FMIX
PRECISE
PASSENGER FLOW

User Manual

Applicable Objects: Fmix series products Used when user installs the device
Version: V1.00

Contents

Foreword

The purpose of this document is to ensure that the user can correctly use the product to avoid operational hazards or property damage. Before using this product, please read it carefully and keep it for future reference.

Precautions for safe use:

- During the installation and use of the product, all the national and local electrical safety regulations must be strictly observed.
- Please use the power adapter provided by certified manufacturer. For the specific requirements of the power adapter, please refer to the Product Datasheet. It is suggested to equip each device with an independent adapter.
- According to the relevant national standards, when supplying power to weak current device, the power supply current should not exceed 8A and the power should not exceed 100W to prevent safety accidents.
- An easy-to-use power protection device should be incorporated into the building installation wiring.
- When installing on the wall or ceiling, make sure the product is securely fastened.
- If the product is not working properly, please contact the store where you purchased the product or the nearest service center. Do not disassemble or modify the product in any way. (Our company is not responsible for problems caused by unapproved modifications or repairs).
- Avoid installing the product in an environment with vibration or shock, and keep the product away from electromagnetic interference. (Ignoring this may cause damage to the product).
- Do not directly touch the heat dissipation parts of the product to avoid burns.
- Do not install indoor products in an environment where it may be exposed to water or other liquids.
- Please store the product in a dry environment without corrosive gas and direct sunlight.
- Do not use the product in extremely hot, cold, dusty, corrosive or high humidity environments. For specific temperature and humidity requirements, please refer to the Product Parameters Table.
- Avoid aiming the lens at strong light (e.g. lighting, sunlight, or laser beams); otherwise, the image sensor will be damaged.
- Avoid accumulation of heat and keep good ventilation around the product.
- Do not directly touch the image sensor. If it is necessary to clean the lens, please slightly dampen a piece of soft and clean cloth with alcohol and gently wipe off the dust and dirt; when the product is not in use, please attach the dust cover to protect the image sensor.
- It may face network security issues when the product is connected to the Internet,

please strengthen the protection of personal information and data security. When you find that the product may have potential network security risks, please contact us in time.

- Please understand that it is your responsibility to reasonably configure all passwords and other related product security settings, and to keep your username and password properly.
- Please keep all the original packaging materials of the product properly, so that when there is a problem, you may pack the product with the packaging materials and send it to the agent or the manufacturer. Accidental damage during transportation caused by non-original packaging materials is the responsibility of the user.

Chapter I: Product Introduction

1.1 Product Description

K3 boasts excellent front-end intelligent processing capabilities, and is suitable for deploying in shopping malls, stores and other commercial scenarios to provide reliable and stable passenger flow data for smart business applications, with the accuracy rate exceeding 95%. Through collaboration with back-end/cloud server platforms, Fmix can provide customers with complete structured video intelligence (Edge Computing + Cloud Computing) solution.

1.1.1 Product Characteristics

- Powerful system imaging capabilities

  Super-sized professional star-level 2 megapixels CMOS image sensor, intelligent ISP algorithm, full color night vision

  Support DOL-based intelligent HDR technology, automatic scene adaptation, and easily achieve 120dB ultra-wide dynamic range imaging

  Support 3D noise reduction, strong light suppression, backlight compensation function, automatic switching between day and night

- Embedded professional-grade high-performance embedded processing platform with rich interfaces, stable and reliable performance

  Support multi-channel H.264/H.265 video encoding

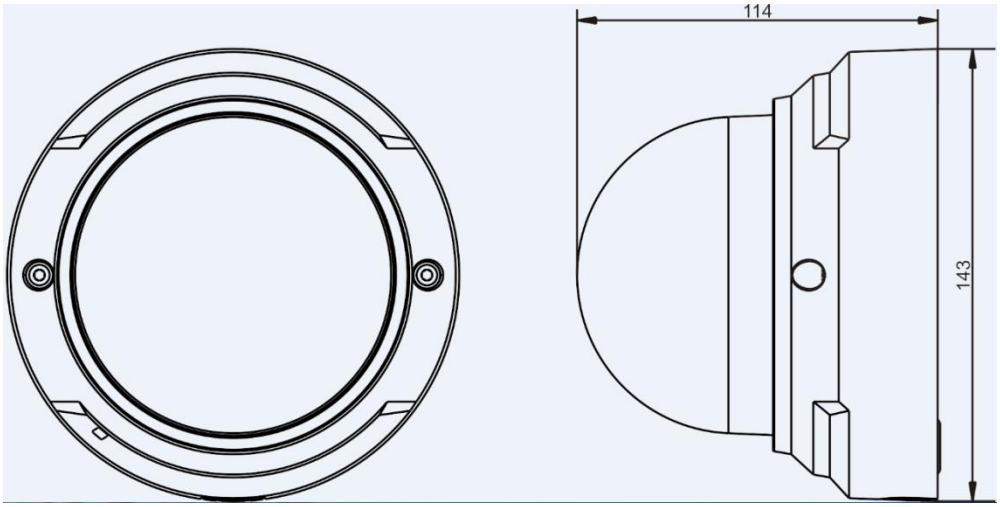
  Support saving of video in SD card, data will not be lost when disconnected from network, support automatic transmission resuming at break-points, save the system log in real time

- Embedded ASIC supporting DL-CNN algorithm, deploy multiple high-performance neural networks, structured analysis, edge computing

  Front-end edge computing, direct analysis of uncompressed image raw data, no delay, more accurate

  Accurate passenger flow statistics

1.1.2 Product Size and Appearance



1.2 Product Functions

Category	Item	Description
Imaging	Basic configuration	Embedded intelligent ISP algorithm Accurate passenger flow statistics Face intelligent optimization dimming algorithm, intelligent adaptation to complex scenes Basic parameters (brightness/contrast/saturation/sharpness/image flip/exposure time, etc.) can be set independently
Camera	Video compression standard	H.264/H.265/MJPEG
	Video stream rate	512Kbps ~ 10000Kbps
	Multi-stream output	Primary stream: 1080P/720P/CIF/640x360 optional Secondary stream: D1/CIF/640x360 optional

	IR	15~20m
	OSD information	Text title, time, etc.
Network	Network protocol	HTTP/TCP/ARP/RTSP/RTP/UDP/SMTP/FTP/DHCP/DNS/PPPOE etc.
	Industry access standards	ONVIF / GB/T28181-2016/ 35114 / T1400
	Online remote upgrade	Support
Intelligent	Accurate passenger flow statistics	Support
	Face area	Detection area setting, shield area setting
	External trigger snapshot	Support
	Portrait manual snapshot	Support
	Intelligent face snapshot	Support minimum interpupillary distance configuration, snapshot times configuration, snapshot interval configuration
	Face optimized exposure	Support, brightness is settable
	Face capture	Support face scoring, multi-frame recognition, ReID intelligent deduplication, ID photo-level portrait output
	Humanoid detection	Support
Management	Browser management	Support management of multiple browsers such as IE
	Multi-user management	Support
	Image push strategy	Support
	Time calibration management function	Support manual/automatic time calibration, NTP time calibration, time zone is settable
	System log	Support

1.3 Product Installation

Install by the user; see Annex 2 for details

1.3.1 Product Site Survey Description

For more details, please contact our staff to obtain the "Site Survey Guide".

- The camera should be set directly in front of the channel, and the face should be captured from the front. The horizontal deflection angle should be <10°, the smaller the better.
- The camera must be installed with a certain viewing angle to prevent the faces of the people behind from being obscured when people in tandem pass through the aisle. The vertical viewing angle should be <10°, the smaller the better.
- Coverage width: The real door width of the face detection position is required to be < 4 meters. If it exceeds the value, the accuracy will decrease
- The center between the camera lens and the entrance and exit of the personnel passage should be open and unobstructed.
- Due to the influence of outdoor strong light, the distance between the installation location and the door should not be < 3m; otherwise, the quality of the captured face images will be reduced.

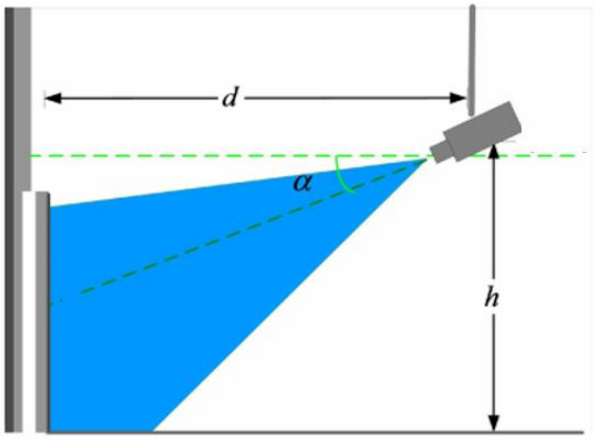
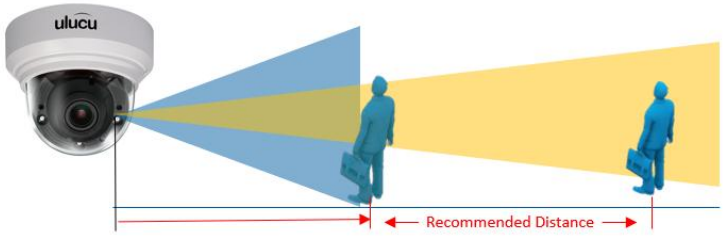


Figure 1 Site Survey Description

1.3.3 Selection of Product Lens



Recommended Lens Use Reference

Model	Mounting Height	Coverage width	Lens Model	Recommended Distance
2MP Hemisphere	2-3.5m	<3m	2.8-12mm	1.1-5m
			7-22mm	2.7-10.2m

Figure 2 Lens Selection

1.3.4 Common Installation Scenarios

Figure 1. Angle Over-Tilted

Figure 2. Camera direction not at Middle

Figure 3. Object Barrier

Figure 4. Right Installation

Figure 3 Common Scenarios

1.3.5 Installation Precautions

- If it does not meet the face installation specifications, choose an installation environment with standard personnel passages or entrances and exits, so as to have a unique direction of passage to ensure that the camera can capture the front face of the person.
- At the entrance there is a middle island of booth (keep clear of the middle island of booth)
- The location of entering the store is blocked by the counter. Try to avoid selecting reflective scenes such as glass, floor tiles, and lake surfaces;
- The environment is relatively stable.

Choose an environment with stable and sufficient lighting. When the wide dynamic function is not enabled, try not to have backlight scenes such as the sky in the camera's field of view. Under backlight conditions and the conditions suffering serious lack of light, supplementary light is required to ensure that the face features are clearly visible.

Chapter II: Preparation for Product Operation

2.1 Network Connection

2.1.1 Wired Network Connection

The camera can be connected to the switch via network cable, or connected to NVR to achieve preview and settings:

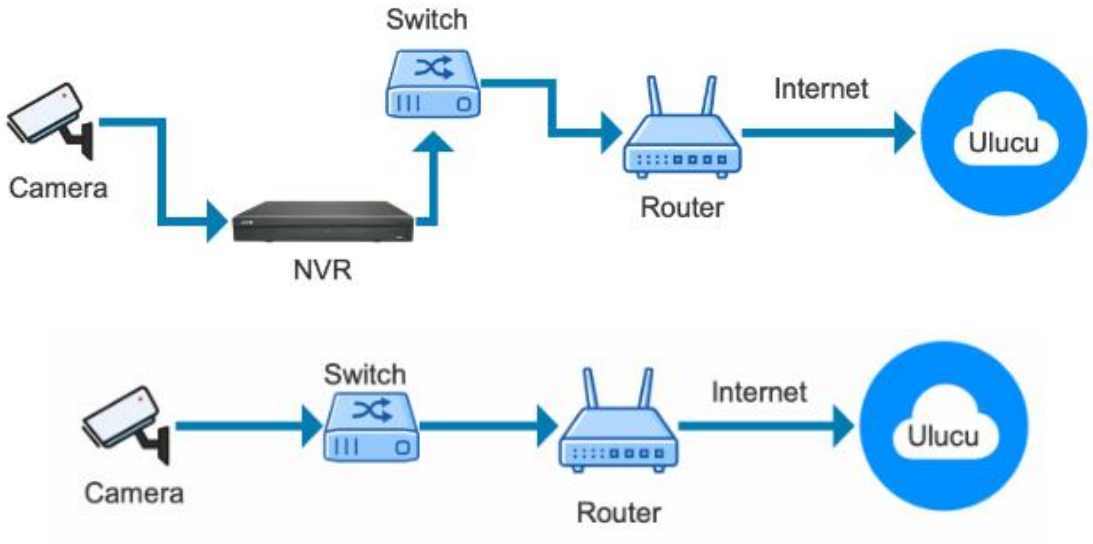


Figure. Connect the camera to the switch

* The camera and NVR must be connected to the same network switch (same network segment).

1. Check the network IP, gateway and DNS of the installation environment:

Check it by connecting the computer network cable to the router or switch.

Open the computer Control Panel - Network and Internet - Network and Sharing Center, select Local Connection, check the IP network segment that the current computer automatically obtained which can access the external network and make a record (IP address, subnet mask, default gateway, DNS).

2. Modify the IP address of the camera and NVR host:

All cameras and recorders must be modified to the same network segment, and the IP, gateway, and DNS which can normally access the external network.

In order to prevent the IP address conflict between the device and other cash registers and WIFI networking devices, it is recommended to set the IP address to address after X.200 (for example, the NVR is set to 192.168.X.201, and the IP of the camera is set after X.202).

* The factory IP of the camera is 192.168.200.2, the user name is admin, and the password is ulucu888

* The factory IP of the NVR is 192.168.200.3, the user name is admin, and the password is ulucu888

See the next section for the method of modifying them.

2.2 Activate and Configure the IP Camera

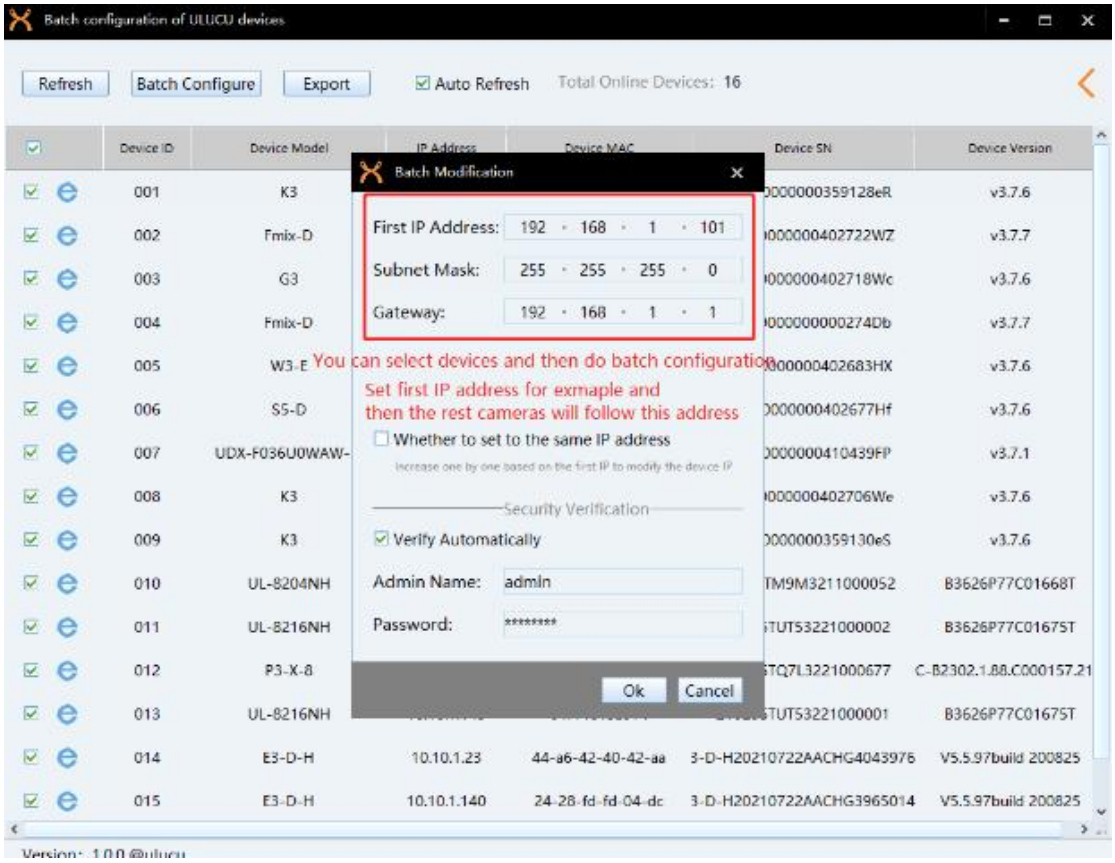
When the IP camera is used for the first time, it needs to be activated and a login password should be set before it can be logged in and used normally. In order to protect your personal privacy and corporate data and avoid network security problems with camera products, you are recommended to set a password with high security level that complies with security specifications.

2.3 Login Access

The initial user name is admin and the password is ulucu888.

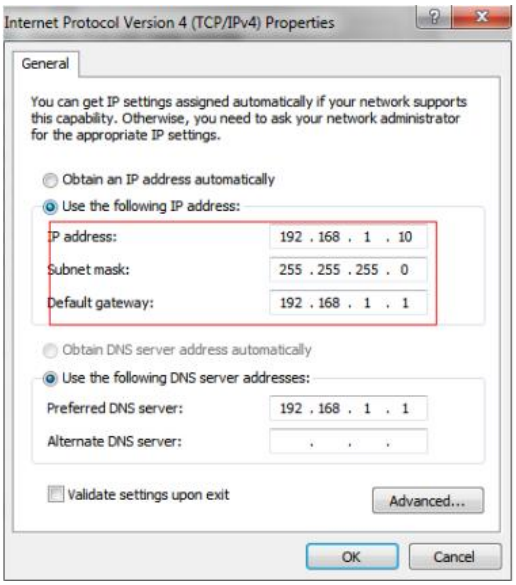
- Method 1: After powering on the camera with 12V2A power supply, use a PC to connect the device through the network, open a browser with IE kernel (recommend IE, Sogou, 360, except Edge browser) and enter the default IP address 192.168.200.2 (the PC and the device should be in the same network segment before connecting)
- Method 2: Download Ulucu Device Batch Configuration Tool at https://www.ulucu.com/global/downloads, to display all devices currently online in the local area network. After selecting the device, expand the configuration bar on the right, configure the required IP address and save it.

The IP address of the camera can be modified through the following two methods:
Method 1. Modify the IP address through tools (recommended)
Download Ulucu Device Batch Configuration Tool at
https://www.ulucu.com/global/downloads
Display all devices currently online in the local area network. After selecting the device, expand the configuration bar on the right, configure the required IP address and save it.



Method 2. Modify the IP address with local PC

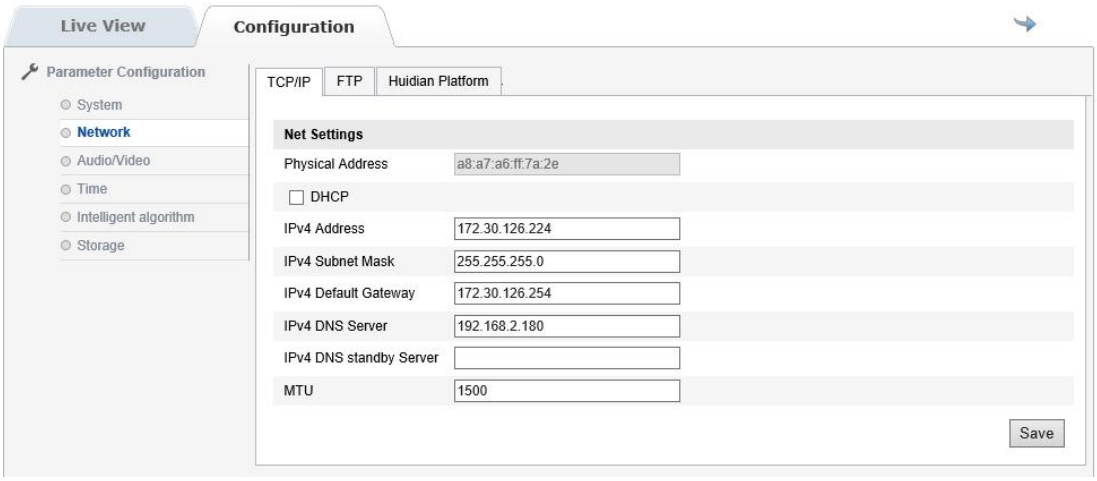
The PC and NVR must be connected to the same network switch (same network segment). Open the computer Control Panel - Network and Internet - Network and Sharing Center, select Local Connection, modify the computer IP address to 192.168.200.x, as shown below:



Access http://192.168.200.2 through the computer IE browser, enter the camera user name and password to log in to the Web, select Configuration-Network

Configuration-TCP/IP, set the IPv4 address, IPv4 subnet mask, IPv4 default gateway and DNS server, save the settings, and then log in with the new IP.

* After setting, remember to change the computer network card settings to the original parameters or to automatically obtain IP



* In order to protect your personal privacy and corporate data, and avoid network security problems of camera products, it is recommended to set a password with high security level that meets security specifications. After setting the IP address, modify the password at the web terminal or the user terminal.

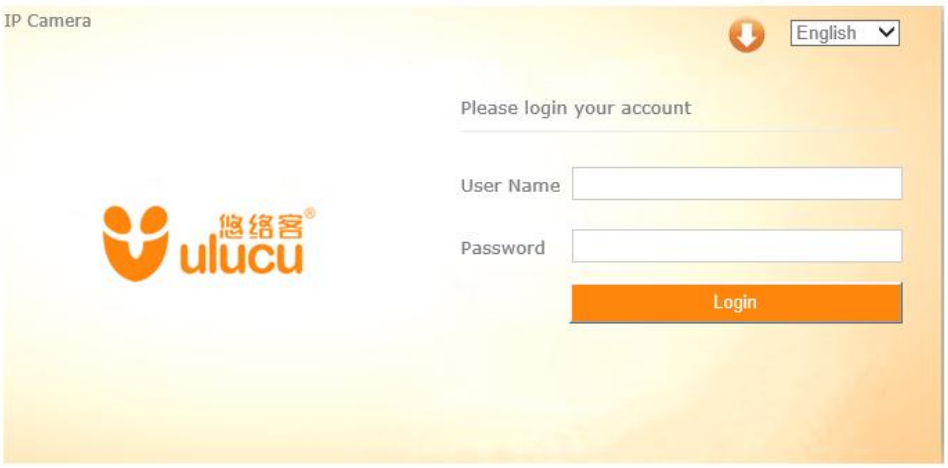


Figure 5 Login Interface

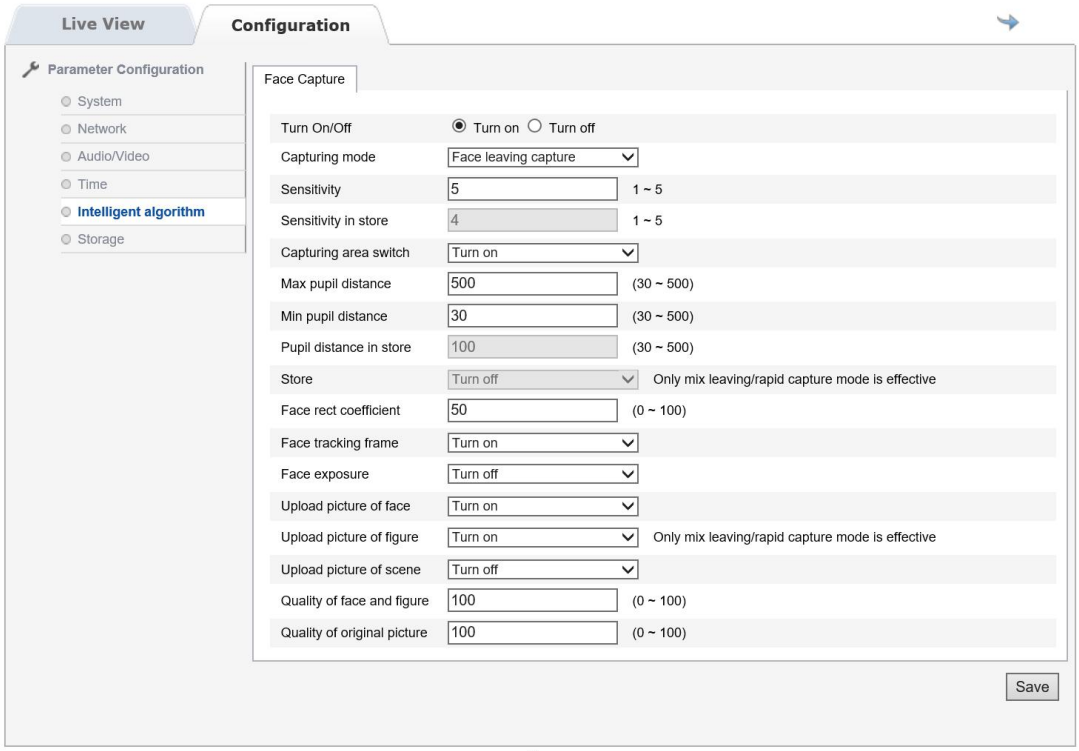
2.4 Main Interface Description

Icon	Description
Main Stream Sub Stream	Switch the playback with primary and secondary streams as needed; the default is primary stream.
4:3 16:9 X1	Adjust the preview screen ratio, respectively: adaptive, 4:3 preview, 16:9 preview, original size

	Expand the PTZ operation bar (current U3 Series does not support PTZ control)
	If the camera has audio access, the scene volume can be adjusted
	Open the local images and videos captured/recorded by the camera
	If the camera has audio play function, it can be enabled for intercom with the scene
	Take a screenshot of the current screen and save it locally
	Record the current screen and save it locally
	3D positioning
	Zoom focus function, adjust the distance and clarity of the video picture
	Exit to the login screen

Chapter III: Introduction to Intelligent Functions

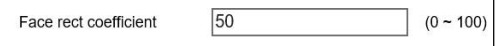
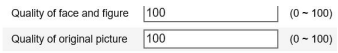
3.1 Face Snapshot



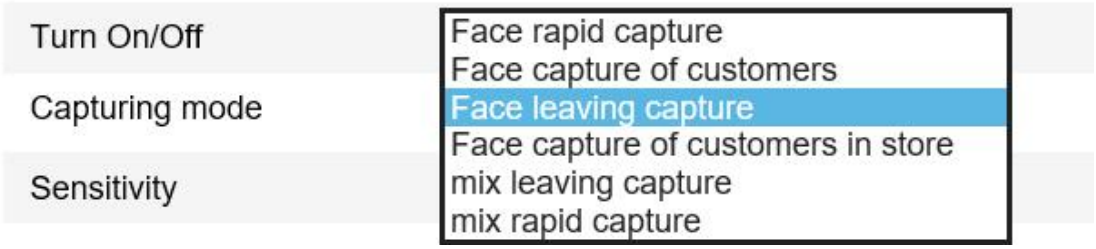
Net Surveillance System

3.1.1 Face Snapshot Configuration

Icon	Description
Turn On/Off ◉ Turn on ○ Turn off	Enable/disable smart algorithm
Capturing mode: Face leaving capture	According to different usage scenarios, select the snapshot mode. After selection, the following parameters can be precisely adjusted. There are a total of 7 modes. Please refer to the description of the snapshot mode for details
Sensitivity: 5	The default is 3. The higher the sensitivity, the easier it is to capture the face. The sensitivity of complex scenes is lower.
Sensitivity in store: 4	The default is 4. The higher the sensitivity, the easier it is to count the passenger flow. The sensitivity of complex scenes is lower.
Capturing area switch: Turn on	After it is enabled, set the captured area and the interpupillary distance requirements. The larger the interpupillary distance, the higher the face pixels
Max pupil distance: 500 (30 ~ 500) Min pupil distance: 30 (30 ~ 500)	Set the range of the interpupillary distance of the captured face. The minimum recommended distance for capturing faces within this range is 40 or more, and the maximum interpupillary

	distance is generally not limited
	The number is counted when the guests who arrive at the store meet the requirements for the pupillary distance. The default is 100
	When the mix leaves the quick capture mode, the passenger flow through the store is counted
	Set the background size of the picture based on the face image. The default is 50. Do not modify it if it is not necessary
	The face frame detected by the real-time video image overlay after it is enabled
	In case of low illumination, the face is too dark, and this function can be enabled. It is not necessary to enable it under normal conditions
	Choose to upload face/humanoid/scene image, and select it according to your demands. Note that the humanoid image will only take effect when the mix leaves the quick capture mode
	Set the quality of the uploaded face image and the quality of the original image. Default can be used for normal use. The higher the quality, the larger the image size.

3.1.2 Snapshot Mode Description



Quick face snapshot: When the face trajectory meets the requirements and appears on the screen (face width, capture area), upload an image immediately; Advantage: it is fast to upload the image

1. Facial rapid capture: When the requirements for face snapshot and passenger flow statistics are met, snapshoot and count at the same time
2. Face capture of customers: When the face track meets the requirements and appears on the screen (face width, snapshot area), after the track ends, select the best image to upload under this track; Advantage: the image selected has high quality
3. Face leaving capture:

The newly defined snapshot strategy; the snapshot strategy threshold should be set to two levels (level A, level B)

Level A - Default face width 60, sensitivity 5

Level B - Default face width 100, sensitivity 4

- Scenario 1: Level A is met, but Level B is not met -- upload 1 image

  When the person enters the screen and satisfies Level A (pupillary distance, sensitivity) after the trajectory ends, upload an image with the best trajectory

  Threshold requirement: (60≤X≤100), sensitivity 5

  Scenario 2: Meet Level A and meet Level B -- upload 1 image

  When the person enters the screen and satisfies the trajectory of Level A and enters Level B without interruption, immediately upload one image after meeting Level B threshold

  Threshold requirements: Meet them at the same time, and the trajectory is not interrupted. The same track ID, X≥60 sensitivity 5; X≥100 sensitivity 4

  Scenario 3: Without entering Level A, directly enter Level B threshold - upload 1 image

  When the person enters the screen and meets Level B threshold, upload one image immediately

  Threshold requirement: X≥100, sensitivity 4

  General application scenarios

  Quick snapshot: [Precise Passenger Flow] [Member Shopping Guide]; if quick push is required, take a snapshot after leaving: [Precise Passenger Flow]

4. Face capture of customers in store:

   Face: When the face meets the snapshot requirements (face width, sensitivity), upload a face image after the face trajectory ends;

   Humanoid: When the humanoid trajectory ends, the judgment status result (entering the store/passing the store/unknown) will be given according to the walking direction of the human. If no human face is captured during this process and it is judged that one has entered the store, a humanoid image will be reported;

   Judgement of the state of the humanoid entering the store: Step into the store from outside and enter the store, and drop the humanoid frame by 1/9 of the height or move the humanoid horizontally by 1/2 of the width of the humanoid frame;

   Judgment of the state of the humanoid passing through the store: The moment from the first frame at the beginning of detection to the last frame at the end is outside the store (if the middle humanoid wanders back and forth at the boundary line for 50 frames, it is considered to have passed the store)

5. mix leaving capture:

   Face: When the face meets the capture requirements (face fast reading, sensitivity), upload a face image immediately;

   Humanoid: When the humanoid trajectory ends, the judgment status result (entering the store/passing the store/unknown) will be given according to the walking direction of the human. If no human face is captured during this process and it is judged that one has entered the store, a humanoid image will be reported;

Judgement of the state of the humanoid entering the store: Step into the store from outside and enter the store, and drop the humanoid frame by 1/9 of the height or move the humanoid horizontally by 1/2 of the width of the humanoid frame;

Judgment of the state of the humanoid passing through the store: The moment from the first frame at the beginning of the detection to the last frame at the end is outside the store (if the middle humanoid wanders back and forth at the boundary line for 50 frames, it is considered to have passed the store)

6. mix rapid capture: Upload a larger image after detecting a humanoid

Chapter IV: System Functions

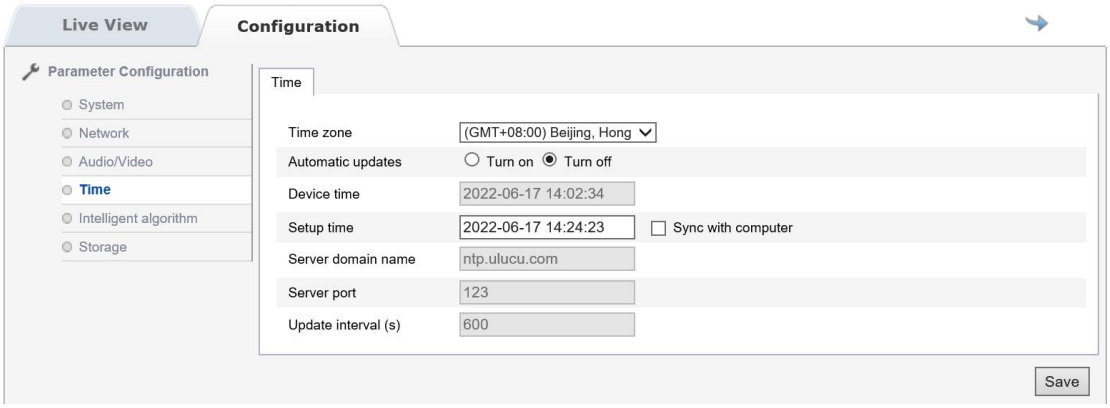
4.1 Management of Saved Video

Set the video stream and mode on this page.

When scheduled recording is selected, drag the mouse to select the time period to be recorded on the timeline.

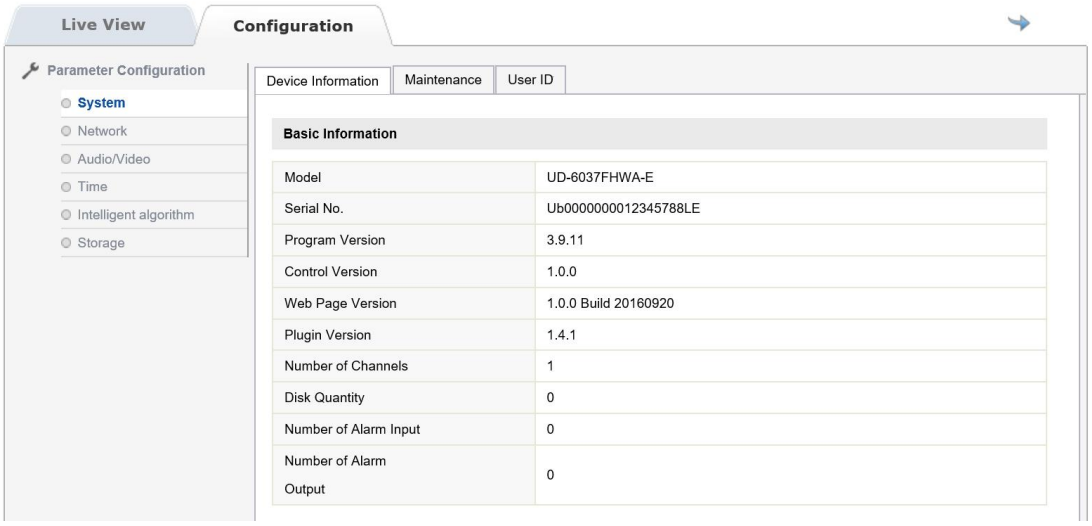
4.2 Time Configuration

Set the camera time to perform NTP automatic time calibration, and choose to synchronize with the computer time according to the situation



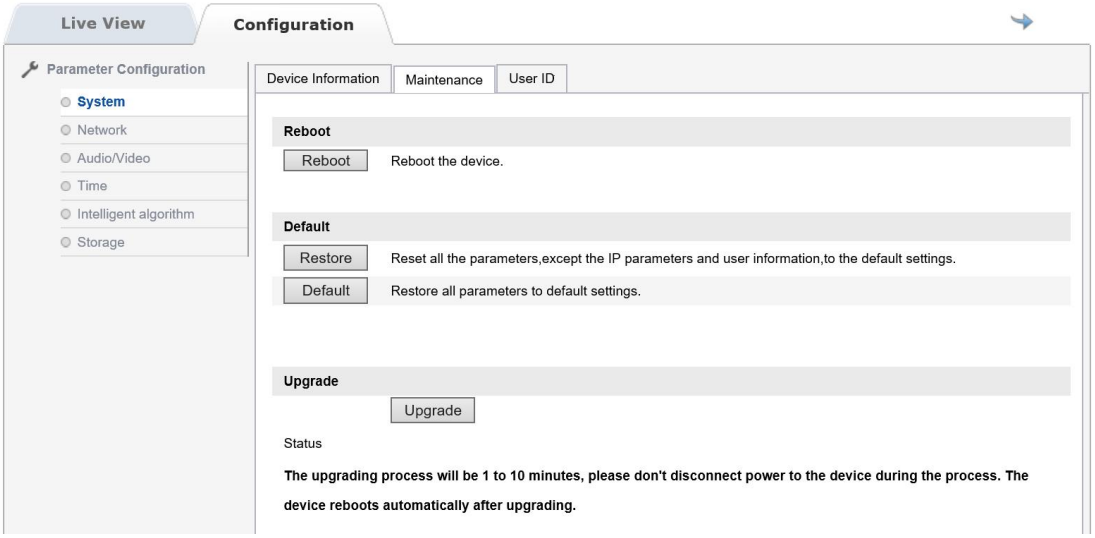
4.3 Basic Information

Display basic information such as the model and serial number of the device



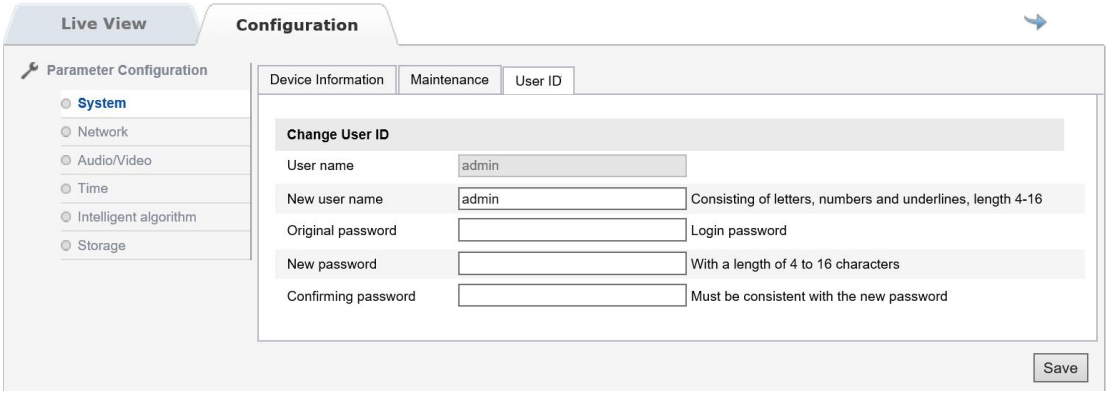
4.4 System Maintenance

Restart the camera, upgrade it, restore parameters



4.5 Account Settings

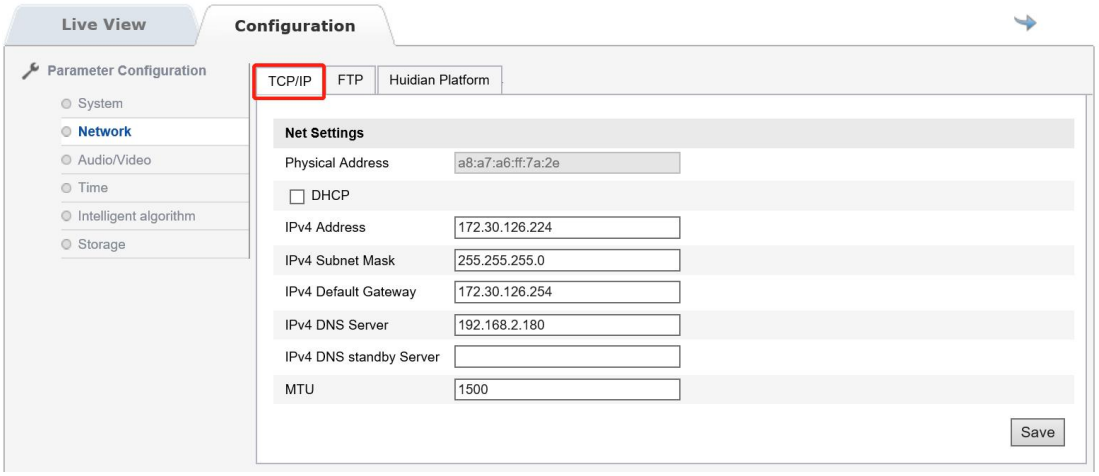
Modify the camera account



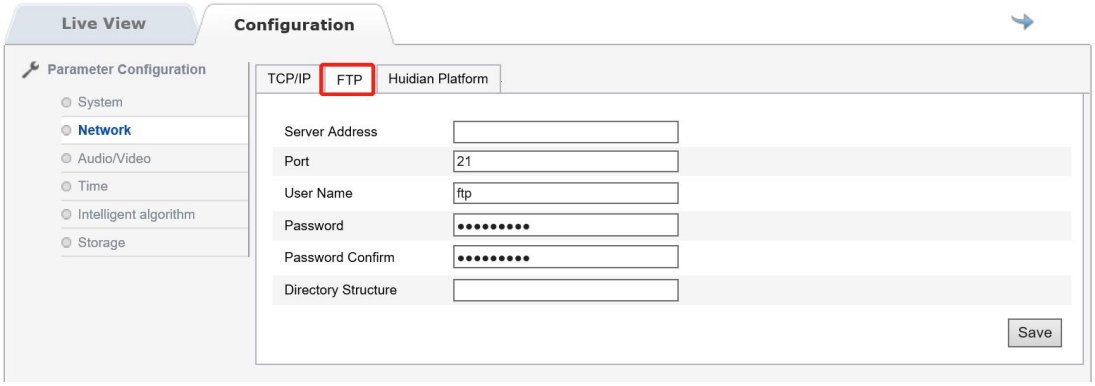
Chapter V: Network Parameters Configuration

5.1 Basic Configuration

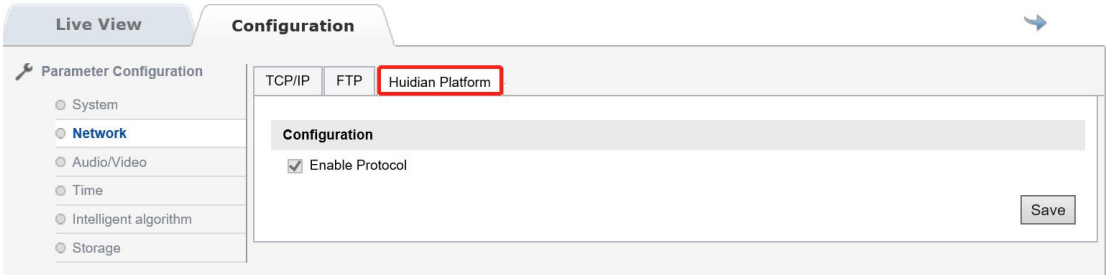
- Modify the IP/TCP address of the device on this page



- Modify the FTP address on this page



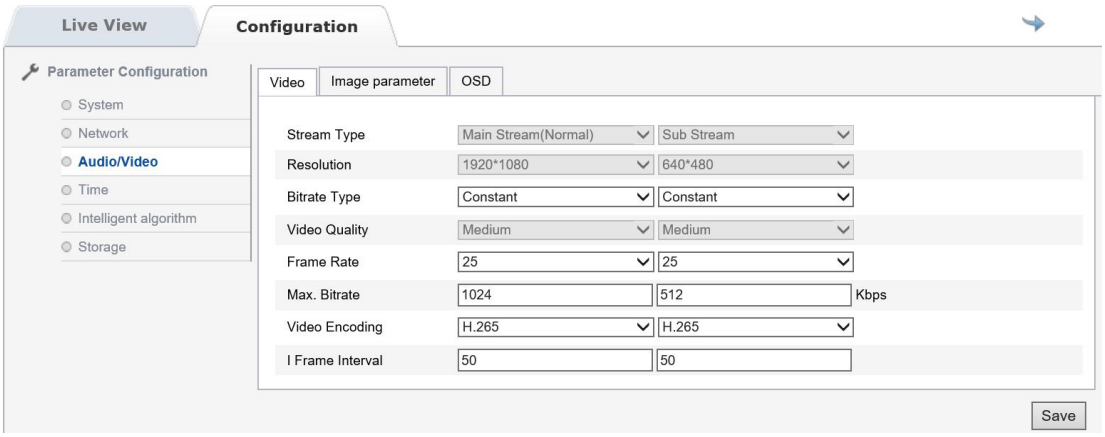
- Enable the platform access on this page, and the data will be automatically transmitted to the platform



Chapter VI: Audio and Video Parameters Configuration

6.1 Video Parameters

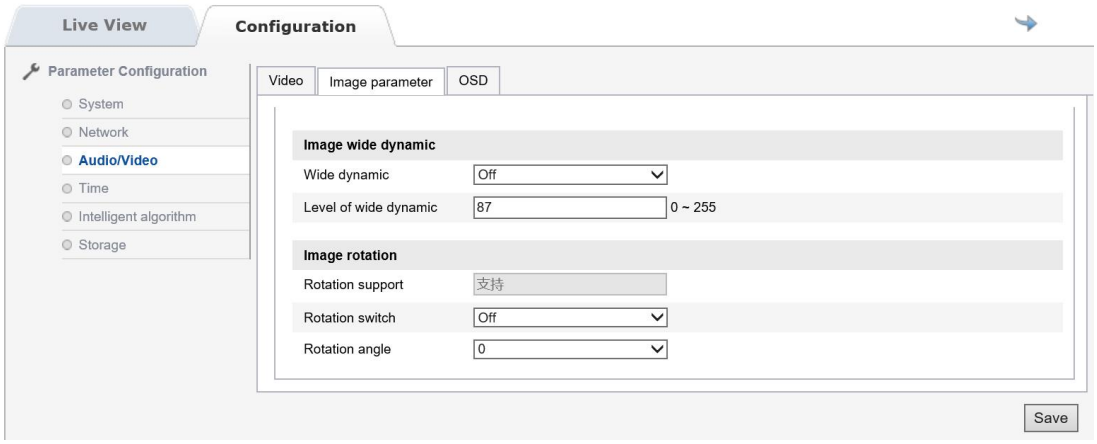
Set primary and secondary stream parameters on this page.



Settings	Description
Bit Rate Type	Constant bit rate/variable bit rate can be selected. Constant bit rate: The live view and recording bit rate is fixed, which is usually suitable for the environment with good network conditions. Variable bit rate: The live view and recording bit rate is adjusted according to the picture change. Usually, the bigger the picture change, the higher the occupied bit rate. It is usually suitable for the environment with general network bandwidth.
Video Frame Rate	The frame rate can be adjusted according to actual demands. Usually, the higher the frame rate, the smoother the picture.
Bit Rate Upper Limit	The highest bit rate limit when the bit rate changes.
Video Encoding	H.265/H.264 optional. H.265 saves about 50% bandwidth compared to H.264. Please note whether it is compatible with H.265/H.264 when using third-party NVR/software at the same time.
I-frame Interval	Usually the larger the interval between key frames, the more key contents contained in each I-frame.

6.2 Image Parameters

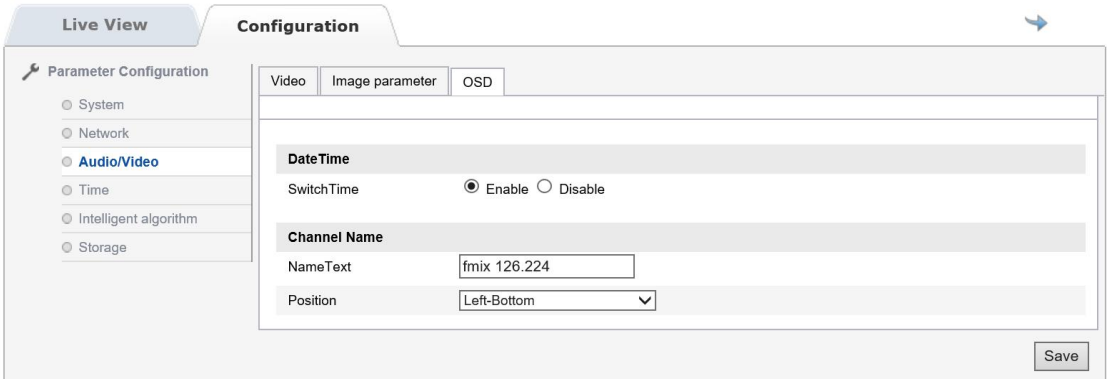
Adjust the image parameters on this page to achieve the most suitable picture.



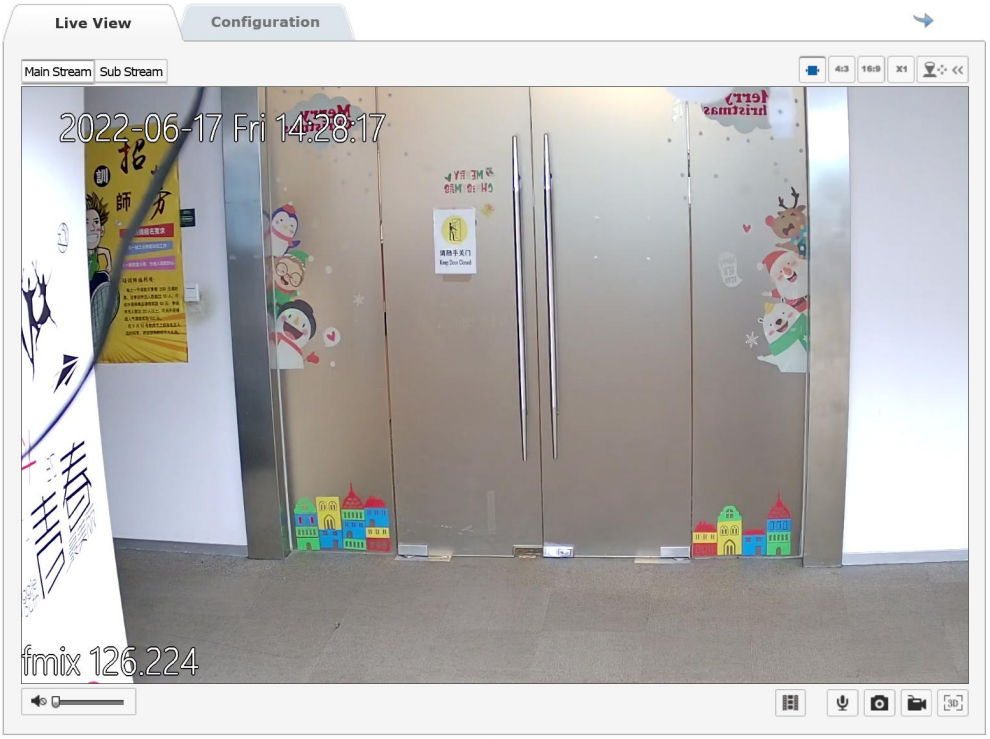
Settings	Description
Wide Dynamic Range	Wide dynamic range can be enabled/disabled according to the installation environment. Wide dynamic range is usually enabled in the backlit environment. The higher the level, the stronger the ability to process backlight images.
Image Rotation	According to the installation angle, rotate the screen to 90°, 180°, 270°, etc.

6.3 OSD Settings

OSD (On-screen display), set the screen OSD content and position on this page. The set OSD content will be displayed in the live view interface.



The preview effect is as shown in the red box below:



Net Surveillance System

6.4 Audio Settings

For devices with audio input/output, enable/disable audio on this page.

Chapter VII: Connect the Device to ULUCU Platform

7.1 Install Client Software

- For Android: Scan the QR code to download at https://www.ulucu.com/global/downloads or search "ULUCU" in the Android APP market to download
- For IOS: Search "ULUCU" in APPSTORE to download

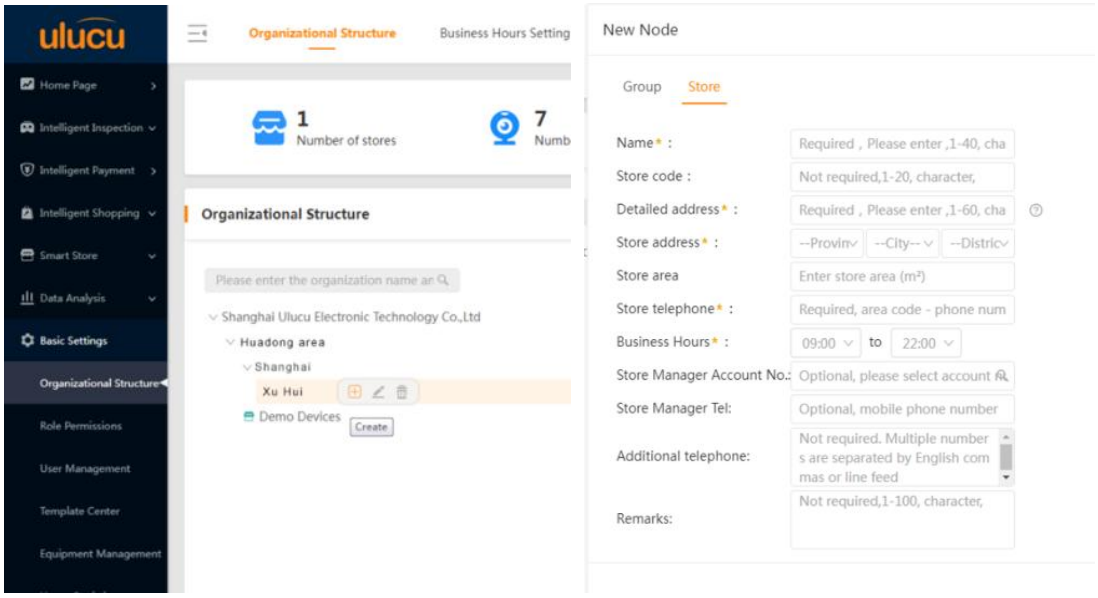
7.2 Add Device to the Platform

11. Add a store in the background of Huidian

- Device should be added based on existing store
- Enterprise administrator account is required (get it from the corresponding sales and

project manager)

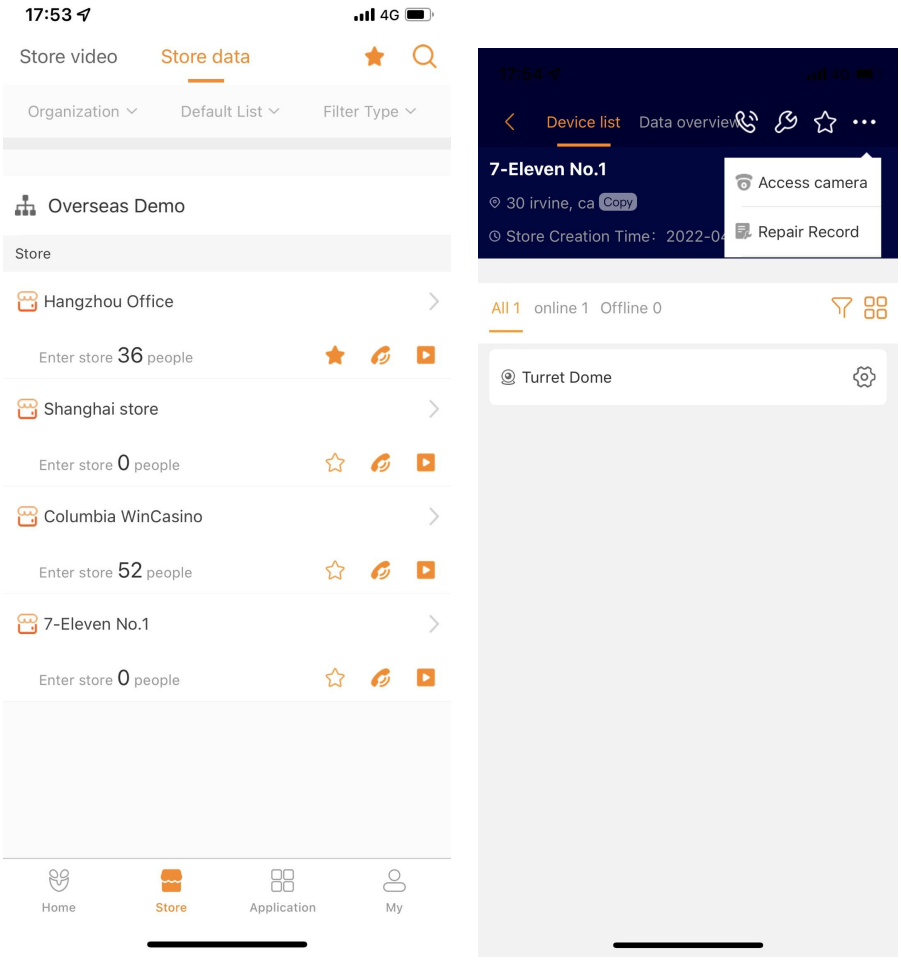
- Visit https://ai-store.apac-ulucu.com to create a store

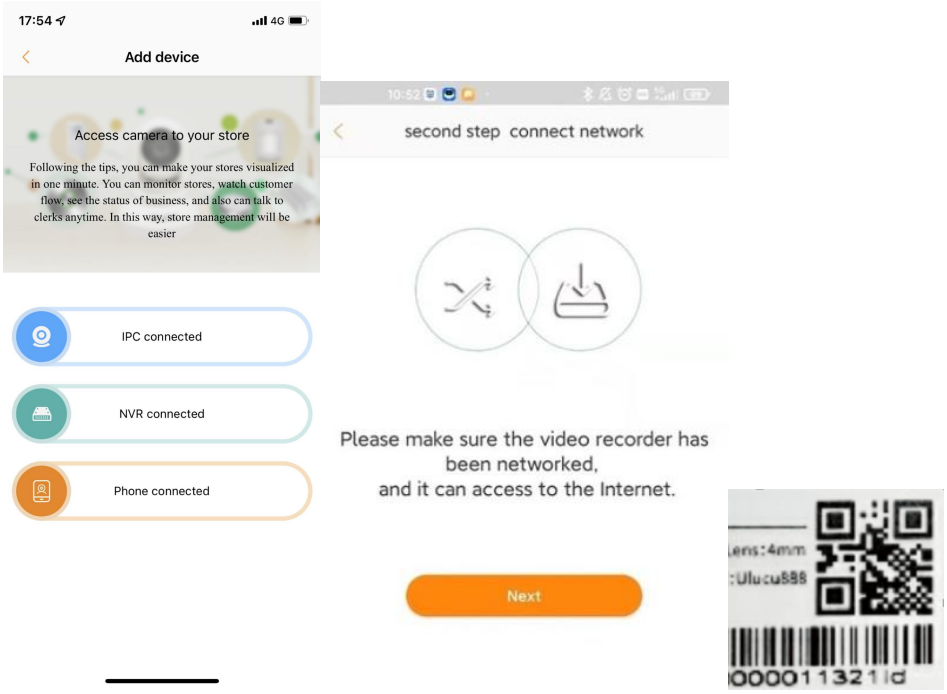


2. Directly connect the camera to the platform

1) Activate the device in the APP

- Download and install the Huidian APP, log in to the account, enter the store and scan the QR code to add actions and perform 1-7 operations

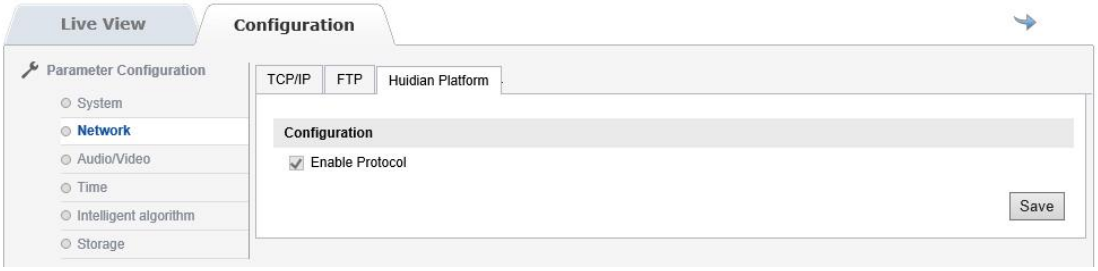




* If it fails to scan the QR code, please manually enter the SN number.

After connecting successfully, you can view the added device.

* If it is still unable to be added and used normally, please log in to the web terminal to check whether the camera has enabled the platform access permission



Annexes

Annex 1: Installation and Quick Connection Guide

Please refer to this document for the installation and configuration of the camera. It is commonly used during on-site installation.

Quick Installation Guide 20220531