FOORIR
Smart Counter Provider

User's Manual

3D People Counter

HX-CCD20

Version 2025-1.5

Statement

Notice

- The parameters used in the screenshots shown in this manual are only used as setting examples for reference and may not be completely consistent with the actual situation. Please set the parameters according to your actual needs.
- The housing is prohibited from being disassembled during operation.
  Anti-disassembly reminder: Be careful when manually disassembling the housing of the device to avoid damage to the device. This is a Class A product. In a living environment, this product may cause radio interference. In this case, the user may need to take practical measures to deal with the interference.
- Due to different software versions, the screenshots shown in this manual may not be completely consistent with the device interface of the product you purchased. Please configure your product according to the actual device interface.
- If you find that there is a shortage or damage to any accessories, please contact your local dealer in time. The product pictures/screenshots in this manual are for reference only and are intended to help users install and configure the product. Please refer to the actual product/actual interface for details.

For assistance, please contact:
Manufacturer: Chengdu Huaxin Zhiyun Technology Co., Ltd.
Phone/WhatsApp:+86 18981978865
E-mail:info@foorir.com
Website: www.foorir.com

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1. Product Introduction

1.1 Product Introduction

The 3D people counter (HX-CCD20) product obtains 3D depth information in real time through binocular stereo vision AI sensors, identifies head and shoulder features in complex scenes based on head and shoulder feature algorithms, and achieves accurate passenger flow statistics through human body tracking algorithms.

It can be used in shopping malls, retail stores, public transportation vehicles, scenic spots, libraries, museums, restaurants, factories, supermarkets, parks, buildings, toilets, etc.

1.2 Product Features

- **Real-time and accurate statistics:** Real-time and accurate identification of people entering and exiting, with an accuracy rate of up to 99%, accurately filtering out children and other large objects.
- **Resident statistics:** Multi-dimensional statistics of the number of people staying in a specified area.
- **Passing statistics:** People who enter the device detection area but do not actually enter the store and leave will be identified as "passing by".
- **Return statistics:** People in the store enter the device detection area but do not completely leave the store, and return to the store will be identified as "returning".
- **Wide coverage:** The device has a 100°-140° soft zoom, which can adapt to scenes at different heights.
- **Data upload timeliness:** You can customize the data upload server time, which can support real-time, 1 minute, 5 minutes, 30 minutes, etc.
- **Multi-protocol support:** The device provides HTTP POST/HTTPS POST/FTP/ SFTP/MQTT protocol data transmission, and supports secondary development data docking of the device.
- **Rich open interfaces:** The device has rich local open application interfaces and RS-485 expansion support, so developers can integrate and develop flexibly and quickly.
- **Network intelligent device:** Supports local computing, no local server required, supports flash offline storage, supports network disconnection and continuous transmission, supports Poe power supply, and supports wired/wireless connection.

Functional Mode:

1. Limited mode: When the number of people exceeds the set value, the device sends a signal to the alarm and the alarm sounds.

2. Child mode: After setting the child's height, people who pass by below this height will be judged as children.

3. Control mode: The device is matched with relays to control a variety of electrical appliances.

4. Data display mode: The device is matched with the host to visualize the data.

5. Channel mode: It can detect the number of people passing by the door and the number of people entering the store.

6. Stand-alone mode: The local data of the device can be stored for 90 days, and the local data of the device can be exported, and can be used in a network-free environment.

2. Product Structure

2.1 Packing List

- **Product Pictures**

Front

Back

- **Product Accessories**

Waterproof cap

screw

I/O and 485 connectors

Power connector

Instructions

inner hexagon spanner

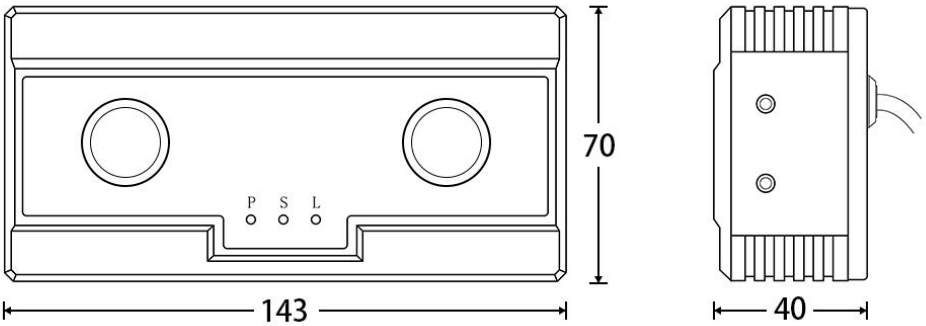
Bracket

Power adapter

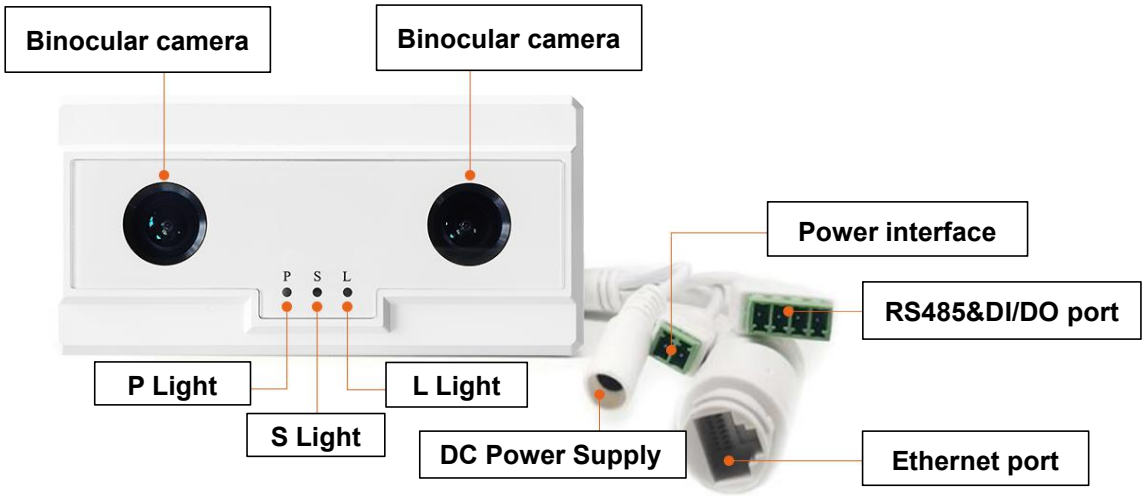
⚠ **If any of the above items are damaged or lost, please contact your supplier in time .**

2.2 Product Size

Unit: mm



2.3 Appearance and Function



Name	Description
Power Light	1. On: Power supply is normal; 2. Off: No power supply;
Status Light	1. Always on: the device is working normally; the public network connection is normal; 2. Long on and short off (3 seconds on and 1 second off), the device is working normally; the public network connection is abnormal; 3. Fast flashing (blink twice and turn off for one second): connecting to Wi-Fi; 4. Slow flashing (blink once and turn off for one second): the device enters the debugging mode when the Wi-Fi mode network cable is connected; the network cable is not connected; the connection timeout in Wi-Fi mode;
Wired Network Connection Indicator	1. Flashing/steady on: The wired network cable is connected normally; 2. Off: The network cable is not connected correctly;
RS485&DI/DO Port	Port 1: 485A, Port 2: 485B, Port 3&4： DI and DO interfaces Attention: For port 1234, please refer to the numbers on the interface
Ethernet Interface	RJ45 interface/PoE port
Power Interface	3.5mm-2Pin power interface (9-36V)
DC Power Supply	5.5-2.1 Power interface (9-36V)

3. Installation Instructions

3.1 Installation Notes

- Refer to the table of height coverage before installation and select a height that can fully cover the installation.
- The installation height needs to be as accurate as possible with an error of less than 5cm.
- The device needs to be installed horizontally and does not support tilted installation.
- The lens cannot be blocked by objects.
- The brightness of the light has a certain impact on the device statistics.

3.2 Installation Height and Coverage

⚠ It is recommended to find an installation location at a suitable height based on the coverage required.

⚠ The detection area needs to be set according to the actual environment and only covers the ground channel.

Installation Height (m)	Coverage Width (m)
1.9	1.1
2.5	3.7
3.0	5.2
3.5	6.4
4.0	7.3
4.5	8.0
5~6	8.4

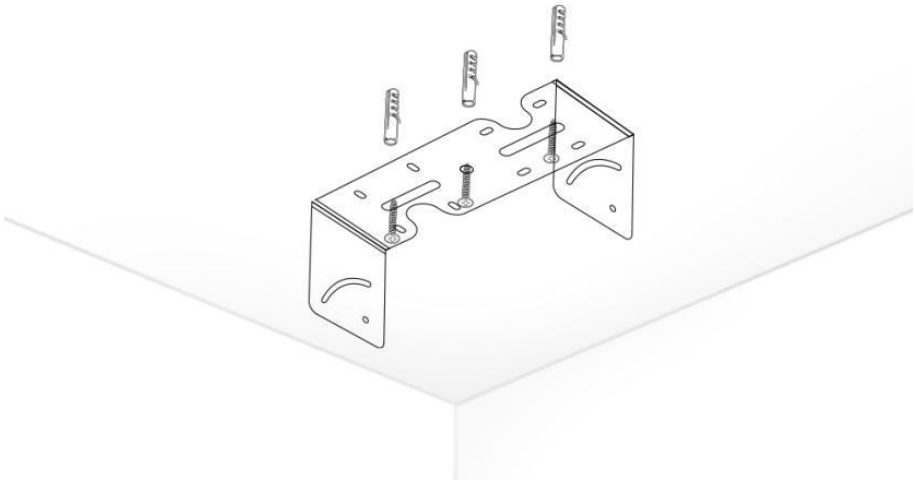
3.3 Factors Affecting Accuracy

- The detection line should only cover the ground and not other higher objects.
- The height should be consistent with the actual installation height. The greater the difference, the lower the accuracy.
- The detection area is too large and the environment in the area is more complex.
- The light in the equipment environment changes greatly.
- Objects block the human body when people enter and exit.

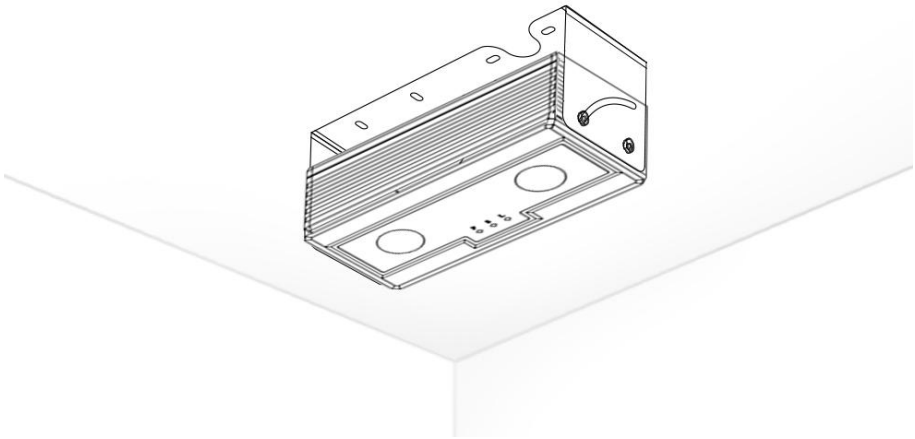
4. Installation Steps

4.1 Ceiling Installation

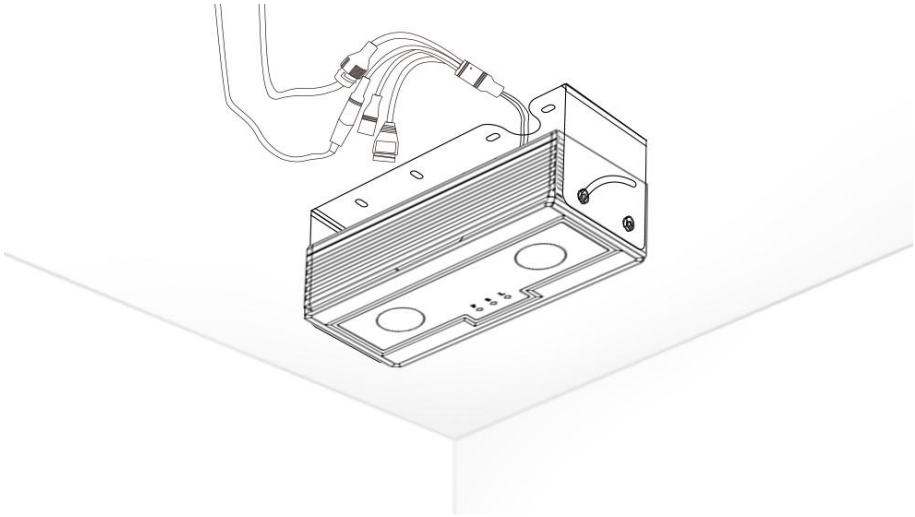
Step 1: Mark the installation position of the bracket with a marker, drill the installation holes with an electric drill, fix the expansion screw slots in the holes on the ceiling, and install the bracket firmly with the expansion screws.



Step 2: Embed the device into the bracket, align the holes on the side of the bracket with the screw holes on the device, and fix it with the standard 304 cylindrical head hexagon screws.



Step 3: Supply power to equipment and the grid.



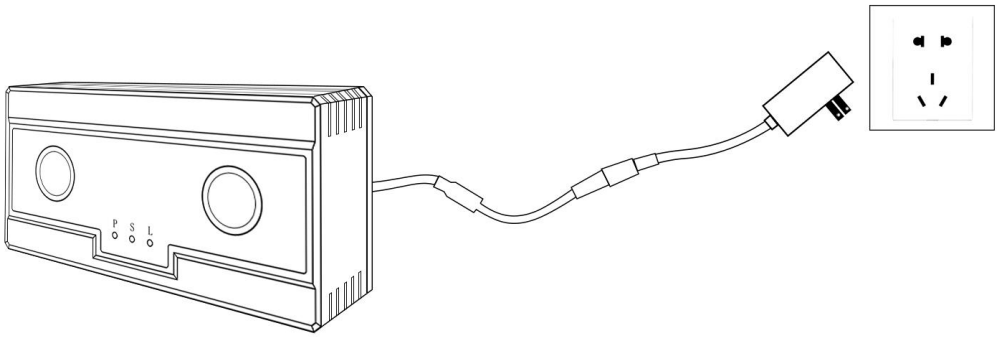
5. Device Connection and Startup

5.1 Device Powered on

Binocular passenger flow statistics products currently have two power supply methods:

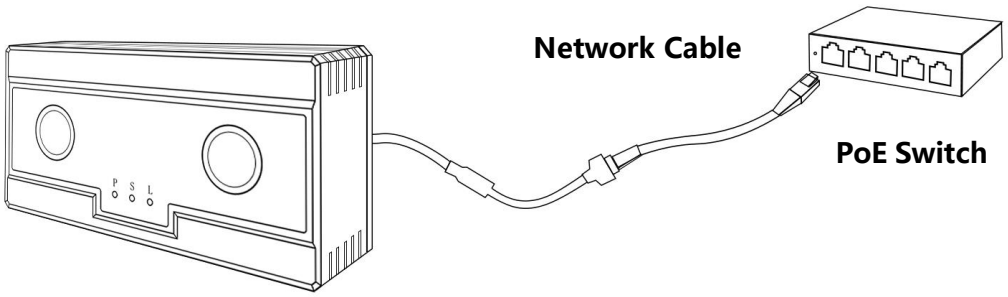
1. DC:9~36V Power supply

Plug the standard DC 12V power adapter into the 220V power supply and connect the 12V output harness terminals to the camera's 12V power supply port.



2. POE Power supply

If the POE switch connection conditions are available, the device can be directly connected to the POE switch, and the power supply and networking can be provided at the same time (no need to connect to DC power supply).



5.2 Device Connects to the Host

After the device is powered on, there are currently two ways to connect the device and the debugging computer to the same network：

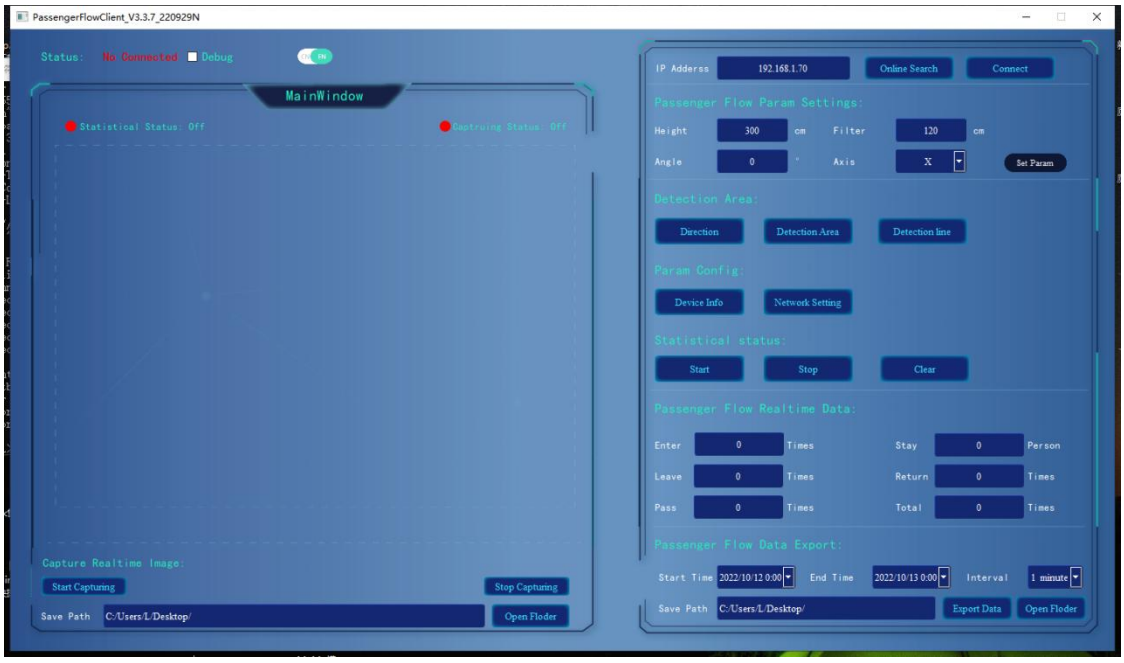
1.The device is powered by DC/POE，Connect the debugging computer to the same router device, the device is factory default DHCP mode, connecting a DHCP-enabled router is automatically assigned a valid IP address；when the device and the computer are connected to the router at the same time, the computer automatically assigns an IP to scan and access the device through the debugging client.

2.When the device is powered by DC，You can connect the network cable directly to the computer end device, use the network cable to connect to the computer and power it on， the device will start the built-in DHCP server to assign an IP address to the computer, and after the computer is assigned an IP, it can scan and access the device through the debugging client.

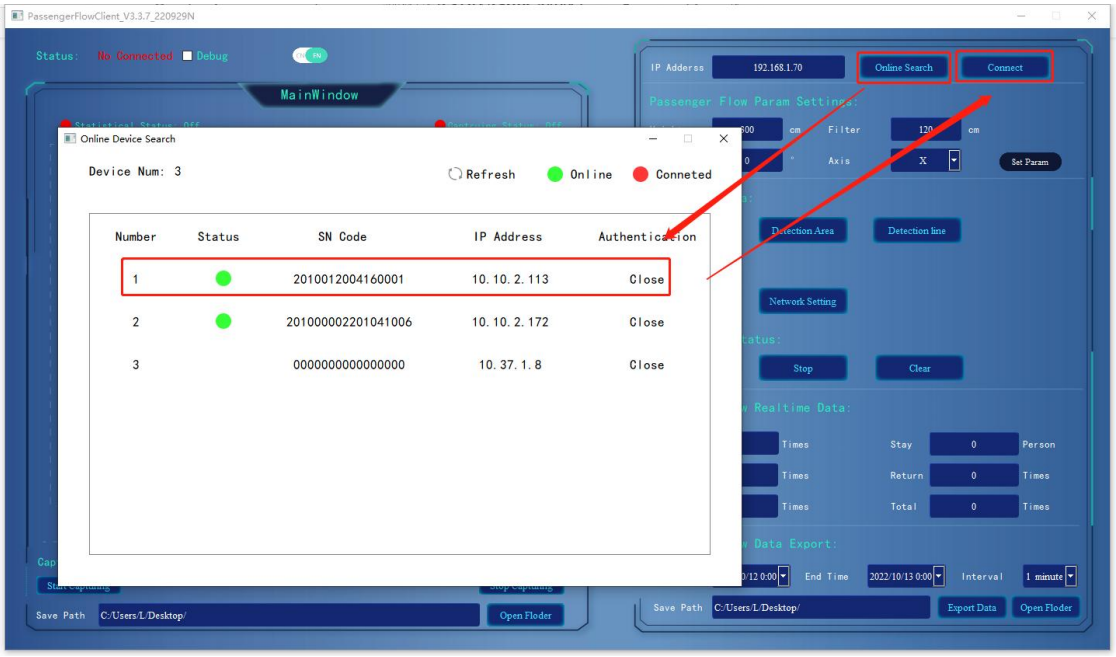
Note:
1. Be sure to ensure that the device and the debugging computer have the connection conditions;
2.The IP address configuration is very important, if it is not in the same network segment as the device address, the device can scan but cannot connect.

5.3 Device Discovery and Connection

1. Open the passenger flow configuration client and the following interface appears：



2. Click "Online Device Search", if the power on and connection are correct, the device with IP address "10.10.2.112" will be found in the pop-up dialog box, click Connect camera, and the connection status will show that the connection is successful.



3. Displays that the connection was successful

5.4 Wired Network Configuration

This section describes how the device is configured for wired and describes how the

device is configured for wireless connectivity

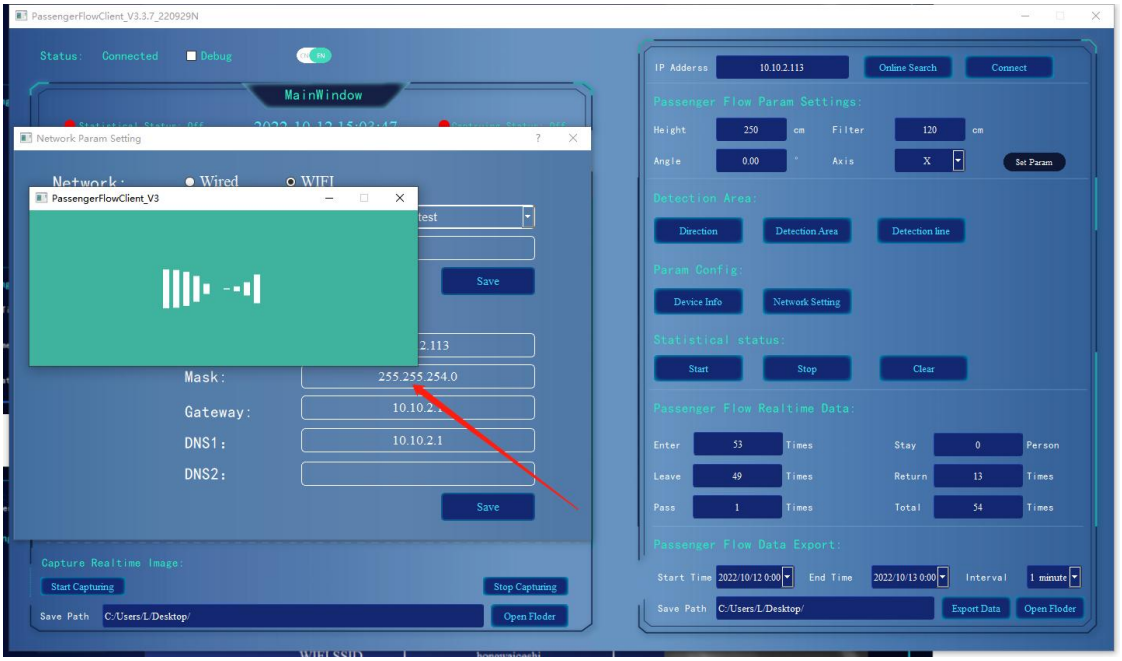
1. Click Edit Network Parameters
2. Enter the next interface and select Wired Network
3. Select DHCP for the network
4. Fill in the IP address, subnet mask, default gateway, and DNS1 (if you select static mode, you need to fill in completely)
5. Click Save

5.5 Wireless Network Configuration

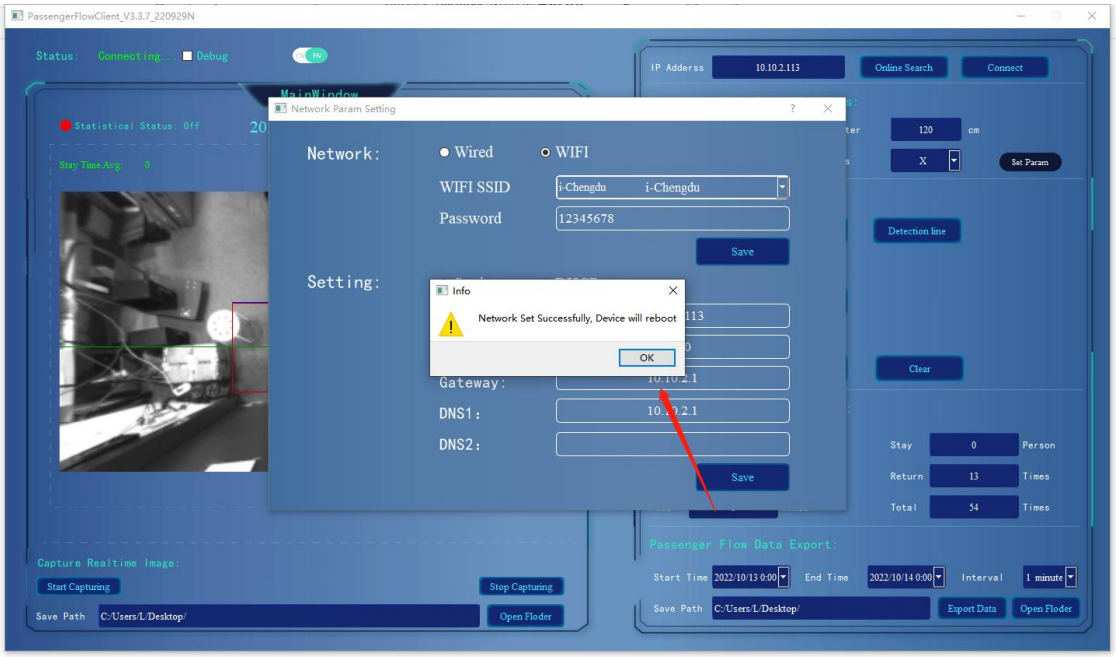
This section describes how the device is configured for wired and describes how the device is configured for wireless connectivity.

1. Click Edit network parameters.

2. Select a wireless network (Only 2.4GWIFI is supported), enter the WIFI name and password, select the IP address allocation method, and select DHCP mode in this example.



3. After clicking WiFi Settings, a WiFi setting progress bar will pop up, and a WiFi configuration successful pop-up window will pop up after the progress bar is completed.



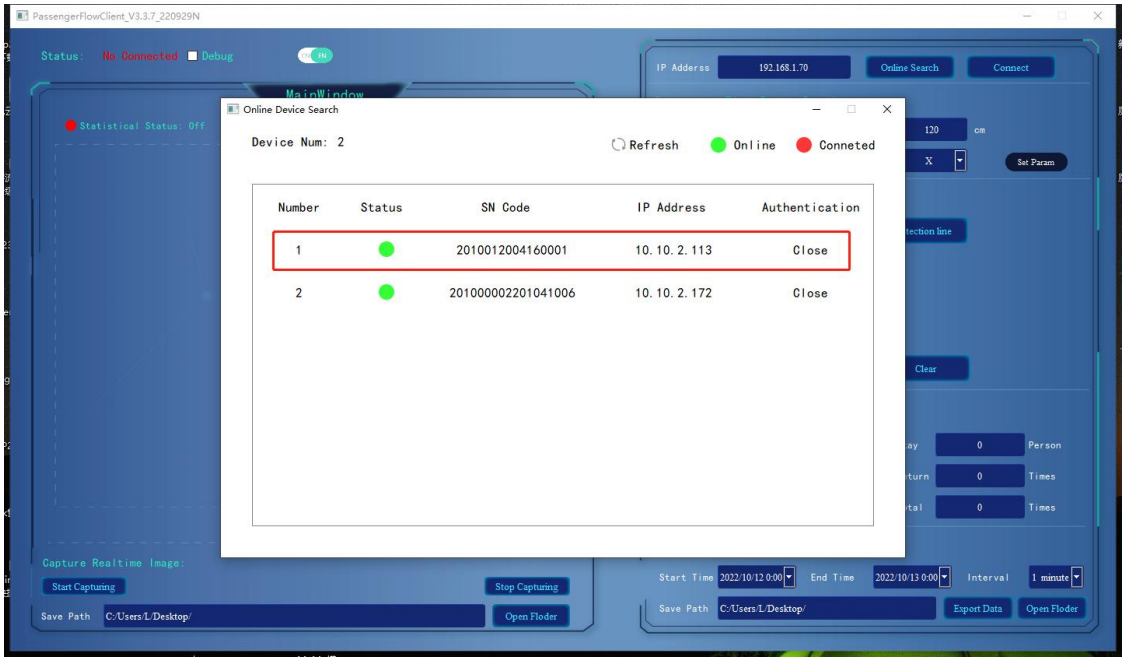
4. After prompting that the WiFi configuration is successful, click Save Settings, and the device will restart when the network configuration is successful.

Note:

1. After saving the settings, the device restarts and the client automatically disconnects from the device， At this time, the camera enters the wired debugging mode in "wireless working mode" without disconnecting the wire, and the status light (middle) flashes once per second (slow flash). At this time, disconnect the wired network cable first, manually power off and then power on.

2.After disconnecting the network cable, the camera enters the automatic wireless network connection state, during the connection process, the status light (middle) flashes twice per second (flash flash), and after the connection is successful, the status light (middle) is solid to indicate that the connection is successful. If the connection is not successful within 30 seconds, return to the configuration mode.The status light (middle) flashes once per second (slow flash), at this time you can plug in the wired connection device and re-enter the correct WI-FI name and password.

3.After the connection is successful, when the status light (middle) is always on, put the wireless network connected to the debugging computer and the device under the same network, scan and find the device, connect, and use it normally.



5.Scan to find the device, connected, normal use

6. Passenger Flow Parameter Configuration

6.1 Passenger Flow Parameters - Altitude Setting

The altitude parameter is a core parameter for the correct counting of passenger flow, and the value is derived from the true distance of the equipment from the ground.

6.2 Passenger Flow Parameters - Detection Area

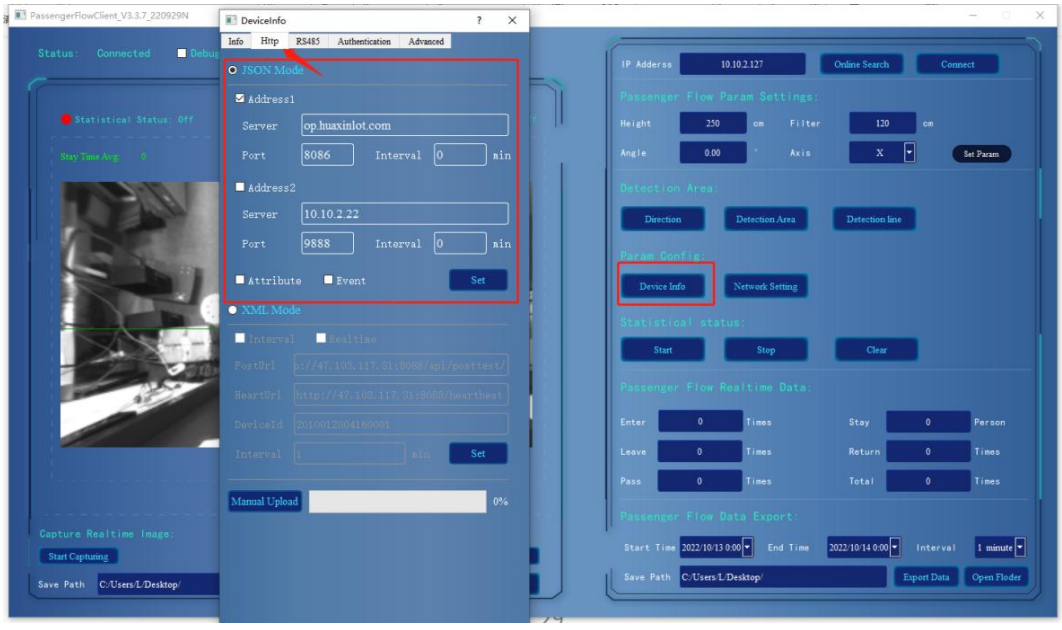
1. Click the "Stop" button to stop the passenger flow statistics before you can save the settings;
2. Click the "Detection Area Location" button to enter the detection area setting status;
3. Drag the dots at the corners of the red frame to adjust the size and position of the detection area;
4. Click the "Save" button to save the detection area settings;
5. (Note: The small red box inside is the ground detection area; The blue box is the maximum possible detection area);
6. After setting, you can click the "Start" button to start the passenger counting function.

6.3 Passenger Flow Parameters - Detection Line and Detection Direction Settings

1. Click the "Stop" button to stop the passenger flow statistics before you can save the settings;
2. Click the "Detect Line Location" button to enter the detection line position setting status;
3. Drag the green detection line with the mouse to adjust the position of the detection line;
4. Click the "Save" button to save the inspection line position settings;
(Note: The blue dashed line indicates the maximum adjustable position of the detection line);
5. Click the "Detection Direction" button to adjust the detection direction;
6. After setting, you can click the "Start" button to start the passenger counting function.

6.4 Passenger Flow Parameters - Data Upload Parameter Configuration

Passenger flow devices support HTTP/HTTPS POST feeds, When the server-side docking is configured, after the client sets the POST address, the device automatically uploads the passenger flow data to the server; After the device is successfully connected, click the Device Information button, Set the upload parameters(Note: Be sure to check Interval Upload or Real-time Upload according to the method set by the server), The following diagram sets the upload address to the HTTP protocol, and you can fill in the address according to your actual needs.



6.5 Passenger Flow Parameters - Run Debugging

When the equipment is installed, and the network parameters and passenger flow parameters are set at the same time, the real-time passenger flow can be viewed in the passenger flow client, and people can simulate walking under the equipment to observe the changes in the passenger flow client data.

7. Common Faults and Handling Methods

7.1 Issue 1-1: Device Cannot be Found in Wired Mode

Solution 1: Connect the computer and the device to the same LAN or connect with a network cable, and change the IP address of the computer to DHCP.
Solution 2: Check the IP of the passenger flow device according to the network device such as the router, change the computer to the same network segment, and manually enter the IP connection.

7.2 Issue 1-2: Failed to Connect to WiFi Successfully, Unable to Search for Device

Solution 1: Connect the device to the computer with a network cable, or keep the device and the computer on the same LAN, and then change the wired network IP of the computer to 192.168.1.X network block to search for the device.
If the device version supports hotspot mode, there is Method 2
Solution 2: Disconnect the device, the device will automatically start a hotspot, the WiFi name is WiFi_xxx, and the computer can directly search for the device after connecting to WiFi.

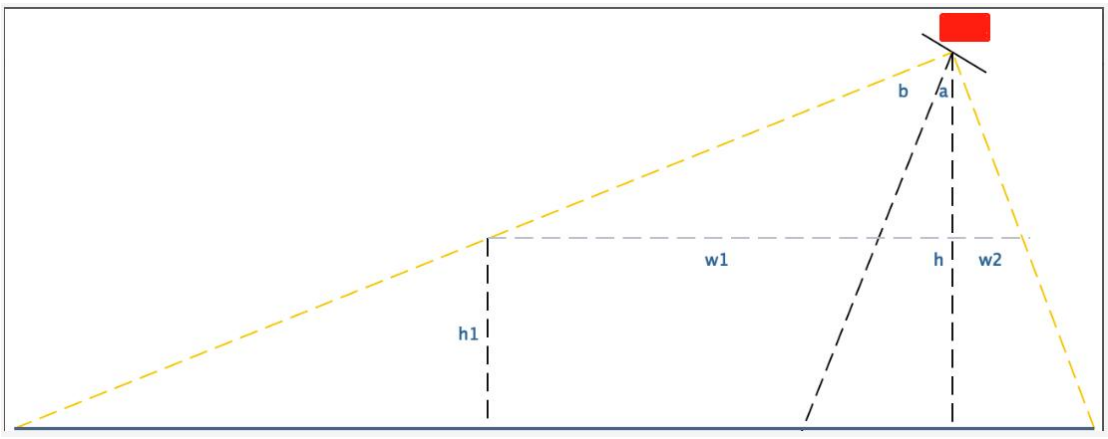
7.3 Problem 1-3: The Search Device SN is all 0000

Solution 1: If the device and the computer are not in the same network segment, change the IP address of the computer to the same network segment as the device, and then connect again.
Solution 2: If the device program starts abnormally, you need to manually turn off the watchdog and reconfigure the upgrade (this method can only be operated by familiar technology)

7.4 Question 1-4: Inaccurate Counting, Miscounting, not Counting

Solution 1: The height of the installation (angle, if it is a strabismus version) needs to be filled in according to the actual situation, and the height higher than the actual height cannot be deliberately filled in in order to expand the detection range (the angle needs to be divided into X and Y axes to distinguish and fill in)
Strabismus has a maximum rotation angle, the x-axis rotation angle is generally required to be less than 45°, and the y-axis rotation angle is generally required to be less than 35°
Solution 2: When installing, pay attention to avoid the blocking of walls and eaves, strong exposure and dim places. Special channels can use the polyline mode of the top view version, and the top view installation should not use the squint version as much as possible

Schematic of the squint version of coverage



Parameter description:
h: The height of the camera suspended from the ground
H1: The height of the measured object from the ground (the average height of the reference person, 170cm)
A: Camera rotation angle

b: Camera field of view/2 (x-axis rotation, b=35°)
w1: Camera coverage distance outside the door (outside the store coverage distance that customers care about)
w2: The camera covers the distance inside the door
Calculation method:
w1=(h-h1)*tan(b+a)
w2=(h-h1)*tan(b-a)

7.5 Device LED Status (Legacy Protocol)

Status light is always on: normal work;
Status light does not light up: The program did not start normally
The status light is on for 3 seconds and goes off 1 time [2 times in 1 second]: the LAN is working normally;
Status light flashes [2 times in 1 second]: the network is trying to connect [WiFi is connecting]; Status light flashes slowly [1 time in 1 second]:
Network connection timeout [WiFi connection timeout] or WiFi mode to connect to the network cable using wired network communication (when connecting to WiFi, the link light does not flash; WiFi mode network cable,link light will flash);

7.6 Notes

1. By default, the device automatically restarts at 5 a.m. every day, and the local video display data is cleared after restarting, and the local storage data of the device is not cleared.
2. The heat dissipation of the device is on the back, if installed outdoors, it is recommended to add a baffle above the device to avoid direct sunlight
3. Try not to have obstructions within the field of view of the lens
4. Wired connections always take precedence over wireless connections, so after

configuring wireless mode, you need to unplug the network cable.
5. WiFi only supports 2.4GHz, not support 5GHz.
6. Network latency affects the device's connection to the client
7. All settings of the local debugging tool need to be set in the "Connection Successful" state, if in the "Connected" or "Not Connected" state, all settings will not take effect.
8. The installation height and angle must be filled in according to the actual one, if the height angle is not correct, it will lead to inaccurate counting.
9. When setting the height, there can be no people or objects under the camera other than the background.
10. the new protocol version is shipped with 18-bit SN code, the old protocol version is shipped with 16-bit SN code, the strabismus version is the old protocol version, if the new protocol version device upgrades the old protocol version, the encoding will be less than the previous 20. (If the last two digits of the code are missing, you need to reset the device SN code).

Phone/WhatsApp:+86 18981978865
E-mail: info@foorir.com
Address: Room 4021, Unit 1, Building 1, 88 Tianchen Road, High-Tech Zone, Chengdu, Sichuan, China