JXCT®

Ethernet Type Version

Ethernet+4G Version

JXYH-7001-LoRa

Lora Gateway User Manual

Version: 2.0
Date: 2020-01-24
Status: Released

www.jxct-iot.com

Chapter I. Product Introduction

1.1 General Info

The intelligent LoRa gateway (hereinafter referred to as the gateway) has a total of 4 LoRa channels, of which channel one is the control channel, and the other three channels are the transmission channels. Each channel is independent of each other, and the multi-channel design greatly expands the capacity of the concentrator LoRa node (hereinafter referred to as the node). The gateway can automatically connect the node to the network, and after successful network access, the corresponding channel will be allocated to the node.The user can view the parameters and status of the node through the gateway management page. Configure LoRa channel parameters, modify server parameters, etc.

1.2 Function & Feature

- Encrypted transmission, multi-protocol support
- Node automatically joins the network
- Node heartbeat detection
- Support connection to Jingxun cloud, support MQTT protocol (does not support SSL)
- Support Modbus-RTU host mode
- View configuration parameters on the Web page
- Provides 4G LTE (downward compatible with 3G, 2G)/network cable two Internet modes, and can also connect to the concentrator WiFi for parameter configuration
- 4 channels long-distance LoRa, the maximum transmission distance of 3000 meters

1.3 Main Specs

Major Specs	Details
Working Voltage	9-15V DC
Working Current	≤200mA
Working Temperature	-40 ~ 85 ℃
Storage Temperature	-40 ~ 90 ℃
Ethernet Port	1 Channel (WAN Port)
RS-485 Port	1 Channel
LoRa Working Frequency	470 ~ 510 MHZ
LoRa Transmit Distance	3Km(Testing Condition: Open, sunny, maximum power, antenna gain 5dBi, 0.125Kbps transmission rate)
Node Capacity	65535

Chapter II Hardware Connection

2.1 Product List

Please check the equipment list before installing the equipment

Name	Qty
Lora Gateway	1 Pc
4G Antenna	1 Pc (Optional)
WIFI Antenna	1 个
LoRa Antenna	4 个
IoT Sim Card	1 Pc(Optional
Charger Adapter	1 Pc
Warranty Card	1 Pc

2.2 Product Description

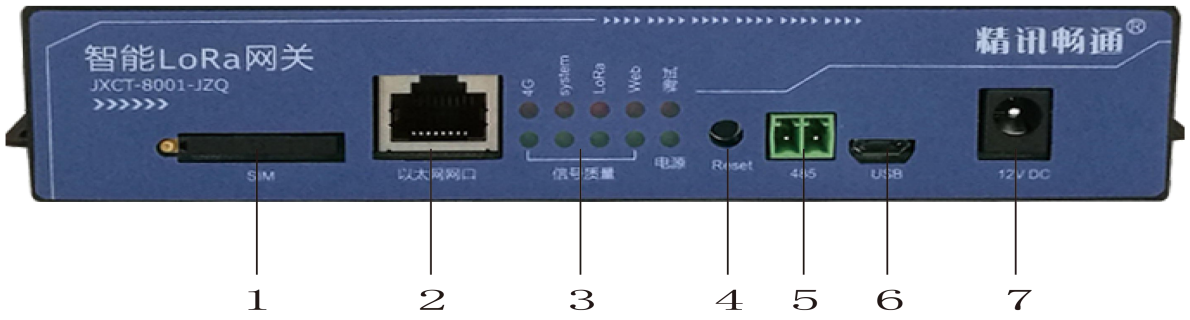
2.2.1 Size

Pls refer to below size diagram:

Picture 1: Product Size

2.2.2 Port Description

The following figure is the interface description diagram of the gateway, as shown in below:



Picture 2: Ports

No.	Name	Function
1	SIM Card Slot	SIM Card Slot
2	Ethernet Port	
3	Indicator Light	
4	RESET	System reset button: Short-press 0 ~ 3 seconds to Reboot the device; Long-press 5 ~ 30 seconds to Restore Factory setting.
5	485	RS-485 Port. One side close to the system reset button is A+, and the other side is B-.
6	USB	System debugging interface for developers to use
7	12V DC	Power Supply Port

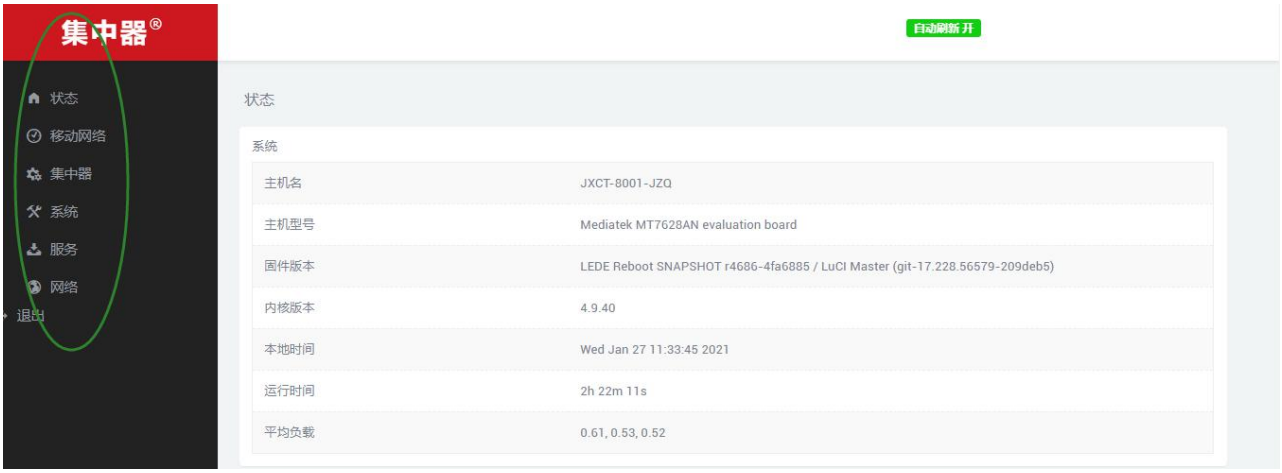
Indicator function description:

Name	Function Description
Power Supply	Power supply indicator, the light is on when the power supply is normal.
Debugging	The light is on when the USB data cable is inserted for debugging.
Web	The light flashes when the device is in network communication.
LoRa	The light flashes when LoRa receives data.
System	System running indicator: The light flashes quickly when the system starts; Flashes for 1S after successful startup.
4G	4G network card working indicator
信号质量	The signal strength indicator of the 4G network card is low on the side close to the power supply. The more lights the signal,

the better the signal.

Chapter III Functions

Gateway function options include status viewing, mobile network, concentrator management, system settings, service management, network settings and logout functions, as shown in the figure:



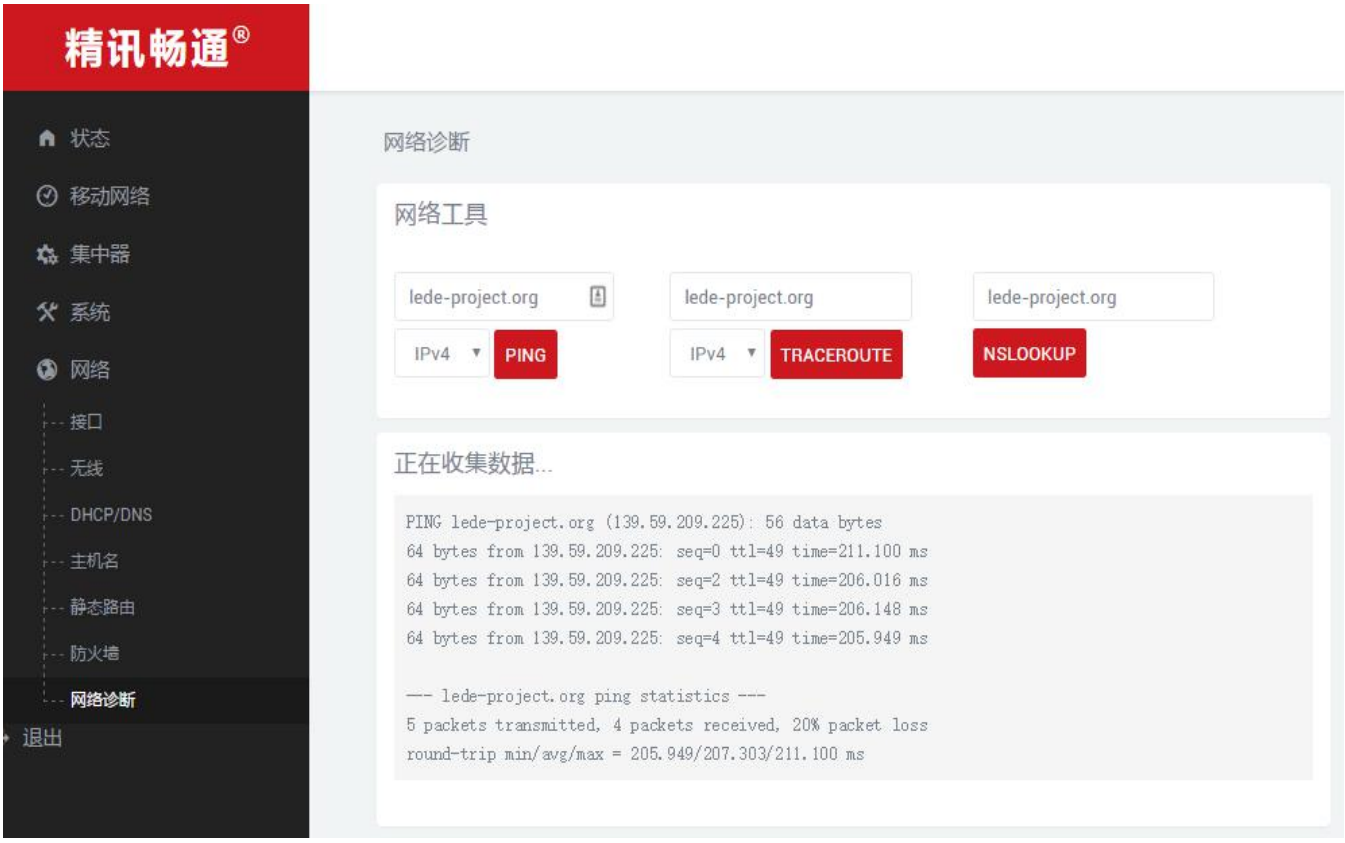
Picture 1: Function Interface

3.1 Internet Type

The gateway supports two networking methods, 4G network card and Ethernet, and the two networking methods cannot be used at the same time. The specific usage methods are as follows:

3.1.1 Ethernet

Use a network cable to connect to the gateway Ethernet interface, and the other end to the switch/router LAN port. Connect gateway WiFi to internet → Port Interface. The gateway opens the DHCP client by default. If the switch/router opens the DHCP server, the gateway will automatically obtain an IP address, as shown in Figure 5. If the DHCP server is not turned on, click "Modify" in the WAN column to select the static address switching protocol, and then fill in the IP and other parameters to connect to the Internet.
To confirm if current Concentrator is well connected to internet, user can check through internet→ Click the page on the network diagnosis menu bar “PING” button to Perform network diagnosis. The following information will be displayed if the network is normal:



Picture 4: Network diagnosis

3.1.2 4G Sim Card

In the shutdown state, use a sharp object such as a mobile phone card extractor to hold the card slot on the side of the card slot to remove the card slot. Put the SIM Card into slot and then turn on the device. Click mobile network, then to SIM info, user can check SIM status on real time basis, and the networking information bar displays networking log information. In addition, users can also check the signal status of the 4G network card through the indicator light.

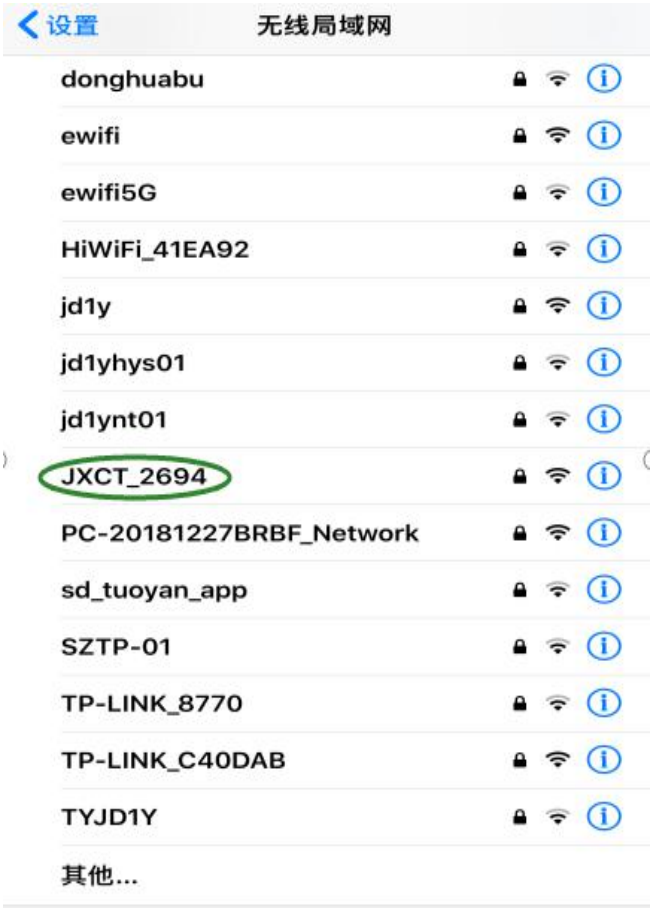
3.2 Login to Managing Interface

Specs Name	Default Parameters
Management IP address (wifi connection)	192.168.3.111
Wifi Name	JXCT_xxxx (xxxx) is the last four digits of the concentrator ID
WiFi Password	jxctdzkj
Username on the management page	admin

Manage page password	admin

3.2.1 WIFI Login

Use WIFI to log in, the operation is as follows, after the gateway is running, you can connect to the WiFi name JXCT_xxxx (xxxx is the last four digits of the ID number of the gateway) through mobile phones or laptops, and enter 192.168.3.111 in the browser to jump to the login page. After entering the user name and password, you can enter the management page. In order to prevent users from consuming the 4G traffic of the concentrator when using mobile phones and other devices to connect to the concentrator wifi, the concentrator has imposed restrictions on the WiFi connection, as shown in the figure:



Picture 5: Mobile Phone wifi Page

Picture 6: login page

3.2.2 Ethernet Login

Use the network cable to log in, the operation is as follows, the gateway will automatically obtain an IP address after plugging in the network cable (the router needs to turn on DHCP), log in to the network of the gateway page through the mobile phone, the WAN port IP under the interface, and browse through the computer and other devices on the

same LAN as the concentrator After entering this IP address in the browser, you can jump to the login page, as shown in the figure:

Picture 7: WAN Port IP Page

3.3 Status Checking Function

The status query function only has to view, no operation is required. Including gateway overview, firewall, routing table, and real-time information.

(1) "Overview" can view the system status, memory usage, network status of the gateway, etc.

(2) "Firewall" is only used to view the network security status

(3) "Routing table" view network status settings

(4) "Real-time information" can view load status, traffic usage, wireless status and network connection status

3.4 Mobile network function

The mobile network includes SIM card information query and network information.
(1) "SIM card information" can query the relevant information of the SIM card
(2) "Network Information" is used to query and display the status information of the SIM card, and at the same time it will print the log information generated during the mobile network connection

3.5 Concentrator management

Concentrator management includes concentrator settings, node management, product management, and debug logs.

3.5.1 Concentrator settings

Users of this function can modify some functions. This function also includes server settings, basic settings, channel one to channel four, as shown in the figure:

Picture 8: Specs Managing Interface

(1) The corresponding parameters of the "Server Settings" device have been set before leaving the factory, and the default configuration can be used if there is no special requirement.

- Protocol: Set the protocol uploaded to the server, currently supports TCP Client
- IP address (TCP Client): The IP address uploaded to the server, such as uploading to Jingxun Cloud, use the default address.
- Port (TCP Client): The port number for uploading to the server, such as uploading to Jingxun Cloud, the default port can be used.
- Jingxun Cloud Transparent Transmission (TCP Client): When this option is

checked, the concentrator data will be forwarded through Jingxun Cloud to meet the needs of customers for local equipment to process the concentrator data.

- Time control relay support: Set to support the protocol of LoRa time control relay version, this item generally does not need to be modified.
- Authentication code: This option is required when you check Jingxun Cloud Transparent Transmission

The user can only change the "ip and port", other parameters of this function cannot be modified; after the parameter setting is completed, click the "save" button to save the corresponding configuration, and click the "save & apply" button to save the corresponding configuration and take effect immediately.

(2) "Basic settings" can view the relevant information of the gateway. This function has been set up with the corresponding parameters before leaving the factory, and it is forbidden to modify it.

(3) "Channel 1 to Channel 4" contains the transmission rate and channel information. The corresponding parameters have been set before leaving the factory for this function, and modification is forbidden.

3.5.2 Node Management

(1) "Node management", the addition of nodes is divided into two methods: manual addition and automatic addition. The default is automatic addition.

Manually add nodes: add nodes to the node list by manually filling in the serial number, node ID, version number, type, and heartbeat. This function realizes the fixed node serial number, which facilitates the reading of device data through RS485, click apply and save and restart Take effect.

If you need a fixed device serial number, you can manually add node information through this function. The serial number and ID of the added node should not conflict with the serial number and ID of the bound node, otherwise it cannot be added normally. After filling in the node information, click the Add button to add the node. After the addition is successful, the node information will be displayed in the node list below.

- Serial number: The serial number assigned to the node. The user can access the original data of the node device through the Modbus protocol of the RS-485 interface. The serial number is the station address of the device.
- Node ID: The unique ID of the node, which is marked with a length of 12 on the

product shell.

- Version number: indicates the software version number of the current node, and the default value can be used without other requirements.
- Type: Indicates the type of the current node, which needs to be selected according to the type of the current node.
- Heartbeat: The heartbeat time of the device. If it is detected that a node has not uploaded heartbeat data for a long time, the gateway will consider that the node is offline. If the node is a sensor type.
- Add: Click the Add button to add the node to the node list.

(1) "Node List" can view the information of the nodes connected to the network through this page after registering to the network. After clicking the remove button, all information of the node will be deleted and it will take effect after restarting the gateway, as shown in the figure:


节点列表

序号	节点ID	版本	传输通道	模式	数量	模板	心跳	状态	电压	Rssi	错误码	Device Secret	移除
1	3339001F0045	10000002	2通道	主动上传模式	1	1 |	60 s	在线	2.697 V	-56 dBm	0	已认证	移除
2	3339001F004F	10000002	3通道	主动上传模式	1	1 |	60 s	在线	3.171 V	-69 dBm	0	已认证	移除

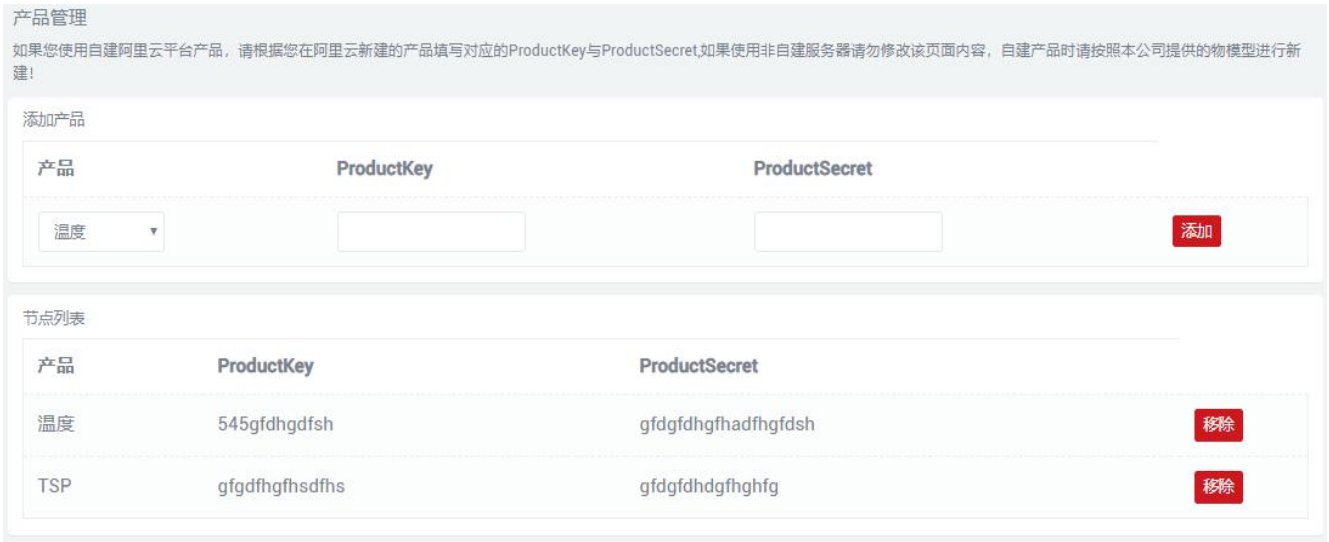
Picture 8: Node list

- Serial number: the serial number registered by the node.
- Node ID: the unique ID of the node, the length is 12.
- Transmission channel: Indicates which of the four transmission channels the node is on.
- Mode: The working mode of the node, divided into real-time mode and active upload mode.
- Quantity: Indicates the current template quantity of the equipment.
- Template: Display the specific value of each template, which corresponds to the node type.
- Heartbeat: The heartbeat time of the device. If it is detected that a node has not uploaded heartbeat data for a long time, the gateway will consider that the node is offline.
- Status: The current status of the device, showing online or offline.

- Voltage: indicates the current battery voltage value of the device.
- Rssi: The signal strength of the node. The larger the value, the stronger the received signal.
- Error code: Errors generated during the operation of the node equipment will be displayed in the form of error codes.
- Device Serect: When the gateway is uploaded to the Alibaba Cloud platform, the node needs to be authenticated. After the node is successfully authenticated, the authentication information will be displayed, otherwise it will be displayed as not authenticated.。
- Remove: Remove the node, restart the gateway and the settings will take effect.

3.5.3 Product Management

When the device uses the Aliyun Link Kit transmission protocol, if users use their own Alibaba Cloud IoT platform, they need to configure the corresponding product information, and need the device object model provided by the company to create products and corresponding devices on the Alibaba Cloud platform, as shown in the figure Show:



Picture 9: Product Management

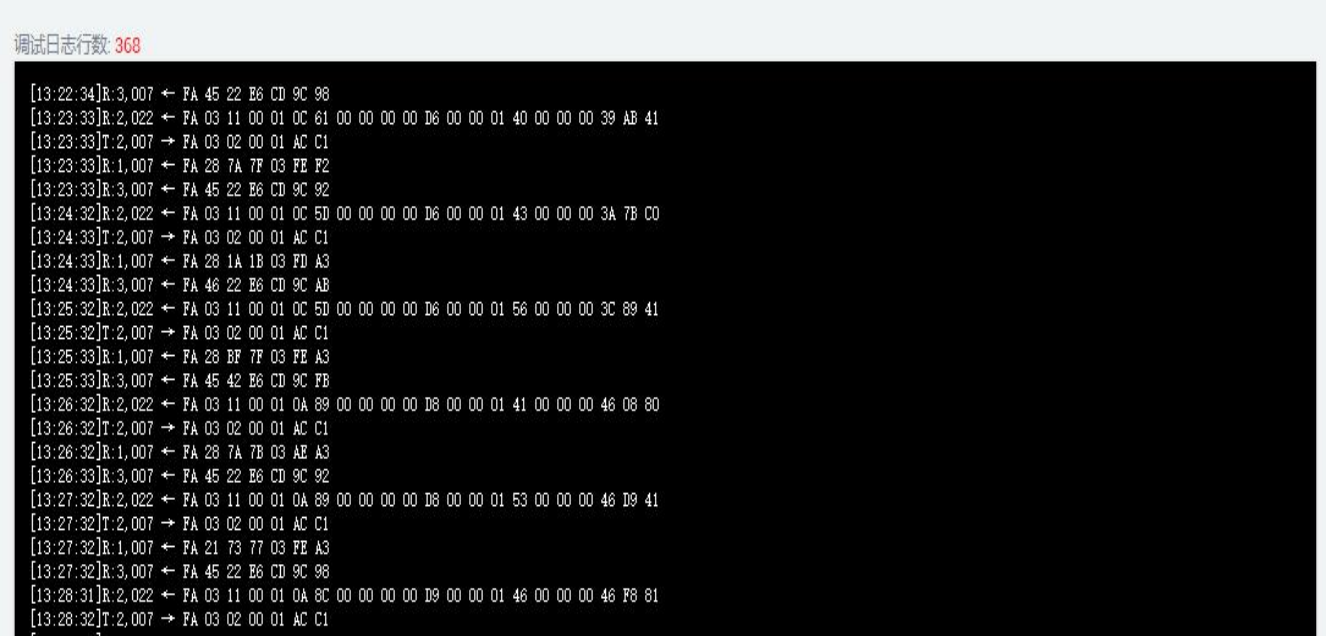
(1)"Add product" add the corresponding type, ProductKey and ProductScrect according to the type of product, click the Add button to add the product, after the addition is successful, you can view the product information in the product list below.

(2)"Product List" lists all current stored product information, clicking the remove button will remove the current listed products and their information.

- Product: indicates the data type of the current product, product type and its corresponding object model. For details, please refer to the object model and product list provided by our company.
- ProductKey: Required for device authentication, this field will be generated when creating a new product on the Alibaba Cloud IoT platform.
- ProductSecret: Required for device authentication, this field will be generated when creating a new product on the Alibaba Cloud IoT platform.
- Remove: Remove the current product and its information.

3.5.4 Debug log

If the user uses his own device to access the concentrator, he can view the communication data between the concentrator and the node device through this page, which is convenient for the user to debug, as shown in the figure:



Picture 10: debug log

The data is in the following format:

LORA concentrator receives data:[timestamp] receiving and sending instructions : transmission channel, data packet length data packet

LORA concentrator sends data: [timestamp] receiving and sending instructions : transmission channel, data packet length → data packet

- Number of debug log lines: indicates the number of lines in the current log. The data is refreshed in real time. The maximum length is 500 lines. Data over 500 lines is automatically cleared.

- Timestamp: the time format of the current data packet transmission hh:mm:ss.
- Transceiving indication: indicates the transmission direction of the current data packet, R represents the data packet received by the concentrator, and T represents the data packet from the concentrator.
- Transmission channel: Represents the LORA transmission channel of the current data packet, which corresponds to the channel set by the concentrator.
- Data packet length, which means the length of the current data packet.
- Data packet: The content of the current data packet, displayed in hexadecimal, and separated by spaces.

3.6 System Setting

This function includes system, management rights, system backup/upgrade and restart function. The management function has not yet been opened.

(1) "System" includes basic settings, logs, language and interface, and time synchronization. The basic settings can modify the "host name" and time zone; log view system related information, factory set default parameters; language and interface can modify the theme and language type; time synchronization factory set parameters. After parameter modification is completed, click "Save & Apply" to take effect.

(2) Before operating the "backup/upgrade" function, you need to consult our technical staff, and users are forbidden to operate privately; at the same time, the gateway should not be powered off during the firmware upgrade process, otherwise the core board of the gateway will be damaged. The gateway cannot be used.

Users can update the firmware of the concentrator through the backup/upgrade page of the concentrator. It should be noted that all the node information will be deleted after the concentrator updates the firmware, and all nodes need to be powered on again to access the network. Uncheck the Keep configuration, then select the file to find the .bin file of the concentrator and click "Refresh Firmware" as shown in the figure below:

Picture 11: Flash firmware

After the firmware verification is completed, click Execute to flash the firmware, and refresh the page after about 5 minutes or re-enter the URL to complete the firmware refresh.

Picture 12: firmware verification

The "Restart" function is applicable to the restart of the gateway.

3.7 Service Management

The default parameters of this function are set at the factory, if you want to modify the user, you need to do it under the guidance of professionals.

3.8 Network Management

This function includes interface settings, wireless functions, DHCP/DNS, hostname, static routing, firewall, diagnostic functions, and load balancing.

(1) In "Interface Settings", you can view the relevant configuration information of the network port and the IP address used for web login. The relevant parameters are set at the factory. If you want to modify it, you can do it under the guidance of a professional.

(2) "Wireless" can modify the WIFI name and password, and view the devices connected to this WIFI.

(3) "Diagnostic function" is used to judge whether the network is normal

(4) "Load Balancing" can view interface status and logs

Chapter IV Troubleshooting

4.1 The power indicator does not light up

- The power supply is not plugged in: please check and plug it in again.
- The power supply is damaged: please contact after-sales service to replace the power supply.

4.2 Unable to connect to the Internet using the network cable device

- Abnormal network: Please test whether the equipment in the same local area network as the gateway can connect to the network normally.
- The network cable is damaged: replace the network cable
- Poor connection of the network cable port: Check carefully to ensure that the connection is normal
- The switch/router does not enable DHCP: enable DHCP or use static IP, see "Networking Mode" for details.

4.3 Cannot connect to the Internet using 4G

- SIM contact is poor: check SIM re-insertion.
- SIM card arrears: Please recharge and restart the device and try again.
- No signal: check whether the antenna is connected properly.

4.4 The gateway cannot connect to the server

- The IP or port number is incorrectly filled: please check it and fill it in again.
- Network error: see network failure above.

4.5 Forgot the gateway WiFi password or login password (modified)

- Restore factory settings: Please long press the gateway “RESET” for 5-30 seconds, the device will restore the factory settings, please do not cut off the power during the restoration.