
Wireless IoT Controller with external antenna

**Wireless IOT Controller
with external antenna
R207C
User Manual**

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1. Introduction

R207C is a smart IoT gateway. R207C can communicate with Netvox LoRa network and act as a gateway in LoRa network. It can automatically add the LoRa device into the network and is adopted CSMA/CA mechanism and AES128 encryption method to improve security.

R207C is the control center of Netvox LoRa Private. It can work with Netvox M2 APP to monitor the information of the device easily.

Netvox LoRa private frequency is as follows:

500.1 MHz_China Region China

920.1 MHz_Asia Region Asia (including Japan, Singapore, Southeast Asia, and other regions)

868.0 MHz_EU Region Europe

915.1 MHz_AU/US Region America/ Australia

2. Product Appearance

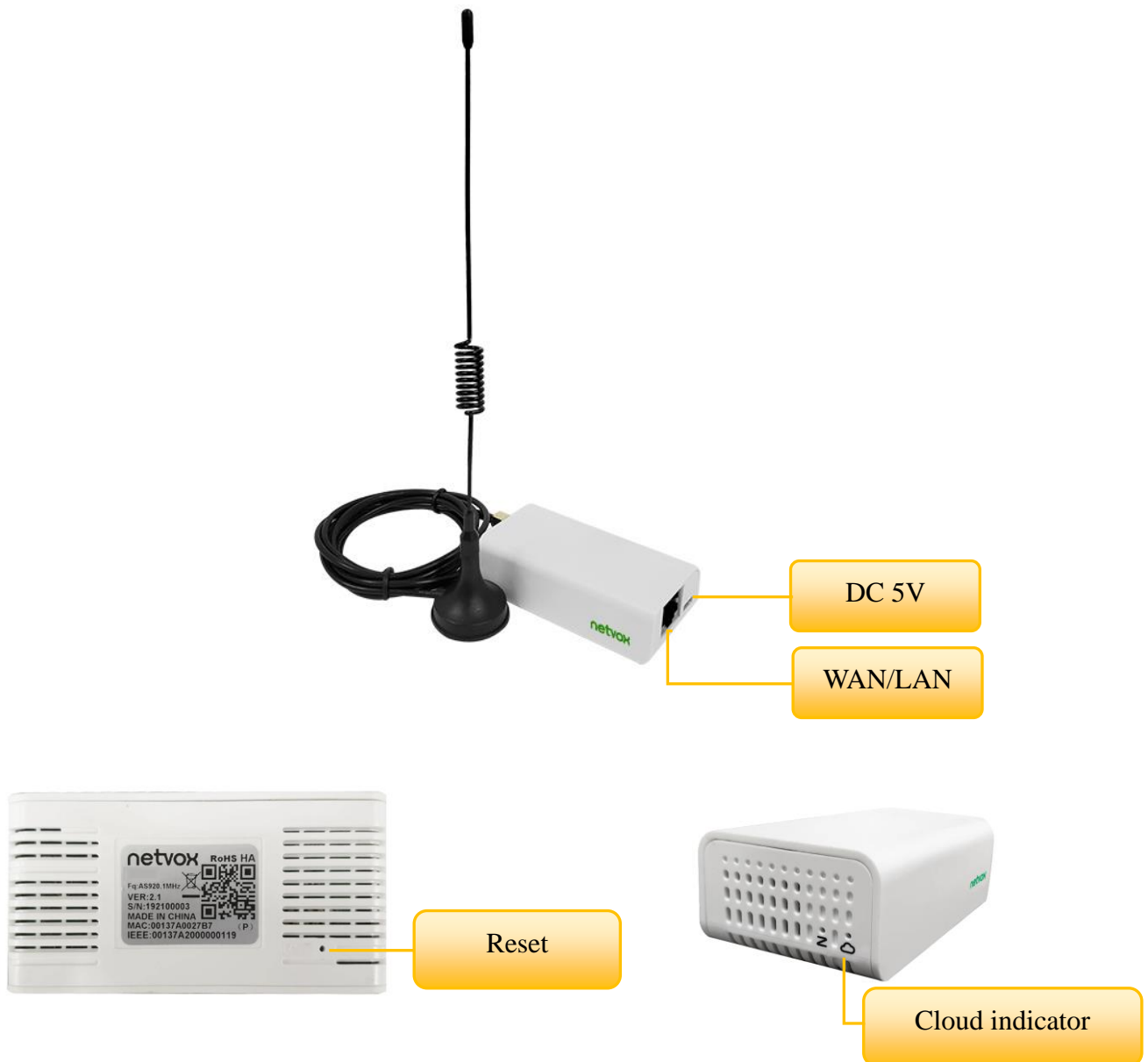


3. Main Characteristics

- The LoRa communication distance is up to 10km (depend on specific environment)
- Support Netvox LoRa Private
- Support Netvox Cloud
- Support M2 APP

4. Installation and Preparation

4.1 R207C Appearance



4.2 WAN/LAN Connection

The network source connects to the RJ-45 port (WAN/LAN). The network source supports static IP and DHCP client. If user needs an external IP Camera, please connect it to another router on the same network segment

4.3 Power on

Plug in the 5V/1.5A transformer to boot

4.4 Reboot

In the power-on state, press the reset button at the bottom to restart R207C

*If press the button for more than five seconds, it will restore to the factory setting.

4.5 Indicator

Cloud indicator:

Keep On: Connected to the cloud

Flash: Not connected to the cloud

4.6 Restore to Factory Setting

In the power-on state, press and hold the reset button for 5 seconds and release to restore the factory setting.

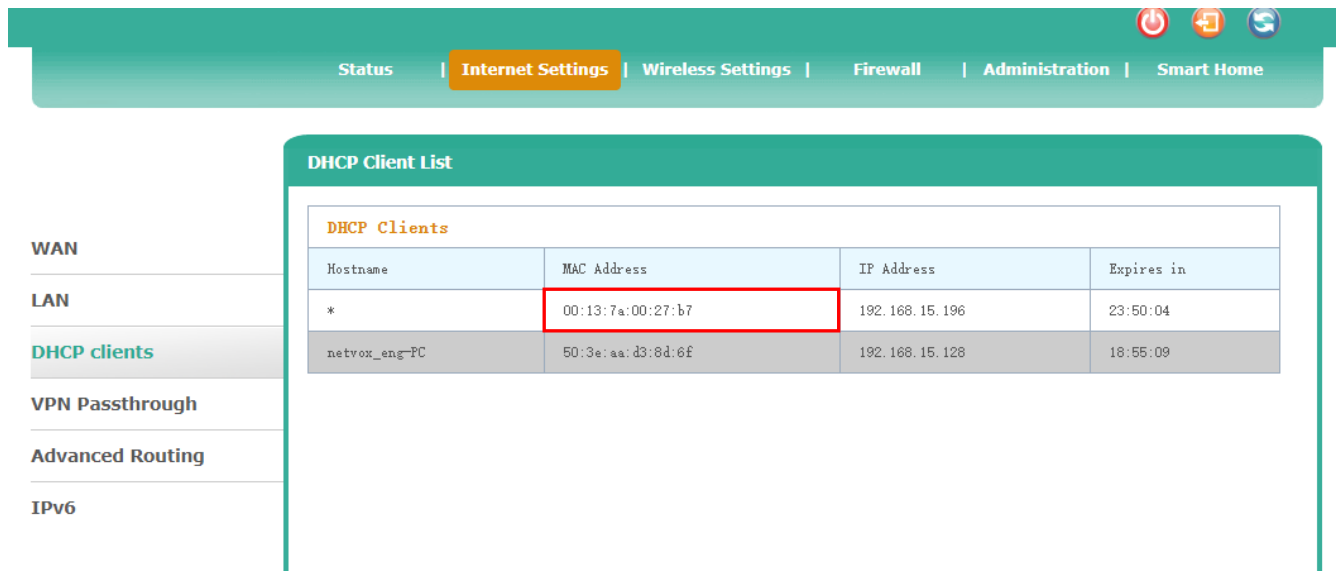
5. Set up R207C

5.1 Connect to the device

Please connect the network source to the RJ-45 (WAN/LAN) jack of R207C and connect to the power supply. The router of the network source needs to enable DHCP to view the DHCP List.

5.2 Inquire R207C IP Address

Open a web browser, log in to the router setting interface of the network source, and find the DHCP List to see the R207C IP address and MAC Address. According to the IP address of R207C in the list, user can log in to the R207C setting interface.



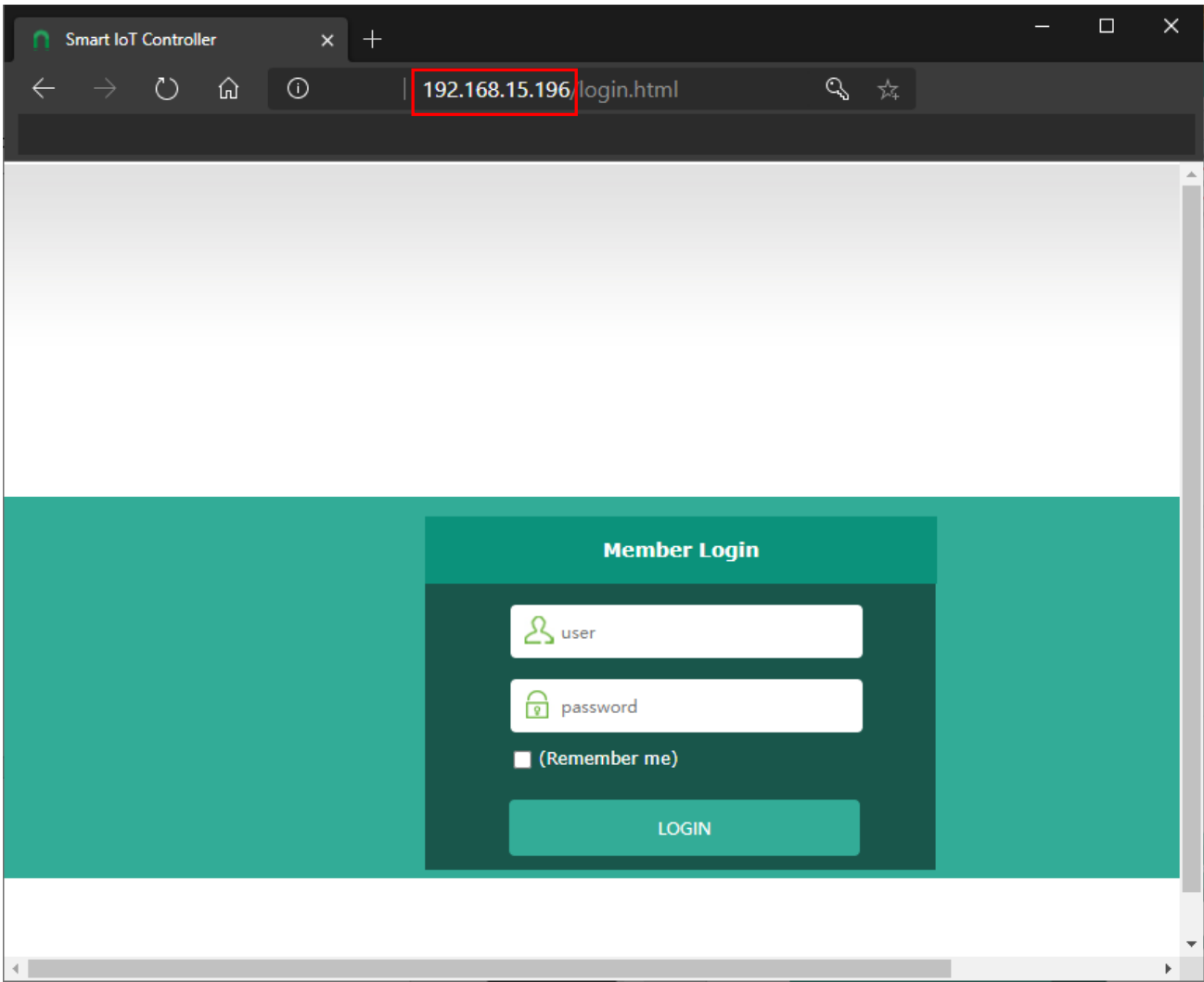
The screenshot displays the router's configuration interface. At the top, there is a navigation bar with tabs for Status, Internet Settings (selected), Wireless Settings, Firewall, Administration, and Smart Home. On the left side, there is a sidebar menu with options: WAN, LAN, DHCP clients (selected), VPN Passthrough, Advanced Routing, and IPv6. The main content area is titled 'DHCP Client List' and contains a table with the following data:

DHCP Clients			
Hostname	MAC Address	IP Address	Expires in
*	00:13:7a:00:27:b7	192.168.15.196	23:50:04
netvox_eng-PC	50:3e:aa:d3:8d:6f	192.168.15.128	18:55:09

*The above network source setting screen is Netvox R206. The location of the DHCP client of routers from other manufacturers may be different.

5.3 Login R207C management interface

Please fill in R207C IP address in the URL bar. (the above example is 192.168.15.196)



Default username and password (Applicable to versions after 0.0.0.83 (inclusive))

The Administrator's Username: operator **Password:** the last six digits of IEEE

The Customer's Username: admin **Password:** the last six digits of IEEE

▶ Status
▶ Internet Setting
WAN Interface
▶ Administration
Statistics
Time Zone Setting
Denial-of-Service
System Log
Upgrade Firmware
Save/Load Setting
Password
▶ Smart Home
Device List
Device Management
User Management
Upgrade Module
Data Management
Communication Setting

System	
Uptime	0day:0h:47m:44s
Firmware Version:	0.0.0.86
Build Time	Tue Jun 2 15:11:39 CST 2020
WAN Configuration	
Attain IP Protocol	DHCP Client
IP Address:	192.168.15.196
Subnet Mask:	255.255.255.0
Default Gateway:	192.168.15.1
DHCP Server	Disable
MAC Address	00:13:7a:00:27:b7

*It is recommended to change the password immediately after logging in for the first time to improve network security

*Before version 0.0.0.83, the administrator's username and password are operator, the customer's username and password are admin.

*If user wants to log in to the R207C page, the computer must be in the same network segment as the network source to access. (the wired network of the source end or Wi Fi can be connected)

6. Gateway Function Description

6.1 Status

Click [Status] in the left list to view system information and network information

▶ Status	System
▶ Internet Setting	Uptime 0day:0h:50m:3s
WAN Interface	Firmware Version: 0.0.0.86
▶ Administration	Build Time Tue Jun 2 15:11:39 CST 2020
Statistics	WAN Configuration
Time Zone Setting	Attain IP Protocol DHCP Client
Denial-of-Service	IP Address: 192.168.15.196
System Log	Subnet Mask: 255.255.255.0
Upgrade Firmware	Default Gateway: 192.168.15.1
	DHCP Server Disable
	MAC Address 00:13:7a:00:27:b7

6.2 Internet Settings

Click [WAN Interface] in the left list, and user can modify the network information, such as WAN Access Type, etc.

The screenshot shows the WAN Interface Setup page with two configurations. The top configuration is for 'Static IP' and the bottom for 'DHCP Client'. Both configurations have 'LAN DHCP' set to 'Enable'.

Static IP Configuration:

- LAN DHCP: Enable
- WAN Access Type: Static IP
- IP Address: 172.1.1.1
- Subnet Mask: 255.255.255.0
- Default Gateway: 172.1.1.254
- MTU Size: 1500 (1400-1500 bytes)
- DNS 1: [Empty]
- DNS 2: [Empty]
- DNS 3: [Empty]
- Clone MAC Address: 000000000000
- Enable uPNP:
- Enable IGMP Proxy:
- Enable Ping Access on WAN:
- Enable Web Server Access on WAN:
- Enable IPsec pass through on VPN connection:
- Enable PPTP pass through on VPN connection:
- Enable L2TP pass through on VPN connection:
- Enable IPv6 pass through on VPN connection:

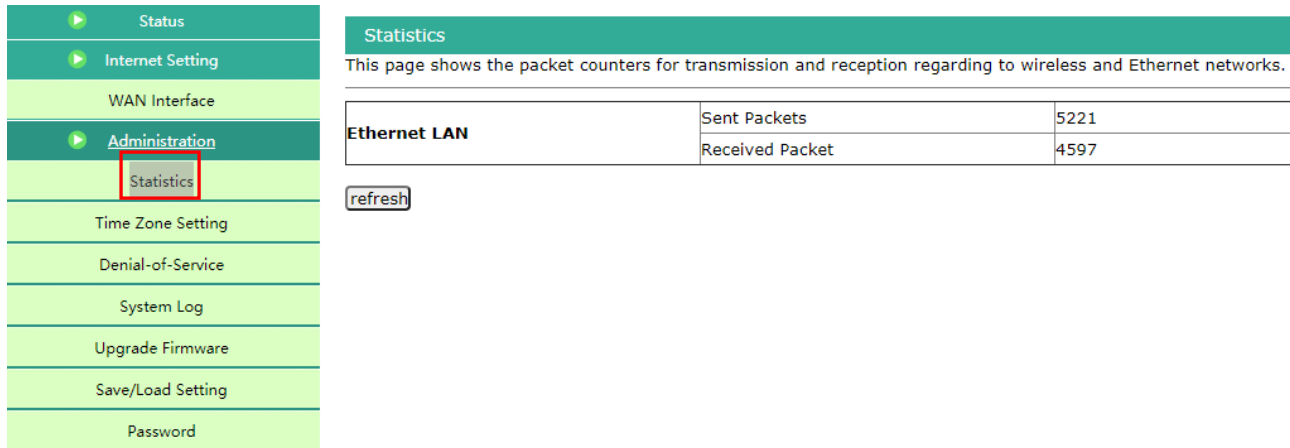
DHCP Client Configuration:

- LAN DHCP: Enable
- WAN Access Type: DHCP Client
- Host Name: [Empty]
- MTU Size: 1492 (1400-1500 bytes)
- Attain DNS Automatically:
- Set DNS Manually:
- DNS 1: [Empty]
- DNS 2: [Empty]
- DNS 3: [Empty]
- Clone MAC Address: 000000000000

6.3 Administration

6.3.1 Statistics

This page shows the packet counters for transmission and reception regarding to wireless and Ethernet networks.



Statistics
This page shows the packet counters for transmission and reception regarding to wireless and Ethernet networks.

Ethernet LAN	Sent Packets	5221
	Received Packet	4597

6.3.2 Time Zone Setting

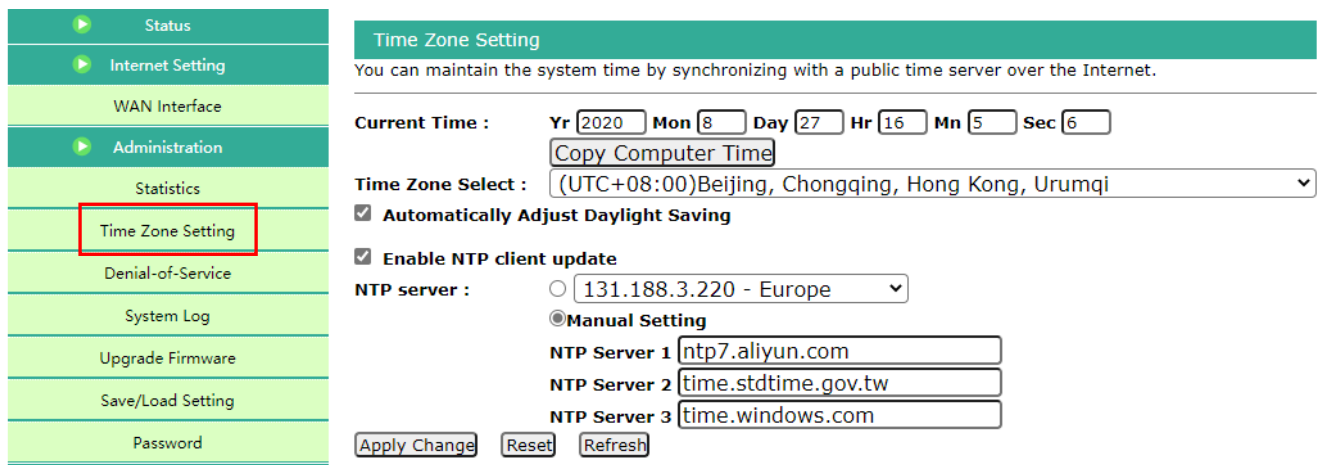
You can maintain the system time by synchronizing with a public time server over the Internet.

The default NTP Server such as the following:

NTP Server1 : ntp7.aliyun.com

NTP Server2 : time.stdtime.gov.tw

NTP Server3 : time.windows.com



Time Zone Setting
You can maintain the system time by synchronizing with a public time server over the Internet.

Current Time : Yr Mon Day Hr Mn Sec

Time Zone Select : (UTC+08:00)Beijing, Chongqing, Hong Kong, Urumqi

Automatically Adjust Daylight Saving

Enable NTP client update

NTP server : 131.188.3.220 - Europe **Manual Setting**

NTP Server 1
NTP Server 2
NTP Server 3

*Please make sure that the gateway time is consistent with the computer system time; otherwise, it will cause the timestamp verification failed when the gateway connects to the cloud and be unable to connect to the cloud.

6.3.3 Denial-of-Service

R207C do not support this function.

6.3.4 System Log

R207C do not support this function.

6.3.5 Upgrade Firmware

This page allows you upgrade the gateway firmware to a newer version. Please note, do not power off the device during the upload because the system might crash.

The screenshot shows the 'Upgrade Firmware' page. On the left is a navigation menu with 'Upgrade Firmware' highlighted in red. The main content area has a title 'Upgrade Firmware' and a warning: 'This page allows you upgrade the gateway firmware to a newer version. Please note, do not power off the device during the upload because the system might crash.' Below this, the 'Firmware Version' is shown as '0.0.0.86'. The 'Select File:' section includes a file input field with the text 'z206m2_httpsf...8_2a9370b.ipk', a '選擇檔案' (Choose File) button, and 'upload' and 'Reset' buttons.

*Do not turn off the power during the firmware update

6.3.6 Save/Load Setting

This page allows you save current settings to a file or reload the settings from the file which was saved previously. Besides, you could reset the current configuration to factory default.

The screenshot shows the 'Save/Reload Settings' page. On the left is a navigation menu with 'Save/Load Setting' highlighted in red. The main content area has a title 'Save/Reload Settings' and a warning: 'This page allows you save current settings to a file or reload the settings from the file which was saved previously. Besides, you could reset the current configuration to factory default.' Below this, there are three sections: 'Save Settings to File:' with a 'Save...' button; 'Load Settings from File:' with a file input field containing '沒有選擇檔案', a '選擇檔案' (Choose File) button, and an 'Upload' button; and 'Reset Settings to Default:' with a 'Reset' button. At the bottom, there is a section 'Replace the old gateway' with a text input field containing 'IEEE' and a 'Replace' button.

*The saved device configuration file is “.dat”.

6.3.7 Password

The login account and password of the administrator and customer can be changed.

The password must be greater than or equal to 6 digits.

It cannot be the same as the account and cannot be 123456.

Default username and password (Applicable to versions after 0.0.0.83 (inclusive))

The administrator's username: operator; Password: the last six digits of IEEE

The customer's username: admin; Password: the last six digits of IEEE

The screenshot shows a web interface for System Management. On the left is a navigation menu with the following items: Status, Internet Setting, WAN Interface, Administration, Statistics, Time Zone Setting, Denial-of-Service, System Log, Upgrade Firmware, Save/Load Setting, and Password. The 'Password' item is highlighted with a red border. The main content area is titled 'System Management' and contains two sections: 'User permission setting' and 'Administrator permission setting'. Each section has input fields for 'Account' and 'Password', and 'Apply' and 'Cancel' buttons.

*When user forgets the password, please press and hold the reset button of R207C hardware for 5 seconds and release it to restore the factory setting.

6.4 Smart Home

6.4.1 Device List

Click [Device List] to view current device information, including Device ID (IEEE), Device name, online/offline status, etc.

* When using for the first time, please power on the end device one by one and refresh the device list to see if all items appear on the list

No	Device ID	Device Name	Online/offline status	Udevice ID	Device Details	Delete
0	00137A2000000119	Lora	online	LORA_00_01	Detail	Delete
1	00137A1000004352	R718F2	online	LORA_3E_01	Detail	Delete

Click [Detail] to view the detail device information.

No	Device ID	Device Name	Online/offline status	Udevice ID	Device Details	Delete
0	00137A2000000119	Lora	online	LORA_00_01	Detail	Delete
1	00137A1000004352	R718F2	online	LORA_3E_01	Detail	Delete

▶ Status
▶ Internet Setting
WAN Interface
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Save/Load Setting
Password
▶ Smart Home
Device List
Device Management
User Management
Upgrade Module
Data Management
Communication Setting

Device List

▼ Device List

[Back](#)

Profileid	
Ep Model ID	
IEEE	
EP	
Nwk Address	
Power Mode	
Manufacturer Name	
Current Power Source	
Voltage	
ZCL Version	
APP Version	0A
Stack Version	
HW Version	02
Ver Date	20190408

Click [Delete] to delete the device.

No	Device ID	Device Name	Online/offline status	Udevice ID	Device Details	Delete
0	00137A2000000119	Lora	online	LORA_00_01	Detail	Delete
1	00137A1000004352	R718F2	online	LORA_3E_01	Detail	Delete

6.4.2 Device Management

Click [Device Management] and “Add Devices” will appear.

Please enter the IEEE (DevEUI) of the device that will be added.

After filling, click [Add Device], and the network will start. Each time that can join in the network is 60 seconds, and the user can refresh the device list to view whether the device has joined in the network.

*Operation tip:

Reset device to factory default and power off, then input the device's IEEE Add. and click on the 'Add Device' button. Power on the device.

▶ Status
▶ Internet Setting
WAN Interface
▶ Administration
Statistics
Time Zone Setting
Denial-of-Service
System Log
Upgrade Firmware
Save/Load Setting
Password
▶ Smart Home
Device List
Device Management
User Management
Upgrade Module
Data Management
Communication Setting

Device Management

▼ Add Devices

IEEE addr: (max=60s) Add Device

Operation tip: Reset device to factory default and power off, then input the device's ieee addr and click on the 'Add Device' button. Power on the device.

6.4.3 User Management

Display the list of users

▶ Status
▶ Internet Setting
WAN Interface
▶ Administration
Statistics
Time Zone Setting
Denial-of-Service
System Log
Upgrade Firmware
Save/Load Setting
Password
▶ Smart Home
Device List
Device Management
User Management
Upgrade Module
Data Management
Communication Setting

User Management

▼ User Management

User Name	nickname
woody@netvox.com.tw	woody
lucy@netvox.com.tw	netvox lucy

6.4.4 Upgrade Module

Please select a file for upgrading LoRa Module firmware and click on the button of Upgrade

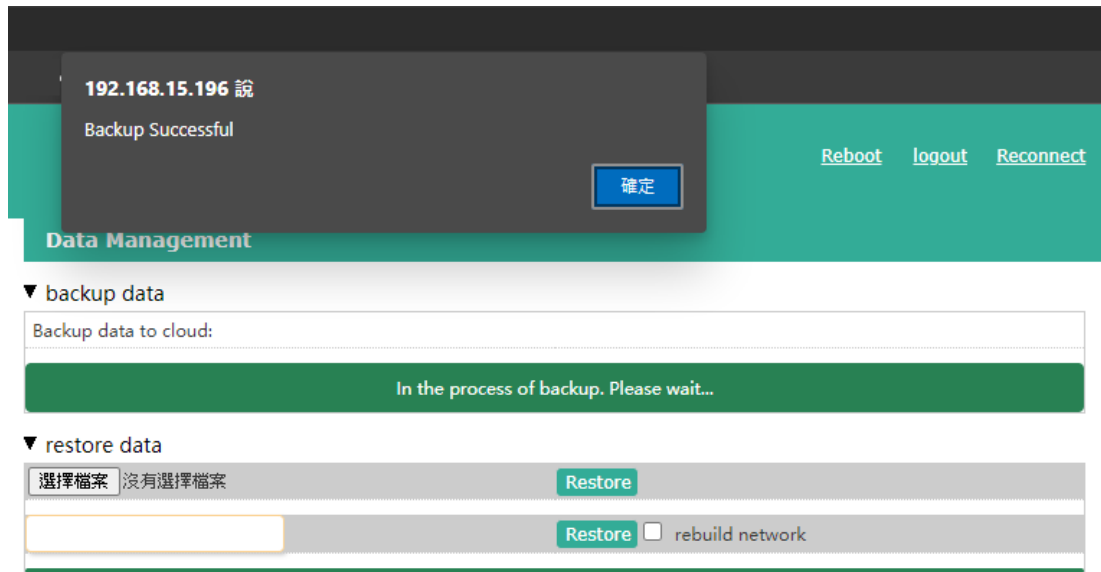
The screenshot shows a web interface for upgrading firmware. On the left is a vertical menu with items like Status, Internet Setting, WAN Interface, Administration, Statistics, Time Zone Setting, Denial-of-Service, System Log, Upgrade Firmware, Save/Load Setting, Password, Smart Home, Device List, Device Management, User Management, Upgrade Module (highlighted with a red box), Data Management, and Communication Setting. The main panel is titled 'Upgrade Firmware' and has a dropdown for 'Upgrade Lora Firmware'. Below this is a file selection area with a button that says '選擇檔案 沒有選擇檔案' and an 'Upgrade' button. An 'Operation tip' below reads: '(Please select a file for upgrading firmware and click on the button of Upgrade)'

*Do not turn off the power when updating the LoRa Module firmware.

6.4.5 Data Management

Click “OK” under [backup data] to back up user data and can back up to the cloud.

The screenshot shows a web interface for data management. The left sidebar is the same as in the previous screenshot, but 'Data Management' is highlighted with a red box. The main panel is titled 'Data Management' and has a dropdown for 'backup data'. Below this is a button labeled 'OK' which is highlighted with a red box. There is also a section for 'restore data'.



In [restore data], user can restore the backup data. Click the blank box of [Cloud Restore] and select the data during the backup period that want to query, and then click the "Search" button. All the backup data during this period will be listed. Then, click the one you want to restore, it will load the cloud backup data.

*This method is also suitable for data restoration operations when the gateway is abnormally replaced by a new gateway.



Data Management

▼ backup data
Backup data to cloud:

▼ restore data
選擇檔案 沒有選擇檔案

rebuild network

Please select backup data X

Backup start time Backup end time

Backup data	Type	Whether backup
restore factory settings	Automatic backup	<input type="button" value="OK"/>
2020-08-28 01:29:54	Manual backup	<input type="button" value="OK"/>
2020-08-28 01:25:14	Manual backup	<input type="button" value="OK"/>
2020-08-28 01:19:37	Manual backup	<input type="button" value="OK"/>

▼ restore data

選擇檔案 沒有選擇檔案

rebuild network

6.4.6 Communication Setting

▼ Amend Secret Key

- Https: Https transfer protocol
- Timestamp authentication:

The timestamp verification is enabled according to the factory setting and can communicate normally within about 10 minutes (600000ms). When the gateway time and the computer time are incorrectly deviant by 10 minutes, it will appear timestamp verification time-out.

- Callback Authorization:

Permission verification is enabled according to factory default, and user does not need to modify this content.

The screenshot displays the 'Communication Setting' configuration page. The left sidebar contains a menu with 'Communication Setting' highlighted. The main content area is titled 'Communication Setting' and includes two expandable sections:

- amend secret key:** Contains checkboxes for 'https' (unchecked), 'Timestamp authentication' (checked), and 'Callback Authorization' (checked). A text input field for 'Timestamp verification range (milliseconds)' is set to '600000'. An 'OK' button is visible below the input.
- Cloud Link:** Shows 'cloud state span' as 'connected'. The 'IP address and port of the cloud proxy server' is set to 'mngm2.netvoxcloud.com:80'. 'OK' and 'cancel' buttons are located below the input field.

▼ Cloud Link

Cloud state span: cloud connection state

IP address and port of the cloud proxy server: **mngm2.netvoxcloud.com:80 (for overseas)**

- * Modifying to another URL may cause the gateway failing to connect to the cloud.
- * If the network is normal and the cloud URL is entered correctly, but it still fails to connect to the cloud, please check whether the [Time Zone Setting] is consistent with the computer system time.

6.4.7 System Settings

Enable https and timestamp, set cloud proxy server or MQTT

A. https

Enable/ Disable https

B. Timestamp authentication

The factory setting defaults that “Timestamp authentication” is selected. If the gateway time is incorrectly deviated by 10 minutes from the local time, the timestamp authentication will be timeout.

The factory setting defaults that timestamp authentication is 10 minutes. Namely, only if the time lag between the gateway time and the local time is within plus and minus 10 minutes, the communication can be normal.

C. Callback Authorization

The factory setting defaults that “Callback Authorization” is selected. Therefore, users do not need to modify it.

D. Cloud Connection

Default Cloud Address: mngm2.netvoxcloud.com:80

* Modifying to other URLs may cause the gateway to fail to connect to the cloud.

E. MQTT Connection

Please enter MQTT Host IP, Port, Username, and Password.

Note: MQTT messages are encrypted. The user needs to be authorized the GW REST API before using. For the related matters, please contact the sales executive.

The screenshot shows a web management interface with a navigation bar at the top containing: Status | Internet Settings | Wireless Settings | Firewall | Administration | Smart Home. On the left is a sidebar menu with items: Device List, Device Management, Initiate Smart Home, Upload Module Firmware, Upload Lora Config, User Management, Data Management, Import Data, and System settings (highlighted). The main content area is titled "Communication Setting" and contains two sections:

- amend secret key**: Includes checkboxes for https, Timestamp authentication, and Callback Authorization. A text field for "Timestamp verification range (milliseconds):" contains the value "600000". An "OK" button is at the bottom right.
- Connection settings**: Includes radio buttons for Cloud Connection and MQTT Connection. Below, it shows "MQTT connection status" as "not connected". Fields for Host (192.168.1.114), Username (test), Port (1883), and Password (test) are present. "OK" and "cancel" buttons are at the bottom.

7. Important Maintenance Instructions

Kindly pay attention to the following in order to achieve the best maintenance of the product:

- Keep the device dry. Rain, moisture, or any liquid might contain minerals and thus corrode electronic circuits. If the device gets wet, please dry it completely.
- Do not use or store the device in dusty or dirty environment. It might damage its detachable parts and electronic components.
- Do not store the device under excessive heat condition. High temperature can shorten the life of electronic devices, destroy batteries, and deform or melt some plastic parts.
- Do not store the device in places that are too cold. Otherwise, when the temperature rises to normal temperature, moisture will form inside, which will destroy the board.
- Do not throw, knock or shake the device. Rough handling of equipment can destroy internal circuit boards and delicate structures.
- Do not clean the device with strong chemicals, detergents or strong detergents.
- Do not apply the device with paint. Smudges might block in the device and affect the operation.
- Do not throw the battery into the fire, or the battery will explode. Damaged batteries may also explode.

All of the above applies to your device, battery and accessories. If any device is not working properly, please take it to the nearest authorized service facility for repair.