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Operation Manual - Engineer Version

Remote Maintenance System

远程运维系统操作手册 – 工程师版

Version	Content	Issued by	Checked by	Approved by	Date
v1.00	Origin	Moly Gu	Sam Xia	Sonic Li	2020.08.24
v2.00	Data management of centrifuge operation	Moly Gu	Sam Xia	Sonic Li	2021.02.25
v3.10	Device discovery based on PN/IE	Moly Gu	Sam Xia	Sonic Li	2022.05.20



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Preliminary Preparation 前期准备

Equipment Introduction：设备简介

Remote Maintenance Gateway-Client(hereinafter referred to as"Client"): The model of "Client" device is "SHXL-IG-RMC", being installed into control panel on-site. User applies for remote maintenance of the on-site PLC or HMI by the "Client" device ;

远程运维网关用户端（以下简称“用户端”）：设备型号为“SHXL-IG-RMC”，安装于用户设备现场。用户依靠此设备对现场PLC或HMI申请远程运维；



LED Indicator – device indicators correspond to different device usage conditions
LED指示灯 – 对应不同设备使用情况的设备指示灯

LAN	WAN	SYS
flashes green 绿灯闪烁	flashes green 绿灯闪烁	flashes red 红灯闪烁
off 熄灭	off 熄灭	glows red 红灯常亮

Antenna Interface – connects to WiFi and Bluetooth
天线接口 – 连接 WiFi 和蓝牙

Wall Bracket – available for 35mm DIN rail
壁挂支架 – 可用于 35mm DIN 导轨

LAN port – connects PLC or HMI or switches connected by devices aforesaid
LAN 端口 – 连接 PLC 或 HMI 或由上述设备连接的交换机

WAN port – connects local wired Network
WAN 端口 – 连接本地有线网络

Power supply
电源供应

LED Indication - WAN LED指示灯 - WAN	Network Status 网络状态
flashes green 绿灯闪烁	Success 连接成功
off 熄灭	Pending 连接中

LED Indication - SYS LED指示灯 - SYS	System Status 系统状态
flashes red 红灯闪烁	Booting 启动中
glows red 红灯常亮	Normal Operating 正常运行

Remote Maintenance Gateway-Server (hereinafter referred to as "Server"): a portable application for Windows(single exe file), which is used by automation engineer to respond to the user's remote maintenance application and implement remote maintenance ;

远程运维网关服务端（以下简称“服务端”）：Windows版绿色应用程序（单个exe文件），由自控工程师使用，用于响应用户的远程运维申请，实施远程运维；

PS: If the following term is directly referred to as "Gateway" or not explicitly specify, it refers to "Client".

若以下直接称“网关”或未明确指明，则是指代“用户端”



(The following are all one-time operations, there is no need to reconfigure later after the first successful configuration)

(以下操作均为一次性操作，首次配置成功后，之后使用无需重复配置)

1. Download, install and open APP： 下载、安装、打开APP

Use smart phone (Android and IOS) to scan the qr code via a browser to download and install the APP named "FS Connector", click the desktop icon to open the APP ;

智能手机（支持Android和IOS系统）通过浏览器，扫描二维码，下载并安装FS Connector APP，点击桌面图标，打开APP；

Tips： APP display language will be the same as system language on your phone. By default, it's set to English (US) when the system language does not display in Chinese or English.

提示： APP语言将跟随手机系统，如手机系统非中英文，默认则为英语。



 **IOS10.0 or later**



 **Android4.4 or later**

2. APP authorization： APP使用授权

Allow authorization of Bluetooth and location according to system prompts ;
按照系统提示，允许蓝牙以及位置等权限的授权；

3. Set company name： 设置公司名称

When open the APP at the first time, user needs to enter the company name. After completing the step above, APP can be used normally. Data between different companies is completely isolated to ensure data security.

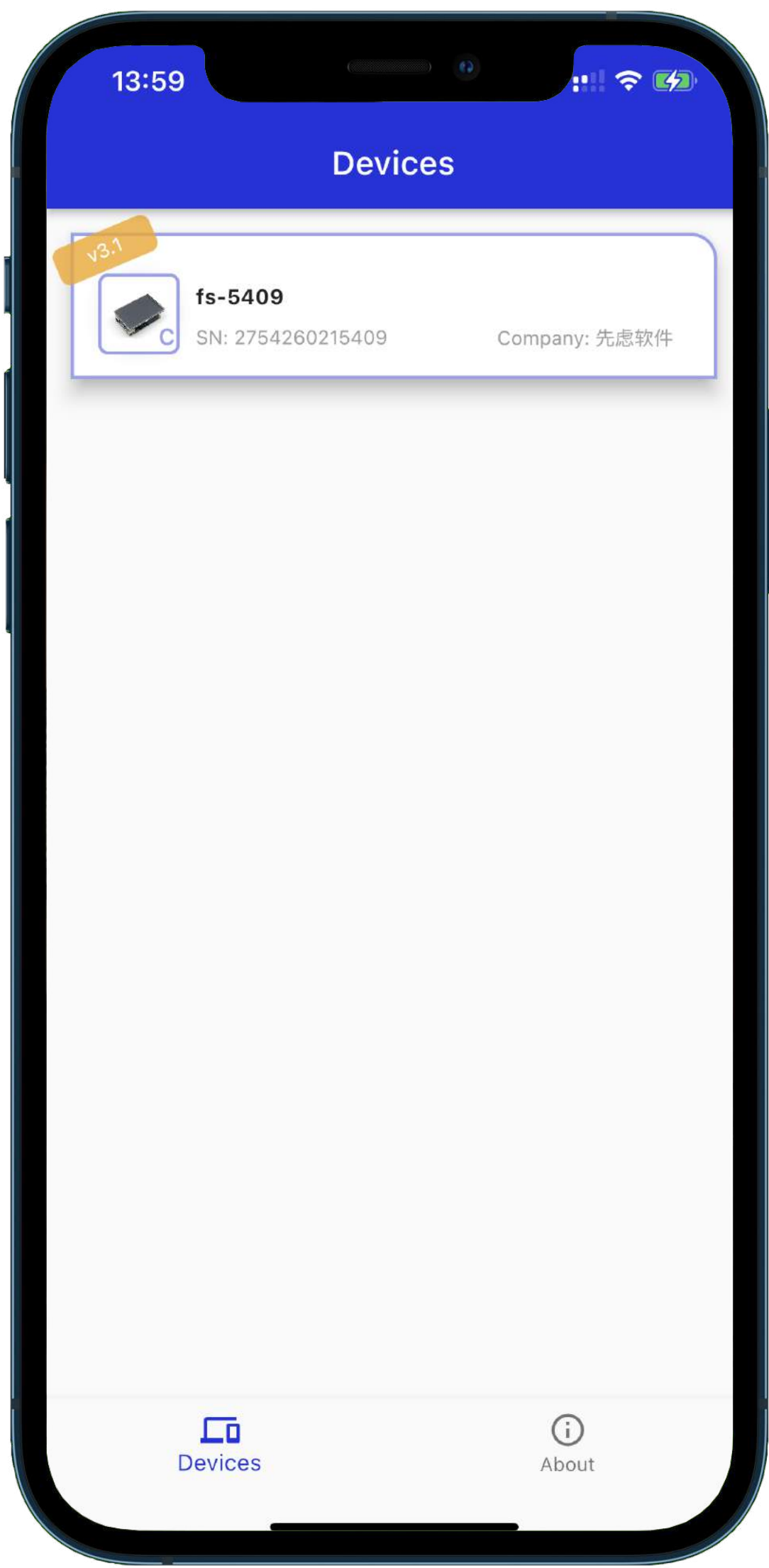
初次使用打开APP时，需要输入公司名称。完成上述步骤后，用户就能正常使用APP。不同公司之间的数据完全隔离，以保障数据安全。



4. Search devices in Device list 设备列表搜索设备

Pull to refresh the device list(before this operation, need to switch on the Bluetooth), search for nearby remote ;

在设备列表下拉刷新，搜索附近远程运维网关设备（运维前请打开手机设备蓝牙）；

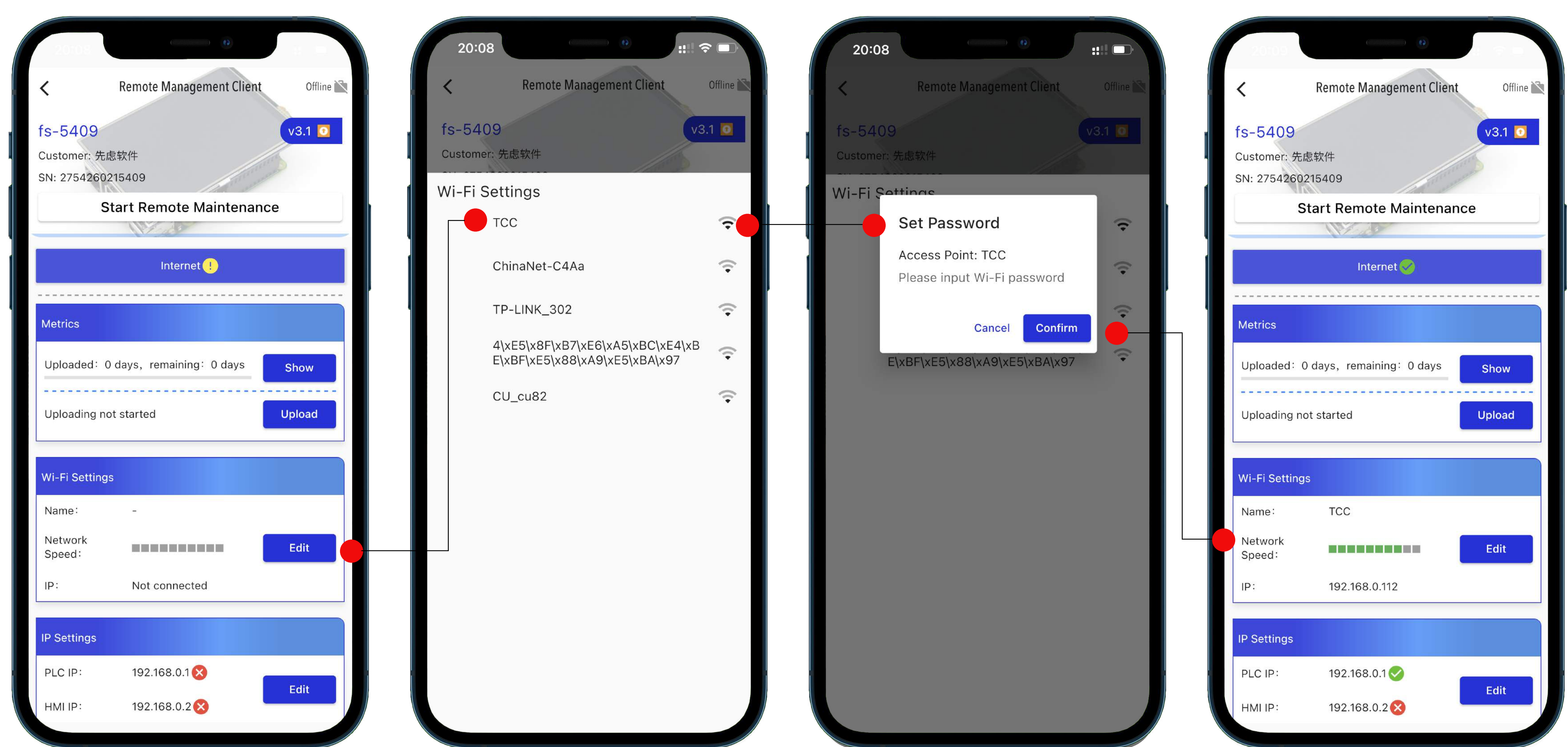


Tips : Gateway can be found when they are in the company with the same configurations .

提示： 支持搜索到相同配置下所属公司的网关。



5. Internet connection of Gateway：将网关设备接入互联网



Wireless Connection

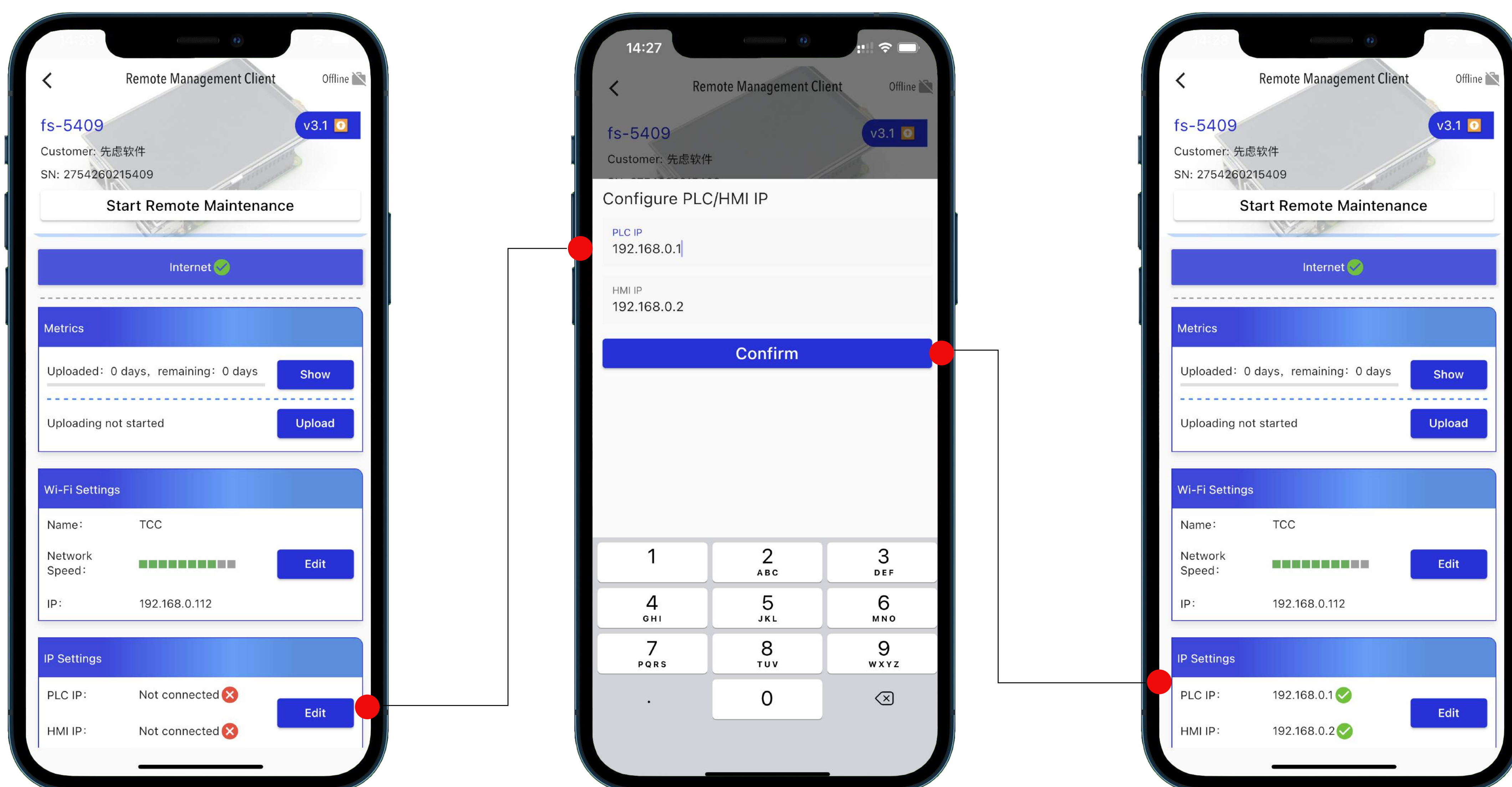
Access the gateway device to the Internet by using WiFi Settings function of the APP, choosing the WiFi name in the list then entering the password. The information of Name, Connectivity, IP will be displayed if WiFi connection is successful. A green tick icon will be displayed next to the "Network Connection" area if WiFi is accessible to the Internet.

使用APP的WiFi配置功能，选择列表中的WiFi名称，输入密码，将网关设备接入互联网。若WiFi成功，则会显示名称、信号强度、IP等信息。若WiFi可接入互联网，则“网络连接”处会出现绿色打钩图标。

6. Configure IP address of PLC and HMI：配置PLC和HMI IP地址

During the commissioning of the project, automation engineer can configure the IP address assigned to PLC and HMI in the LAN in the APP. If the IP address is configured correctly and the corresponding device exists on the LAN, a green tick icon will be displayed next to the corresponding IP. When configuring the wired IP address, you need to keep the same network segment with PLC and HMI (the first three segments of the IP address are consistent, and the last group of numbers does not exceed 255). Devices that are configured and connected can perform other operations.

在项目调试阶段，自控工程师进入APP配置局域网中给PLC以及HMI分配IP地址。若IP地址配置正确，并且局域网中存在对应设备，则对应的IP旁边会显示绿色打钩图标。配置有线IP地址，需要与PLC以及HMI保持同网段即可（即IP地址前三段数字保持一致，最后一组数字不超过255）。配置完成并连通的设备可以进行其他操作



Tips: When the device fail to be connected, please switch off the power of gateway and reconnect it to resolve.

提示：若操作时遇到设备无法连接的特殊情况，可通过“断开网关设备电源并重新连接的重启操作”来解决。

Remote Maintenance 远程运维

(Please ensure that the preparatory work has been completed before implementation)
(实施前，请确保前期准备工作均已完成)

1. "Client" application for remote maintenance：“用户端”申请远程运维

The user enters the "Client" device details page, clicks the "Start Operations" button, the system prompts the successful message, and displays the 4-digit security code. The automation engineer will be informed of the 4-digit security code by user and response to the application of the maintenance (click "Terminate" button to disconnect the remote maintenance) ;

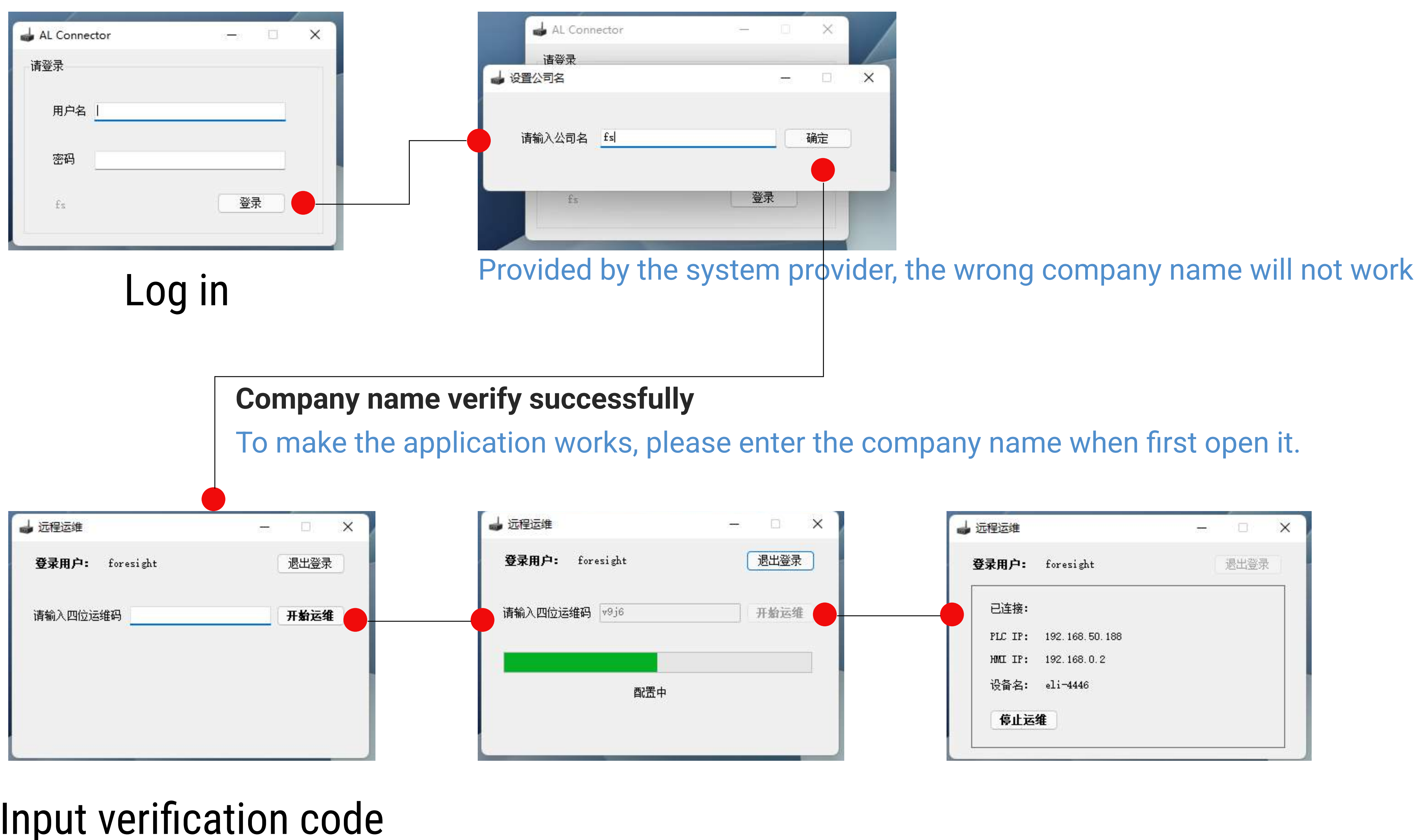
用户进入“用户端”设备详情页，点击“开始运维”按钮，系统提示操作成功，并显示4位验证码。用户将验证码告知自控工程师，等待自控工程师响应（点击“停止运维”可主动断开远程运维）；



2. "Server" responds to remote maintenance：“服务端”响应远程运维

Automation engineer enters the "Server" application in Windows, then enter the username and password and press "Go". To make the application works, please enter the company name when first open it. Clicks the "Start Operations" button after inputing the 4-digit verification code informed by the user, then automatically connects to the corresponding "Client" device (also can click "Terminate" button to disconnect the remote maintenance proactively) ;

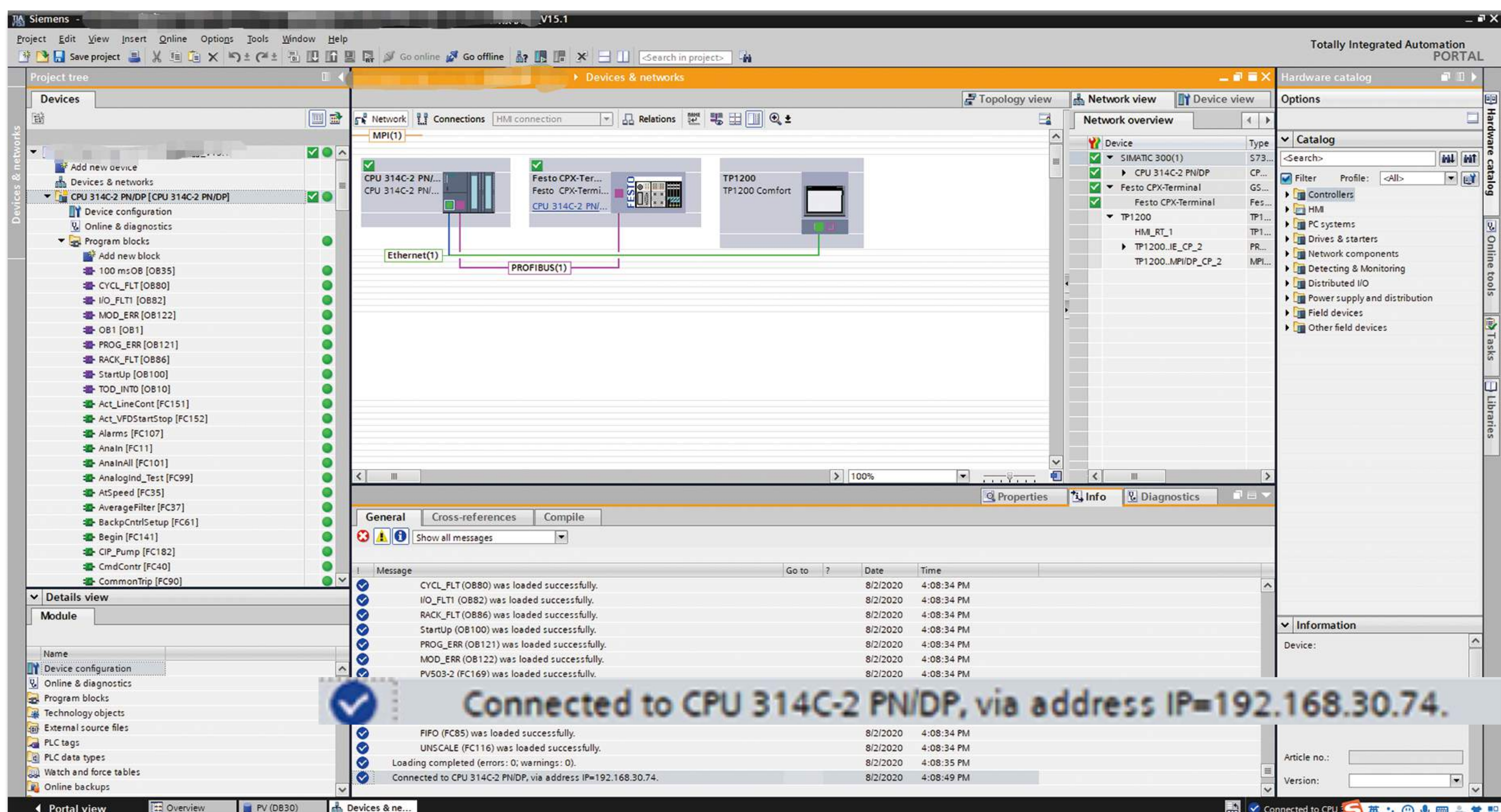
自控工程师打开“服务端”Windows应用程序，输入用户名和密码并点击“登录”。初次登录后请输入公司名称以确保后续正常操作。输入用户告知的4位验证码，点击“开始运维”按钮，则会自动连接上对应的“用户端”设备（点击“停止运维”亦可主动断开远程运维）；





3. TIA Portal software starts debugging directly：“博图”软件直接开始调试

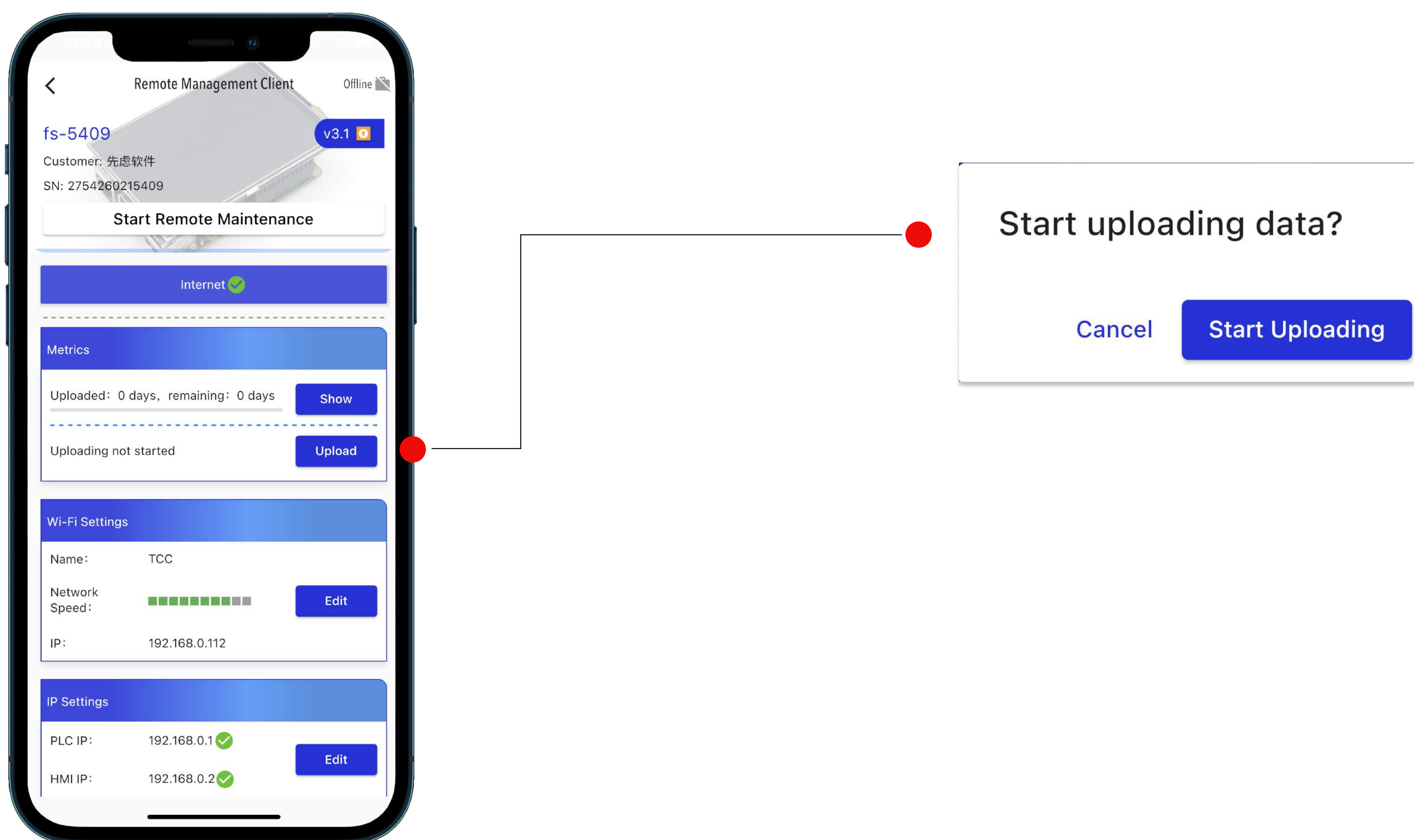
After one pair of Gateway(Server and Client) are connecting successfully, Automation Engineer can start to commissioning with the remote PLC or HMI via the Siemens TIA Portal software in a completely consistent operation experience as the local project ;
两端设备连接成功后，打开博图软件，与调试本地项目完全一致地配置PLC或者HMI的局域网IP地址，便可连通远程项目进行调试了；



Data Management 数据管理

1. Collection, Storage, Upload of Data：数据采集、存储、上传

After finishing the collection device of the device on the PC by the automation engineer, data will be stored during normal operation of the centrifuge. User can upload data to the cloud environment through click “upload” button on APP.
自控工程师在PC端平台完成设备的采集配置并下发后，数据将会在设备正常运行期间存储数据。用户通过在APP端人工点击【上传数据】，将数据上传至云端。



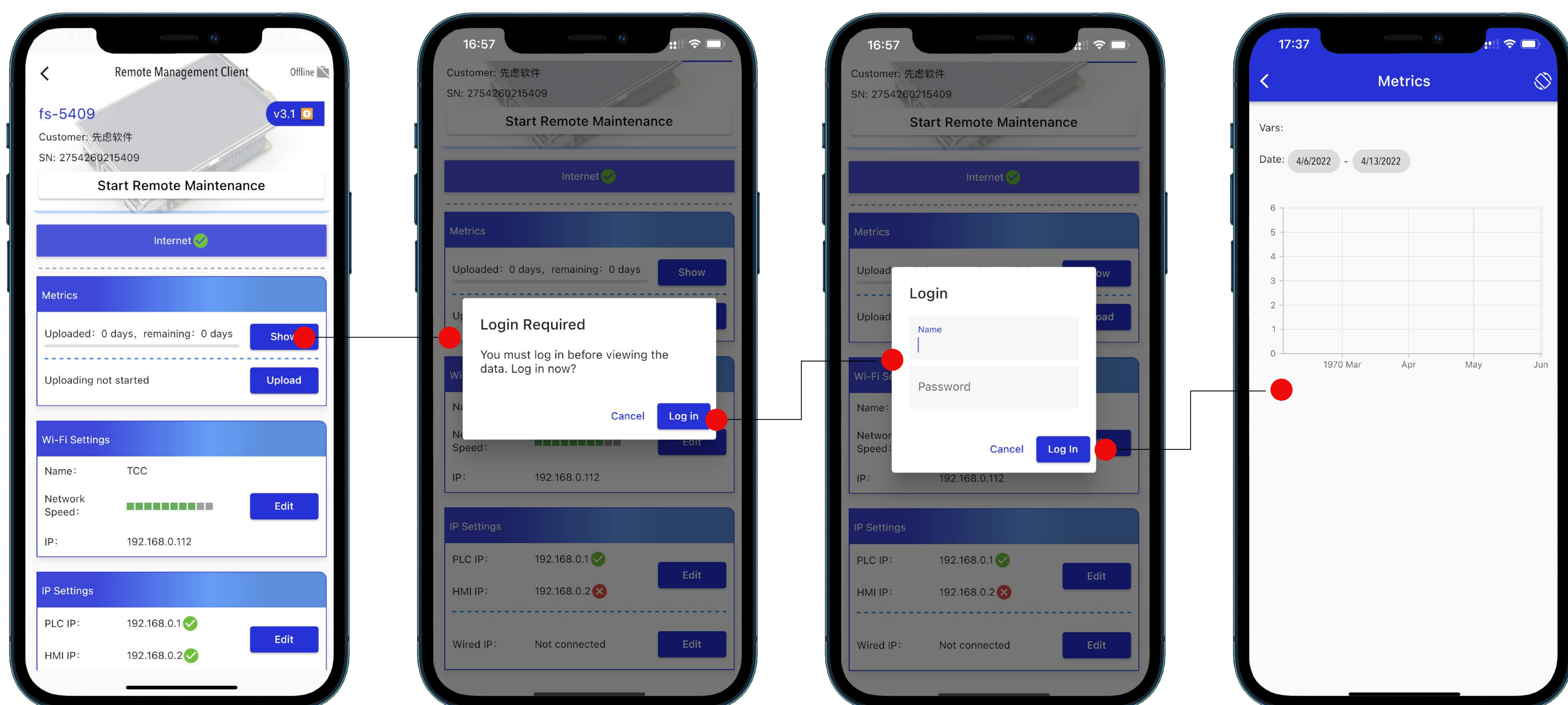
2. Data Display 数据展示

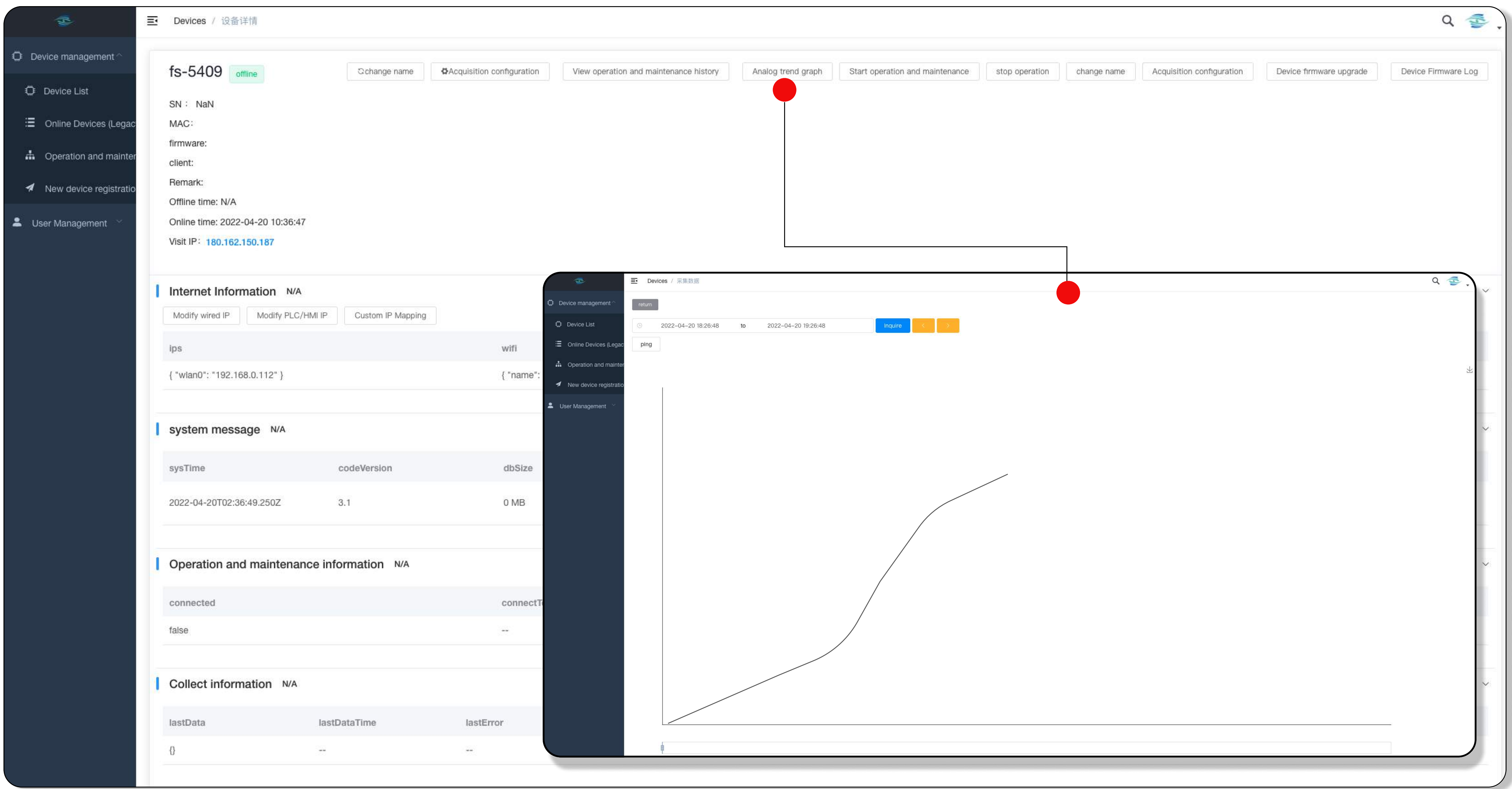
When upload data successfully through the APP, the operation data of the device will be displayed as operation trend on APP side. It is available for downloading the operation trend with selected time range as picture

用户通过APP成功上传数据后，设备运行数据可以在APP端进行查看数据的运行趋势图，支持下载当前查看数据区间展示的数据图，格式为PNG。

Tips: Data upload and the operation data of the device requires users to log in to the APP before they can be viewed

提示：用户需要先进行APP登录方能进行数据上传和查看设备数据展示





User can also view the operation data of the device on the page of the FS management system mentioned later.

用户同样支持在之后提到的FS管理系统中查看数据查看设备数据展示。

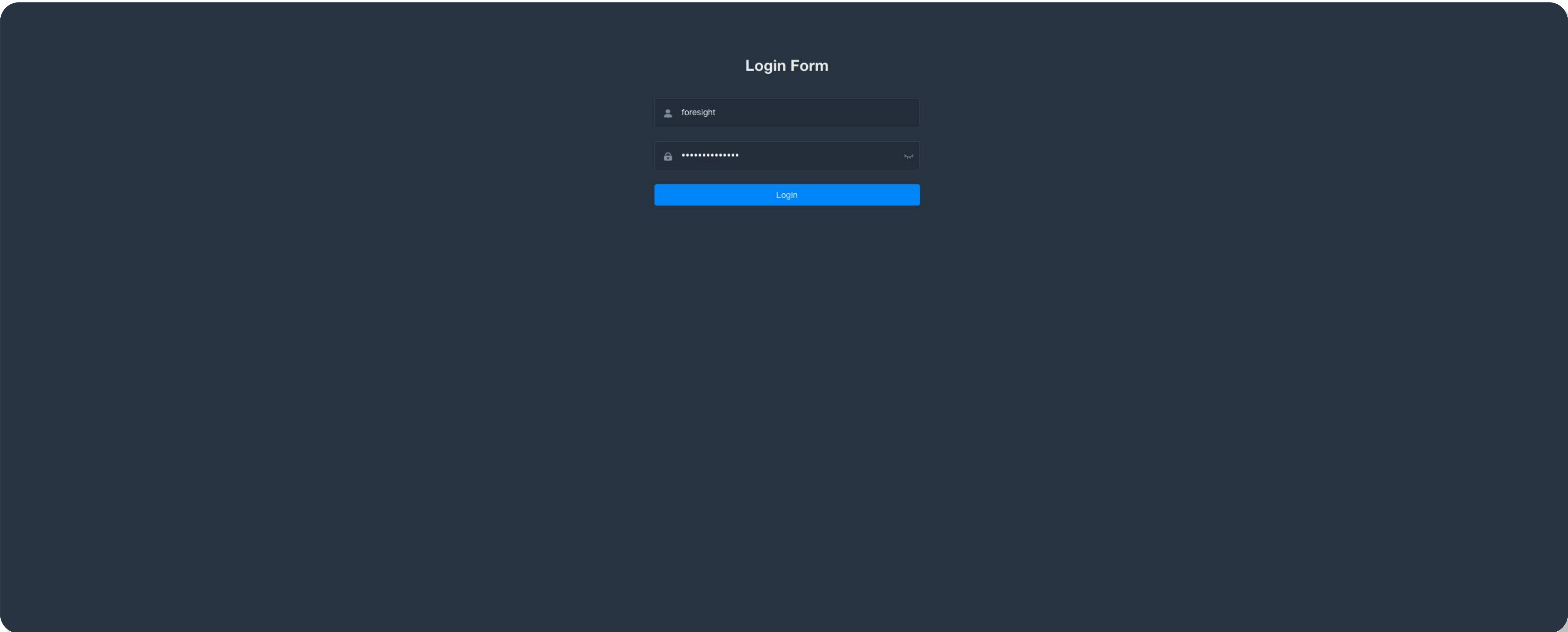
3. Login - FS management system FS管理系统登录

User enter the username and password to access the account successfully on the login page of FS management system(https://***.foresight-rms.com/#/login).

用户在FS管理系统的登录页面 (https://***.foresight-rms.com/#/login) 通过输入特定用户名和密码完成账号登录。

Tips: Since all the platform login domain name of customer is seperate, please consult our company for details

提示：由于所有客户的平台登录域名都是单独开放的，详情请咨询我司



Tips: The username and password required to login the above 3 systems ('Server' Windows application; FS Connector APP; FS management system) are exactly the same

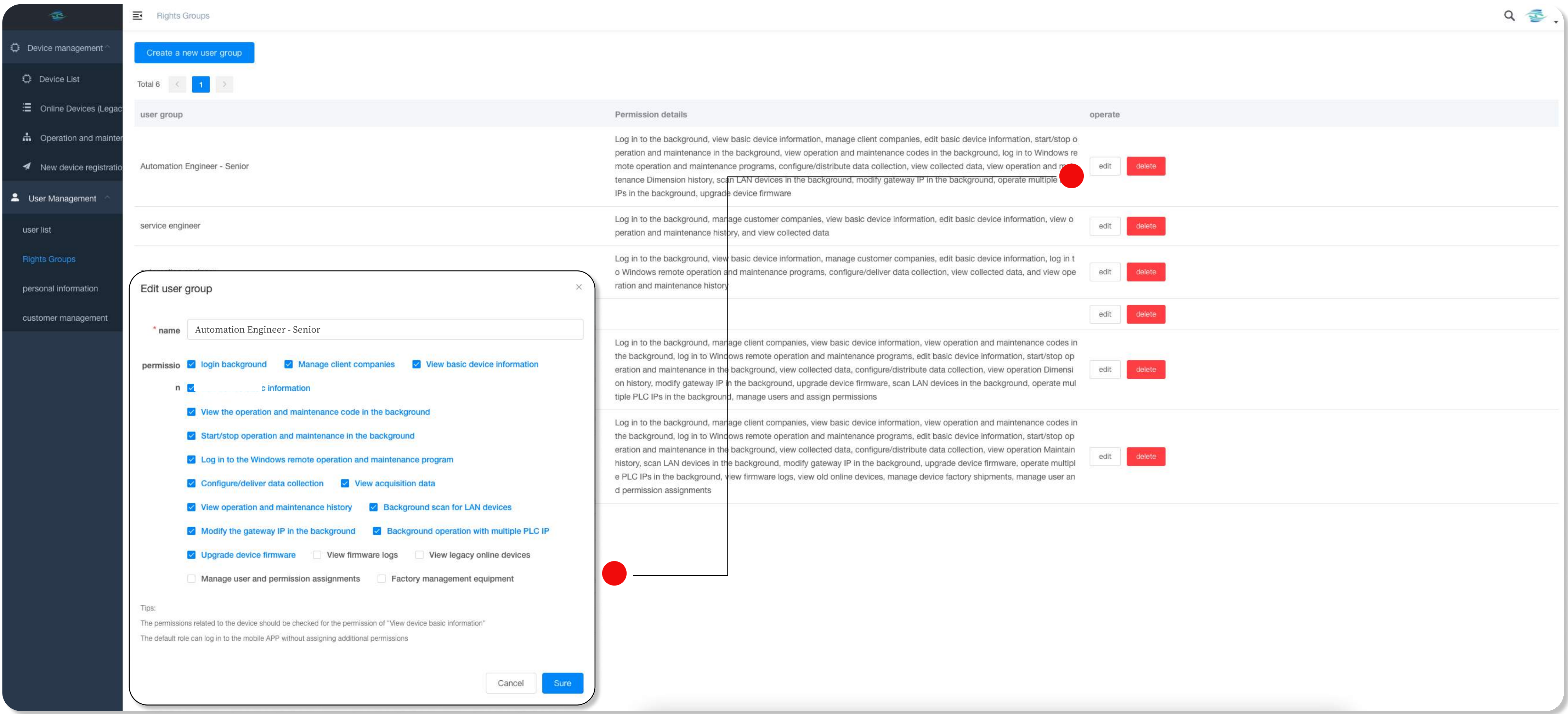
提示：上述3处系统登录('服务端'Windows应用程序; FS Connector APP; FS管理系统登录)所需用户名和密码完全一致



4. Configuration of permission groups 权限组配置

The system administrator choose the [Rights Groups] under menu [User Management] and configures permission groups for accounts to ensure the accuracy and security of the system operation. The system initializes several permission groups by default to meet the needs of different accounts.

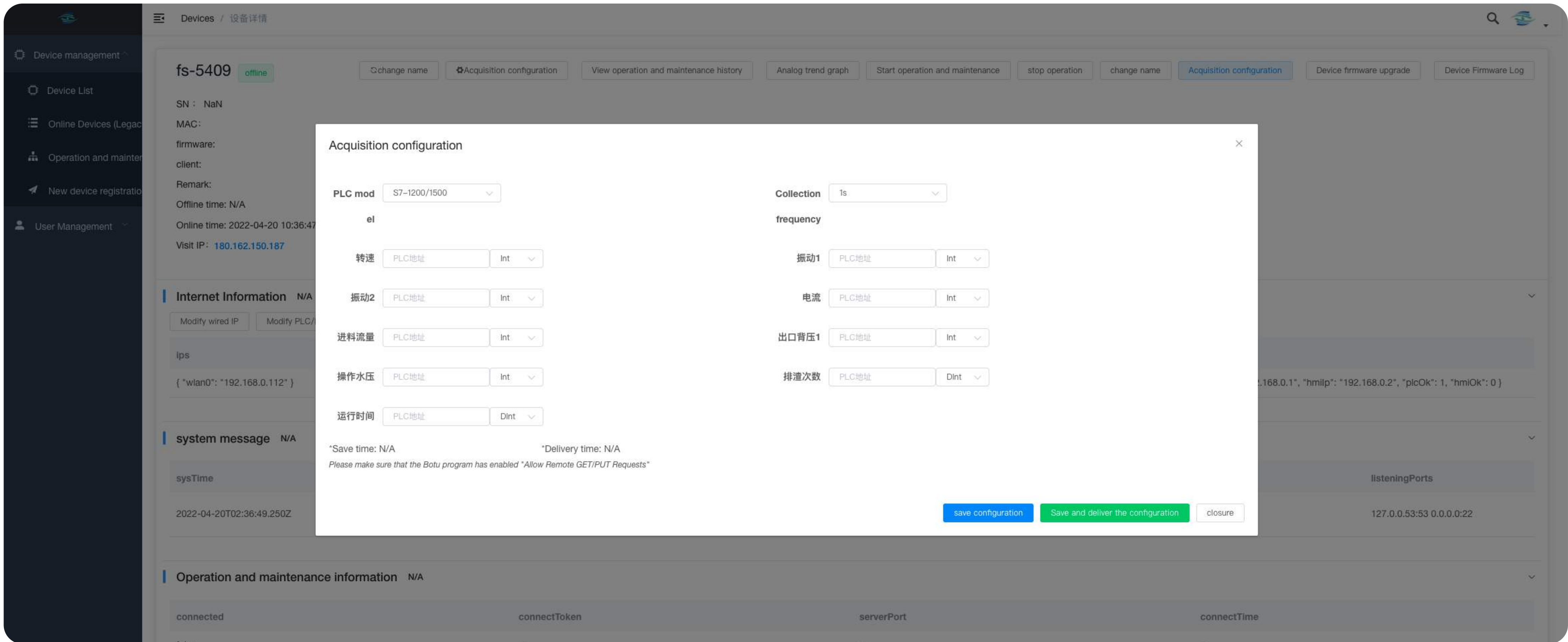
系统管理员选择菜单【User Management】下的【Rights Groups】给账户配置权限组以保证系统运行的准确性和安全性，当前系统默认初始化若干个权限组以满足不同账户的使用需求。管理员在使用过程中也可以对权限组进行动态调整来满足系统使用。



5. Parameter configuration of devices：设备参数配置

User enters the [Device Details] page of the device, click the button ‘Acquisition configuration’ to enter correspond parameters in the pop-up window. Only when complete the parameters configuration, user can view correspond data of the device on the Data Display page.

用户点击进入对应设备的【设备详情】页，点击“采集配置”，在弹框中输入对应参数。当且仅当配置参数后，方可在设备数据展示页查看到对应数据。

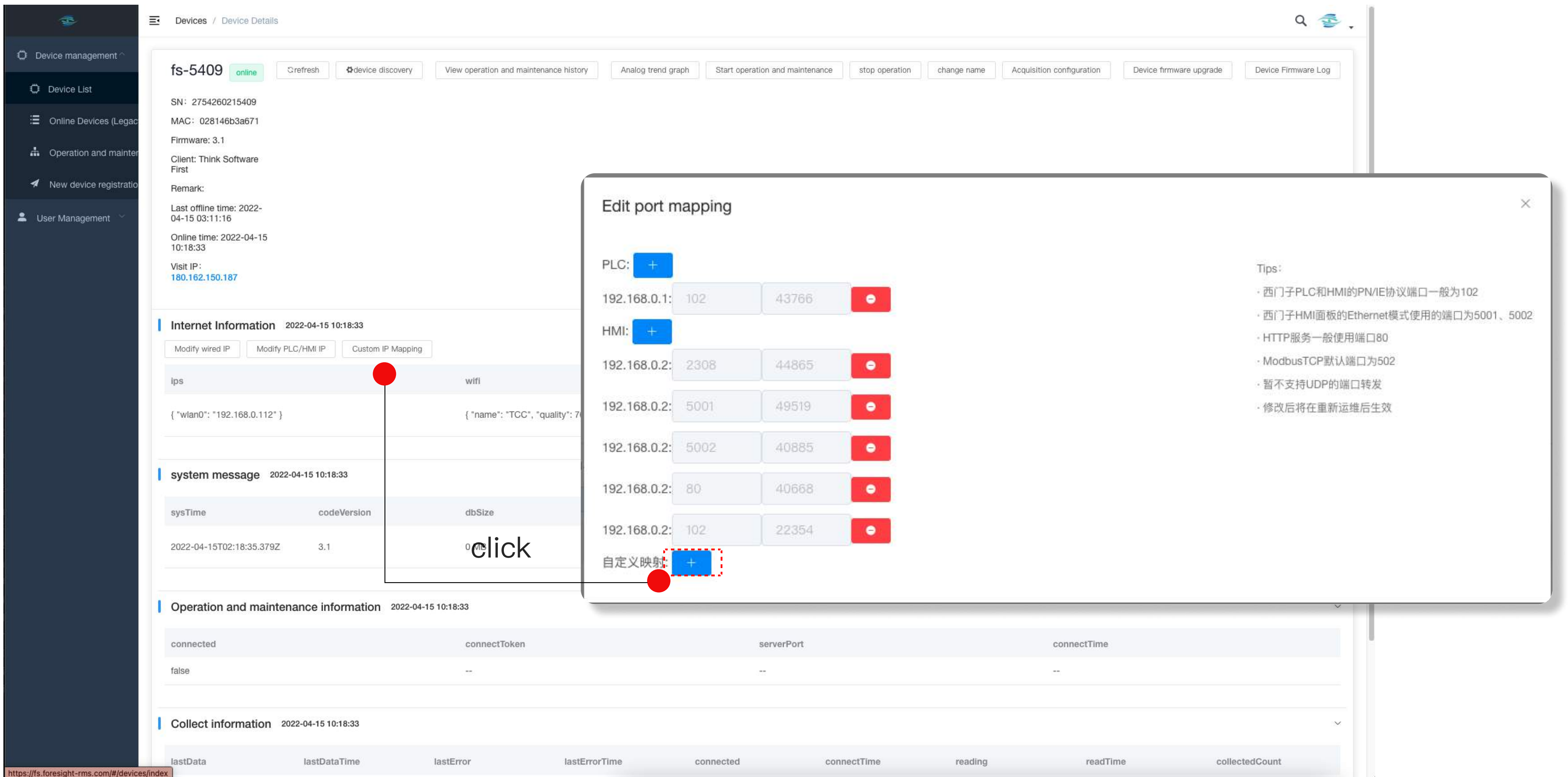
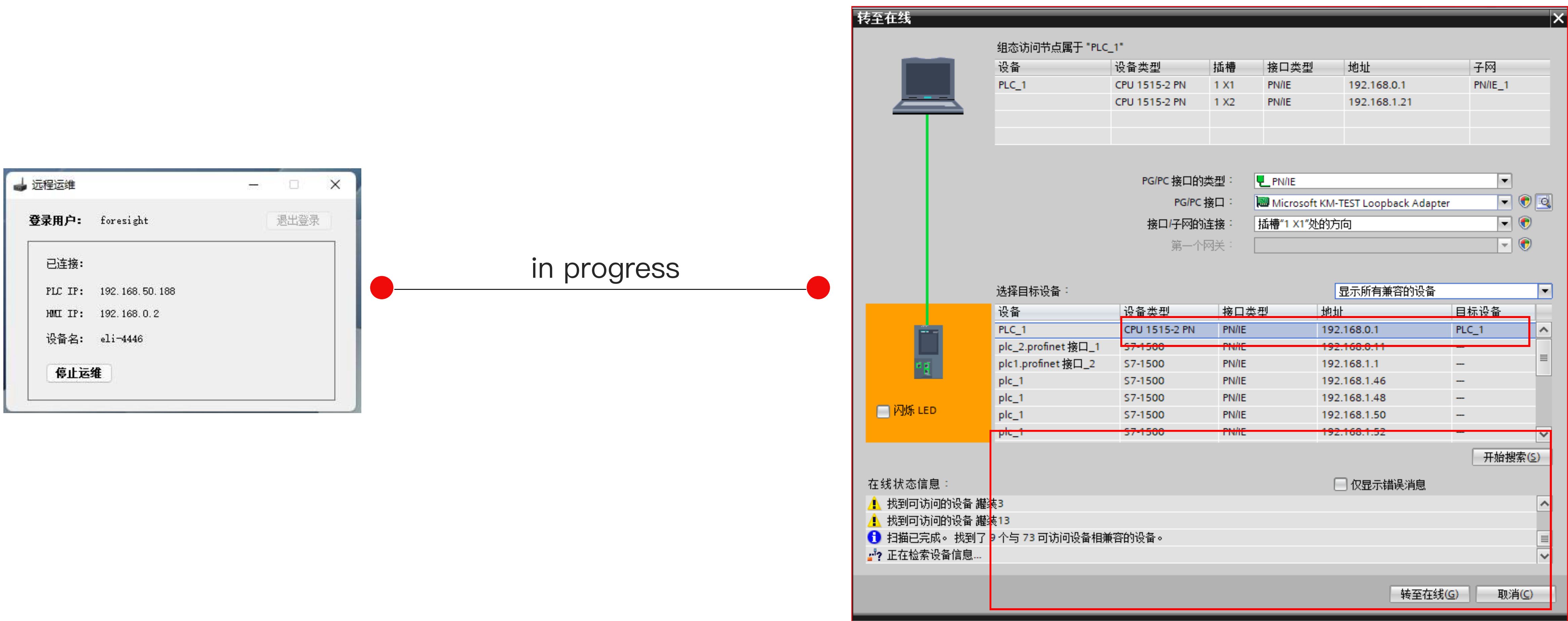




Device discovery 设备发现

When remote maintenance is in progress, the automation engineer can start to discover all authorized devices based on PN/IE protocol via the Siemens Portal software. Enter the device detail page in the FS management system, and click the button ‘Custom IP Mapping’ to configure IP address of devices found before. When the configuration work has been completed, the automation engineer can upload and download program of devices via the Siemens Portal software.

网关远程运维后，自控工程师在博图软件中可发现工段内所有基于PN/IE协议的设备。在FS管理系统中，进入设备详情页并点击自定义IP映射，添加上述已发现设备对应的IP地址并保存。配置完成后，工程师可以在博图中对已配置IP映射的设备进行程序的上传和下载操作。

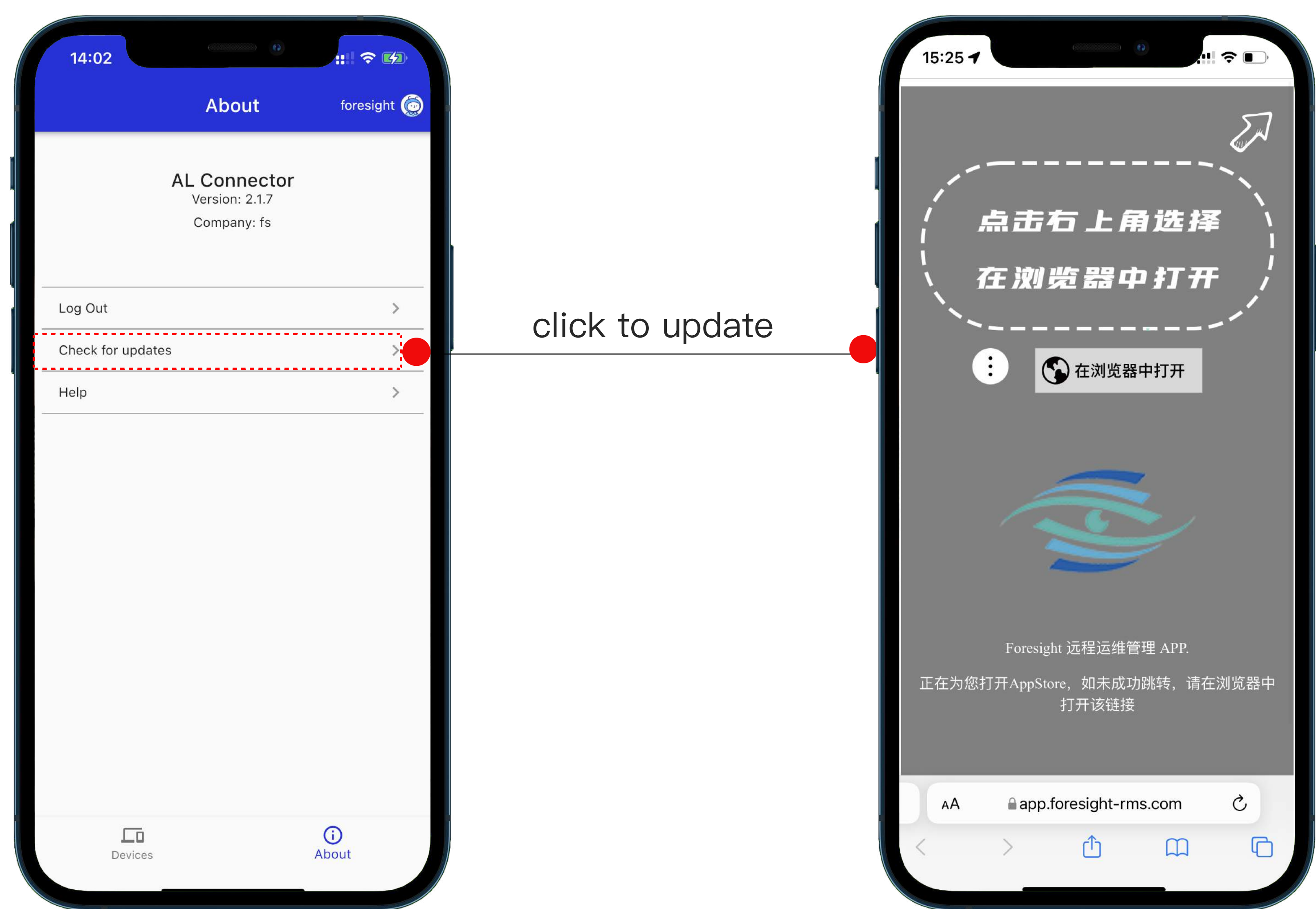




Gateway Upgrading 网关升级

1. Upgrade APP version : 升级APP版本

When opening the APP, users can click "Check for updates" on the "About" page to upgrade the APP version according to the prompts ;
在打开APP时，用户可在“关于”页面，点击“版本更新”，根据提示进行APP版本的升级；

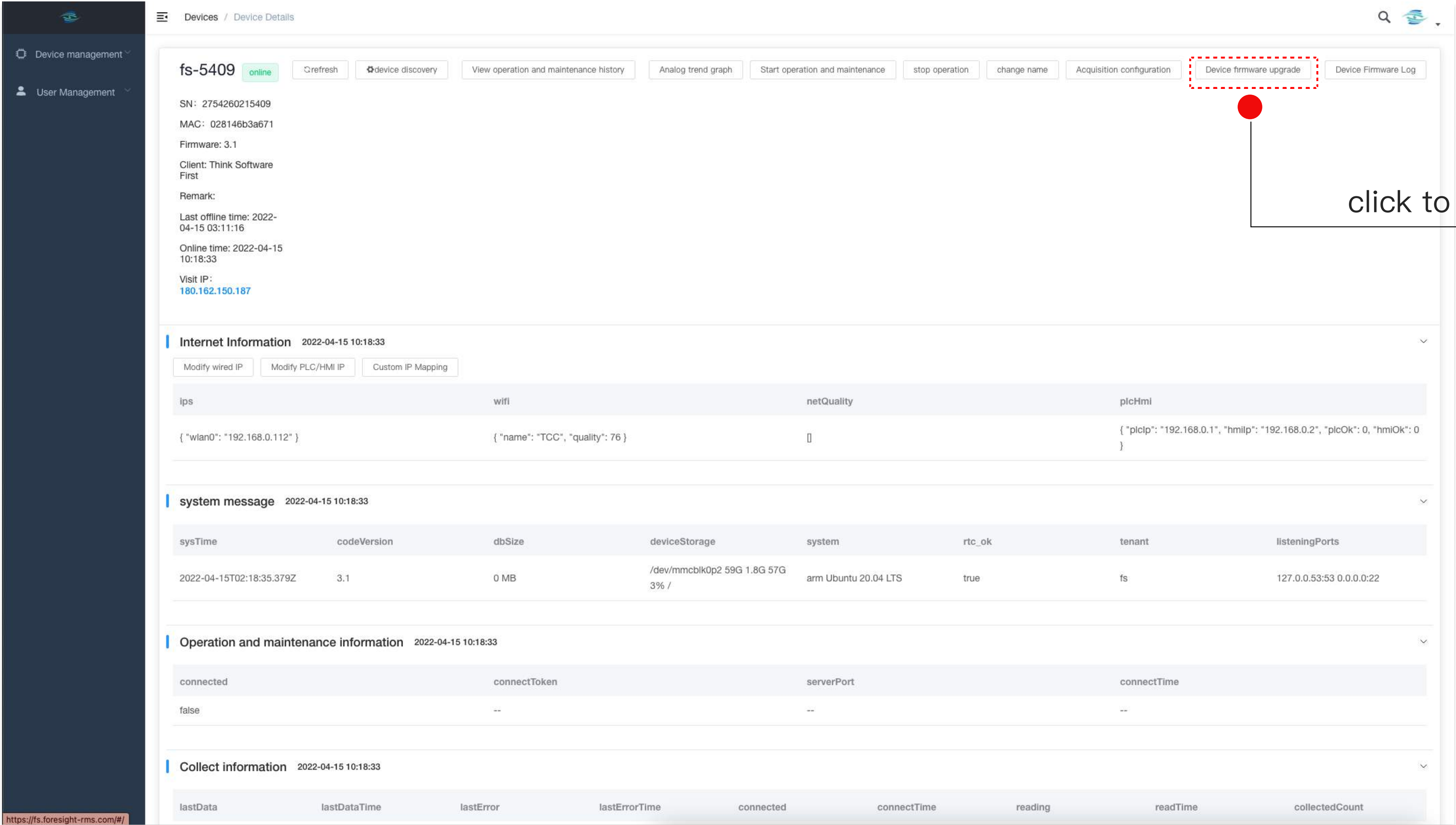


Tips: Android device can download directly, while IOS device needs jump to the APP store to download.
提示： 安卓系统设备支持直接启动下载， iOS系统设备将跳转到APP store下载。

2. Upgrade gateway firmware version : 升级网关设备固件版本

When entering the device Details page of the FS management system , users can click the button 'Device firmware upgrade' in the upper right corner to upgrade the device firmware according to the prompt ;
用户可在FS管理系统的“设备详情”页面，点击“设备固件升级”按钮，根据提示进行设备固件的升级；

Tips: The firmware version can be upgraded when the online maintenance of the gateway is worked.
提示： 在确保网关在线运维后，方能进行固件版本的升级。



Troubleshooting 故障排除

No	Problem	Reason	Solution
1	Unable to find the gateway in APP	Too far between mobile and gateway	search nearby the gateway
		Unable to turn on the bluetooth	Turn on the bluetooth and allow the APP to refresh the device list through the bluetooth
		Gateway power off	Check if the gateway semaphore is flicker and access in the power supply of 5V/1.5A
		others	Reboot the gateway and exit the process of the APP in the mobile and reopen the APP
2	APP shows that fail in PLC/HMI(an error behind the IP address)	IP address between gateway and PLC are not in the same network segment	reset the gateway IP and confirm the PLC IP
		HMI prompt error even it can ping successfully	The background program of the touch screen crashed, it needs reboot the HMI program by the other way
		The network cable is plugged into the wrong network port	Check if the cable which connects with HMI/PLC insert into the gateway LAN port
3	Fail to start remote maintenance	The device fail to connect to the internet	Check if the APP has connected to the hotspot or network cable with the internet. Reboot the device to ensure the identification correctly when switch the networking mode
		Poor network quality and APP shows the Exclamation mark in the page	Switch to the hotspot or wired network
		Prompt the device is not registered or the key is wrong	Unauthorized device, need to be confirmed with the supplier
4	Portal can not connect the PLC	The Portal in the virtual machine system while the server program is outside the virtual machine system	Ensure the Portal and the server program stay in the same system or the same virtual machine
5	Portal fail to show the online HMI program	The interface of PG/PC setup incorrect	Setup the PG/GC interface as the network card instead of the SIM network card of PLC

序号	问题	原因	解决方案
1	手机APP搜索不到网关	手机距离网关距离过远	靠近网关位置进行搜索
		手机未打开蓝牙	打开手机蓝牙，允许APP使用蓝牙并刷新设备列表
		网关未通电	检查网关信号等是否闪烁，并接入5V1.5A电源
		其他	重启网关并且退出手机APP进程重新打开APP
2	APP显示PLC/HMI不通（IP后有红叉）	网关IP和PLC IP不在一个网段	重新设置网关IP和确认PLC IP
		能和HMI互相ping，但是HMI仍然显示错误	触摸屏后台程序故障，需要使用其他方法重启HMI程序
		网线插错网口	确认直连HMI/PLC的网线插入网关LAN口
3	操作开始运维失败	设备未联网	确认已连接至有网络的热点或者网线，切换联网方式后可以重启设备以确保正确识别
		网络质量太差，APP会显示感叹号提示	更换热点或者使用有线网络
		提示设备未注册或者KEY不正确	设备未授权，需要联系供应商确认
4	博图无法连接运维的PLC	博图位于虚拟机系统中，而服务端程序在虚拟机外	确保博图和服务端程序在同一系统中或者同一虚拟机中
5	博图无法在线HMI程序	PG/PC 接口未设置正确	设置PG/PC接口为上网的网卡，而非PLC的SIM网卡