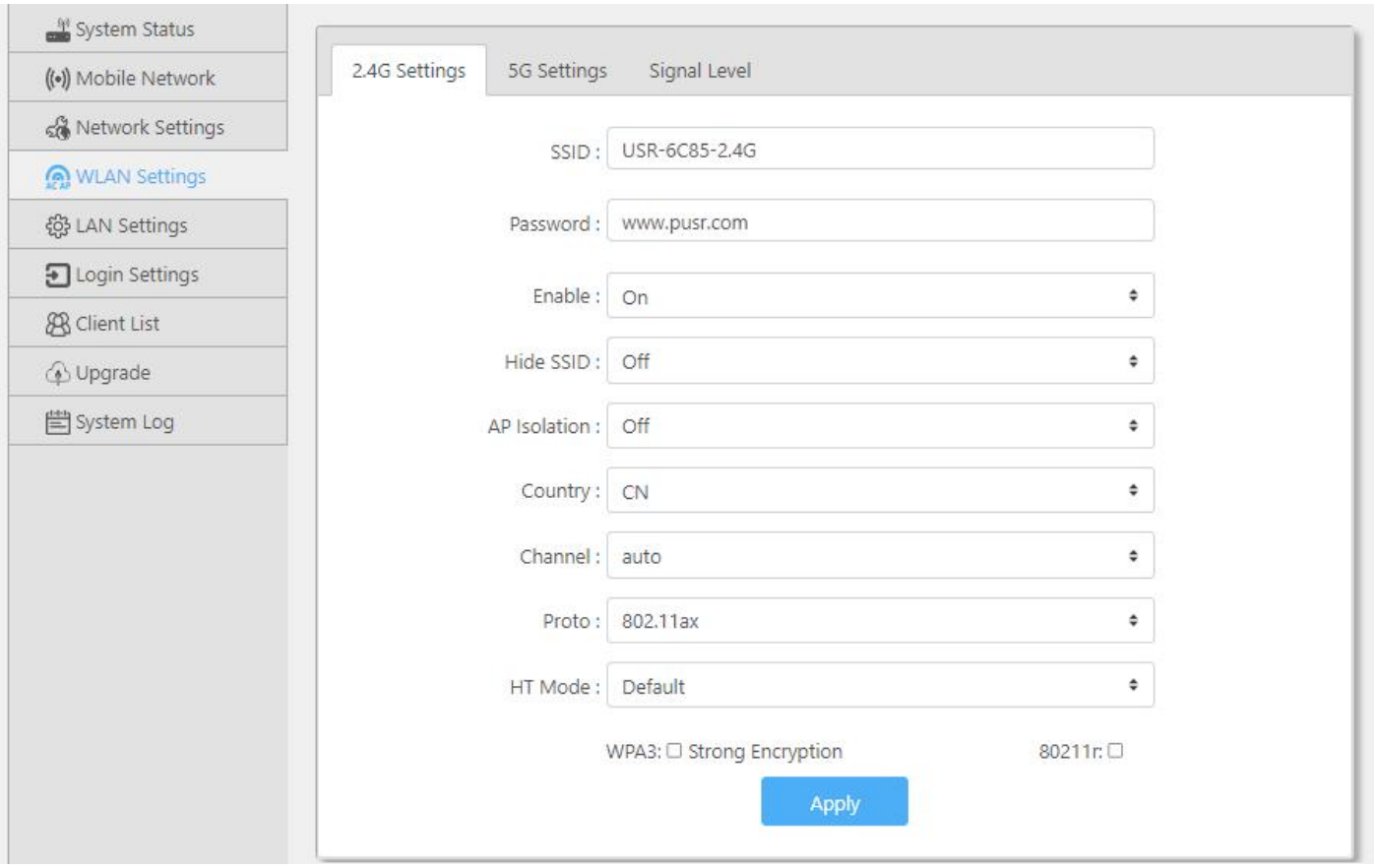

Figure 15. 2.4G Wi-Fi settings

Table 4. Parameters details of 2.4G Wi-Fi settings

Items	内容
SSID	Set the SSID of AP device, the maximum length is up to 22 characters.
Password	Length: 8~32, it can be characters and numbers. Users can leave it blank, it will open to all users. Default: www.pusr.com
Wi-Fi enable	Turn on / turn off the Wi-Fi function.
Hiding SSID	Turn on / turn off the SSID. After enabling this function, users will not be able to detect the SSID.
AP Isolation	Turn on: STAs connected to this AP cannot access each other. Turn off: STAs connected to this AP can access each other.
channel	Channel 1~ 13 can be selected, or user can leave it to auto.
IEEE 802.11	802.11ax/n/g/b.
Bandwidth	HT20/HT40.
WPA3 Encryption	Enable WPA3 enhanced encryption protocol.
80211r	Turn on / turn off 802.11r protocol.

3.4.2. 5G settings

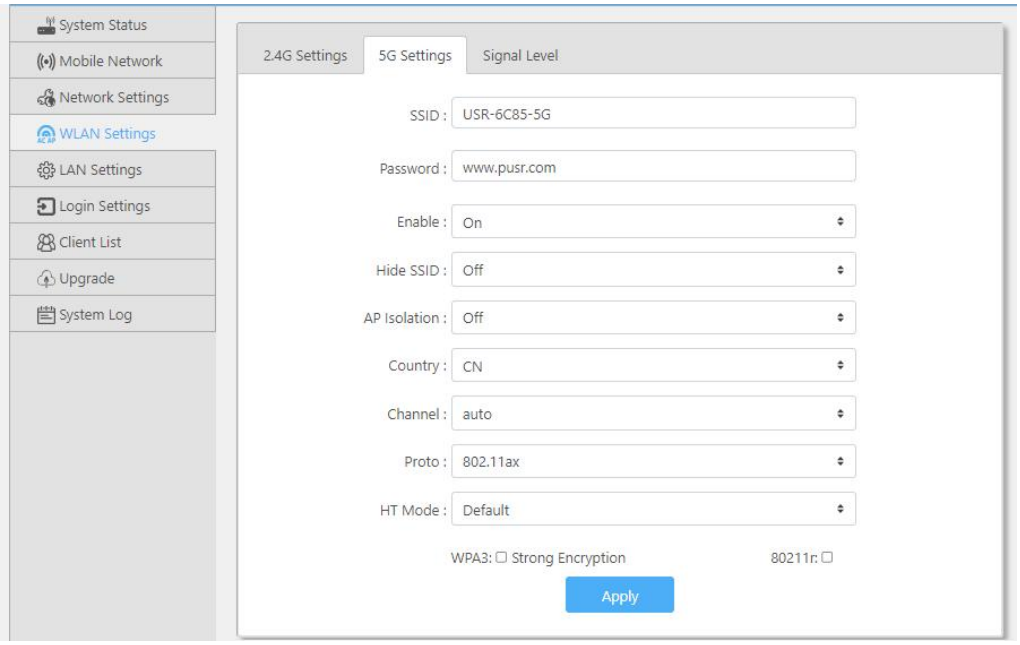

Figure 16. 5G Wi-Fi settings

Figure 17. Parameters details of 5G Wi-Fi settings

Items	内容
SSID	Set the SSID of AP device, the maximum length is up to 22 characters.
Password	Length: 8~32, it can be characters and numbers. Users can leave it blank, it will open to all users. Default: www.pusr.com
Wi-Fi enable	Turn on / turn off the Wi-Fi function.
Hiding SSID	Turn on / turn off the SSID. After enabling this function, users will not be able to detect the SSID.
AP Isolation	Turn on: STAs connected to this AP cannot access each other. Turn off: STAs connected to this AP can access each other.
channel	Channel 36、40、44、48、52、56、60、64、149、153、157、161、165 can be selected, or user can leave it to auto.
IEEE 802.11	802.11ax/ac/ (n/a) /a
Bandwidth	HT20/HT40/HT80/HT160
WPA3 Encryption	Enable WPA3 enhanced encryption protocol.
80211r	Turn on / turn off 802.11r protocol.

3.4.3. Signal selecting

Users can choose (Energy Saving)/(Normal)/(Penetration) signal strength based on requirements.

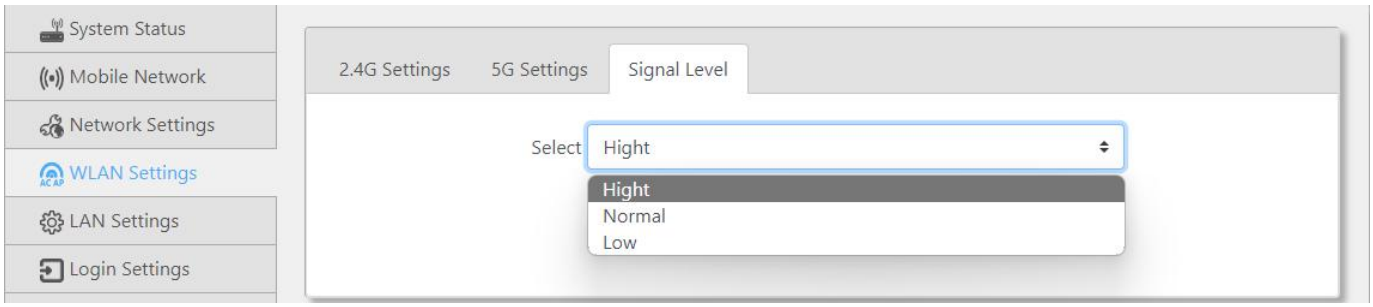

Figure 18. Signal selecting

3.5. LAN network settings

This function block is used to set the LAN IP address of the 520X, with the setting options as shown in the following diagram, and the configuration instructions as in Table 3.

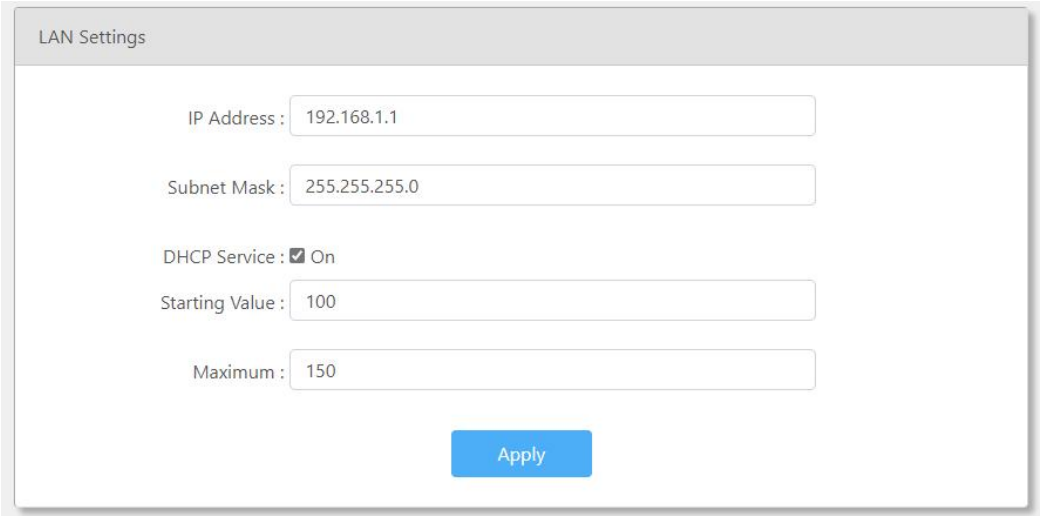

Figure 19. LAN network settings

Table 5. Parameters details of LAN network settings

Items	Description
IP address	The LAN IP of the AP(NR)520X. The default is 192.168.10.1
Subnet Mask	Subnet Mask of AP(NR)520X LAN port.
DHCP service	After enabling DHCP, the AC200/1000 can assign IP addresses to terminal devices. The IP addresses start from the “initial value” and can be allocated up to the “maximum number“set.

3.6. Login settings

This function is used to change the login password of a webpage.

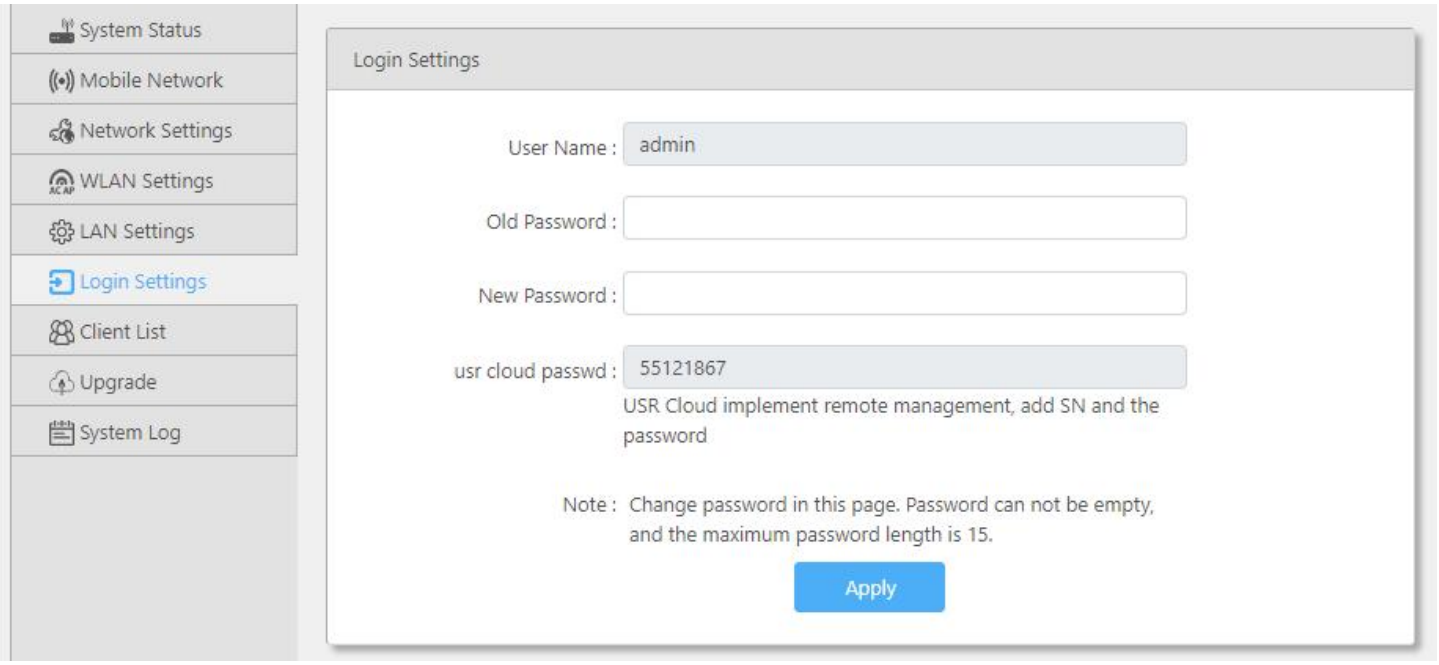

Figure 20. Login password settings

3.7. Client list

Client list has 3 submenus: DHCP List wireless clients and IP Binding.

DHCP List: Clicking on "refresh" button will display the information of computers that have obtained IP addresses through the router's DHCP service, as shown in the following figure.

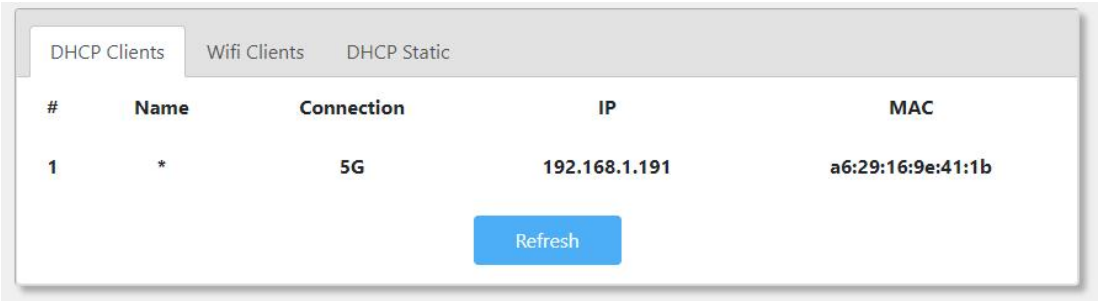

Figure 21. DHCP list

Wireless clients: It displays the clients connected to the AP device via wireless. Click "Refresh" to update the latest client list.

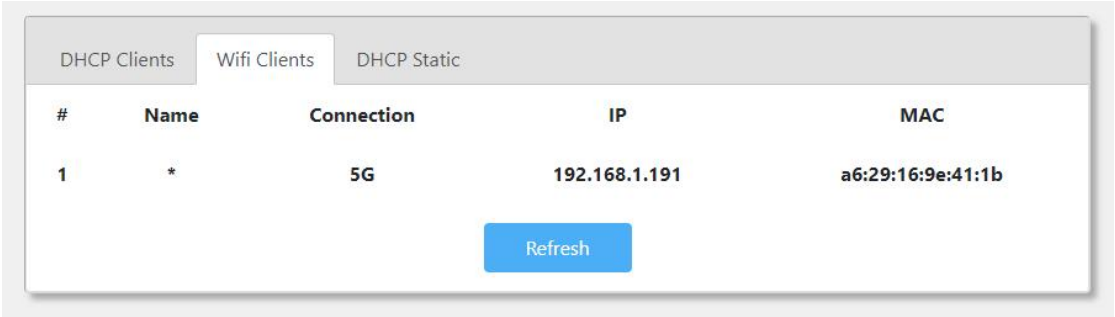

Figure 22. Wireless clients

IP Binding: Enter the IP address and MAC address of the device that needs to be bound, then click on <Add>. Click on <Refresh> to view the devices that have already been bound.

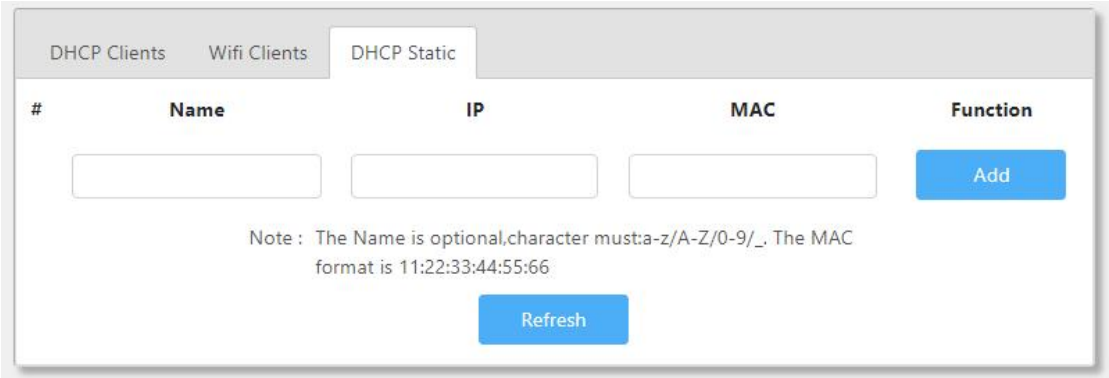

Figure 23. IP binding

3.8. Software upgrading

This functional block includes 5 submenus: [Firmware Upgrade], [Backup/Restore Configuration], [Date/Time], [Restart], and [Restore Factory Settings].

3.8.1. Firmware upgrading

Select firmware file-> Click upgrade

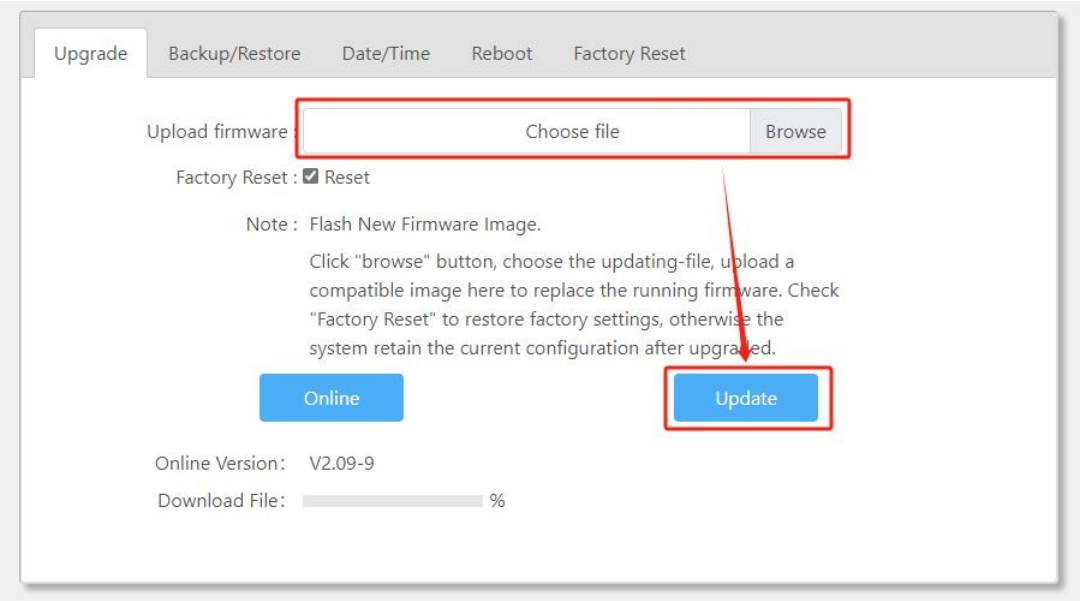

Figure 24. Firmware upgrading online

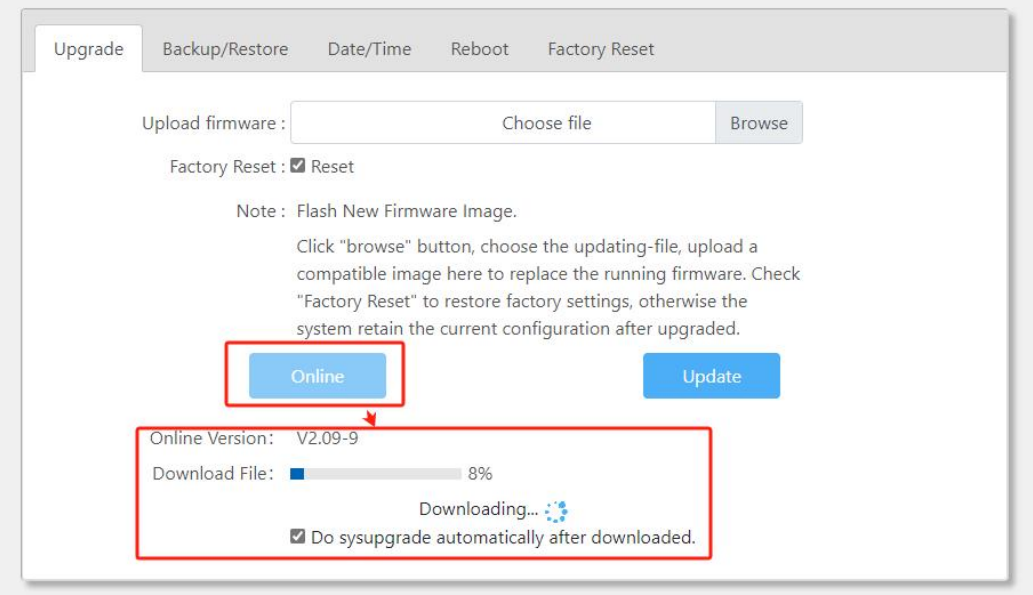

Figure 25. Firmware upgrading

3.8.2. Backup

This function is used to back up the current parameters of AP device, and it also allows the import of previously saved parameters, making it convenient for users to configure settings.

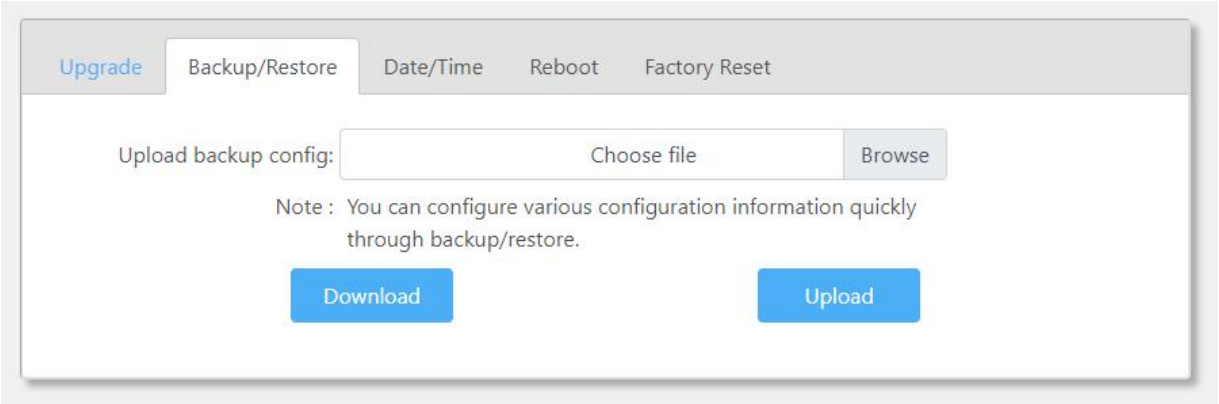

Figure 26. Configuration backup

Table 6.

Items	Description
Backup parameters	Click the <Backup Configuration> button to save the current settings to a file.
Import backup file	Click <Browse> to select the configuration file. Click <Import Configuration>, and in the prompt box, click <OK> to upload the settings to AC200/1000 and restart.

3.8.3. Time & Date

Set the time and date of the AP520X.

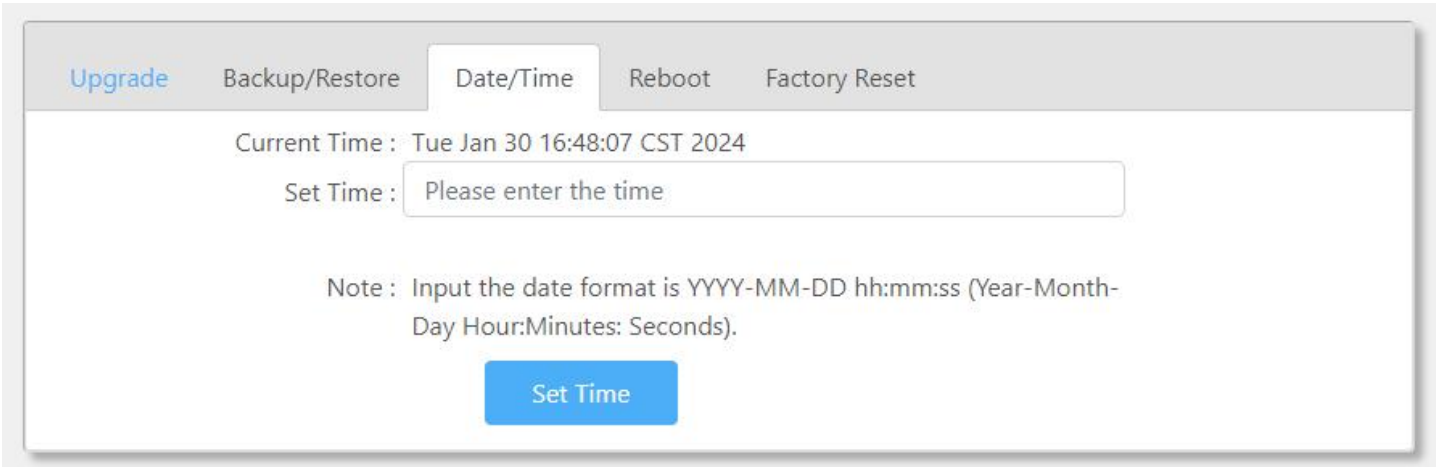

Figure 27. Time&Date

3.8.4. Reboot

Reboot the AP device.

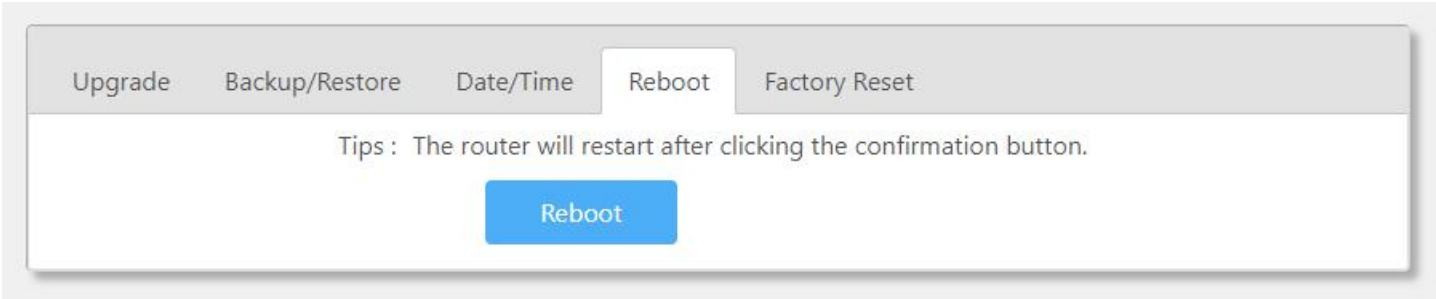

Figure 28. Reboot

3.8.5. Reset to factory setting

Reset to factory settings.

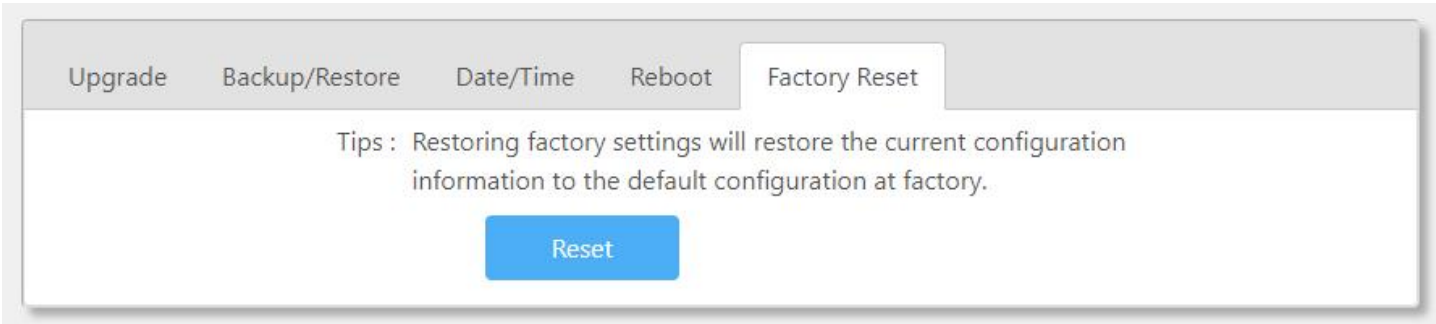

Figure 29. Reset to factory settings

3.9. System log

To check the system log.

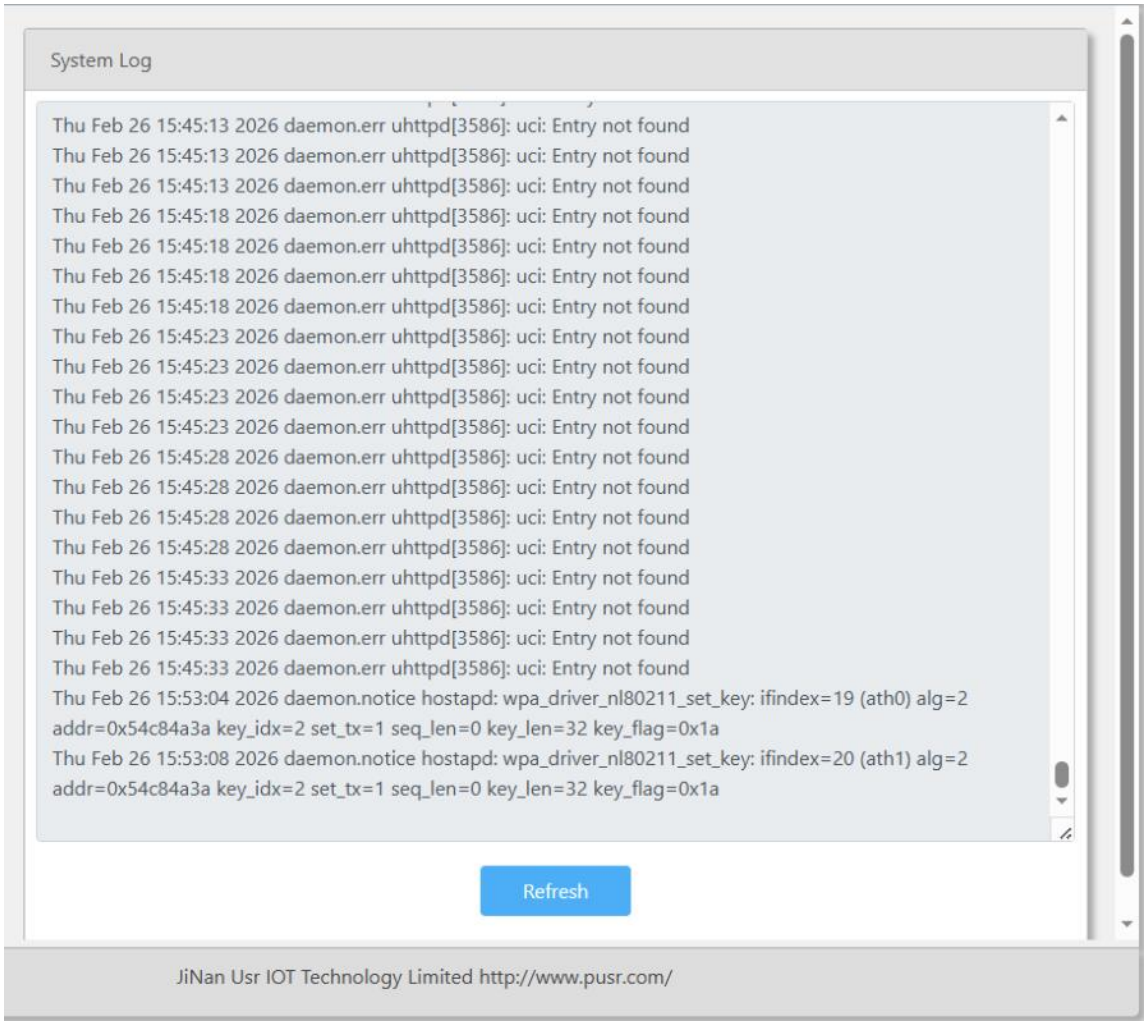

Figure 30. System log

4. Warranty

5. Contact Us

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7. Revision History

Version	Date	Author	Description
V1.0.0	2023-11-17		Established
V1.0.1	2024-01-29	May Liu	Translation

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