Acrel

AWT200-LW Intelligent DTU
Installation Instruction Manual V1.0

Acrel Co.,Ltd

Declaration

Catolog

1. Overview

AWT200-LW series LoRa gateway is a LoRaWan gateway product based on SX1302 RF chip. There are a number of different frequency bands and different models of products to choose from, to meet the different needs of different customer groups in different regions. The gateway can easily provide users with fast LoRaWan network access and LoRaWan wireless services.

AWT200-LW data communication gateway can be used in various terminal equipment data acquisition and data analysis, between the gateway and the terminal equipment through wireless information transmission, without tedious wiring, with long transmission distance, strong anti-interference ability, large network capacity, cost-effective, suitable for a variety of applications.

2. Product Model

Product Model	Frequency Range	Function Description
AWT200-LW470	470MHz-480MHz	Ethernet access
AWT200-LW470-4G	470MHz-480MHz	4G- Ethernet access
AWT200-LW868	863MHz-870MHz	Ethernet access
AWT200-LW868-4G	863MHz-870MHz	4G- Ethernet access
AWT200-LW923	902MHz-928MHz	Ethernet access
AWT200-LW923-4G	902MHz-928MHz	4G- Ethernet access

Table 1

3. Function Features

1) Support 8 channels BW125KHZ LoRa data reception
2) Dynamic frequency regulation, preserving communication stability
3) Built-in web configuration tool, convenient to set gateway parameters
4) Optional 4G module to access the network
5) The NS server address can be changed
6) Terminal nodes can be added to NS web pages and group management between different nodes is supported

4. Typical Application

AWT200-LW collects data from terminal nodes through radio frequency, uploads data to NS platform for processing through Ethernet or 4G, and also receives information from platform for transmission to specified terminal node, realizing flexible and accurate control of different terminal nodes.

In addition, the AWT200-LW is also suitable for: Internet of Things low power application (IoT), automatic meter reading, smart city, industrial automation, smart home and other scenarios.
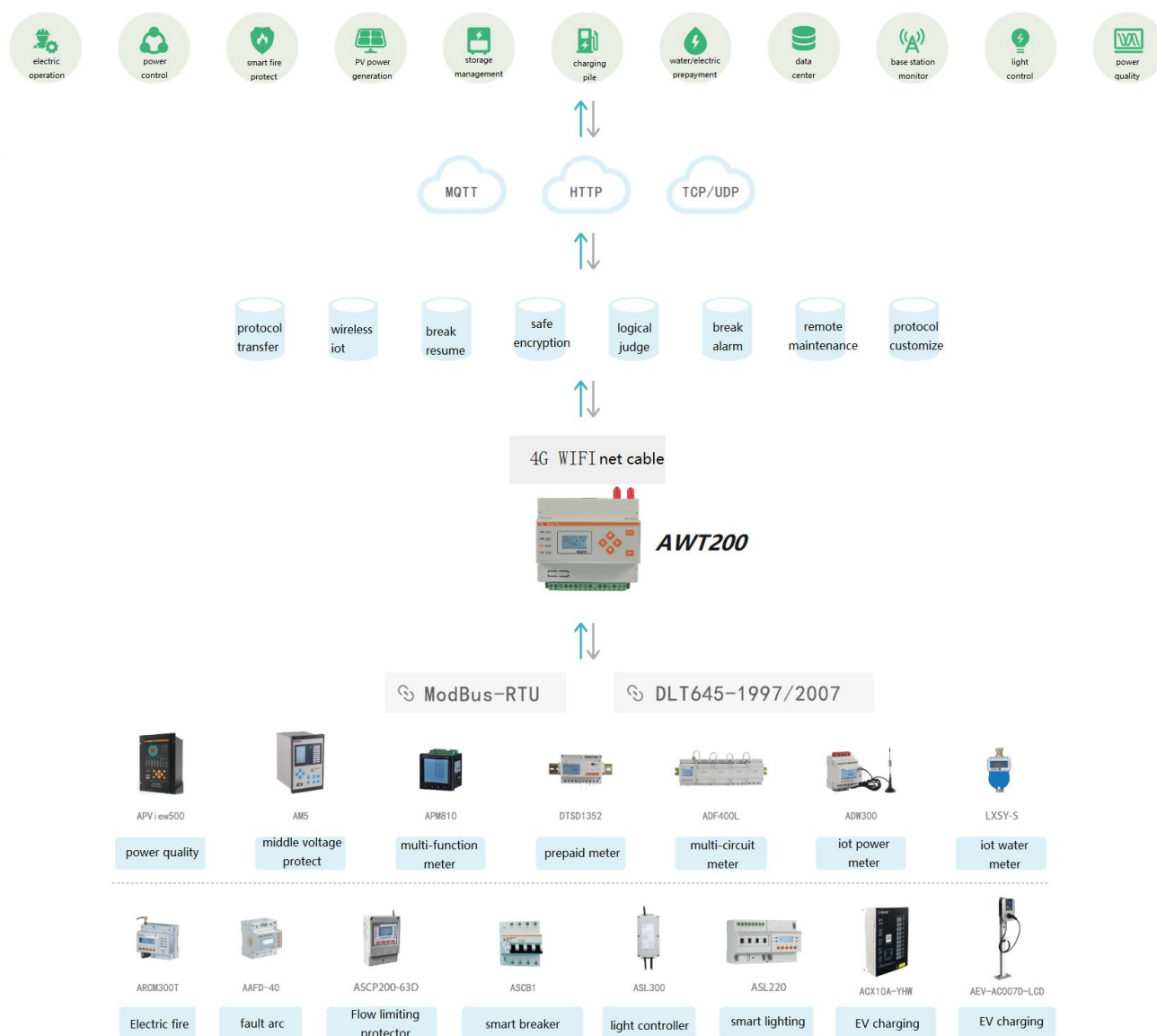
Acrel-EIOT Energy IOT Cloud Platform

Figure 1

5. Technical Parameter

Shape	
Interface	RS485: wiring terminal AI/DI/DO: wiring terminal
Size	6-mold (108mmX87.75mmX70mm) din-rail, flame retardant ABS material
Performance	
Processor	M4 Kernel
Frequency	168MHZ
Storage	8G TF Card
Communication Interface	
Ethernet	10M/100M＊1，Electrical Isolation
Serial Port	RS485＊（4/8）：485A、485B、GND，Electrical Isolation

Serial Port parameter			
Baud Rate	1200~115200bps	Check Bit	None,Odd,Even
Data Bit	7～8 Bits	Flow Control	No Flow Control
Software			
IP Mode	IPV4、IPV6		
Protocol	TCP、UDP、HTTP、DHCP		
Configuration Mode	WEB Browser, Remote Debugging		
Communication Mode	TCP/IP Direct Communication, LORA		
Communication Protocol	LORAWAN		
Firmware Upgrade	Upgrade the Windows desktop software, WEB browser, and serial port		
Working mode			
Terminal Node, AWT200-LW Gateway, NS server, Application server			
Power Requirements			
Power Supply	DC 12-24V （Power Adapter）		
Environment			
Operating Temperature	-20℃~+55℃		
Storage Temperature	-40℃～+85℃		
Humidity Range	<95%RH, No Condensation		

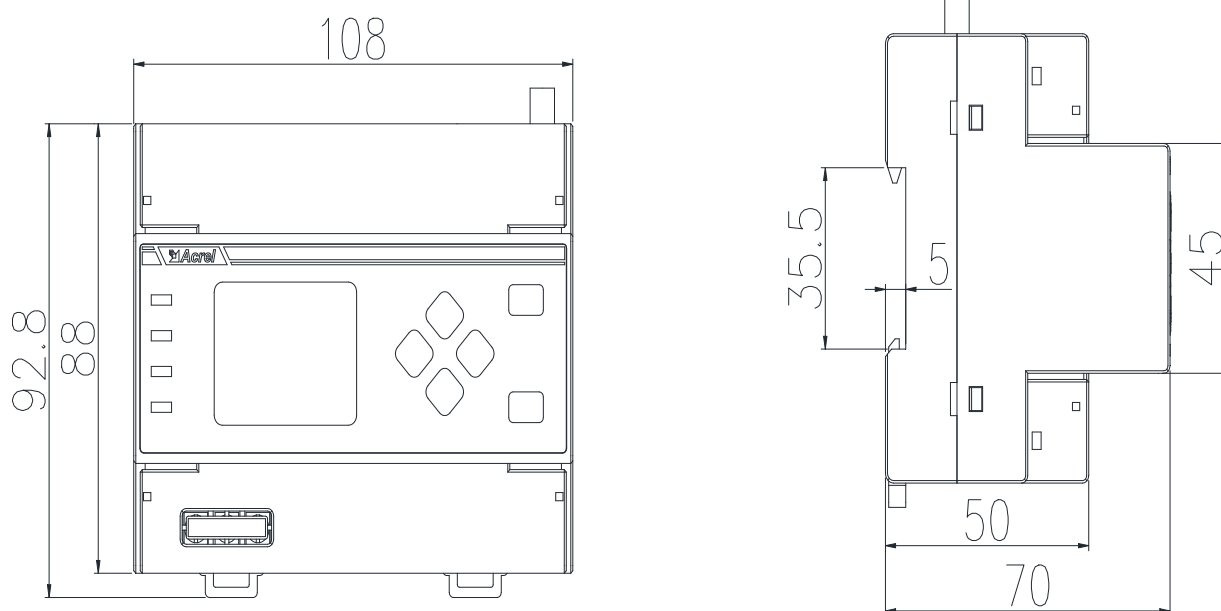# 6. Installation And Wiring

Dimension and cut-out size

Figure 2

Installation Method

AWT200-LW data communication gateway adopts 35mm standard guide rail installation.

Wiring Instruction

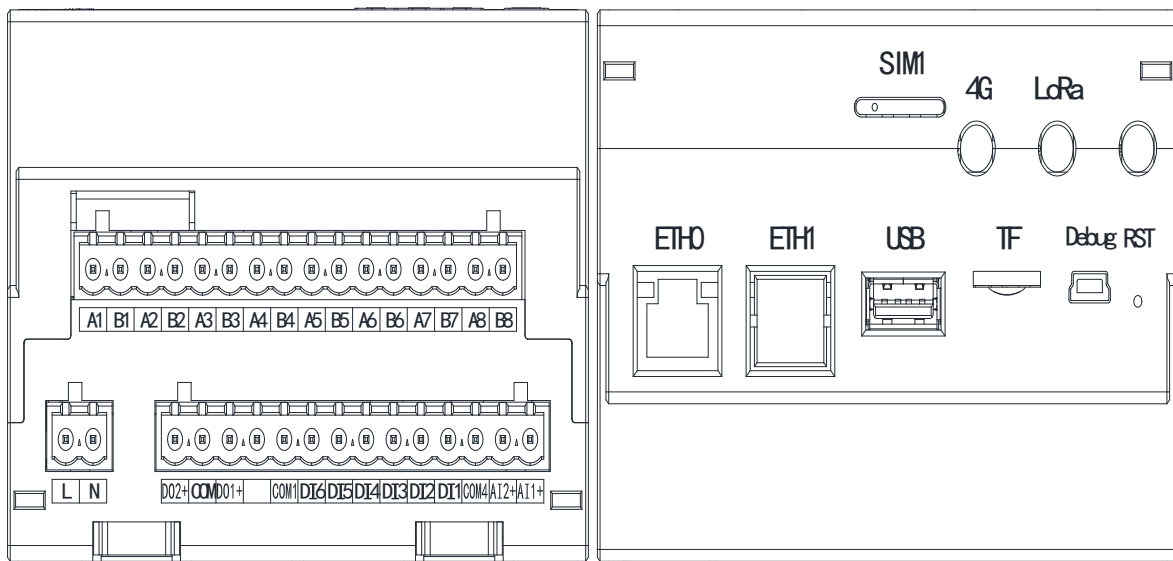
Figure 3

7. Panel Light Definition

The function of each status indicator should be marked with Chinese characters. The details of indicator color and indicator status are as follows:

Status indicator (green) : Blinking at short intervals (working normally), blinking at long intervals or off (abnormal);

Communication indicator (green) : Blinking (communicating with the terminal device);

Network indicator (red):Steady on (the network connection is normal), blinking at short intervals (communicating with the platform), and blinking at long intervals (connecting to the network);

Alarm indicator (red) : steady on (fault occurs), off (no fault occurs)

8. User Configuration

Configure gateway parameters using the embedded web page:

1) Log in to the WEB configuration page

Enter the IP address of the gateway in the browser address input field, press enter, and the login interface appears, as shown in Figure 4. On the login screen, enter the user name and password "admin", and tap "Login" to go to the configuration screen.
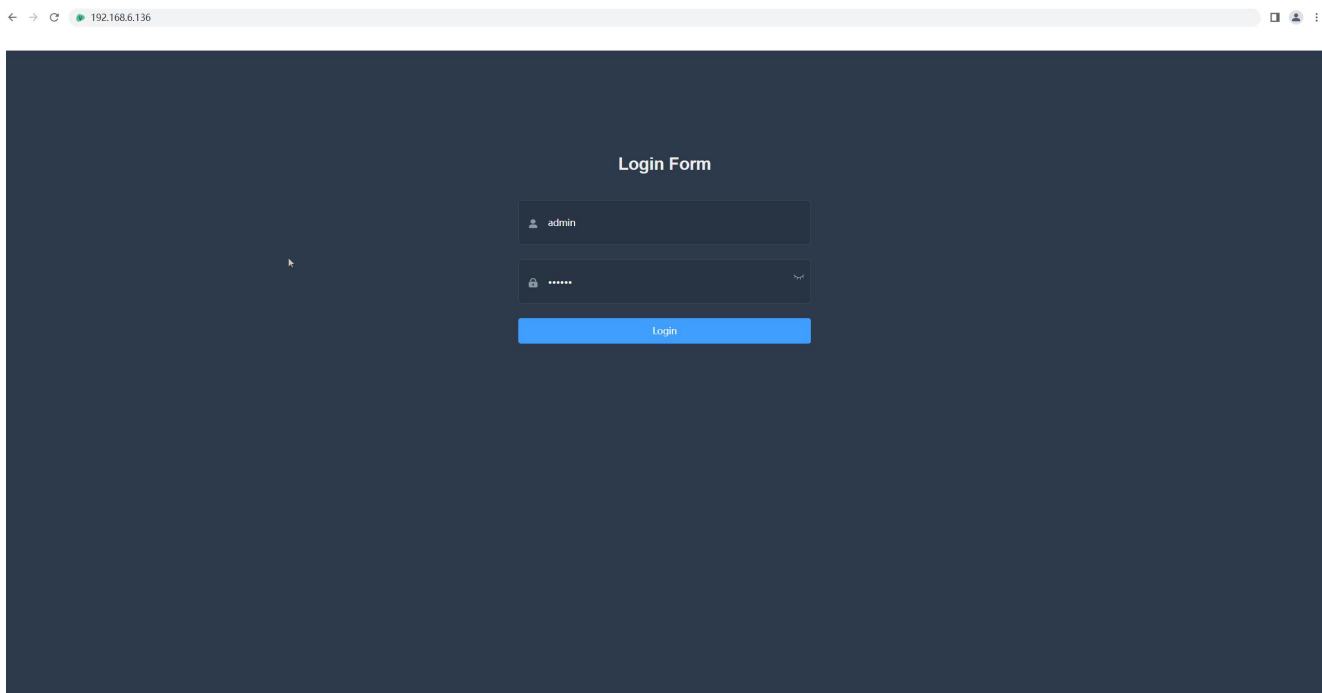
Figure 4 Login Interface

2) Common Settings interface.

 After successfully logging in to the gateway configuration page, you will first enter the interface of common Settings, as shown in Figure 5 below. The left column is a navigation column, including several main menu bars such as gateway status, common Settings and capabilities. The gateway restart button is displayed in the upper right corner. On this page, you can view the network status and parameters of the gateway, and configure the Internet access mode of the gateway, such as static ip address and DHCP.

 If a static ip address is used to access the Internet, set parameters such as the IP address, gateway, and subnet mask, and then tap Apply.
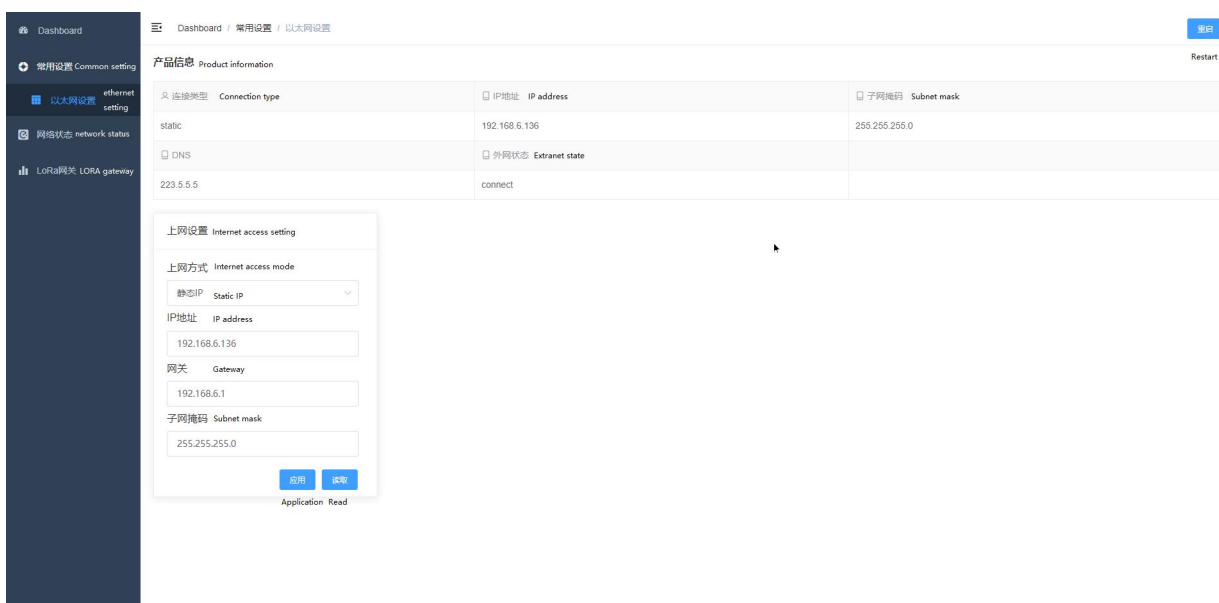

Figure 5 Common Setting

If you need to automatically obtain an ip address for Internet access, as shown in Figure 6, select DHCP and click Apply to complete the setting.
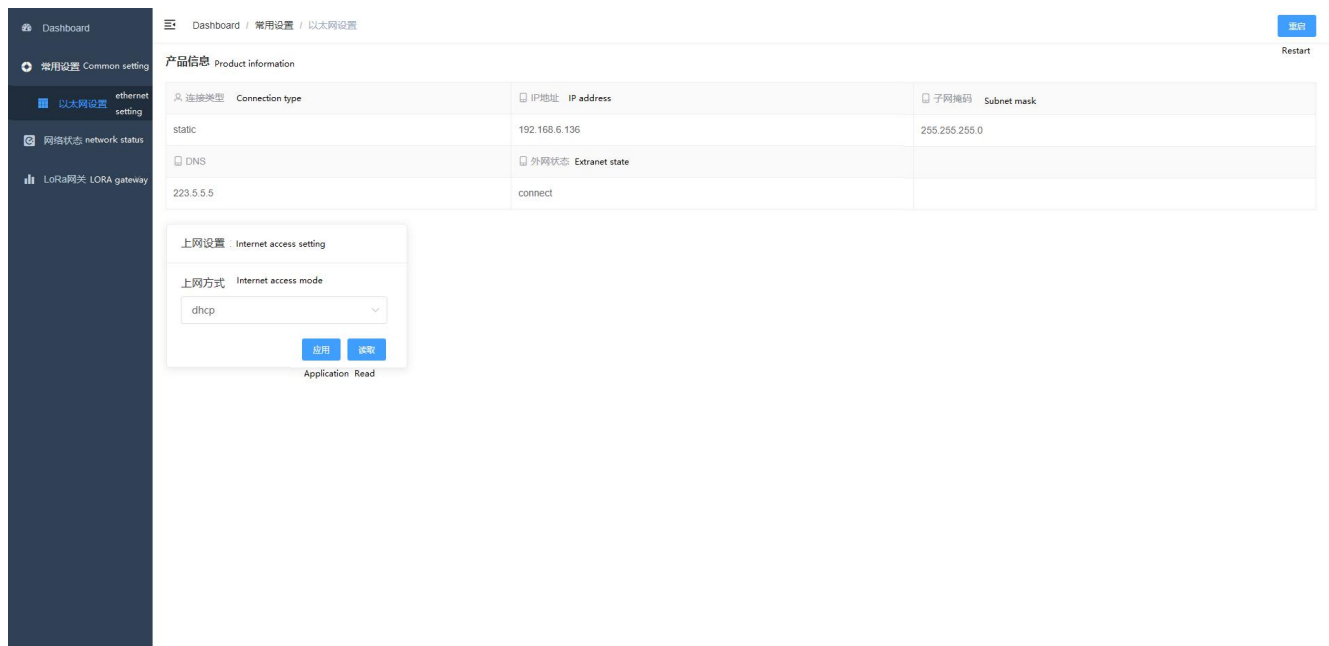

Figure 6 dhcp Network Setting

3) Health monitoring.

Check the working status of the gateway. Switch to the health monitoring page as shown in Figure 7 below to check the working status of the gateway. The health monitoring page contains the product information and link overview of the gateway. The gateway product information includes the gateway model, system ROM version, and gateway ID. Gateway Link overview contains the status information such as LoRa RF working status, LoRaWAN gateway working status, network media, Internet connection status, and LoRa server connection status.

Based on the gateway link overview, you can check the working status of the gateway, for example, whether the RF circuit works properly, whether the network is normal, and whether the LoRa server is connected.
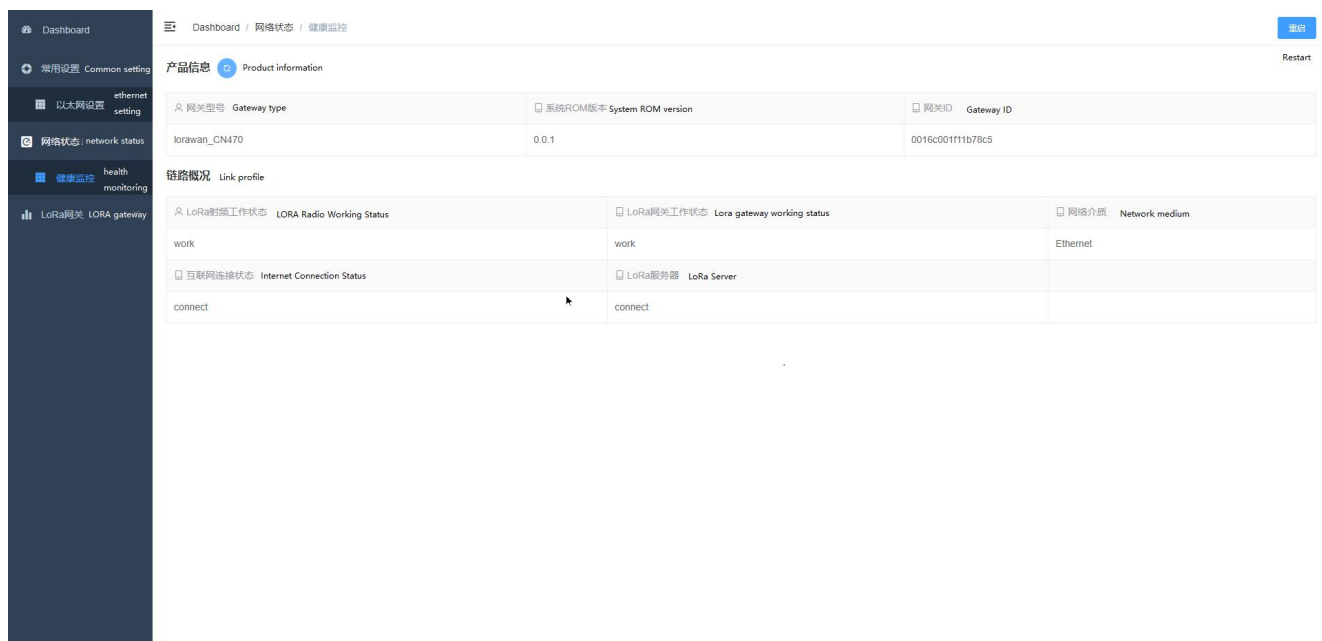

Figure 7 Health Monitoring

4) Lora RF

The gateway has two hardware radio channels, namely radio 0 and radio 1. You can manually allocate radio 0 and radio 1 channels by customizing the ISM frequency band. In total, there are eight upstream data channels, and each channel supports LoRa spread factor 7 to 12. The relationship between channel frequency and RF channel center frequency is as follows:

Channel frequency = RF center frequency + channel offset frequency.

Default gateway channel parameters: The default ISM frequency bands vary with gateways of different models. The following table lists the default ISM frequency bands.

Gateway Type	Area	Frequency Band	Channel Scheme
AWT200-LW470	China	470-510 MHz	CN470-510
AWT200-LW868	Europe	863-870 MHz	EU863-870
AWT200-LW923	America	902-928 MHz	US902-928

As shown in Figure 7 below, the frequencies of central frequency points 0 and 1 are 471800000hz and 472600000hz respectively. According to the channel offset frequency in the table below, a total of 8 upstream data channel frequencies can be calculated.

		Center Frequency Point		
radio_0_freq -300000	radio_0_freq -100000	radio_0_freq	radio_0_freq +100000	radio_0_freq +300000
radio_1_freq -300000	radio_1_freq -100000	radio_1_freq	radio_1_freq +100000	radio_1_freq +300000

According to the above table, the 8 uplink data channels of the gateway in Figure 7 can be calculated as follows:

Channel 1	471800000 - 300000	471,500,000
Channel 2	471800000 - 100000	471,700,000
Channel 3	471800000 + 100000	471,900,000
Channel 4	471800000 + 300000	472,100,000
Channel 5	472600000 - 3000000	472,300,000
Channel 6	472600000 - 1000000	472,500,000
Channel 7	472600000 + 1000000	472,700,000
Channel 8	472600000 + 3000000	472,900,000

Beacons periodically send data packets to synchronize the time between nodes and gateways. Terminal nodes must support beacons. By default, beacons are enabled.
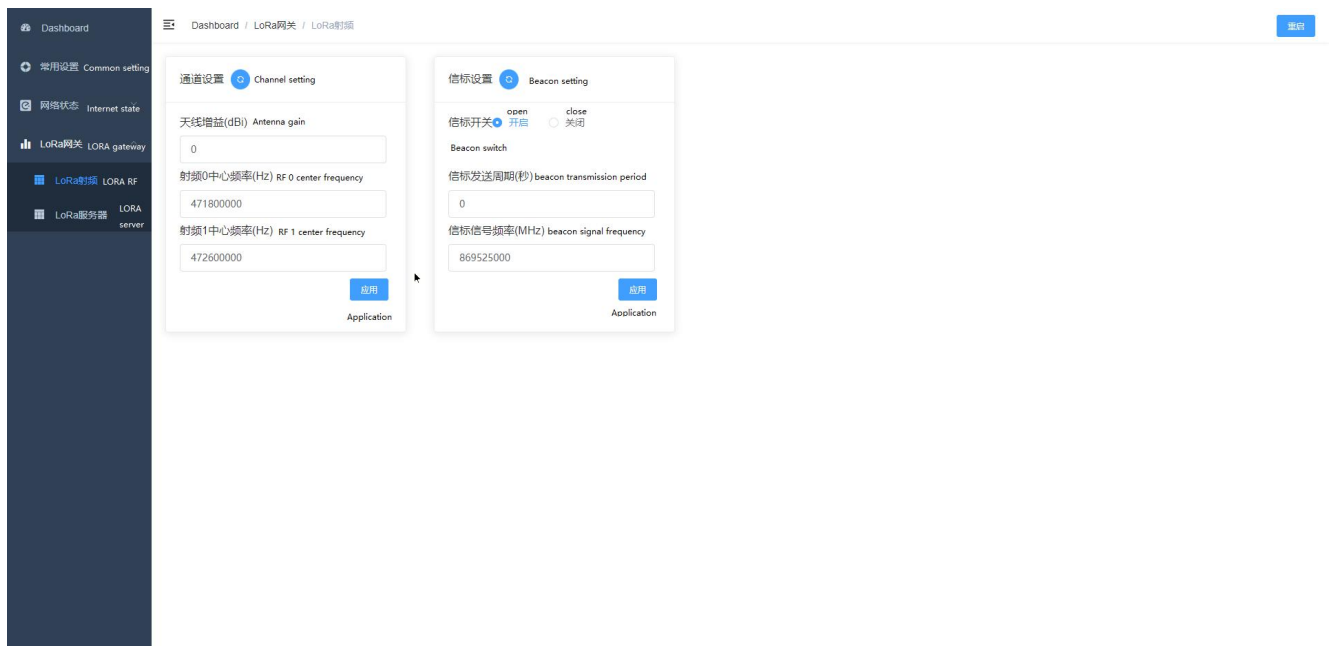
Figure 8　Lora RC

5)　Lora Server

On this page, you can see that the gateway contains parameters such as the server IP address, port, heartbeat, and timeout, and you can also set these parameters, as shown in Figure 9.
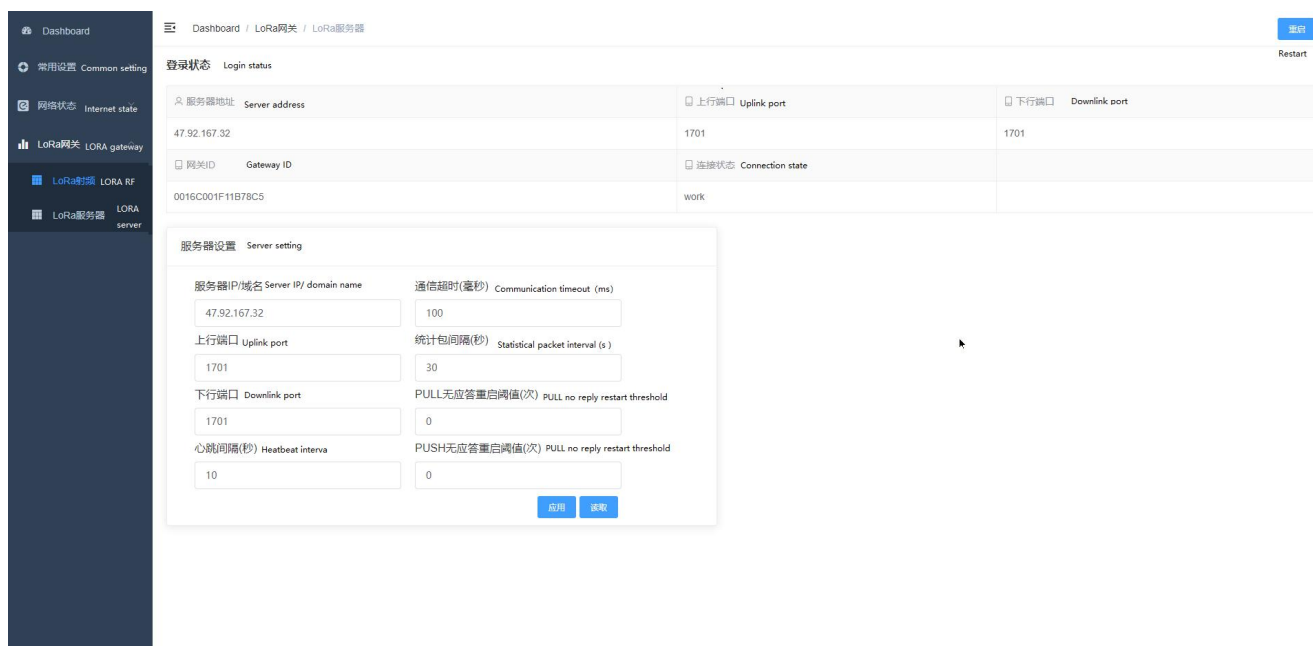

Figure 9 Lora Server Setup

Parameter	Default Value	Description
IP address/domain name of the server	47.92.167.32	IP address or domain name of the LoRa server
Uplink Port	1701	Uplink communication port of the LoRa server
Downlink Port	1701	Downlink port of the LoRa server
Heartbeat Interval	10 Seconds	This parameter is the interval at which the gateway sends heartbeat packets to the server to keep the connection alive. It needs to be set according to the network situation. Too short will increase the network bandwidth and traffic occupancy (4G and other wireless may be more sensitive), and too long will cause the operator to disconnect the data channel
Communication Timeout	100 ms	The timeout duration for communicating with the server depends on the network smoothness and maximum latency
Statistical Packet Interval	30 Seconds	Packet statistics include information about gateway sending and receiving within an interval
PULL No Response Restart Threshold (times)	0	Not supported at present
PUSH no response restart threshold (times)	0	Not supported at present

Note:

1. After modifying the gateway configuration, if a message is displayed indicating that the modification succeeded, the gateway configuration is successfully modified.

2. After modifying the gateway configuration, click the restart button in the upper right corner of the page or restart the gateway by powering off the power to make the modified configuration take effect.

3. After the restart is complete, log in to the configuration page again to view the modified result.

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