

F-PLS Power Line Security Camera	Version:	V2.0.1
	Model:	F-PLS
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F-PLS Power Line Security Camera User Manual



This description applies to the following models:

Model	Product Category
F-PLS200	Standard Edition
F-PLS210	Enhanced Edition



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1. Introduction

1.1. Product Description

Power line security system (F-PLS) is an important part of power facilities on-line monitoring system. The device provides a set of intelligent and visual real-time monitoring scheme for power facilities by using image acquisition, data resolution, remote control and other technologies.

F-PLS has a high performance 64-bit processor, based on Android operating system, with 2G/3G/4G communication, GPS positioning, 433MHz access, image recognition, wire temperature measurement, environmental monitoring, voice broadcast and other functions. It is the best choice for online monitoring in the power industry.

The product has been widely used in the field of transmission, substation and distribution monitoring, especially in the areas near the line corridor which is prone to illegal activities such as pole-climbing theft, ultra-high operation, sand excavation, mountain blasting, cofferdam digging ponds, burning, and natural disasters such as snow ice, rainstorm, landslides and so on.

Following picture shows the typical application :

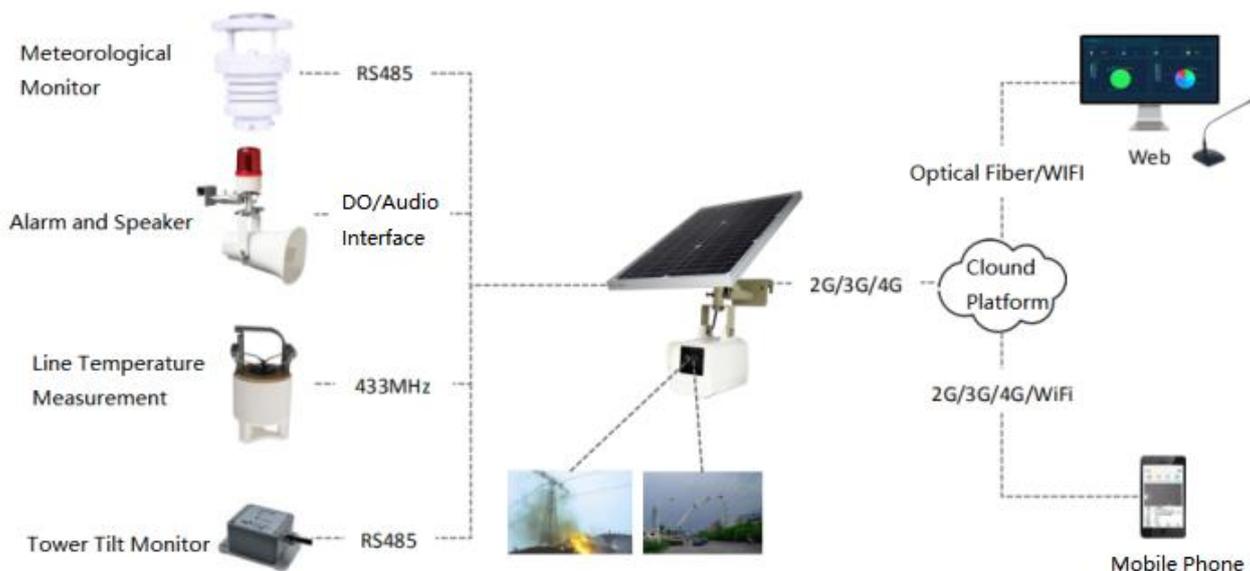


Figure 1. Application Diagram

1.2. Features

➤ **Application Design:**

- ◆ High-performance industrial 64 Bit processor
- ◆ Professional power supply design including under-voltage, over-voltage, over-current, reverse polarity, short circuit and surge protection function
- ◆ Using autocratic power cable, not easy to loose
- ◆ Stainless steel frame
- ◆ Dust-proof and water-proof design, IP67 Protection class
- ◆ Multiple power supply design: Solar panel + battery + super capacitor
- ◆ Aerial connector, not easy to loose

➤ **Stable and reliable:**

- ◆ WDT Watchdog design to ensure system stability
- ◆ Adopt a comprehensive anti-dropped mechanism to ensure product is always on line
- ◆ Use eMMC FLASH Storage, high-speed data read and write to ensure security and stability
- ◆ Mainly taking photos, supplemented by video, high on-line rate, low communication failure rate
- ◆ 30 days endurance time of battery without power from solar panel
- ◆ 8 years life time
- ◆ 30,000 hours MTBF
- ◆ 2G / 3G / 4G antenna, GPS antenna, WIFI antenna, 433MHz Built-in Antenna

➤ **Standard and Easy to Use:**

- ◆ In line with State Grid, Southern Power Grid transmission line monitoring technical specifications in China
- ◆ Immediately into operation status after power-up
- ◆ Provide RS232/RS485, DI , DO and 12VDC, that can be directly extended to other line monitoring equipment
- ◆ WIFI Hot spot and wireless parameter configurable
- ◆ Integrated design with small size, light weight and compact structure

➤ **Multiple Functions:**

- ◆ Support local storage eMMC FLASH and TF Card (optional)
- ◆ Support GPS, GLONASS and Beidou location system
- ◆ Support 802.11a/b/g/n/ac WIFI network
- ◆ Internal RTC ,support NTP
- ◆ Support for timed photograph, remote manual photograph, duration of timed photograph can be set
- ◆ Support timed video recording, remote manual recording, duration of timed recording can be set
- ◆ Supports real-time video (optional)
- ◆ Support night vision function (optional)
- ◆ Support zoom function (optional)
- ◆ Support tower tilt monitoring function (optional)
- ◆ Support wire temperature monitoring function (optional)
- ◆ Support Pan Tilt control function (optional)
- ◆ Support weather monitoring function (optional)
- ◆ Support acousto-optic alarm (optional)
- ◆ Support remote call function (optional)
- ◆ Support configuration of WIFI Hot spot parameters through web
- ◆ Support remote monitoring, parameters configuration and firmware upgrading

1.3 Specifications

1.3.1 Wireless Parameters

Item	Content
Standards and Frequency Bands	LTE FDD: B1/B3/B5/B8
	LTE TDD: B34/B38/B39/B40/B41
	WCDMA: B1/B8
	TD-SCDMA: B34/B39
	EVDO/CDMA: BC0
	GSM: 900/1800 MHz
Theoretical Bandwidth	LTE FDD: max. 300 Mbps (DL)/50 Mbps (UL)
	LTE TDD: max. 265Mbps (DL)/35Mbps (UL)
	WCDMA: max. 384 Kbps (DL/UL)
	TD-SCDMA: max. 4.2 Mbps (DL)/2.2 Mbps (UL)
	EVDO: max. 3.1 Mbps (DL)/1.8 Mbps (UL)
	GSM: max. 107 Kbps (DL)/85.6 Kbps (UL)
Transmit power	< 24dBm
Reception sensitivity	>-109dBm

1.3.2 GNSS Parameters

Item	Content
Receive Type	GPS/GLONASS/BeiDou
Sensitivity	Cold Start: -146 dBm Capture: -158 dBm Tracing: -160 dBm
TTFF	Cold Start: 32s Warm Start: 30s Hot Start: 2s
Static Drift	6m

1.3.3 WIFI Parameters

Item	Content
Standard	Support IEEE802.11a/b/g/n/ac
Frequency	2.4G, 5G
Max. Rate	433Mbps
Transmit Power	<16dBm
Reception sensitivity	>-91dBm

1.3.4 Hardware System

Item	Content
CPU	8 cores, 64 bits, ARM Cortex-A53 processor, frequency 1.8GHz
Flash	16GB eMMC
DDR3	2GB
Camera	Camera : normal 16 million pixels , night vision 2 million pixels (optional) , look down 16 million pixels (optional) Video format : 1920*1080P , 30f/s Zoom : 20 times (optional)
TF Card	32GB(optional)

1.3.5 Software System

Item	Content
Operating System	Android 7.1
APP	Compatible with Android system

1.3.6 Interface Type

Item	Content
Power Switch	Rocker switch
SIM/UIM Card	2 MICRO SIM card interface, support 1.8/3V SIM/UIM card
TF Card	Standard TF card interface
USB	1 USB 2.0 OTG, for debug
LED Indication	Status: sleep--normally on, activation--blinking, AP on--fast blinking Network: connected--on, unconnected--off
Power Output (optional)	two 12VDC outputs, max. current 1.5A
Serial Port (optional)	2 RS485, 1 RS232(share the same port with RS485)
DI (optional)	2 DI, input high: 5~30VDC, input low: 0~3VDC, load current: max. 50mA @ 30VDC
DO (optional)	2 DO, open collector output
Audio Output (optional)	1 audio output

1.3.7 Power Supply

Item	Content
Solar Panel	18V, 20W
Battery	6.4V, 10Ah, 30 days duration (without charge from solar panel, 10 pictures per day)

1.3.8 Physical Characteristics

Item	Content
Enclosure	PC/ABS, IP67
Dimension	Main unit: 224*120*127mm, Solar panel: 340*450*20mm
Weight	5.5kg (without extended equipment)

1.3.9 Other Parameters

Item	Content
Temperature	Operating : -25 ~ +70°C; Store: -40 ~ +85°C
Relative Humidity	100% (no condensation)

2. Installation

2.1 Overview

F-PLS must be installed correctly in order to achieve the design features. Generally, the installation of equipment must be carried out under the guidance of qualified engineers approved by the company

2.2. Unpacking

For safe transport, usually product requires a good package, when you unpack the box, please take good care of the things inside of package.

The list inside of packing is as follows:

- 1 set Main unit
- 1pcs solar panel
- 2pcs Installation Hook
- 1pcs tilt module (optional)
- 1pcs Meteorological module (optional)
- 1pcs acoustic-optical module (optional)
- 1pcs temperature measurement module (optional)
- 1pcs Pan Tilt module (optional)
- 1pcs quality certificate and warranty card

2.3. Installation

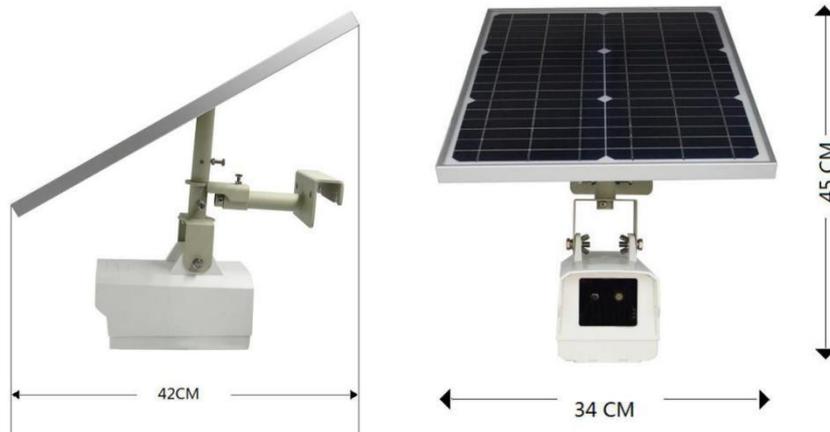


Figure 2. Appearance Dimension

2.3.1 SIM / UIM or TF Card Installation

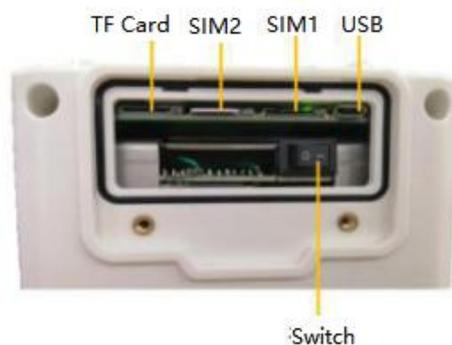


Figure 3. SIM/UIM or TF Card installation

Installation steps:

- 1) Unscrew two screws on card cover, then remove the card cover
- 2) Turn off the power switch (it is not allowed to install SIM / UIM or TF card with power)
- 3) Install SIM / UIM or TF card (metal contacts of SIM / UIM or TF card should face downwards)
- 4) Turn on the power switch
- 5) Install the card cover, tighten the screws

2.3.2. Main unit Installation



Figure 4

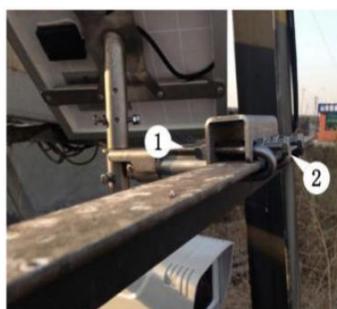


Figure 5



Figure 6

Installation steps:

- 1) As shown in Figure 4, pull out and fix the cable of solar panel to the back of the panel and the edge of the frame, and pre-lock the screws 1 and 2
- 2) Pre-adjust the direction of solar panel and main unit according to the direction of power line.
- 3) Use your phone or PC to configure the device parameters. (Refer to 3.1)
- 4) As shown in Figure 5, hook the iron with two screw hooks and lock the screws 1 and 2
- 5) As shown in Figure 6, adjust the solar panel angle and camera angle, and lock the screws 1, 2, 3 and 4.

Note:

- 1) Camera direction: horizontal or downward, it is forbidden to face up. and the potential danger area around the line / tower (such as construction site, sediment, pool, fire, etc.) shall be in the center of the image.
- 2) Solar panel direction: 10 ° south by west of solar panel, mainly facing south under the premise of avoiding blocking.
- 3) Installation height: the lowest point of conductor sag is the best photo angle, try to install it at a high place to prevent theft, and try to select the cross brace for installation.

3. Operating Instructions

3.1. Device Configuration

- 1) Install SIM and TF card (refer to Section 2.3.1).
- 2) Activate the device WiFi hot spot (Name: F-PLS200_*****, where ***** is the factory number) by using the magnet near the reed switch (as shown in Figure 7)

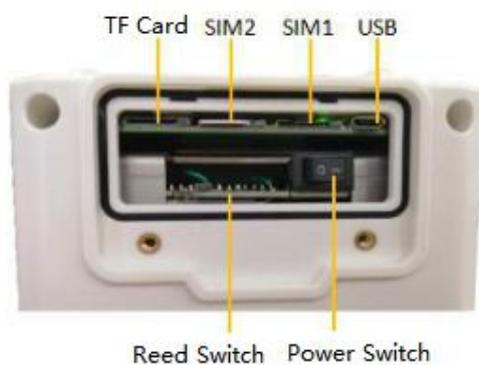


Figure 7.

- 3) Use the WIFI of Computer or mobile phone to connect the hot spot (default password: 123456).
- 4) Use your browser and enter: <http://192.168.43.1:8088/>
- 5) Log in the page, the default user name and password are both “admin”.



Figure 8

6) Set the server IP and server port on the "Network" page (for example, server IP of the Four-Faith platform: 212.64.11.125, port: 1910).

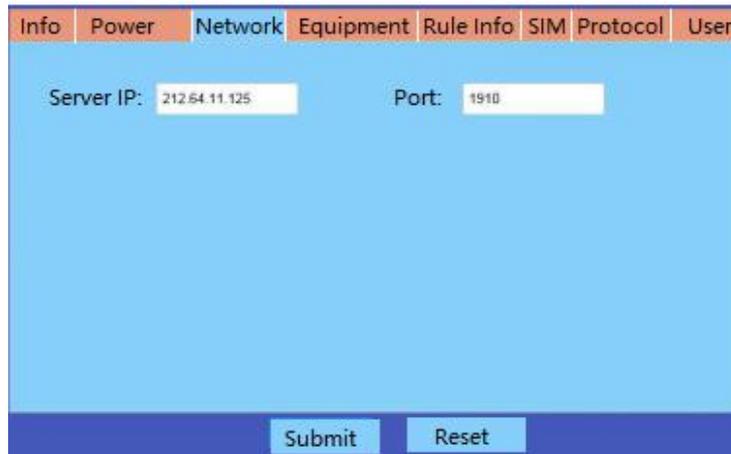


Figure 9.

7) Set parameters of camera, video recording and data acquisition in "Rule Info".

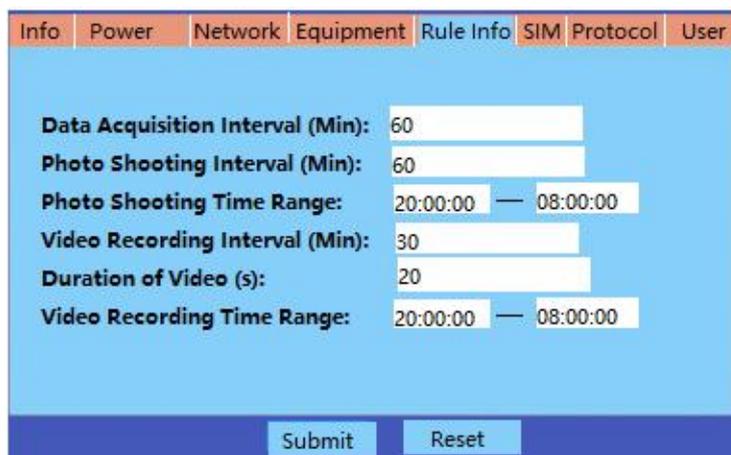


Figure 10.

8) Click Submit and restart the device to make the configuration take effect

3.2 Platform Configuration

1) Prepare a PC, enter “https://cs.four-faith.net/ffem-admin/login.html” in the browser, and log in to the system. (please contact our staff for initial account number and password)

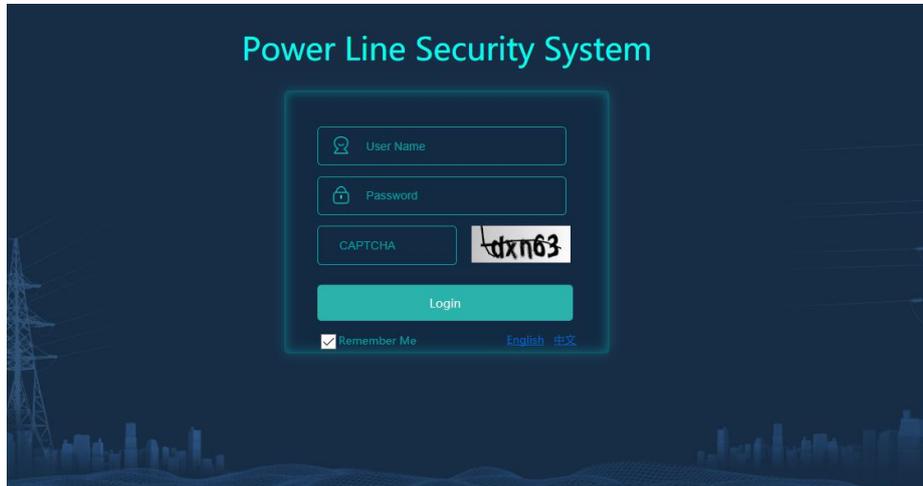


Figure 11.

2) After login, enter “Org Management”, click "Add" to establish a group.



Figure 12.

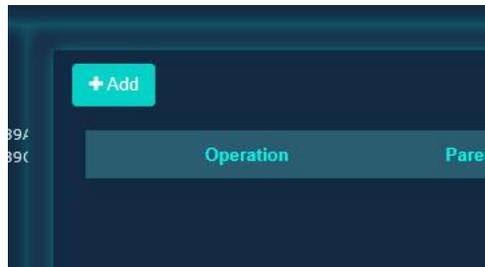


Figure 13.



Figure 14.

3) Select the newly added group in the organization tree on the left, click "add" to create a "line", and select "line" in the "group type"

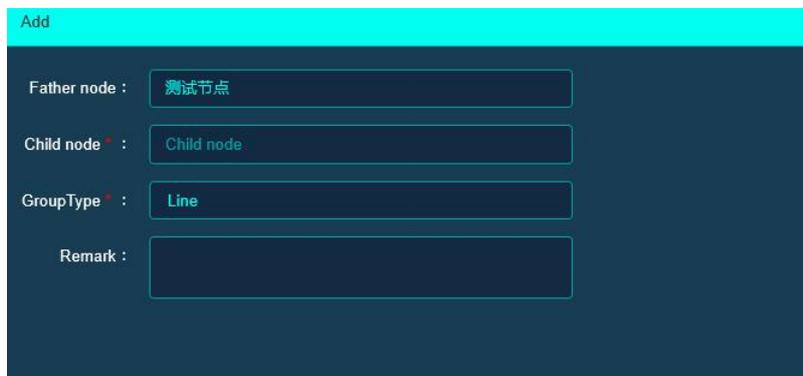


Figure 15.

4) Select the newly added line in the organization tree on the left, click "Add" to build a "tower", select "tower" in the "group type".

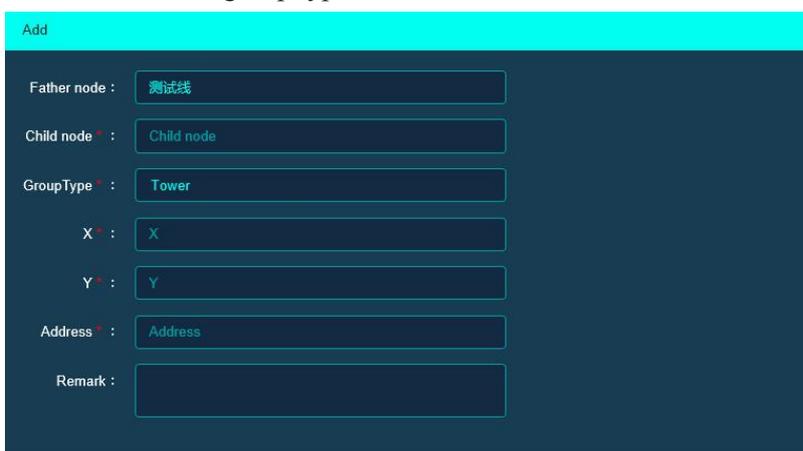


Figure 16.

5) Select the newly added tower in the organization tree on the left, click "Add" to create a device, select "device" in the "group type"

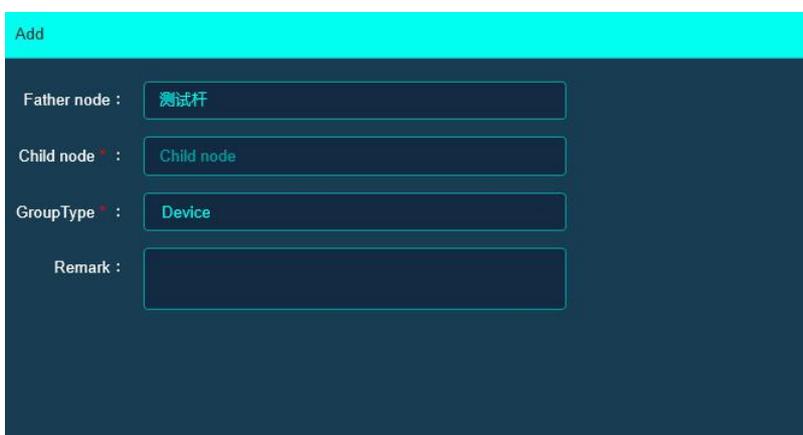


Figure 17

6) Click “Device” in the main menu, select the newly added device in the left organization tree, click "Install", enter the device ID and SIM card information in the pop-up installation interface, and click "OK" to complete the binding of device and platform..

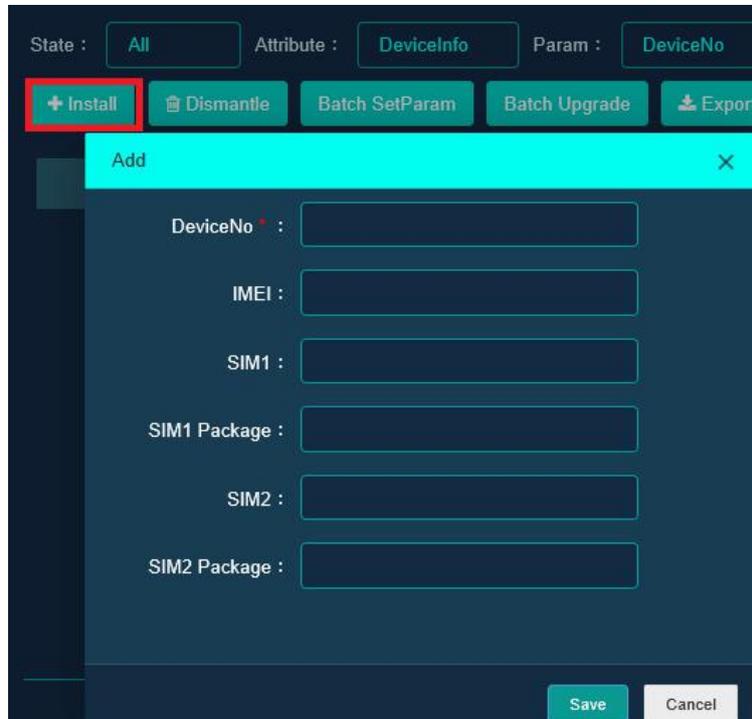


Figure 18.

Icon Description:

: Group

: Tower

: Device (green icon indicates online, gray icon indicates Offline, red icon indicates an alarm, the question mark icon indicates not installed)

3.3 Platform Features

3.3.1. Login

Enter the account, password and verification code to log in the system . Please contact our staff for the initial account and password.



Figure 19.

3.3.2. Home Page

You can view the number of alarms, the total number of devices, the number of online devices, the online rate, the number of alarm types and the installation of extended modules in the past seven days.



Figure 20.

Click "Alarm Data in last seven days" to enter the list of alarm information in recent seven days. You can view and process the alarm information, as shown in the following figure:

Operation	Address	DeviceNo	Alarm Typ	Alarm Info	Fault Time	Process State	DeaTime	Handler	Description
1	国网协议测试单位测试节点_测试	EL0005A123456789	Image Alarm	crane	11-09 06:00	Unprocessed	11-09 06:00		
2	国网协议测试单位测试节点_测试	EL0005A123456789	Image Alarm	crane	11-09 18:00	Unprocessed	11-09 18:00		
3	国网协议测试单位测试节点_测试	EL0005A123456789	Image Alarm	crane	11-09 20:00	Unprocessed	11-09 20:00		
4	国网协议测试单位测试节点_测试	EL0005A123456789	Image Alarm	crane	11-09 21:00	Unprocessed	11-09 21:00		
5	国网协议测试单位测试节点_测试	EL0005A123456789	Image Alarm	crane	11-09 22:00	Unprocessed	11-09 22:00		
6	国网协议测试单位测试节点_测试	EL0005A123456789	Image Alarm	crane	11-10 06:00	Unprocessed	11-10 06:00		

Figure 21.

Click "Device Count" to enter the list of equipment management information to view the details of the equipment, as shown in below figure:

State : Attribute : Param : Content :

DeviceNo	Device St	IMEI	SIM1	CSQ1	SIM2	CSQ2	CurrentVersion	Operation
1	EL0005A123456789	Offline	A100005C2F5CA8/€	13313854394	80	0	F-PLS200V1.1.6(升级超时)	<input type="button" value="Edit"/> <input type="button" value="Delete"/> <input type="button" value="Refresh"/> <input type="button" value="Info"/> <input type="button" value="Help"/>
2	FFM0000000000001	Offline	863178040363764/€	18559627249	80	80	F-PLS200V1.1.6	<input type="button" value="Edit"/> <input type="button" value="Delete"/> <input type="button" value="Refresh"/> <input type="button" value="Info"/> <input type="button" value="Help"/>
3	FFM0000000000001	Offline	863178040363764/€	18559635874	60	20	F-PLS200V1.1.7	<input type="button" value="Edit"/> <input type="button" value="Delete"/> <input type="button" value="Refresh"/> <input type="button" value="Info"/> <input type="button" value="Help"/>
4	FFM0000000000001	Offline	863178040373763/€		0	13625019645	F-PLS200V1.1.6	<input type="button" value="Edit"/> <input type="button" value="Delete"/> <input type="button" value="Refresh"/> <input type="button" value="Info"/> <input type="button" value="Help"/>
5	FFM0000000000001	Offline	0/null	15359409126	80	80	F-PLS200V1.1.6	<input type="button" value="Edit"/> <input type="button" value="Delete"/> <input type="button" value="Refresh"/> <input type="button" value="Info"/> <input type="button" value="Help"/>
6	EL0005A123456789	Offline	null/null	13055249604			F-PLS200V1.1.0(升级超时)	<input type="button" value="Edit"/> <input type="button" value="Delete"/> <input type="button" value="Refresh"/> <input type="button" value="Info"/> <input type="button" value="Help"/>
7	EL0005A123456789	Offline	A100005C2F5C9C/€		0	18559639476	F-PLS200V1.1.7	<input type="button" value="Edit"/> <input type="button" value="Delete"/> <input type="button" value="Refresh"/> <input type="button" value="Info"/> <input type="button" value="Help"/>

Figure 22.

Click "Online Count" to enter the list of device management information to view the details of online devices, as shown in below figure:

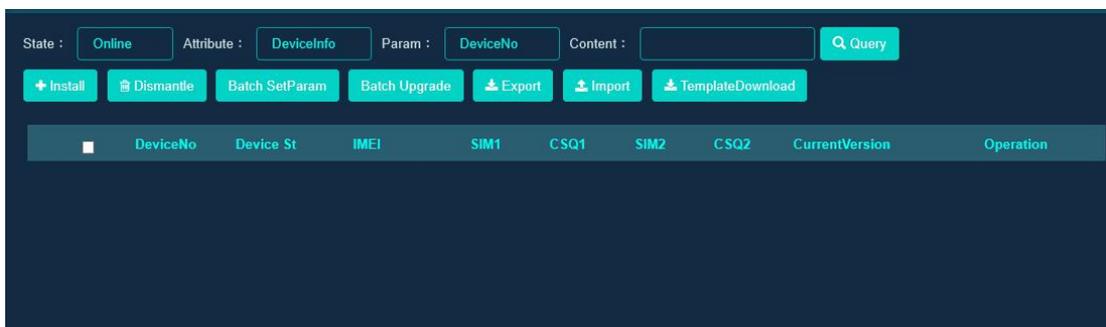


Figure 23.

3.3.3 GIS Positioning

You can view the location information of the device on the map, and click the device on the map to display the device details. It is green when the device is normal and red when it is in alarm.

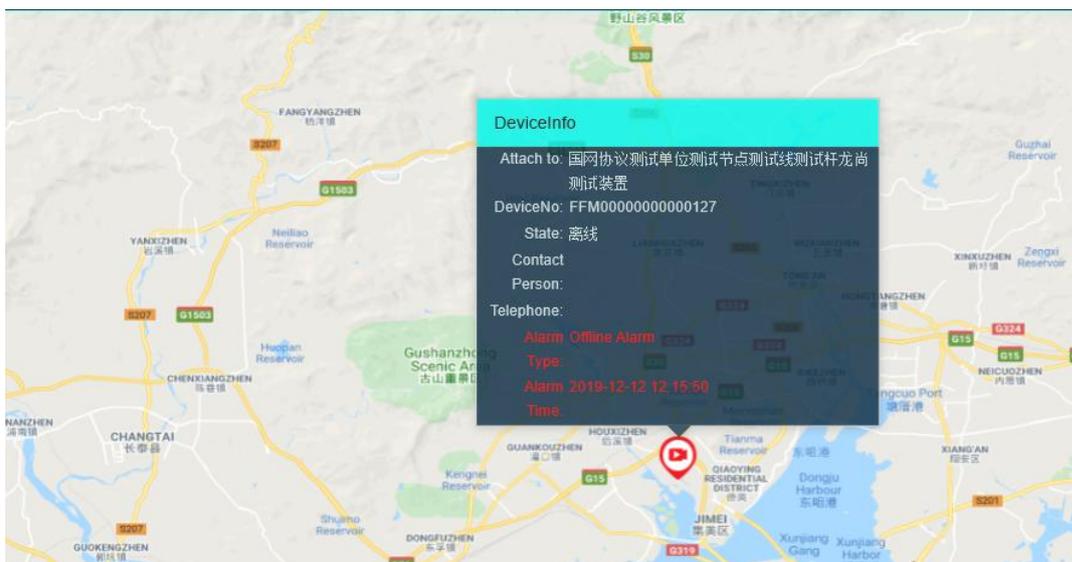


Figure 24.

The system polls the alarm information regularly. If there is an alarm, the pop-up window on the right will display the alarm details. Click the alarm information, the page will jump into the alarm processing page.

3.3.4. Real-time Monitoring

Click “Live” in the main menu, and select the device you want to see, it can carry out real-time monitoring, manual photographing, manual video recording and remote calling on the platform system. On the right you can see the information about device. The last 3 unprocessed alarms will be displayed.

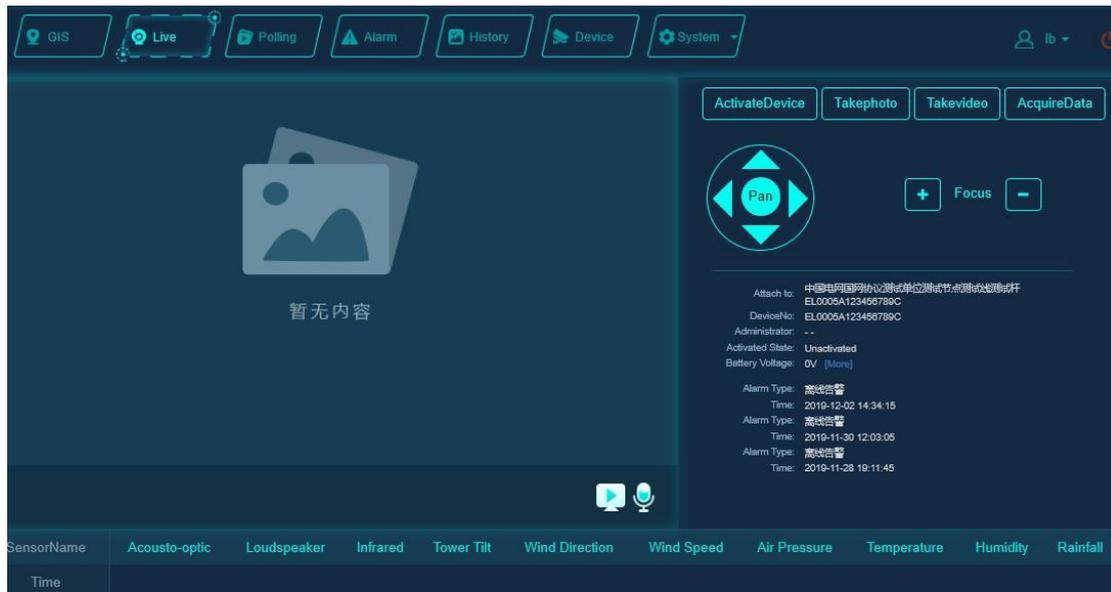


Figure 25.

Clicking "ActivateDevice", the device will be connected to the platform.

Clicking "TakePhoto", device will take pictures immediately and send to the platform

Clicking "TakeVideo", device can record video immediately and send to the platform.

Clicking "AcquireData", the device can get the monitoring data immediately and send the data to the platform.



Figure 26.

Remote calling, real-time video, pan tilt control and focusing functions will be effective only after the device is activated.

3.3.5. Polling Monitoring

Click “Polling” in the main menu, it can monitor the historical pictures, videos and monitoring data of the devices in the group. The group can be created and deleted freely, and the polling time (time displayed by each device) can be set.

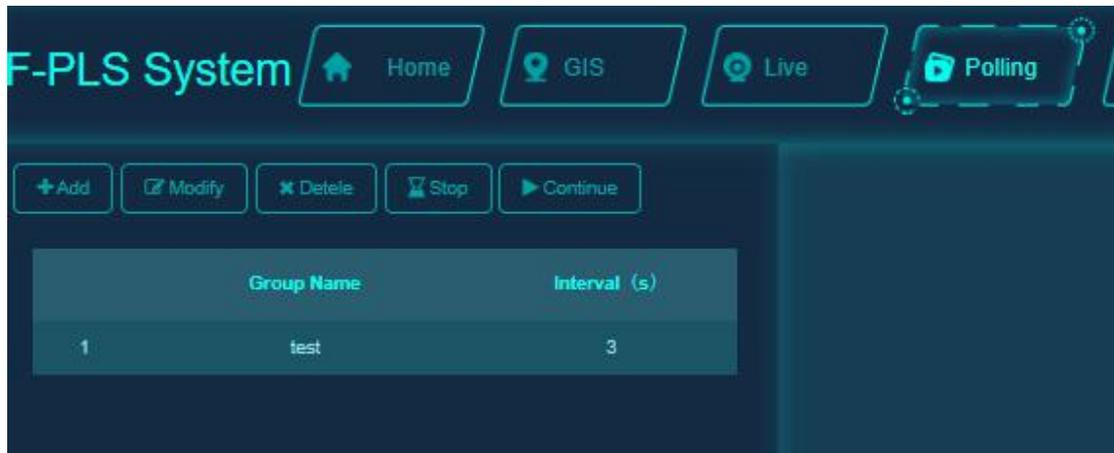


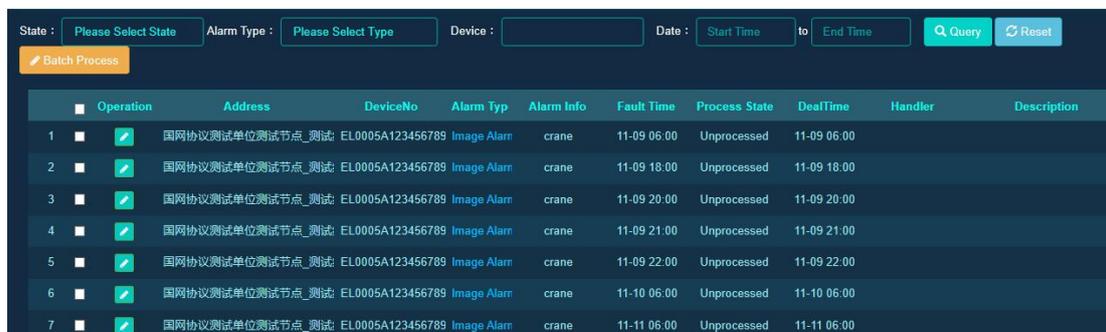
Figure 27.

Click "Start", the information of the equipment in the group will be displayed circularly on the right, including the latest photo or video, equipment information, alarm information (the latest three unprocessed data), and the latest reported monitoring data.

Click “Pause” or “Stop” button to pause or stop the polling of pictures / videos and data.

3.3.6. Alarm Handling

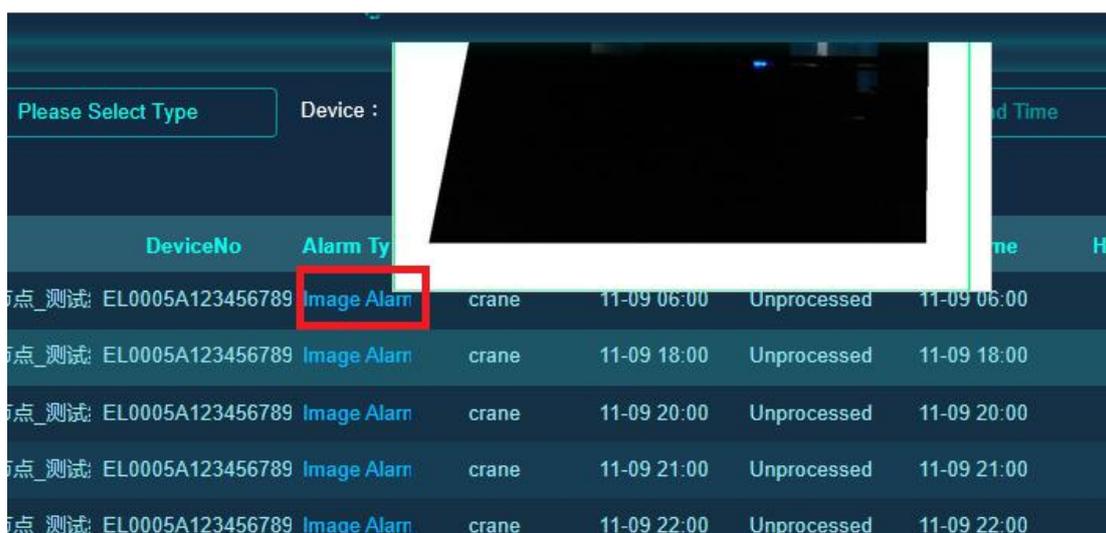
Click “Alarm” in main menu, you can view the alarm details and alarm processing results. Support condition search and batch processing for alarms.



Operation	Address	DeviceNo	Alarm Typ	Alarm Info	Fault Time	Process State	DealTime	Handler	Description
1	国网协议测试单位测试节点_测试	EL0005A123456789	Image Alarm	crane	11-09 06:00	Unprocessed	11-09 06:00		
2	国网协议测试单位测试节点_测试	EL0005A123456789	Image Alarm	crane	11-09 18:00	Unprocessed	11-09 18:00		
3	国网协议测试单位测试节点_测试	EL0005A123456789	Image Alarm	crane	11-09 20:00	Unprocessed	11-09 20:00		
4	国网协议测试单位测试节点_测试	EL0005A123456789	Image Alarm	crane	11-09 21:00	Unprocessed	11-09 21:00		
5	国网协议测试单位测试节点_测试	EL0005A123456789	Image Alarm	crane	11-09 22:00	Unprocessed	11-09 22:00		
6	国网协议测试单位测试节点_测试	EL0005A123456789	Image Alarm	crane	11-10 06:00	Unprocessed	11-10 06:00		
7	国网协议测试单位测试节点_测试	EL0005A123456789	Image Alarm	crane	11-11 06:00	Unprocessed	11-11 06:00		

Figure 28.

Click the alarm type in the alarm list, you can view specific alarms.



DeviceNo	Alarm Ty	Alarm Info	Fault Time	Process State	DealTime	Handler
点_测试: EL0005A123456789	Image Alarm	crane	11-09 06:00	Unprocessed	11-09 06:00	
点_测试: EL0005A123456789	Image Alarm	crane	11-09 18:00	Unprocessed	11-09 18:00	
点_测试: EL0005A123456789	Image Alarm	crane	11-09 20:00	Unprocessed	11-09 20:00	
点_测试: EL0005A123456789	Image Alarm	crane	11-09 21:00	Unprocessed	11-09 21:00	
点_测试: EL0005A123456789	Image Alarm	crane	11-09 22:00	Unprocessed	11-09 22:00	

Figure 29.

3.3.7. Historical Inquiry

Click “History” in the main menu, you can view historical pictures / videos, voltages, sensor data, etc., and search can be done by time and data type

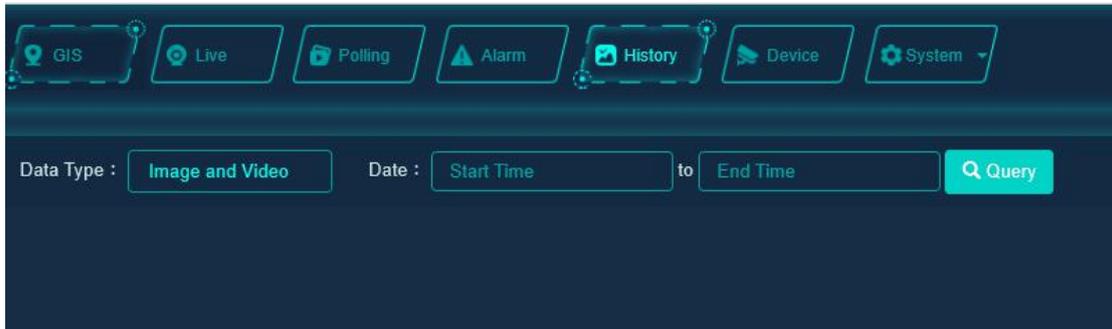


Figure 30.

3.3.8 Device Management

Click “Device” in the main menu, the equipment can be installed, dismantled, set parameters, upgraded remotely, imported and exported in batches

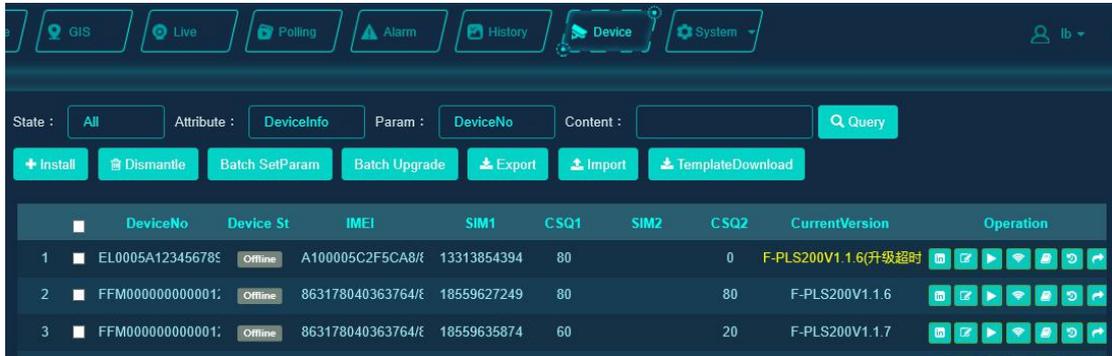


Figure 31.

During the installation operation in platform, the device number of device must be filled in.

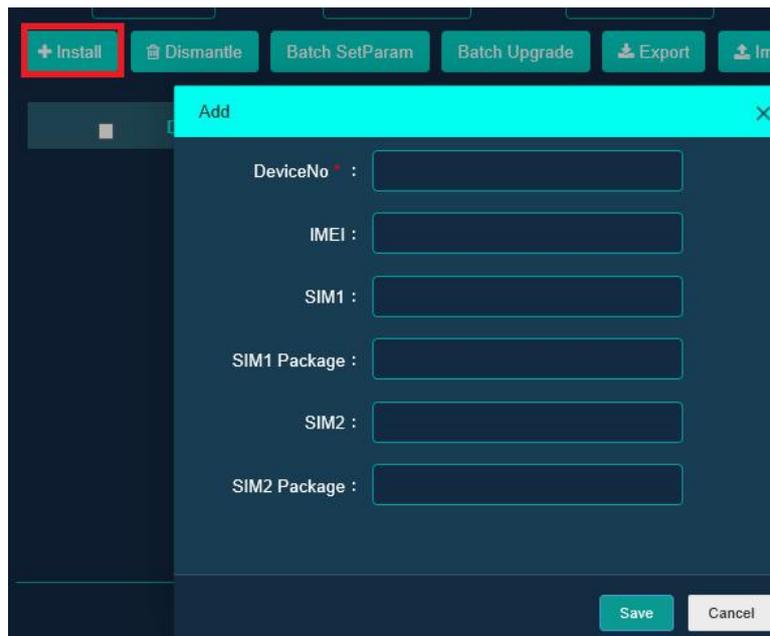


Figure 32.

Select the device, click “Dismantle” to remove the device.

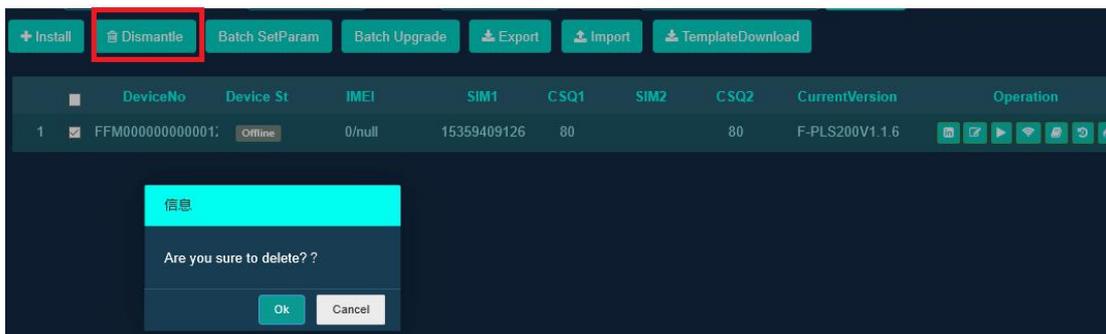


Figure 33.

Click “Batch SetParam” button to batch set network information, extended device threshold, rule information and contact person. It takes 1 minute after batch modification to modify again.

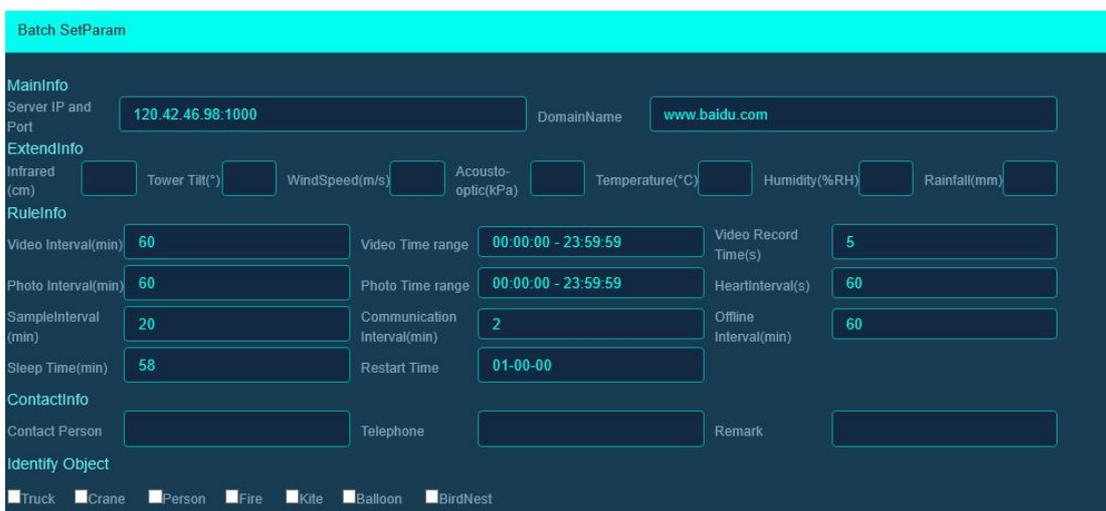


Figure 34.

Click “export” to export the information of the selected device and save it locally in Excel format.

Click "template download" to download a template. Fill in relevant information according to the template, and you can import devices in batch.

Click “Import” to batch import the devices into the system.

On the right side of the device list, you can view device details, restart the device, modify device parameters, view logs, and upgrade firmware remotely.

	DeviceNo	Device St	IMEI	SIM1	CSQ1	SIM2	CSQ2	CurrentVersion	Operation
1	FFM0000000000012	Offline	0/null	15359409126	80		80	F-PLS200V1.1.6	

Figure 35.

3.3.9 System Management

Click “System” in the main menu, you can add, modify, or delete users, roles, and organizations.

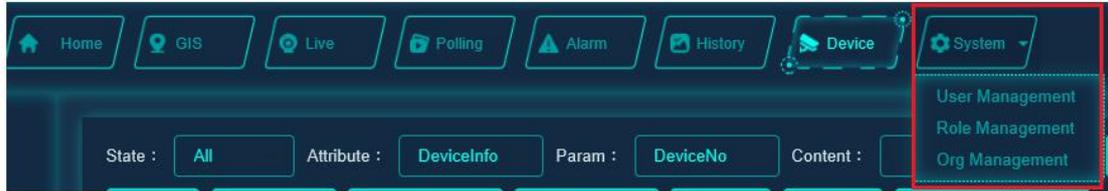


Figure 36.

In the “User Management” page, you can add, modify or delete an account.



Account	Username	Department	Email	Telephone	State	Create Time
1 test1	test1	厦门四信智慧电力科技有限	iiieg@qq.com	18559022057	Normal	2019-04-02 11:38:54
2 15260812066	zerol	厦门四信智慧电力科技有限	chenzhaoyou@four-faith.com	15260812066	Normal	2019-04-08 10:02:01
3 test11	test11	厦门四信智慧电力科技有限	iiieg@qq.com	18559022057	Normal	2019-04-09 00:28:55
4 gjcl	告警处理	厦门四信智慧电力科技有限	gaozhixiong@four-faith.com	13606027942	Normal	2019-04-22 17:49:54
5 lsch	历史查询	厦门四信智慧电力科技有限	gaozhixiong@four-faith.com	13606027942	Normal	2019-04-22 17:52:19
6 sbgl	设备管理	厦门四信智慧电力科技有限	gaozhixiong@four-faith.com	13606027942	Normal	2019-04-22 17:54:21
7 test3	测试2	厦门四信智慧电力科技有限	gaozhixiong@four-faith.com	13606027942	Normal	2019-04-22 19:24:06
8 hardware	HBY	厦门四信智慧电力科技有限	hebaoyi@four-faith.com	18650106435	Normal	2019-04-25 09:52:22
9 gw1	gw1	国网协议测试单位	aa@qq.com	18559022057	Normal	2019-06-12 11:13:10
10 yangzeng	yz	国网协议测试单位	123123@qq.com	1312333333	Normal	2019-07-31 17:51:01

Figure 37.

In the “Role Management” page, you can add, modify or delete roles. In the role adding page, as shown in the following figure, you can select the corresponding permissions.

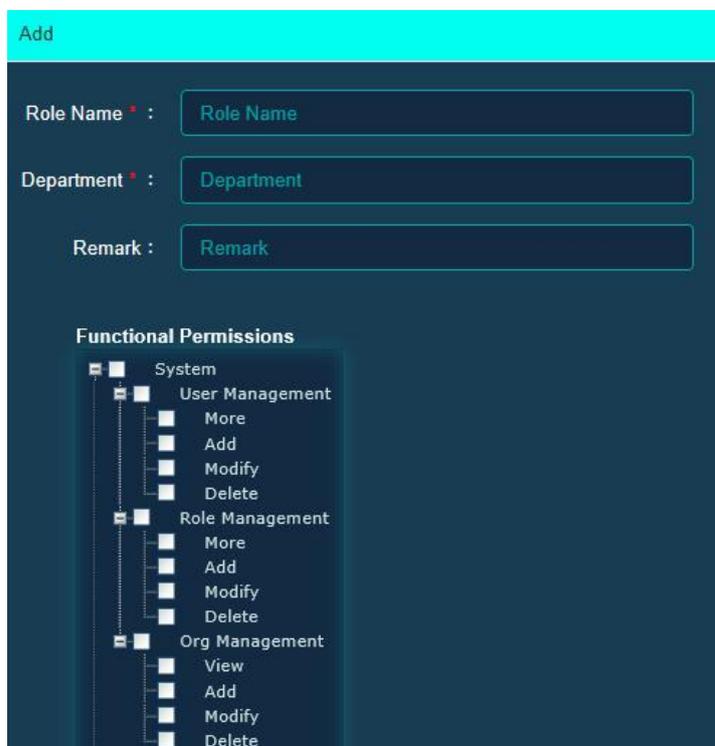


Figure 38.

In the “Org Management” page, you can add, modify or delete the organization tree. On the node adding page, as shown in the following figure, there are four types of organization tree node: group, line, tower and device. The operations for each type of node are similar.

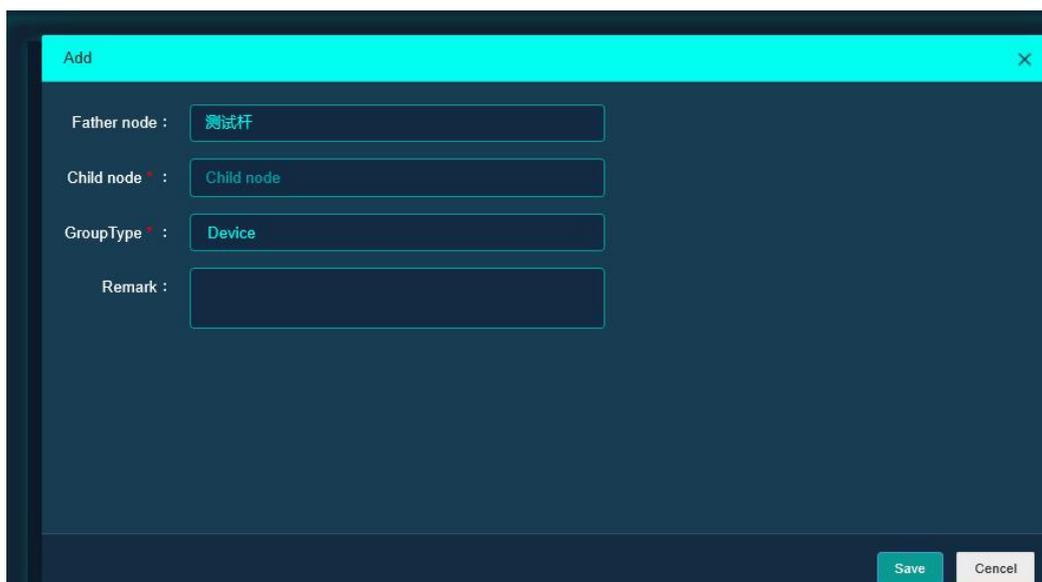


Figure 39.