Haiwell 海为®

Haiwell Intelligent Gateway CBOX

Haiwell Intelligent Gateway Instructions



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Edit History

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I. Product Introduction

1. Main Functions

Haiwell Intelligent Gateway CBOX, which we call a "Haiwell Cloud HMI without a screen", can be easily managed through a mobile app and cloud website. It is an industrial automation monitoring and management device running on embedded system software, namely Haiwell configuration engineering. By accessing the CBOX operation screen through a mobile app and cloud website, the on-site industrial situation can be monitored. It can also communicate with various industrial control devices. Just connect to the network via Ethernet, WIFI, or 4G, and remote device management operations can be performed, with data collected and uploaded to the cloud for further application. On-site alarm information can be promptly notified to relevant staff through WeChat, APP, or emails. Multiple devices in different locations can be simply configured through Haiwell Cloud to easily achieve centralized management and control of one-to-many and many-to-many devices in different locations.

2. Core Highlights

- **Mobile as HMI Screen:** Download HMI configuration projects for direct local access via mobile devices, supporting QR code-based instant access.
- **LAN Interconnectivity:** Plug-and-play connectivity with phones, tablets, PCs, TVs, cameras, and HMIs in local networks.
- **IoT Capabilities:** Seamless internet-based connections with phones, tablets, PCs, TVs, cameras, and HMIs.
- **Remote Access:** Revolutionizes traditional Web SCADA solutions with zero reconfiguration and WYSIWYG visualization; supports asynchronous/synchronous multi-user monitoring.
- **Data Security:** Enables data transmission/storage to designated servers with flexible local or public network deployment.
- **Open Interfaces:** Compatible with MQTT, OPC UA, HTTP, TCP protocols for seamless ERP/MES/third-party system integration.
- **UI Embedding:** Direct integration of third-party software, apps, and mini-programs into project interfaces for instant remote control.
- **Equipment Intelligence:** Supports text-to-speech, full-scene voice intercom, audio file playback, camera monitoring and other applications.
- **Digital Dashboard:** Achieve smart factory visualization via Haiwell TVBOX networking for data display and centralized equipment monitoring.
- **Satellite Positioning:** Supports Beidou positioning and trajectory tracking, making device positioning more accurate and enabling functions such as dynamic trajectory tracking and electronic fences for the device.

II. Product Specifications

1. Product Parameter

Model		CBOX	CBOX-E	CBOX-GP
Software	Programming management software	Haiwell Cloud Configuration SCADA		
Hardware	Flash	4GB		
	RAM	512MB		
	Serial Port	COM1：RS232*1 COM2：RS485*1		
	Ethernet	10/100 Base-T*2		
	USB	USB 2.0*2		
	RTC	Built in real-time clock		
Power supply	Input power supply	24V DC±20%		
	Power consumption	7W@24VDC		
	Power protection	Equipped with surge protection and anti-reverse connection protection		
	Withstanding voltage	500V AC		
	Insulation impedance	Exceed 50MΩ @500VDC		
Environment	Storage environment temperature	-20℃ ~ +70℃		
	Operating ambient temperature	-10℃ ~ +60℃		
	Relative humidity	10% ~ 90% RH（no condensation）		
	Cooling method	Natural wind cooling		
	Vibration resistance	10~25 Hz (X.Y and Z axis 2G/30 minutes)		
	Resistance to impact	15G, 11ms duration, 6 times each in the X, Y and Z directions		
	Usage environment	Dustproof, moisture-proof, corrosion-resistant, and protected from electric shock and external impact environments		
Shape	External dimensions (W*H*D)	50mm*120mm*88mm		
	Shell material	Engineering plastic ABS+PC (flame retardant requirements: 94V0, in line with ROHS requirements)		
	Installation method	35mm Guide rail		
Features	WIFI	Support		/
	Satellite positioning	/		Support
	4G	/	Global 4G	4G（China）

2. Product Model List

Model	Storage	LAN	USB	COM	GPS	WIFI	4G	Dimensions W*H*D（mm）
CBOX	4G+512M	2	2	2	/	Yes	/	50*120*85
CBOX-GP	4G+512M	2	2	2	Yes	/	4G（China）	
CBOX-E	4G+512M	2	2	2	/	Yes	Global 4G	

III. Product Description

1. Product Appearance



Figure1 3D Display of CBOX

2. Product Dimensions

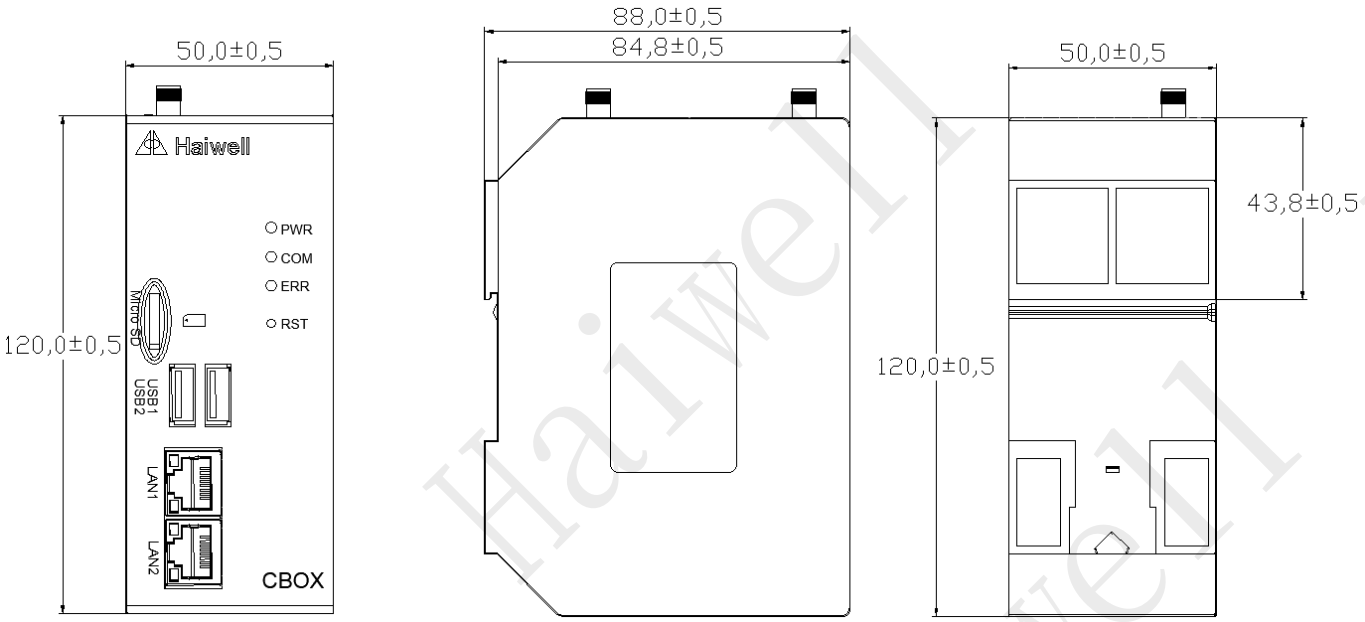


Figure2 Three-view Dimensions of CBOX

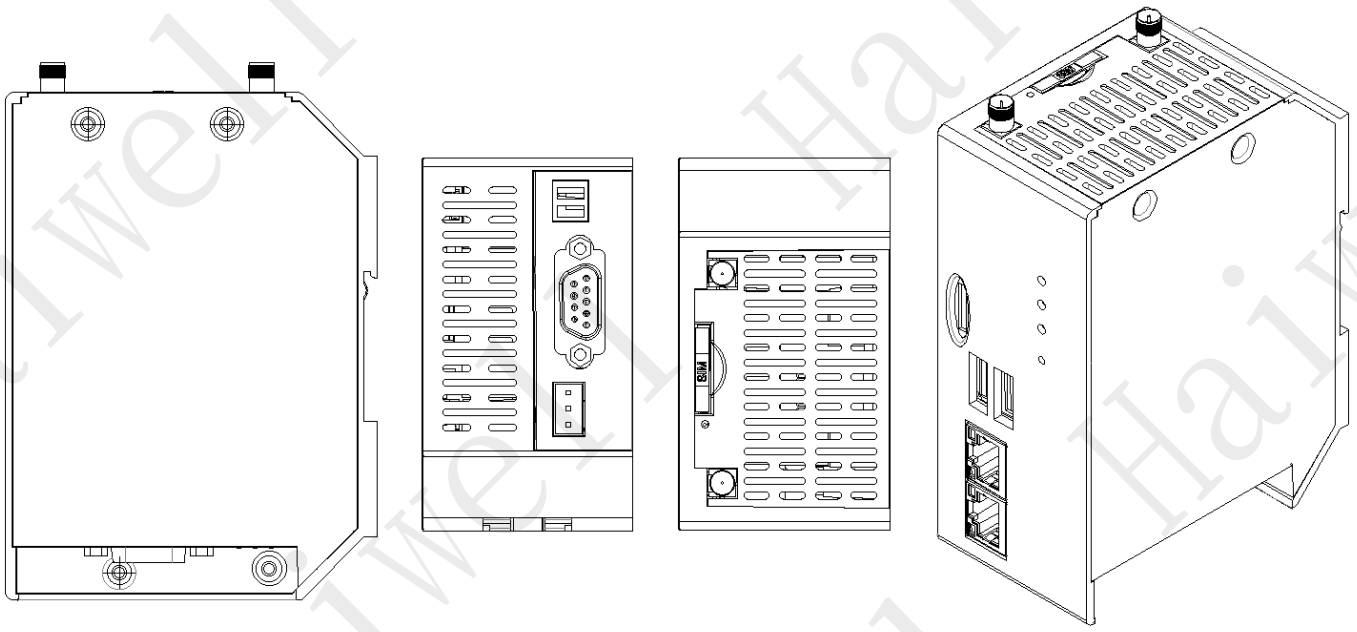


Figure3 Other CAD Drawings of CBOX

3. Product Interface Description

3.1 Front Interface

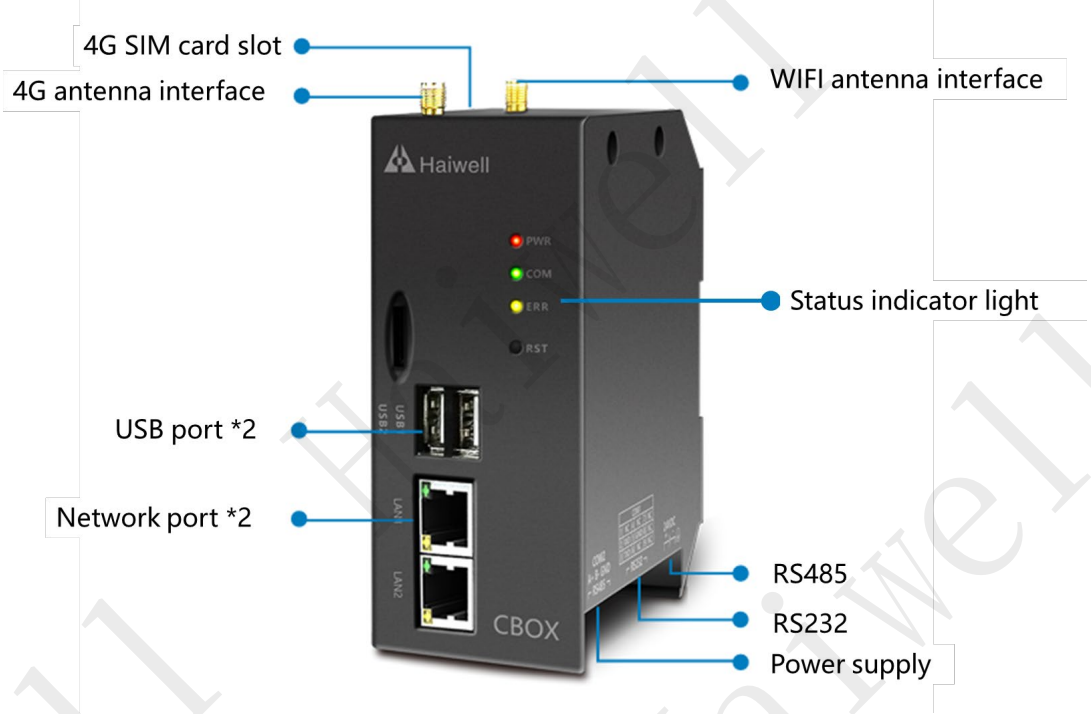


Figure4 Front Interface Diagram of CBOX

3.2 Indicator Light Descriptions

Table 1 Indicator Light Descriptions

CBOX Indicator Light Instructions			
	Indicator	Name	Description
	PWR (Red)	Power Indicator	On: Normal power supply Off: Abnormal power supply
	COM (Green)	Communication Indicator	Blinking: Communication in progress, the blinking frequency indicates the speed of communication Off: No communication
	ERR (Yellow)	Error Indicator	Off: Normal On: Abnormal

CBOX power-on initialization/download project: all indicator lights will be lit up simultaneously and remain on for 3-4 seconds, then enter the three-channel flowing mode of alternating flashing.

CBOX cloud passthrough mode: all indicator lights will be switched on and off simultaneously with a period of 1 second.

3.3 Bottom Interface

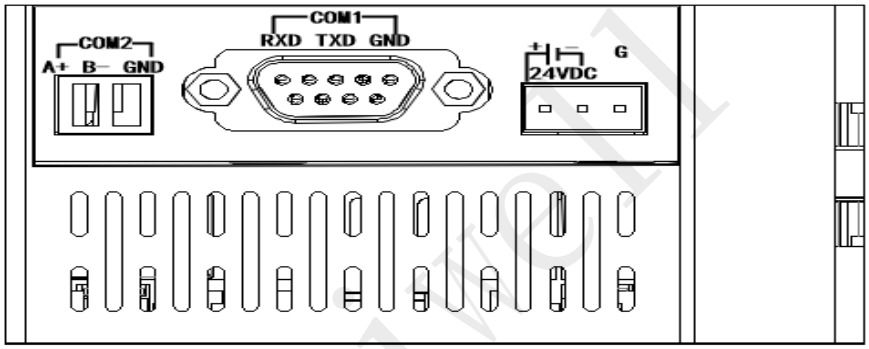


Figure5 Schematic Diagram of the Bottom Interface of CBOX

3.4 Communication Interface Definition

Table 2 RS232 Nine-pin Serial Port Pin Definitions

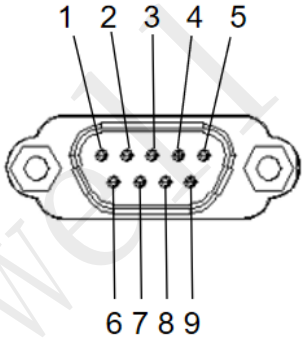
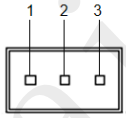
COM1 Definition of nine pin serial port pins			
 RS232:COM1	Pin number	Definition	Pin description
	1	NC	null signal
	2	COM1:RXD	RS232 communication receives data
	3	COM1:TXD	RS232 communication sends data
	4	NC	null signal
	5	COM1:GND	signal ground wire
	6	NC	null signal
	7	NC	null signal
	8	NC	null signal
	9	NC	null signal

Table 3 COM2 Serial Port Pin Definitions

COM2 RS485 Pin Definitions			
 RS485:COM2	Pin number	Definition	Pin description
	1	COM2:A+	RS485 communication "A+"
	2	COM2:B-	RS485 communication "B-"
	3	COM2:GND	signal ground wire

4. Electrical Connection of CBOX

4.1 Power Connection

With the product identification plate on the side of the device facing downwards, the power interface of the CBOX is located at the bottom right of the device. The device is powered by 24VDC. Connect the "24V+" terminal of the switching power supply to the "24V+" port of the device, and the "24V-" (0V) terminal of the switching power supply to the "24V-" port of the device. To better protect the device and

reduce electromagnetic interference, the CBOX can be grounded.

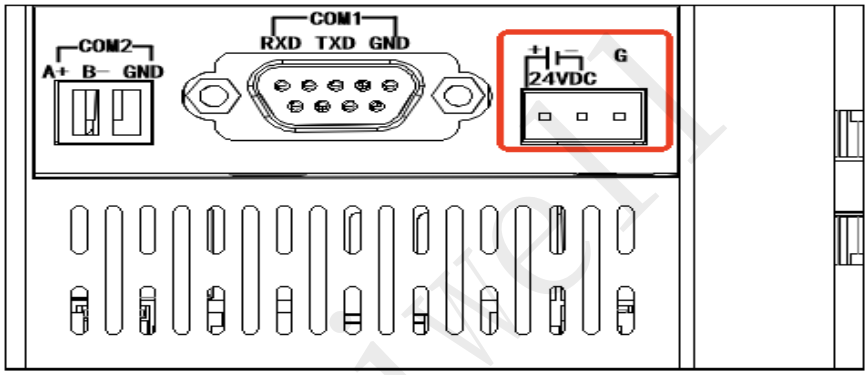


Figure6 CBOX Power Interface

4.2 Ethernet Connection

The CBOX Ethernet LAN port is located at the lower part of the front panel of the device. It is mainly used for device networking, uploading and downloading projects, etc. Users can also connect the lower computer through the LAN port for communication.



Figure7 CBOX Ethernet Interface

4.3 Serial Port Connection

The CBOX serial port is divided into DB9 interface and RS485 interface, which can simultaneously support RS232/RS485 communication. COM1 is the RS232 DB9 interface, and COM2 is the RS485 interface. The detailed definition of DB9 pins can be found in 3.4 Communication Interface Definition.

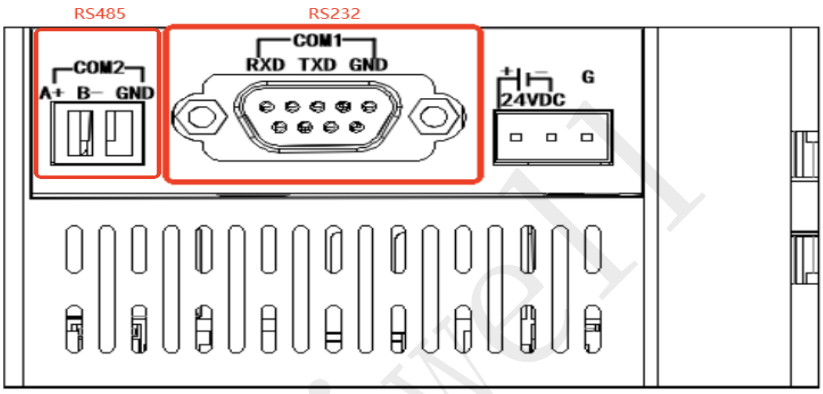


Figure8 CBOX Serial Port Interface

IV. Installation and Use of CBOX

1. Hardware Installation

Step 1: Assemble the standard 35mm rail.

Step 2: After placing the gateway on the rail, push the white latch upwards to the locked position.

Step 3: Connect the 24VDC power supply according to the markings on the device and check if the PWR indicator light on the panel is lit normally.

Note:

① The installation direction must be in accordance with the provisions of this manual. Connect the wires strictly in accordance with the markings on the terminals; otherwise, it may cause product failure or burnout.

② The product and other components at the bottom must maintain sufficient space to avoid equipment damage caused by poor heat dissipation.

2. Antenna Installation

The Haiwell Intelligent Gateway is standard equipped with WIFI (Except for the -EP and -GP models) and optional 4G function. To obtain the best signal strength, please lead the antenna out of the control cabinet. It is recommended to install the gateway on the topmost rail of the cabinet. After leading the antenna out from the gateway, note that the antenna should avoid the power supply line slot and be led out through the line slot to the opening at the top of the cabinet, as shown in the following figure:

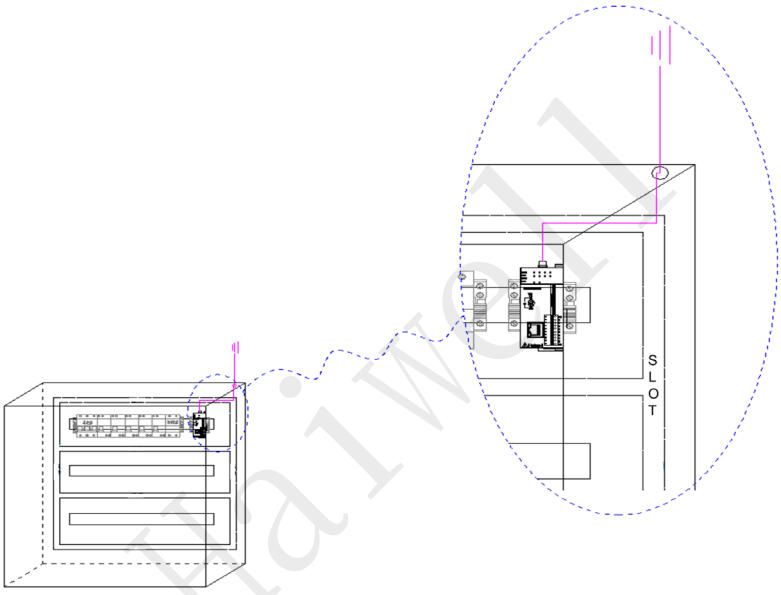


Figure9 Antenna Installation Diagram

V. CBOX Settings

1. Companion Software

Download of Haiwell SCADA:

● Haiwell gateway needs to be used in combination with Haiwell SCADA cloud configuration software. Please download it from the Haiwell official website.

● Haiwell cloud service can be used by visiting the Haiwell cloud website http://ecloud.haiwell.com. It is recommended to download the Haiwell Cloud APP on your mobile phone.

Download of Haiwell Cloud APP (Haiwell Cloud):

● Download from Haiwell cloud website;

● Download directly by scanning the QR code below;

● For IOS terminals, you can search for "Haiwell Cloud" in the Apple App Store to download.

2. Connection and Access

2.1 Binding without Powering On and Scanning the Code

CBOX supports the binding of devices by scanning the code without power. After logging in to the Haiwell Cloud APP with your account, scan the QR code on the left side label of CBOX to send the binding application message. When CBOX is powered on and connected to the network, enter the background settings and click on the cloud settings to approve the device binding application.

Step 1: Open the Haiwell Cloud APP and log in with your account.

Step 2: Click on the top left corner ⊕ and select the Scan function.

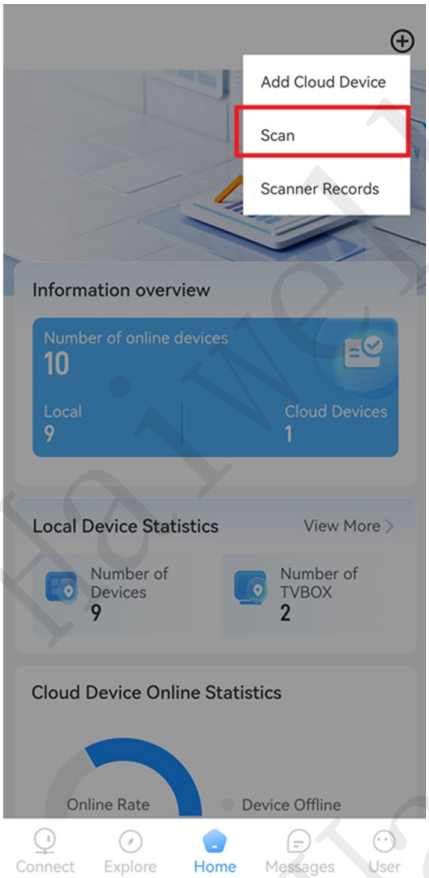


Figure10 Open the Scan Function on the Mobile APP

Step 3: Use your mobile phone to scan the QR code on the label on the left side of the CBOX to enter the binding application interface.



Figure11 QR Code on the Side of CBOX

Step 4: Click to confirm the binding of the device.



Figure12 CBOX Device Binding

Step 5: You can edit the device name, review mechanism, and device location. Note: CBOX requires an internet connection.

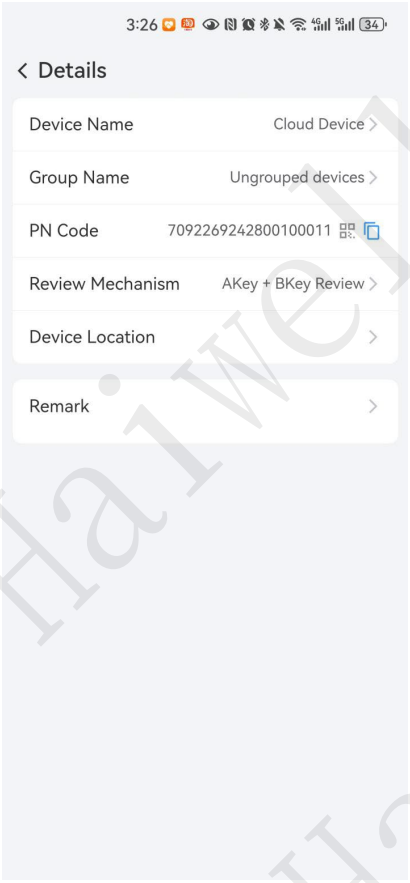


Figure13 Editing Device

Step 6: Wait for the APP to redirect to the device details interface, which is as follows:

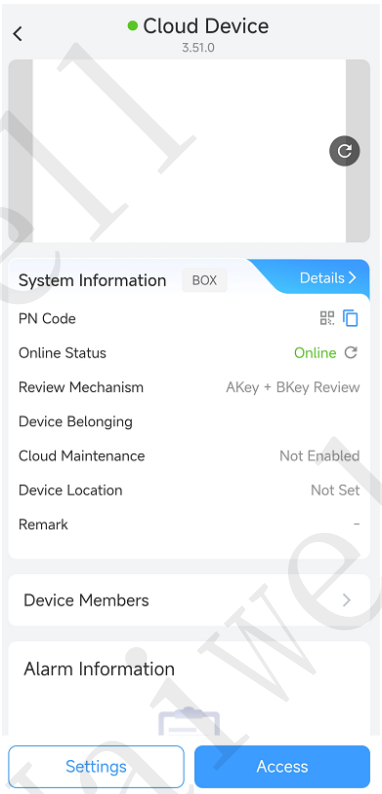


Figure14 Detailed Interface of CBOX Device

2.2 Connect to the Hotspot to Access CBOX

Step 1: Turn on the WIFI connection on your mobile phone and search for the CBOX hotspot. (The P/N code is on the label on the left side of the CBOX.) For example, if the PN code is 7081447500170193030, the hotspot name will be BOX-708144-93030.

Note: Since the CBOX-GP does not support WIFI, it cannot be accessed via a hotspot connection. You need to use a computer to directly connect to the CBOX. Click to jump: Directly connect the computer to the CBOX via an Ethernet cable.



Figure15 Mobile Phone Connecting to a WIFI Hotspot

Step 2: Open the Haiwell Cloud APP, click on local devices, download and refresh the device list, and then click on direct access.

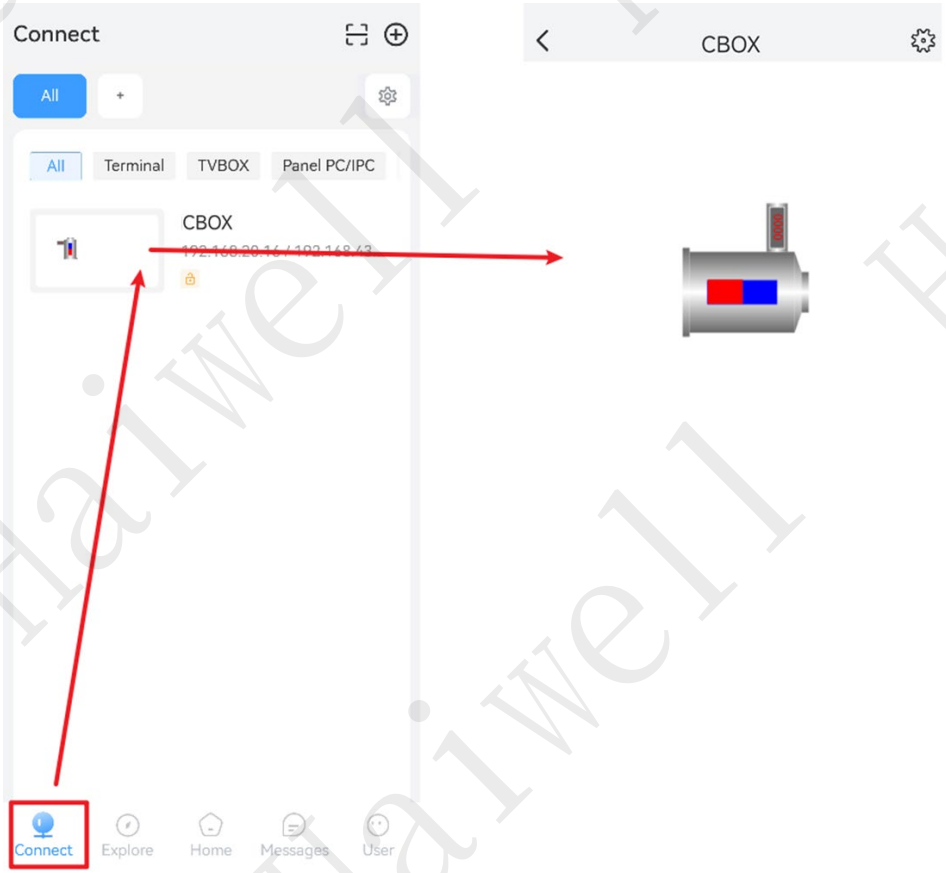


Figure16 Local Device of Mobile APP

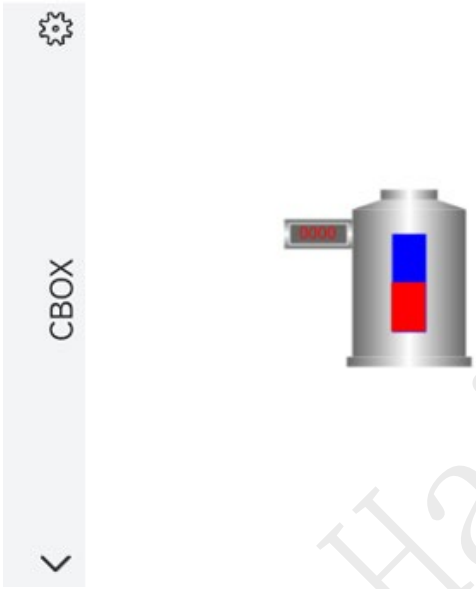


Figure17 CBOX Operating Screen

Special Case: If the local device list is empty, click ⊕ Enter hotspot IP: 10.5.5.1 and then click "Connect Now" to access the CBOX screen.

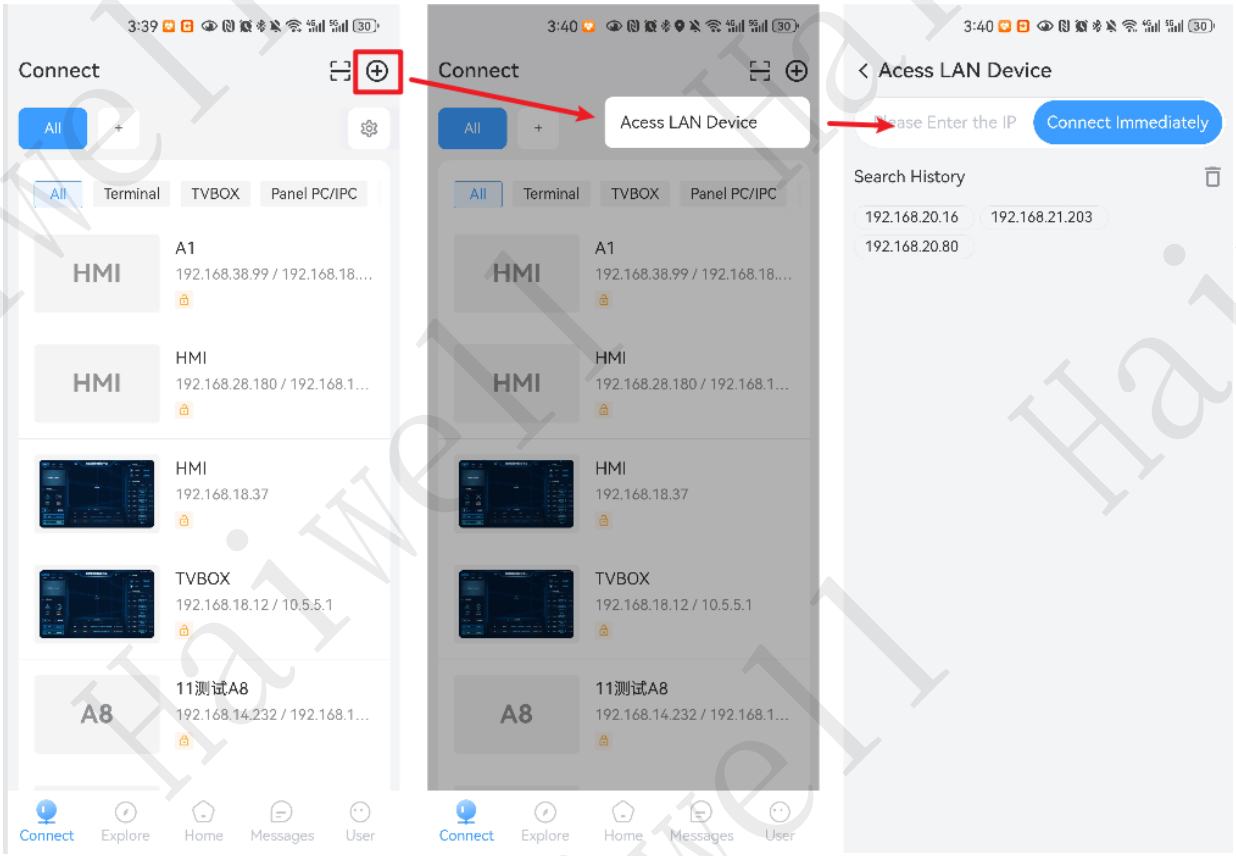


Figure18 Local Device Search for Hotspots

2.3 Directly Connect Computer to CBOX with Network Cable

Users can connect their computers to CBOX with a network cable to access and control CBOX.

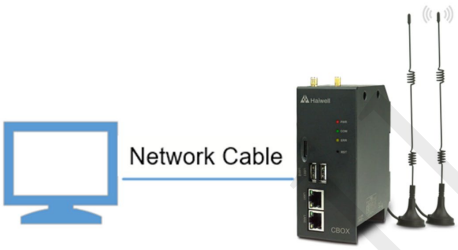


Figure19 Schematic Diagram of CBOX Directly Connected to Computer

The default IP address of CBOX is 192.168.1.112. Users need to set the IP address of their computer's network card to be in the same network segment as CBOX.

Step 1: Open "Control Panel" and select "Network and Sharing Center".

Step 2: In the "Network and Sharing Center" window, click on "Change adapter settings" on the left side.

Step 3: In the "Change adapter settings" window, you can see a list of all network adapters on your computer.

Step 4: Double-click on the local connection of your computer's network card, then click on "Internet Protocol Version 4 (IPV4)". Here you can view the IP parameters of your PC: IP address 192.168.1.31, subnet mask 255.255.255.0, default gateway 192.168.1.1. Set the IP parameters of your computer to be in the same network segment as CBOX.

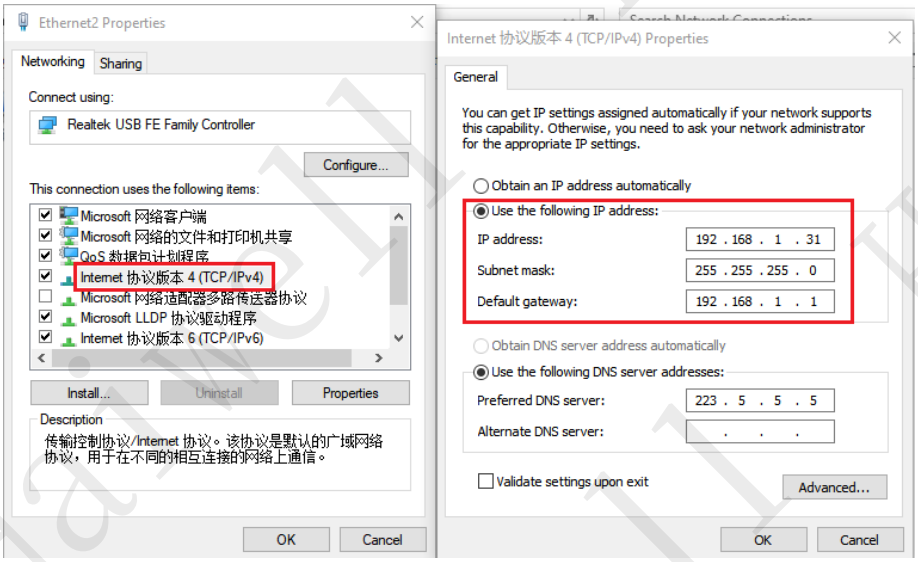


Figure20 Modifying the Ethernet Segment of a Computer

In a local area network (LAN), you can also access CBOX through a web browser. The prerequisite is that the computer and CBOX must be in the same LAN and on the same network segment. Enter the device's IP address in the browser to access it; enter the device IP + /setting (example: 192.168.11.123/setting) to enter the background settings interface.

For example, if CBOX's IP is 192.168.130.3 and the computer's Ethernet IP is 192.168.130.155, both are already in the same LAN.



Figure21 Local Access and Operation Interface of the Computer Browser



Figure22 Local Access Background Settings in Computer Browser

3. Background Settings

Users can configure the basic functions and parameters of the CBOX through the background. The following is an introduction to some of the important configurations.

3.1 Project Settings

（1） Generate USB Flash Drive Running Files

CBOX supports the operation file of the USB flash drive project generated by using the Haiwell Cloud SCADA configuration software Cloud SCADA.

Step 1: Create a new project, select the operation platform as CBOX-7/CBOX-10 and click confirm. Here, the operation platform is the resolution distinction. CBOX-7 is 800*480, and CBOX-10 is 1024*600 (the operation platform is universal for the model tail number -E or -GP). Click on the【Project】under the Scada menu bar, expand the tag, and click on【Generate USB flash drive operation file...】.

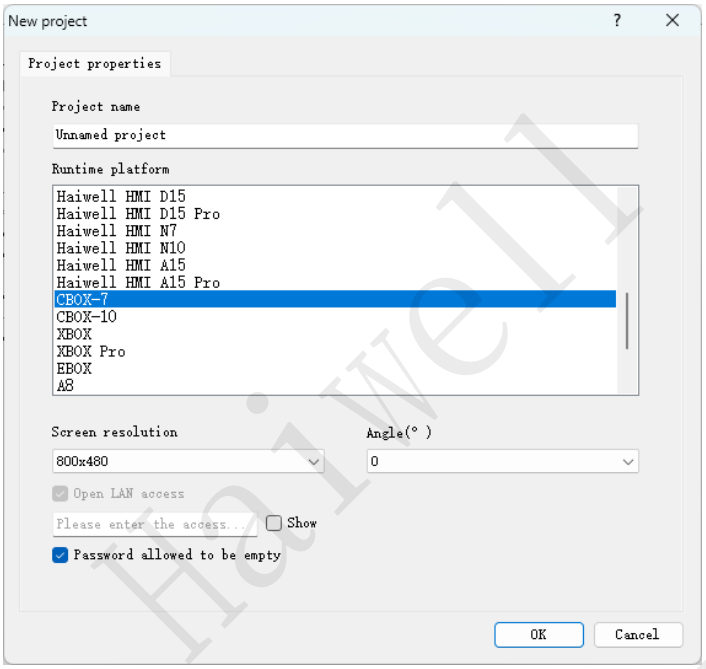


Figure23 Operating Platform

Step 2: Enter the compilation interface. After the compilation is successful, set an appropriate output path and click【OK】.

Step 3: After the file is saved successfully, a prompt box indicating successful saving will pop up. Click【OK】to proceed.

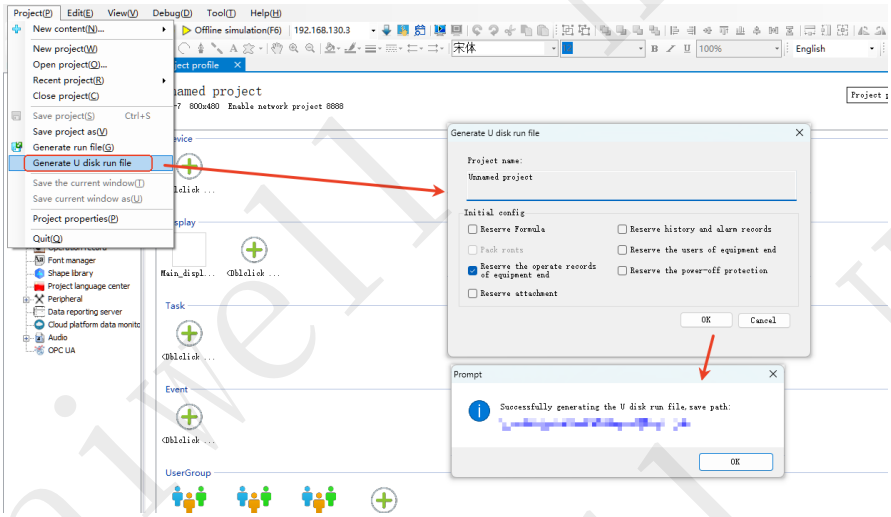


Figure24 Generate the Running File for the USB Flash Drive

Note: The file name cannot contain spaces.

（2） Downloading the Project Via USB Flash Drive

Step 1: When the device is in a power-off state, insert the USB flash drive. Power on the device and enter the CBOX background setting interface. Click on【Project Settings】to enter the project setting interface.

Step 2: Click on【Download Project】to enter the project download interface.

Step 3: Select and click on【USB】; choose the generated USB flash drive running file and click on【OK】. After the download is successful, the CBOX device will automatically restart.

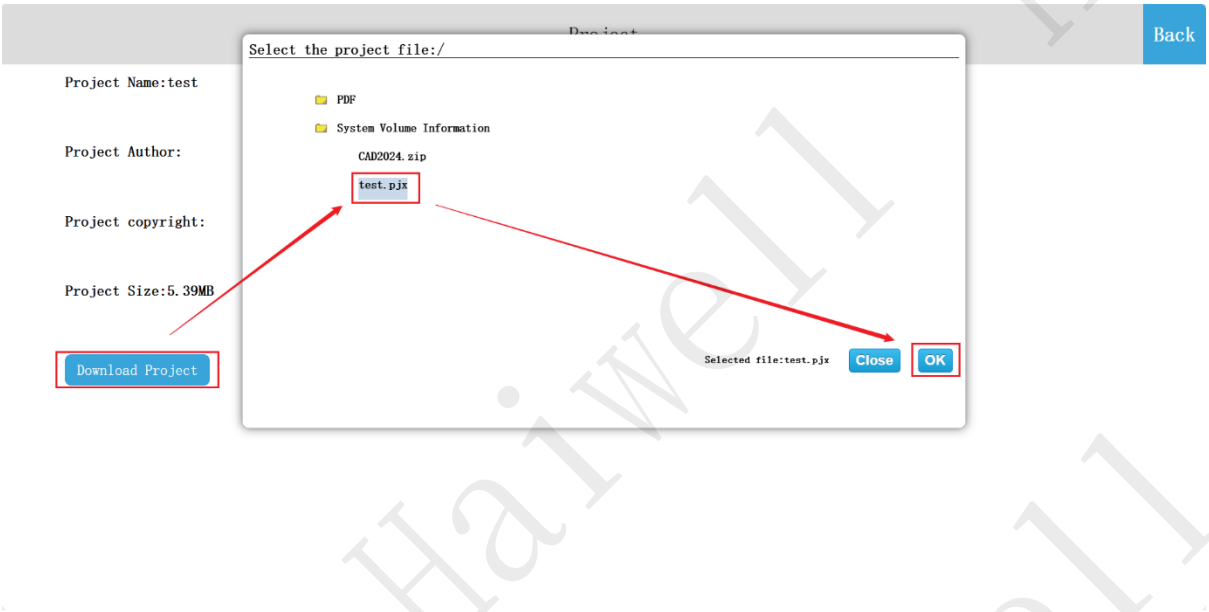


Figure25 USB Flash Drive Downloading Project

3.2 Settings

（1） Settings

① Set Terminal Name

Enter the CBOX background settings interface, click on【Settings】, in the【Local Settings】interface, user can see【Terminal Name】, click【Set】, enter the new terminal name, and press the Enter key on the keyboard. Terminal Name: Device Name.

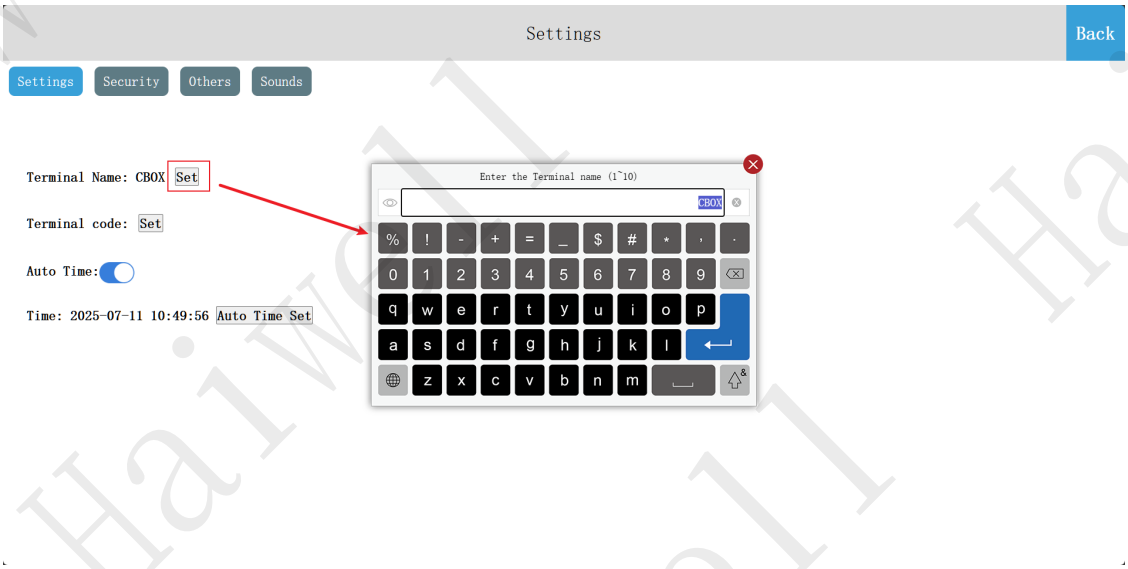


Figure26 Set Terminal Name

Note: The length of the terminal name should be 1 to 10 characters.

② Set Terminal Number

Enter the CBOX background settings interface, click on【Settings】. In the【Local Settings】interface, you can see【Terminal Number】. Click【Set】, enter the new terminal number, and press the Enter key on the keyboard. Terminal Number: The number of the device.

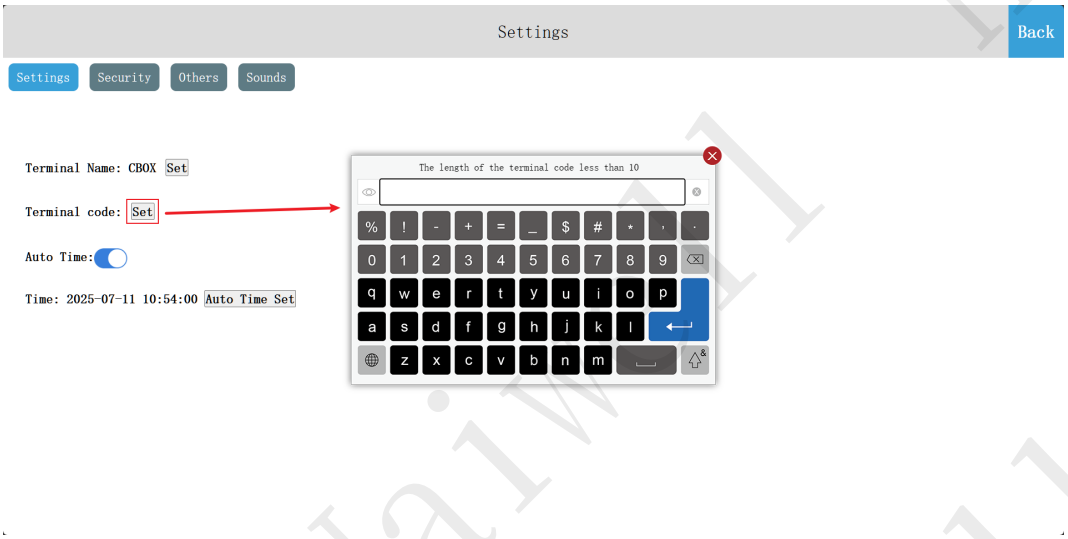


Figure27 Set Terminal Number

Note: The length of the terminal number is 0 to 10 digits.

③ Set Network Time Synchronization

Enter the CBOX background settings interface, click on【Settings】, and in the【Local Settings】interface, turn on network time synchronization. Then click on the automatic time synchronization settings, and the current time will automatically correspond to the network time.

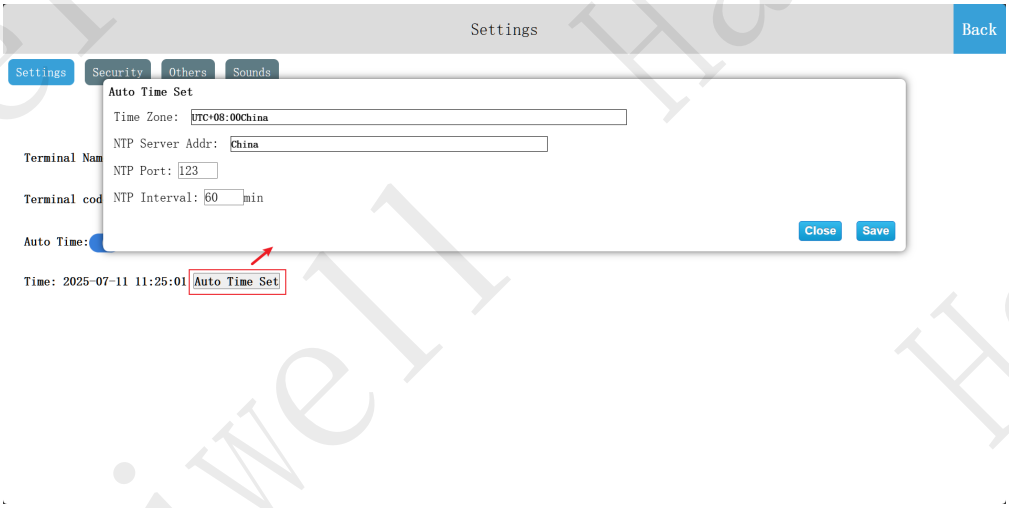


Figure28 Setting Network Time Synchronization 1

Enter the CBOX background settings interface, click on【Settings】, in the【Local Settings】interface, turn off the network time synchronization, then click on change time. You can manually input and set the time. After inputting, click on【OK】. Clicking on【Cancel】will not save the just entered time.

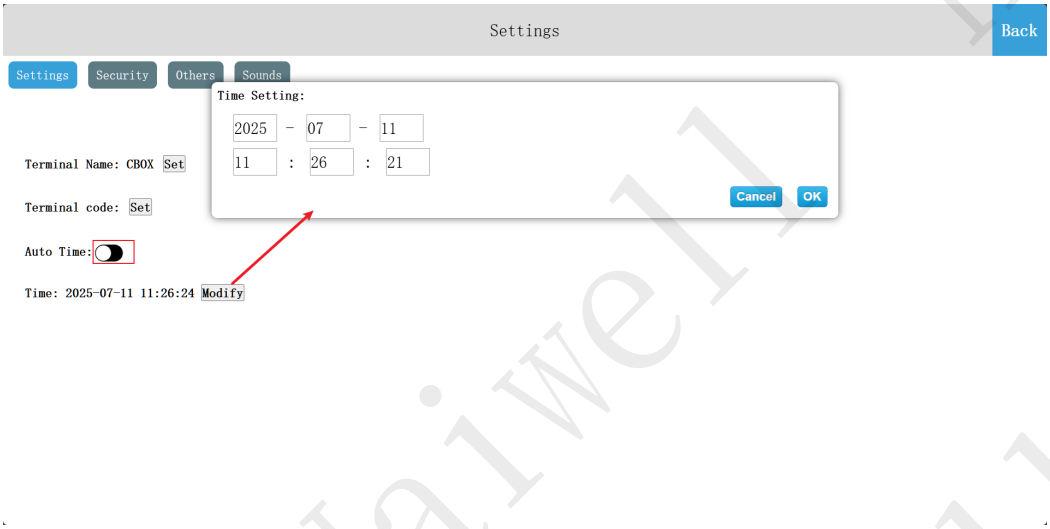


Figure29 Setting Network Time Synchronization 2

（2） Security Settings

① Download Project Password

Enter the CBOX background settings interface, click 【Settings】, and in the【Security Settings】interface, turn on the【Download Project Password】function. Set the CBOX download project password. After the setting is successful, users need to verify the password when downloading projects or updating firmware; otherwise, they cannot perform the relevant operations.

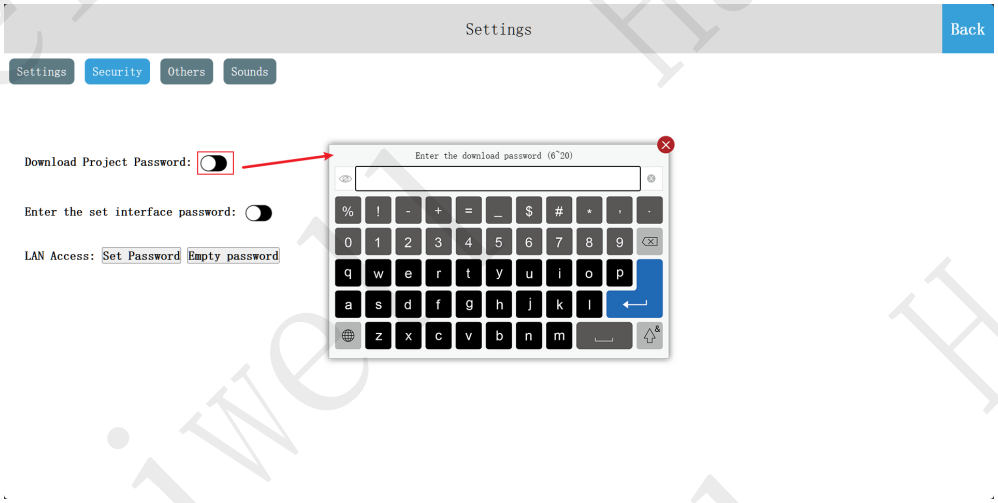


Figure30 Downloading Project Password

Note: The downloading project password should be set carefully. Once forgotten, the factory settings need to be restored to reset it.

② Background Password

Adding a password verification for entering the background can prevent security risks and economic losses caused by unauthorized personnel's accidental operations. The specific steps are as follows:

Step 1: Enter the CBOX background settings interface and click on【Settings】;

Step 2: In the【Security Settings】interface, enable the【Background Password】function;

Step 3: Set the background password. After the setting is successful, users need to verify the password when entering the background settings.

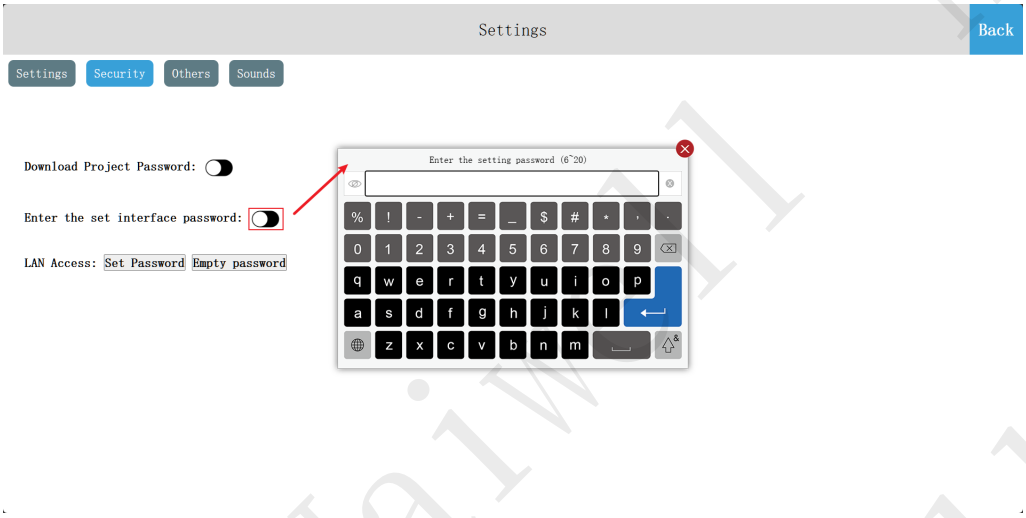


Figure31 Enter the Background Password

Note: Setting the password to enter the background needs to be set prudently. Once you forget the password, you need to contact Haiwell technology support to clear it.

③ Local Area Network Access Password

Enter the CBOX background settings interface, click 【Settings】, and in the【Security Settings】interface. By default, the local area network access is enabled. Users can set it as needed. Click on【Set Password】, input the password to be set, press Enter, input the password just entered again, press Enter, and the local area network access password just set will be saved. If users want to access this device through local area network browser, local mobile device access, TVBOX local access, they must input the correct local area network access password.

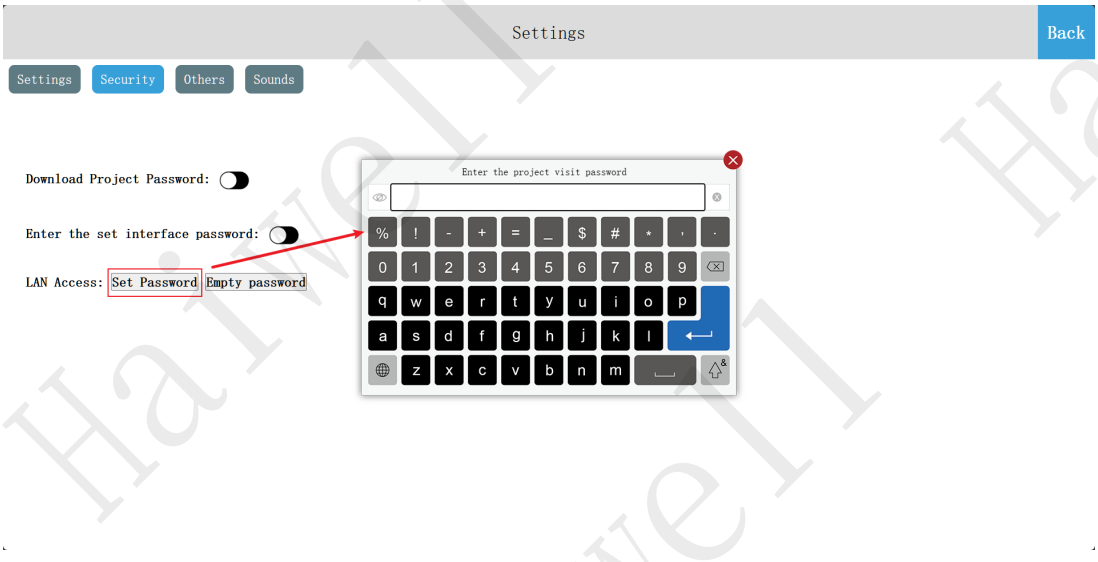


Figure32 Set LAN Access Password



Figure33 Clear LAN Access Password

（3） Other Settings

① Set the Frequency of Cloud Online Detection

Enter the CBOX background setting interface, click on【Settings】, switch to the【Other Settings】interface, click on【Set】on【Set the Frequency of Cloud Online Detection】, and select the cloud online detection frequency we need.



Figure34 Other Settings

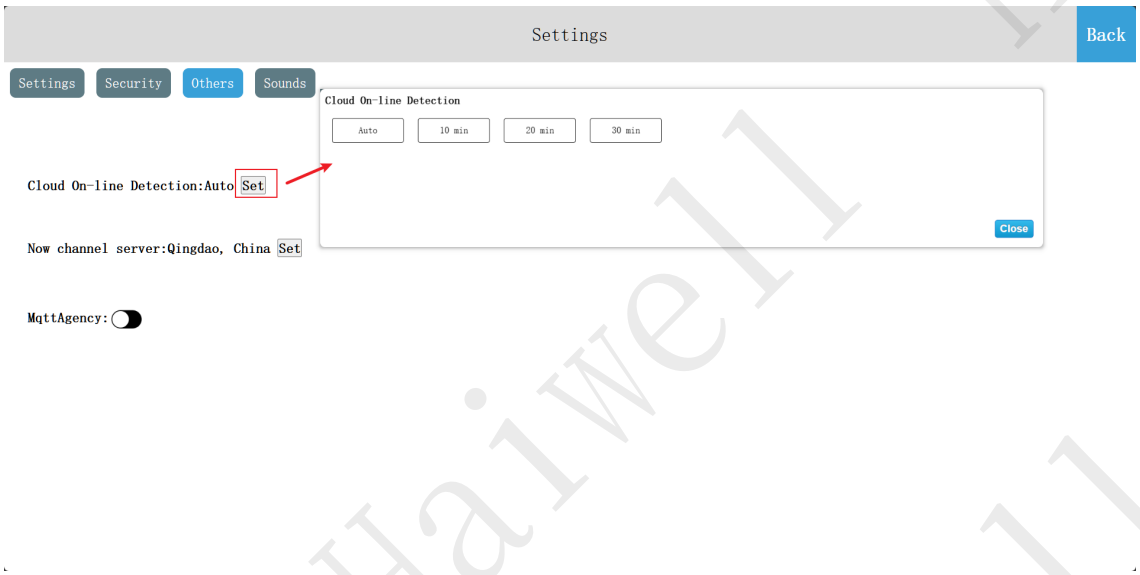


Figure35 Online Detection Frequency of Device Cloud

② Set up Server Channels

Enter the CBOX background setting interface, click on【Settings】, switch to the【Other Settings】interface, click on【Set】on "Current Server Channel", users can choose the required cloud server address in the pop-up window. When the selection is completed, the current server channel will be displayed as the selected server. Click on【Auto】, the system will automatically select the relatively closer cloud server address according to the IP address. Click on【Close】, then the window can be saved and closed.



Figure36 Current Channel Server

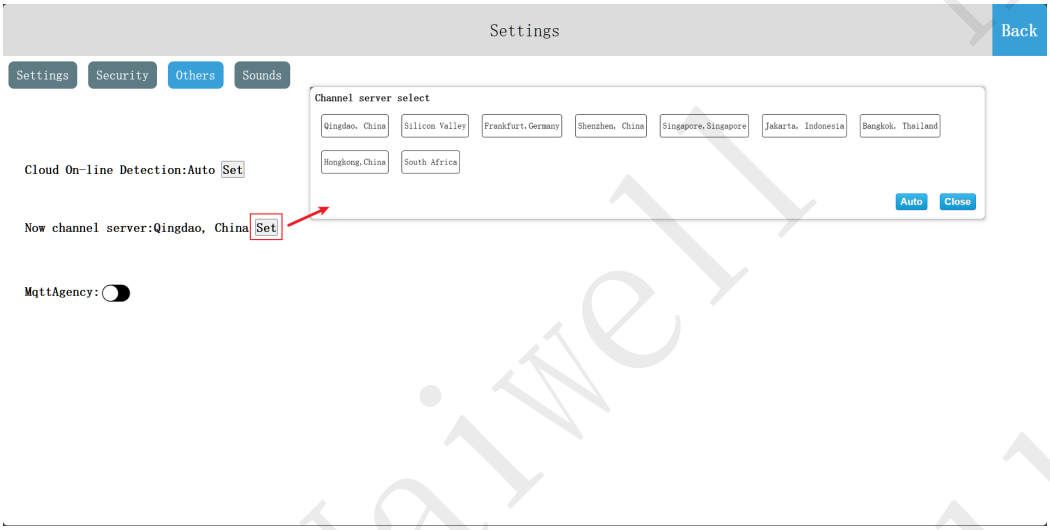


Figure37 Channel Server Selection

③ MQTT Broker

Clicking on MQTT Broker allows you to enable or disable the MQTT Broker. When enabled, CBOX will act as a small MQTT server, with the server address being the Ethernet or WIFI IP address of the device. For detailed usage of MQTT, please refer to the MQTT User Manual. The MQTT Broker is disabled by default and will remain enabled until manually disabled.

Devices within the local network, such as BOX/HMI, can report to the device with the MQTT Broker enabled, facilitating data interaction. In Haiwell SCADA Cloud Configuration Software, the specific configuration for reporting is as follows: Create a new project → Add a data reporting server → Add an MQTT server → Enter the reporting IP (the IP address of the device with MQTT enabled) and click Confirm; Add a data group → Select remote reporting via MQTT → Add a group identifier → Configure the recording method → Add channel variables.

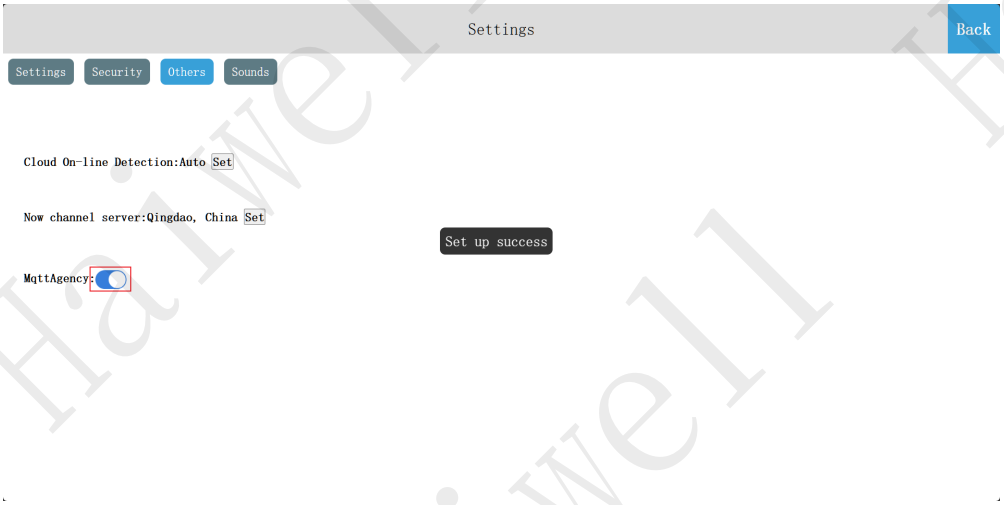


Figure38 MQTT Broker

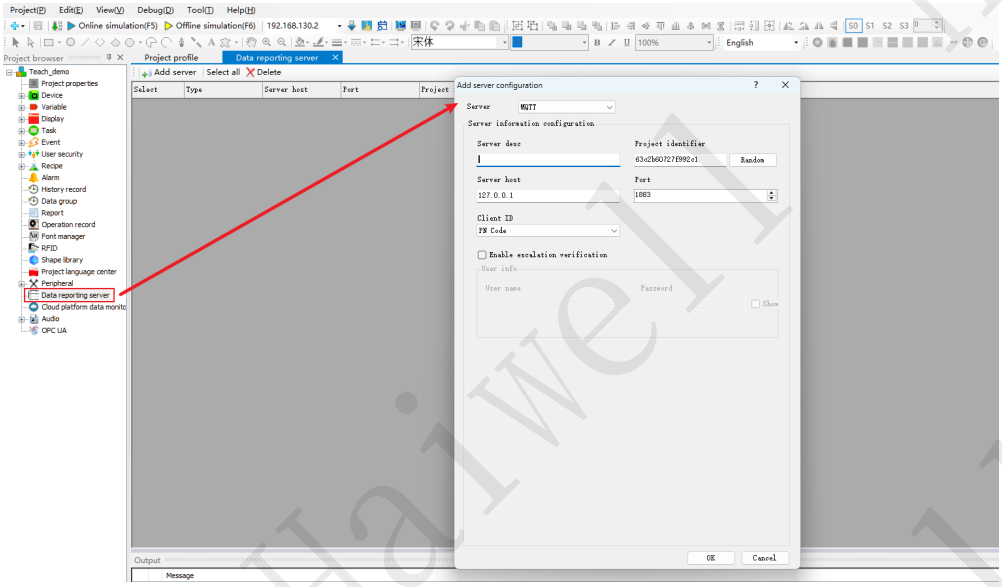


Figure39 Add Report to MQTT Server

（4） Sound Settings

Users can set the sound options of CBOX on this interface, but except for the buzzer, other sounds require an external sound card and speaker.

① Buzzer Switch

Enter the background setting interface of CBOX, click on【Settings】, switch to the【Sound Settings】interface, and turn on the "Buzzer Switch". When operating the CBOX, the device will give sound feedback of “beep”.

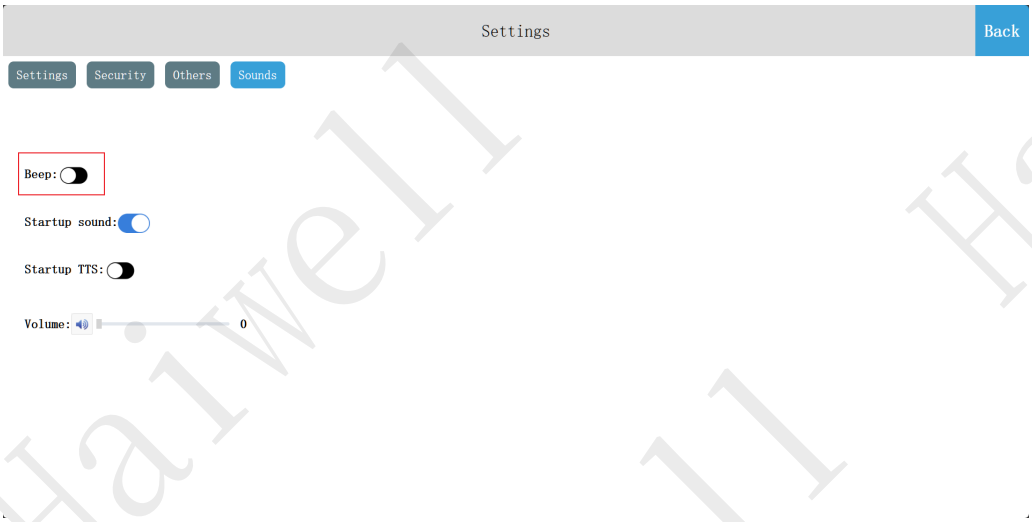


Figure40 Beeper Switch

② Startup Sound

Turn on the【Startup Music】switch, and the device will play the music that has been set in the SCADA project when it starts up.



Figure41 Startup Sound

The settings in the SCADA project are as shown in the following figure:

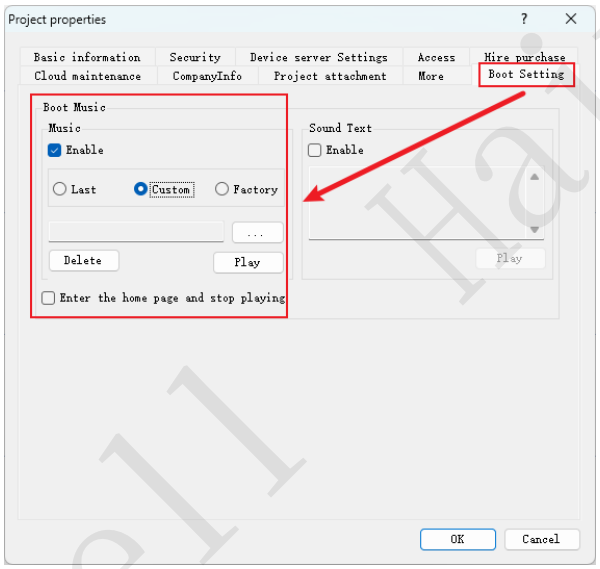


Figure42 Customization Settings for Startup Music

When "Factory Reset" is selected, check "Clear Custom Music on Device" to perform a factory reset and remove all existing custom music.

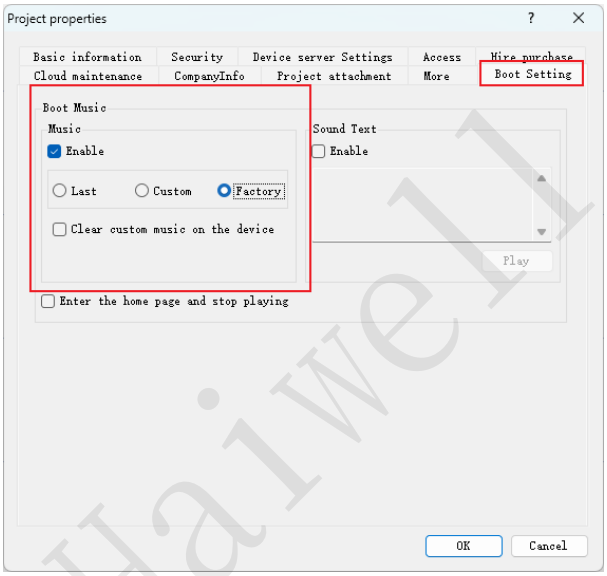


Figure43 Factory Settings for Startup Music

③ Startup TTS

Turn on the【Startup TTS】switch, and the device will read out the text content set in the SCADA project when it starts up.

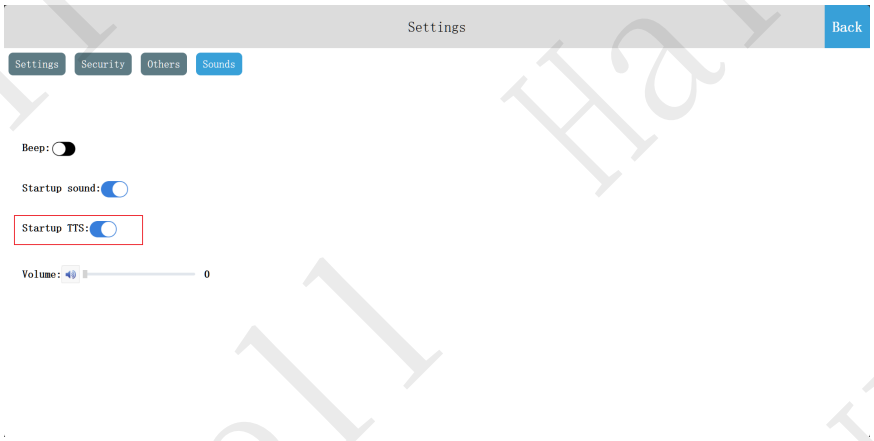


Figure44 Startup TTS

Open Haiwell SCADA (version 3.39.0 and above), double-click on Project properties , enter the project property interface, click on【Boot Options】, enable text-to-speech, input the corresponding text content and the setting is completed.

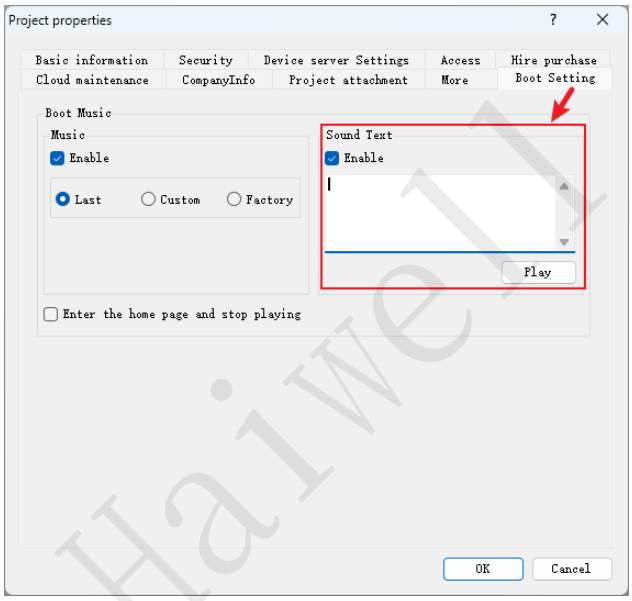


Figure45 TTS Settings

3.3 System Information

（1） Restart the Device

The user enters the background settings interface of CBOX, clicks on 【System Information】, selects 【Restart the Device】, and then the CBOX device can be restarted.

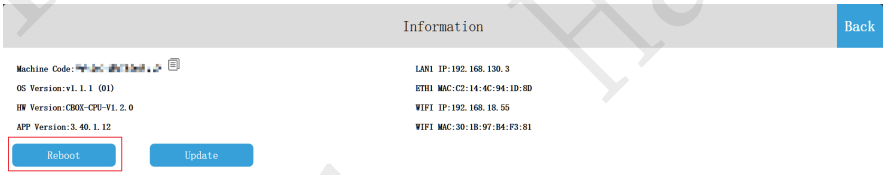


Figure46 Restart the Device

（2） Firmware Update

Select "Firmware Update", enter the firmware upgrade interface, choose "USB", select the appropriate firmware update package, and click "OK" to upgrade the firmware. After the upgrade is successful, the device will restart.

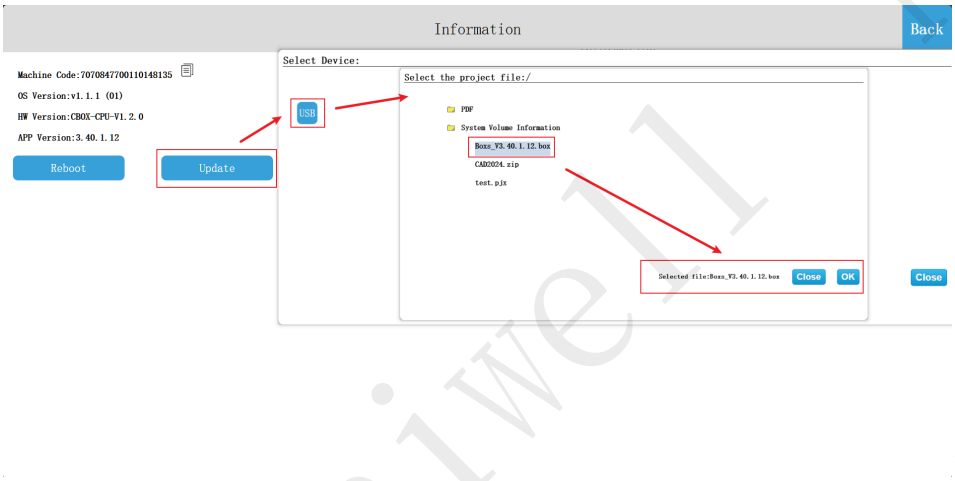


Figure47 Firmware Update

3.4 Network Settings

The CBOX supports multiple network connection methods, including Ethernet, WIFI, and 4G. Through different networking methods, the CBOX connects to the Internet, enabling remote access, remote operation, and remote Penetration.

（1） Ethernet Settings

Go to the CBOX background Settings screen, tap【Network】 to enter the Ethernet Settings screen, and turn on "Network switch". The network type includes DHCP and Static IP.

① Dynamic State IP

Network type selection【DHCP】,Click【Save】， The device automatically obtains it IP.

② Static IP

Network type selection【Static IP】，Enter the correct IP address、Subnet mask code、Default gateway and DNS，Click【Save】,After verification，CBOX Devices can be connected to the network via Ethernet.

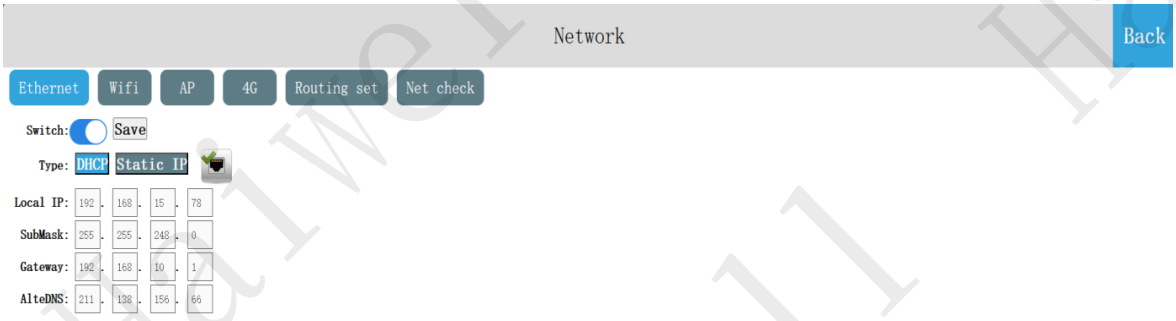


Figure48 Ethernet Settings

（2） WIFI Settings

Click on【WIFI】to enter the WIFI settings interface, which supports connecting to the network via WIFI. In the WIFI settings interface, turn on the WIFI switch, select the target WIFI account, enter the correct WIFI password, and after verification is successful, you can connect to the WIFI network. After successful connection, a green tick"" will be displayed.



Figure49 Successful Connection to WIFI

After a successful connection, you can see the gray " ". Click the icon to set the IP address, subnet mask, default gateway, and DNS statically or dynamically. After the settings are completed, click【Save】to set the IP address information of the WIFI. Click "Ignore this network" to disconnect from this WIFI. If you need to use this WIFI again, you need to re-enter the password to connect.

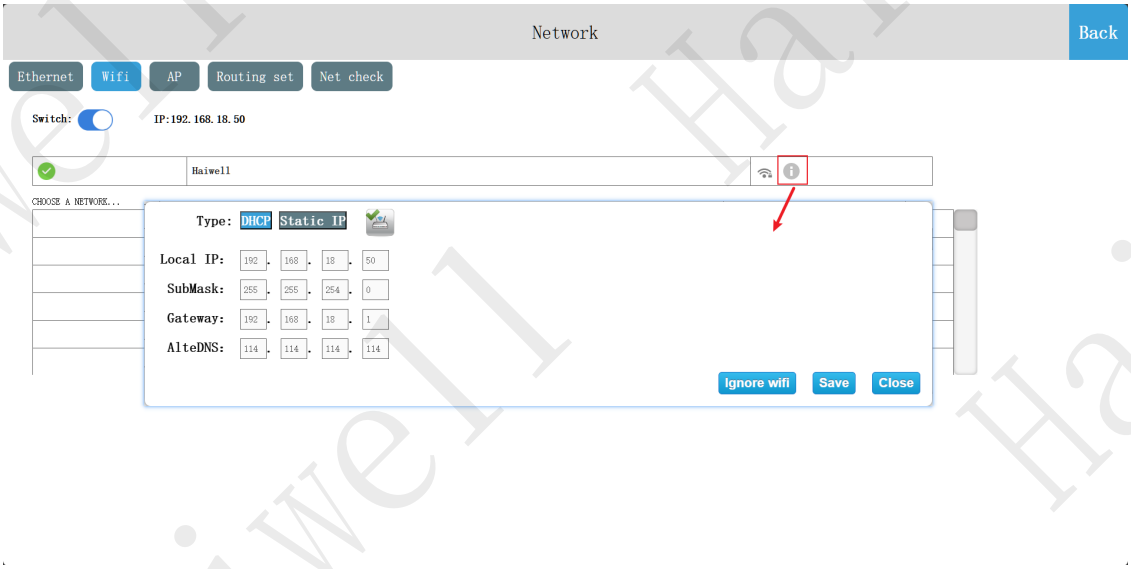


Figure50 WIFI Network Information

Note: ①CBOX needs to be connected to a WIFI antenna; otherwise, the signal strength will be weak, and it won't be able to connect to WIFI or search for it. ②WIFI can only search for the AP frequency band of 2.4GHz, and 5GHz cannot be searched. If you use a mobile phone to open a WIFI hotspot, please pay attention to setting the hotspot frequency band.

（3） Personal Hotspot Settings

Click on【AP】to enter the Personal Hotspot interface. CBOX can also share a Wi-Fi hotspot with other users. Turn on the Personal Hotspot switch, set the hotspot name and password, and you can share a Wi-Fi hotspot with other users.



Figure51 CBOX Personal Hotspot

To set the hotspot name, click on "Hotspot Name", and a hotspot name input box will pop up. Enter the hotspot name, press【Enter】, and finally click【Save】to save the added hotspot name information.

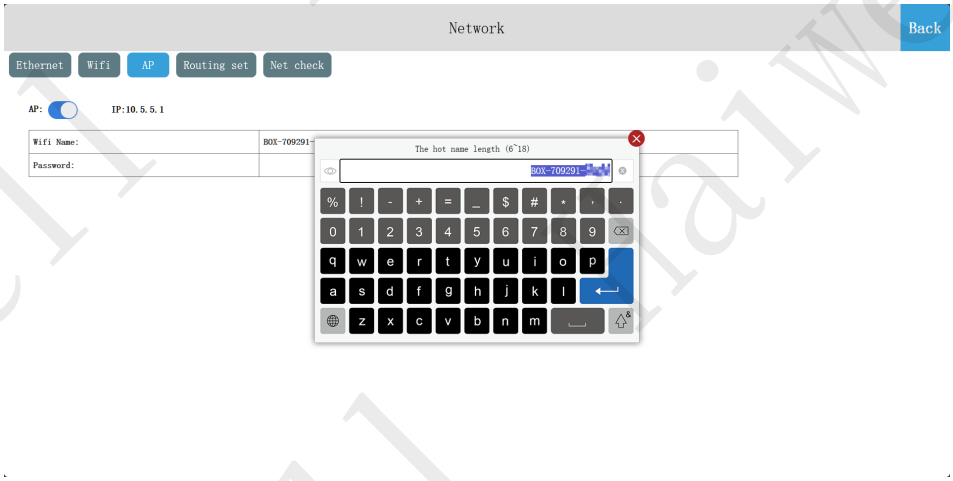


Figure52 CBOX Personal Hotspot Name

Set a password，Click on "Password"，The password input box is displayed，Click on the top left corner of the input box You can switch between plain-text and ciphertext passwords. Enter password，Click 【Enter】，Finally click【Save】，You can save the added password information.

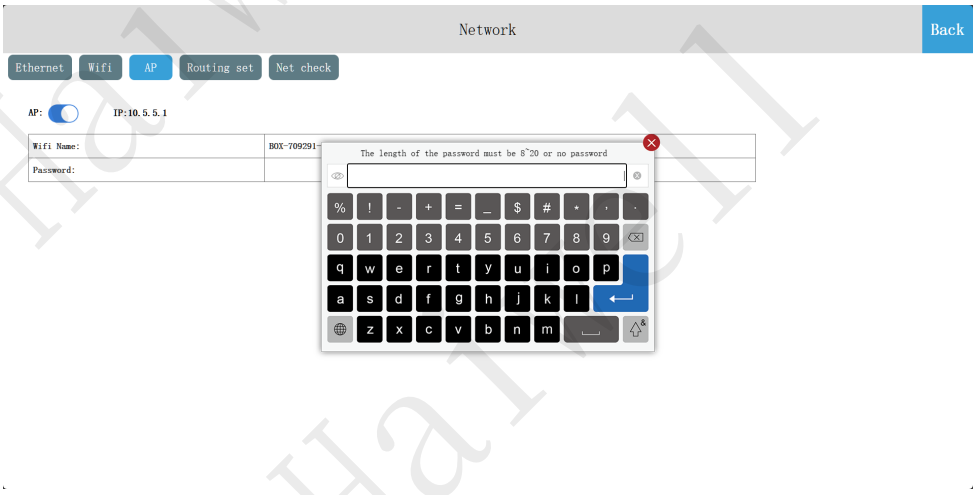


Figure53 CBOX Personal Hotspot Password

CBOX The Ex-factory default Hotspot password is empty.

Note: The hotspot name contains 6 to 18 characters, The password can be empty or contains 8 to 20 characters. Out of range, Click Enter, Enter the name of hotspot, The password will not be displayed in the appropriate location, and pop-up prompt.

（4） 4G Settings

Click on【4G】to enter the 4G configuration interface. The device is externally connected to a SIM card. Users can identify or obtain relevant information about the device and its SIM card through three codes: IMEI (International Mobile Equipment Identity), IMSI (International Mobile Subscriber Identity), and ICCID (Integrated Circuit Card Identifier).

① Disabled 4G

Turn off the 4G switch, a prompt "Closing..." pops up, and only the IMEI code is displayed. At this time, the device is not connected to the 4G network.

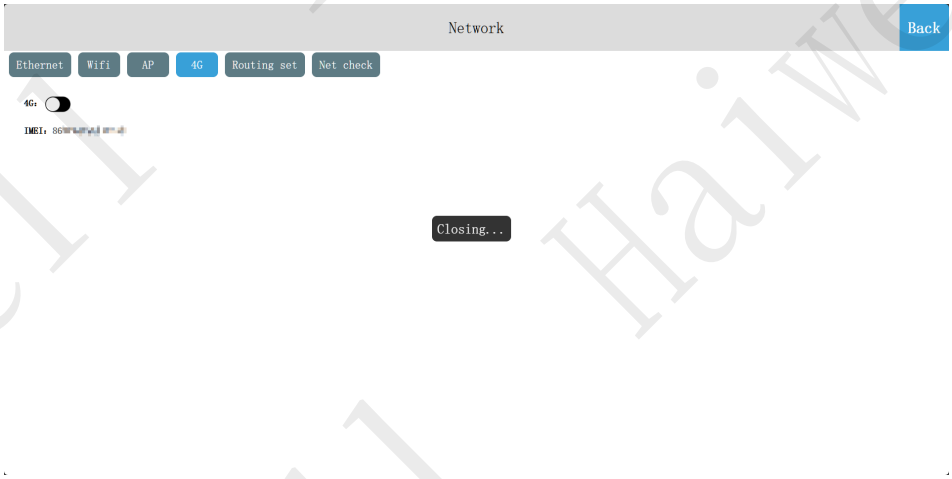


Figure54 Disable 4G Function

② Enable 4G

Turn on the 4G switch. At this point, the device can access the 4G network. A pop-up window will display the IMSI (International Mobile Subscriber Identity) and ICCID (Integrated Circuit Card Identifier) as well as the signal strength. At this point, the device can access the 4G network.

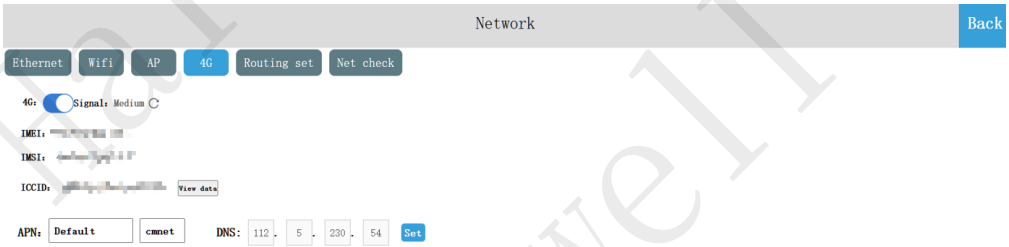


Figure55 Enable 4G

APN Settings: Click on the "Default" option for APN, and you can choose between "Default" and "Custom" methods. If you select "Custom", you can modify the APN (Access Point Name), username, password, and dial-up number according to your needs.

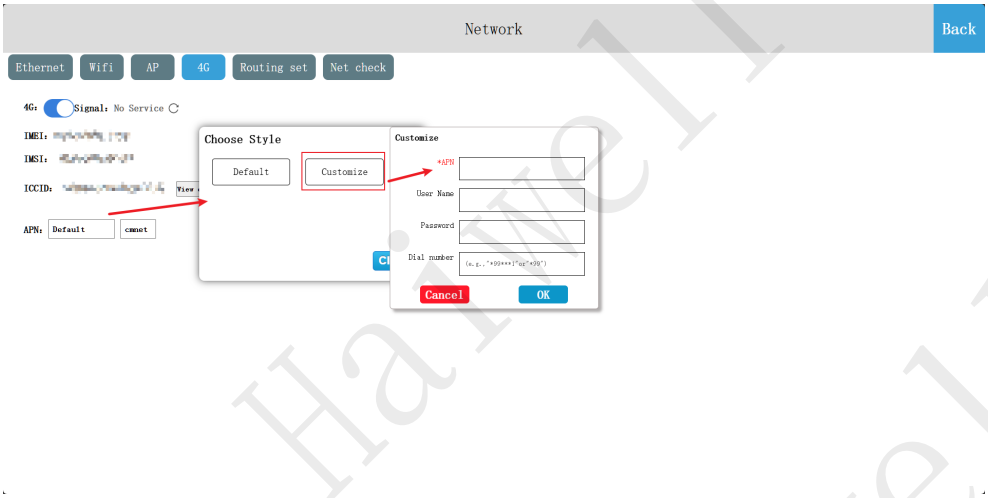


Figure56 APN Settings

DNS Settings: Users can set the 4G DNS function to configure DNS by themselves, solving the problem of 4G network being unable to be used due to the probabilistic abnormality of automatically obtained DNS.

Click on the【Set】at the DNS section to pop up the DNS configuration window. Users can choose the DNS server allocation method. Selecting the static DNS server allocation method allows for custom modifications.

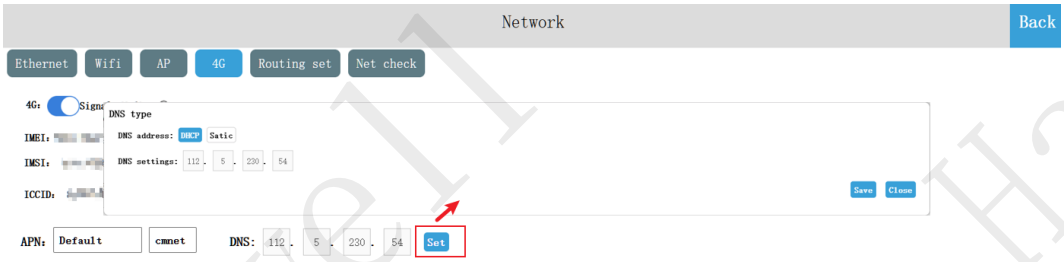


Figure57 DNS Settings

After setting the DNS server address, click【Save】to save the DNS server address.

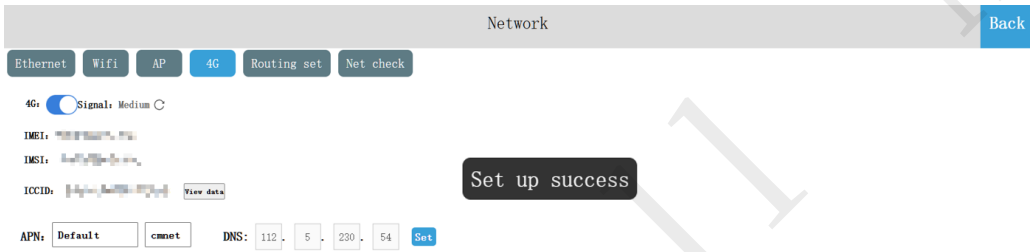


Figure58 DNS Settings Successful

Note: When the signal strength is displayed as "No Service", DNS information will not be shown.



Figure59 Service Less State

（5） Route Configuration

The router configuration not only supports the device to access the Internet through three modes: "LAN", "WIFI", and "4G", achieving "device Internet access", but also supports sharing through LAN or directly creating a hotspot to provide network connections to the outside, realizing "providing network to the outside".



Figure60 Routing Mode Settings Interface

① The Routing Mode Disabled

The CBOX background Settings screen is displayed， Click【Network Settings】, The route configuration page is displayed, Click【Settings】, Click【Route Mode not enabled】, The message "This mode will only close routes is displayed, do not perform other operations, confirm to disable the routing mode. Click【OK】， That is the routing mode is disabled.

“Route Not Enabled” mode, and the device cannot provide network access to other external devices via LAN or hotspot.



Figure61 The Routing Mode Disabled

② Provided via LAN Network

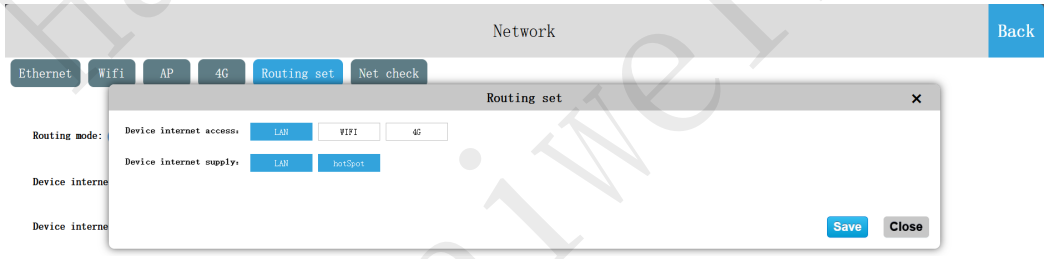
Router mode is enabled, selecting LAN as the device's internet access method allows users to provide network connectivity to other external devices via either LAN or hotspot.



(a)



(b)



(c)

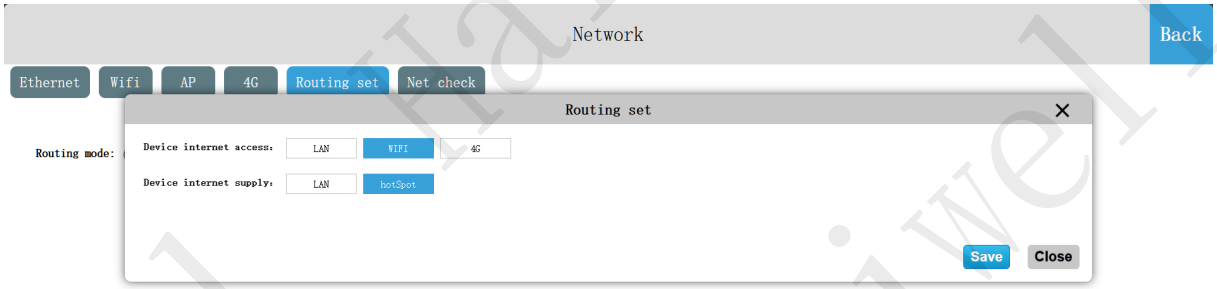
Figure62 Provided via LAN Network

③ Provided via WIFI Network

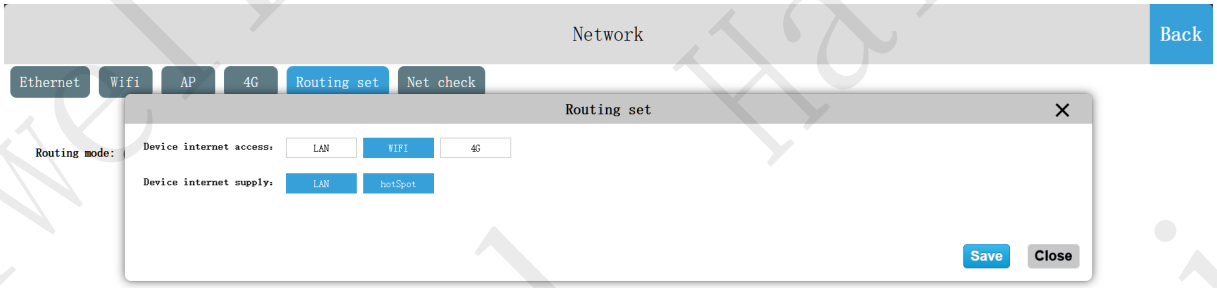
Router mode is enabled, selecting WIFI as the device's internet access method allows users to provide network connectivity to other external devices via either LAN or hotspot.



(a)



(b)

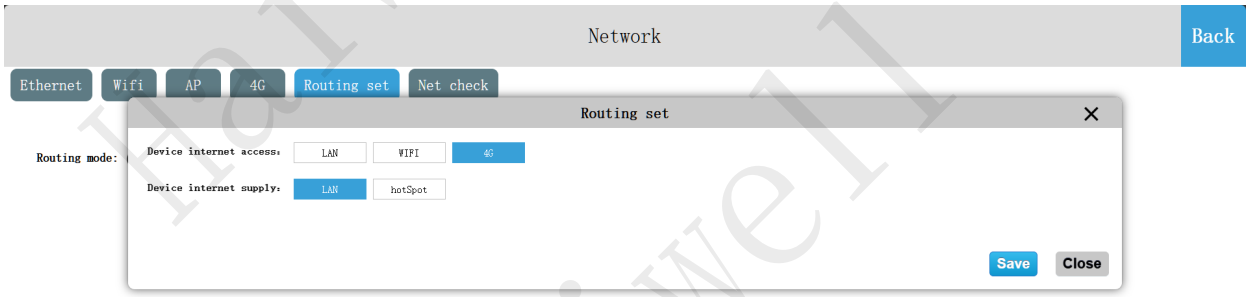


(c)

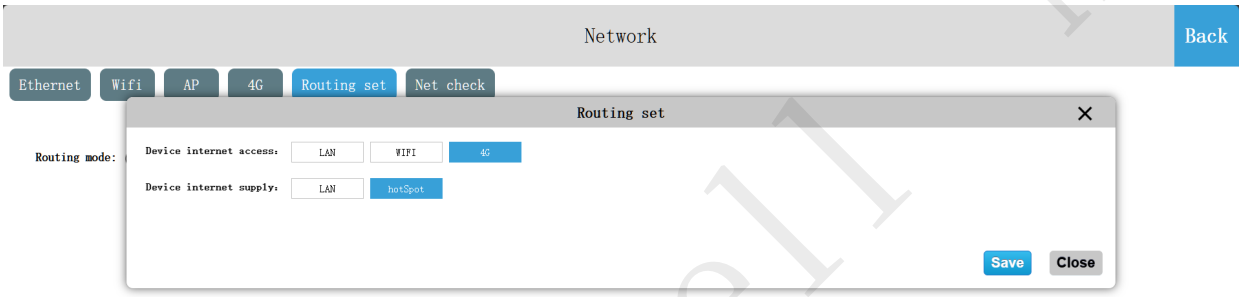
Figure63 Provided via WIFI Network

④ Provided via 4G Network

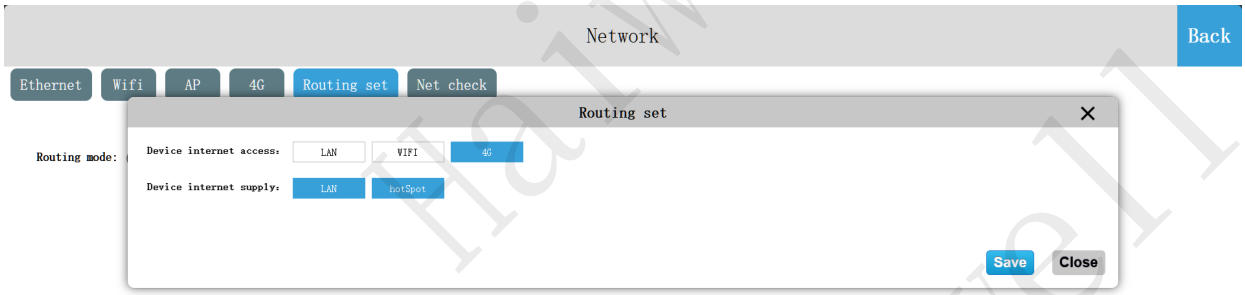
Router mode is enabled, selecting 4G as the device's internet access method allows users to provide network connectivity to other external devices via either LAN or hotspot.



(a)



(b)



(c)

Figure64 Provided via 4G Network

（6） Network Diagnosis

① External Network Access

To use network diagnostics, click on the URL ⋯， Select a web address to access. If a message is returned, then means device is connected to the network.

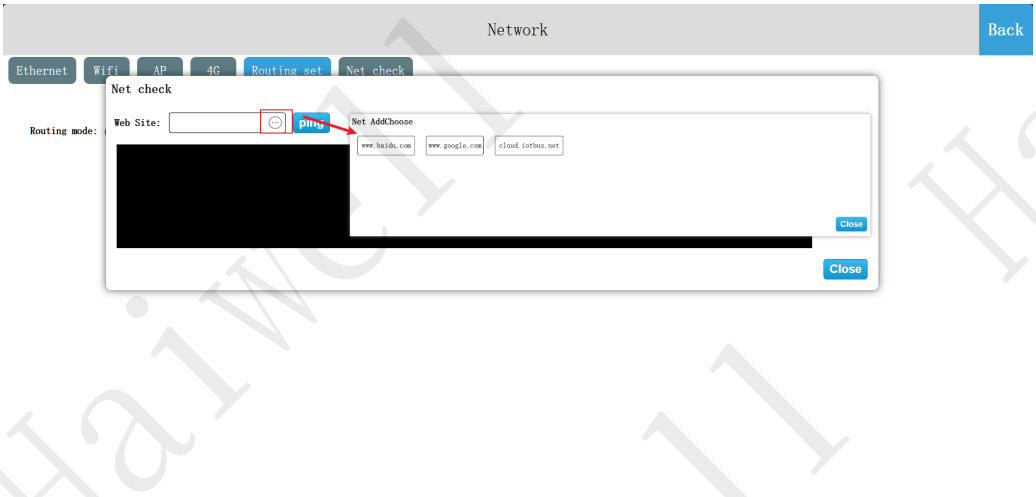


Figure65 External Network Access

② LAN Access

Use network diagnosis, click on the website, enter the corresponding IP address of the device you want to visit, if the information is returned, then the access is successful.



Figure66 LAN Access

3.5 Cloud Settings

Cloud settings are mainly used to bind devices as personal or enterprise devices, facilitating users' remote monitoring or centralized management. The prerequisite for using this function is to ensure that the device can access the Internet normally. If the device is not connected to the network, please refer to the 2.3 Network Settings first and configure the device's network.

（1） Mobile Phone Cloud APP/ WeChat Applet Download

① APP

Scan the QR code to obtain it directly



Figure67 Download the QR Code of Haiwell Cloud APP

② WeChat Mini Program

Search Xiamen Haiwell on WeChat official account, click Send Message, select Hotspot - applet in the chat box, and you can directly enter Haiwell APP.

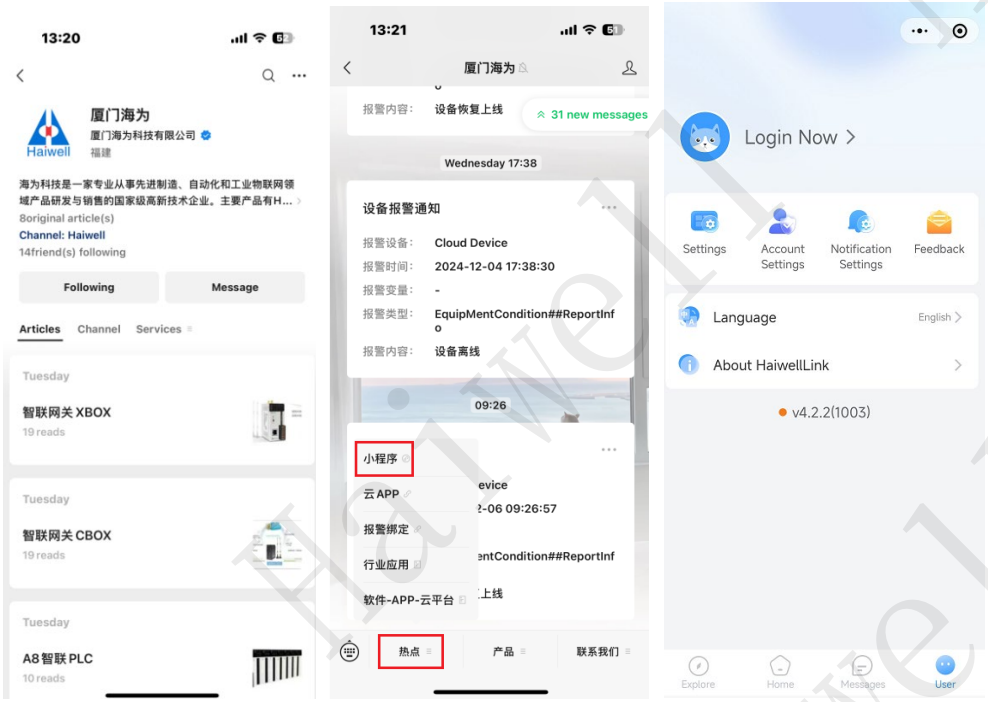


Figure68 Download the QR Code of Haiwell Cloud APP

Note: The WeChat mini program does not have a local device and requires downloading the Haiwell APP.

（2） Haiwell Cloud APP/WeChat Mini Program Scan Code to Bind QR Code

Enter the CBOX background settings interface, click on【Cloud Settings】, turn on the cloud switch, and a QR code and machine code will pop up. If the cloud status shows offline, please check if the CBOX has successfully connected to the external network.



Figure69 Binding Cloud Settings QR Code

Log in to the Haiwell Cloud APP on your mobile phone, enter the local device interface, click the button ⊕ in the upper left corner of the main interface, and then click on the dropdown menu to scan. Scan the QR code to add the device. A confirmation binding prompt box pops up on the device, click【Confirm】, the device is successfully added, and the user can remotely access the device.

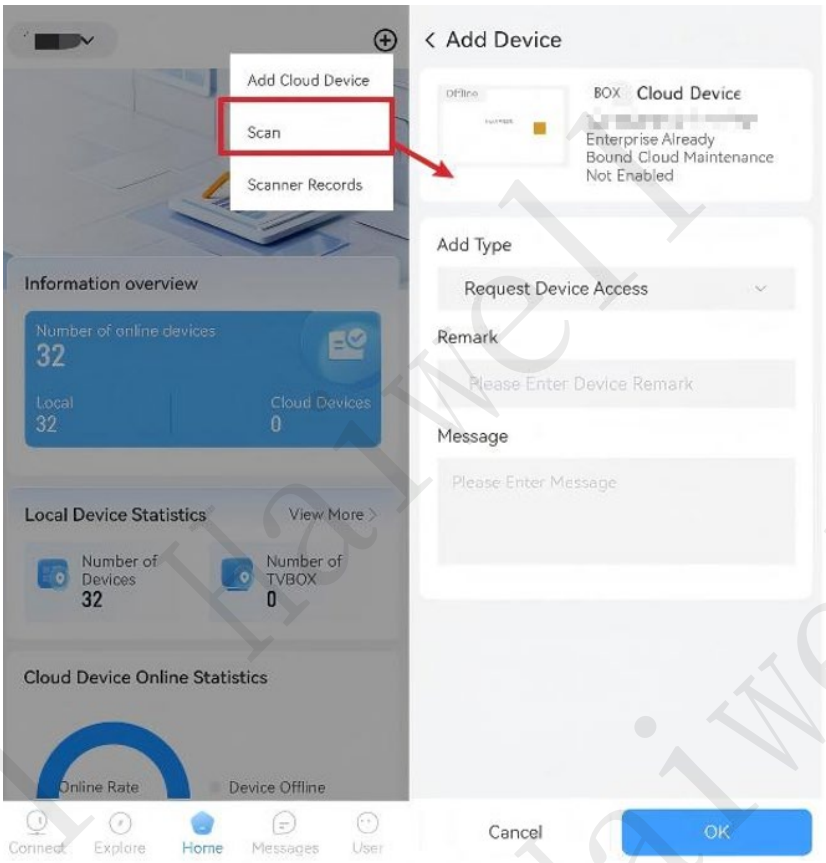


Figure70 Binding Device to Mobile APP



Figure71 Cloud Settings Interface for the First Binding of the Device - Confirm Binding

（3） Remote Monitoring and Control

Open the Haiwell Cloud app on your phone and enter the cloud device; Find the corresponding device and click on【Access】in the bottom right corner to remotely access the device. If the current project allows remote operation, users can control the device remotely through their mobile phone.

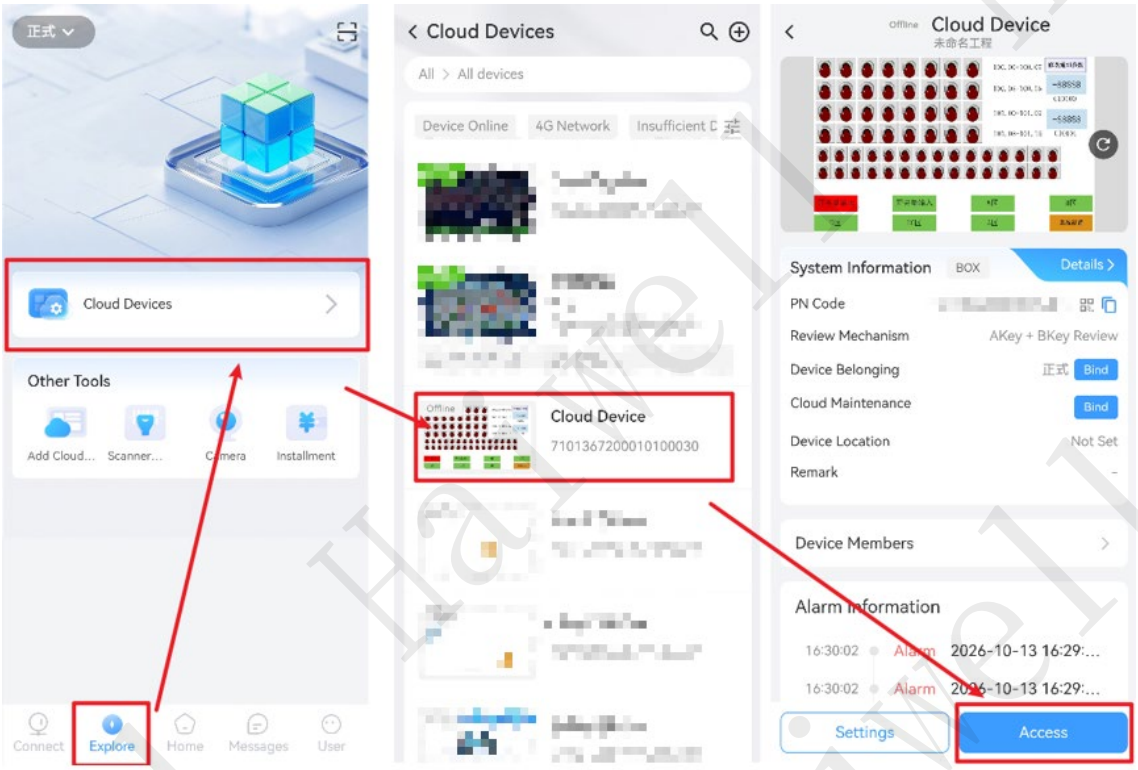


Figure72 Remote Access to CBOX Screen Via APP

VI. Configuration SCADA Project

1. Project Establishment

This paper takes a new project as an example to realize CBOX and Siemens 200smart Ethernet communication, and can achieve local access and remote access to CBOX screen control PLC.

1.1 Add New Project

Step 1: Open the Haiwell Cloud Configuration SCADA software and click "New Project" on the configuration software start page.

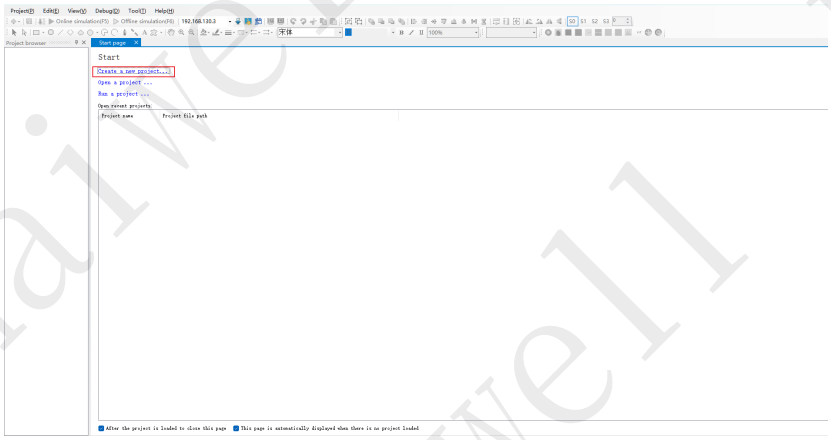


Figure73 New Project

Step 2: After clicking "Create a new project", a project property window will pop up. The project name can be customized. Select the corresponding operation platform. Select CBOX-7/CBOX-10. Here, the operation platform is distinguished by resolution. CBOX-7 is 800*480 and CBOX-10 is 1024*600 (the model tail number -E , -GP all share one operation platform). After selection, the screen resolution of the

used device can be seen. The corresponding angle can be selected according to actual needs. If the angle is not set, it will be set to 0° by default. Selecting "Local Area Network Access" enables the local area network access function. You can use the Haiwell Cloud APP/PC browser/TVBOX to access and view through the local area network. The password can be set to blank, meaning no password is needed for access. Finally, click "OK".

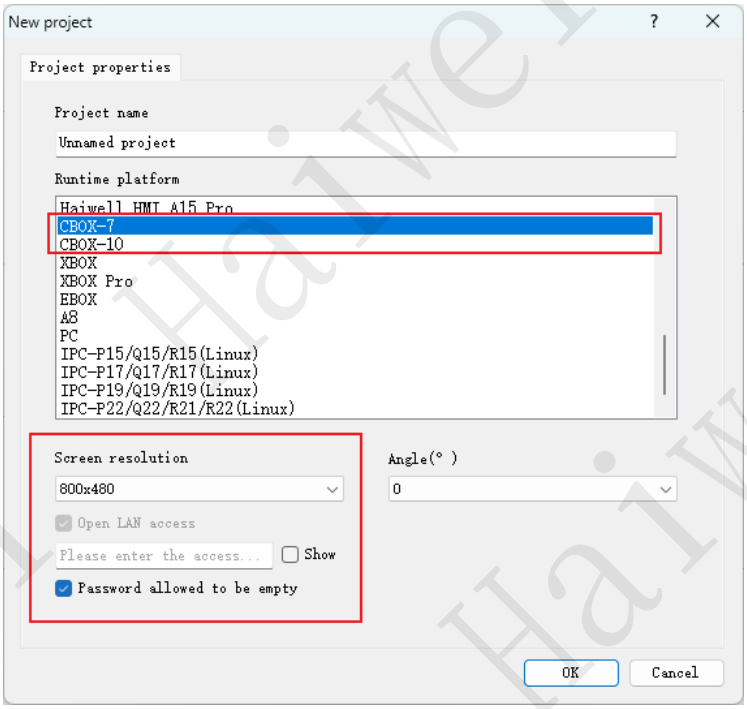


Figure74 Selecting a Running Platform

1.2 Add New Device

Step 1: Right-click Ethernet in Project Browser and choose "Add Device". Click OK.

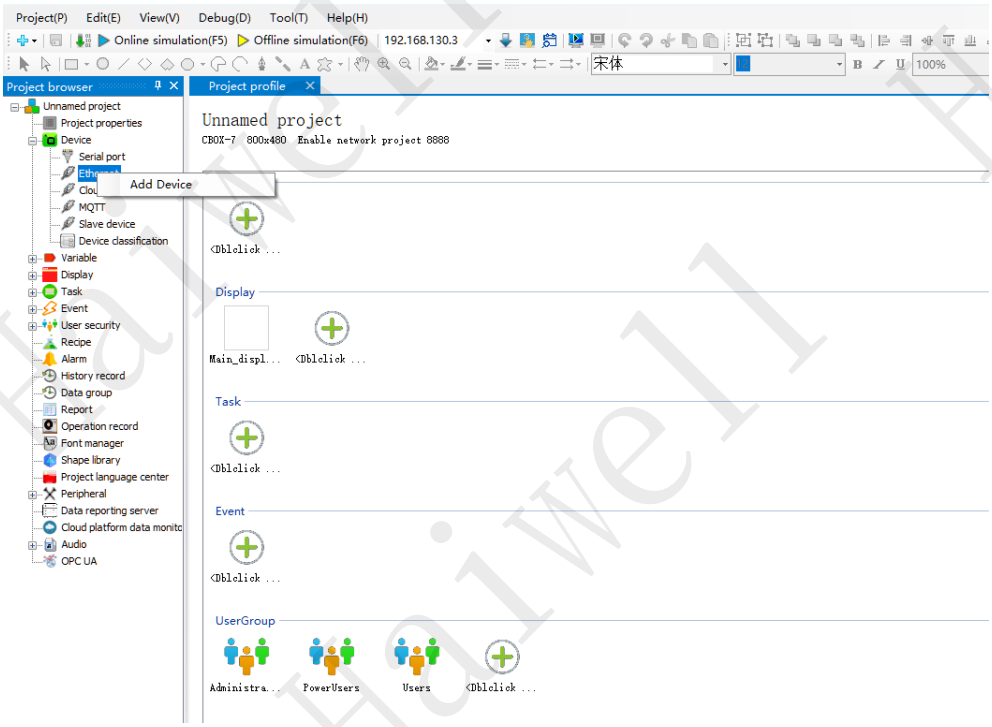


Figure75 Adding a Device

Step 2: Select Ethernet (TCP/IP) for the device interface, select the device on the left to find the corresponding Siemens model, and enter the IP address of Siemens PLC in the device properties.

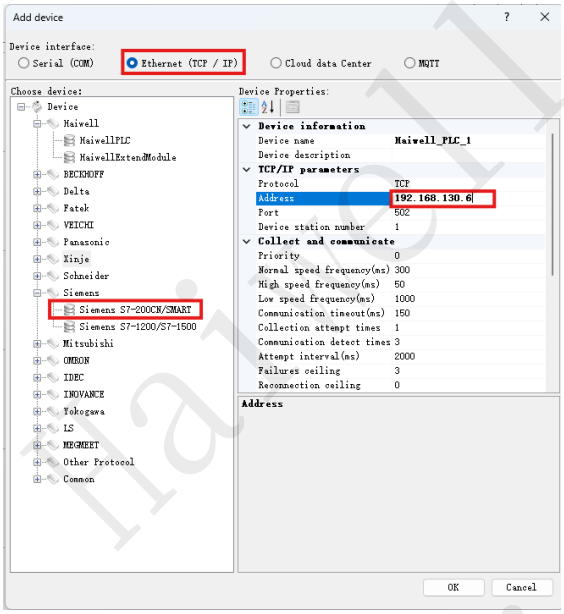


Figure76 Setting Device Communication Parameters

1.3 Add the New Variables

After you click OK, a prompt box will pop up asking you whether to define variables for the device immediately. Select Yes to add a Q0.0 and VW0.0 respectively.

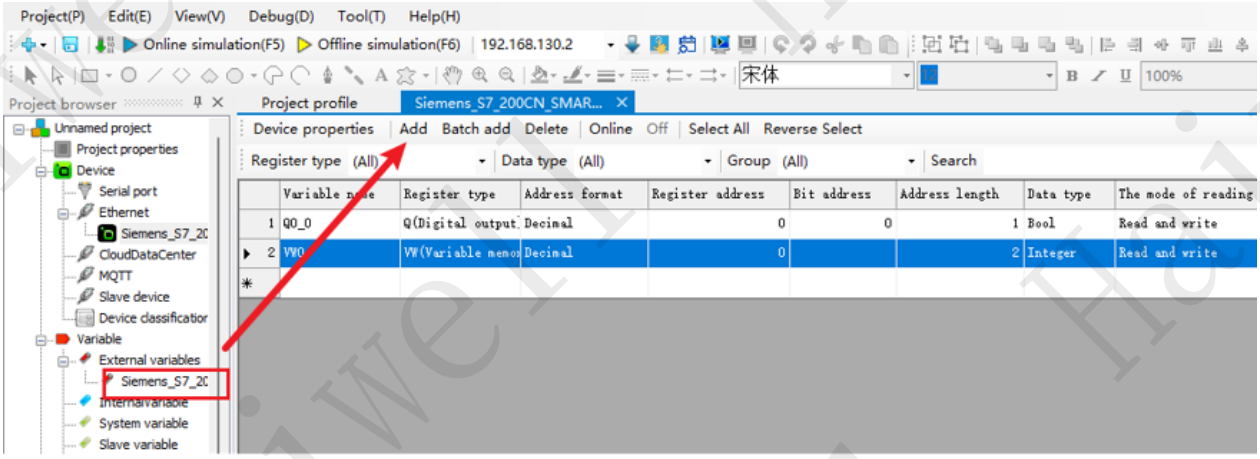


Figure77 Create New Variable

1.4 Edit Screen

Project browser select the main screen, in the right of the library - function components, drag "bit Settings" and "numerical display input" to the screen, double-click the meta binding variable.

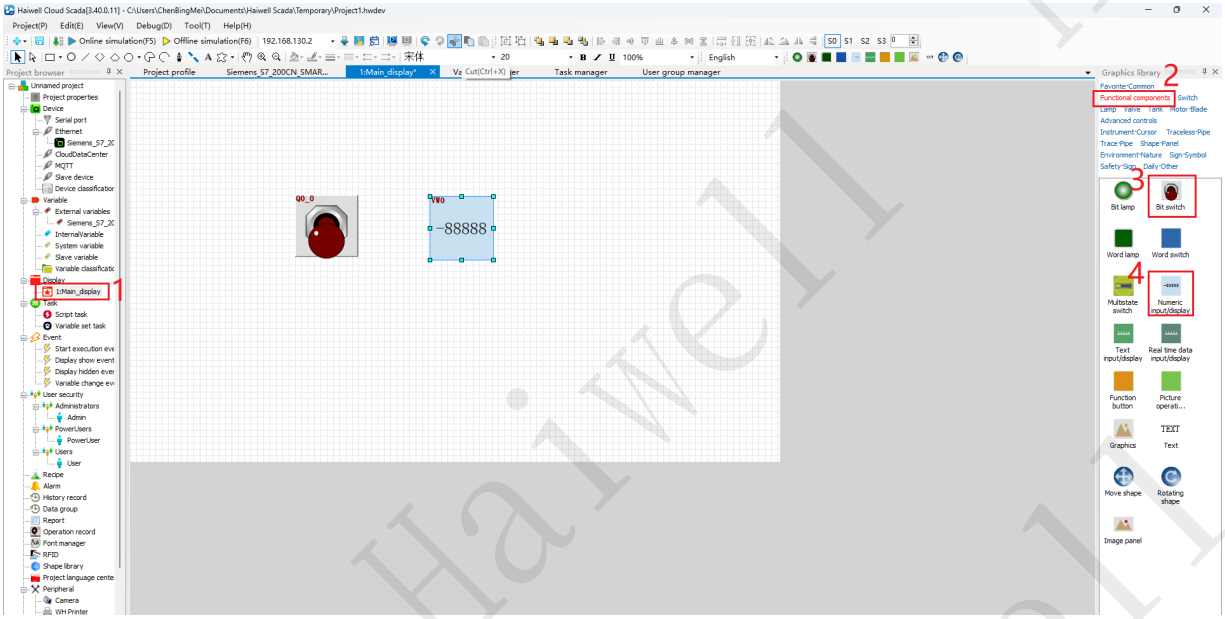
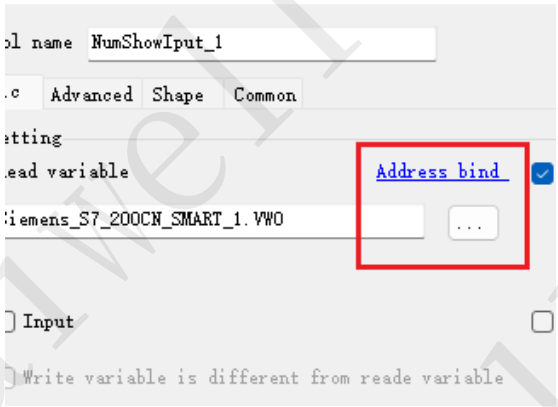


Figure78 Edit Screen

If users need to write the VW value to the PLC, you need to select Input in the value display input attribute, otherwise only read-only attribute.



(a)



（b）

Figure79 Meta Binding Variable

1.5 Debugging and Running

The developed and edited project can be run and debugged through "online simulation" and "offline simulation".

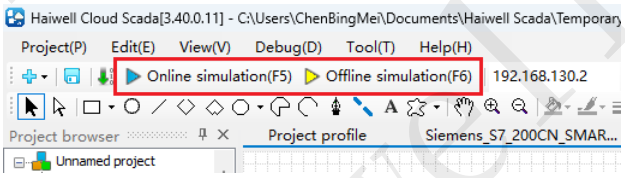


Figure80 Simulation and Debugging

（1） Online Simulation and Offline Simulation Differences

Online Simulation: take the port on the computer as the port of the CBOX screen, communicate with the PLC, etc., for simulation and debugging.

Offline Simulation: that is, it does not communicate with the actual PLC, but only simulates the

screen of the simulation operation.

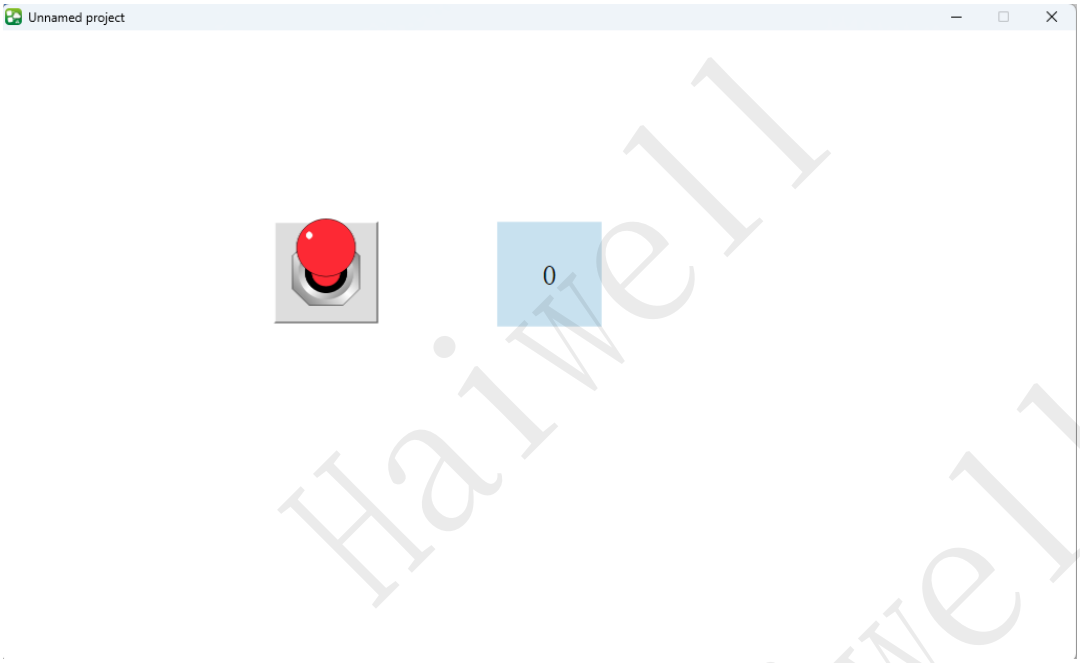


Figure81 Online/Offline Simulation Screen

2. Device Management Tool



Open the configuration design terminal on the computer, click the device management tool icon in the menu bar to enter the device management tool; Or click【Programs】, expand the installation file【Haiwell Scada】, and click【Haiwell Cloud HMI Manager】to enter the device management tool.

Supports effective CBOX control using local and cloud management.

2.1 Local Management

In local management, you can select and manage devices based on the IP addresses of devices on the LAN.

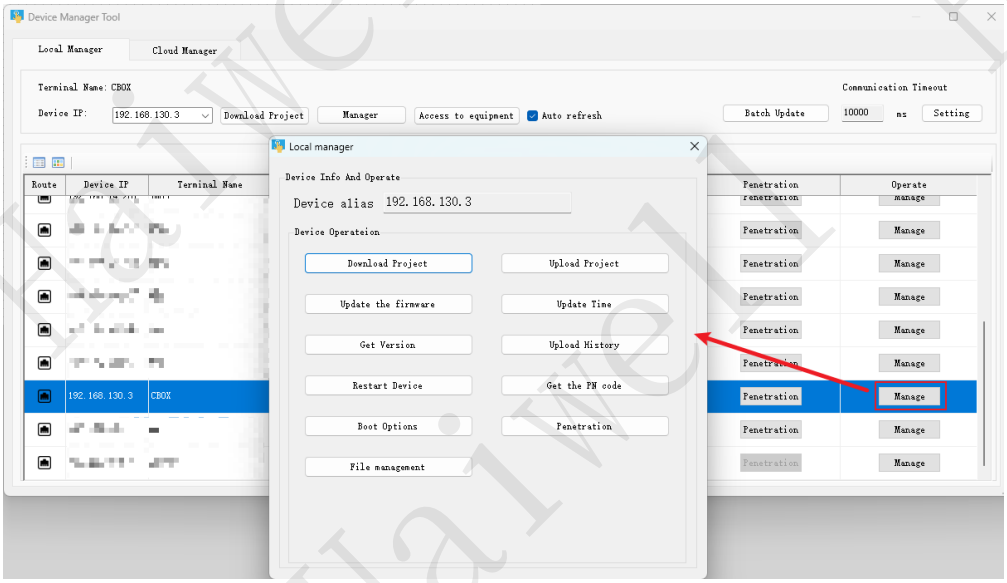


Figure82 Local Manager

2.2 Cloud Management

In cloud management, users can log in by mobile phone or email. Device administrators and owners can manage current devices, but common users do not have device management rights. Users can log in to the device Manager by entering the correct account and password. After login, users can select a specific device and perform management operations.

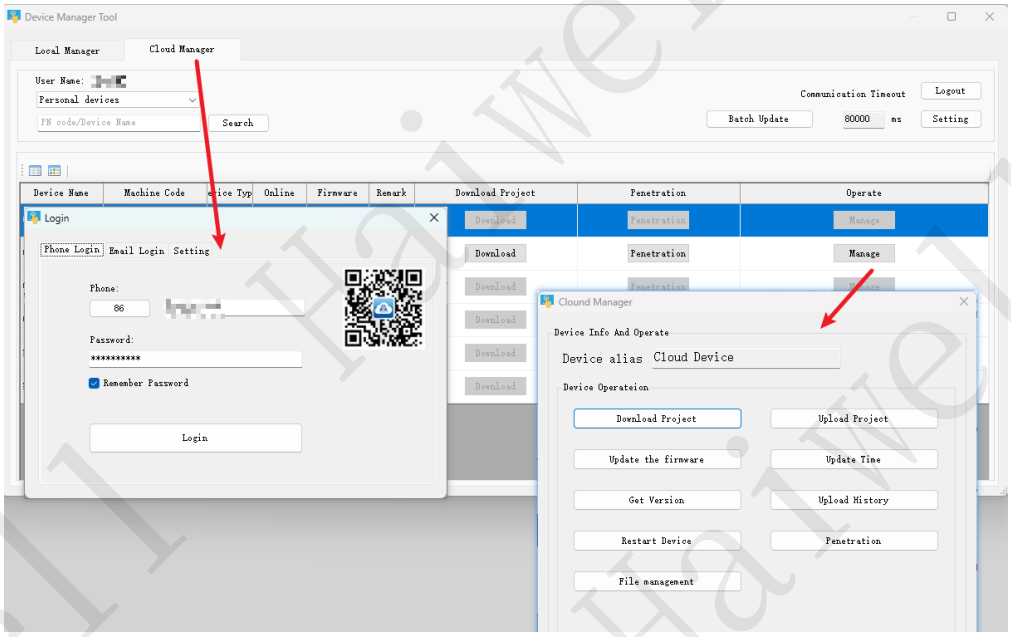


Figure83 Cloud Manager

3. Project Download

3.1 Local Download

Step 1: Go to the Device management tool. You can choose to use local management or cloud management, find the corresponding CBOX, and click "Download Project".

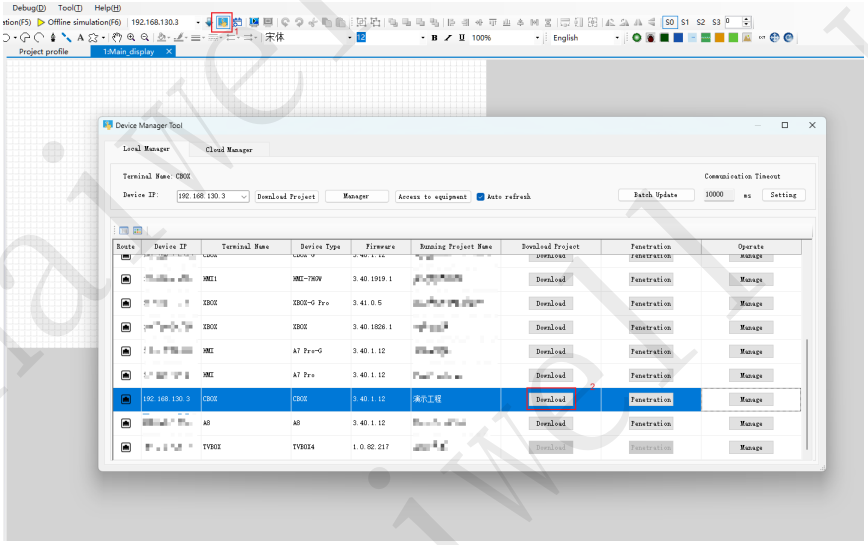


Figure84 Local Download Project

Step 2: In the confirmation download interface, you can choose whether to retain history and alarm records, whether to retain recipes, and whether to pack fonts for download according to your needs. You can check it by default and click "OK".

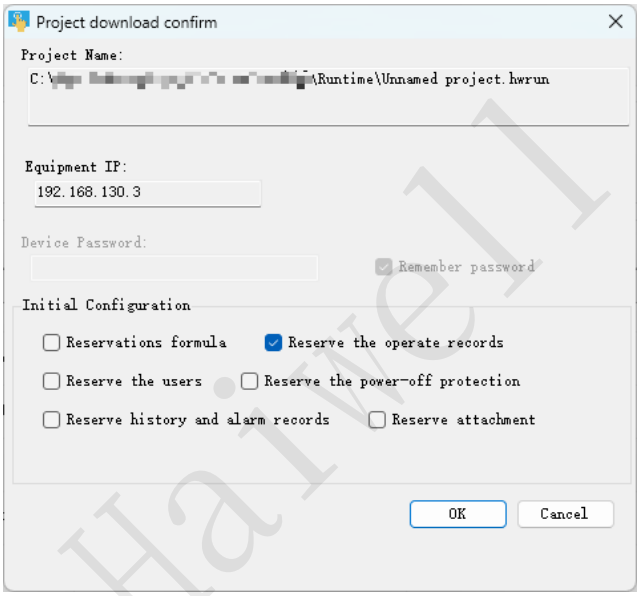


Figure85 Project Download Confirmation

Step 3: Wait until the message "Download success!" is displayed. Click "OK" to run the new project on the CBOX.

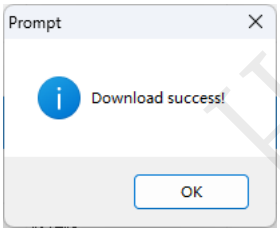


Figure86 Download Successfully

3.2 Remote Download

Step 1: To use cloud management, you need the CBOX to connect to the Internet and the cloud is online. Log in to the cloud APP account and password, find the bound CBOX, and select Download Project.

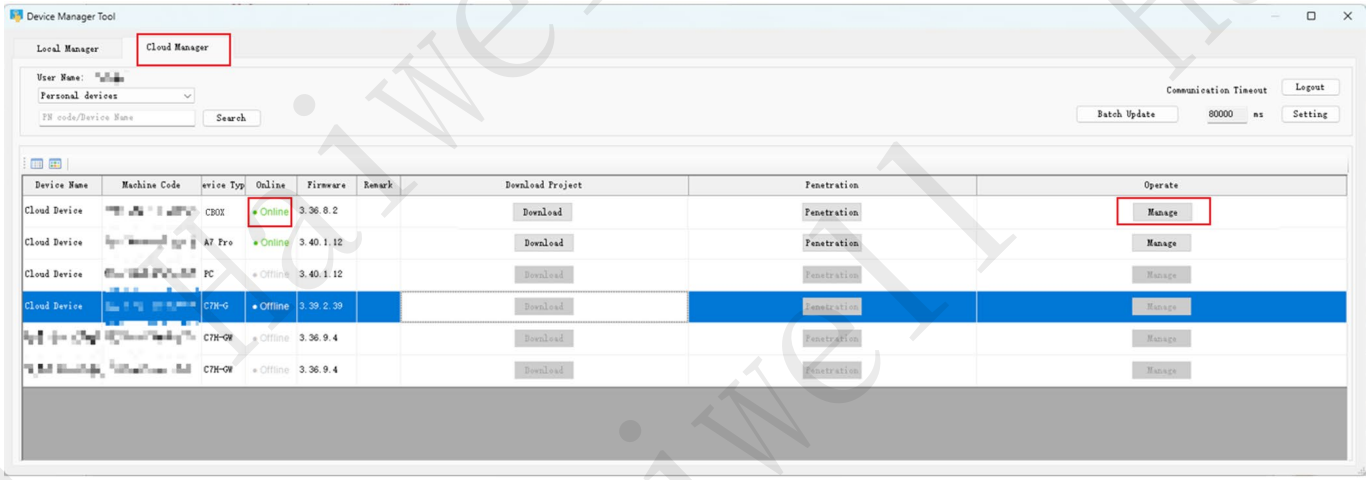


Figure87 Remote Download Project

Step 2: The follow-up is the same as the local download, and will not be summarized here.

4. Project Operation

After the project download is successful, wait for CBOX restart, after the successful restart, the touch

screen will automatically open the project start screen, the toggle bit is set to on, the value displays the input write value of 10, and you can observe the PLC monitoring to see that there is a successful write.

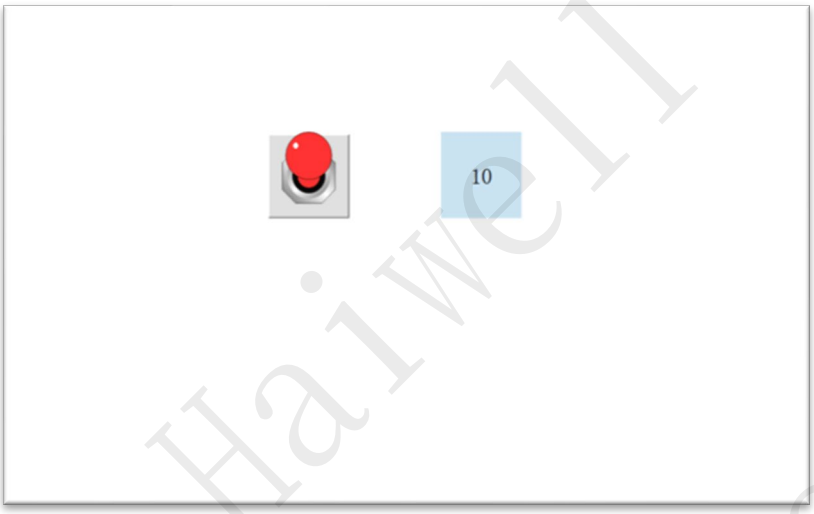


Figure88 CBOX Running Screen

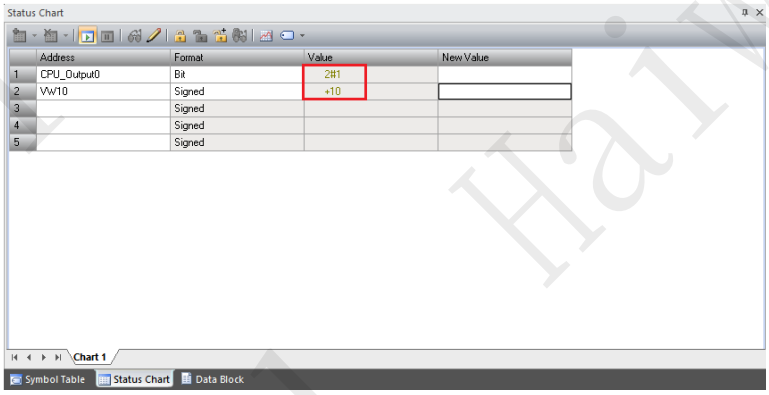


Figure89 PLC Real-time Monitoring

5. Local/Remote Access CBOX Screen

5.1 PC Local/Remote Access

（1） PC Local Access

Method 1: Local management After downloading the project, check the project properties to run LAN access, you can enter the CBOX IP address in the browser and press Enter to locally access the CBOX screen (for example: 192.168.130.3).



Figure90 Enter IP in the Browser

Method 2: Local management in the Device management tool Click Access Device. The browser is automatically displayed to access the device on the LAN.

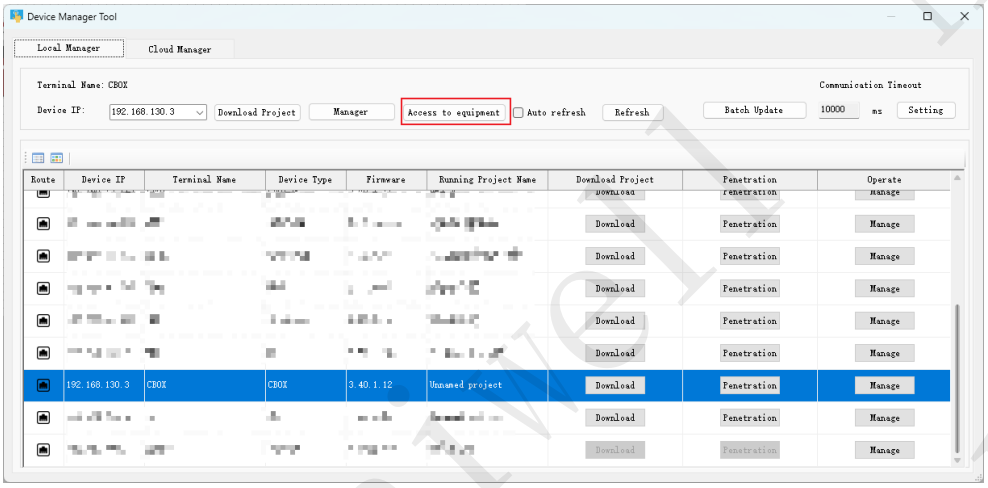


Figure91 Manage Access Devices Locally

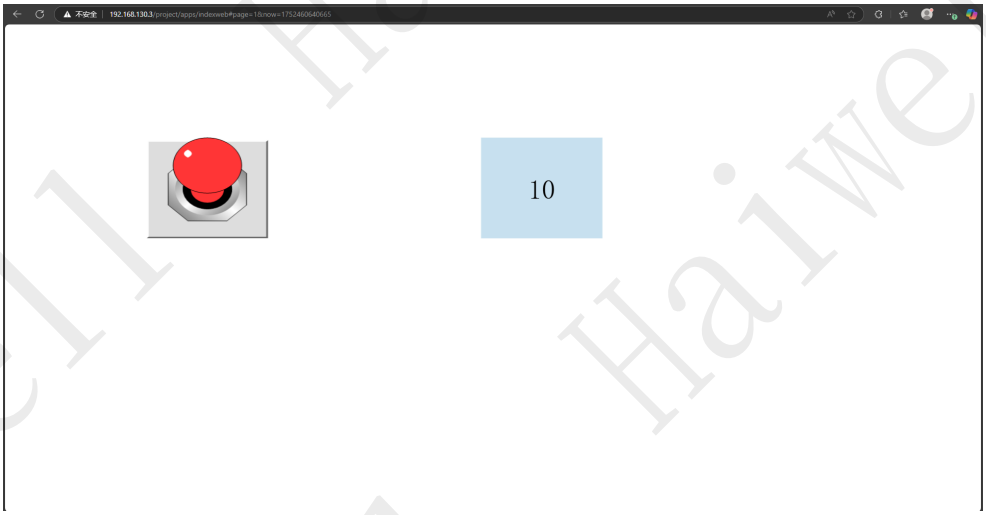


Figure92 Browser LAN Access

（2） PC Remote Access

Step 1: open the computer browser, type https://ecloud.haiwell.com/ access to the Haiwell for IIoT at cloud platform, login password is selected to individual users into the platform.

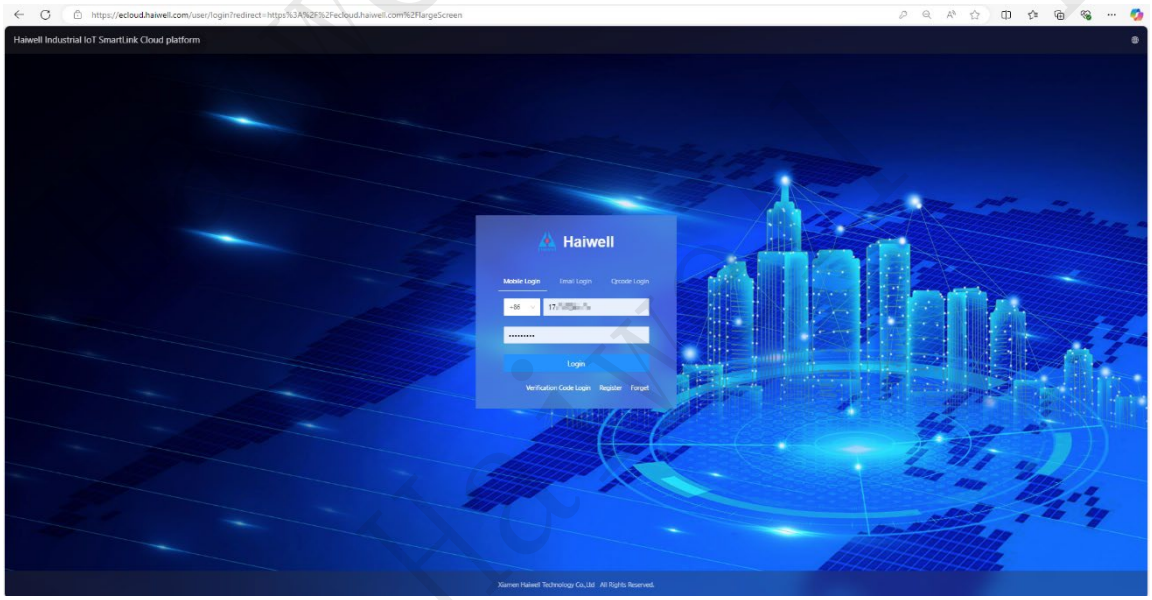


Figure93 Log in Haiwell IIOT Intelligent Cloud Platform

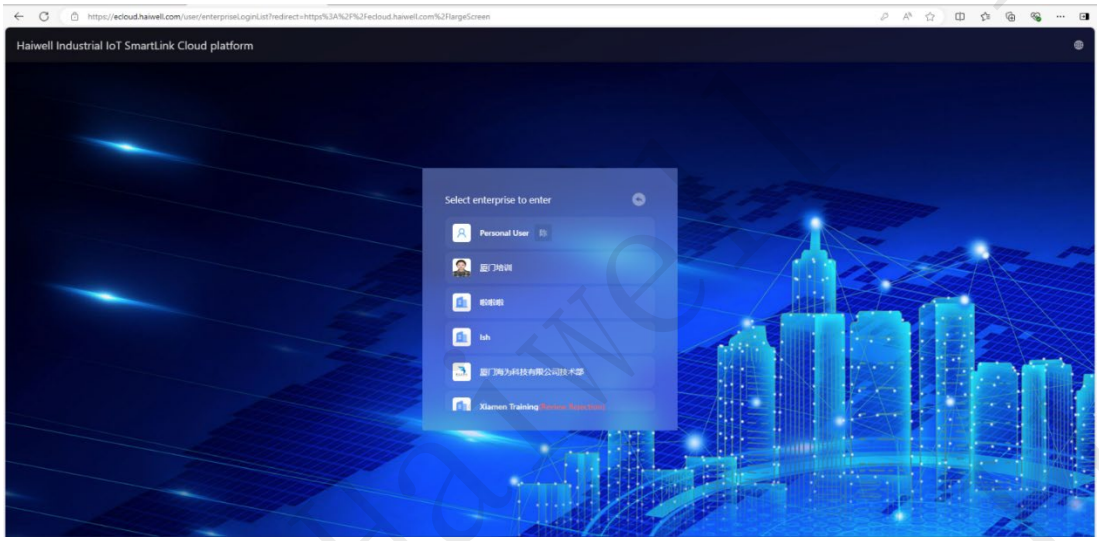


Figure94 Select Individual User

Step 2: In the device list, select the corresponding CBOX and click  Enter device details.

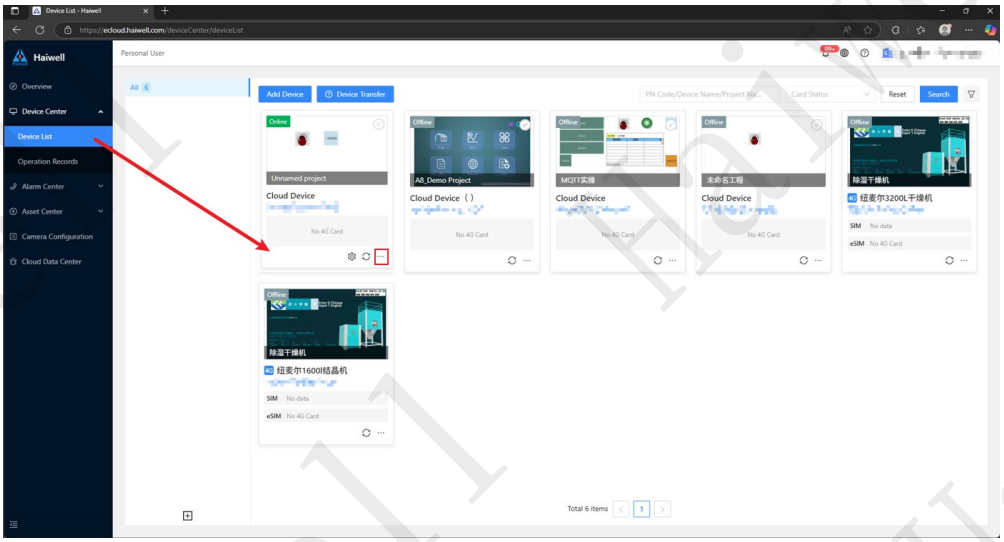


Figure95 Enter Device Details

Step 3: Click【Access Program】in the device details to access the CBOX screen remotely.

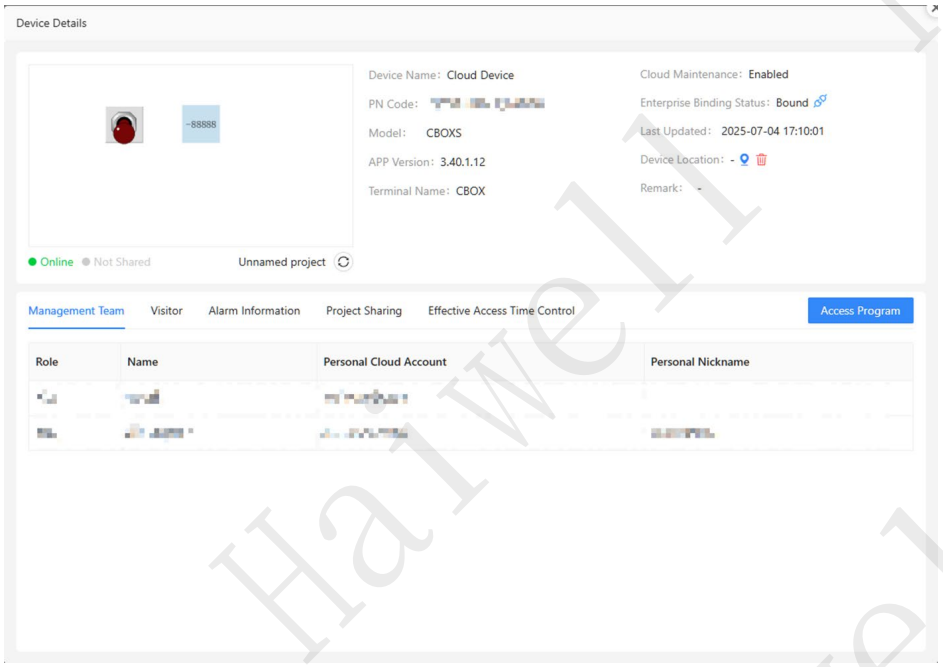


Figure96 Access Program

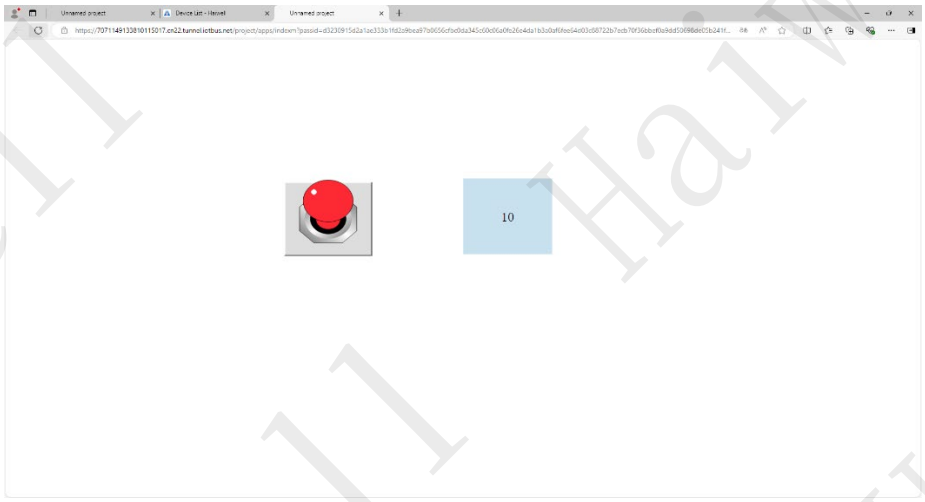


Figure97 Remote Access to CBOX Screen

5.2 Remote Access on Mobile

Open the Haiwell Cloud APP or WeChat Mini program on your mobile phone, log in to the cloud device with the account password, select the corresponding CBOX device, and finally click "Direct access".

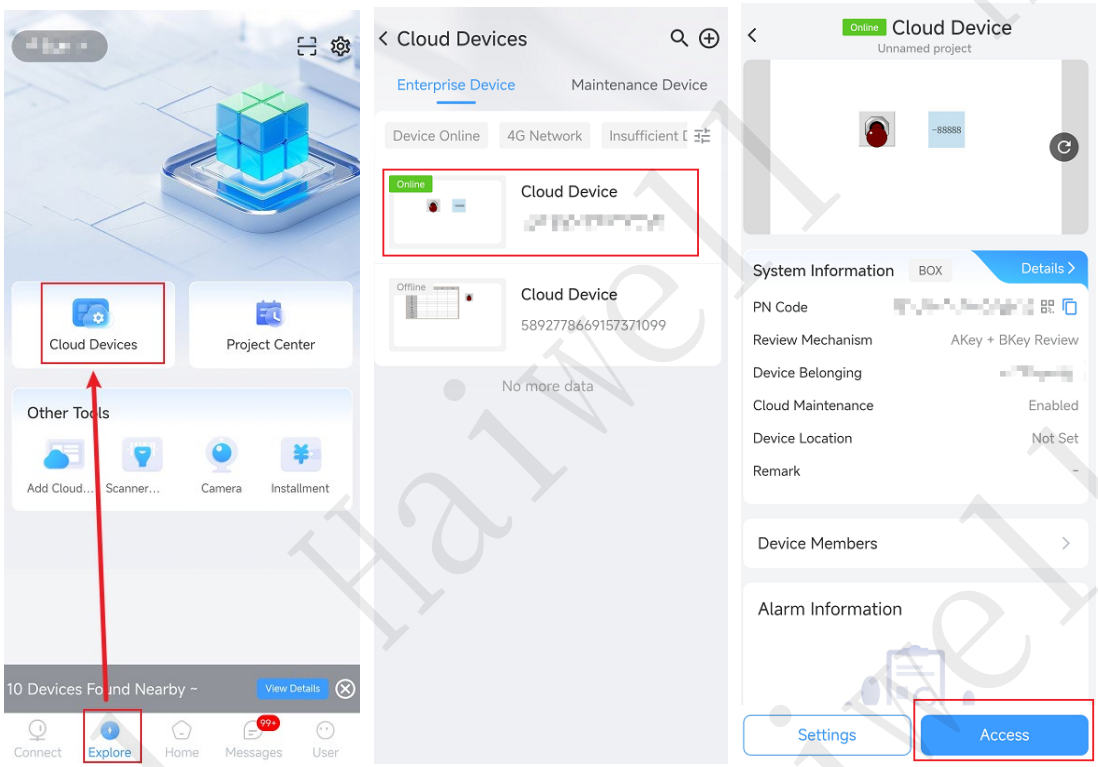


Figure98 Remote Access to CBOX screen on Mobile Phone

VII. Remote Passthrough PLC

In this paper, Siemens 200 smart passthrough transmission as an example, in the case of successful Ethernet communication between CBOX and PLC, then perform the following steps to achieve the remote download of PLC function.

1. Modify the Computer Supply Network Segment

Open your computer Settings and click【Change Adapter Options】

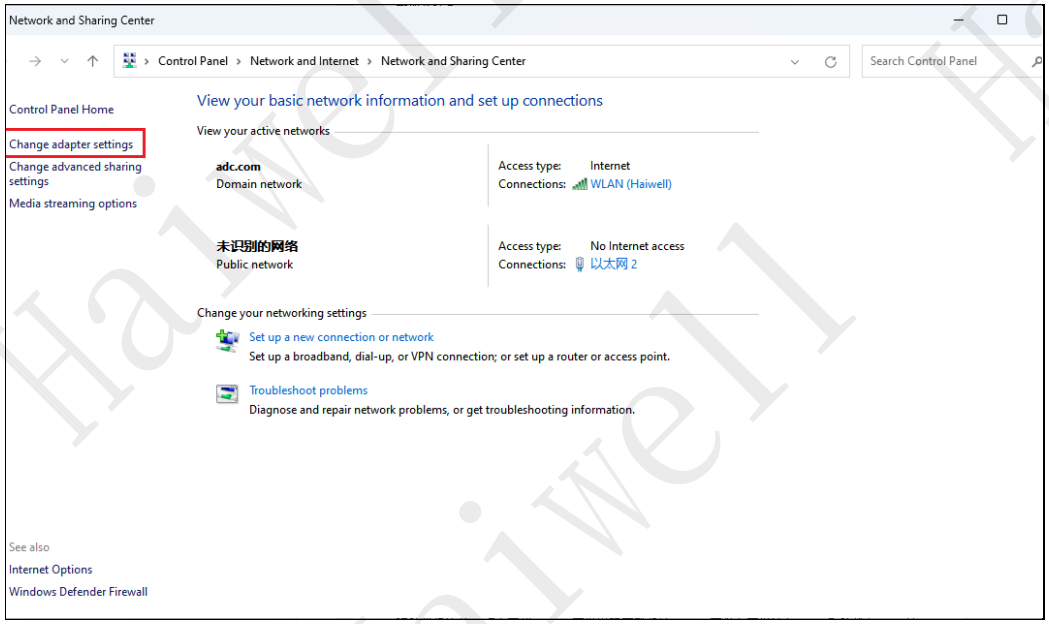


Figure99 Open Computer Settings

If the computer is supplied by Ethernet, check the Ethernet IP address segment to ensure that the Ethernet IP address segment is different from the PLC IP address segment. For example, if the IP address

of the PLC is 192.168.130.6, then the IP address segment of the computer's Ethernet must be changed to an address other than 6.

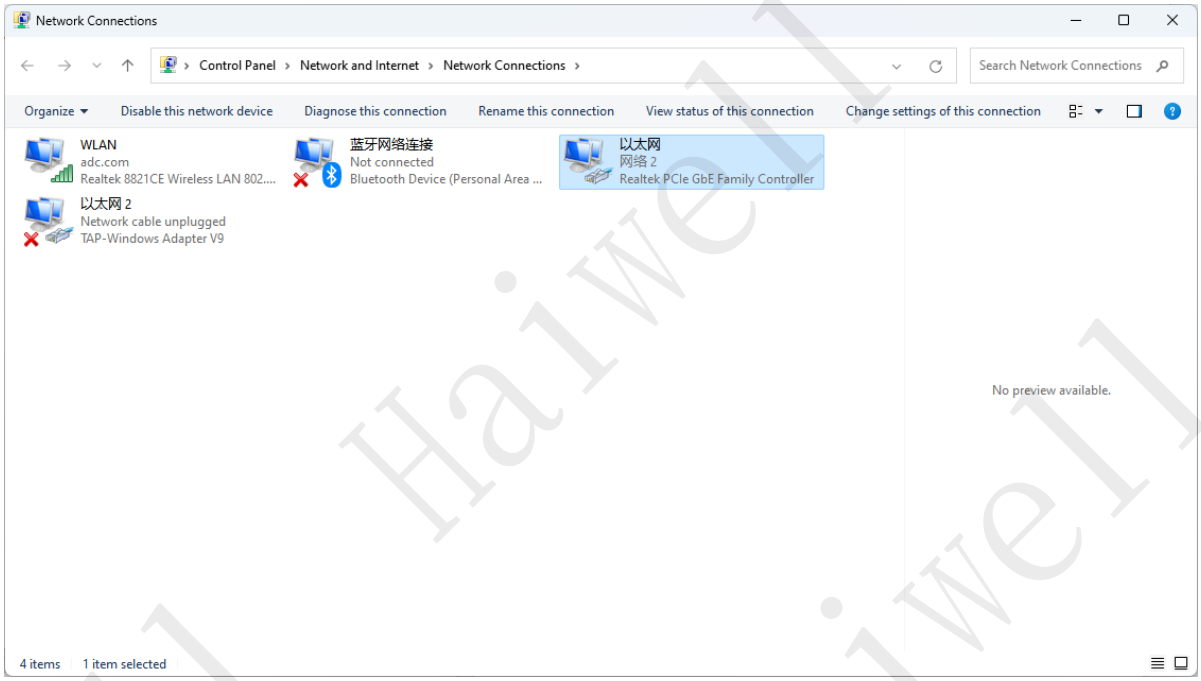


Figure100 Check the Supply Network Segment 1

2. Open the Device Management Tool

After the successful communication between CBOX and Siemens 200 smart according to the previous project, open the configuration SCADA software - Tool - Device management tool, select Cloud Management, and carry out passthrough transmission of the device.

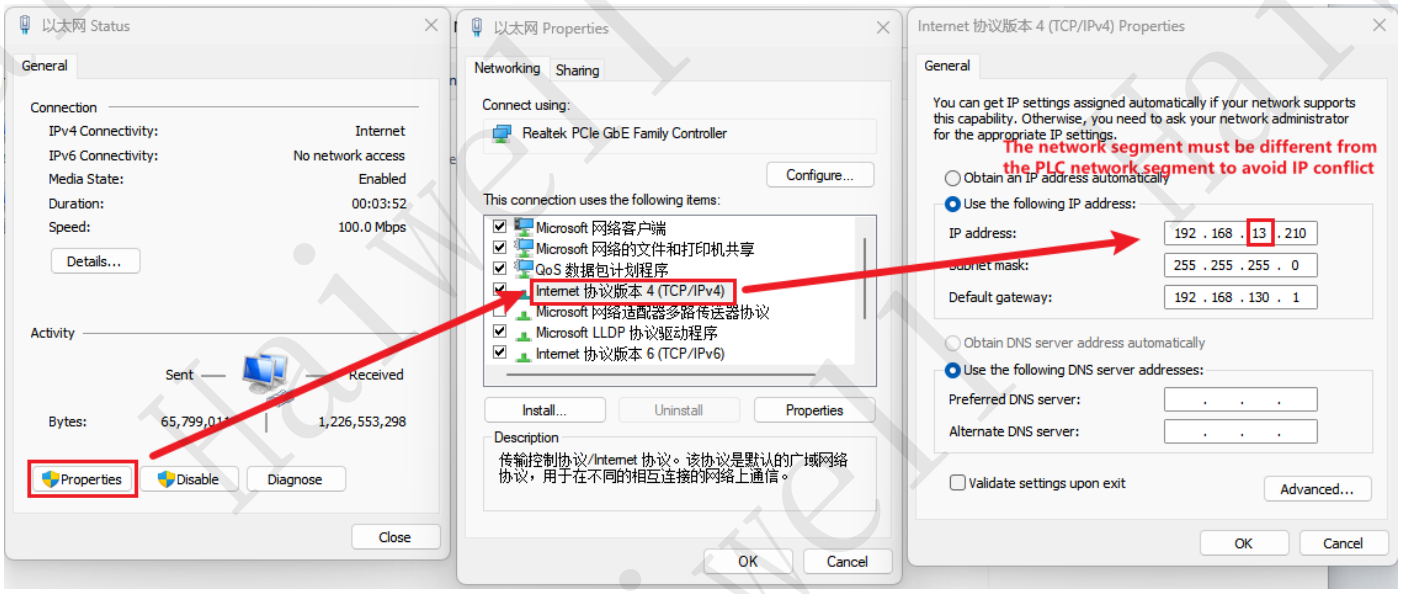


Figure101 Check the Supply Network Segment 2

Note：If the computer has WIFI function, the network mode can use WIFI first and then perform VPN passthrough transmission operation.

3. Open the Device Management Tool

After the successful communication between CBOX and Siemens 200 smart according to the previous project, open the configuration SCADA software - Tool - Device management tool, select Cloud Management, and carry out passthrough transmission of the device.

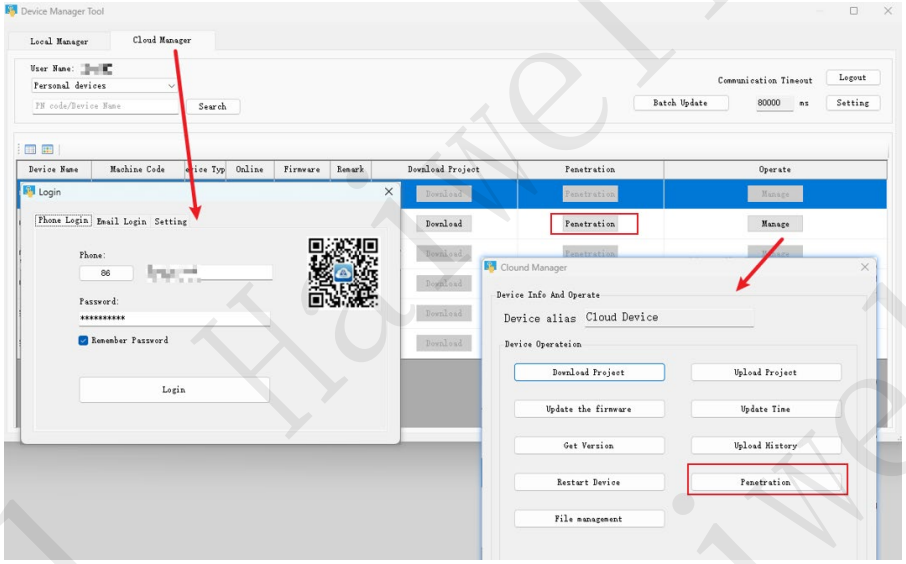


Figure102 Open the Device Management Tool

4. Connect Penetrating Devices

Please turn off the device's routing mode before penetration.

Use the device management tool - Cloud Management to perform VPN passthrough transmission, log in to the cloud account, select the corresponding Intelligent device - and connect the device.

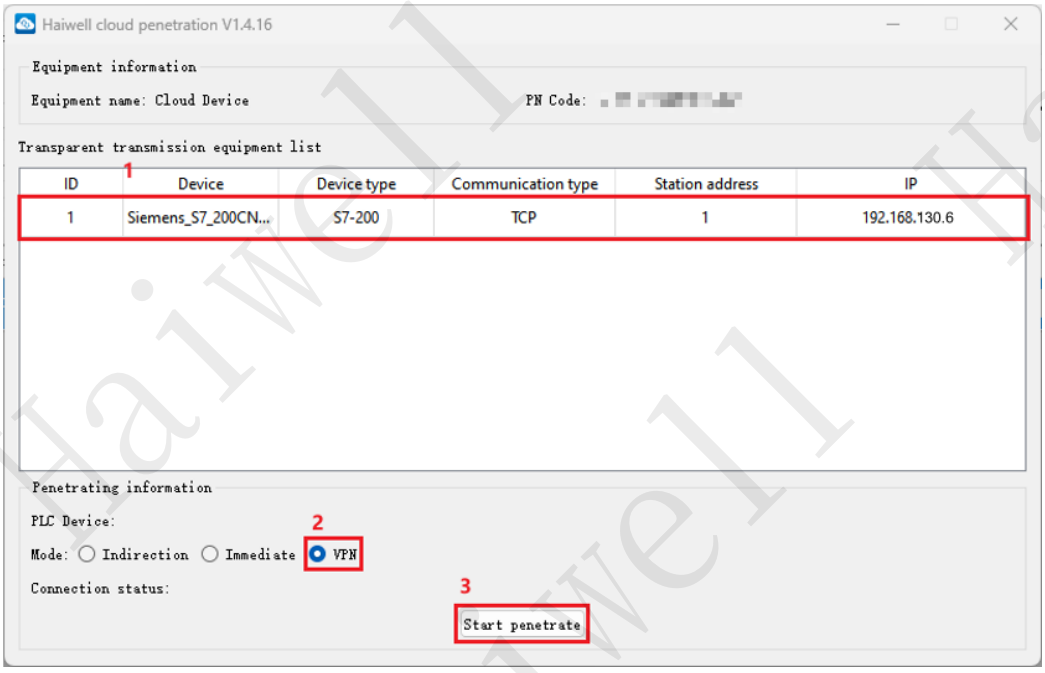


Figure103 VPN Connect the Passthrough Device

After connecting the device - select the corresponding PLC, and the passthrough transmission mode is the transit mode by default. In this paper, select VPN, click Start passthrough transmission, and fill in the IP address to establish a virtual IP address through the CBOX's screen.

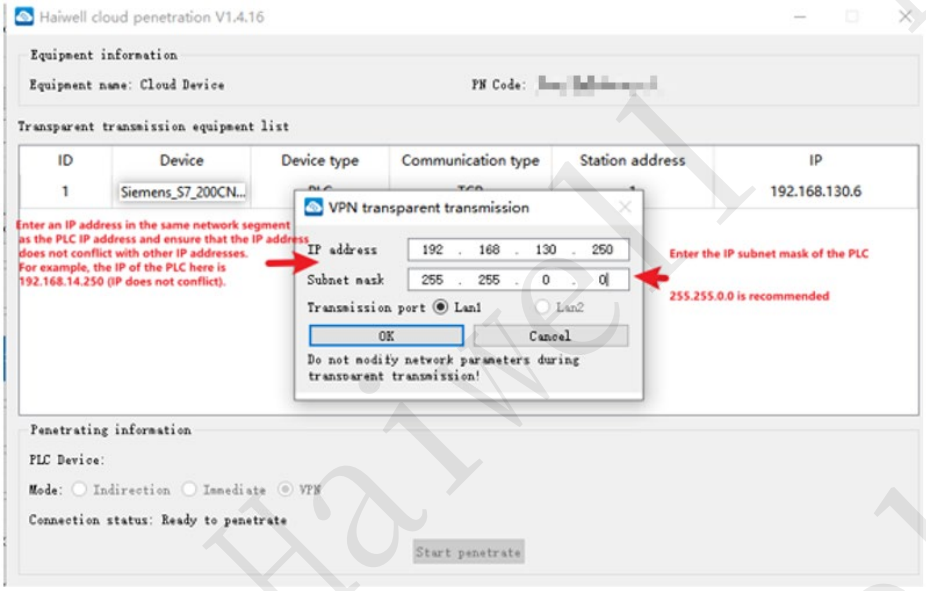


Figure104 VPN Passthrough Transmission Fill Information

Note: Click after start pass through. The virtual IP address that needs to be set up here is not an IP address that is exactly the same as that of the PLC. The IP address is in the same network segment as the IP information of the PLC device that needs VPN passthrough transmission, and there is no IP address conflict with the local area network where the PLC device is located. Subnet Mask Enter the subnet mask corresponding to the PLC IP address or 255.255.0.0, and click OK.

5. VPN Status Check

After the preceding operations are performed and transmission through is enabled, you need to check the VPN status. Open your computer Settings and click【Change Adapter Options】.

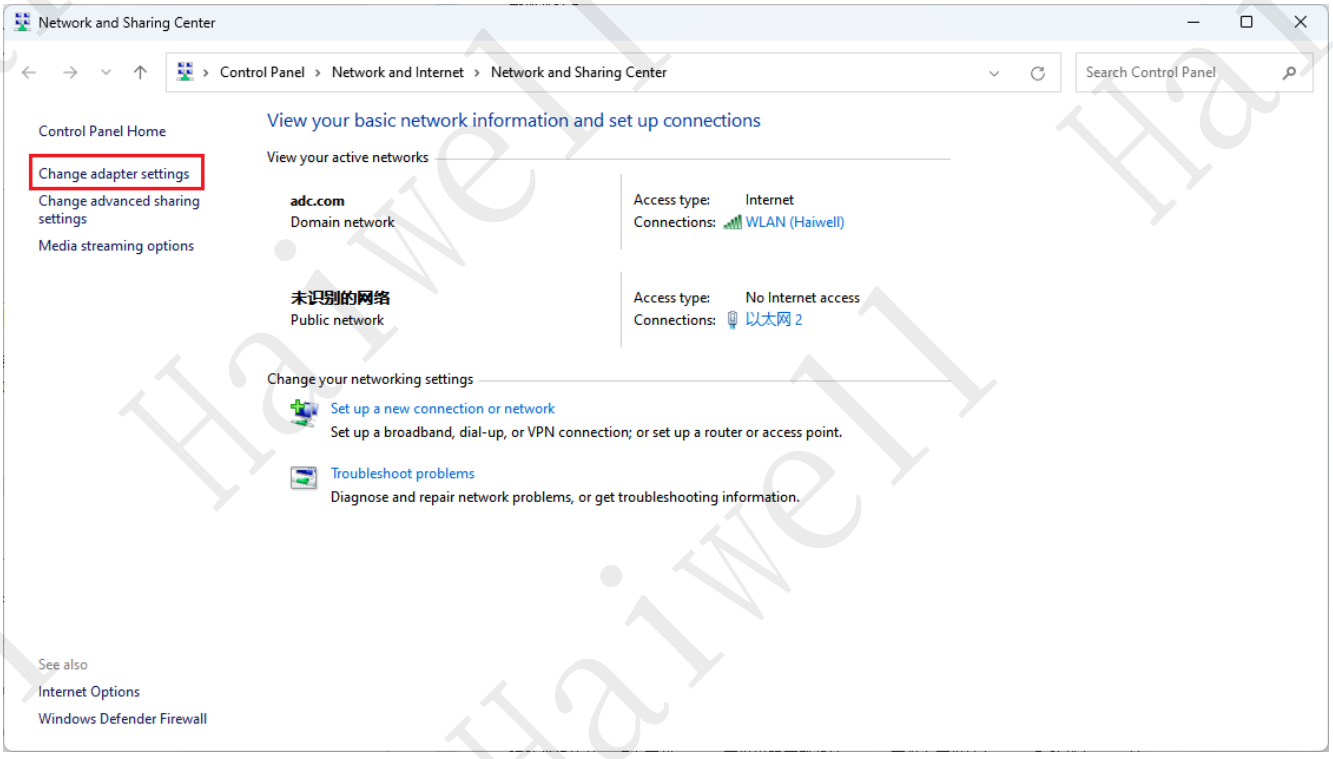


Figure105 Change Adapter Options

Locate the Ethernet (in this case, Ethernet 2) where the virtual network interface TAP-Windows

Adapter V9 is located. Double-click the "Ethernet 2" interface.

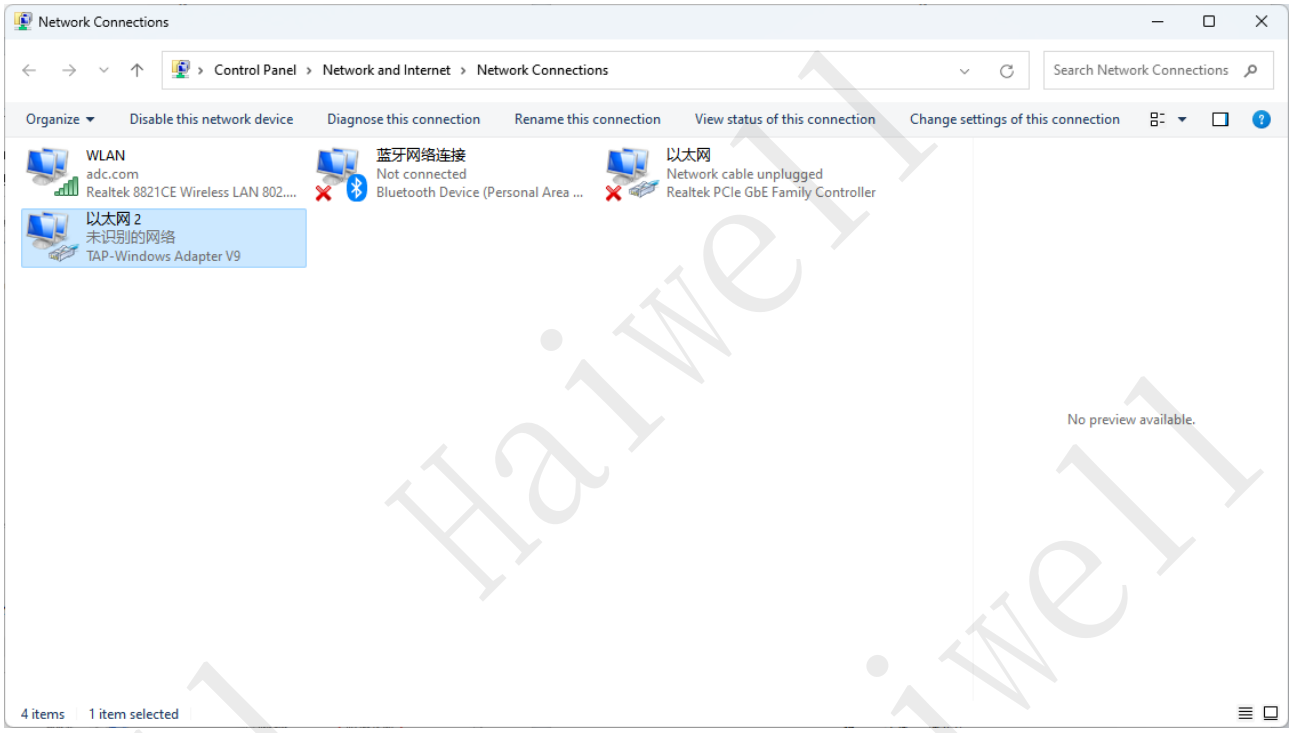


Figure106 Open the Virtual Network Card

Click【Details】, you can check the IPv4 address and IPv4 subnet mask information in the pop-up "Network Connection Details" page, and when the two are consistent with the VPN parameter Settings, you can start the passthrough transmission PLC device.

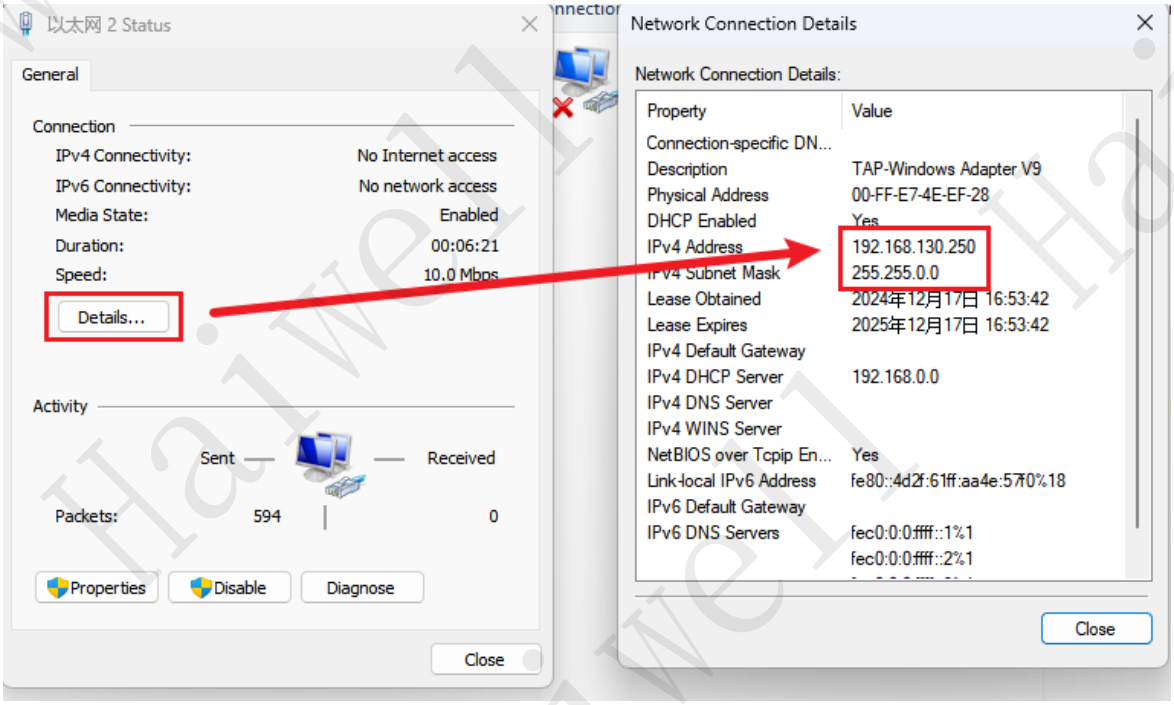


Figure107 Check the IP Address of the Virtual Network Card

Note: When the result of the query is: The generated TAP-Windows Adapter V9 network interface is connected to an unidentified network, and its right-click status is displayed - The IPv4 address and IPv4 subnet mask in the details are consistent with the VPN parameter Settings, you can start passthrough

transmission of PLC devices.

(The preceding method is used to query VPN status in windows 10. In windows 11, you only need to click Settings > Network and Internet > Advanced Network Settings to query related network information.)

6. Passthrough Transmission PLC

Open the Siemens programming software and click to go online. In the dialog box that is displayed, select the TAP-Windows Adapter V9 network interface driver. Click Find CPU, you can appear online PLC, if there is no CPU can be added manually enter the PLC IP address.

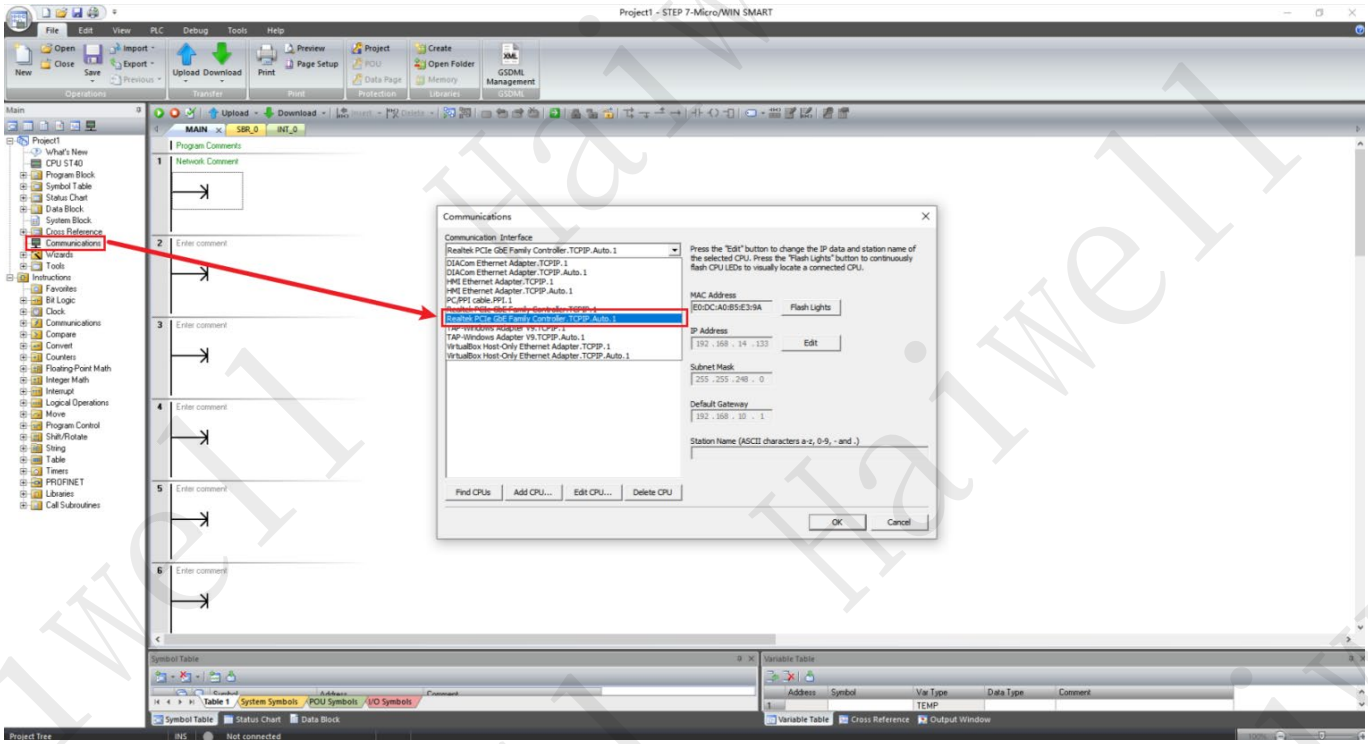


Figure108 Select the V9 Communication Interface

Select the IP device connected to the Siemens SMART PLC and double-click the corresponding IP to connect the PLC.

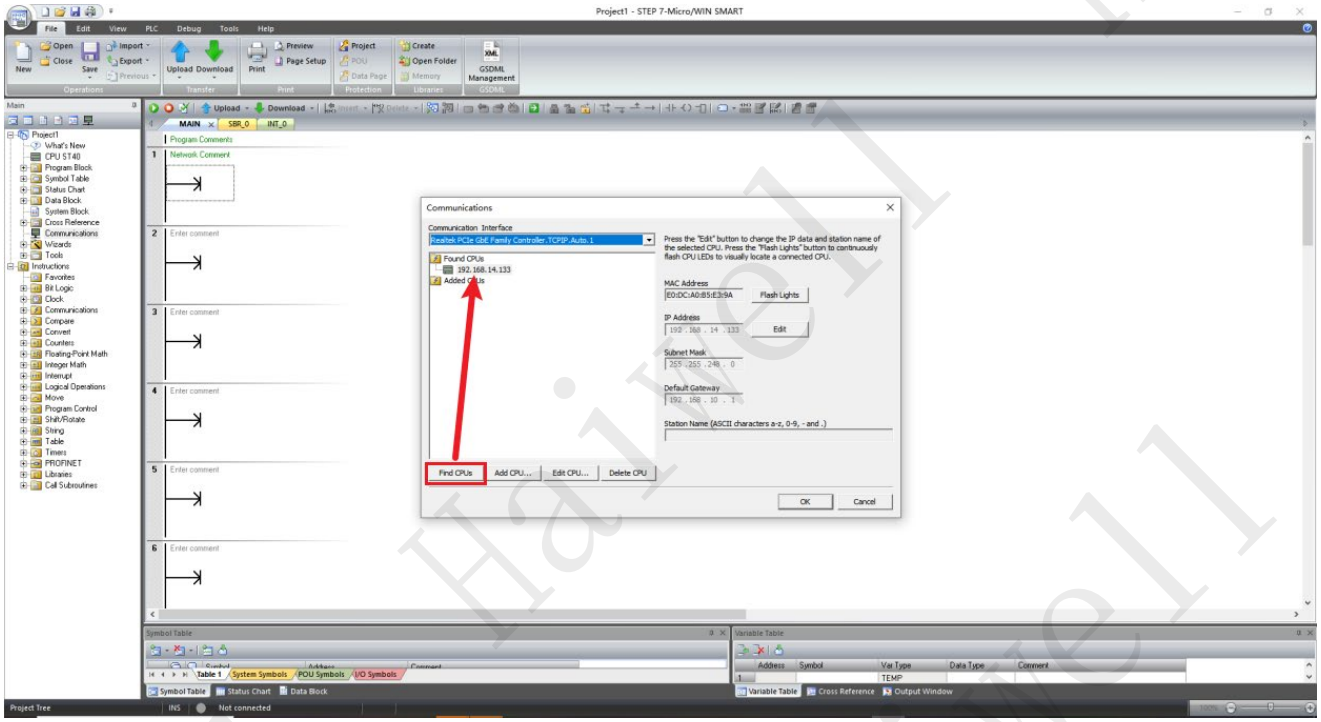


Figure109 Look Up CPU

After the connection is successful, you can see the connection status below, and you can download the PLC project.

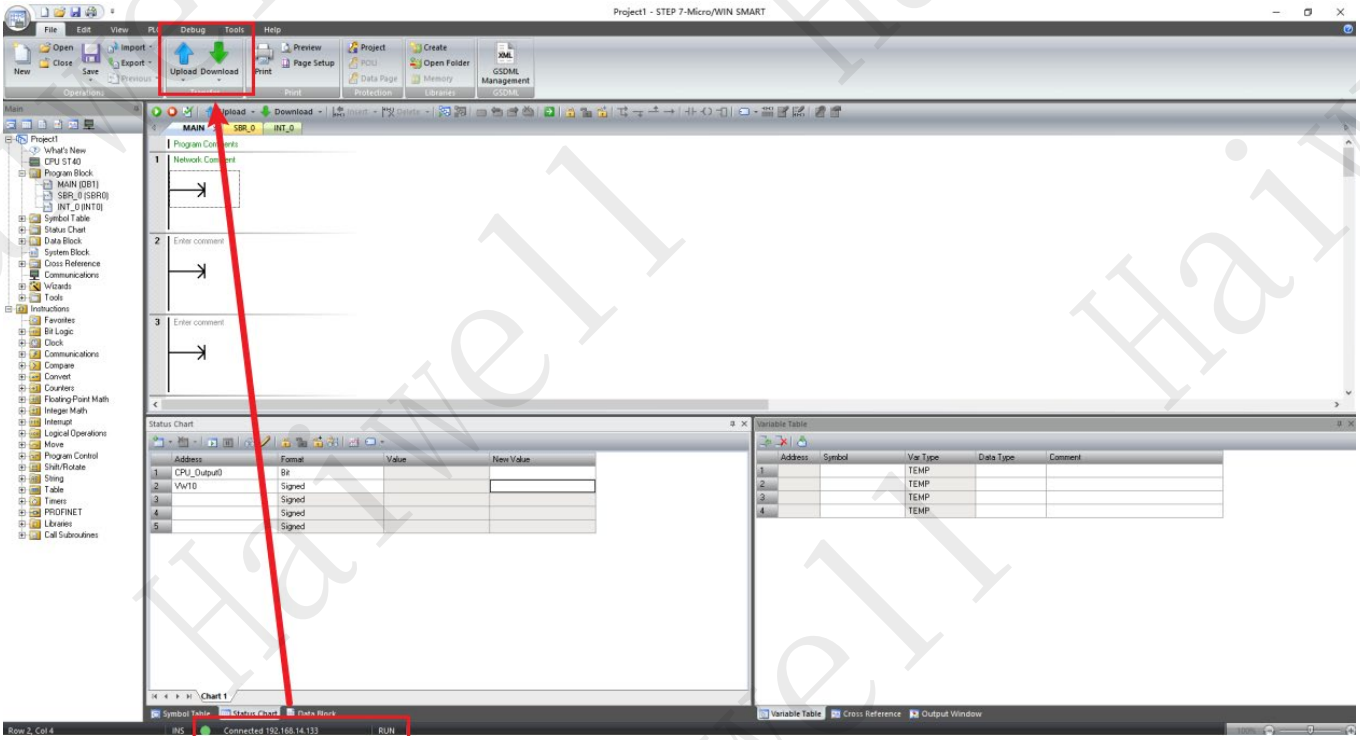


Figure110 Check Connection Status

Note: VPN passthrough transmission support PLC and Haiwell products communication failure can also be normal passthrough transmission;

VPN passthrough transmission supports all PLC devices in the same LAN with passthrough transmission set IP address parameters.

VIII. Factory Reset

During the use of the device, the factory reset function can be used to restore the CBOX to its initial state. The operation method is as follows:

First, confirm that the RST button on CBOX is functioning properly by clicking it and listening for a "beep" sound.

1. Restore Network Configuration

The network configuration and the password for entering the system settings interface will be restored to their initial states.

Steps1: Press the【RST】button briefly three times to enter the network configuration restore mode. Wait for the buzzer to emit a "beep" sound and the three lights to flash slowly. This indicates a successful restoration.

2. Factory Reset

The network configuration and the password for entering the system settings interface will be restored to their initial states; all system settings information will be restored to their initial states.

Steps 1: Press and hold the【RST】button for 5 seconds. The three lights will flash slowly, entering the factory reset network configuration mode. Release the【RST】button.

Steps 2: Within 3 seconds after releasing the【RST】button, press and hold the【RST】button for 3 seconds again. The three lights will flash quickly, entering the factory reset mode. Release the【RST】button. If the buzzer emits three "beep" sounds, the restoration is successful.

IX. Common Problem

1. What is the default IP address of CBOX?

The factory default IP address of CBOX is 192.168.1.112. To modify the IP address, refer to the （1）Ethernet Settings for specific steps.

2. How to upload/download projects locally on CBOX?

Local Project Download:

- Ensure CBOX and the computer are on the same local network and share the same subnet.
- Open the configuration software → Device Management Tool → Local Devices.
- Locate the target CBOX device in the list and click Download Project.

Local Project Upload:

- Ensure CBOX and the computer are on the same local network and share the same subnet.
- Open the configuration software → Device Management Tool → Local Devices.
- Locate the target CBOX device in the list, select Manage to enter the local manager, and click Upload Project.

(Note: Project upload is disabled by default. To enable it, open the configuration software, go to Project → Project Properties → Security Settings, check "Allow Project Upload" and set an upload password.)

3. How to access CBOX's background settings?

3.1 Method 1: LAN Access

Computer:

Ensure the computer and CBOX are on the same LAN and subnet. Enter [Device IP]/setting in the browser (e.g., 192.168.130.4/setting) to access the background settings.



Figure111 Browser-based LAN Access to Background Settings

Mobile:

Connect the mobile device to CBOX's built-in hotspot via WIFI. Open the Haiwell Cloud APP → Local Devices → locate the CBOX device. If the device is not visible, manually enter the hotspot IP 10.5.5.1 in the top-left corner ⊕ of the Local Devices page, then click to enter the background settings.

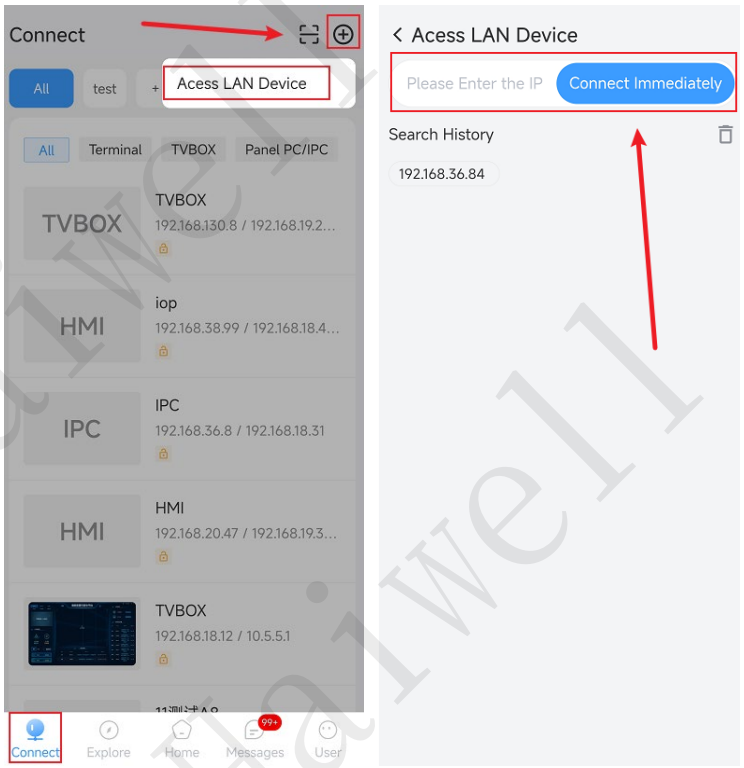


Figure112 APP LAN Access

4. Unstable or failed communication between CBOX and Ethernet devices?

Communication Failure:

Step 1: Verify wiring connections. Use a multimeter to check pin alignment if necessary. Ensure communication parameters (COM port, station address, protocol type, baud rate, data format, etc.) match the configuration in the project.

Step 2: Test communication using a third-party tool (e.g., Modbus Poll). If unsuccessful, the device may use a non-standard Modbus protocol.

Unstable Communication:

Step 1: Adjust Communication Timeout (recommended: 1500ms) and Packet Length (recommended: 10).

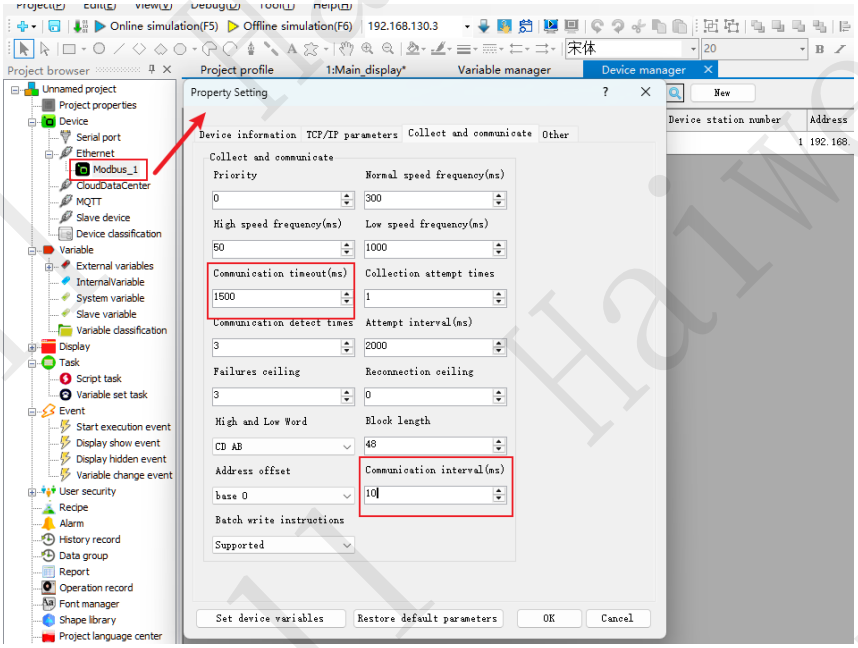


Figure113 Adjusting Communication Parameters

5. CBOX reads incorrect values from devices (e.g., flow meters, energy meters)?

CBOX defaults to CD AB byte order. Adjust the byte order in the configuration project to match the target device. Use tools like Modbus Poll to test different byte orders if unsure.

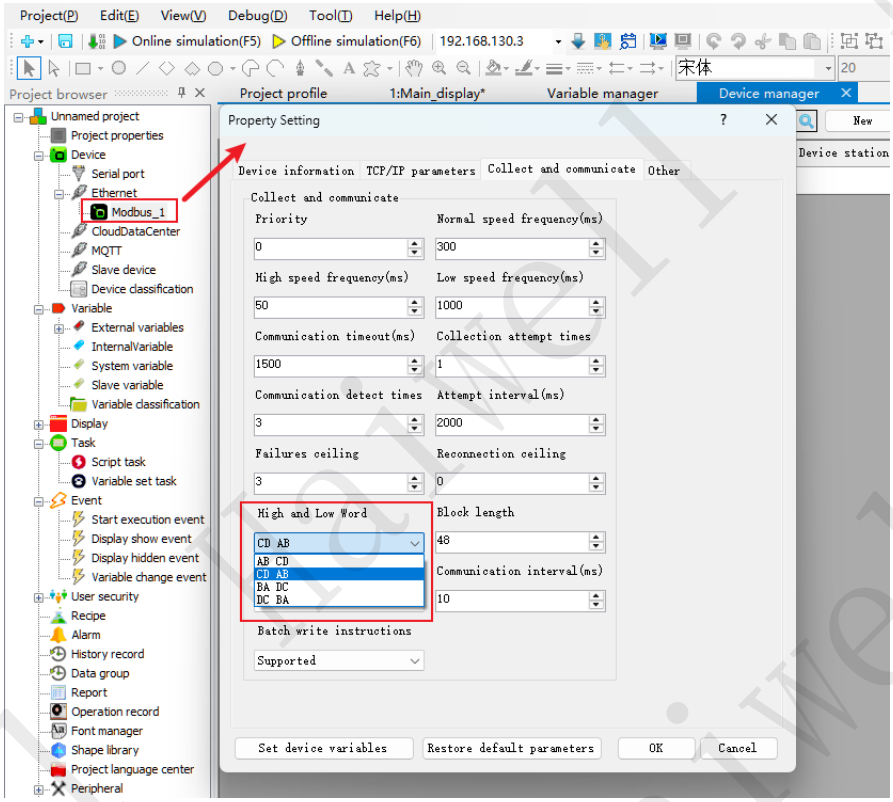


Figure114 Modifying Byte Order Settings

6. How to unbind the owner Akey in CBOX cloud settings?

Owner Akey is accessible

Mobile: Open the Haiwell Cloud APP/WeChat Mini Program → Cloud Devices → Select the device → Edit Device → Delete Device. (If other users are bound, remove them first.)

Computer: Log in to ecloud.haiwell.com → Device Center → Device List → Select the device → Delete Device.

7. CBOX cloud status is offline. How to troubleshoot?

Step 1: Go to Background Settings → Network Diagnostics, ping cloud.haiwell.com to check server connectivity. If failed, resolve network issues.

Step 2: In Background Settings → Local Settings → Other Settings, switch the server channel (e.g., switch between Shenzhen/Qingdao servers).

Step 3: (4G networks): Disable/re-enable 4G or set DNS to 8.8.8.8 or 1.1.1.1.

8. No service after inserting a 4G SIM card into CBOX?

Step 1: Verify SIM card status (balance, internet access). For restricted SIMs, bind domain names (see appendix).

Step 2: Insert the SIM while CBOX is powered off (chip side facing the pins).

Step 3: Enable 4G in Background Settings → Network Settings → 4G and check for signal/card details.

Step 4: Ping www.google.com or cloud.haiwell.com. If successful but still offline, switch server channels in Background Settings → Local Settings → Other Settings.

9. WIFI connection failed on CBOX?

Step 1: Ensure the Wi-Fi antenna is properly installed near the signal source.

Step 2: Use 2.4GHz Wi-Fi frequency.

Step 3: Avoid spaces or special characters in the SSID/password.

10. CBOX VPN passthrough fails to connect to PLC?

Step 1: Ensure the computer and PLC are on different subnets. Change the computer's subnet or use Wi-Fi.

Step 2: Verify the virtual NIC IP settings in firewall/antivirus software.

Step 3: Uninstall the VPN tool via C:\Program Files\OpenVPN\Uninstall.exe, then reinstall it through the configuration software during passthrough setup.

11. How to optimize device connection latency with Haiwell Cloud?

Users can try changing the device's internet DNS to 8.8.8.8 or 1.1.1.1 through the device background settings.



Figure115 Change Device Internet DNS (Ethernet)

Appendix

1. Self-shopping IoT network card binding domain name collection

Serial Number	Agreement	Wildcard Domain Name
1	UDP	time.windows.com
2	UDP	*.ntp.org.cn
3	TCP UDP HTTP HTTPS	*.tunnel.iotbus.net
4	HTTP HTTPS WS WSS	*.haiwell.com
5	TCP UDP MQTT	*.iotbus.net
6	TCP UDP MQTT	*.cloud.haiwell.com
7	TCP UDP	47.107.224.237
8	TCP UDP ICMP	8.8.8.8 or 1.1.1.1

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