4MP AI Enforcement Camera

Web Operation Manual

V1.0.0

Foreword

General

This manual introduces the web operations of the 4MP AI enforcement camera (hereinafter referred to as "the Camera").

Safety Instructions

The following signal words might appear in the manual.

Signal Words	Meaning
DANGER	Indicates a high potential hazard which, if not avoided, will result in death or serious injury.
WARNING	Indicates a medium or low potential hazard which, if not avoided, could result in slight or moderate injury.
CAUTION	Indicates a potential risk which, if not avoided, could result in property damage, data loss, reductions in performance, or unpredictable results.
NOTE	Provides additional information as a supplement to the text.
TIPS	Provides methods to help you solve a problem or save time.

Revision History

Version	Revision Content	Release Time
V1.0.0	First release.	September 2023

Privacy Protection Notice

As the device user or data controller, you might collect the personal data of others such as their face, fingerprints, and license plate number. You need to be in compliance with your local privacy protection laws and regulations to protect the legitimate rights and interests of other people by implementing measures which include but are not limited: Providing clear and visible identification to inform people of the existence of the surveillance area and provide required contact information.

About the Manual

- The manual is for reference only. Slight differences might be found between the manual and the product.
- We are not liable for losses incurred due to operating the product in ways that are not in compliance with the manual.
- The manual will be updated according to the latest laws and regulations of related jurisdictions. For detailed information, see the paper user's manual, use our CD-ROM, scan the QR code or visit our official website. The manual is for reference only. Slight differences might be found between the electronic version and the paper version.
- All designs and software are subject to change without prior written notice. Product updates might result in some differences appearing between the actual product and the manual. Please

contact customer service for the latest program and supplementary documentation.

- There might be errors in the print or deviations in the description of the functions, operations and technical data. If there is any doubt or dispute, we reserve the right of final explanation.
- Upgrade the reader software or try other mainstream reader software if the manual (in PDF format) cannot be opened.
- All trademarks, registered trademarks and company names in the manual are properties of their respective owners.
- Please visit our website, contact the supplier or customer service if any problems occur while using the device.
- If there is any uncertainty or controversy, we reserve the right of final explanation.

Table of Contents

1 Webpage Introduction

After mounting the Camera, power on the Camera, connect it to the network, and configure its settings. Then, you can obtain the desired detection results.

The actual page might vary depending on the model you purchased and the version of software. The figures in this manual are only for reference, and might differ from the actual page.

1.1 Device Initialization

The Camera is delivered in the uninitialized status. You need to initialize the Camera and change its default password before it can be used.

Procedure

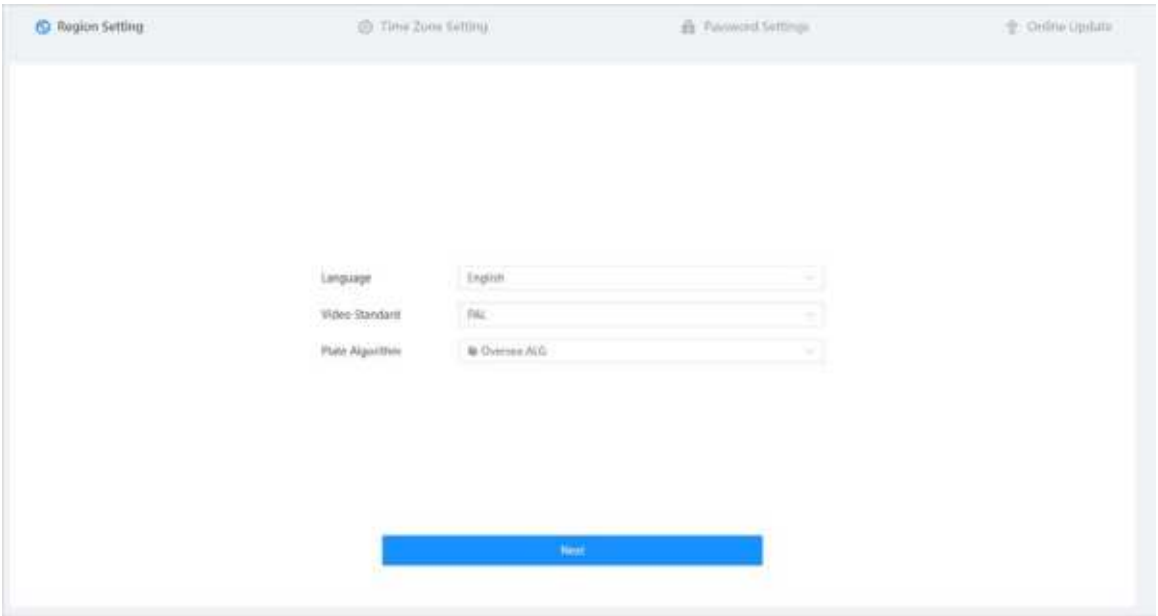
Step 1 Connect the Camera to the network.

1) Connect the Camera to computer over the Ethernet cable.
2) Keep the IP address of the computer and the camera on the same network segment. The network segment can be set to 192.168.1.X, but cannot be the same as the factory default IP of the Camera (192.168.1.108).
3) Execute ping ***.***. ***. *** (device IP) command on computer to check the network connection.

Step 2 Enter the IP address of the Camera (192.168.1.108) in the browser address bar, and press the Enter key to log in to the webpage of the Camera.

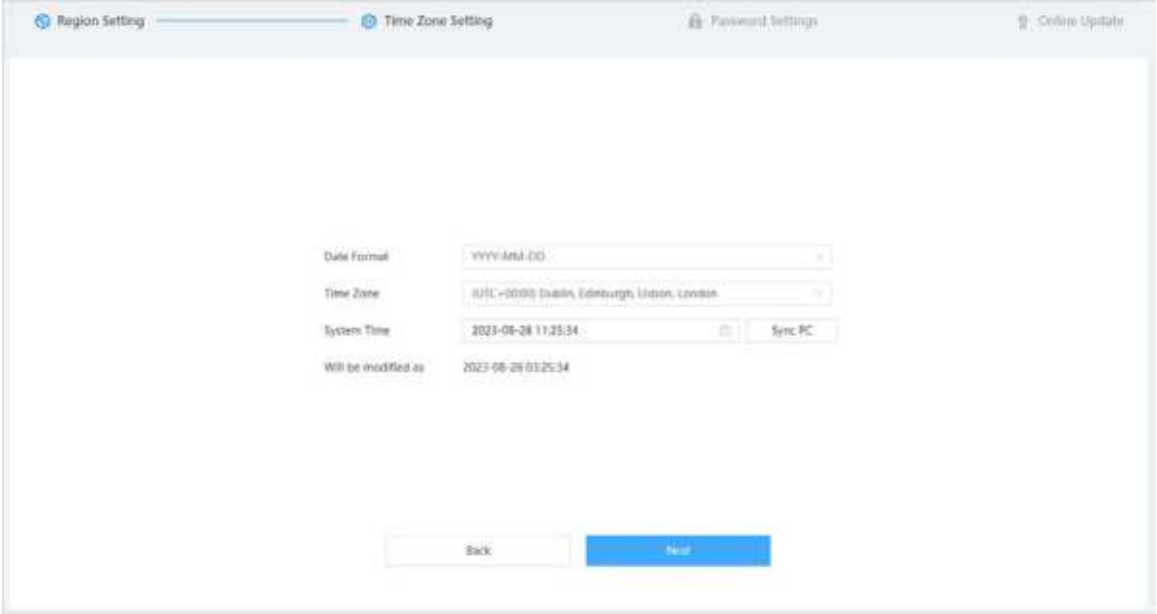
Step 3 On the **Region Setting** page, configure **Language** and **Video Standard**. Then, click **Next**.

Figure 1-1 Region setting



Step 4 On the **Time Zone Setting** page, configure date & time parameters. Then, click **Next**.

Figure 1-2 Time zone setting

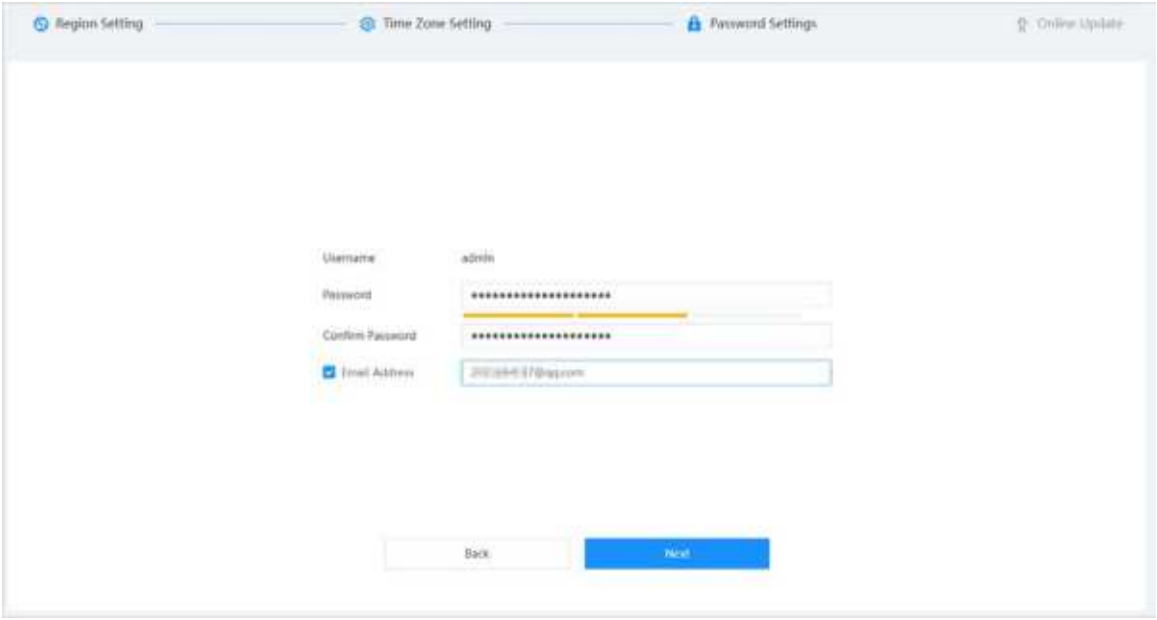


Step 5 On the **Password Settings** page, enter your new password.

Step 6 Select the **Email Address** checkbox, and then enter your email address. This helps you reset your password when your password is lost or forgotten.

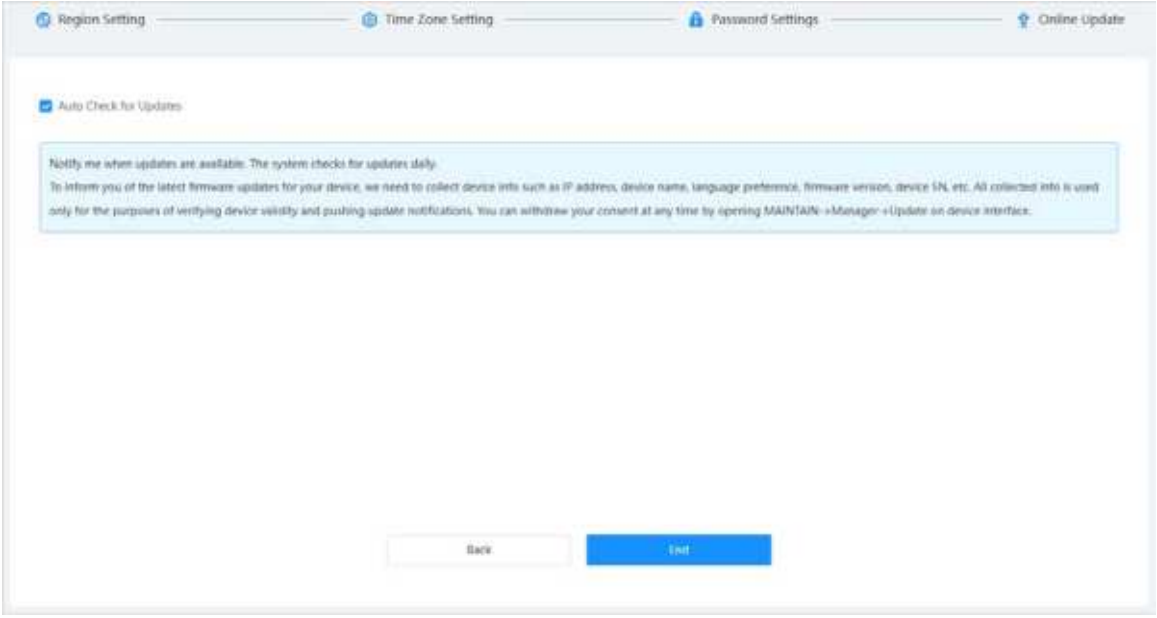
Step 7 Click **Next**.

Figure 1-3 Password setting



Step 8 On the **Online Upgrade** page, select **Auto Check for Updates** and click **End**.

Figure 1-4 Online upgrade



Step 9 On the **Login** page, enter the username (admin) and the password that you set, and then click **Login**.

1.2 Device Login

Procedure

Step 1 Enter the IP address of the Camera in the browser address bar, and then press Enter.

Step 2 Enter username and password on the login page, and then click **Login**.

Figure 1-5 Login

- A box pops up when the username or password is incorrect.
- If you enter an invalid username or password five times, the account will be locked for five minutes.

Figure 1-6 Home page

Table 1-1 Parameter description

Parameter	Description
1	The name of the device.
2	Home.
3	Functions module.
4	Alarm subscription. You can enable alarm function, and select events that trigger alarm.
5	Theme.
6	Language. You can change the language of the webpage.
7	Account. You can restart the device and log out.
8	Functions. You can view all functions of the device.
9	Exit full screen mode.

Related Operations

If you forget password, click **Forgot password?**, and you can reset the password through the email address that is set during the initialization. For details, see "1.4 Resetting Password".

1.3 Logout

Click **Logout** at the upper-right corner of the webpage to log out.

You can enter the username and password to log in again.

1.4 Resetting Password

You can reset your password through email when it is lost or forgotten. Make sure that your email is correctly entered during initialization.

Procedure

Step 1 Enter the IP address of the Camera in the browser address bar, and then press Enter.

Step 2 On the login page, click **Forgot password?**.

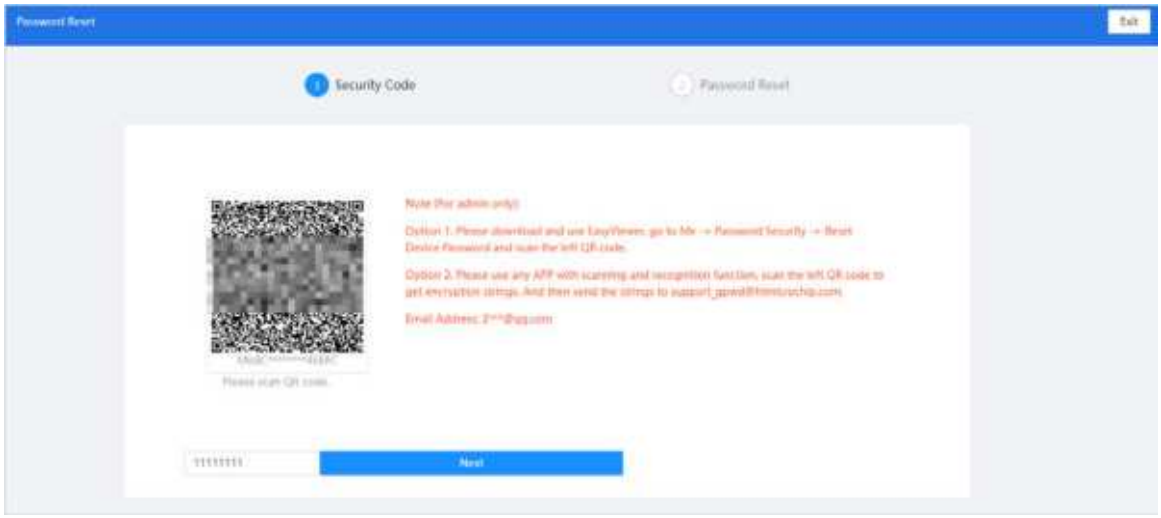
Step 3 In the pop-up dialog box, click **OK**.

Step 4 Scan the QR code according to the page prompt, and send the scanning result to the designated email to acquire security code.

Scan the actual QR code. Do not scan the QR code in this manual.

Step 5 Enter the security code that you received in the text box of **Security code**.

Figure 1-7 Reset password



Step 6 Click **Next**.

Step 7 Configure **Password**, and then enter your new password again in **Confirm Password**.

- The new password must consist of 8–32 characters, and contain at least two types from upper cases, lower cases, numbers and special characters (excluding ' " ; : and &).
- The new password must be the same as the **Confirm Password**. Follow the password security notice to set a high-security password.

Step 8 Click **OK**.

1.5 Functions

You can view real-time video captured by the Camera, set detection rules of number plate recognition and traffic violations, and play back video recordings and snapshots to track back events (if any). This chapter introduces each function.

Figure 1-8 Navigation bar

Table 1-2 Function introduction

Function	Description
Local	You can configure the naming format of picture and storage path.
Configuration Wizard	You can configure the scene for capture, and use various functions to help you with different installation scenarios.
Live	Displays real-time videos and images. You can record video and capture images, and configure video play and image settings.
Search	You can search for images, traffic flow information, pedestrian information, and records on this page.
Playback	You can play back manual video recordings and videos related to traffic violations to track back events (if any).
Camera	You can configure camera attributes such as brightness, contrast, shutter, metering zone, and focus.
ITC	You can configure smart plan, image, OSD, vehicle blocklist/allowlist, perform intelligent analysis, and more.

Function	Description
Network Settings	You can configure TCP/IP, port number, automatic registration, basic services and ITSAPI.
Remote Config	You can enable the remote device such as enforcement camera or IP camera to work with the Camera.
Event	You can enable how the Camera responds when alarms and exception occur.
Peripheral	You can add and configure external devices.
Storage	You can configure the storage path of snapshots and video records.
System	You can configure system information, add users, restore to factory settings, import and export system configuration files, and more.
System Info	You can view information such as version, log, online user, running status, device location and legal information.
Security	You can view security status and enable multiple system services to secure network safety.

2 Local

You can configure the names of snapshots and video recordings.

Prerequisites

To use the functions on this page, you must install the plugin first. Configure any parameter, and then a prompt will be displayed on the bottom of the page. Follow the instructions to install the plugin. If you do not install the plugin, images and videos will be stored to the default path set by your browser.

Procedure

Step 1 Select > **Local**.

Figure 2-1 Local

Step 2 Name the snapshots in the **Naming Format** section. You can click **Help** to view the naming rules, or click **Reset** to restore the naming rule to the default.

Step 3 Click **Apply**.

3 Configuration Wizard

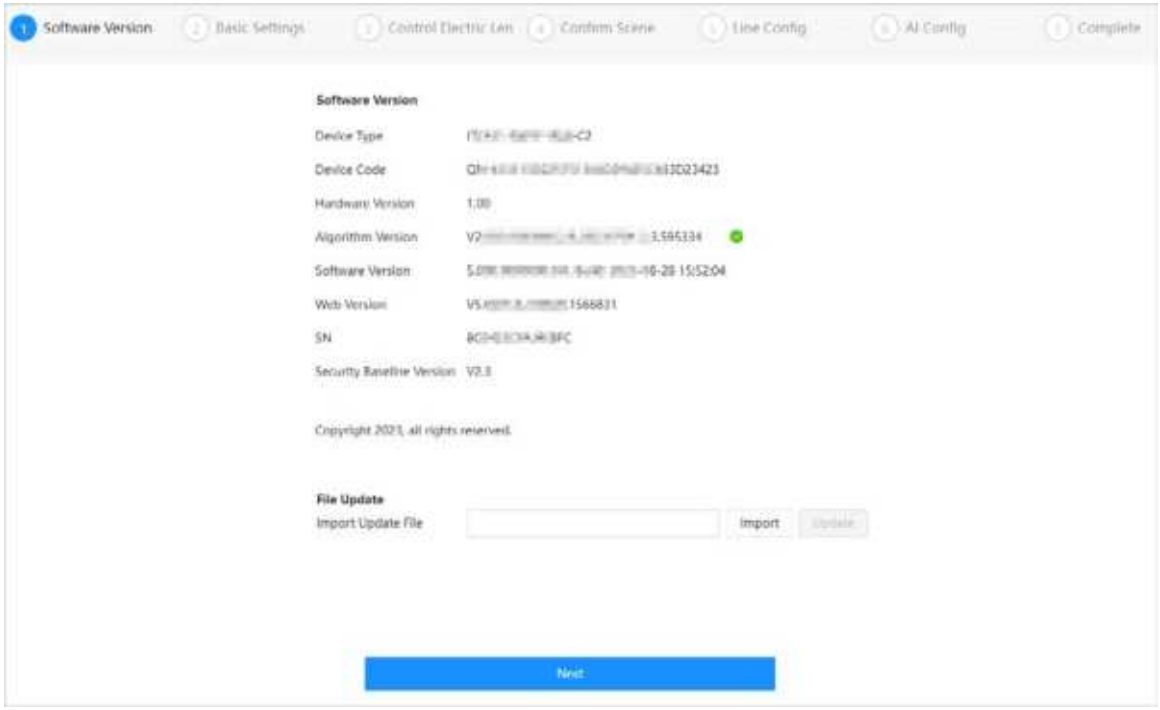
You can upgrade software, configure scene for capture, lens type, detection line, AI detection, and more.

Procedure

Step 1 Log in to the webpage.

Step 2 Click **Configuration Wizard**.

Figure 3-1 Configuration wizard

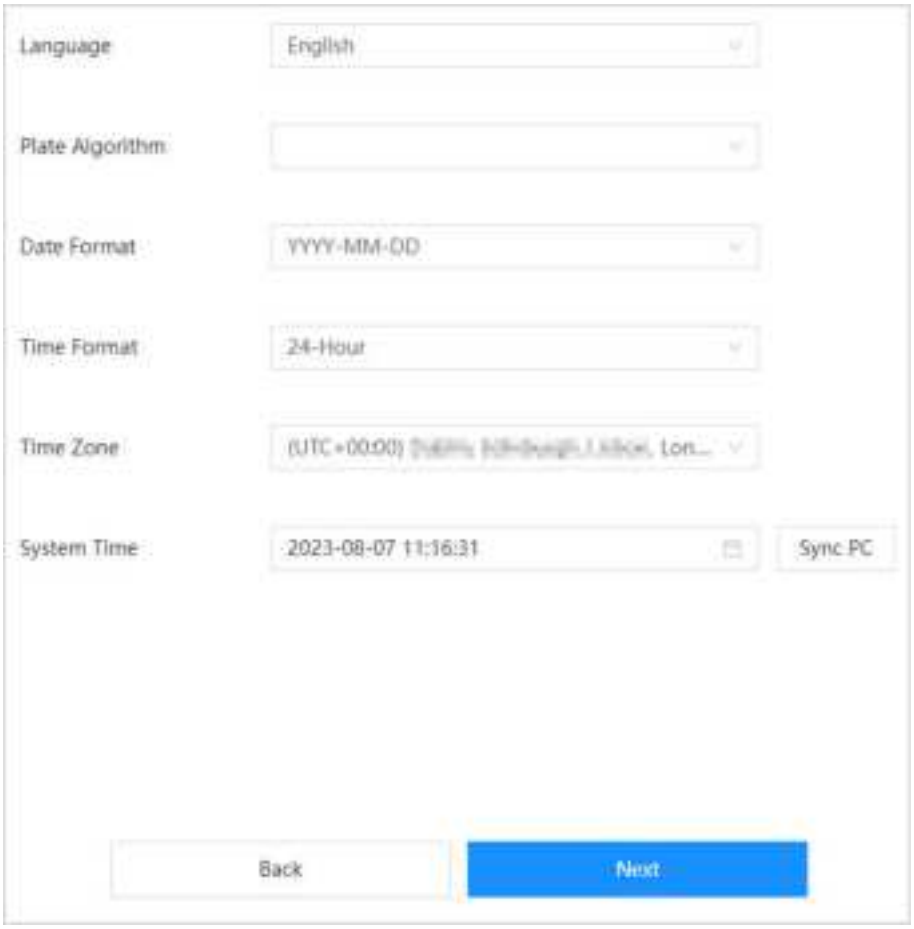


Step 3 (Optional) Click **Import** to select upgrade file from local computer, and then click **Upgrade**. Click **Next**.

When the software version is not what you need but the device type is what you need, you can upgrade the software.

Step 4 Configure the date and time format and system time of the Camera, and then click **Next**.

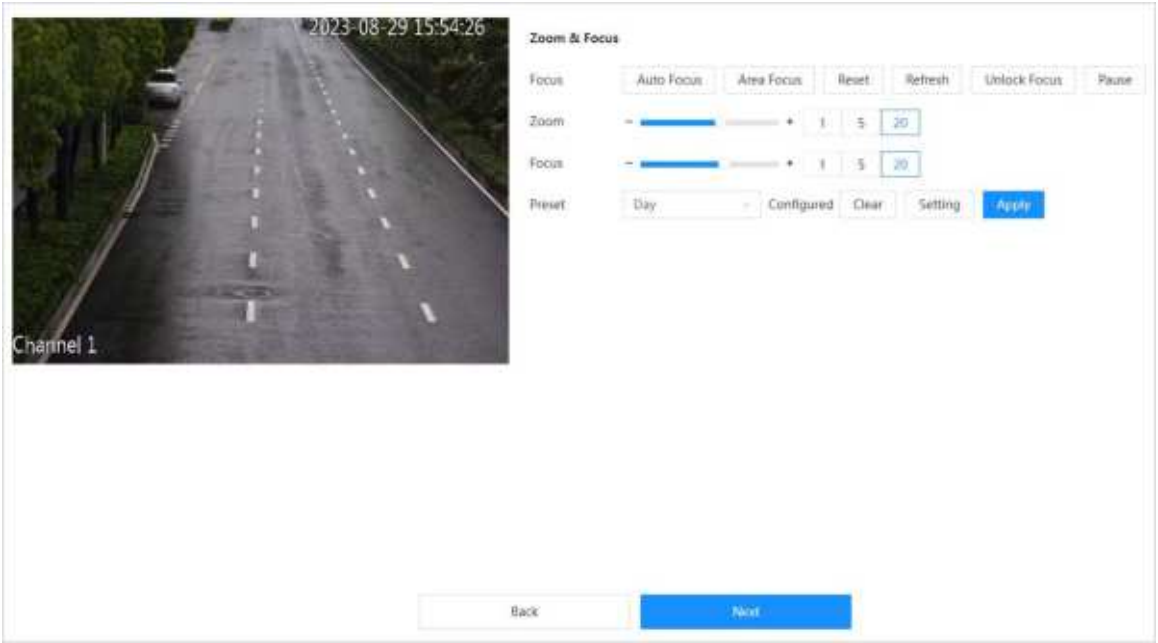
Figure 3-2 Configure basic parameters



- You can manually enter the time, or click **Sync PC** to synchronize time from the server.
- Set **Plate Algorithm** to your country to get better results.

Step 5 Check whether the video image is properly zoomed, and focused by the plate pixel.

Figure 3-3 Adjust the video for recognition



1) Click **Unlock Focus**, and then configure the focus mode.
   - **Auto Focus**: Adjusts video clarity automatically.
   - **Area Focus**: Draw a detection zone and adjust the clarity of the detection zone.

- **Reset**: Reset all focus and zoom parameters to the default settings.
- **Refresh**: Update the page content.
- **Unlock Focus**: Unlock the focus setting.

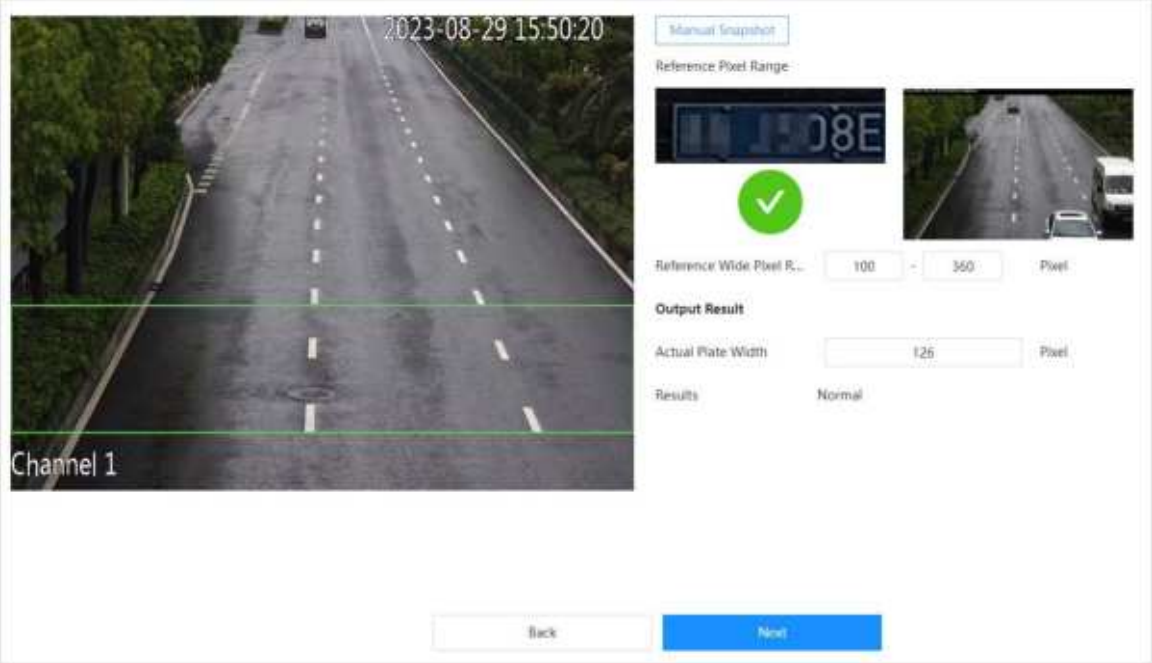
  The focus configuration will be locked without any operations within 60 s.
- **Pause**/**Play**: Click **Pause** to stop playing the live video, and then click **Play** to start playing the live video.

2) Drag the zoom and focus bars to adjust the video image until the image is clear.
3) Configure the presets.
   You can select **Day** or **Night** presets.
4) Click **Setting** to configure presets, and then click **Apply**.
5) Click **Next**.

Step 6 Configure scene validation.

1) When the target enters the green box, click **Manual Snapshot** to capture a picture of plate.
2) the Camera compares the pixel of the snapshots with the pixel range.
   If the pixel of the snapshot is within the given pixel range, the results display **Normal**. Otherwise the results will display **Too Small**, and then you need to click **Back** to configure the parameter of zoom and focus again.

Figure 3-4 Scene validation



3) Click **Next**.

Step 7 Configure detection mode for lines.

1) Select trigger mode.
   - **Video**: Draw detection line manually according to line drawing requirements.

Figure 3-5 Video

a. Configure the total lanes.

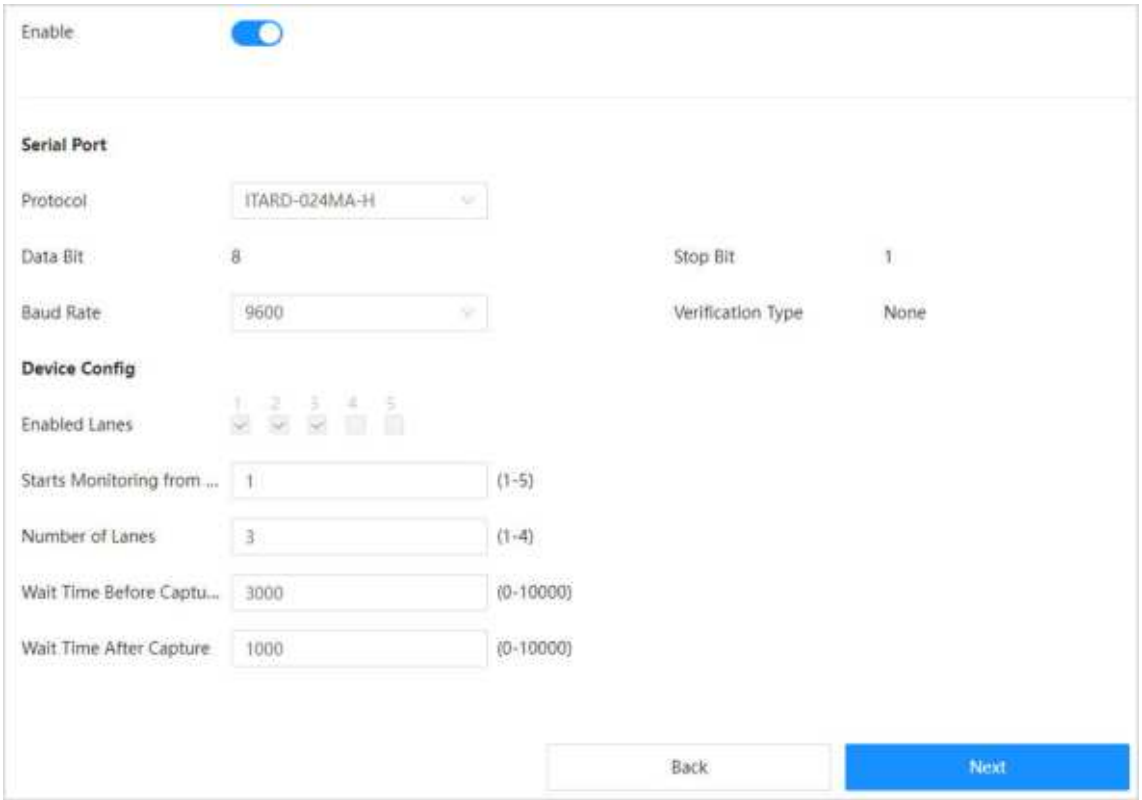
You need to draw lanes from left to right, beside you just need to draw the left lane lines.

b. Draw lane lines and right lane boundary.

c. Configure advanced settings according to your needs.

- **Radar**: Click to enable radar mode, and then configure the parameters.

Figure 3-6 Radar

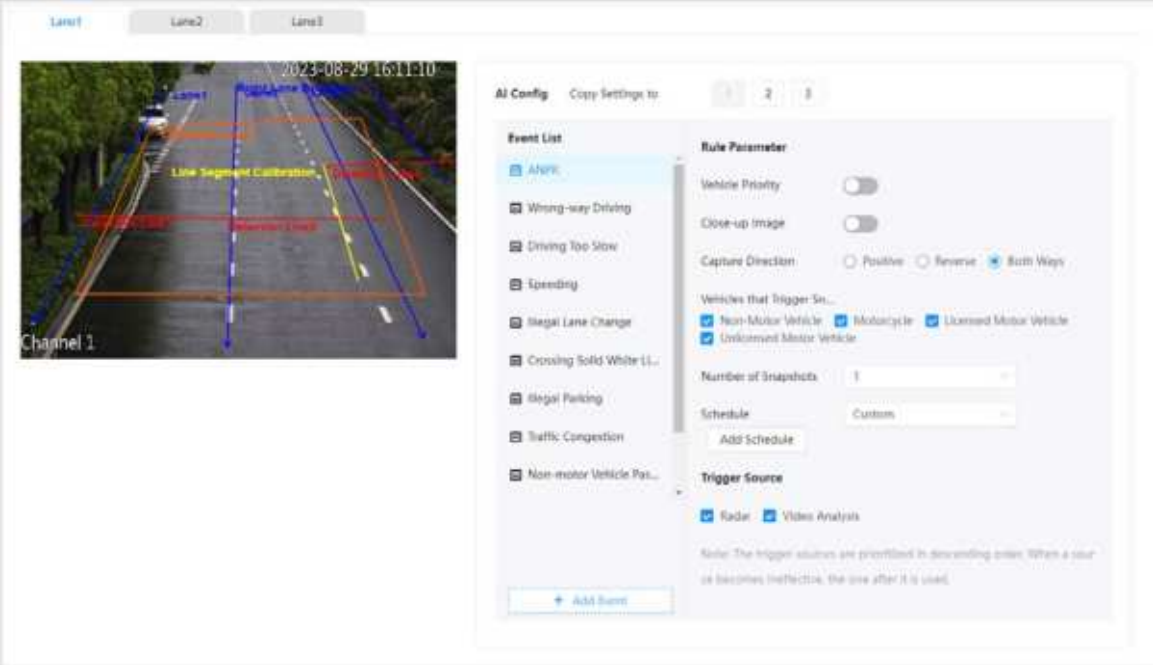


- **Radar and Video**: Configure video and radar mode at the same time.

2) Click **Next**.

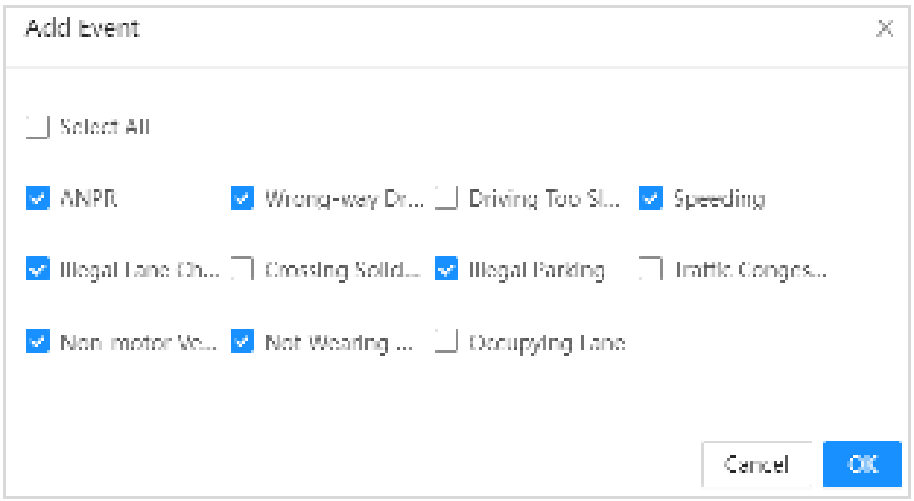
Step 8 Configure AI detection for lanes.

Figure 3-7 AI configuration



1) Select a lane.
2) Click **Add Event** to select events to the lane.

Figure 3-8 Add event



Click **Select All** to select all events.

3) Click **OK**.
4) Configure the parameters of every event you add.

Select **2** or **3** next to **Copy Settings to** to copy the settings of lane1 to lane2 and lane3.

Step 9 Click **Next**, and then goes to **Complete** page.

Step 10 Click **Go to Home Page**.

4 Live

The **Live** page is displayed after you successfully log in to the webpage. On this page, you can view the live video image and the captured number plate, take snapshots, view snapshot details, and perform other operations.

Figure 4-1 Live page

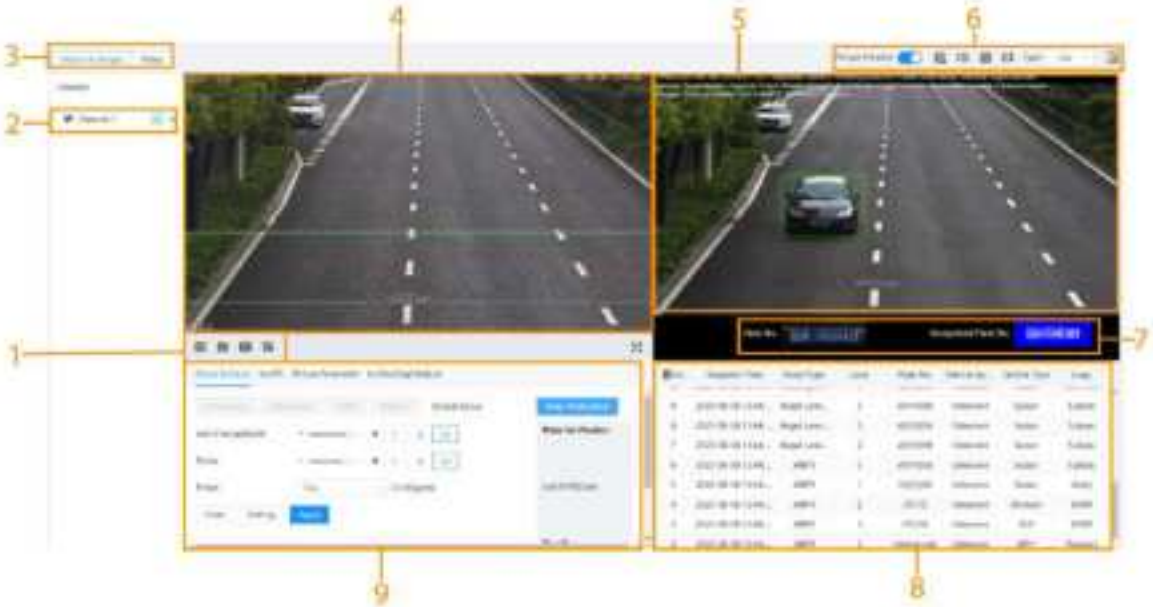


Table 4-1 Description of the live page

No.	Function	Description
1	Video adjustment	Adjustment operations in live viewing.
2	Device channel and stream	Select a video stream based on your network bandwidth. • Main stream: Displays video with high resolution, but requires large bandwidth. This option can be used for storage and monitoring. • Sub stream: Displays the video in lower resolution but smoothly. It requires less bandwidth. This option is normally used to replace main stream when the network bandwidth is not enough.
3	Display mode	The display modes include **Video & Image** and **Video** mode.
4	Live view	Displays real-time video.
5	Snapshot	Displays license plate snapshots.
6	Live view function bar	Functions and operations in live viewing.
7	Plate snapshot and plate number	Displays plate snapshots and recognized plate number.

No.	Function	Description
8	Snapshot details	Displays the details of the vehicle that is captured.
9	Frequently used functions	These functions are frequently used when viewing live videos, such as adjusting the focus and zoom, AI detection, picture parameters, flash light, and more.

4.1 Live View

Displays the live video of the camera. You can click the icons to change the display mode of live view.

Figure 4-2 Live view

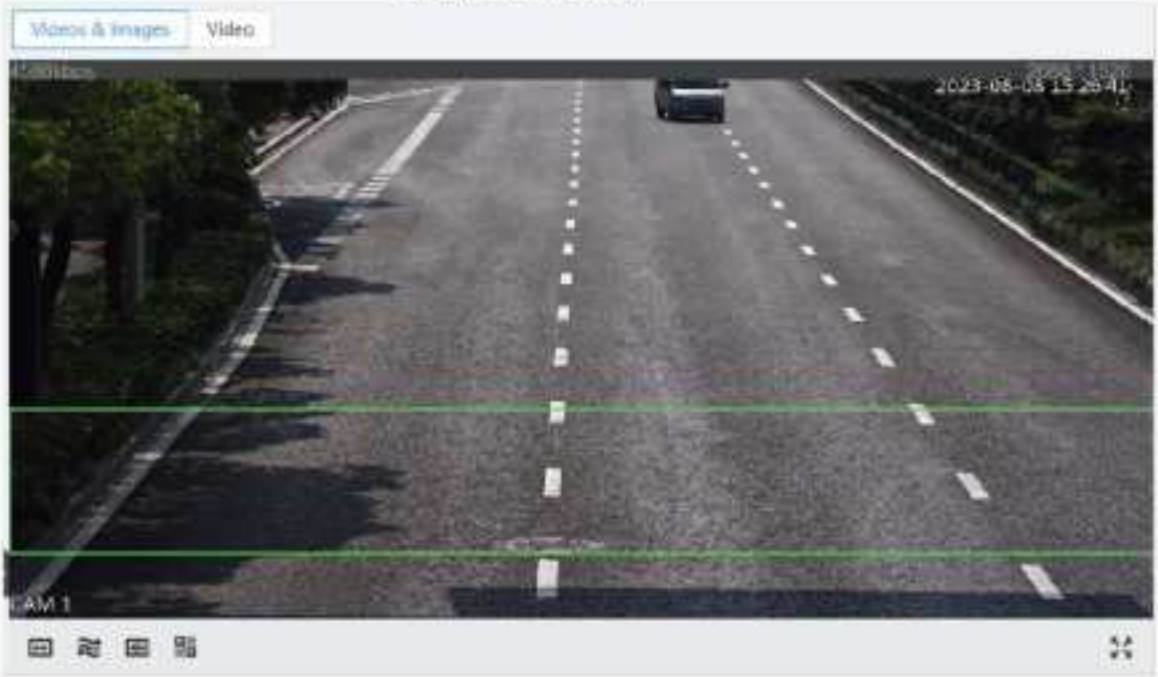


Table 4-2 Icon description of live view page

Icon	Function	Description
	W:H	Click the icon to select **Original** or **Adaptive** playback.
	Smoothness Adjustment	Change the fluency of the video. Select one based on your network bandwidth. Download and install the plug-in before using the function. • **Realtime**: Guarantees the real time of the video. When the network bandwidth is not enough, the video might not be smooth. • **General**: It is between **Realtime** and **Fluent**. • **Fluent**: Guarantees the fluency of the video but the video might not be real-time.

Icon	Function	Description
	AI Rule	Click the icon to enable smart track detection. Number plate, vehicle bounding box, and other smart tracking information will be displayed on the video image.
	Pixel	Click the icon, and then draw a rectangular area on the image to show the pixel size of that area.

4.2 Frequently Used Functions

4.2.1 Zoom and Focus

Click **Zoom & Focus** to drag the slider to adjust the parameters. For details, see "3 Configuration Wizard".

Figure 4-3 Zoom and focus

4.2.2 AI Configuration

Draw detection line for every lane, and then click **Save**. For details, see Step8 in "3 Configuration Wizard".

Figure 4-4 AI configuration

4.2.3 Picture Parameter

You can adjust the picture parameters of the camera to obtain clear images.

Click **Picture Parameter** to configure the parameters of images.

Figure 4-5 Picture parameter of manual mode

Figure 4-6 Picture parameter of Auto mode

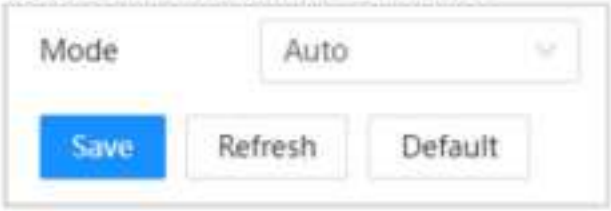


Table 4-3 Parameter description

Parameter	Description
Mode	You can select **Manual** or **Auto** mode.
Shutter	You can select the shutter value, or select **Custom**, and then set the shutter range. You need to configure shutter when **Shutter** is set to **Custom**.
Gain	Set the value range of gain. You need to configure gain scope when **Mode** is set to **Manual**.

4.2.4 Illuminator Adjustment

Click **Illuminator Adjustment** to configure the output mode, brightness, auto mode, ambient brightness of the illuminator.

Figure 4-7 Flash light

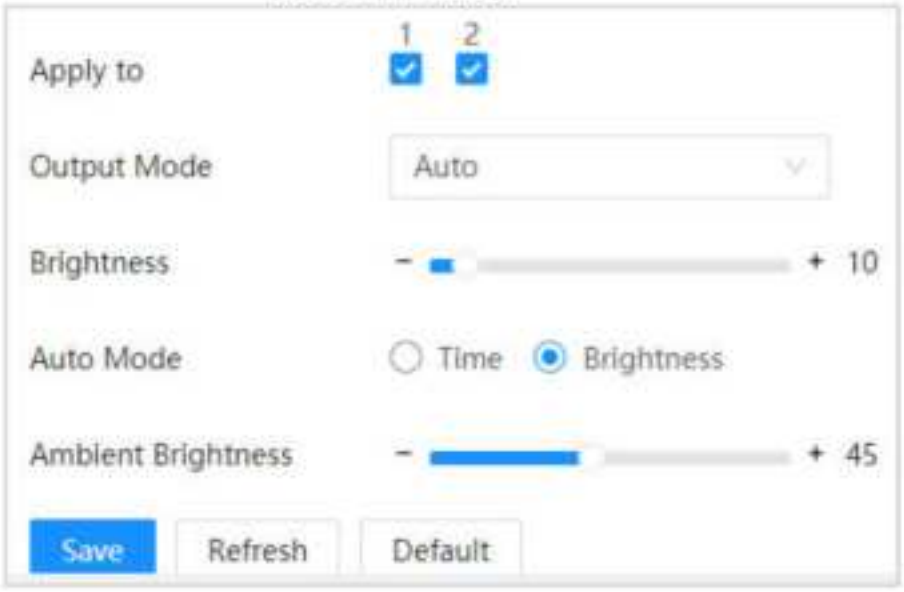


Table 4-4 Parameter description of flash light

Parameter	Description
Apply to	Select **1** or **2** (each number controls 2 LEDs on the camera) to turn on or off the illuminators.
Output Mode	Selects the output mode of spotlight. • **Close**: The spotlight is always off. • **Always**: The spotlight is always on. • **Auto**: The spotlight turns off according to the ambient brightness.
Brightness	Drag the slider to adjust the brightness of the light. Both the darker areas and the brighter areas will be changed together when adjusting the brightness. The image might become blurry when the value gets bigger.
Auto Mode	You can select **Time** or **Brightness**.
Ambient Brightness	You can adjust the ambient brightness.

4.3 Live View Function Bar

Configure functions on the **Live** page, and then the system will display the desired information on the **Live** page.

Table 4-5 Function description of the live page

Icon	Name	Description
Picture Preview	Picture Preview	• Click to enable the function, and then the Camera automatically receives vehicle snapshots and detects event information triggered by sources such as radar or video detection, and displays such snapshots and information in the window on the right. • The snapshots are saved in the storage path. To change the storage path, go to the **Storage** page.
	Manual Snapshot	Click the icon, and then camera takes 1 snapshot. The snapshot is saved in the storage path. This function usually used when a vehicle passes. Enable **Picture Preview** first.
	Digital Zoom	Use this function to zoom in on any area of the video. Click the icon and drag to select any area in the video, and then the camera will zoom in on the area you selected.
	Snapshot	Click the icon to take 1 snapshot from the video, and then you can acquire a snapshot of bmp format. You can check the quality of the video by viewing the snapshot.
	Record	Click the icon to start recording. Click again to save the recording to your local computer.
Type dav	Type	Select the format of the video recording (**dav**) by default.
	Auto Focus	Click the icon to start auto focus, local focus, and license plate check for the monitoring image.

4.4 Plate Number Recognition

Displays the plate number recognized by the camera in real-time when a vehicle passes.

4.5 Vehicle Snapshot

Select **Picture Preview**, and then snapshots will be displayed when vehicles pass.

4.6 Event List

Click  to enable **Picture Preview** function, and the event information will be displayed, including number, snapshot time, event type, lane, plate number, vehicle speed, vehicle type, and logo.

Figure 4-8 Event list

No.	Snapshot Time	Event Type	Lane	Plate No.	Vehicle Spee...	Vehicle Type	Logo
4	2023-08-09 09:02:45	ANPR	2	Unlicensed	Unknown	Sedan	Unknown
3	2023-08-09 09:02:31	ANPR	2	Unlicensed	Unknown	Pickup	Opel
2	2023-08-09 09:02:21	Manual Snap...	2	[illegible]	Unknown	Sedan	Chery
1	2023-08-09 09:02:10	ANPR	2	Unlicensed	Unknown	Sedan	Infiniti

5 Camera

You can configure camera attributes such as brightness, contrast, saturation, shutter, metering zone, and focus. Besides, you can also configure encoding parameters such as video stream, video OSD and ROI (region of interest).

5.1 Configuring Camera Attributes

After connecting the camera to the network and viewing the live video on its webpage, you can adjust the image parameters of the camera to obtain clear images.

5.1.1 Configuring General Parameters

You can configure the brightness, contrast, saturation, mode, and other attributes of the camera.

Procedure

Step 1 Select **Camera** > **Image** > **General**.

Figure 5-1 General

Step 2 Configure the parameters.

Table 5-1 Description of general parameters

Parameter	Description
Brightness	• Both the darker areas and the brighter areas will be changed together when adjusting the brightness. The image might become blurry when the value gets bigger. The recommended range is 40–60, and the available range is 0–100. • It is 50 by default. The larger the value, the brighter the image.

Parameter	Description
Contrast	• The larger the value, the darker the dark area, and the more exposed the bright area. • The image might become blurry when the value gets smaller. The recommended range is 40–60, and the available range is 0–100. • It is 50 by default. The larger the value, the stronger the contrast.
Saturation	• The saturation value does not change the overall image brightness. • The larger the value, the more saturated the image. • It is 50 by default. The smaller the value, the more unsaturated the image. The recommended range is 40–60, and the available range is 0–100.
Heat to Defog	• **Open**: Enable the defog function. • **Close**: Not enable the defog function.
Mode	• **Color**: The image is always colored. • **Auto**: When the brightness is higher than the threshold, the image automatically changes to color. When it is below the threshold, the image changes to black and white. • **B/W**: The image is always black and white.
ICR Switch	• **Auto**: You need to pre-set the brightness in this mode. When the ambient brightness is higher than the pre-set value, the Polarizer will start to work. • **Polarizer**: The Polarizer is always running. Applicable to scenarios with high brightness. • **IR**: Applicable to scenarios with low brightness.
Ambient Brightness	The light adjusts its brightness according to the ambient brightness.

Step 3 Click **Apply**.

5.1.2 Configuring Shutter

You can configure shutter mode, exposure mode, and gain mode.

Procedure

Step 1 Select **Camera** > **Image** > **Shutter**.

Figure 5-2 Shutter

Step 2 Configure the parameters.

Table 5-2 Description of shutter parameters

Module	Parameter	Description
Shutter Mode	Single Shutter	Video and snapshot share the same exposure mode.
3D NR	Video/Image 3D NR	Click , and then 3D NR is enabled to reduce noise of video/image. The higher the value, the less the noise.
Image	Scene	You can change the scene and adjust the sharpness of the corresponding scene. Available scenes include **Morning/Dusk**, **Day**, and **Night**.
	Sharpness	You can set the sharpness of the corresponding scene. The higher the value, the clearer the image. But there will be noise if the sharpness is too high.
	WDR	Click to enable WDR (wide dynamic range), which helps provide clear video images in bright and dark light.
Exposure	Mode	• In **Auto** mode, only **Manual** iris type is available. • In **Force** mode, several iris types are available, and you also need to configure **Iris**, which includes **Auto** and **Manual**. If **Manual** is selected, you can manually drag the slider to adjust the value.
	Iris Type	Displays the detected iris type.
	Mode	Select the way of adjusting exposure mode. You can select from **Manual** and **Auto**.
	Shutter	You can select the shutter value, or select **Custom**, and then set the shutter range. You need to configure shutter when **Mode** is set to **Manual**.
	Shutter	Set the time range of shutter. You need to configure shutter when **Shutter** is set to **Custom**.

Module	Parameter	Description
	Gain	Set the value range of gain. You need to configure gain scope when **Mode** is set to **Manual**.
WB	Mode	Set scene mode to adjust the image to its best status.

Step 3 Click **Apply**.

5.1.3 Configuring Metering Zone

This section provides guidance on configuring the measure mode of metering zone.

Procedure

Step 1 Select **Camera** > **Image** > **Metering**.

Figure 5-3 Metering

Step 2 Configure the parameters.

Table 5-3 Description of metering parameters

Parameter	Description
Plate Brightness Compensation	Click to enable this function, and then you can select **Backlighting Compensation** and **Frontlighting Compensation** according to scene requirements to improve the backlight and frontlight image brightness.

Parameter	Description
Metering Mode	• **Global Metering**: Measure the brightness of the whole image area and intelligently adjust the overall image brightness. • **Partial Metering**: Measure the brightness of sensitive areas and intelligently adjust the overall image brightness. If the measured area becomes bright, then the whole area becomes dark, and vice versa. Click **Draw**, and then drag the mouse to draw measured areas and yellow boxes display over the video image. ◦ Click **Clear** to redraw partial metering areas. ◦ Click to delete a partial metering area.

Step 3 Click **Apply**.

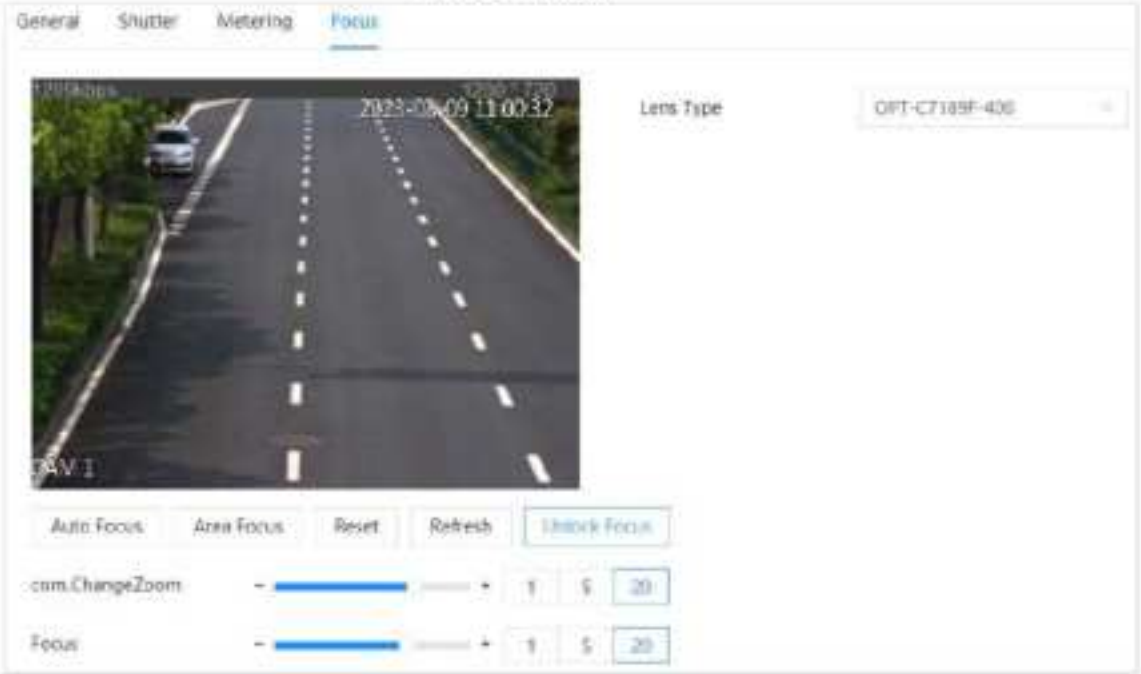
5.1.4 Configuring Focus

Adjust the focus of the Camera.

Procedure

Step 1 Select **Camera** > **Image** > **Focus**.

Figure 5-4 Focus



Step 2 Configure the parameters.

Table 5-4 Description of focus parameters

Parameter	Description
Lens Type	Keep it as default.

Parameter	Description
Zoom	Drag the slider to zoom in or out the video image at the selected speed. Click **Unlock Focus** before configuring the parameters.
Focus	Drag the slider to adjust the camera focus.
Auto Focus	Automatically adjusts the camera focus to get clear images.
Area Focus	Function reserved.
Reset	Reset all focus and zoom parameters to the default settings.
Refresh	Update the page content.
Unlock Focus	Unlock the focus setting.

Step 3 Click **Refresh**.

5.2 Configuring Encode Parameters

After connecting the camera to the network and viewing the live video on its webpage, you can configure encoding parameters when necessary to obtain clear and smooth video image.

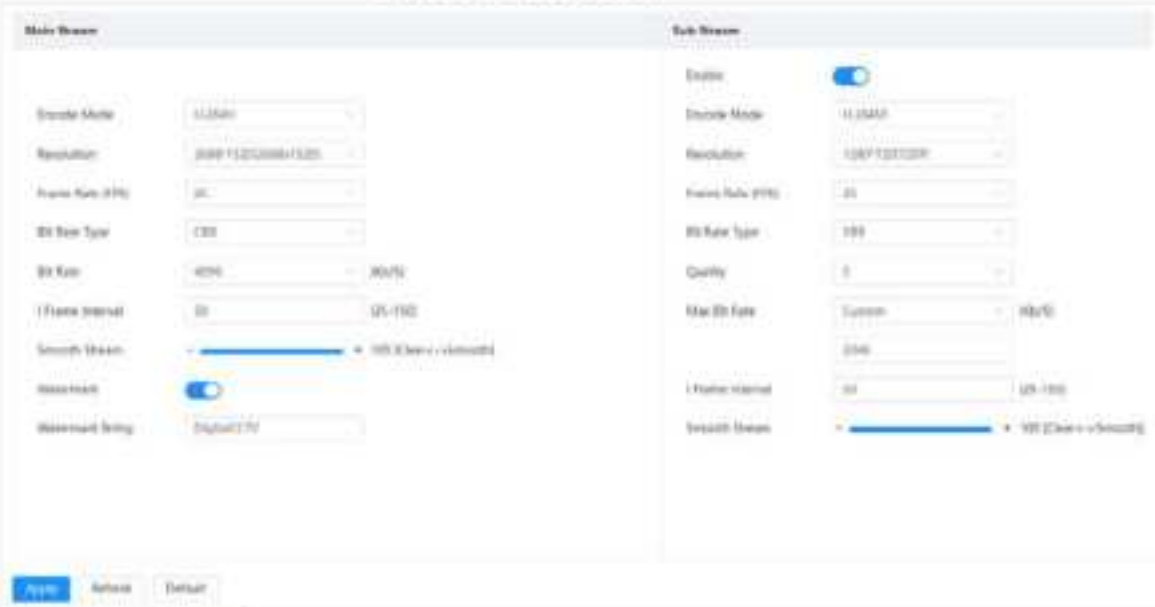
5.2.1 Configuring Video Parameters

Configure the parameters of video streams.

Procedure

Step 1 Select **Camera** > **Encode** > **Video Stream**.

Figure 5-5 Video stream



Step 2 Configure the parameters.

Table 5-5 Description of video stream parameters

Parameter	Description
Encode Mode	Modes of H.264M, H.264H, MJPEG, and H.265 can be selected.
Resolution	The higher the value, the clearer the overall image. For each resolution, the recommended bit stream value is different. The resolution of sub stream cannot be greater than that of main stream.
Frame Rate (FPS)	The higher the value, the smoother the video image. The frame rate might vary due to different resolutions.
Bit Rate Type	You can select from **VBR** (variable bitrate) and **CBR** (constant bitrate). • **VBR**: Gives the best balance between quality and file size as the bitrate can be altered depending on the video. • **CBR** keeps the bitrate the same during encoding, and it is more advantageous to use when the network connection is limited to performing at, for example, 320 Kbps.
Quality	6 quality levels are available. The higher the value, the better the quality. You need to configure the image quality when **VBR** is set to **Bit Rate Type**.
Bit Rate	Higher bit rate signifies greater image or video quality, but also occupies more storage space. You need to configure the bit rate when **CBR** is set to **Bit Rate Type**.
Max Bit Rate	It is the upper limit of stream in VBR. In CBR, the value is fixed.
I Frame Interval	The number of P-frame between two I-frames. The number varies according to the bit rate. The range is 25-150. We recommend configuring the value to be twice the amount of the bit rate.
Smooth Stream	The higher the value, the smoother the video and the less the clarity.
Watermark	You can verify the watermark to check whether the video has been tampered. Select the **Watermark** checkbox to enable watermark verification. The watermark character is **DigitalCCTV** by default. Watermark character consists of up to 85 characters with numbers, letters and underlines.
Enable	Enable sub stream when your network bandwidth is insufficient or other conditions that influence the video smoothness in main stream.

Step 3 Click **Apply**.

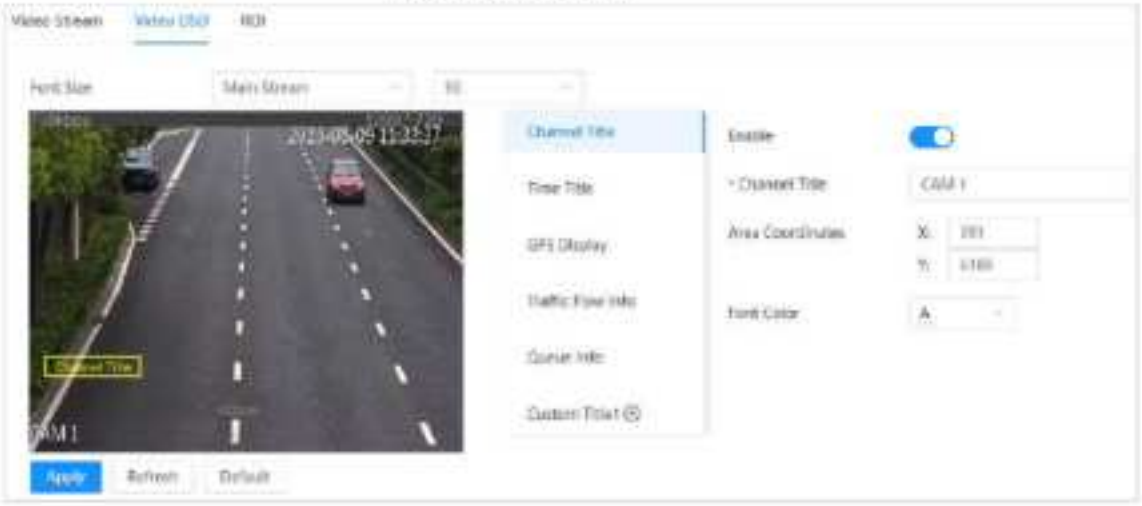
5.2.2 Configuring Video OSD

Configure the OSD information of videos.

Procedure

Step 1 Select **Camera** > **Encode** > **Video OSD**.

Figure 5-6 Video OSD



Step 2 Configure the parameters.

Table 5-6 Description of video OSD parameters

Parameter	Description
Font Size	Configure the font size of **Main Stream** or **Sub Stream1**.
Channel Title	Click to enable the function and configure the channel title, coordinates and font color (can be customized) of channel information OSD.
Time Title	Click to enable the function and configure the coordinates and font color (can be customized) of time information OSD. You can click to enable **Week Display** to display week information on the video image.
GPS Display	Click to enable the function and configure the coordinates and font color (can be customized) of channel information OSD.
Traffic Flow Info	Click to enable the function and configure the coordinates and font color (can be customized) of flow information OSD.
Queue Info	Click to enable the function and set the font color (can be customized) of queue information OSD.
Custom Title	Click to enable the function and set the coordinates, custom title and font color (can be customized) of custom information OSD. You can add up to 8 custom titles.

Step 3 Click **Apply**.

5.2.3 Interest Area

Configure the region of interest in the video image, and then the selected image will be displayed with the configured quality.

Procedure

Step 1 Select **Camera** > **Video** > **ROI**.

Figure 5-7 ROI

Step 2 Drag anywhere in the video image to draw the region of interest. You can draw more than one region when necessary.

- You can add up to 3 regions of interest.
- The higher the value, the better the quality will be.
- Large regions may influence the smoothness of the video.

Step 3 Configure the image quality of the regions of interest.

6 quality levels are available. The higher the value, the better the quality.

Step 4 Click **Apply**.

Related Operations

- Click **Clear** to delete all the regions of interest.
- Click to delete the corresponding area.

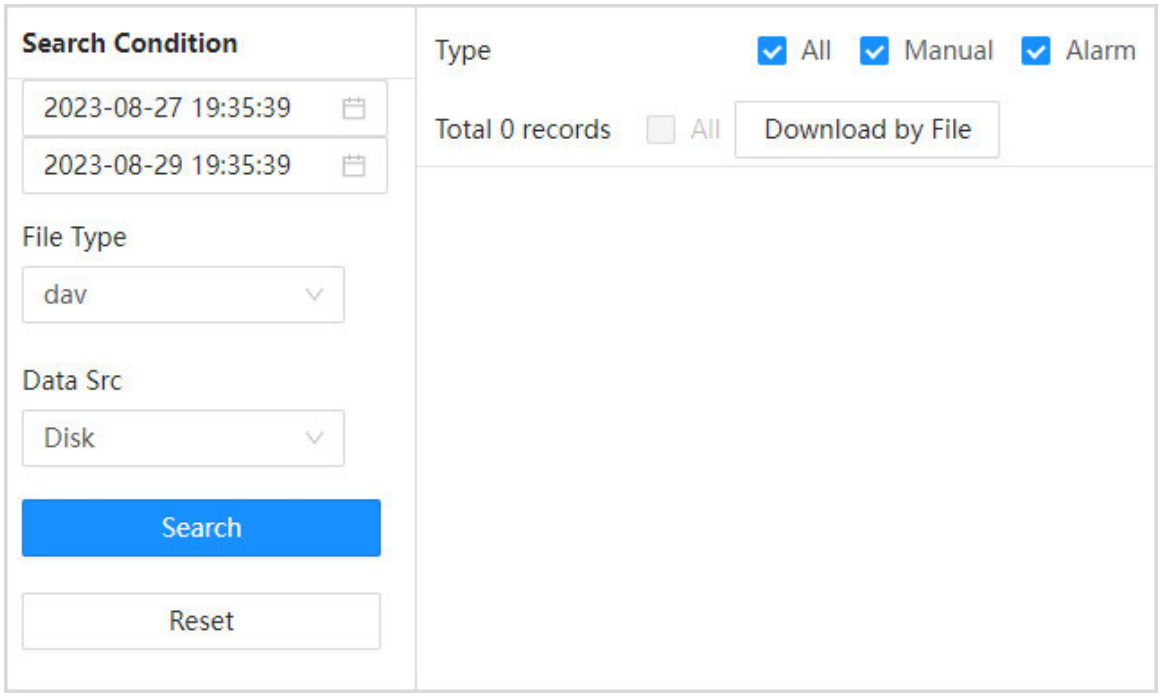
6 Playback

You can search for and download video recordings.

Procedure

Step 1 Select > **Playback**.

Figure 6-1 Playback



Step 2 Select the record time, **File Type** and data source (**Data Src**).

The data source is **Disk** (here referred to as TF card) by default. No video will be played if there are no videos stored on the TF card.

Step 3 Select the type of the snapshot.

- **All**: Take the snapshot of vehicles and the vehicles that violate the rules.
- **Manual**: Take snapshots of vehicles that passed.
- **Alarm**: Take snapshots of vehicles that violates rules.

Step 4 Click **Download by File** to download files to your local computer.

7 Search

You can search for snapshots, vehicle flow, and video recordings on the **Search** page.

7.1 Picture Query

7.1.1 Searching for SD Card Image

Background Information

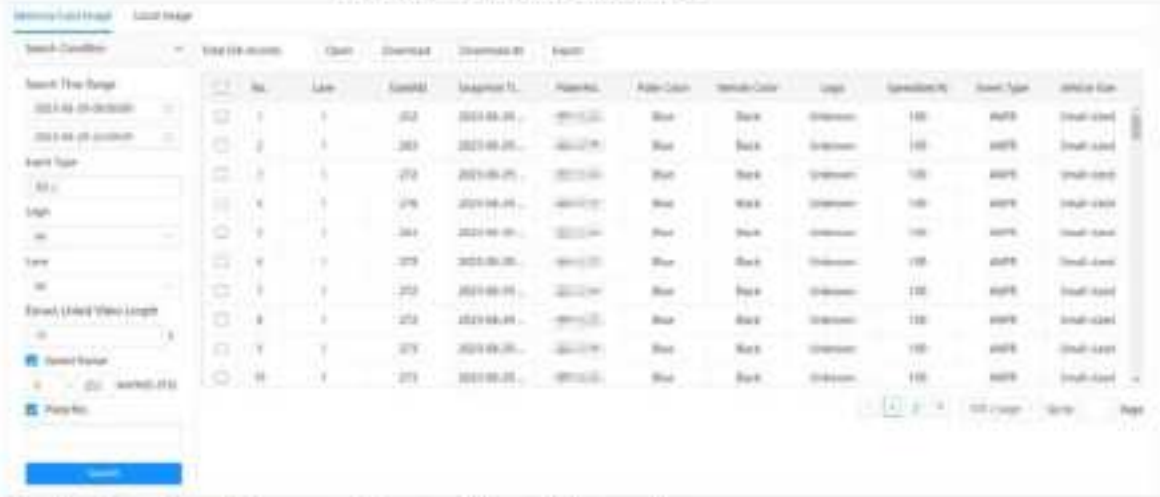
On the **Memory Card Image** page, you can search for and download the images stored in the TF card of the Camera.

Make sure that the TF card is inserted into the Camera. Otherwise, there might be no results.

Procedure

Step 1 Select **Search** > **Picture Query** > **Memory Card Image**.

Figure 7-1 Memory card image



Step 2 Configure the parameters, and then click **Search**.

Table 7-1 Parameter description

Parameter	Description
Search Time Range	Configure the start time and the end time to define a period, and then you can search for images stored on the TF card within this period.
Event Type	• **All**: Search for all snapshots. • Search for snapshots related to events, which include but are not limited to **ANPR**, **Cross Solid White Line**, and **Wrong-way Driving**.
Logo	Search for snapshots by the selected vehicle sign. You can select **All**, **Unknown**, or a specific vehicle sign.

Parameter	Description
Lane	Select the capture lane.
Speed Range	Select the **Speed Range** checkbox, and set the speed range to search for images of vehicles within the defined speed range.
Extract Linked Video Length	The length of a recorded video associated with the snapshot that you want to save.
Plate No.	Select the **Plate No.** checkbox, and then enter the plate number to search for images related to this plate.

Step 3 Select the images that you need, and click **Open** to view the images in photo viewer.

To open the image, you need to download and install the plug-in.

Step 4 Select the images that you want to download, and then click **Download**.

Step 5 Select the items, and then click **Export** to export the information on captured passed vehicles to your computer.

Related Operations

Click **Download All** to download all images to your computer.

7.1.2 Downloading Attributes

You can configure the image information.

Procedure

Step 1 Select **Search** > **Picture Query** > **Memory Card Image**.

Step 2 Click **Download**, and then configure **Download Image by** to download snapshots based on their **Creation Time** or **Snapshot Time**.

Step 3 Select cutouts that you want to download from **All** or **Plate Cutout**.

Step 4 Click **Browse** to select the path.

Step 5 Click **Default** to go back to default.

Figure 7-2 Downloading attributes

7.1.3 Local Image

You can view images saved on your and verify whether the image contains a watermark.

Prerequisites

To use the function, you need to download and install the plug-in first.

Procedure

Step 1 Select **Search** > **Picture Query** > **Local Image**.

Step 2 Click **Browse** to select a picture.

Step 3 Click **Watermark**, and view result under **Watermark**.

- When the result is **Exception**, the image is tampered.
- When the result is **Normal**, the image is not tampered.

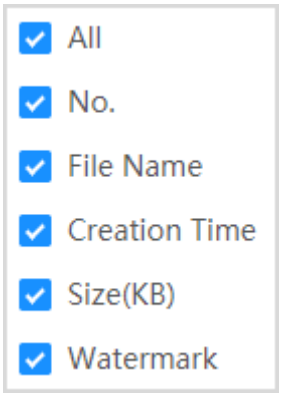
Click **Open** or double-click the picture if you need to preview the image.

Figure 7-3 Local images

Related Operations

Click to select filters.

Figure 7-4 Filters



7.2 Flow Query

Background Information

You can search for traffic flow and pedestrian flow within the defined period.

- The function is available on select models, and might differ from the actual product.
- This section uses **Traffic Flow** as an example.

Procedure

Step 1 Select **Search** > **Flow Query** > **Traffic Flow** (select **Pedestrian Flow** if you want to search for pedestrian flow).

Step 2 Configure **Search Time Range**.

Step 3 Click **Search**.

Step 4 Select search results, and click **Backup** to save the results to your computer.

Figure 7-5 Traffic flow search

Step 5 (Optional) Click **Clear** to delete all results.

7.3 Search Video

Search for the video recordings stored on your computer to track back abnormal events (if any).

7.3.1 Recording

Background Information

You can search for a recorded video on your computer and play back the video.

- Click on the **Live** page, and the Camera starts recording. The recorded video is saved on the path defined in **Local** > **Record** > **Live Record**.
- The function is available on selected models, and might differ from the actual product.

Procedure

Step 1 Select **Search** > **Search Video** > **Record**.

Step 2 Click **Select File** to select the recorded video on your computer, and then you can play back the video.

Figure 7-6 Record

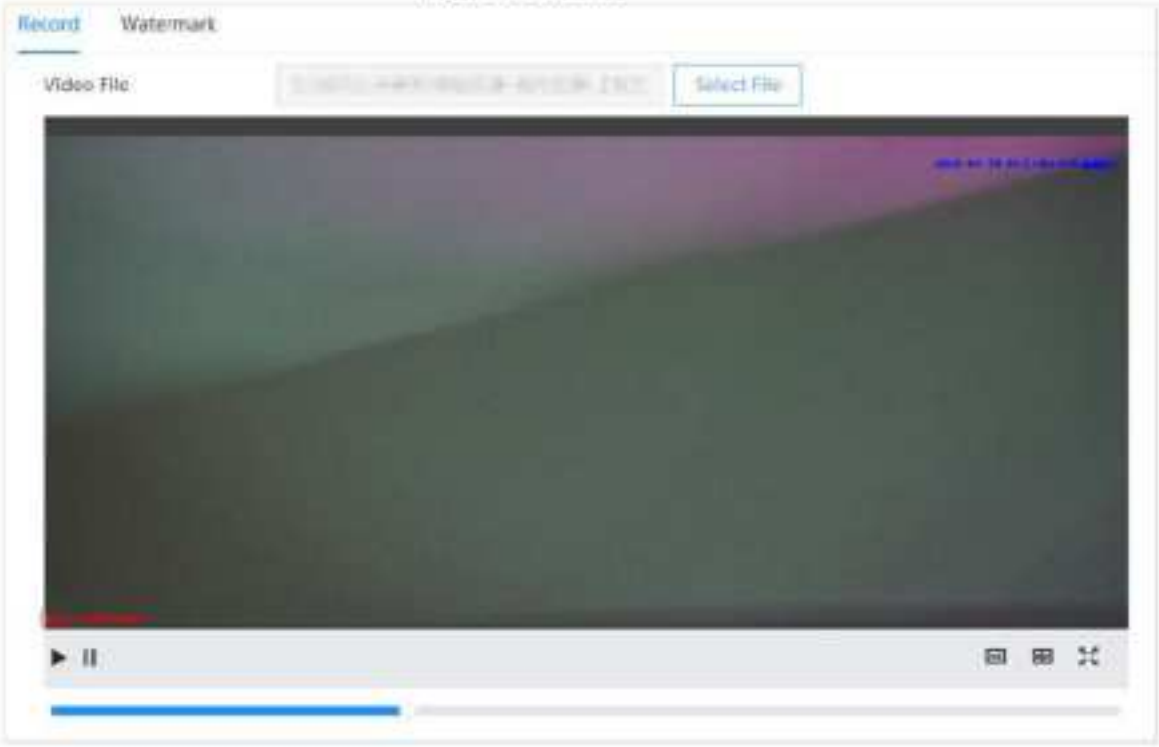


Table 7-2 Description of play parameters

Icon	Description
	Click it to select **Original** or **Adaptive** playback.
	Click it to enable smart track detection. Number plate, vehicle bounding box, and other smart tracking information will be displayed on the video image.
	Click it to enter full screen. Double-click the video image or press Esc to exit.
	Click it to play back the video.
	Click it to stop playing back the current video.

7.3.2 Watermark

Prerequisites

Before verifying the watermark, you need to select **Watermark** and configure **Watermark String** from **Camera** > **Encode** > **Video Stream** > **Main Stream**.

The watermark character is **DigitalCCTV** by default.

Procedure

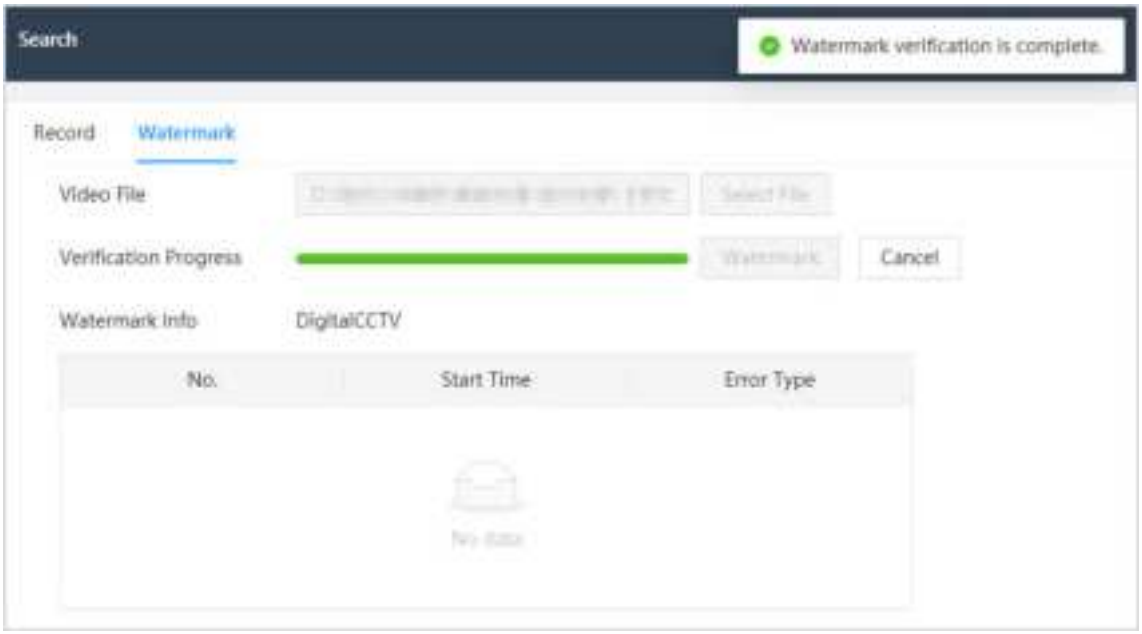
Step 1 Select **Search** > **Search Video** > **Watermark**.

Step 2 Click **Select File** to select a recording.

Step 3 Click **Watermark**. The system will display the verification progress and normal watermark information.

If the video is verified to be authentic, the watermark you set is displayed next to **Watermark Info**.

Figure 7-7 Watermark



8 ITC

Configure smart plan, intelligent analysis, image, OSD, vehicle blocklist and allowlist, and view traffic flow statistics.

8.1 Configuring Smart Plan

Configure lines and detection rules for lanes.

Procedure

Step 1 Select **ITC** > **Smart Plan**.

Step 2 Configure the lines for lanes.

Figure 8-1 Configure the lines

- **Manual Draw**: You can click **Delete** to delete the lines. You can also click **Clear** to clear all lines.
- **Line Drawing Requirements**: You can draw lane line for lane1,2 and 3, and draw right lane boundary and detection line for lane1.

Step 3 (Optional) Click **Advanced Settings** to configure **Area Line**, **Vehicle Area**, **Calibration Area**, **Line Segment Calibration**, **Calibration Verification** or **Match Line**.

Table 8-1 Parameter description

Parameter	Description
Area Line	The detection area.
Vehicle Area	The area for detecting the volume of vehicles.
Calibration Area	The area for analyzing vehicle speed.
Line Segment Calibration	Used to verify the accuracy of calibration results. Click **Line Segment Calibration** to draw the calibration segment in the calibration area, enter the actual length of the calibration segment in the pop-up page, and then click **Calibration Validation**.
Calibration Verification	Used to verify the accuracy of calibration results.
Match Line	Used to match vehicles with speed information. when an external device captures, the speed information will be matched to the vehicles closet to the match line.

Step 4 Configure the parameters for lanes.

Figure 8-2 Configure the lane parameters

Table 8-2 Parameter description

Parameter	Description
Lane Direction	Set the lane direction as **Vehicle Front** or **Vehicle Back**.
Lane Type	Set the lane type as **General Lane**, **Motor Vehicle Lane**, **Non-Motor Vehicle** and **Bus Lane**.
Custom Lane No.	Customize the lane number to differentiate it from others.
Distance between Stop Line and Image Bottom	Set the distance between the stop line and the bottom of the image.
Passing Direction	Configure the passing direction of the vehicle. You can select **South to North**, **West to East**, **North to South**, **East to West** or **Custom**.

Step 5 Configure the speed limit for different types of vehicles.

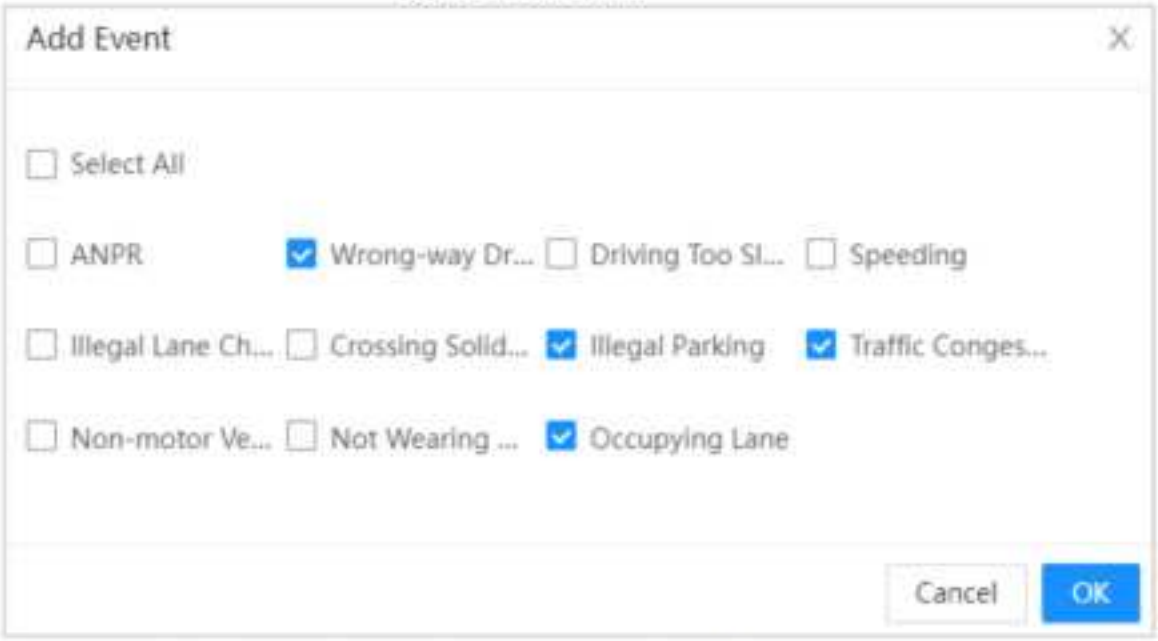
Figure 8-3 Configure the speed of vehicles

- **Vehicle Min Speed Limit**: The low speed limit that when reached, causes a signal to be sent to the Camera to take snapshots.
- **Highest Speed Limit**: The high speed limit that when reached, causes a signal to be sent to the Camera to take snapshots.

Step 6 Configure events for lanes.

1) Select a lane.
2) Click **Add Event**.

Figure 8-4 Add event



3) Select the event you want to configure, and then click **OK**.

Click **Select All** can select all events.

4) Configure the parameters for every event you add.

Figure 8-5 Configure the parameter of ANPR

Table 8-3 Parameter description of ANPR

Parameter	Description
Vehicle Priority	Click to enable the function. If vehicles enter the trigger line with plate obscured, the camera will not capture until the plate displays totally.
Close-up Image	The close-up of the offending vehicle.
Capture Direction	Vehicle driving direction to the camera.

Parameter	Description
Vehicle that Trigger Snapshots	Select the vehicle type to take snapshots.
Number of Snapshots	The number of snapshots.
Schedule	The period during which alarms will be triggered. To set a time, click **Add Schedule**, and then drag the slider over the time table to configure the time. If you want to add more schedules, click **+Time Plan Table**. • Click **Clear** to reset time. • Click **Copy** to copy the defined time to other days, and then click **Apply**.
Trigger Source	Set the trigger source as **Radar** and **Video Analysis**. The trigger sources are prioritized in descending order. When a source becomes ineffective, the one after it is used.

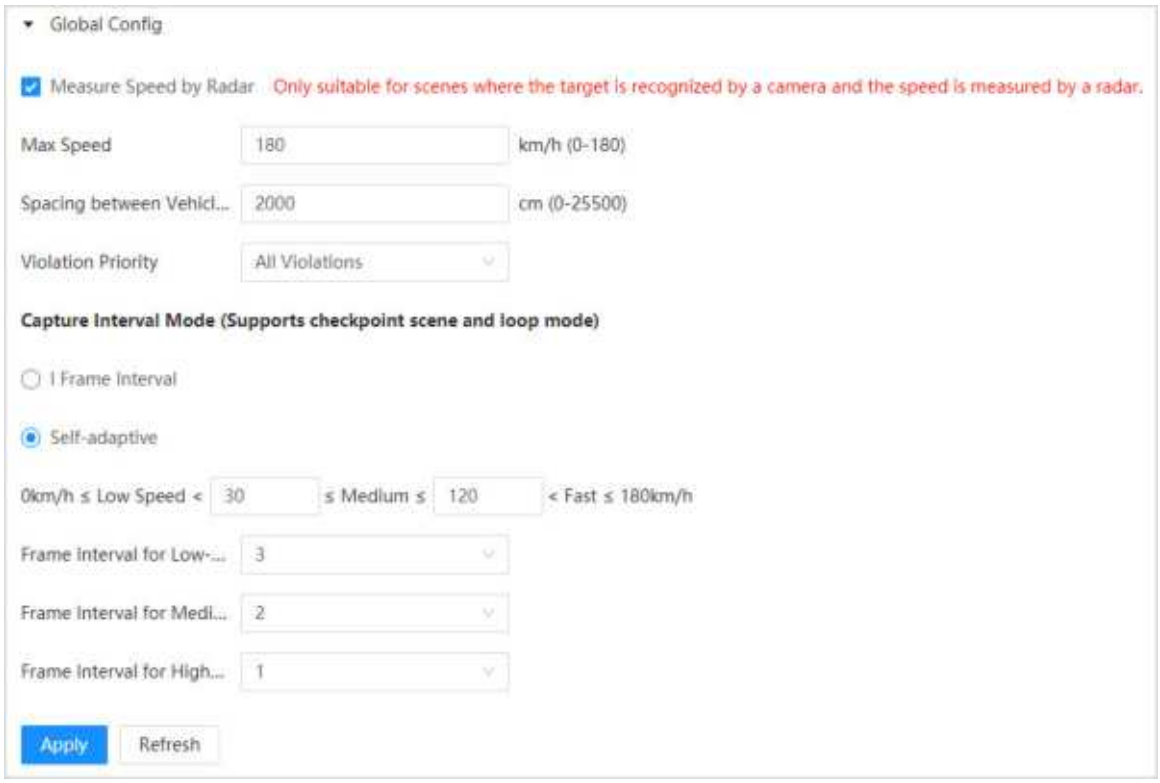
Figure 8-6 Configure the parameters of wrong-way driving

Table 8-4 Parameter description of wrong-way driving

Parameter	Description
Record Linkage	Click to enable record linkage function. The Camera will automatically record the corresponding videos.
Record Duration	Configure the record duration.
Pre-event Record	Configure the time before an event occurs.

Step 7 (Optional) Configure global configurations for the Camera according to your needs.

Figure 8-7 Global configuration



8.2 Intelligent Analysis

Configure the intelligent functions of the Camera.

8.2.1 Recognition

Procedure

Step 1 Select **ITC** > **Intelligent Analysis** > **Recognition**.

Figure 8-8 Recognition

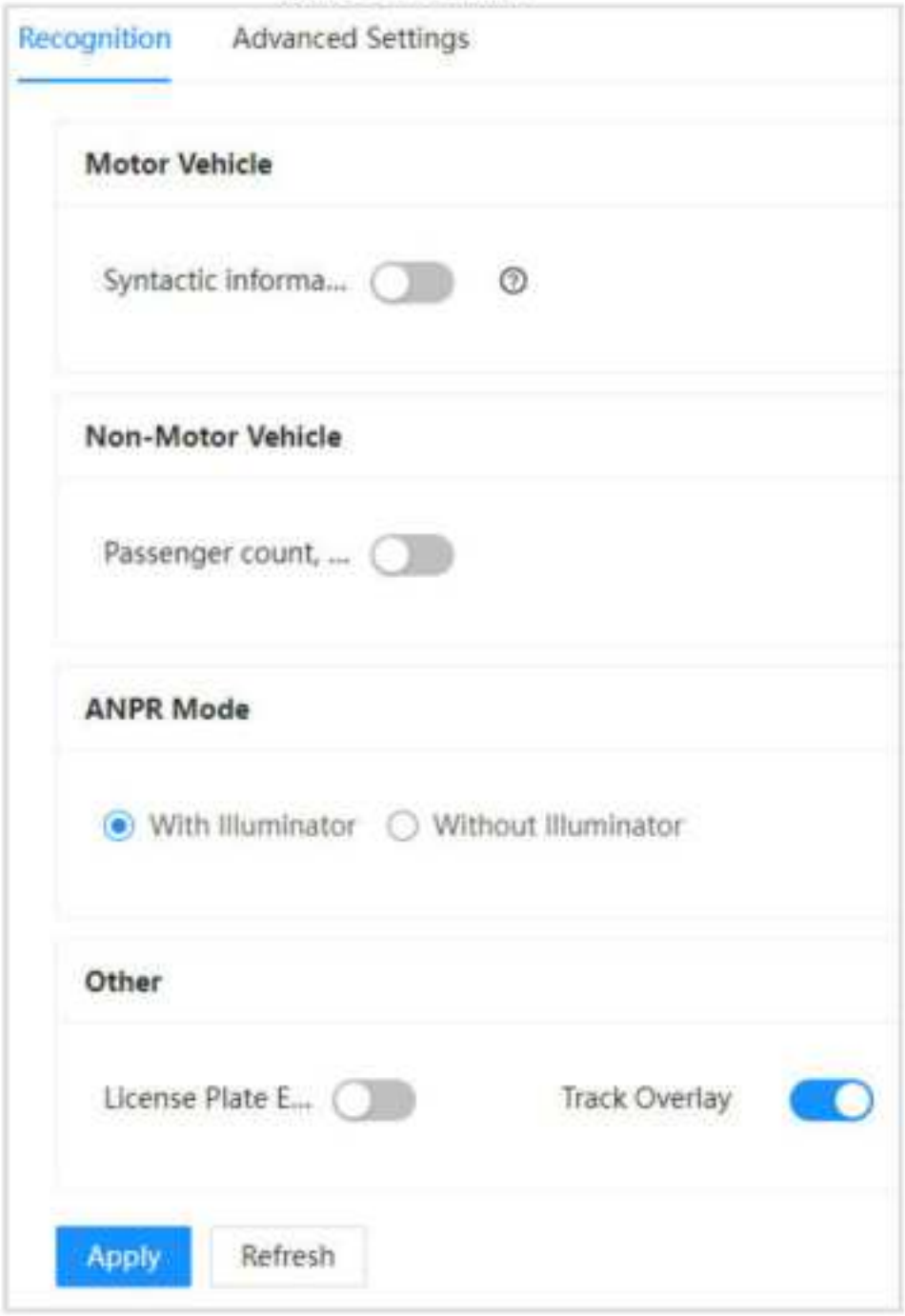


Table 8-5 Parameter description of recognition

Parameter	Description
Motor Vehicle	Click to enable structure information of motor vehicle, including motor vehicle sign and vehicle type. Click to view the detailed information of structure information.
Non-motor Vehicle	Identifies non-motor vehicle attributes such as type, helmet, and rider number.
ANPR Mode	You can select **With Illuminator** or **Without Illuminator**.

Parameter	Description
Other	• **License Plate Enhancement**: Enhances number plate image effect (function reserved). • **Track Overlay**: Enable track overlay, and then you can see each vehicle is covered by a green frame on **Live** page, which means each vehicle is tracked.

Step 2 Click **Apply**.

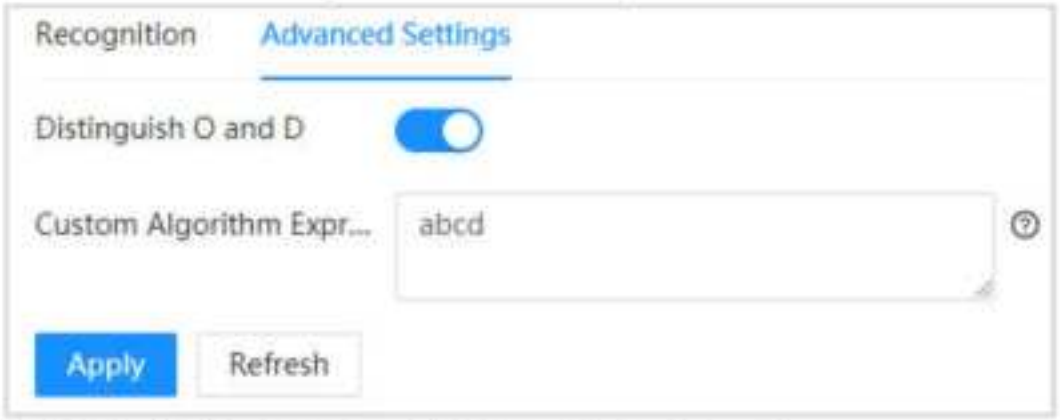
8.2.2 Advanced Settings

You can make a custom algorithm.

Procedure

Step 1 Select **ITC** > **Intelligent Analysis** > **Advanced Settings**.

Figure 8-9 Advanced settings



Step 2 (Optional) Click to enable **Distinguish O and D** function.

Step 3 Configure a custom algorithm.

Step 4 Click **Apply**.

8.3 Traffic Flow Statistics

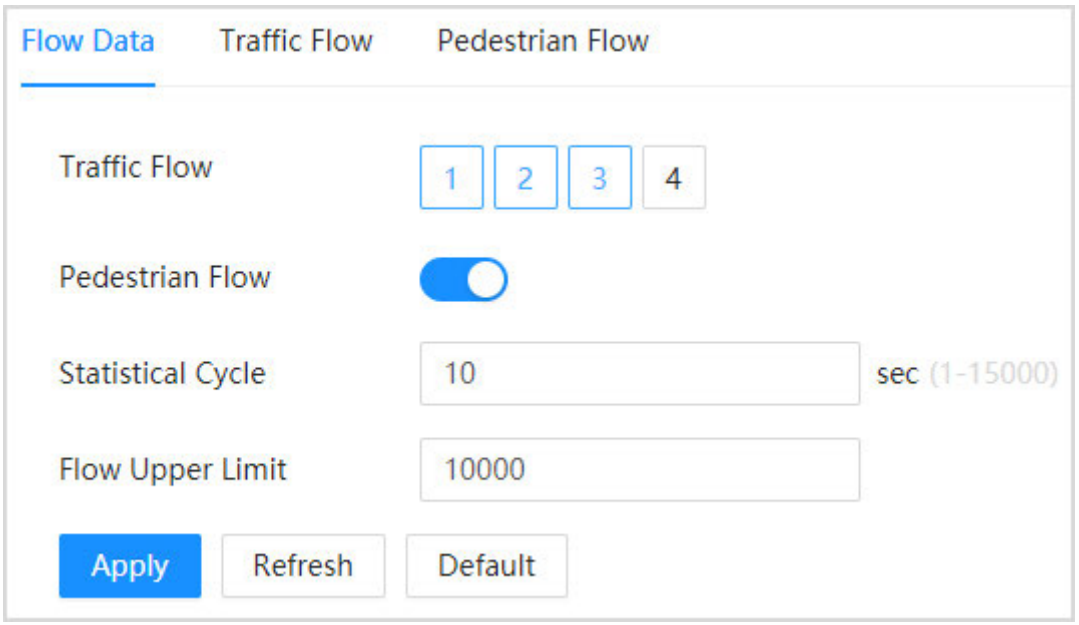
8.3.1 Flow Data

You can configure the lane and the period of traffic flow statistics, and then the flow data will be displayed in the **Traffic Flow** and **Pedestrian Flow**.

Procedure

Step 1 Select **ITC** > **Traffic Flow Statistics** > **Flow Data**.

Figure 8-10 Flow data



Step 2 Select the **Pedestrian Flow** checkbox to enable statistics of pedestrian flow as needed.

Step 3 Configure the **Statistical Style** and **Flow Upper Limit** of making statistics.

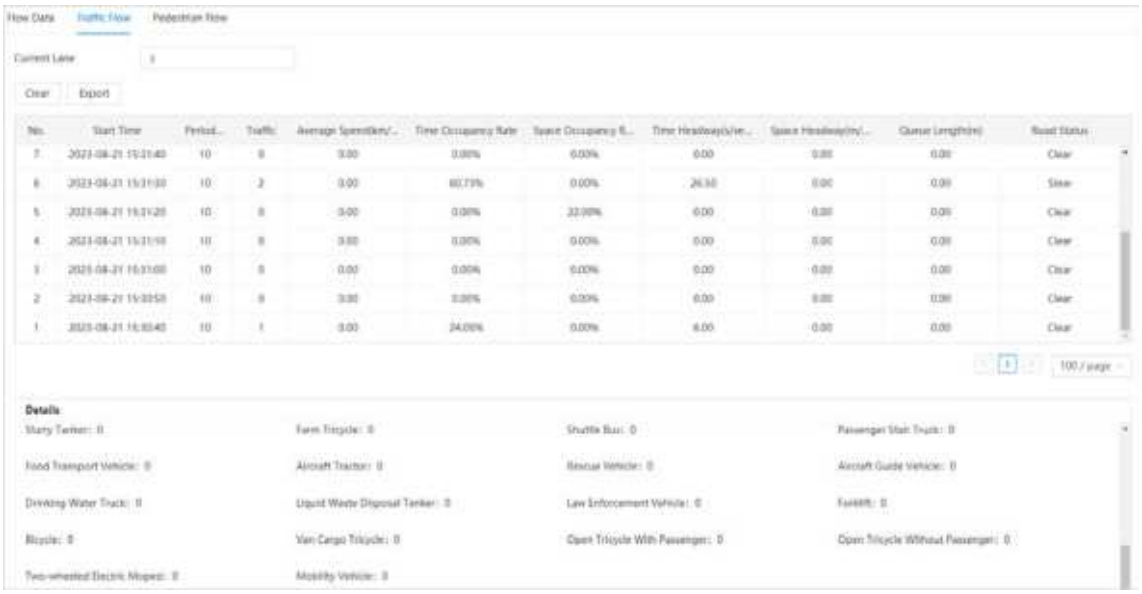
Step 4 Select the lanes that you want to make flow statistics.

Step 5 Click **Apply**.

8.3.2 Traffic Flow

After enabling traffic flow statistics, you can view the traffic flow data of the defined lane within the defined period by clicking the **Traffic Flow**. The flow data will automatically update when a period ends.

Figure 8-11 Traffic flow



8.3.3 Pedestrian Flow

After enabling pedestrian flow statistics, you can view the pedestrian flow data of the defined lane

within the defined period by clicking the **Pedestrian Flow**. The flow data will automatically update when a period ends.

Figure 8-12 Pedestrian flow

8.4 Configuring Image

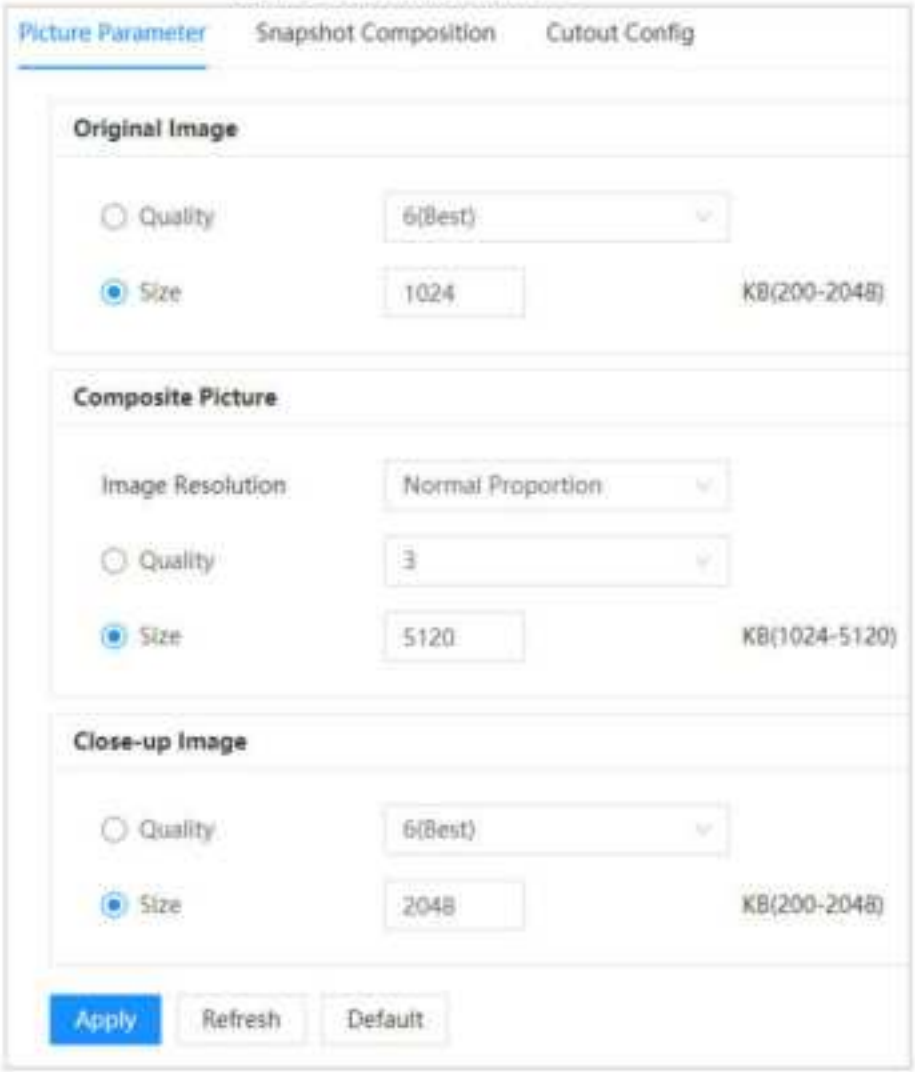
8.4.1 Configuring Picture Parameter

You can configure the parameter of the image of the captured vehicle.

Procedure

Step 1 Select **ITC** > **Image Config** > **Picture Parameter**.

Figure 8-13 Picture parameter



Step 2 Configure the parameters of the picture.

Table 8-6 Parameter description of picture

Parameter	Description
Original Image	The original picture of the vehicle that is violating traffic rules.
Composite Picture	The compound picture of several sequential images of the vehicle violating the traffic rules.
Close-up Image	The close-up of the offending vehicle.
Quality	Select the level of picture quality.
Size	Limit the size of the picture.

Step 3 Click **Apply**.

8.4.2 Configuring Snapshot Composition

Procedure

Step 1 Select **ITC** > **Image Config** > **Snapshot Composition**.

Figure 8-14 Snapshot composition

Step 2 Configure the parameter of snapshot composition.

Table 8-7 Main parameter description of snapshot composition

Parameter	Description
Composite Picture	Click to enable this function, and the select **ANPR** or **Violation**. The camera will upload original pictures and composite pictures of ANPR and other events.
Upload All	Click to enable this function, and then you can upload original picture and composite pictures.
Combination Mode for pictures	Select combination mode for different number of pictures.
Feature Picture No.	Configure the number of the picture, you can select **Auto** or a specific number.

Step 3 Click **Apply**.

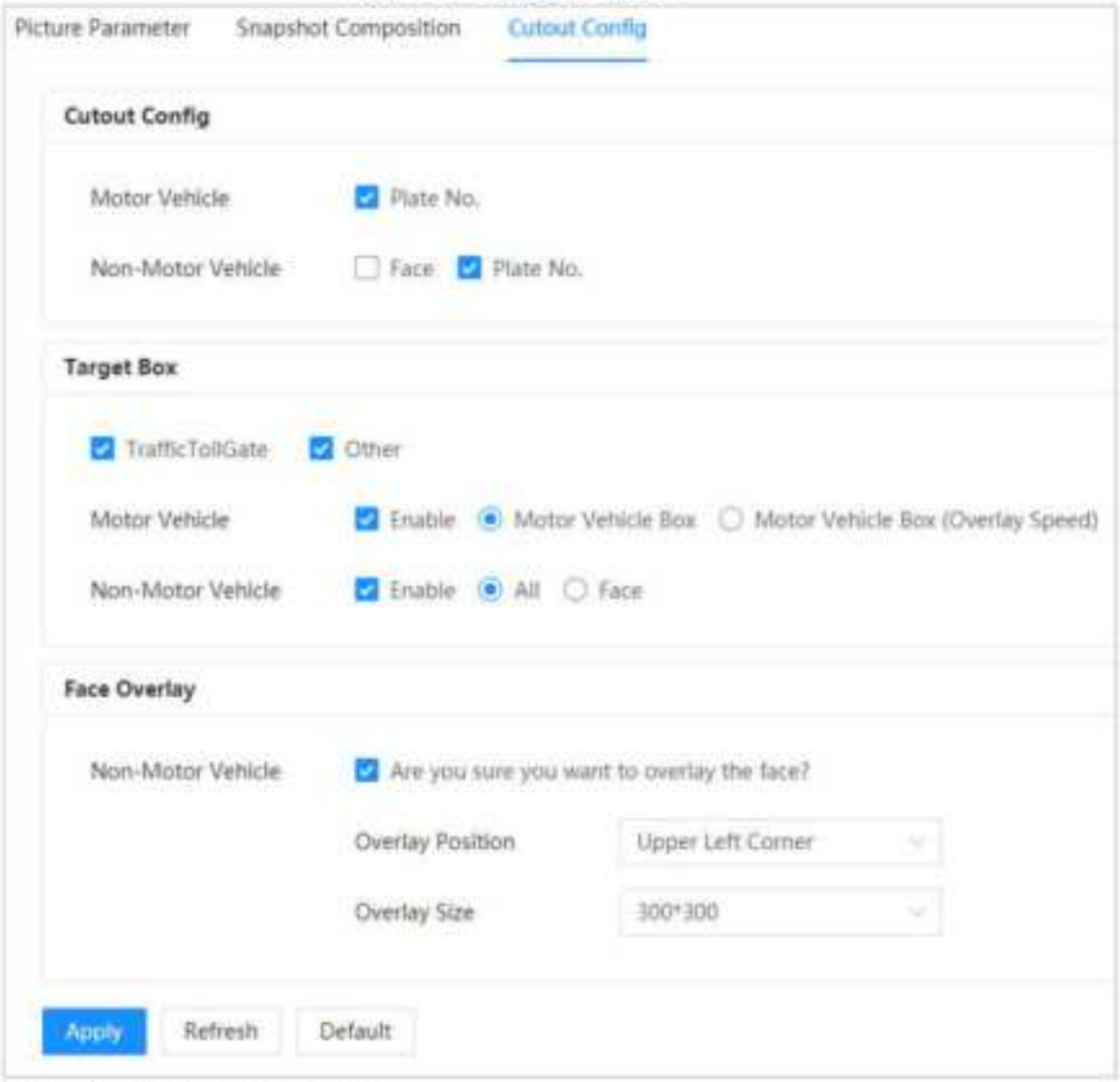
8.4.3 Configuring Cutout

The Camera can recognize and crop snapshots, and save the cutouts.

Procedure

Step 1 Select **ITC** > **Image Config** > **Cutout Config**.

Figure 8-15 Configure cutout



Step 2 Configure the parameters.

Table 8-8 Parameter description of cutouts

Parameter	Description
Cutout Config	Select cutout type for motor vehicles and non-motor vehicles.
Target Box	Configure overlay track box on the driver of motor vehicles and non-motor vehicles.
Face Overlay	Select **Are you sure you want to overlay the face** to enable overlapping face picture on the snapshots. If overlap is enabled, you can configure the overlap position and size of driver faces.

Step 3 Click **Apply**.

8.5 Configuring OSD

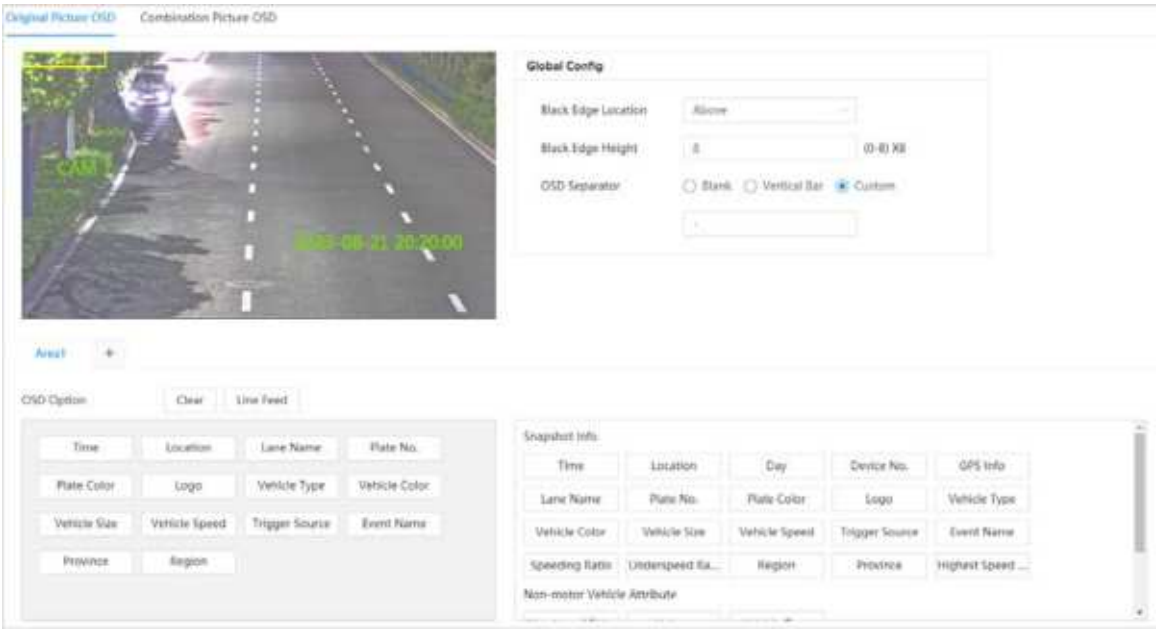
Configure OSD content, style and position for captured image.

8.5.1 Configuring Original Picture OSD

Procedure

Step 1 Select **ITC** > **OSD Config** > **Original Picture OSD**.

Figure 8-16 Original picture OSD



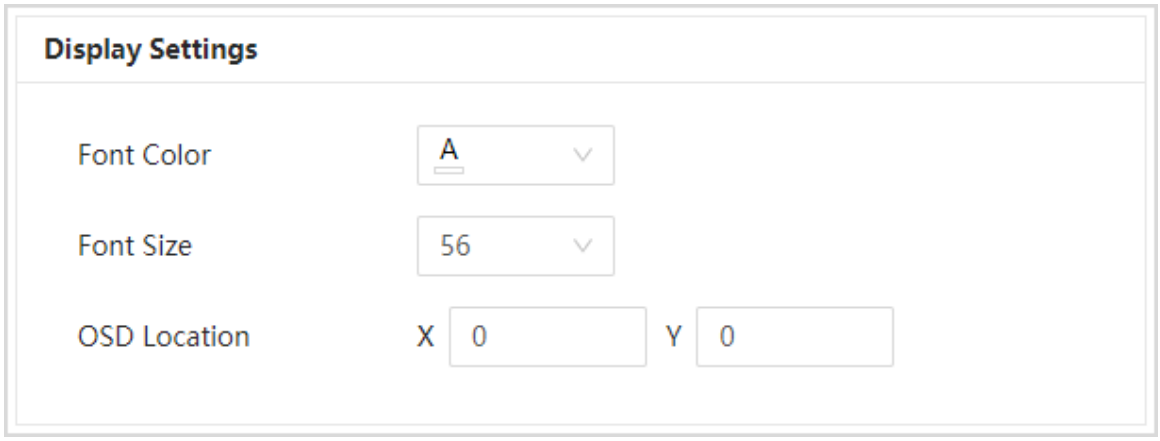
Step 2 Configure OSD black edge position, black region height, OSD separator, and front size.

Step 3 Configure OSD parameters.

- **Line Feed**: To start a new line after a certain OSD option, click the OSD option, and then click **Line Feed**.
- **Clear**: Delete all the selected OSD options.
- Hover the mouse over the OSD options selected, and then click to delete the option.
- Click a selected OSD option, and then configure the prefix, suffix and delimiter quantity of the OSD option.

Step 4 Configure the display settings.

Figure 8-17 Display settings



- **Font Color**: Custom font color of the OSD.
- **Font Size**: Custom font size of the OSD.
- **OSD Location**: Configure the display position of the OSD.

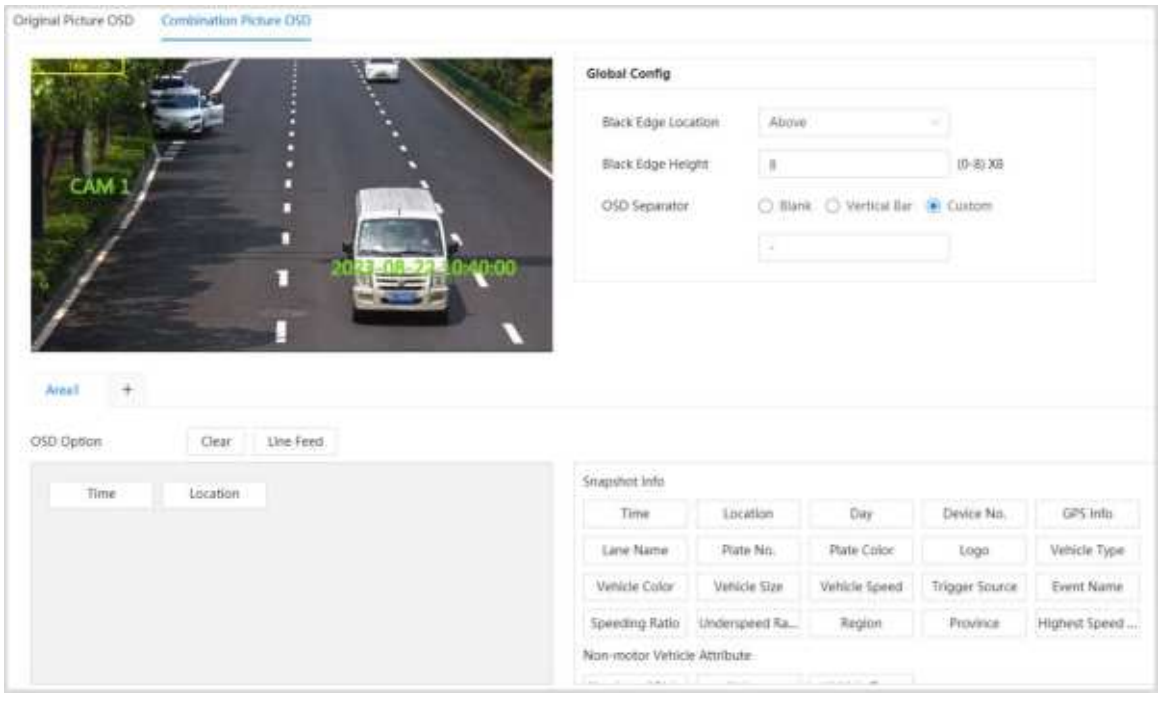
Step 5 Click **Apply**.

8.5.2 Configuring Combination Picture OSD

Procedure

Step 1 Select **ITC** > **OSD Config** > **Combination Picture OSD**.

Figure 8-18 Combination picture of OSD



Step 2 Configure the parameters. For details, see "8.5.1 Configuring Original Picture OSD".

Step 3 Click **Apply**.

8.6 Configuring Blocklist and Allowlist

An alarm is triggered when a vehicle is detected in the blocklist. A vehicle in the allowlist will not be

captured.

8.6.1 Allowlist Search

You can search to see whether a plate number is included in the allowlist, or you can import or export plate numbers in the allowlist.

Procedure

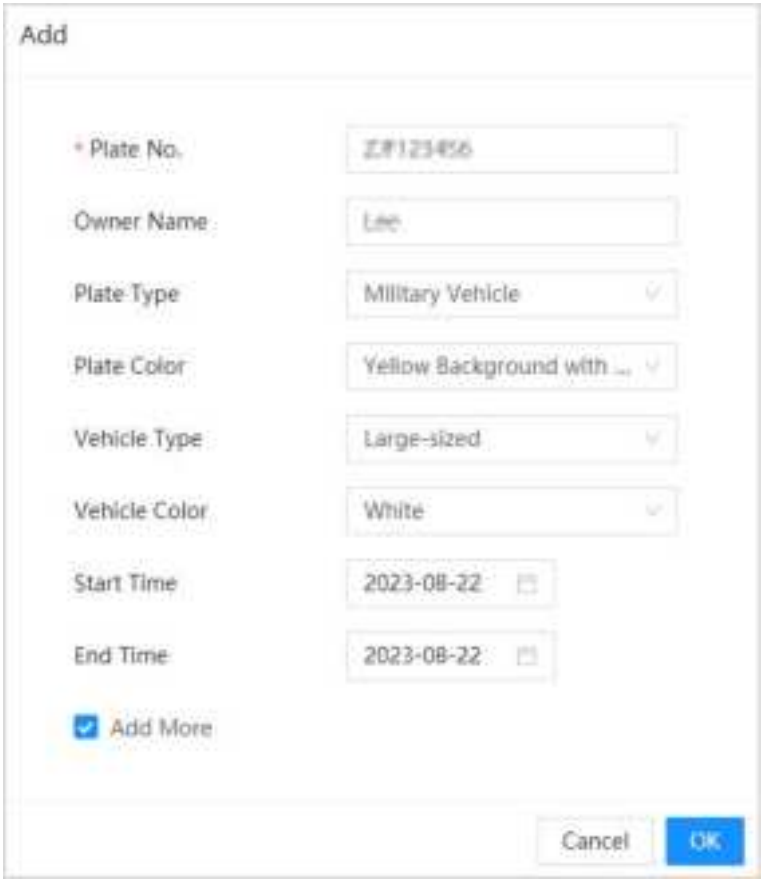
Step 1 Select **ITC** > **Vehicle Blocklist/Allowlist** > **Allowlist**.

Figure 8-19 Allowlist

Step 2 Add a number plate.

1) Click **Add**.

Figure 8-20 Add



2) Enter the entire plate number and owner name.
3) Select the plate type, plate color, vehicle type and vehicle color.
4) Configure the start time and end time to add the plate number in the allowlist. The plate number will be outside of the allowlist beyond this time period.
5) Click **OK**.

6) To save and add more, select **Add More** before clicking **OK**.

Related Operations

- Search for a plate number: Enter the plate number (or part of it) that you want to search for, and then click **Search** to check whether it is in the allowlist.
- Delete a plate number: Click **Delete** to delete the corresponding plate number.
- Delete plate numbers in batches: Click **Clear**, and then click **OK** in the pop-up box to delete all the information in the allowlist.
- Import allowlist plates in batches: Click **Import**, and then download template. Fill in the template, and then click **Select File** to select the template to import the allowlist information to the system.
- Export allowlist plates in batches: Click **Export**, and then select the path to save the file to. Click **Export** to export the allowlist information to the system.
- You can encrypt the file when importing and exporting the allowlist, depending on your actual needs.

Figure 8-21 Encrypt configuration (1)

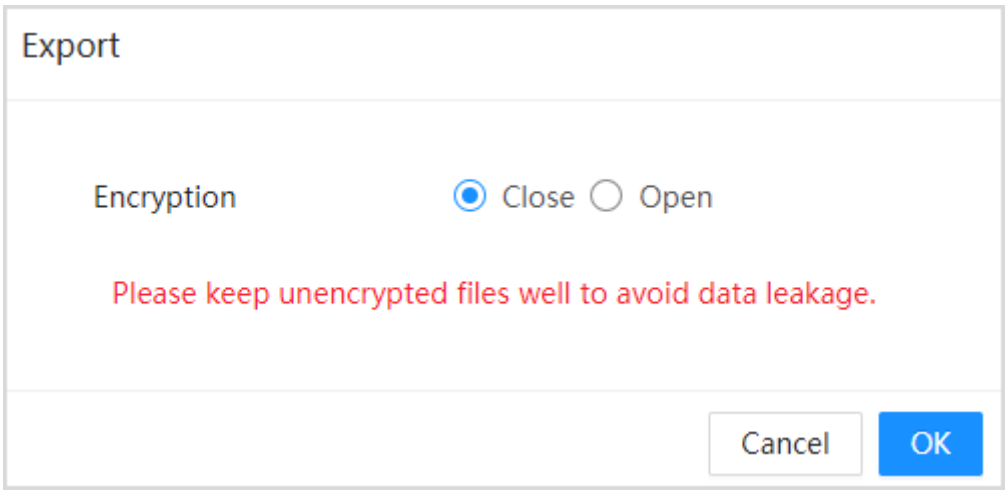
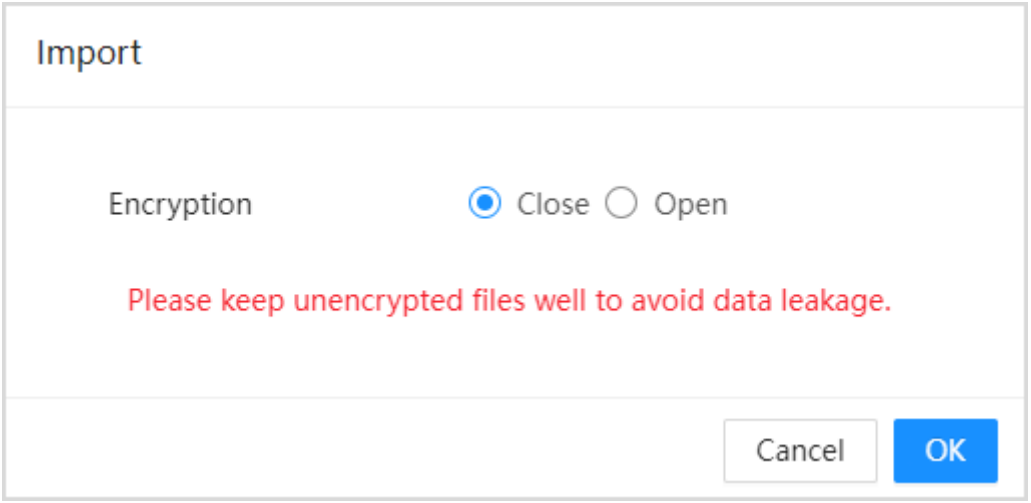


Figure 8-22 Encrypt configuration (2)



8.6.2 Blocklist Search

An alarm will be triggered when a vehicle in the blocklist is detected.

Select **ITC** > **Vehicle Blocklist/Allowlist** > **Blocklist**, and then click to enable the blocklist

function.

Figure 8-23 Blocklist search

The search, import, and export of blocklist are similar to that of allowlist. For details, see "8.6.1 Allowlist Search".

8.7 Smart Restore Factory Settings

Select **ITC** > **Smart Restore Factory Settings**, and then click **DefaultConfig** to restore configurations of the camera to default settings.

Figure 8-24 Smart restore factory settings

This function will cause violation, snapshot, intelligent analysis, violation code, IO parking space detectors and signal detectors to be deleted, please be advised.

9 Network Settings

You can configure network parameters such as TCP/TP, port, auto registration, basic services and ITSAPI.

9.1 Configuring TCP/IP

You can configure IP address and DNS (Domain Name System) server and so on according to network planning.

Prerequisites

The Camera has connected to the network.

Background Information

Some models are designed with two network ports. Do not configure the ports to be on the same network segment. Otherwise, the network might fail.

Procedure

Step 1 Select > **Network Settings** > **TCP/IP**.

Figure 9-1 TCP/IP

Step 2 Configure the parameters.

Table 9-1 Description of TCP/IP parameters

Parameter	Description
Host Name	Enter the host name, and the maximum length is 15 characters.
NIC	Supports wired network only.
Mode	The mode that the camera gets IP: • **Static**: Configure **IP Address**, **Subnet Mask**, and **Default Gateway** manually, and then click **Apply**, the login page with the configured IP address is displayed. • **DHCP**: The Camera automatically assigns IP addresses. In this case, the **IP Address**, **Subnet Mask**, and **Default Gateway** cannot be configured.
MAC Address	Displays host MAC address.
IP Version	**IPv4** and **IPv6** are available. Both IP version can be accessed.
IP Address	When you select **Static** in **Mode**, enter the IP address and subnet mask that you need. • IPv6 does not have subnet mask. • The default gateway must be in the same network segment with the IP address.
Subnet Mask	
Default Gateway	
Preferred DNS	IP address of the preferred DNS.
Alternate DNS	IP address of the alternate DNS.

Step 3 Click **Apply**.

9.2 Port

9.2.1 Configuring Port

You can set the port information. Then, you can access the Camera through different protocols or configuration tools.

Procedure

Step 1 Select > **Network Settings** > **Port** > **Port**.

Figure 9-2 Port

Step 2 Configure port parameters.

Table 9-2 Description of port parameters

Parameter	Description
Max Connection	The max number of users (web client, platform client or mobile phone client) that can connect to the device simultaneously. The value is 10 by default.
TCP Port	TCP protocol communication port. It is 37777 by default.
UDP Port	User data packet protocol port. It is 37778 by default.
HTTP Port	HTTP communication port. It is 80 by default.
RTSP Port	Media streaming control port. It is 554 by default.
HTTPS Port	HTTPS communication port. It is 443 by default.

Step 3 Click **Apply**.

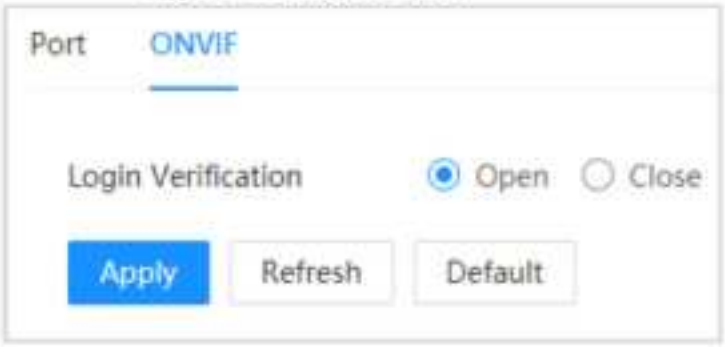
9.2.2 Configuring ONVIF

Open Network Video Interface Forum (ONVIF) is an open industry forum with the goal of providing and promoting standardized pages for interoperability of physical IP-based security products, such as IP camera, and network recorder, and more.

Select > **Network Settings** > **Port** > **ONVIF**.

Verification of username and password will be required for logging in to ONVIF when ONVIF authentication is turned on. If it is turned off, then no verification is required.

Figure 9-3 Configure ONVIF



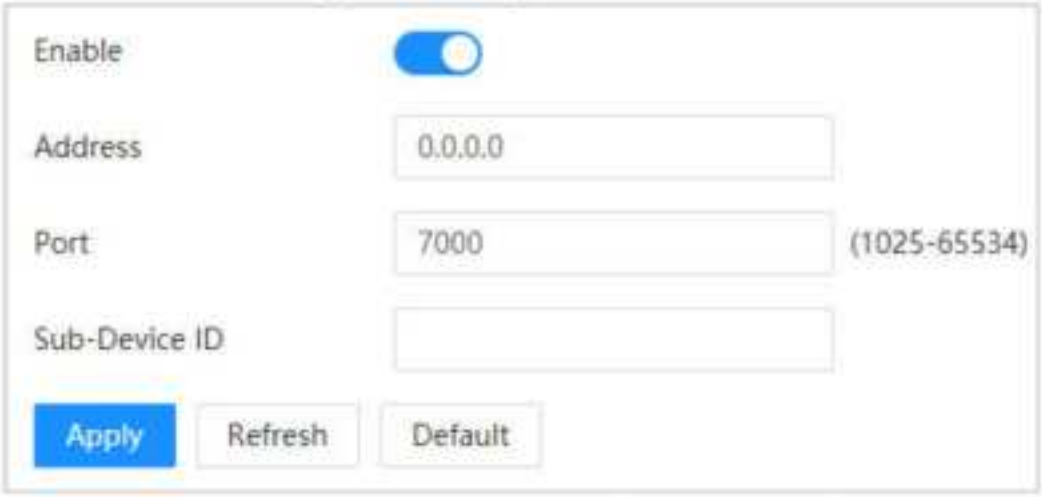
9.3 Configuring Auto Registration

When the Camera is connected to the network, it will automatically report its location to the server specified by the user. This helps client software to access the Camera through the server for viewing and monitoring the live video.

Procedure

Step 1 > **Network Settings** > **Auto Registration**.

Figure 9-4 Auto registration



Step 2 Click to enable the function, and then configure the parameters.

Table 9-3 Parameter description

Parameter	Description
Address	The IP address or domain name of the server to be registered.
Port	The port for registration.
Sub-Device ID	The custom ID for the camera.

Step 3 Click **Apply**.

9.4 Configuring Basic Service

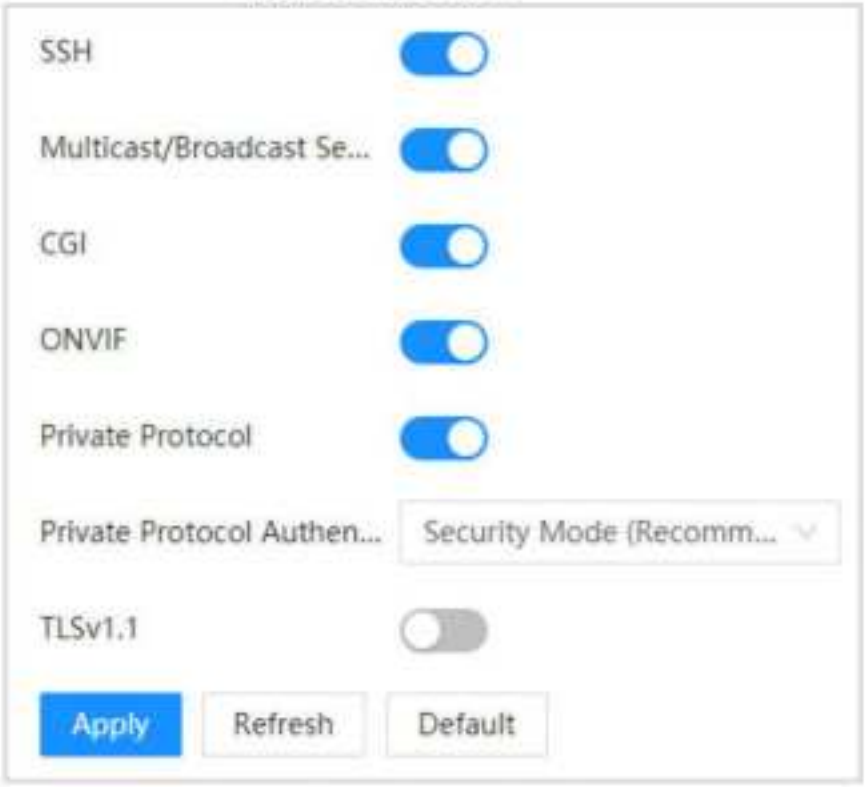
Configure the IP hosts (devices with IP address) that are allowed to visit the device. Only the hosts in

the trusted sites list can log in to the webpage. This is to enhance network and data security.

Procedure

Step 1 Select > **Network Settings** > **Basic Service**.

Figure 9-5 Basic service



Step 2 Enable the basic service according to the actual needs.

Table 9-4 Description of basic service parameters

Function	Description
SSH	You can enable SSH authentication to perform safety management.
Multicast/Broadcast Search	Enable this function, and then when multiple users are viewing the device video image simultaneously through network, they can find your device with multicast/broadcast protocol.
CGI	CGI is the port between external application program and web server.
ONVIF	Realizes network video framework agreement to make different network video products interconnected.
Private Protocol	Enable this function to transmit data through private protocols.
Private Protocol Authentication Mode	Select the authentication mode from **Security Mode** and **Compatible Mode**. Security mode is recommended.
TLSv1.1	Enable this function so that you can access the webpage with TLSv1.1. ⚠ There might be security risks if you enable this function. Please be advised.

Step 3 Click **Apply**.

9.5 ITSAPI

You can configure this function to push the captured vehicle violations information to the server.

Background Information

- All communications must be based on the HTTP protocol, conform to RFC2616 standards, and support Digest authentication.

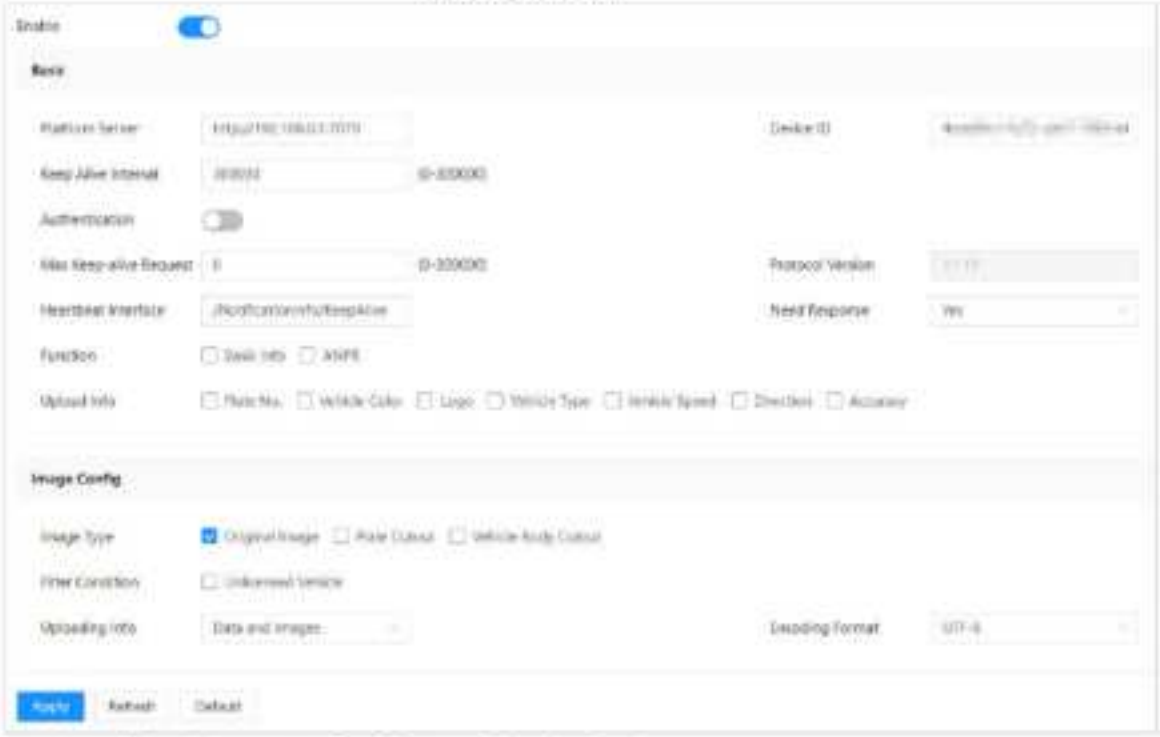
  IO multiplexing must be available on the server.

- Related business data must be in JSON format with ContentType: application/json;charset=UTF-8 as HTTP headers, which means the encoding method is UTF-8.

Procedure

Step 1 Select > **Network Settings** > **ITSAPI**.

Figure 9-6 ITSAPI



Step 2 Click next to **Enable** to enable the function.

Step 3 Configure the parameters.

Table 9-5 Description of basic service parameters

Function	Description
SSH	You can enable SSH authentication to perform safety management.
Multicast/Broadcast Search	Enable this function, and then when multiple users are viewing the device video image simultaneously through network, they can find your device with multicast/broadcast protocol.
CGI	CGI is the port between external application program and web server.

Function	Description
ONVIF	Realizes network video framework agreement to make different network video products interconnected.
Private Protocol	Enable this function to transmit data through private protocols.
Private Protocol Authentication Mode	Select the authentication mode from **Security Mode** and **Compatible Mode**. Security mode is recommended.
TLSv1.1	Enable this function so that you can access the webpage with TLSv1.1. ⚠ There might be security risks if you enable this function. Please be advised.

Step 4 Click **Apply**.

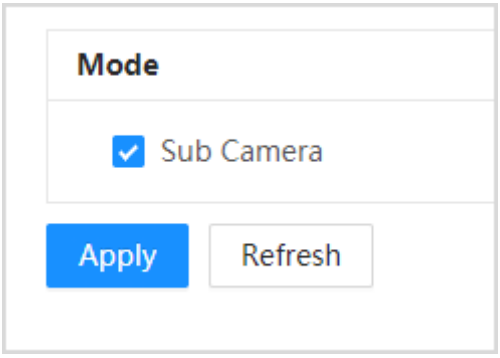
10 Remote Config

You can enable the remote device to work with the Camera to capture events. Currently, only events of crossing the stop line and running a red light can be captured by combining the Camera and remote device.

Select > **Remote Config**.

Select **Sub Camera**, and then click **Apply**.

Figure 10-1 Remote configuration



11 Event

You can configure how the Camera responds when alarms or abnormal events occur.

11.1 Alarm

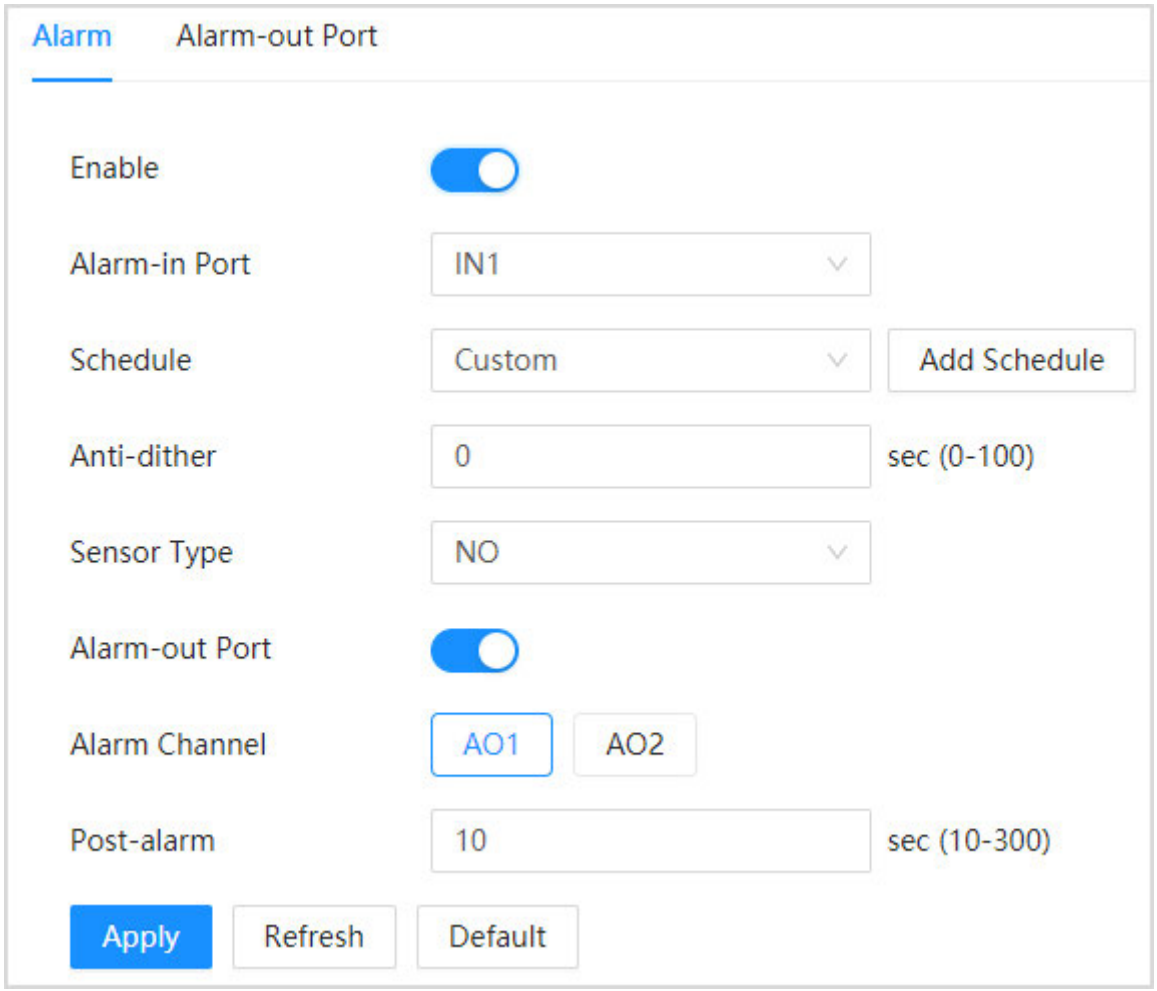
11.1.1 Enabling Alarm-in and Alarm-out Ports

You can connect the alarm output device to corresponding I/O port.

Procedure

Step 1 Select > **Event** > **Alarm** > **Alarm**.

Figure 11-1 Alarm



Step 2 Click next to **Enable** to enable alarm input for the current channel.

Step 3 Select an alarm input channel and schedule.

If there are no suitable schedules, you can follow the steps below to add a new one.

1. Click **Add Schedule**.

2. Drag on the timeline to set the arming periods. Alarms will be triggered in the green period.
3. Click **+ Time Plan Mode** to add more schedules.
4. Click **Apply**.

Figure 11-2 Drag to set periods

- Click **Copy** next to a day, and select the days that you want to copy to in the prompt page, you can copy the configuration to the selected days. Select the **Select All**.
- You can set 6 periods per day.

Step 4 Configure the parameters.

Table 11-1 Parameter description

Parameter	Description
Anti-dither	Enter anti-dither time (1 s–100 s). System will only record one when there are multiple alarms during the defined time.
Sensor Type	Select relay-in type according to the connected alarm input device. • **NO**: Normally open. • **NC**: Normally closed.
Alarm-out Port	Click , and then select one or more alarm output channels. The corresponding device will be activated when alarms are triggered.
Alarm Channel	
Post-alarm	The alarm linkage keeps running for the defined time after alarm ends. The time range is 10 s–300 s.

Step 5 Click **Apply**.

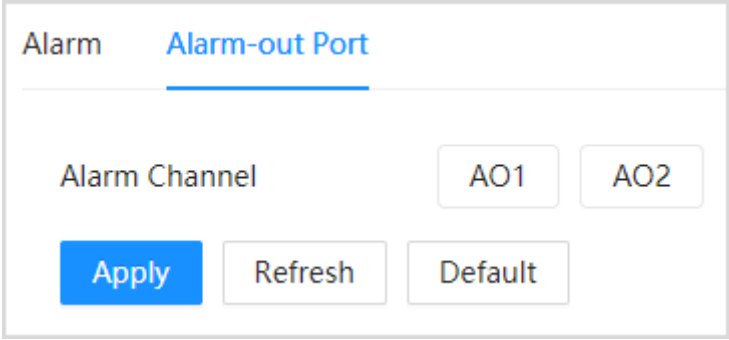
11.1.2 Alarm-out Ports

This function is used to check if alarm-out ports are working properly.

Procedure

Step 1 Select > **Event** > **Alarm** > **Alarm-out Port**.

Figure 11-3 Alarm-out port



Step 2 Select **AO1** or **AO2** to configure one-channel alarm output.

Step 3 Click **Apply** to send alarm signals to the selected ports.

For example, if the camera is connected to a buzzer, the buzzer will produce a sound. This means the alarm-out port is working properly.

11.2 Exception

Abnormality includes SD card, network, illegal access, voltage detection, and security exception.

Prerequisites

Only the device with SD card has the abnormality functions, including **No SD Card**, **SD Card Error**, and **Low SD card space**.

Background Information

An alarm will be triggered when an abnormal event occurs. The event types include:

- **SD Card Exception**: Alarm will be triggered when there is **No SD card**,**Low SD card space**, or **SD card error**.
- **Network Exception**: Alarm will be triggered when there is **Offline** (the Camera is offline) or **IP Conflict**.
- **Invalid Access**: Alarm will be triggered when unauthorized access is detected by the system.
- **Security Exception**: Alarm will be triggered when security problem occurs.
- **Traffic Light Fault**: Alarm will be triggered when the Camera detects traffic light fault.

- You can set the alarm tone by selecting **Alarm** at the upper-right side of the Camera's web page.
- **Traffic Light Fault** is only available in **E-Police** mode.

11.2.1 Setting SD Card Exception

In case of SD card exception, the system performs alarm linkage. The event types include **No SD**

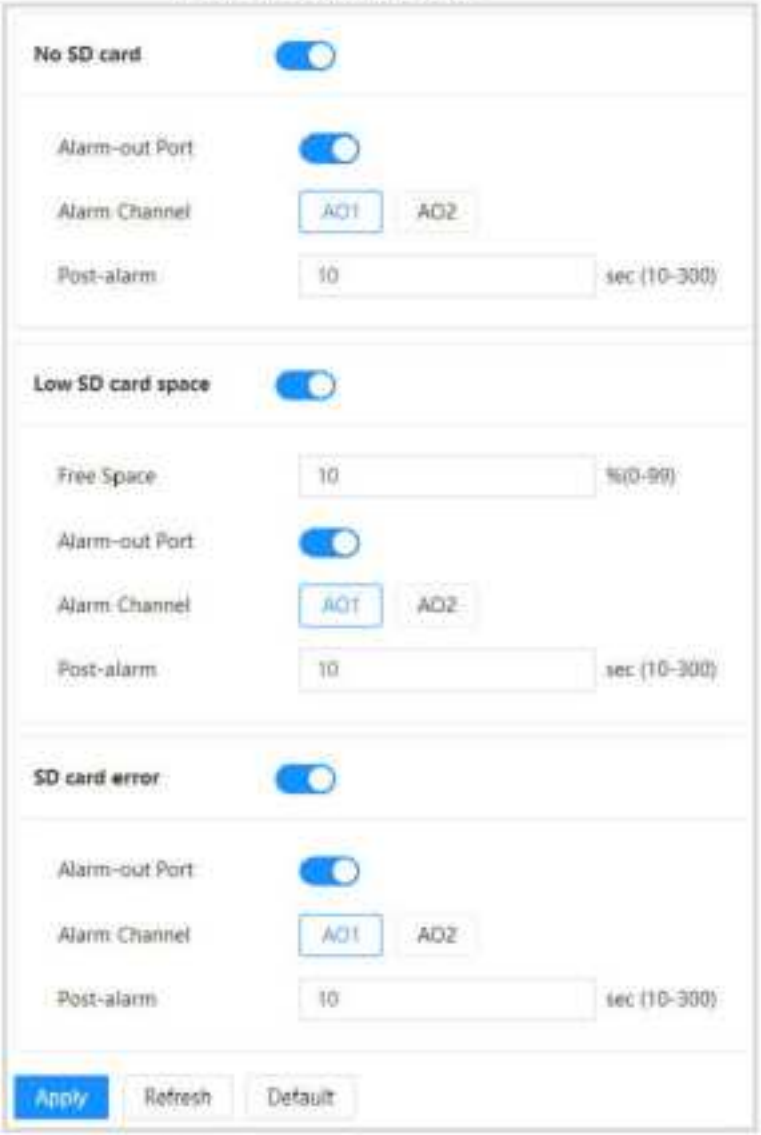
Card, **Low SD Card Space**, and **SD Card Error**. Functions might vary with different models.

Procedure

Step 1 Select > **Event** > **Exception** > **SD Card Exception**.

Step 2 Click to enable detection of one or more events.

Figure 11-4 Enable events



Step 3 Configure the parameters.

Table 11-2 Parameter description

Parameter	Description
Alarm-out Port	Click , and then select an alarm output channel. The corresponding device will be activated when alarms are triggered.
Alarm Channel	
Post-alarm	When an alarm is triggered, it will continue for the defined period after it ends.
Free Space	When enabling **Low SD Card Space**, set a value for **Free Space**. When the remaining space of SD card is less than this value, an alarm is triggered.

Step 4 Click **Apply**.

11.2.2 Setting Network Exception

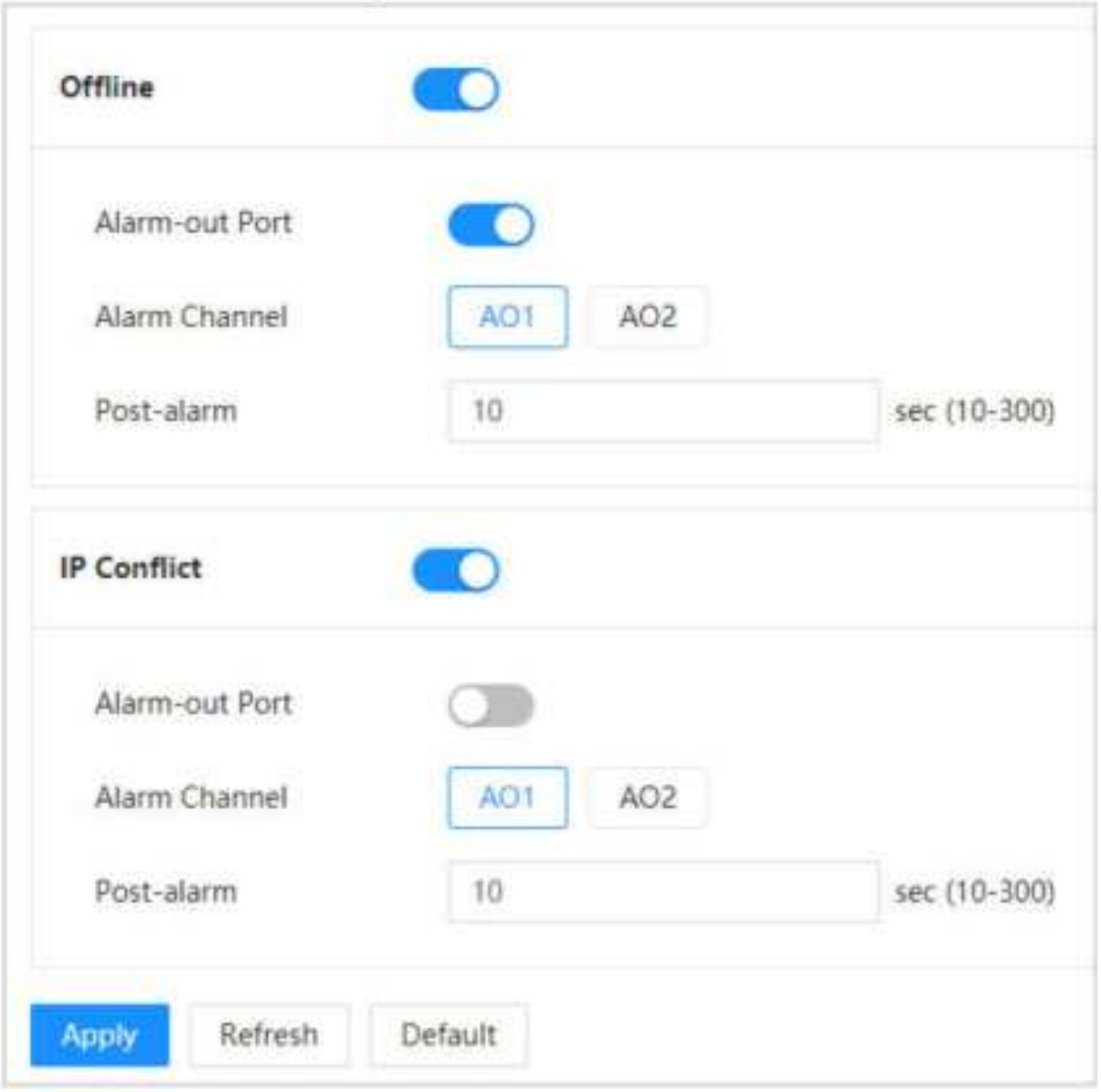
In case of network abnormality, the system performs alarm linkage. The event types include **Offline** and **IP Conflict**.

Procedure

Step 1 Select > **Event** > **Exception** > **Network Exception**.

Step 2 Click to enable detection of one or more events.

Figure 11-5 Enable events



Step 3 Configure the parameters.

Table 11-3 Parameter description

Parameter	Description
Alarm-out Port	Click , and then select an alarm output channel. The corresponding device will be activated when alarms are triggered.
Alarm Channel	
Post-alarm	When an alarm is triggered, it will continue for the defined period after it ends.

Step 4 Click **Apply**.

11.2.3 Setting Invalid Access

An alarm will be triggered if a user logs in to the device with the wrong password for more than the defined value.

Procedure

Step 1 Select > **Event** > **Exception** > **Invalid Access**.

Step 2 Click to enable detection of the event.

Figure 11-6 Enable events

Step 3 Configure the parameters.

Table 11-4 Parameter description

Parameter	Description
Login Attempt	An alarm will be triggered if a user logs in to the device with the wrong password for more than the defined value.
Alarm-out Port	Click , and then select an alarm output channel. The corresponding device will be activated when alarms are triggered.
Alarm Channel	
Post-alarm	When an alarm is triggered, it will continue for the defined period after it ends.

Step 4 Click **Apply**.

11.2.4 Setting Security Exception

An alarm is triggered when the device detects malicious attacks.

Procedure

Step 1 Select > **Event** > **Exception** > **Security Exception**.

Step 2 Click to enable detection of the event.

Figure 11-7 Enable events

Step 3 Configure the parameters.

Table 11-5 Parameter description

Parameter	Description
Alarm-out Port	Click , and then select an alarm output channel. The corresponding device will be activated when alarms are triggered.
Alarm Channel	
Post-alarm	When an alarm is triggered, it will continue for the defined period after it ends.

Step 4 Click **Apply**.

12 Peripheral

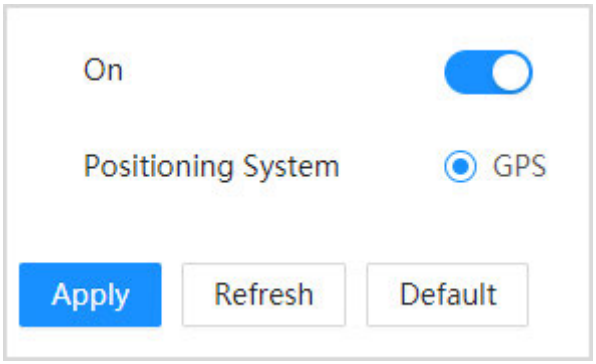
You can view the status of the device, configure the work mode of the illuminator and the serial port of radar, positioning method, external light and transparent.

Device Status

Figure 12-1 Status

Configuring Serial Port of the GPS

Figure 12-2 Configure the parameters of GPS



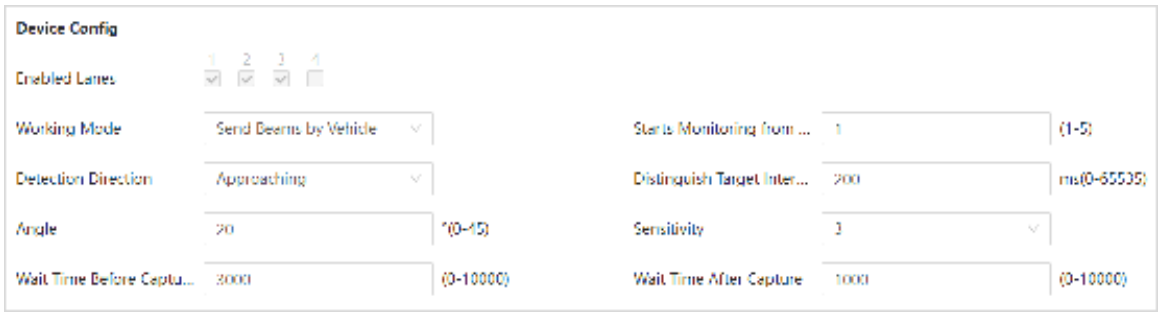
Configuring the Parameters of Illuminator

Figure 12-3 Configuring the parameters of illuminator

Configuring the Serial Port and Parameters of Radar

Figure 12-4 Configure the serial port of radar

Figure 12-5 Configuring the parameters of radar

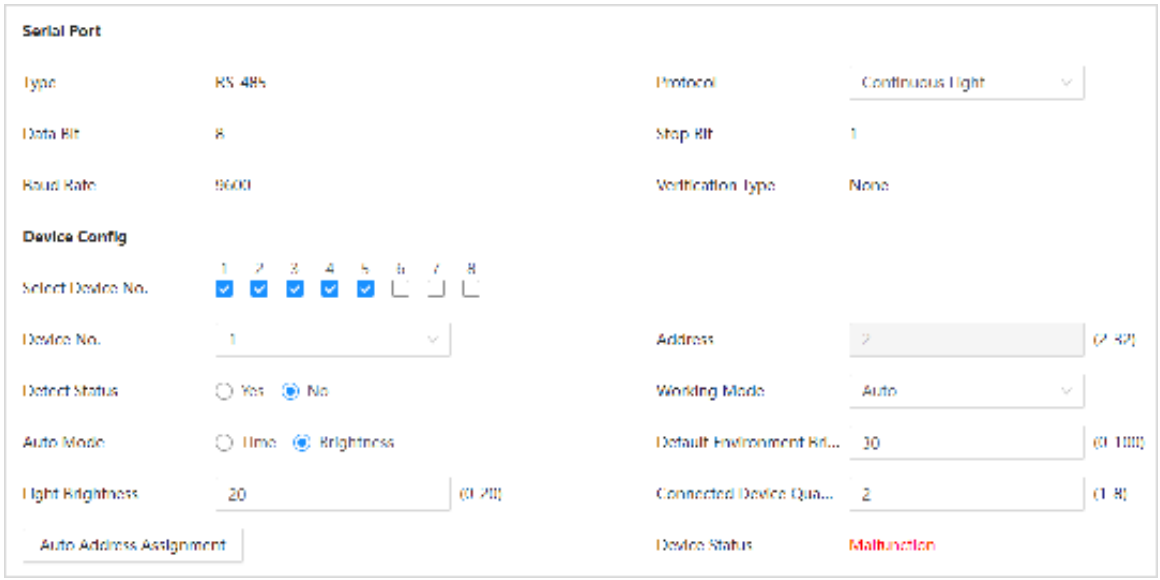


Configuring Transparent

Figure 12-6 Configuring the parameters of transparent

Configuring External Light

Figure 12-7 Configuring the parameters of external light



13 Storage

You can configure the storage path of snapshots and video records.

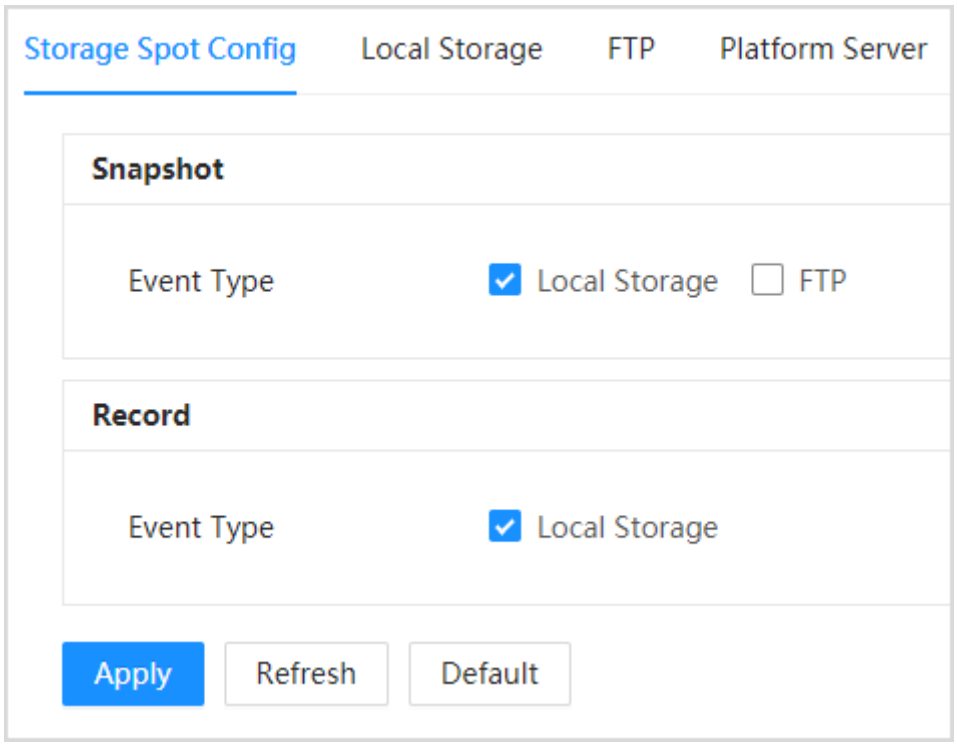
13.1 Storage Spot Config

Configure the storage path of snapshots and video recordings.

Procedure

Step 1 Select > **Storage** > **Storage** > **Storage Spot Config**.

Figure 13-1 Storage spot config



Step 2 Select storage path as needed.

- **Local Storage**: Store in the TF card, which has a limited capacity but offers continuous access to its storage, even during network failure. Videos can only be stored in TF card.
- **FTP**: Store in the FTP server, which offers a greater capacity but it will stop storing when the network fails.

Step 3 Click **Apply**.

13.2 Local Storage

Select > **Storage** > **Storage** > **Local Storage**, and the page displays the information of the TF card.

You can **Format** or **Hot Swap** the TF card, or select to **Overwrite** or **Stop** storage when the disk is full. Click **Save** after these operations.

Make sure that a TF card is inserted. Otherwise, no card information will be displayed on the **Local**

Storage page.

Figure 13-2 Local storage

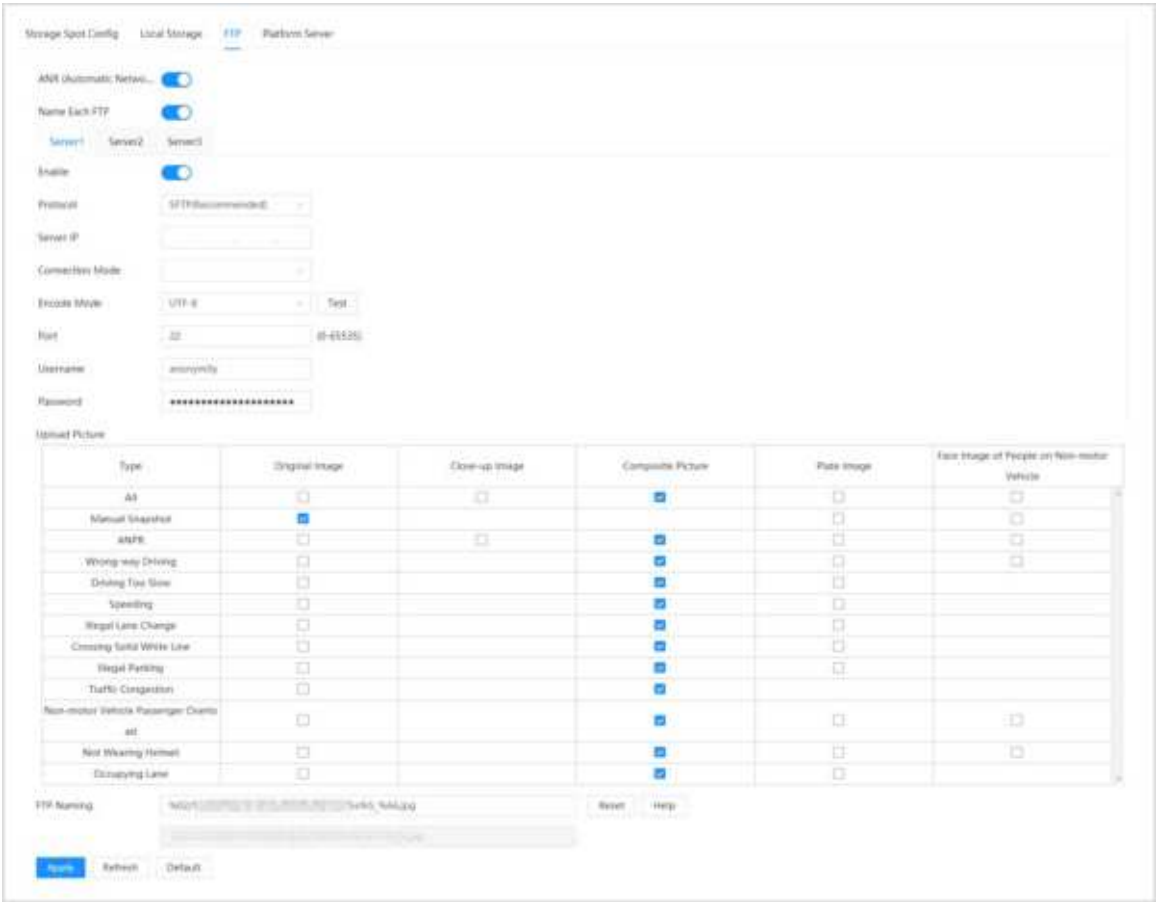
13.3 FTP

FTP function can be enabled only when TF card is inserted and FTP server is enabled. Only snapshots can be saved to the FTP server.

Procedure

Step 1 Select > **Storage** > **Storage** > **FTP**.

Figure 13-3 FTP



Step 2 Configure the parameters.

Table 13-1 FTP parameters

Parameter	Description
ANR	When the network disconnects or fails, snapshots will be stored in TF card. After the network is restored, the snapshots will be uploaded from the TF card to FTP or client. Make sure that TF card is inserted in the Camera; otherwise, the offline transfer function cannot be enabled.
Name Each FTP	Click to enable this function, and then the parameters of **FTP Naming** can be different.
Enable	Enable FTP server storage.
Protocol	• **SFTP(Recommended)**: Secure File Transfer Protocol, a network protocol allows file access, and transfer over a secure data stream. • **FTP**: File Transfer Protocol, a network protocol implemented to exchange files over a TCP/IP network. Anonymous user access is also available through an FTP server.
Server IP	The IP address of FTP server.
Connection Mode	The connection mode of FTP server. • **Long Connection**: Keep the connection after completing the data transmission. • **Short Connection**: Disconnect all connections after completing data transmission.
Encode Mode	Refers to the encode mode of Chinese characters when naming images. Only **UTF-8** is supported. After configuring **Server IP** and **Port**, click **test** to check whether the FTP server works.
Picture Name Settings	Set the naming rule of snapshots to be saved in FTP server. You can click **Help** to view the **Image Naming Rules**, or click **Reset** to restore the default naming rule.
Server1, Server2, Server3	Supports uploading to multiple servers. You can save different types of snapshots to different servers. Select the snapshot types from **Upload Picture**.
Server IP	The IP address of FTP server.
Port	The port number of FTP server.
Username	The username and password of FTP server.
Password	
Upload Picture	Select event(s) and picture type(s) to be uploaded to each FTP server. Different modes support different events, and might differ from the actual page.
FTP Naming	Configure the naming rule of snapshots to be saved in FTP server. You can click **Help** to view the naming rule, or click **Reset** to restore the default naming rule.

Step 3 Click **Apply**.

13.4 Platform Server

You can set the parameters of storing to the client, which generally refers to the platform.

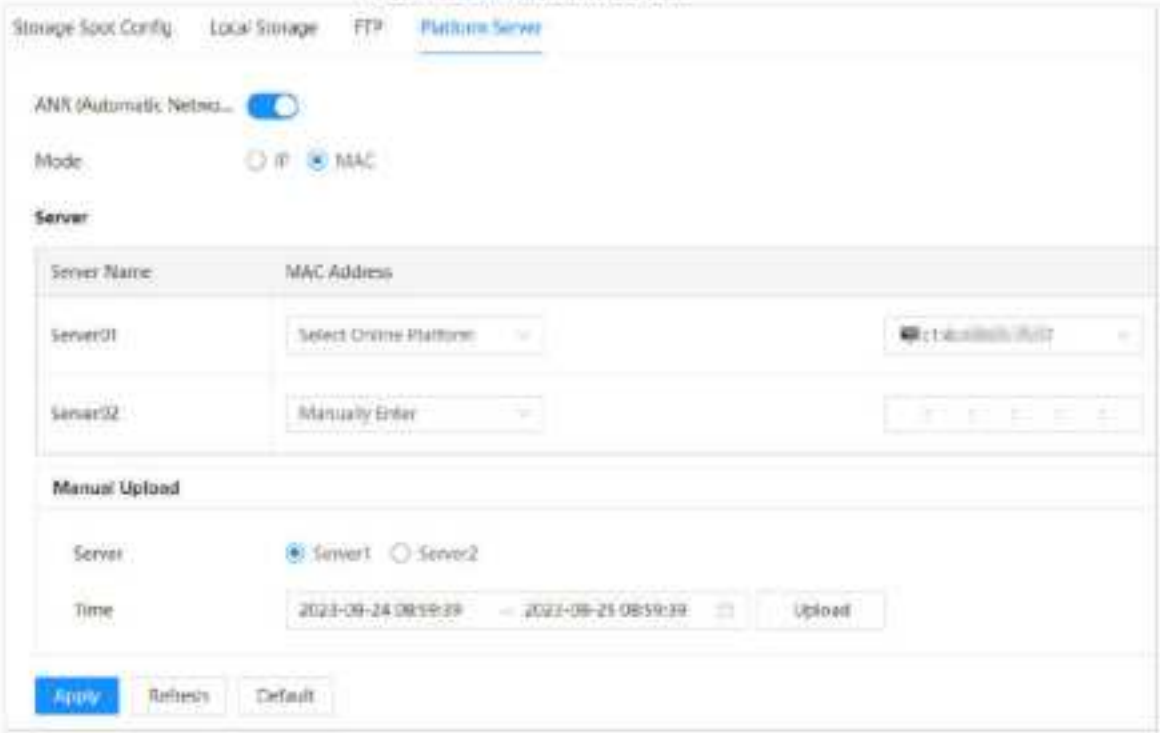
Prerequisites

You need to install and log in to platform first before you can store snapshots to platform server.

Procedure

Step 1 Select > **Storage** > **Storage** > **Platform Server**.

Figure 13-4 Platform server



Step 2 Configure the parameters.

Table 13-2 Parameter description

Parameter	Description
ANR	When network is disconnected or failed, you can store the picture into local storage card, and it will automatically upload to platform server after network resumes.
Mode	Select how the camera will connect to the platform. • **IP**: Connect to platform server through an IP address. • **MAC**: Connect to platform server through a MAC address.
Server	Configure the IP address or MAC address of the platform server.
Manual Upload	You can manually upload images within the specified period to the server. Select a server you want to upload images to, configure the time, and then click **Upload**.

Step 3 Click **Apply**.

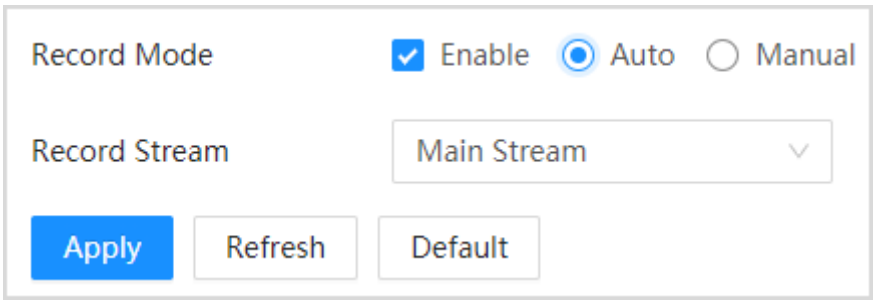
13.5 Record Control

You can set how to record the videos and the stream for recording the videos.

Procedure

Step 1 Select > **Storage** > **Record**.

Figure 13-5 Record



Step 2 Select the checkbox to next to **Enable** to enable the record mode.

- **Auto**: Record videos only when a traffic violation event is detected.
- **Manual**: Record videos continuously.

Step 3 Select the record stream. You can select from **Main Stream** and **Sub Stream**.

Step 4 Click **Apply**.

14 System

You can configure system information, add users, restore to factory settings, import and export system configuration files, and more.

14.1 General

You can configure display language, video standard, and also set the time and time zone of the Camera.

14.1.1 General Settings

You can configure the device code, system, video standard, and more.

Procedure

Step 1 Select > **System** > **General** > **General**.

Step 2 Configure the parameters.

Figure 14-1 General

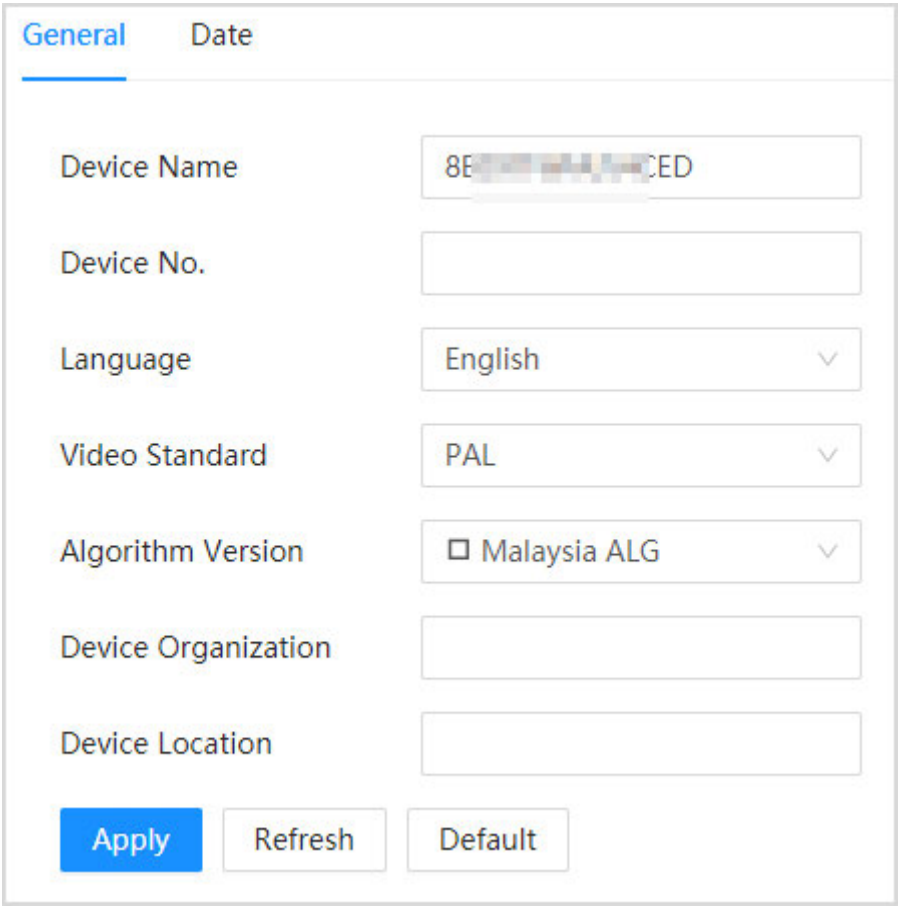


Table 14-1 General parameters

Parameter	Description
Device Name	The device serial number consisting of letters, numbers, underlines and strikethroughs.
Device No.	No. of the Camera. The device code cannot be overlaid with OSD information.
Language	Language of web browser page. You need to log in again when switching to another language.
Video Standard	**PAL** and **NTSC** are available. • **PAL**: Much more common around the world, and can be found in most of Western Europe, Australia, China, and elsewhere. • **NTSC**: Mostly limited to North America, parts of South America, Japan, the Philippines and more.
Device Organization	The group or entity that uses the Camera.
Device Location	The locations where snapshots were taken by the Camera.

Step 3 Click **Apply**.

14.1.2 Date & Time

You can configure date, time, time zone, and more for the Camera.

Procedure

Step 1 Select **Setting** > **System** > **General** > **Date & Time**.

Step 2 Configure the parameters.

Figure 14-2 Date & time

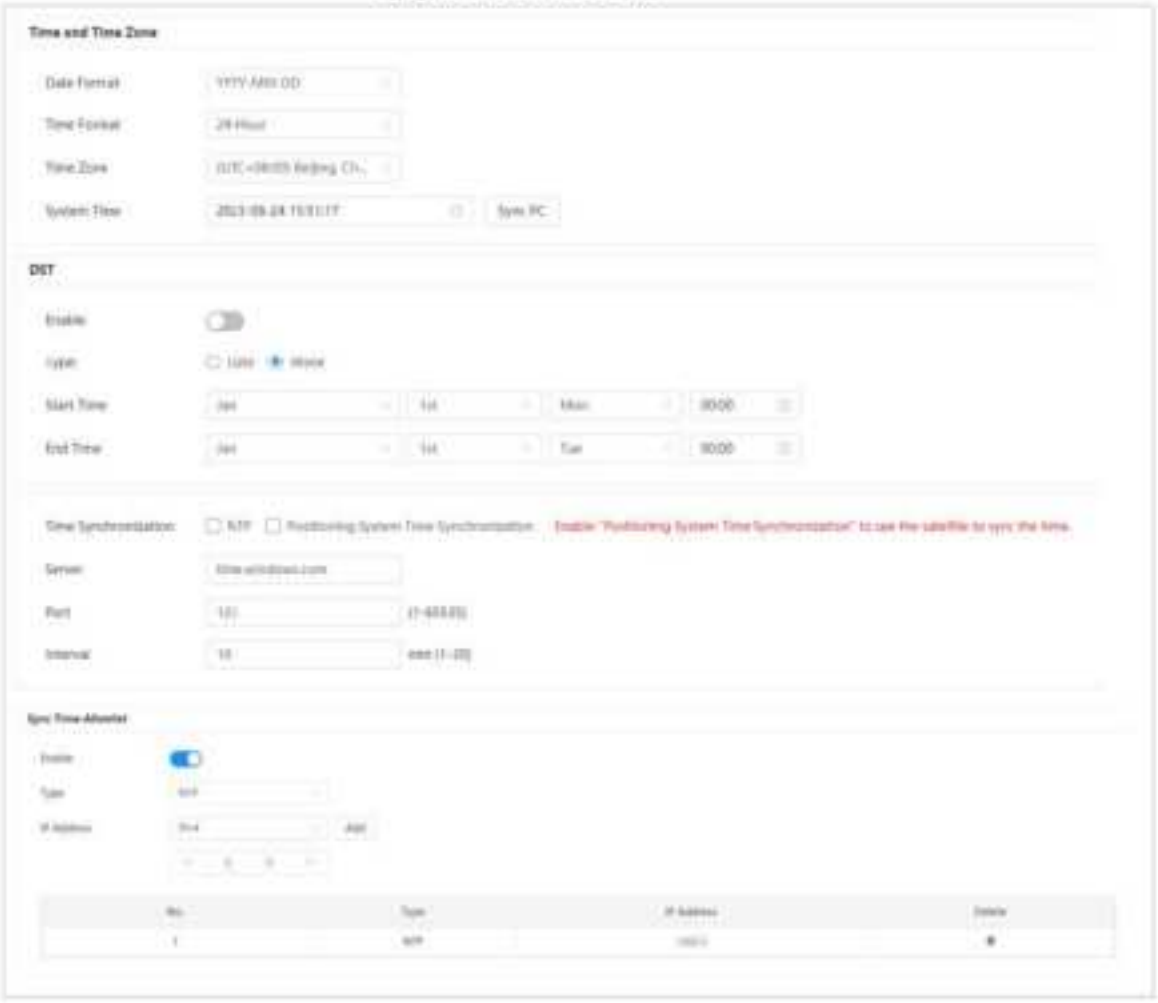


Table 14-2 Date & time parameters

Parameter	Description
Date Format	Select the date format. Three formats are available: **YYYY-MM-DD**, **MM-DD-YYYY** and **DD-MM-YYYY**.
Time Format	Select the time format. Two formats are available: **24-Hour** and **12-Hour**.
Time Zone	The time zone where the Camera is located.
System Time	The current time of the Camera. Click **Sync PC** to synchronize the time of the Camera to that of the computer.
DST	Click to enable the **DST** (means daylight saving time) function, set the **Type** by **Date** or by **Week**, and then configure the **Start Time** and **End Time** of DST.
Time Synchronization	Time synchronization mode. You can select **NTP** (network time protocol) or **Positioning System Time Synchronization**.
Server	The IP address and the port number of NTP server. Required when **NTP** is set to **Time Synchronization**.
Port	
Interval	The time synchronization interval of the Camera and the NTP or satellite.
Sync Time-Allowlist	Click to enable **Sync Time-Allowlist**, and then only the added IP and devices can synchronize the time with the computer.

Step 3 Click **Apply**.

14.2 Account Management

You can add or delete users and user groups, assign permissions to new users and user groups, change passwords, and manage users and user groups.

14.2.1 User

14.2.1.1 Adding Users

You can view the information of a user or user group, add or delete users or user groups, change user password, assign user permissions, restrict user login, and more.

Procedure

Step 1 Select > **System** > **Account** > **Account** > **Username**.

Figure 14-3 User

Step 2 Click **Add**.

Figure 14-4 Add user (System)

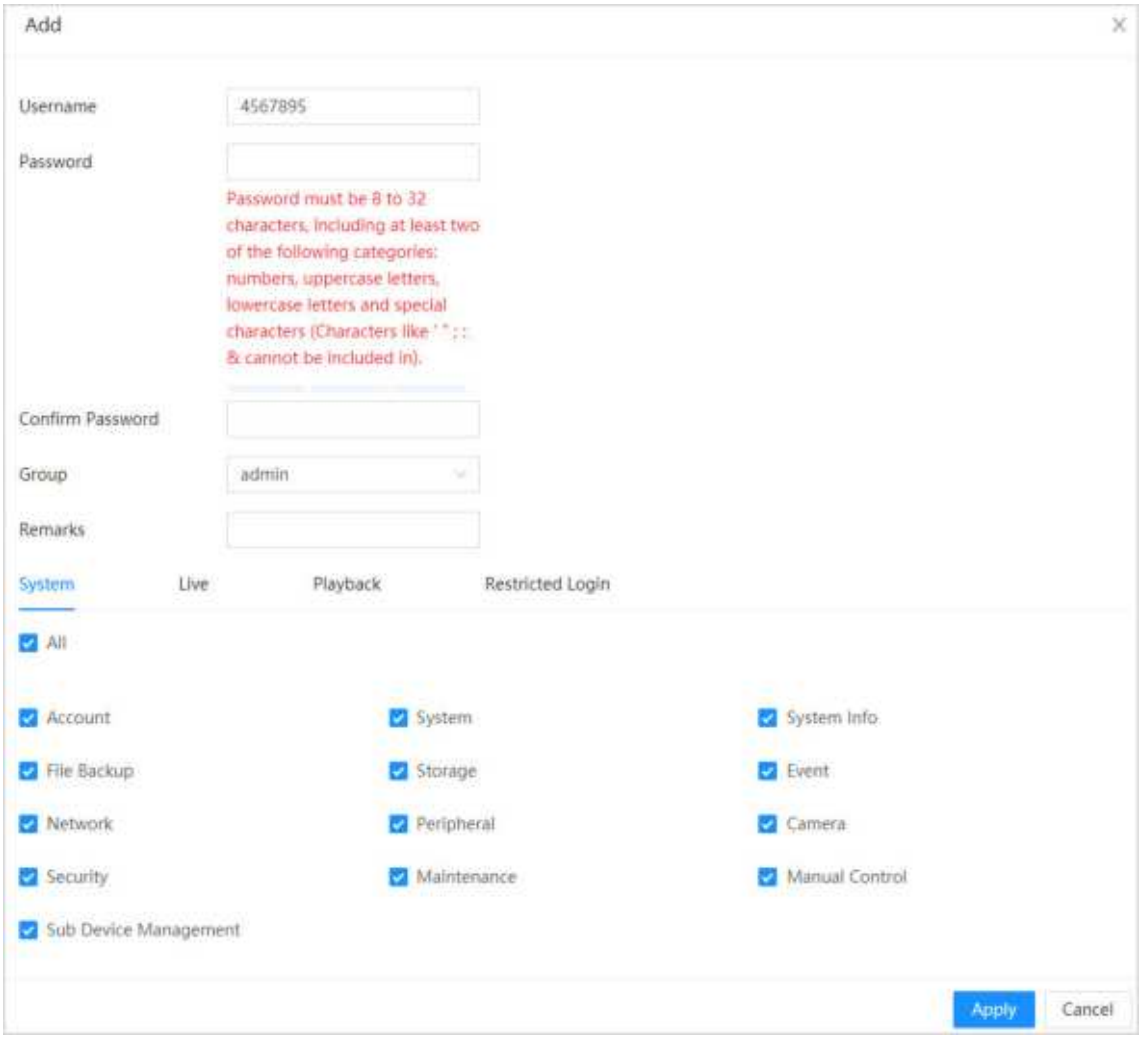
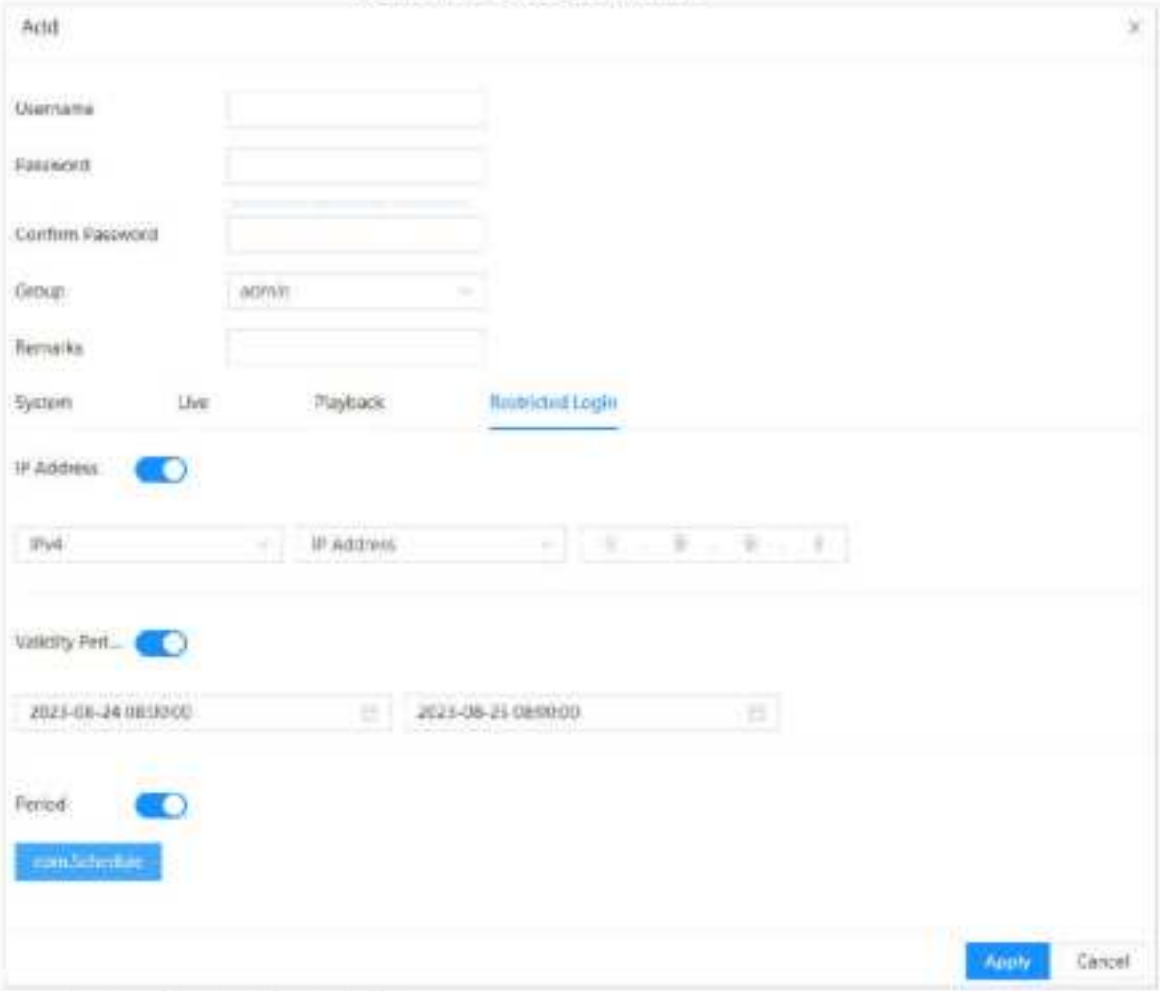


Figure 14-5 Set log restriction



Step 3 Configure the parameters.

Table 14-3 Description of parameters

Parameter	Description
Username	User's unique identification. You cannot use existed username.
Password	Enter password and confirm it again.
Confirm Password	The password must consist of 8 to 32 non-blank characters and contain at least two types of characters among upper case, lower case, number, and special character (excluding ' " ; : &).
Group	The group that users belong to. Each group has different authorities.
Remarks	Describe the user.
System	Select authorities as needed. We recommend you give fewer permissions to normal users than premium users.
Live	Select the live view authority for the user to be added.

Parameter	Description
Restricted Login	Set the PC address that allows the defined user to log in to the camera and the validity period and time range. You can log in to the webpage with the defined IP in the defined time range of validity period. • IP address: You can log in to web through the PC with the set IP or one within the set IP segment. • Validity period: You can log in to web in the set validity period. • Period: You can log in to web in the set time range.

Step 4 Click **Apply**.

The user is displayed in the username list.

Related Operations

- Click ✎ to edit password, remarks, or authorities.

  For admin account, you can only edit the password.

- Click 🗑 to delete the added users. Admin user cannot be deleted.

  The admin account cannot be deleted.

14.2.1.2 Resetting Password

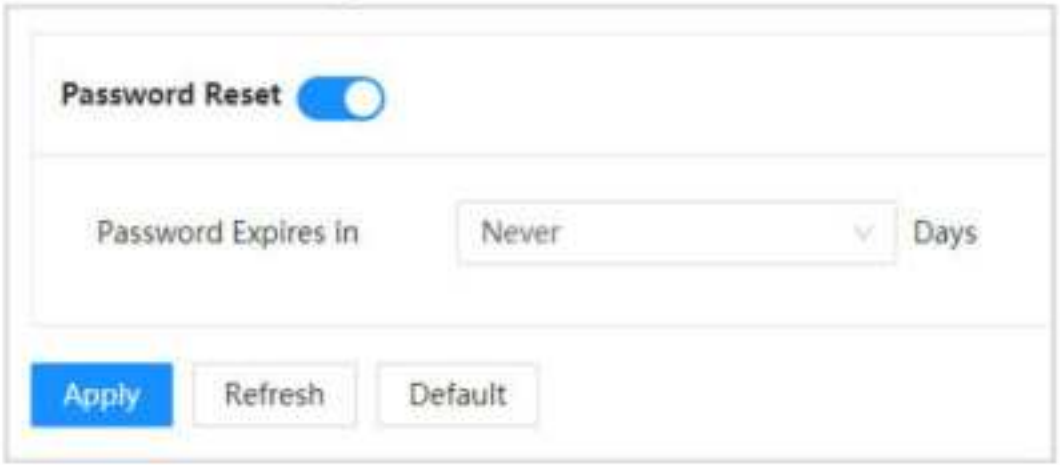
Enable the function, and you can reset password by clicking **Forget Password?** on the login page. For details, see "1.4 Resetting Password".

Procedure

Step 1 Select ⚙ > **System** > **Account** > **User**.

Step 2 Click ○ next to **Password Reset**.

Figure 14-6 Password reset



If the function is not enabled, you can only reset the password by resetting the Camera.

Step 3 Configure the validity period of the password.

Step 4 Click **Apply**.

You can now reset the password of users on the login page by clicking **Forgot Password?**.

14.2.2 Adding User Groups

A group is a set of permissions. You can configure different groups to quickly assign permissions to different users. There are 2 groups named admin and user by default.

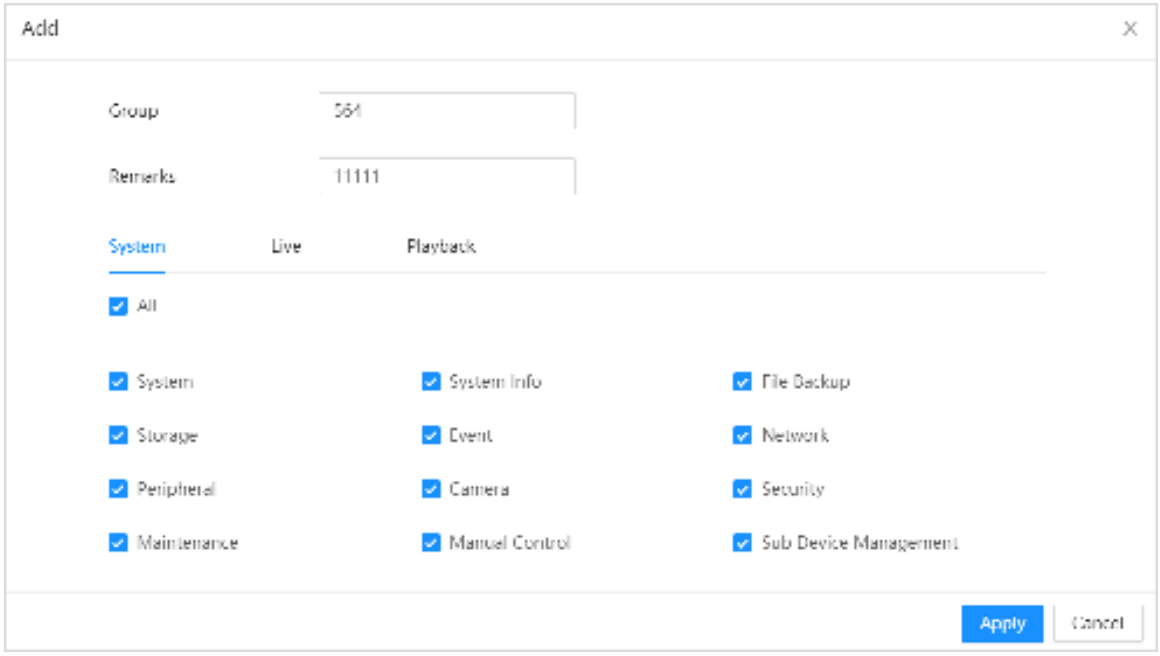
Procedure

Step 1 Select > **System** > **Account** > **Group**.

Figure 14-7 Group

Step 2 Click **Add**.

Figure 14-8 Add group



Step 3 Enter the group name and remarks, and then select permissions.

Step 4 Click **Apply**.

The group is displayed in the list.

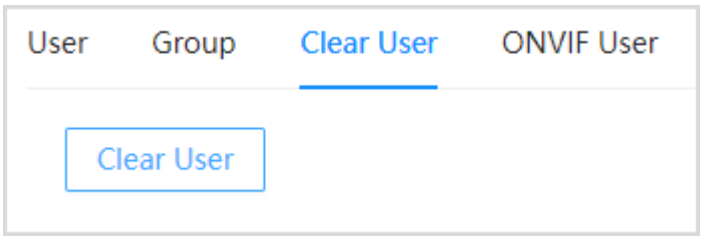
Related Operations

- Click to edit the remarks and permissions.
- Click to delete a group. The admin and user groups cannot be deleted.

14.2.3 Clearing User

Select > **System** > **Account**.

Figure 14-9 Clear user



Click **Clear User**, and then enter the password on the dialogue box to clear all information on custom users.

This operation will clear all information on custom users and restart the device, please be advised.

14.2.4 ONVIF User

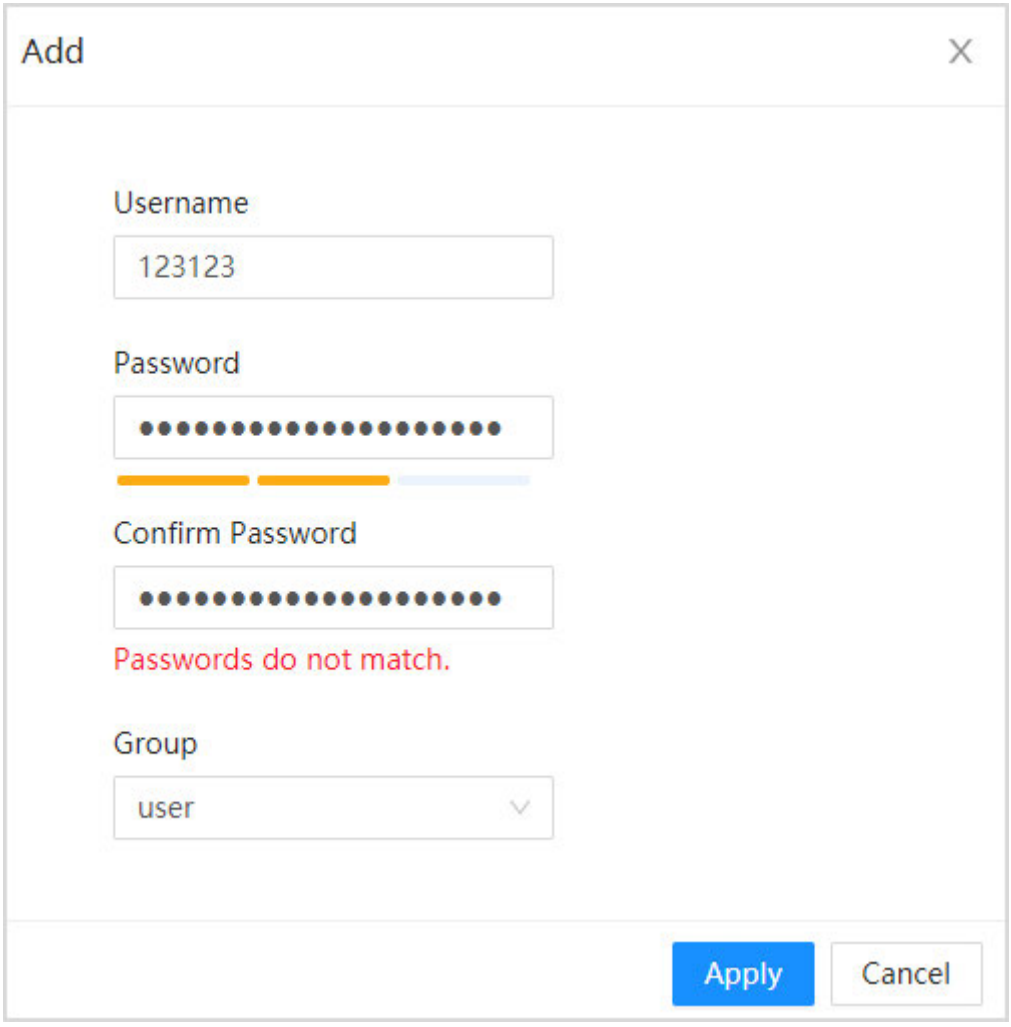
You can add, delete ONVIF users, and change their passwords.

Procedure

Step 1 Select > **System** > **Account** > **ONVIF User**.

Step 2 Click **Add**.

Figure 14-10 Add user



Step 3 Configure the parameters.

Table 14-4 Parameter description

Parameter	Description
Username	User's unique identification. You cannot use existed username.
Password	Enter password and confirm it again. The password must consist of 8 to 32 non-blank characters and contain at least two types of characters among uppercase, lowercase, number, and special character (excluding ' " ; : &).
Confirm Password	
Group	The group that users belong to. Each group has different authorities.

Step 4 Click **Apply**.

The user is displayed in the list.

Related Operations

- Click to edit password, group, memo or authorities.

  For admin account, you can only change the password.

- Click to delete the added user.

  The admin account cannot be deleted.

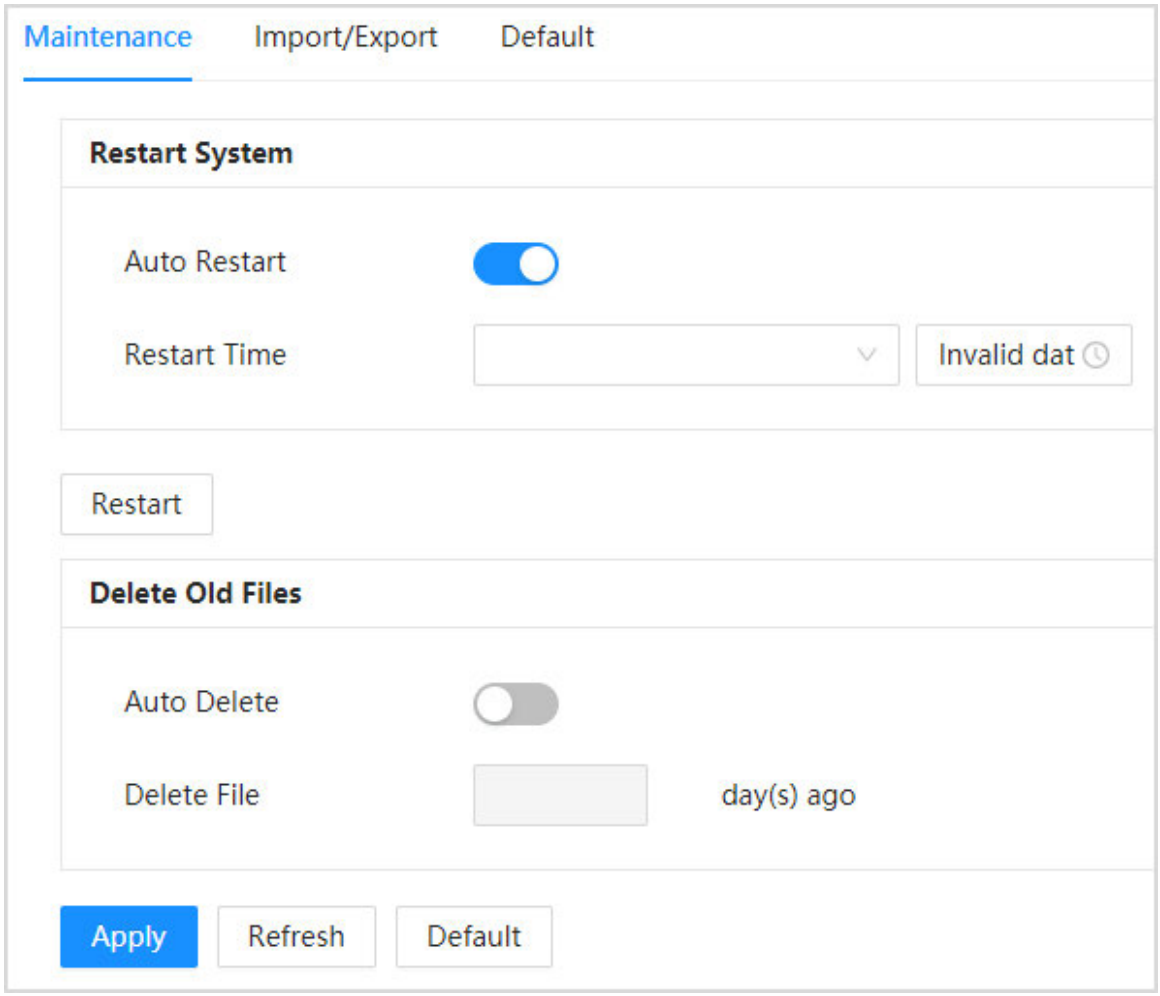
14.3 Manager

14.3.1 Maintenance

Procedure

Step 1 Select > **System** > **Manager** > **Maintenance**.

Figure 14-11 Maintenance



Step 2 Configure the parameters.

- Click next to **Auto Restart** and configure the restart time. The device will automatically restart at the defined time every week.
- Click next to **Auto Delete** and set the time. The device will automatically delete old files at the defined time. The time range is 1 to 31 days.

When you enable and confirm the **Auto Delete** function, the deleted files cannot be restored. Please be advised.

Step 3 Click **Apply**.

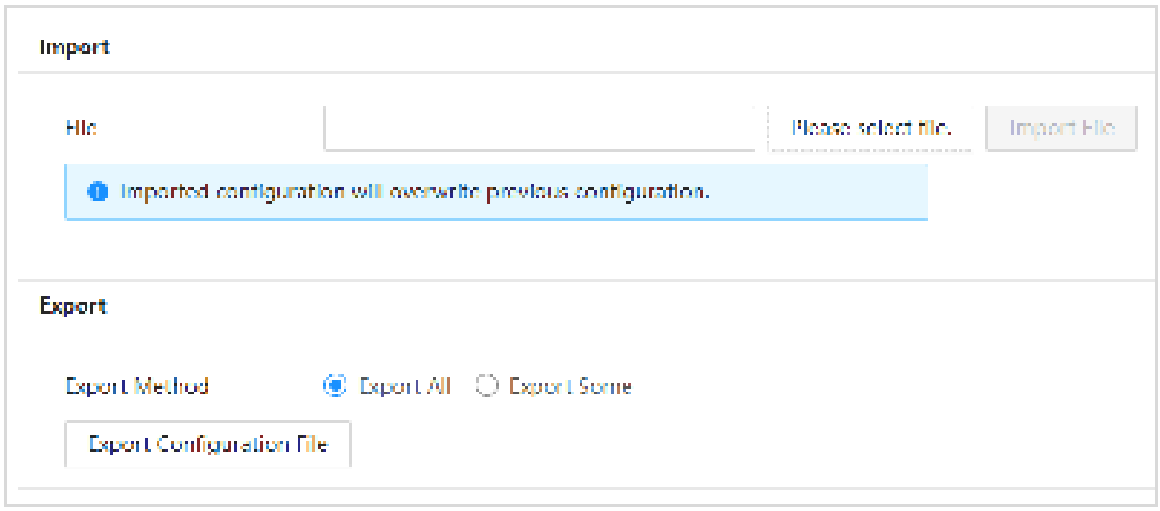
14.3.2 Import/Export

- Export the configuration of the camera in a file to your computer for backup.
- Import a configuration file to quickly configure the Camera.

Procedure

Step 1 Select **System** > **Import/Export**.

Figure 14-12 Import/Export



Step 2 Import or export the file.

- Import: Select the configuration file on your computer, and then click **Import File** to import it to the Camera.
- Export: Click **Export Configuration File** to export the configuration of the Camera in a file to your computer.

Step 3 Select the path of the file to import, or the path of the file to export.

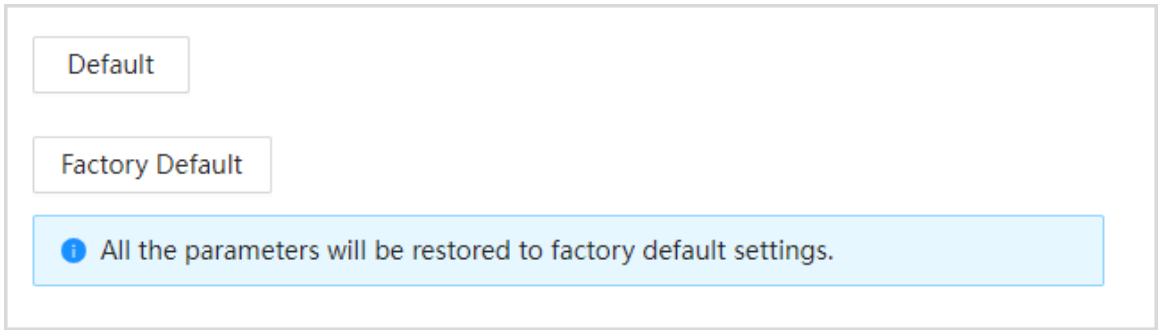
14.3.3 Default

Restore all settings of the camera to the default status.

Select > **System** > **Manager** > **Default**.

- Click **Default**, and then all the configurations, except IP address, automatic registration, port numbers, HTTPS, and multicast, are reset to the default status.
- Click **Factory Default**, and then all the configurations, including IP address, automatic registration, port numbers, HTTPS, and multicast, are reset to factory settings.

Figure 14-13 Default



14.4 Update

Update the camera to the latest version to improve its stability and functions. If wrong update file has been used, restart the device; otherwise some functions might not work properly.

Procedure

Step 1 Select > **System** > **Update**.

Step 2 Update the camera in the following ways.

- Use an update file.
  1. Click **Browse**.
  2. Select the update file in .bin format.

     If you use an incorrect update file and the update is in progress, restart the device manually. Otherwise, certain functions might not work properly.
  3. Click **Update**.
- Update manually.
  1. Click **Manual Check**, and then the camera will search for new version.
  2. If there is a new version available, follow the on-screen instructions to finish the process.
- Update online.

  Click next to **Auto Check for Updates** to enable the function. The camera will regularly check for updates, and automatically update when available.

15 System Information

You can view information such as version, log, online user, and work status.

15.1 Version Information

- Select > **System Info** > **Version** to view information such as device model, and the version of the hardware, system, and software.
- Select > **System Info** > **Peripheral Version** to view version information of the external device, such as radar and flashing light.

Version might differ depending on the device model.

15.2 Log

15.2.1 System Log

You can search for and view logs by the time and type, and backup the logs. The log type includes **All**, **System**, **Config**, **Storage**, **Alarm Event**, **Record**, **Account**, and **Security**.

Procedure

Step 1 Select > **System Info** > **Log** > **Log**.

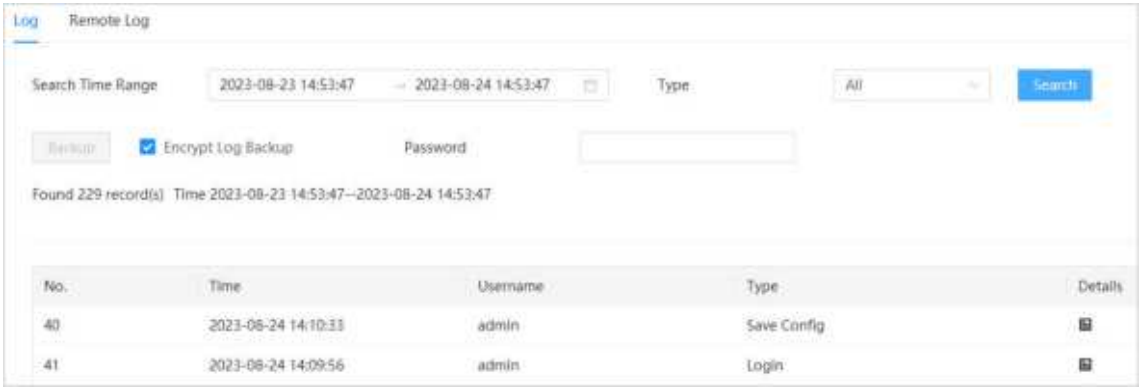
Step 2 Configure **Search Time Range**, and then select log type.

Step 3 Click **Search**.

Step 4 View and backup the search results.

You can save the search results to your computer in a .txt file.

Figure 15-1 Log



Related Operations

Click to view the details.

15.2.2 Remote Log

Critical logs can be saved to the log server. This helps provide important clues to the source of security incidents. The log server needs to be deployed in advance by a professional or system administrator.

Procedure

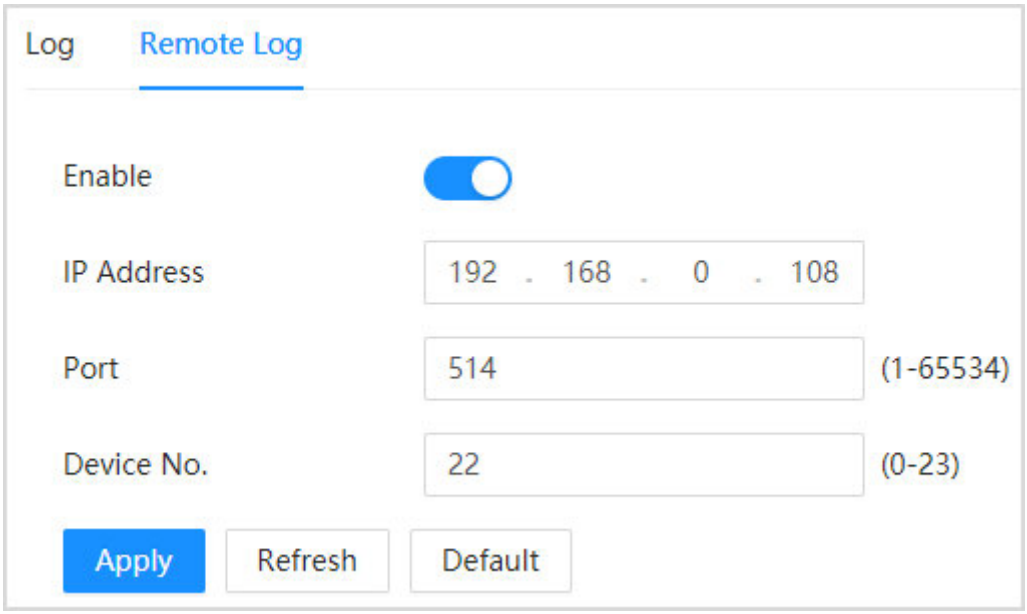
Step 1 Select > **System Info** > **Log** > **Remote Log**.

Step 2 Select **Enable** to enable **Remote Log**.

Step 3 Configure the IP address, port and device number.

Step 4 Click **Apply**.

Figure 15-2 Remote log



15.3 Online User

Select > **System Info** > **Online User**, and then you can view online users' information, such as username, user local group, IP address, and user login time.

Figure 15-3 Online user

15.4 Running Status

Select > **System Info** > **Running Status**, and then you can view device work status, including

CPU, memory and temperature.

15.5 Device Location

Select > **Device Location** to view the longitude, latitude of GPS and numbers of satellites.

15.6 Legal Information

Select > **System Info** > **Legal Info** to check the legal information.

16 Security

16.1 Security Status

Detects the user and service, and scans the security modules to check the security status of the camera, so that when abnormality appears, you can process it timely.

- User and service detection: Detect login authentication, user status, and configuration security to check whether the current configuration conforms to recommendation.
- Security modules scanning: Scan the running status of security modules, such as audio/video transmission, trusted protection, securing warning and attack defense, not detect whether they are enabled.

Procedure

Step 1 Select > **Security** > **Security Status**.

Step 2 Click **Rescan** to scan the security status of the Camera.

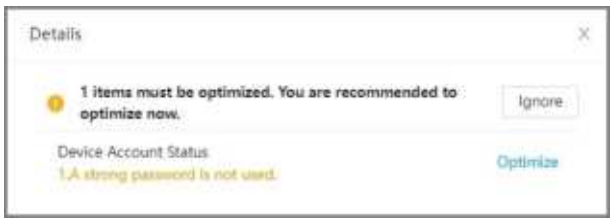
Figure 16-1 Security status

Related Operations

After scanning, different results will be displayed in different colors. Yellow indicates that the security modules are abnormal, and Green indicates that the security modules are normal.

1. Click **Details** to view the details of the scanning result.
2. Click **Ignore** to ignore the exception, and it will not be scanned in next scanning.
   Click **Rejoin Detection**, and the exception will be scanned in next scanning.
3. Click **Optimize**, and the corresponding page will be displayed, and you can edit the configuration to clear the exception.

Figure 16-2 Security status



16.2 System Service

16.2.1 802.1x

The camera can connect to LAN after passing 802.1x authentication.

Procedure

Step 1 Select > **Security** > **System Service** > **802.1x**.

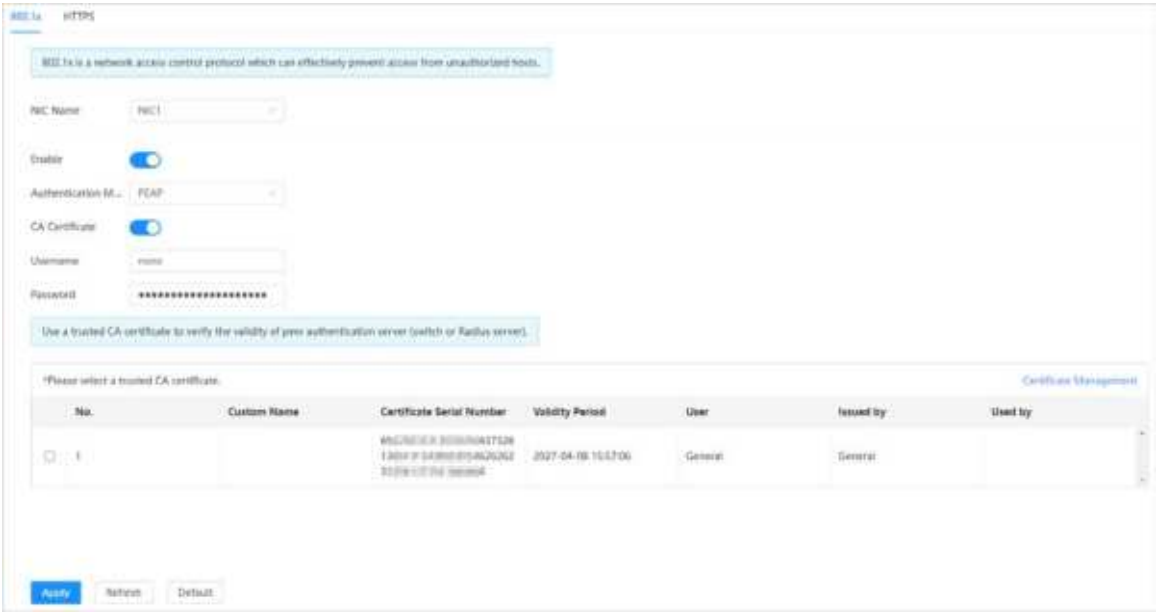
Step 2 Select the NIC name as needed, and click to enable it.

Step 3 Select the authentication mode, and then configure parameters.

- PEAP: Protected EAP protocol.
  1. Select PEAP as the authentication mode.
  2. Enter the username and password that has been authenticated on the server.
  3. Click next to CA certificate, and select the trusted CA certificate in list.

     If there is no certificate in the list, click **Certificate Management** at the left navigation bar.

Figure 16-3 802.1x (PEAP)

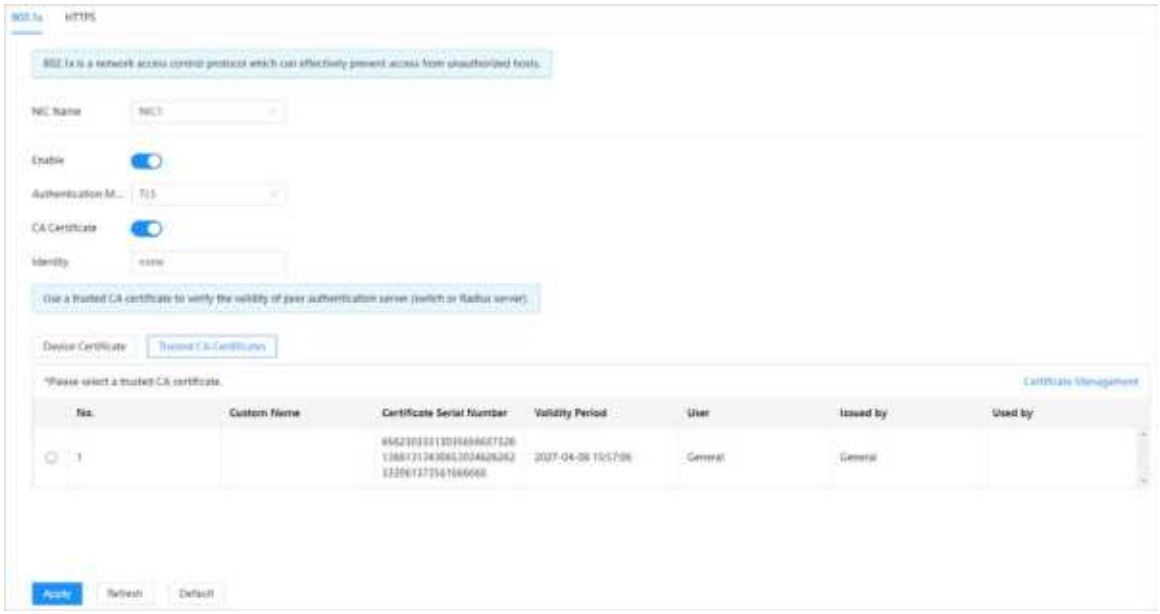


- TLS: Transport Layer Security. It is applied in two communication application programs to guarantee the security and integrity of the data.
  1. Select TLS as the authentication mode.

2. Enter the username.
3. Click next to CA certificate, and select the trusted CA certificate in list.

If there is no certificate in the list, click **Certificate Management** at the left navigation bar.

Figure 16-4 802.1x (TLS)



Step 4 Click **Apply**.

16.2.2 HTTPS

Create a certificate or upload an authenticated certificate, and then you can log in through HTTPS with your PC. The HTTPS can protect page authenticity on all types of websites, secure accounts, and keep user communications, identity, and web browsing private.

Procedure

Step 1 Select > **Security** > **System Service** > **HTTPS**.

Step 2 Click to enable the function.

Step 3 Select the certificate.

If there is no certificate in the list, click **Certificate Management** to configure one.

Figure 16-5 HTTPS

Step 4 Click **Apply**.

16.3 Attack Defense

16.3.1 Firewall

Configure the firewall to limit access to the camera.

Procedure

Step 1 Select > **Security** > **Attack Defense** > **Firewall**.

Step 2 Click to enable the function.

Figure 16-6 Firewall

Step 3 Select the mode: **Allowlist** and **Blocklist**.

- **Allowlist**: Only when the IP/MAC of your PC in the allow list, can you access the camera. Ports are the same.
- **Blocklist**: When the IP/MAC of your PC is in the block list, you cannot access the camera. Ports are the same.

Step 4 Click **Add** to add the host IP/MAC address to **Allowlist** or **Blocklist**, and then click **OK**.

Figure 16-7 Firewall

Step 5 Click **Apply**.

Related Operations

- Click to edit the host information.
- Click to delete the host information.

16.3.2 Account Lockout

If you use a wrong password to log in for more than the configured value, the account will be locked.

Procedure

Step 1 Select > **Security** > **Attack Defense** > **Account Lockout**.

Step 2 Configure the login attempt and lock time for device account and ONVIF user.

- Login attempt: Upper limit of login attempts. If you consecutively enter a wrong password more than the configured value, the account will be locked.
- Lock time: The period during which you cannot log in after the login attempts reaches the upper limit.

Step 3 Click **Apply**.

16.3.3 Anti-DoS Attack

You can enable **SYN Flood Attack Defense** and **ICMP Flood Attack Defense** to defend the device against DoS attack.

Procedure

Step 1 Select > **Security** > **Attack Defense** > **Anti-DoS Attack**.

Step 2 Click to enable **SYN Flood Attack Defense** or **ICMP Flood Attack Defense**.

Step 3 Click **Apply**.

16.4 CA Certificate

16.4.1 Installing Device Certificate

Create a certificate or upload an authenticated certificate, and then you can log in through HTTPS with your computer.

16.4.1.1 Creating Certificate

Create certificate in the device.

Procedure

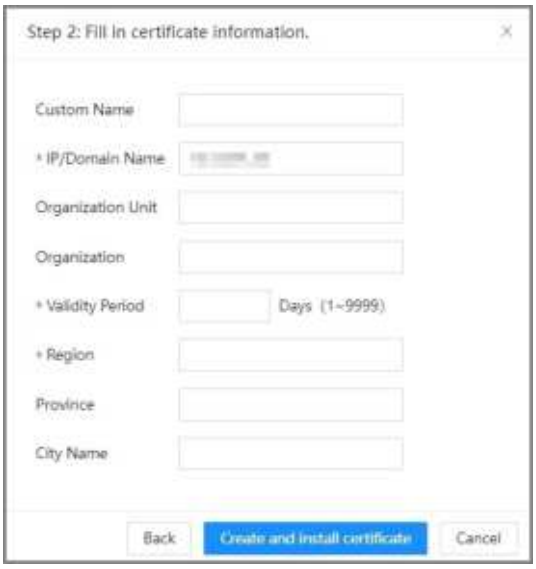
Step 1 Select > **Security** > **CA Certificate** > **Device Certificate**.

Step 2 Click **Install Device Certificate**.

Step 3 Select **Create Certificate**, and click **Next**.

Step 4 Enter the certificate information.

Figure 16-8 Certificate information (1)



Step 5 Click **Create and install certificate**.

After the certificate is created successfully, you can view the created certificate on the **Device Certificate** page.

Related Operations

- Click **Enter Edit Mode**, you can edit the custom name of the certificate.
- Click to download the certificate.
- Click to delete the certificate.

16.4.1.2 Applying for and Importing CA Certificate

Import the third-party CA certificate to the camera.

Procedure

Step 1 Select > **Security** > **CA Certificate** > **Device Certificate**.

Step 2 Click **Install Device Certificate**.

Step 3 Select **Apply for CA Certificate and Import (Recommended)**, and then click **Next**.

Step 4 Enter the certificate information.

Figure 16-9 Certificate information (2)

Step 5 Click **Create and Download** and save the request file to your computer.

Step 6 Use the request file to apply for a CA certificate with a third-party certificate authority.

Step 7 Click **Browse**, and then open the CA certificate.

Figure 16-10 Import a CA certificate

Step 8 Click **Import and Install**.

Related Operations

- Click **Enter Edit Mode**, you can edit the custom name of the certificate.
- Click to download the certificate.
- Click to delete the certificate.

16.4.1.3 Installing Existing Certificate

Import the existing third-party certificate to the camera. When applying for the third-party certificate, you also need to apply for the private key file and private key password.

Procedure

Step 1 Select > **Security** > **CA Certificate** > **Device Certificate**.

Step 2 Select **Install Device Certificate**.

Step 3 Select **Install Existing Certificate**, and then click **Next**.

Step 4 Click **Browse** to open the CA certificate and private key, and enter the private key password.

Figure 16-11 Certificate and private key

Step 5 Click **Import and Install**.

After the certificate is created successfully, you can view the created certificate on the **Device Certificate** page.

Related Operations

- Click **Enter Edit Mode** to edit the custom name of the certificate.
- Click to download the certificate.
- Click to delete the certificate.

16.4.2 Installing Trusted CA Certificate

A CA certificate is a digital certificate for the legal identity of the camera. For example, when the camera accesses the LAN through 802.1x, the CA certificate is required.

Procedure

Step 1 Select > **Security** > **CA Certificate** > **Trusted CA Certificates**.

Step 2 Select **Install Trusted Certificate**.

Step 3 Click **Browse** to open the certificate.

Figure 16-12 Installing trusted certificate

Step 4 Click **OK**.

After the certificate is created successfully, you can view the created certificate on the **Trusted CA Certificate** page.

Related Operations

- Click **Enter Edit Mode**, you can edit the custom name of the certificate.
- Click to download the certificate.
- Click to delete the certificate.

16.5 A/V Encryption

The device supports encrypting data during audio and video transmission.

We recommend enabling the A/V Encryption function. Otherwise there might be safety risks.

Procedure

Step 1 Select > **Security** > **A/V Encryption**.

Step 2 Configure the parameters.

Figure 16-13 A/V encryption

Table 16-1 Parameter description

Area	Parameter	Description
Private Protocol	Enable	Enables stream frame encryption by using private protocol. There might be safety risk if this service is not enabled.
	Encryption Type	Use the default setting.
	Update Period of Secret Key	Secret key update period. Value range: 0–720 hours. 0 means never update the secret key. Default value: 12.
RTSP over TLS	Enable	Enables RTSP stream encryption by using TLS. There might be safety risk if this service is not enabled.
	Select a device certificate	Select a device certificate for RTSP over TLS.
	Certificate Management	For details about certificate management, see "16.4 CA Certificate".

Step 3 Click **Apply**.

16.6 Security Warning

When a security exception event or illegal login is detected, the camera sends a warning to remind you to process it timely to avoid security risks.

16.6.1 Security Exception

The camera monitors exceptions and triggers a warning when one occurs.

Procedure

Step 1 Select > **Security** > **Security Warning** > **Security Exception**.

Step 2 Click to enable the function.

Step 3 Configure the parameters.

Figure 16-14 Security warning

- **Alarm Channel**: Select an alarm output channel. The corresponding device will be activated when an event is detected.
- **Post-alarm**: When an alarm is triggered, it will continue for the defined period after it ends.
- **Log Info**: After it is enabled, the camera will generate a log when an event occurs.

Step 4 Click **Apply**.

16.6.2 Illegal Login

The camera triggers a warning when illegal login is detected.

Procedure

Step 1 Select > **Security** > **Security Warning** > **Illegal Login**.

Step 2 Click to enable the function.

Step 3 Configure the parameters.

- **Alarm Channel**: Select an alarm output channel. The corresponding device will be activated when an event is detected.
- **Post-alarm**: When an alarm is triggered, it will continue for the defined period after it ends.
- **Log Info**: After it is enabled, the camera will generate a log when an event occurs.

Step 4 Click **Apply**.

Appendix 1 Cybersecurity Recommendations

Mandatory actions to be taken for basic device network security:

1. **Use Strong Passwords**

   Please refer to the following suggestions to set passwords:

   - The length should not be less than 8 characters.
   - Include at least two types of characters; character types include upper and lower case letters, numbers and symbols.
   - Do not contain the account name or the account name in reverse order.
   - Do not use continuous characters, such as 123, abc, etc.
   - Do not use overlapped characters, such as 111, aaa, etc.

2. **Update Firmware and Client Software in Time**

   - According to the standard procedure in Tech-industry, we recommend to keep your device (such as NVR, DVR, IP camera, etc.) firmware up-to-date to ensure the system is equipped with the latest security patches and fixes. When the device is connected to the public network, it is recommended to enable the "auto-check for updates" function to obtain timely information of firmware updates released by the manufacturer.
   - We suggest that you download and use the latest version of client software.

"Nice to have" recommendations to improve your device network security:

1. **Physical Protection**

   We suggest that you perform physical protection to device, especially storage devices. For example, place the device in a special computer room and cabinet, and implement well-done access control permission and key management to prevent unauthorized personnel from carrying out physical contacts such as damaging hardware, unauthorized connection of removable device (such as USB flash disk, serial port), etc.

2. **Change Passwords Regularly**

   We suggest that you change passwords regularly to reduce the risk of being guessed or cracked.

3. **Set and Update Passwords Reset Information Timely**

   The device supports password reset function. Please set up related information for password reset in time, including the end user's mailbox and password protection questions. If the information changes, please modify it in time. When setting password protection questions, it is suggested not to use those that can be easily guessed.

4. **Enable Account Lock**

   The account lock feature is enabled by default, and we recommend you to keep it on to guarantee the account security. If an attacker attempts to log in with the wrong password several times, the corresponding account and the source IP address will be locked.

5. **Change Default HTTP and Other Service Ports**

   We suggest you to change default HTTP and other service ports into any set of numbers between 1024–65535, reducing the risk of outsiders being able to guess which ports you are using.

6. **Enable HTTPS**

   We suggest you to enable HTTPS, so that you visit Web service through a secure communication channel.

7. **MAC Address Binding**

   We recommend you to bind the IP and MAC address of the gateway to the device, thus reducing

the risk of ARP spoofing.

8. **Assign Accounts and Privileges Reasonably**

   According to business and management requirements, reasonably add users and assign a minimum set of permissions to them.

9. **Disable Unnecessary Services and Choose Secure Modes**

   If not needed, it is recommended to turn off some services such as SNMP, SMTP, UPnP, etc., to reduce risks.

   If necessary, it is highly recommended that you use safe modes, including but not limited to the following services:

   - SNMP: Choose SNMP v3, and set up strong encryption passwords and authentication passwords.
   - SMTP: Choose TLS to access mailbox server.
   - FTP: Choose SFTP, and set up strong passwords.
   - AP hotspot: Choose WPA2-PSK encryption mode, and set up strong passwords.

10. **Audio and Video Encrypted Transmission**

    If your audio and video data contents are very important or sensitive, we recommend that you use encrypted transmission function, to reduce the risk of audio and video data being stolen during transmission.

    Reminder: encrypted transmission will cause some loss in transmission efficiency.

11. **Secure Auditing**

    - Check online users: we suggest that you check online users regularly to see if the device is logged in without authorization.
    - Check device log: By viewing the logs, you can know the IP addresses that were used to log in to your devices and their key operations.

12. **Network Log**

    Due to the limited storage capacity of the device, the stored log is limited. If you need to save the log for a long time, it is recommended that you enable the network log function to ensure that the critical logs are synchronized to the network log server for tracing.

13. **Construct a Safe Network Environment**

    In order to better ensure the safety of device and reduce potential cyber risks, we recommend:

    - Disable the port mapping function of the router to avoid direct access to the intranet devices from external network.
    - The network should be partitioned and isolated according to the actual network needs. If there are no communication requirements between two sub networks, it is suggested to use VLAN, network GAP and other technologies to partition the network, so as to achieve the network isolation effect.
    - Establish the 802.1x access authentication system to reduce the risk of unauthorized access to private networks.
    - Enable IP/MAC address filtering function to limit the range of hosts allowed to access the device.