



All-in-one AI Traffic Camera

User's Manual



V1.0.0

Foreword

General

This manual introduces the installation, functions and operations of the 16MP All-in-one AI Traffic Camera (hereinafter referred to as "the Camera"). Read carefully before using the Camera, and keep the manual safe for future reference.

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.
 TIPS	Provides methods to help you solve a problem or save time.
 NOTE	Provides additional information as a supplement to the text.

Revision History

Version	Revision Content	Release Time
V1.0.1	Updated appearance	December 2024
V1.0.0	First release.	April 2023

Privacy Protection Notice

As the Camera 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 Camera.
- If there is any uncertainty or controversy, we reserve the right of final explanation.

Important Safeguards and Warnings

This section introduces content covering the proper handling of the device, hazard prevention, and prevention of property damage. Read carefully before using the device, and comply with the guidelines when using it.

Transportation Requirements



Transport the device under allowed humidity and temperature conditions.

Storage Requirements



Store the device under allowed humidity and temperature conditions.

Installation Requirements



- Do not connect the power adapter to the device while the adapter is powered on.
- Strictly comply with the local electrical safety code and standards. Make sure the ambient voltage is stable and meets the power supply requirements of the device.
- Do not connect the device to two or more kinds of power supplies, to avoid damage to the device.



- Personnel working at heights must take all necessary measures to ensure personal safety including wearing a helmet and safety belts.
- Do not place the device in a place exposed to sunlight or near heat sources.
- Keep the device away from dampness, dust, and soot.
- Put the device in a well-ventilated place, and do not block its ventilation.
- Use an adapter or cabinet power supply provided by the manufacturer.
- The power supply must conform to the requirements of ES1 in IEC 62368-1 standard and be no higher than PS2. Please note that the power supply requirements are subject to the device label.
- The device is a class I electrical appliance. Make sure that the power supply of the device is connected to a power socket with protective earthing.
- An emergency disconnect device must be installed during installation and wiring at a readily accessible location for emergency power cut-off.
- Disconnect the device when installing and connecting the lens.

Operation Requirements



- Make sure that the power supply is correct before use.
- Do not unplug the power cord on the side of the device while the adapter is powered on.
- Operate the device within the rated range of power input and output.
- Use the device under allowed humidity and temperature conditions.
- Do not drop or splash liquid onto the device, and make sure that there is no object filled with liquid on the device to prevent liquid from flowing into it.
- Do not disassemble the device.
- Do not aim the device at strong light sources (such as lamplight, and sunlight) when focusing it.
- Do not vibrate, squeeze or immerse the device in liquid during transportation, storage or installation.
- Do not block the ventilation near the device.
- We recommend you use the device with a lightning protection device for stronger protection against lightning. For outdoor scenarios, strictly comply with the lightning protection regulations.
- Ground the function earthing portion of the device (grounding cable or lightning surge protector) to improve its reliability. The device is a class I electrical appliance. Make sure that the power supply of the device is connected to a power socket with protective earthing.
- The device must be used with the protective cover for outdoor scenarios to avoid the risk of water damage to the device.
- Protect the line cord and wires from being walked on or squeezed particularly at plugs, power sockets, and the point where they exit from the device.
- Modify the default password of the device after first-time login to prevent the device from being stolen.

Maintenance Requirements

- Pack the device with packaging provided by its manufacturer or packaging of the same quality before sending it back for repair.
- Please do not touch the photosensitive device with your hands. Use an air blower to clean off the dust and filth on the lens.
- Clean the surface of the device with a soft dry cloth or a clean soft cloth dipped in neutral detergent.
- Use the accessories suggested by the manufacturer. Installation and maintenance must be performed by qualified professionals.

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1 Product Introduction

1.1 Overview

With its high-performance AI processor, 16MP All-in-one AI Traffic Camera delivers excellent quality images even in the toughest weather conditions. For monitoring, it uses deep learning algorithms and traffic-specific, GS-CMOS image sensors with a wide dynamic range and high frame rate.

The Camera is ideal for use in intelligent traffic management and for smart city businesses. It is capable of detecting traffic violations, capturing license plates, generating passing vehicle records, collecting traffic data, and detecting events.

1.2 Functions

Reduced Light Pollution

The IR illuminators supplement light when the Camera captures license plates without using the external flashing light or strobe, significantly reducing light pollution.

Ultra-high Frame Rate

Uses traffic-specific, high-performance GS-CMOS image sensors with a wide dynamic range, high frame rate, and high signal-to-noise ratio, displaying realistic video images in the day and night.

Video Metadata

Deep learning algorithms and a high-performance AI processor allow the Camera to detect and extract detailed information on motor vehicles, providing a reliable data source that can be used in making effective decisions.

Applicable to Various Road Scenes

Ideal for scenarios where license plate recognition is needed, the Camera is capable of capturing more than ten different types of traffic violations, and supports traffic information collection and event detection. It is suitable for road scenarios.

Multi-dimensional Data Sensing

Using GPS positioning and behavior detection by electronic gyroscope, the Camera realizes multi-dimensional data sensing.

Safe and Reliable Performance

Built to withstand the toughest conditions, the Camera functions in a wide temperature and voltage range. It has a built-in lightning protection module, and is IP66 rated. Feel safe using it in all-weather types.

2 Structure

2.1 Appearance

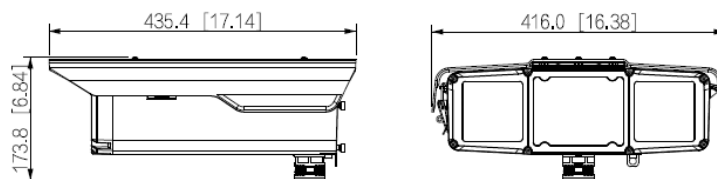
Figure 2-1 Device appearance



Only two models are supported.

2.2 Dimensions

Figure 2-2 Dimensions (mm [inch])



3 Quick Configuration

You can use the ConfigTool to quickly configure the Camera, including initialization, system update and web client login.



- The operation pages vary depending on different versions.
- Get the ConfigTool installation package from technical support and install it on your local computer.

3.1 Initializing the Camera

You can initialize the Camera, and cameras connected to the Camera in batches through the ConfigTool.



Uninitialized devices are not available for any operations and are displayed in gray on the Camera list.

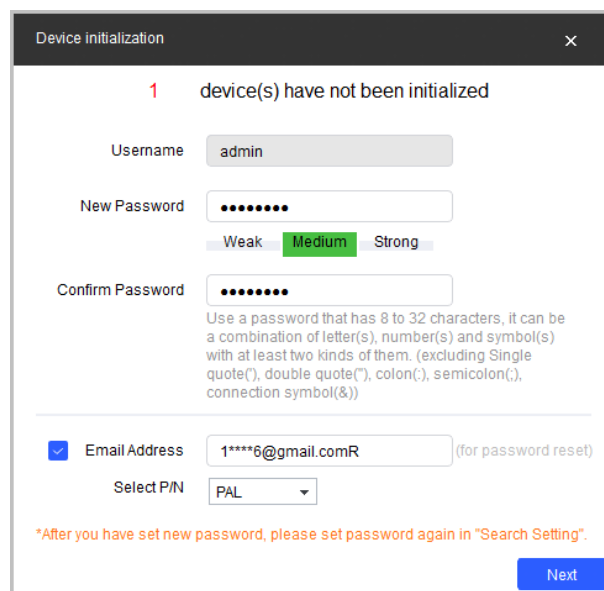
Procedure

Step 1 Start the ConfigTool, and then click **Modify IP**.

The ConfigTool automatically searches for devices on the same network segment with the computer.

Step 2 Select a device to be initialized, and then click **Initialize**.

Figure 3-1 Device initialization



Step 3 Set and confirm the password, and enter an email for future password reset.



The pages are for reference only, and might differ from the actual page.

Step 4 Click **Initialize**, and the system starts initializing the Camera.

 is displayed for successful initialization, and  is displayed for initialization failure. Click the icon to view details.

Step 5 Click **Finish**.

3.2 Changing IP Address

Background Information

You can acquire and change the IP address of devices accessed through wired network. This section uses changing IP address with the ConfigTool as the example.

Procedure

- Step 1 Start the ConfigTool.
- Step 2 Click **Modify IP**.
- Step 3 Select the device(s) whose IP need(s) to be changed.
- Change one IP address: Click **Edit** corresponding to the device.
 - Change IP addresses in batches: Select the devices, and then click **Batch Modify IP**.
- Step 4 Set mode, IP, subnet mask and gateway.
- Step 5 Click **Confirm**.

3.3 Upgrading the Camera

Background Information

Single upgrade and batch upgrade are supported.

Procedure

- Step 1 Start the ConfigTool.
- Step 2 Click **Device Upgrade**.
- Step 3 Select the Camera to be updated.
- Update one by one: Click  corresponding to the Camera.
 - Update in batches: Select multiple devices, and then click **Batch Upgrade**.
- Step 4 Select the update file.
- Step 5 Update the Camera.
- Update one by one: Click  to start updating.
 - Update in batches: Click **OK** to start updating.



During update, if the Camera is disconnected, as long as the ConfigTool stays on the update page, the upgrade will continue when the Camera is reconnected.

3.4 Logging in to Web

On the **Modify IP** page, click **Web** corresponding to the Camera, and then you are directed to the login page of the web client. Enter the login username and password to log in.

4 Web Client Operations

You can access and manage connected devices, such as cameras and radars through the web client of the Camera.



The web pages displayed in this section are for reference only, and might differ from the actual model.

4.1 Web Introduction

Log in to the web client of the Camera through a browser, on which you can operate, configure and maintain the Camera.

4.1.1 Recommended System Requirements

Table 4-1 Recommended system requirements

Component	Recommended System Requirements
Operating system	Windows 7 and later.
CPU	Intel core i3 and later.
Graphics card	Intel HD Graphics and later.
Memory	2 GB and bigger.
Monitor resolution	1024 × 768 and higher.
Browser	Internet Explorer 11, Chrome 41/33, and Firefox 49.

4.1.2 Login

Background Information



- For first-time login or login after the Camera is restored to factory defaults, initialization is required.
- Make sure that the IP address of the computer and that of the Camera are on the same network segment. Otherwise, the initialization might fail.

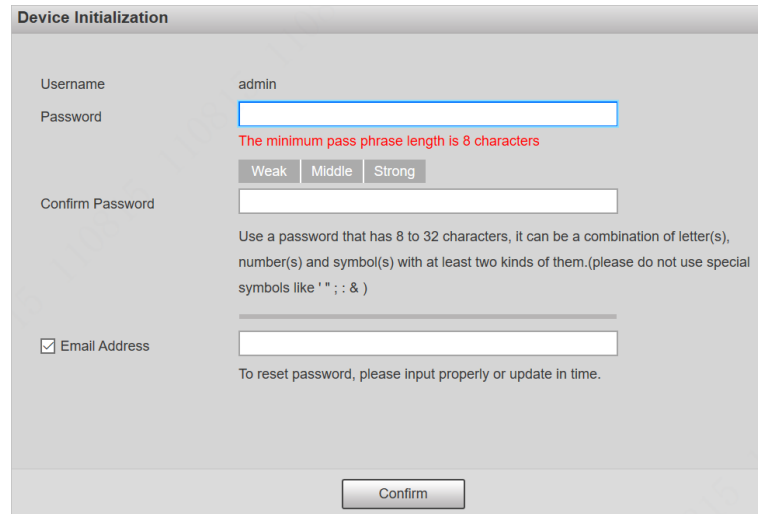
Procedure

- Step 1 Open the browser and enter the IP address of the Camera, and then press the Enter key.
- Step 2 Enter and confirm the password.



Change the password from **Setting** > **System** > **Account** > **Account** > **Username**. For details, see "4.7.9.2.1 Account".

Figure 4-1 Device initialization



Device Initialization

Username: admin

Password:

The minimum pass phrase length is 8 characters

Weak Middle Strong

Confirm Password:

Use a password that has 8 to 32 characters, it can be a combination of letter(s), number(s) and symbol(s) with at least two kinds of them.(please do not use special symbols like ' " ; : &)

☒ Email Address:

To reset password, please input properly or update in time.

Confirm

Step 3 Select **Email Address**, and then enter an email address.

The email address is used for resetting password.

Step 4 Click **Confirm**.

Step 5 Enter **Username** and **Password** on the login window, and then click **Login**.



The account will be locked for five minutes after five failed username or password attempts.

Step 6 On the **Live** page, click **Please click here to download and install the plug-in** to download and install the plug-in.

The **Live** page is normally displayed.

4.1.3 Resetting Password

When you forget the password, you can set a new password.



- You need to enter an email address during device initialization to receive the security code. Otherwise, password reset is not available. You can also change the email address from **Setting > System > Account > Account > Username**. For details, see "4.7.9.2.1 Account".
- The password of a device can only be reset up to 10 times a day.
- You can only get two security codes for each QR code.
- Use the security code to reset the password within 24 hours after you receive it. Otherwise the security code will become invalid.

Procedure

Step 1 Open the browser and enter the IP address of the Camera, and then press Enter.

Step 2 Click **Forgot password?** on the login page, and then click **OK** in the pop-up window.

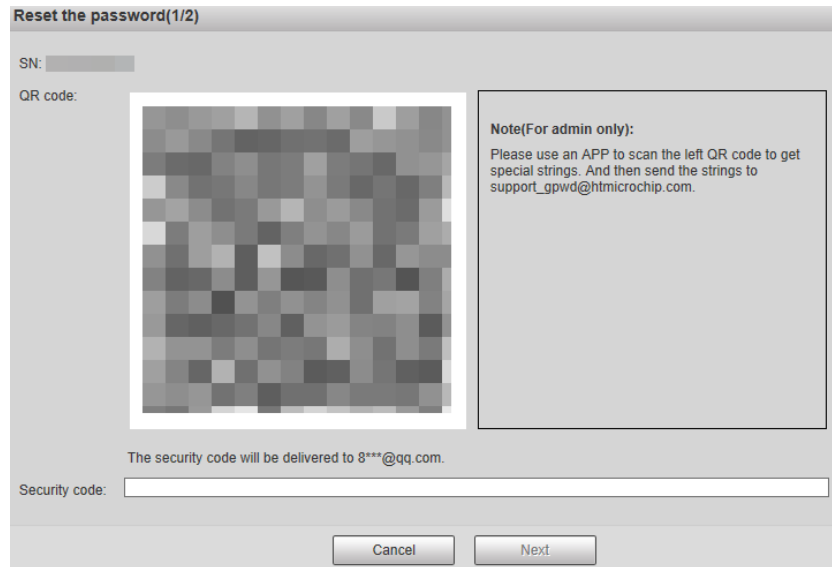


If Internet Explorer is used, **Stop running this script** is displayed. In this case, click **No** to continue to run the script.

Step 3 Scan the QR code, and the scan result will be sent to the reserved email.

- Step 4 Send the received scan result to support_gpwd@htmicrochip.com through the reserved email address to get the security code.

Figure 4-2 Reset password (1)



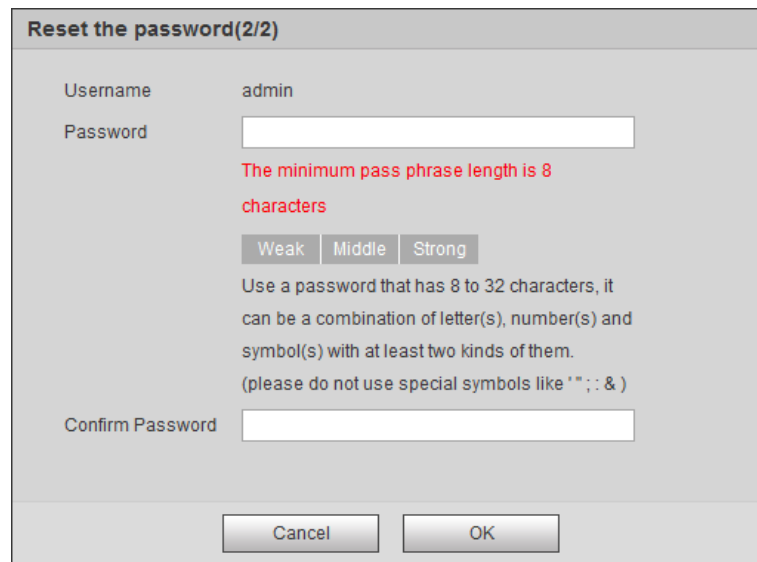
- Step 5 Enter the security code, and then click **Next**.

- Step 6 Enter and confirm the new password.



Follow the password security prompt to set a password with a high security level.

Figure 4-3 Reset password (2)



- Step 7 Click **OK**.

4.1.4 Web Functions

Figure 4-4 Tabs

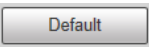
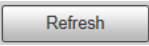


Table 4-2 Tab functions

Function	Content
Live	View the real-time videos and captures of the camera.
Radar & Video Integration	Integrates the video and radar detection results together, allowing you to view the integrated images and metadata.
Radar	Configure the radar and debug the detection result.
Playback	Plays back video recordings and videos related to traffic violations to track events (if any).
Search	Search for vehicles and recordings.
Setting	Configure intelligent traffic rules, the basic attributes of the Device, network settings, event management, storage management, system management, and view system information.
Alarm	Set alarm prompts.
Logout	Log out of the web client.

The common buttons on the web page are as follows.

Table 4-3 Common buttons

Button	Description
	Restores the parameter to the default value.
	Restores the parameter to the value saved last time.
	Saves current configurations.

4.2 Live

The **Live** page is displayed after you successfully log in to web. On this page, you can view the live video image and the captured number plate, take snapshots, view event details, and more.

Figure 4-5 Live

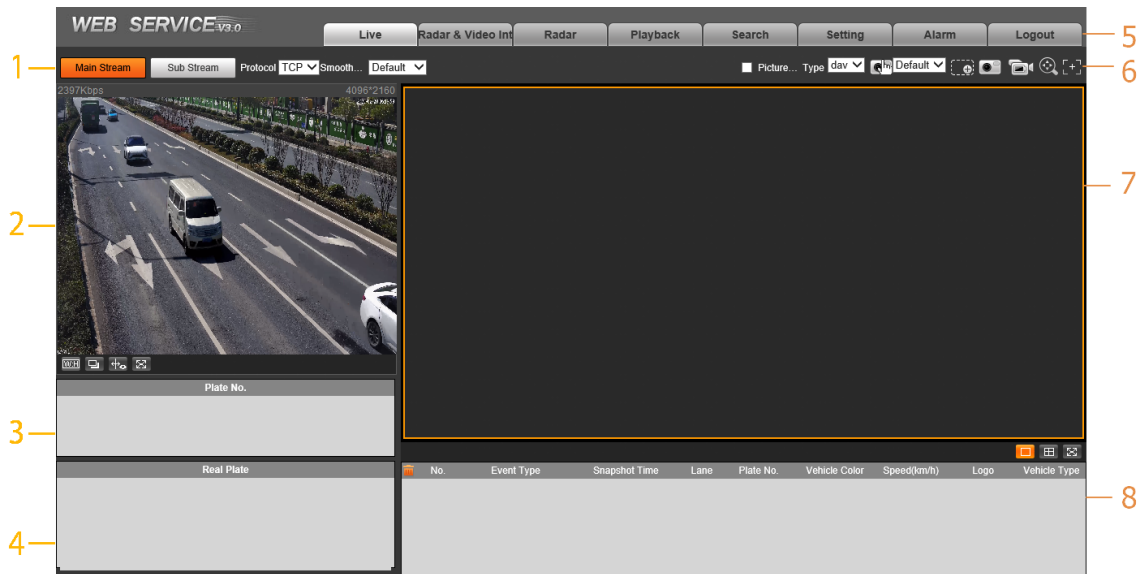


Table 4-4 Description of live page

No.	Description	No.	Description
1	Video stream	5	System functions
2	Live view	6	Functions of the live view
3	Logged plate number	7	Vehicle snapshot
4	Plate snapshot	8	Event list

4.2.1 Video Stream

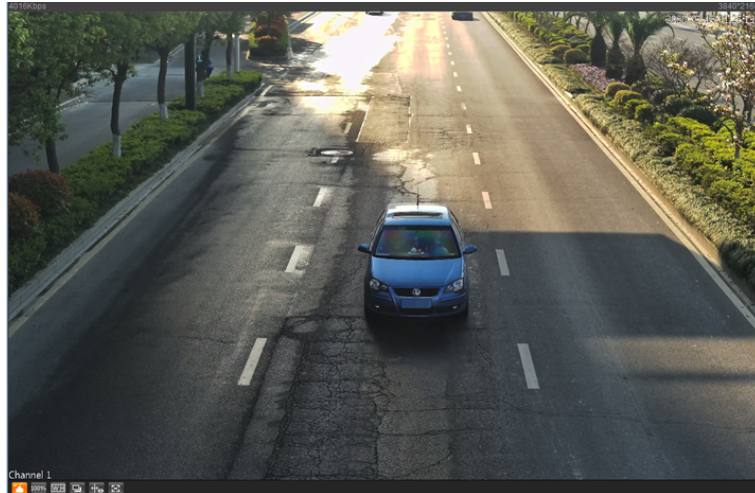
- **Main Stream** : Make sure that the Camera can record videos and carry out network surveillance when the network is normal. You can configure main stream resolution within the supported range of the Camera.
- **Sub Stream** : Replaces main stream to make network surveillance and reduce the network bandwidth usage when network bandwidth is insufficient.
- **Protocol** : Video surveillance protocol. Currently it only supports **TCP**.
- **Fluency** : Fluency of viewing the live video. The fluency can be set to **High**, **Middle**, **Low** and **Default** (recommended).

4.2.2 Live View

Displays the live video captured by the Camera. You can also click the icons to change the display mode of live view.

-  : Adjust the image to original size or appropriate window.
-  : Click it to switch to big window. Click it again to exit big window.

Figure 4-6 Big window



- : Click it to enable smart track detection. Number plate, vehicle bounding box, and other smart tracking information will be displayed in the video image.
- : Click it and the window is displayed in full screen; double-click or right-click to exit full screen.

Table 4-5 Image adjustment

Icon	Name	Description
	Brightness	Adjust the overall image brightness. Change the value when the image is too bright or too dark. The range is from 0 to 128 (64 by default).
	Contrast	Change the value when the image brightness is suitable, but contrast is not enough. The range is from 0 to 128 (64 by default).
	Hue	Adjust the image hue. For example, change red into blue. The default value is made by the light sensor and normally it does not have to be adjusted. The range is from 0 to 128 (64 by default).
	Saturation	Adjust the vividness of the colors, without influencing the overall brightness of the image. The range is from 0 to 128 (64 by default).
	—	Click it to restore brightness, contrast, saturation, and hue to their default values.



In this image adjustment window, you can only adjust image brightness, contrast, hue, and saturation of local web. To adjust system brightness, contrast, hue and saturation, go to **Setting > Camera > Image > General**.

4.2.3 Plate Number Recognition

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

4.2.4 Plate Snapshot

Displays the snapshot of a license plate when a vehicle passes.

4.2.5 System Functions

Click the icons to set system functions, which include playback, video recording and snapshot query, intelligent rules setting, alarm event setting, and system logout. See more details in the following chapters.

4.2.6 Functions on the Live Interface

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

Table 4-6 Function description of the Live page

Icon	Name	Description
	Picture Preview	Select the checkbox, and 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 at the lower part of the page. The snapshots are saved in the storage path defined by Setting > Storage > Storage > Storage Path .
	Type	Select the format of video recordings (dav by default).
	Manual Snapshot	Click it, and the Camera takes a snapshot when a vehicle passes. The snapshot is saved in the storage path.  • Enable Picture Preview first. • To change the storage path of snapshots, go to Setting > Storage > Storage > Storage Path.
	Snapshot	Click it, and a snapshot is taken, even when there is no vehicle passing. The snapshot is saved in the path defined by Setting > Storage > Storage > Storage Path .
	Digital Zoom	Click and drag to select any area in the video window, and then the area will be zoomed into. In any area of the video window, click  or right-click to exit.
	Video Recording	Click it to start recording. Click  again to stop recording and the recorded video will be saved to the set path.  The Camera will keep recording until the web page is closed or you log out if the recording is not manually stopped.

Icon	Name	Description
	Easy Focus	Click it to start auto focus, local focus, and license plate check for the monitoring image.  Picture Preview and license plate check cannot be enabled at the same time.

4.2.7 Vehicle Snapshot

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

4.2.8 Event List

Select **Picture Preview**, and the event information will be displayed, including number, event types, capture time, lanes, plates, vehicle color, speed, vehicle signs, and vehicle types.

4.3 Viewing Radar & Video Integration

Background Information

View the integrated data of the Camera video and radar detection results on one page.

Procedure

- Step 1 Click **Radar & Video Integration**.
- Step 2 On the left side, click icons at the lower-left corner to view vehicle details on the image.
- Click  to enable radar & video integration, and then the target ID, distance and travelling speed are displayed on the image.
 - Click  to display the radar targets.
 - Click  to display the video targets.
 - Click  to display the video image in full screen. Double-click or press Esc to exit the full screen.
- Step 3 Adjust the radar detection.
- Click **On** or **Close** next to **Target Trajectory** to display or hide the target trajectory.
 - Different types of targets, such as Non-motor vehicles, pedestrians, large, middle and small vehicles, can be displayed in different icons respectively.
- Step 4 Click **Picture Preview** at the upper-right corner, and then the metadata obtained after the radar & video integration are displayed on the list.

4.4 Radar Configuration

Configure the radar to accurately capture events during bad weathers and poor light conditions.

4.4.1 Radar Settings

4.4.1.1 Calibrating by Radar & Video

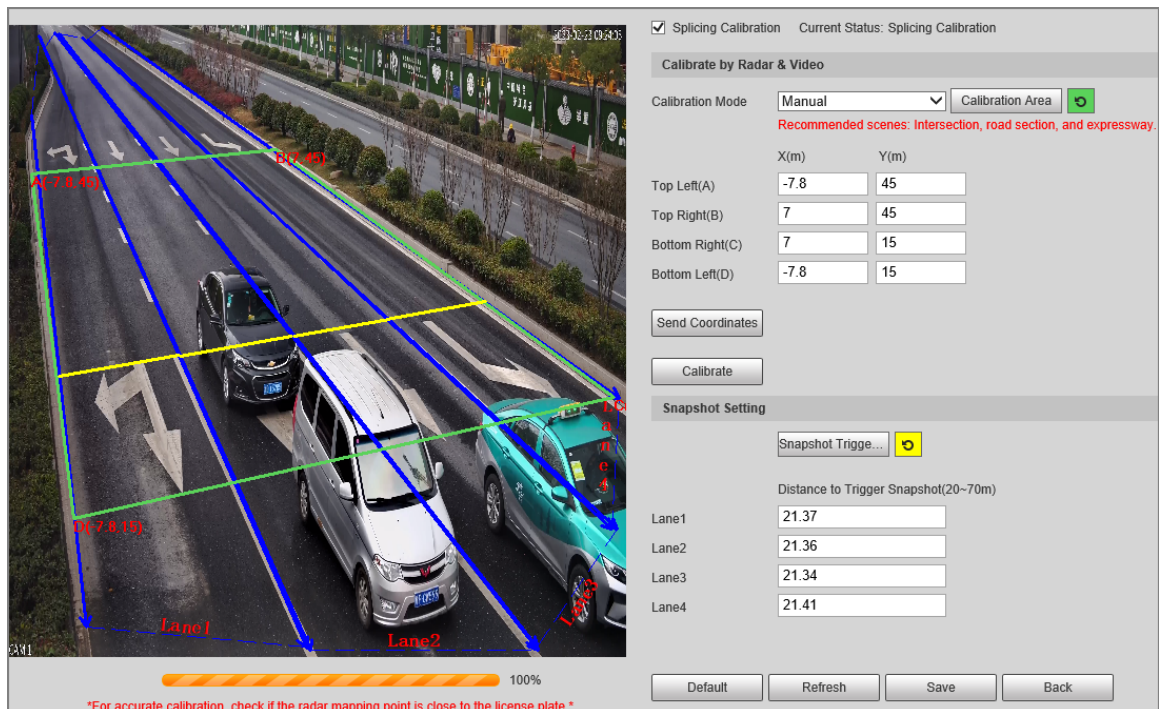
Calibrate the radar. Make sure when the radar sends signals to the camera, the camera can capture the right target.

Procedure

- Step 1** Select **Radar** > **Radar Settings**.
- Step 2** Click **Calibrate by Radar & Video**.
- Step 3** Select a channel on the prompted page, and then select the **Splicing Calibration** checkbox.

You can also calibrate the radar manually without enabling splicing calibration. In this case, you need to manually measure the distance between the drawn calibration area and the Camera.

Figure 4-7 Radar calibration



Step 4 Calibrate the radar.

- Manual calibration

Set the coordinates of the calibration area and the trigger distance manually.



In situations where manual measurement is accurate, the precision of manual calibration is higher than automatic calibration.

1. Select **Manual** next to **Calibration Mode**, and then adjust the calibration frame on the image based on the on-site measurement.

You can also click , and then click **Calibration Area** to draw an area on the image.

2. Set the coordinates of the calibration area.

3. In the **Snapshot Setting** section, click **Snapshot Triggering Line**, and then draw the lines on each lane.

The distance between the triggering line and the Camera is displayed on the bottom.

4. Adjust the triggering distance as needed, and then click **Confirm**.
5. Click **Calibrate**, and then click **Confirm**.

- Automatic calibration

Set the width of the calibration area to be the same as that of the actual road, and then the algorithm will automatically calibrate the radar.

1. Select **Auto** next to **Calibration Mode**.
2. Set the **Area Width** according to the actual width of the road.
3. Click **Calibrate**, and then click **Confirm**.

Step 5 Click **Back**.

4.4.1.2 Configuring General Information

Set the parameters of the radar and the lanes.

Procedure

Step 1 Select **Radar** > **Radar Settings**.

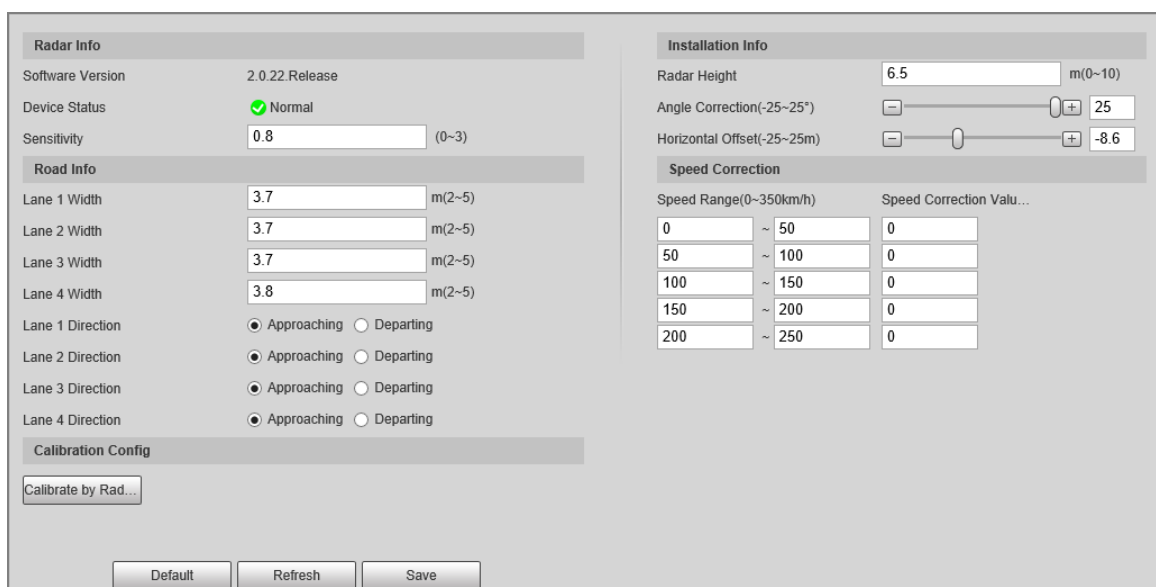
The information of the connected radar is displayed on the top of the page, and you can adjust the **Sensitivity**.



Under general situations, we recommend you leave the sensitivity as default to avoid false detections brought by higher sensitivity.

Step 2 In the **Road Info** section, set the lane width and direction based on the actual site.

Figure 4-8 Lane information



The screenshot shows the 'Radar Settings' interface. It is divided into several sections:

- Radar Info:**
 - Software Version: 2.0.22 Release
 - Device Status: ✔ Normal
 - Sensitivity: 0.8 (range 0~3)
- Road Info:**
 - Lane 1 Width: 3.7 m(2~5)
 - Lane 2 Width: 3.7 m(2~5)
 - Lane 3 Width: 3.7 m(2~5)
 - Lane 4 Width: 3.8 m(2~5)
 - Lane 1 Direction: ☒ Approaching ☐ Departing
 - Lane 2 Direction: ☒ Approaching ☐ Departing
 - Lane 3 Direction: ☒ Approaching ☐ Departing
 - Lane 4 Direction: ☒ Approaching ☐ Departing
- Calibration Config:**
 - Calibrate by Rad...
- Installation Info:**
 - Radar Height: 6.5 m(0~10)
 - Angle Correction(-25~25°): 25
 - Horizontal Offset(-25~25m): -8.6
- Speed Correction:**

Speed Range(0~350km/h)		Speed Correction Valu...
0	~ 50	0
50	~ 100	0
100	~ 150	0
150	~ 200	0
200	~ 250	0

At the bottom, there are buttons for 'Default', 'Refresh', and 'Save'.

Step 3 In the **Installation Info** section, set the installation information of the Camera.

Table 4-7 Installation information description

Parameter	Description
Radar Height	The installation height of the Camera.

Parameter	Description
Angle Correction	Adjust the installation angle of the radar. Make sure the angle is the same as that in the Visualized Data section. For details, see "4.4.2 Configuring Visualized Data".
Horizontal Offset	Adjust the horizontal offset of the radar. Make sure the value is the same as that in the Visualized Data section.

Step 4 In the **Speed Correction** section, set the speed range and the speed correction value of the Camera.

Step 5 Click **OK**.

4.4.2 Configuring Visualized Data

See the effect of your configurations on radar detection in real time. You can also adjust some of the radar parameters and view the changes.

Procedure

Step 1 Select **Radar** > **Visualized Data**.

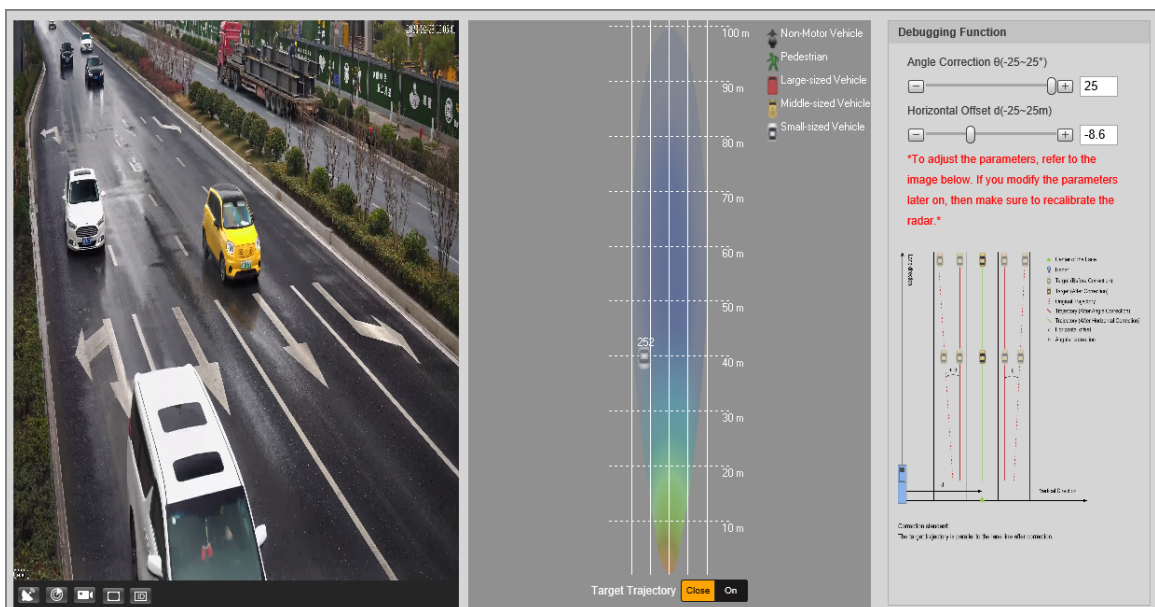
Step 2 Adjust the value of angle correction and horizontal offset.

Click the image at the lower-right corner to see the correction standards.

Step 3 Click **Close** **On** to display **Target Trajectory**.

You can see the trajectory of targets the radar detects.

Figure 4-9 Visualized Data



Step 4 Click , you can see the detection points of the radar on targets.



When the target is large and the detection sensitivity is set high, the radar might recognize it as two targets.

4.5 Viewing Recordings

You can search for, view and download recordings.

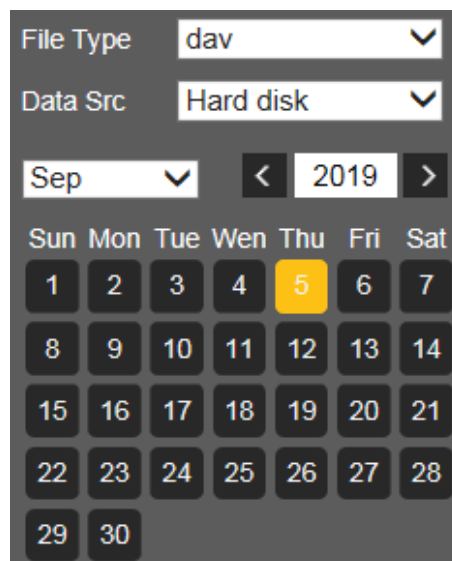
Procedure

Step 1 Click **Playback**.

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

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

Figure 4-10 Playback file

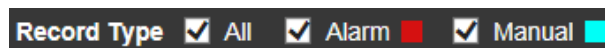


Step 3 Select a day with a blue point which indicates that there are recordings on that day, and a colored progress bar is displayed on the timeline.

- Point to this day, and the color turns to orange.
- Select this day, and the color turns to green.

Step 4 Select a record type, and then only files of the selected types will be displayed on timeline and on the file list.

Figure 4-11 Record type



You can click each time format to play back the videos in 24-hour mode, 2-hour mode, 1-hour mode, and 30-minute mode respectively.

Figure 4-12 Time format



Step 5 Click any time on the progress bar, and the system plays back recordings starting from that time.

Figure 4-13 Timeline

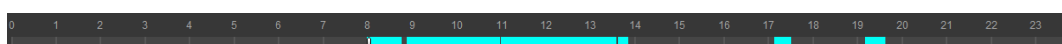


Table 4-8 Video playing description

Icon	Function	Description
	Play and pause	: The video is paused or not being played. : The video starts playing.
	Stop	Stop playing video.
	Play by frame	Play by frame.
	Slow	Slow down.
	Fast	Speed up.

Step 6 Click , and videos recorded on a selected day will be displayed in a list.

Figure 4-14 Playback file

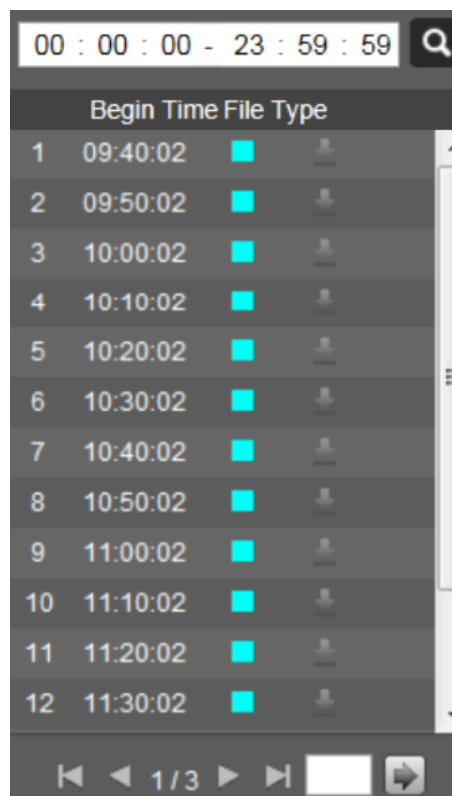


Table 4-9 Playback file description

Parameter	Description
	Search for all the video files within the selected period.
	Click it to download files to local.
	Click it to go back to the calendar page, where you can search for and play back videos of other periods.

Step 7 Double-click a file in the list, and the file will be played with information displayed such as the file size, start time, and end time.

4.6 Search

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

4.6.1 Picture Query

4.6.1.1 Querying Memory Card Images

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

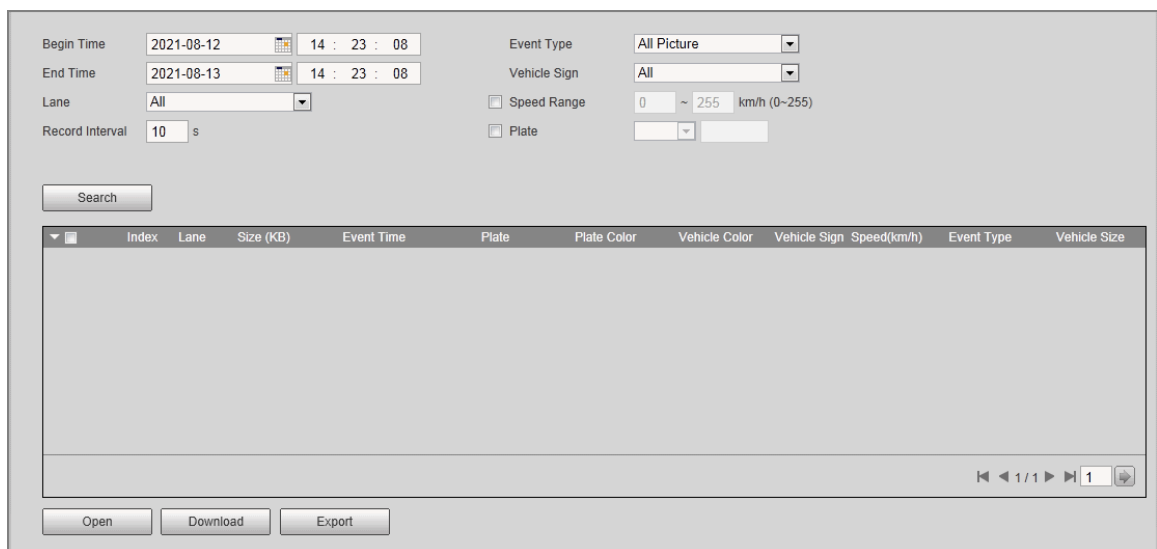


Make sure the TF card is inserted into the Camera; otherwise, there might be no results.

Procedure

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

Figure 4-15 Memory Card Image



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

Table 4-10 SD picture parameters

Parameter	Description
Begin Time	Set the begin time and the end time to define a period, and then you can search for images stored on the TF card within this period.
End Time	
Event Type	All Picture : Search for all snapshots. Mix Events : Search for snapshots related to events, which include but are not limited to ANPR , Cross Solid White Line , and Wrong-way Driving .
Vehicle Sign	Search for snapshots by the selected vehicle sign. You can select All , Unknown or a specific vehicle sign.
Lane	Select the capture lane.

Parameter	Description
Speed Range	Select the Speed Range checkbox, and set the speed range to search for images of vehicles within the defined speed range.
Record Interval	The length of a recorded video associated with the snapshot that you want to save.
Plate	Select the Plate checkbox, and then enter the plate number to search for images related to this plate.
	This icon is displayed next to the traffic violation snapshot when Related Record is enabled in Advanced Parameter (except ANPR) under Setting > Event > ANPR Snapshot > Rule Config .

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

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

Step 5 Select the path to save the images, and the system starts downloading the images to your computer.

4.6.1.2 Setting Downloading Attribute

You can configure the image information.

Procedure

Step 1 Select **Search > Picture Query > Download**.

Step 2 Set **Download Image by** to download snapshots based on their **Creation Time** or **Snapchat Time**.

Step 3 Select **Download Mode**.

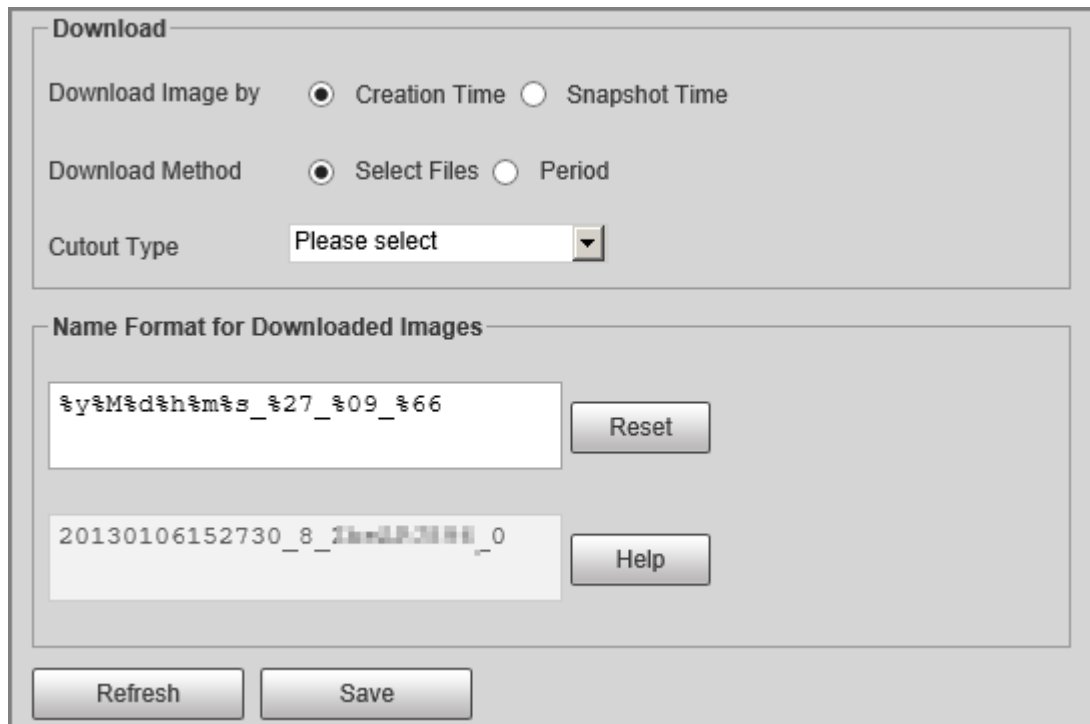
- **Selected File** : Download the selected snapshots.
- **Selected Time** : Download all images captured during the set time period. You can set the time in the **Memory Card Image** tab.

Step 4 Select cutouts that you want to download from **All** , **Plate Cutout**, **B/W Plate Cutout**, **Front Seat Passenger's Face** (cutout of front-seat passenger's face), **Driver Face**, and **Vehicle Body Cutout**.

Step 5 Name the snapshots. Click **Help** to view the image naming rule. Click **Reset** to go back to default.

Step 6 Click **Save**.

Figure 4-16 Downloading attribute



4.6.1.3 Local Image

You can view images saved on your computer and verify whether the image was tampered with a watermark.



To view or set the save path of images on your computer, go to **Setting > Storage > Storage > Storage Path**.

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 Verification**.
 - When the result is **Error**, the picture is tampered.
 - When the result is **Normal**, the picture is not tampered.



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

4.6.2 Flow Query

Background Information

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

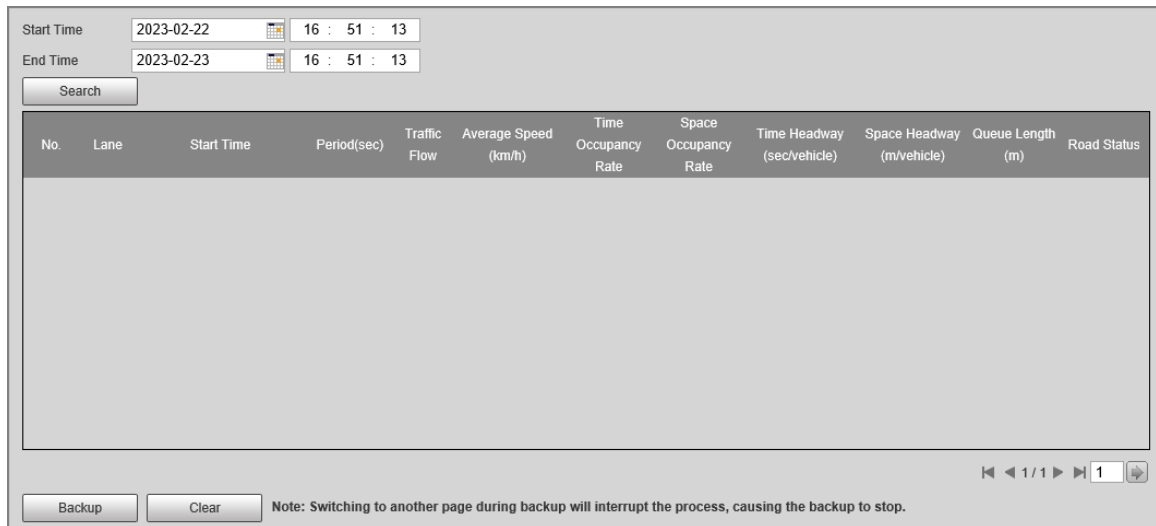


The function is available on select models, and might differ from the actual product.

Procedure

- Step 1 Select **Search** > **Flow Query** > **Flow Query**.
- Step 2 Set **Start Time** and **End Time** of your search.
- Step 3 Click **Search**.
- Step 4 Select search results, and click **Backup** to save the results to computer.
- Step 5 Click **Clear** to delete all the current results.

Figure 4-17 Flow query



The screenshot shows the Flow Query interface. At the top, there are input fields for 'Start Time' (2023-02-22 16:51:13) and 'End Time' (2023-02-23 16:51:13), with a 'Search' button below them. Below the search area is a table with the following columns: No., Lane, Start Time, Period(sec), Traffic Flow, Average Speed (km/h), Time Occupancy Rate, Space Occupancy Rate, Time Headway (sec/vehicle), Space Headway (m/vehicle), Queue Length (m), and Road Status. The table is currently empty. At the bottom, there are 'Backup' and 'Clear' buttons, and a note: 'Note: Switching to another page during backup will interrupt the process, causing the backup to stop.' There are also pagination controls showing '1 / 1'.

4.6.3 Video Search

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

4.6.3.1 Recording

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 to the path defined in **Setting** > **Storage** > **Storage** > **Storage Path**.
- The function is available on select 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 4-18 Record



Table 4-11 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 to enable radar & video integration, and then the target ID, distance and travelling speed are displayed on the image
	Click to display the radar targets.
	Click it to play back the video. Click  to pause.
	Click it to stop playing back the current video.
	Click it to slow down the video to play at $\times (1/2)$, $\times (1/4)$ or $\times (1/8)$. Click  to restore to normal playing speed.
	Click it to speed up the video to play at $\times 2$, $\times 4$, or $\times 8$. Click  to restore to normal playing speed.
	Click it to play back the next frame.

4.6.3.2 Watermark

Verify the watermark of selected video recordings to check whether the recording was tampered. Only .dav recording is supported.

Prerequisites

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

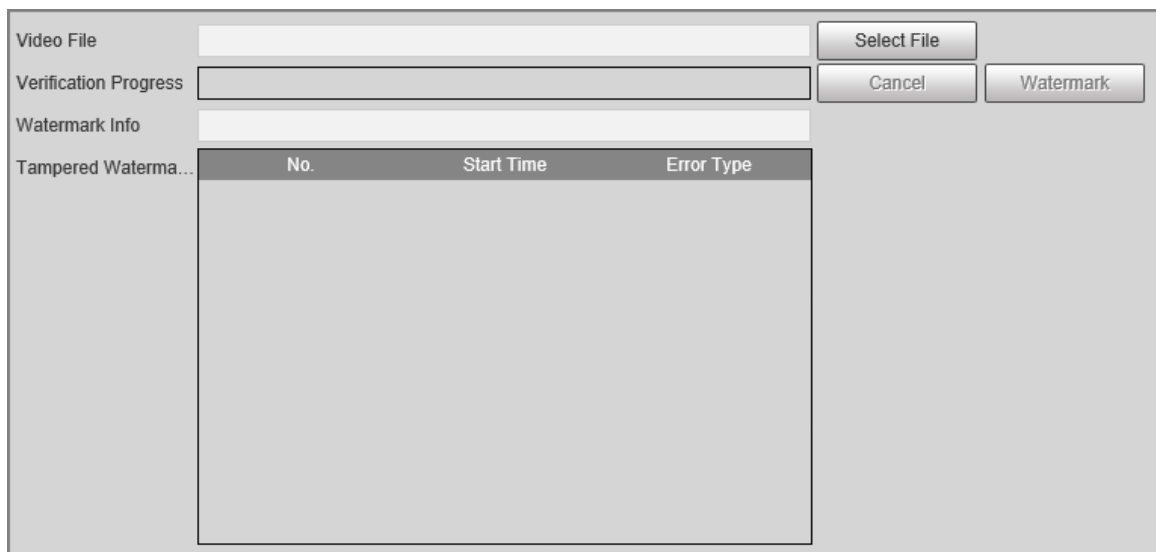


The watermark character is **DigitalCCTV** by default.

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**.
 - If the video is tampered, you can check the details next to **Tampered Watermark**.

Figure 4-19 Watermark



No.	Start Time	Error Type

4.7 Setting

Set parameters of the Camera, including intelligent traffic rules, network settings, remote devices, event management, storage management, system management, and system information, to realize functions such as image composition, speed measuring, network connection, data storage and alarm.

4.7.1 Camera Settings

After connecting the Camera to the network and viewing the live video on its web client, you can adjust the image and video parameters of the Camera to get clear images.

4.7.1.1 Camera Attributes

4.7.1.1.1 Configuring General Parameters

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

Procedure

- Step 1** Select **Setting > Camera > Image > General**.
- Step 2** Select a channel and then configure the corresponding parameters.

Figure 4-20 General

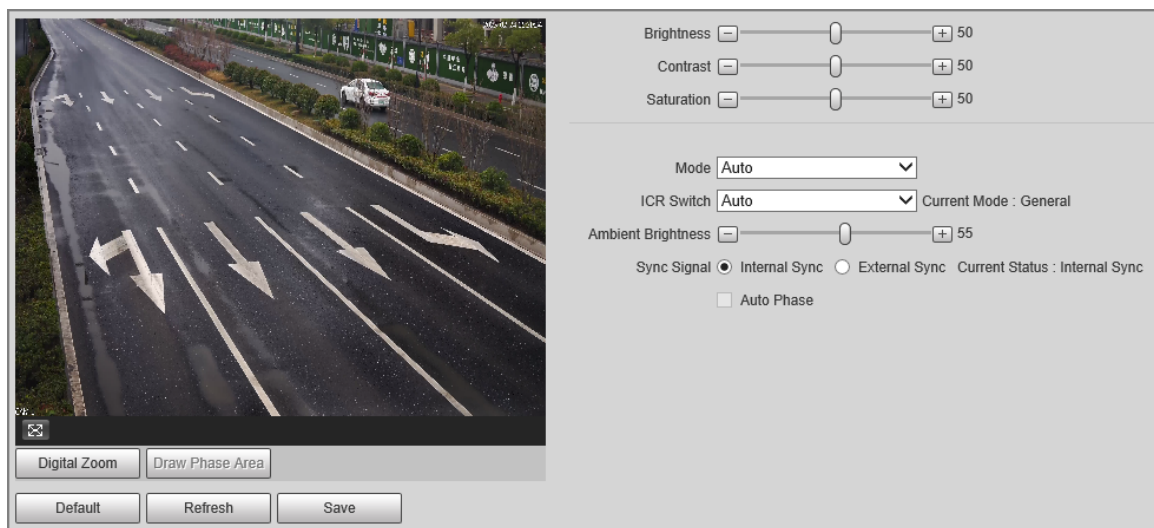


Table 4-12 General parameters

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.
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	- 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.

Parameter	Description
Mode	● Colorful : The image is always colored. ● Auto Switch by Brightness : 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 CPL will start to work. ● CPL : The CPL is always running. Applicable to scenarios with high brightness. ● IR (for IR models) or Normal (for white light models): Applicable to scenarios with low brightness.
Ambient Brightness	Set the brightness value of the environment where the device is located.
Sync Signal	Select the synchronization signal mode. When you select External Sync, you can set a fixed synchronization phase value by dragging the slider for day and night respectively to adjust the brightness of the red light in different scenes. 1. Select Auto Phase. 2. Click Setting to set the phase of each shutter interval. Automatic phase interval can only be within the day/night phase range. 3. Select the indicator need to be adjusted, the system displays a yellow box. 4. Click Test, the system provides reference values, you can fine-tune on the basis of the reference value. 5. Click OK.  In the setting interface, the red box indicates the current valid phase value.
Day Phase	Manually adjust the phase value of the sync signal during the day.
Night Phase	Manually adjust the phase value of the sync signal during the night.

Step 3 Click **Save**.

4.7.1.1.2 Configuring Shutter

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

Procedure

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

Step 2 Select a channel, and then configure the corresponding parameters.

Figure 4-21 Shutter

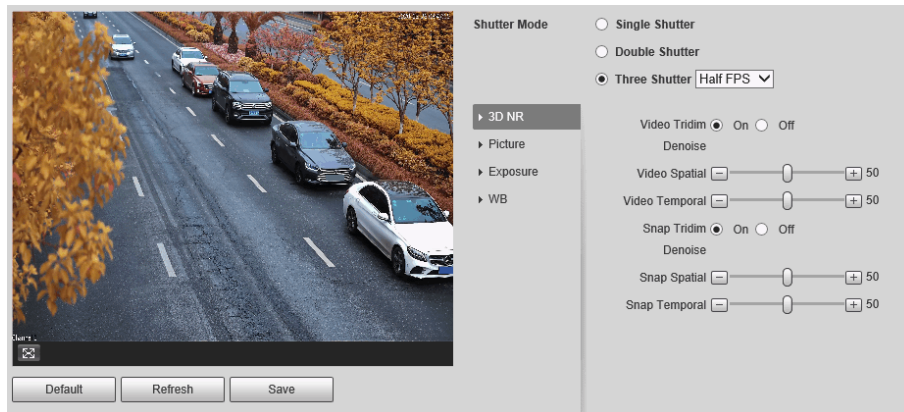


Table 4-13 Shutter parameters

Module	Parameter	Description
Shutter Mode	Single Shutter	Video and snapshot share the same exposure mode.
	Double Shutter	● Half FPS : Video and snapshot take half of the frame respectively. ● Full FPS : Snapshot takes 1frame, and video takes the rest of the frames. Video Shutter and Snap Shutter can be separately configured.
	Three Shutter	Video Shutter , Snap Shutter and Recognition Shutter can be separately configured. Three Shutter mode is available only when Common Mode is set to Snap Match Mode from Setting > Event > ANPR Snap > Illegal Capture > Other Settings.
3D NR	Video/Snap Tridim Denoise	When it is On , 3D NR is enabled to reduce noise of video/ snapshot.
	Video/Snap Spatial	Spatial video/snapshot denoising. The higher the value, the less noise there is.
	Video/Snap Temporal	Temporal video/snapshot denoising. The higher the value, the fewer the flicker noise.
Picture	Scene	You can change the scene and adjust the sharpness of the corresponding scene. Scenes available: Dawn/Dusk , Daytime , 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	Select On to enable WDR (wide dynamic range), which helps provide clear video images in bright and dark light.

Module	Parameter	Description
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 the Iris Adjust Mode. 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 Customized Range , and then set the shutter range.  Only available when Mode is set to Manual .
	Shutter Scope	Set the time range of shutter.  Only available when Shutter is set to Customized Range .
	Gain Scope	Set the value range of gain.  Only available when Mode is set to Manual .
WB	Mode	Set scene mode to adjust the image to its best status.

Step 3 Click **Save**.

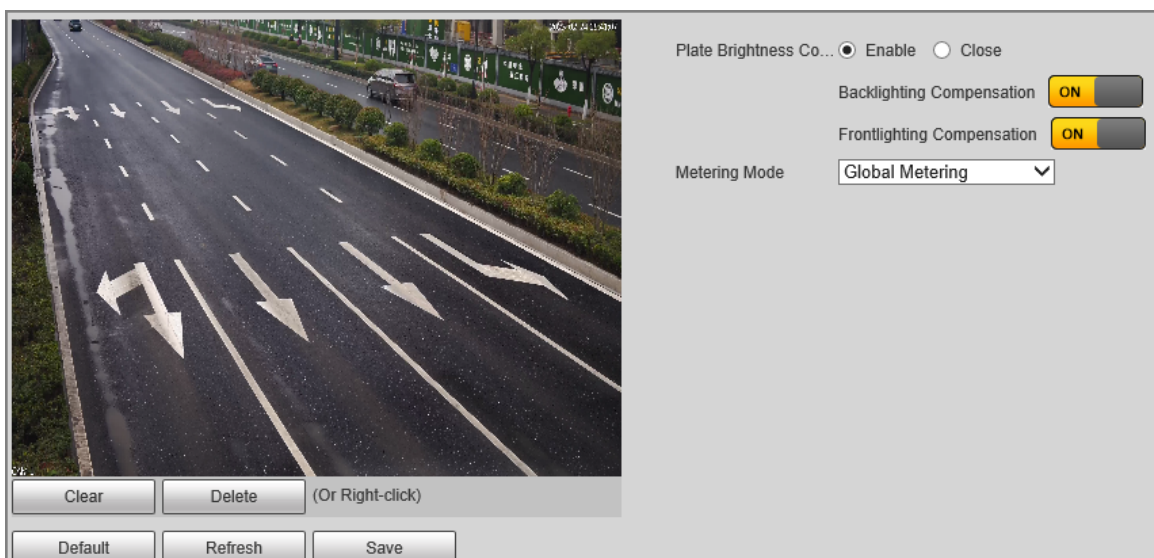
4.7.1.1.3 Configuring Metering Zone

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

Procedure

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

Figure 4-22 Metering



Step 2 Configure the parameters.

Table 4-14 Metering parameter description

Parameter	Description
Plate Light	When selecting On , you can turn ON backlight and frontlight according to scene requirements to improve the backlight and frontlight image brightness.
Backlight	
Frontlight	
Measure Mode	● Global Measure : Measure the brightness of the whole image area and intelligently adjust the overall image brightness. ● Partial Measure : Measure the brightness of drawn areas and adjust the overall image brightness to the opposite.  Draw areas on the image, and you can right-click an area or select it and then click Delete to delete it. Click Clear can delete all areas.

Step 3 Click **Save**.

4.7.1.1.4 Configuring Focus

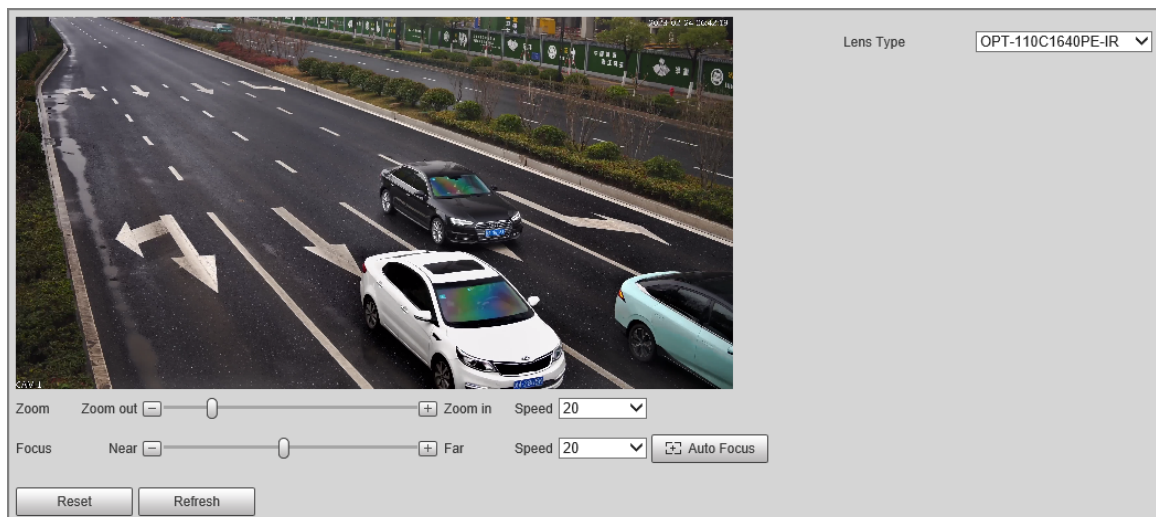
Background Information

Adjust the focus of the Camera.

Procedure

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

Figure 4-23 Focus



Step 2 Configure the parameters.

Table 4-15 Description of focus parameters

Parameter	Description
Lens Type	The type of the Camera lens. Select Manual Vari-Focal to restart the Camera when the lens is not standard.
Zoom	Drag the slider to zoom in or out the video image at the selected speed.

Parameter	Description
Focus	Drag the slider to adjust the camera focus at the selected speed.
Speed	Set the speed of adjusting the value of zoom in/out and focus.
Auto Focus	Automatically adjusts the camera focus to get clear images.

4.7.1.2 Video Attributes

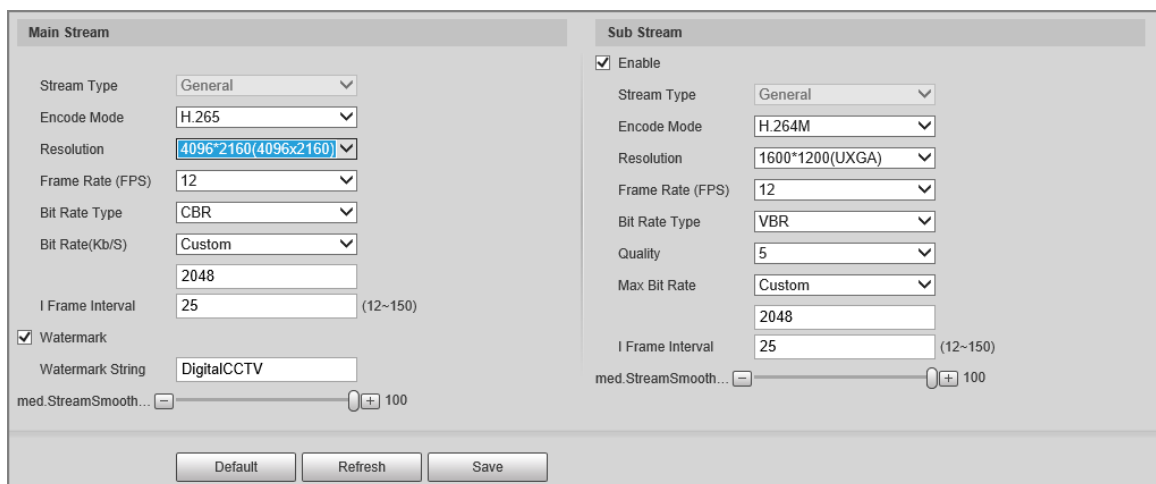
4.7.1.2.1 Configuring Video Parameter

Configure the parameters of video stream.

Procedure

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

Figure 4-24 Video stream



The screenshot displays the 'Video Stream' configuration window, divided into two panels: 'Main Stream' and 'Sub Stream'.

Main Stream Settings:

- Stream Type: General
- Encode Mode: H.265
- Resolution: 4096*2160(4096x2160)
- Frame Rate (FPS): 12
- Bit Rate Type: CBR
- Bit Rate(Kb/S): Custom
- I Frame Interval: 25 (12~150)
- Watermark: ☒ Watermark
- Watermark String: DigitalCCTV
- med.StreamSmooth...: Slider from - to + 100

Sub Stream Settings:

- ☒ Enable
- Stream Type: General
- Encode Mode: H.264M
- Resolution: 1600*1200(UXGA)
- Frame Rate (FPS): 12
- Bit Rate Type: VBR
- Quality: 5
- Max Bit Rate: Custom
- I Frame Interval: 25 (12~150)
- med.StreamSmooth...: Slider from - to + 100

At the bottom, there are buttons for 'Default', 'Refresh', and 'Save'.

Step 2 Configure the parameters.

Table 4-16 Video stream parameter

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.

Parameter	Description
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.
Watermark Settings	You can verify the watermark to check whether the video has been tampered. Select the Watermark Settings 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.
med.StreamSmoothing	Set the video smoothness.
Enable	Enable sub stream when your network bandwidth is insufficient or other conditions that influence the video smoothness in main stream.

Step 3 Click **Save**.

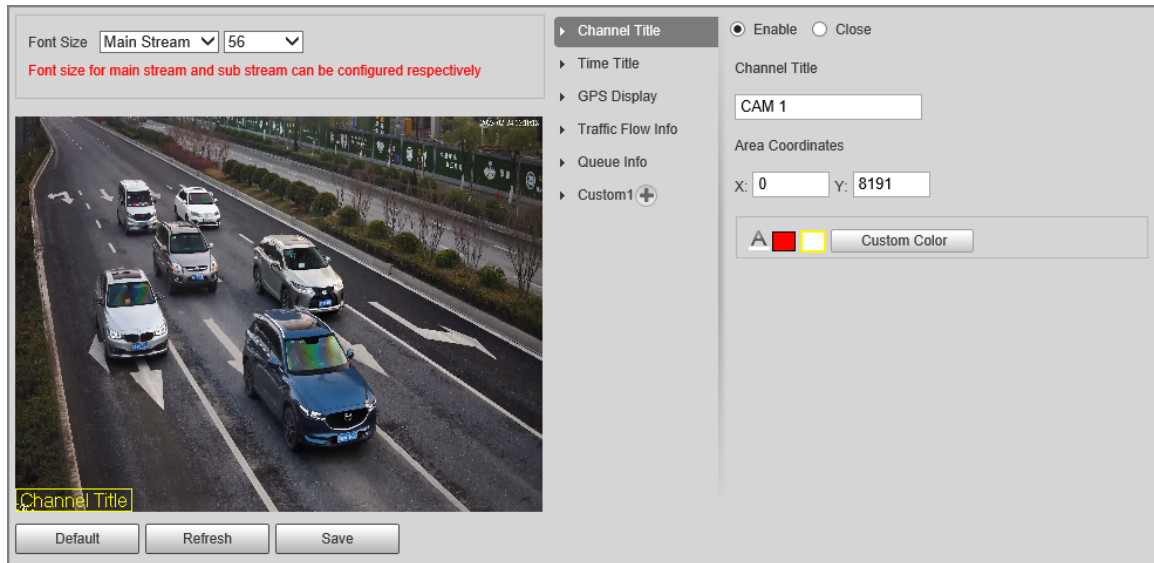
4.7.1.2.2 Configuring Video OSD

Configure the OSD information of videos.

Procedure

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

Figure 4-25 Video OSD



Step 2 Configure parameters.

Table 4-17 Description of video OSD parameters

Parameter	Description
Font Size	Set the font size of Main Stream or Sub Stream .
Channel Title	Enable the function and set the channel title, coordinates and font color (can be customized) of channel information OSD.
Time Title	Enable the function and set the coordinates and font color (can be customized) of time information OSD. You can select Display Week Info to display week information on the video image.
GPS Title	Enable the function and set the coordinates and font color (can be customized) of channel information OSD.
Traffic Flow Info	Enable the function and set the coordinates and font color (can be customized) of flow information OSD.
Queue Info	Enable the function and set the font color (can be customized) of queue information OSD.
Custom	Enable the function and set the coordinates, custom title and font color (can be customized) of custom information OSD.  You can add up to 5 custom titles.

Step 3 Click **Save**.

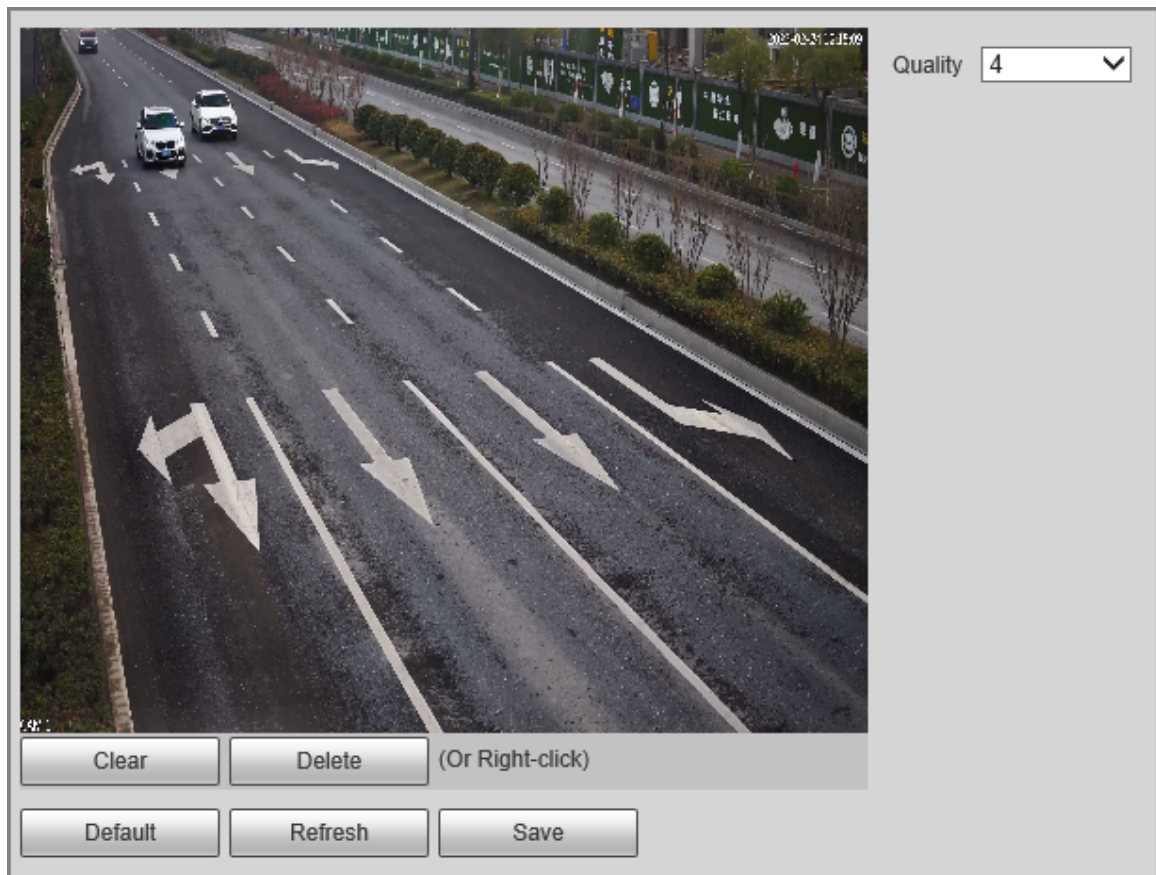
4.7.1.2.3 ROI

Set one or more interested areas in the image, and then the selected image will be displayed with the configured quality.

Procedure

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

Figure 4-26 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 click **Clear** to delete all the regions of interest, or click **Delete** or right-click on the video image to delete the most recently drawn area.

Step 3 Set the image quality of the regions of interest. 6 quality levels are available. The higher the value, the better the quality.

Step 4 Click **Save**.

4.7.2 Network Settings

You can set the network parameters of the Camera.

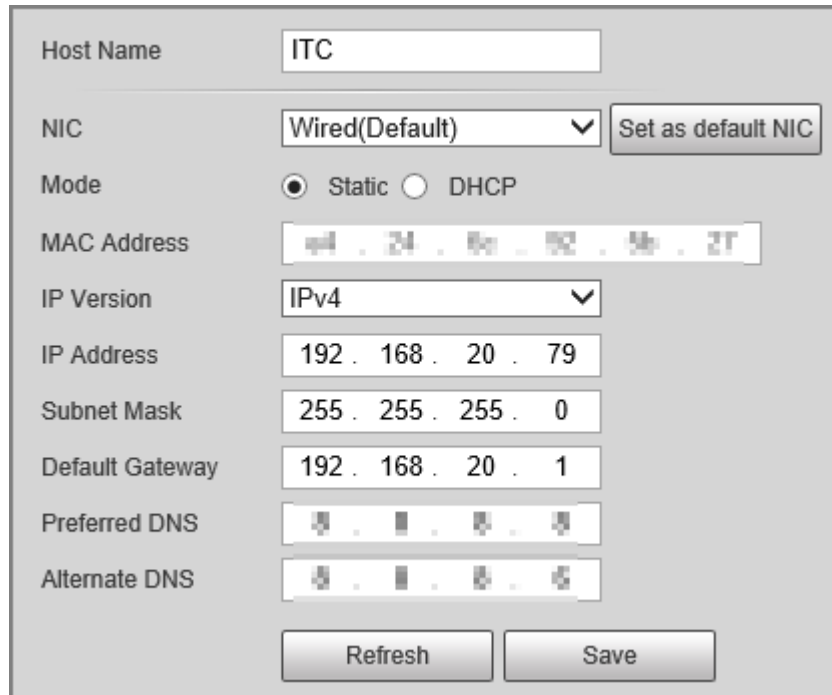
4.7.2.1 TCP/IP

You can set the IP address, DNS server and other parameters of the Camera to make sure that the Camera can connect to other devices on the network.

Procedure

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

Figure 4-27 TCP/IP



Step 2 Configure parameters.

Table 4-18 TCP/IP parameters

Parameter	Description
Host Name	Set the name of the current host, with a maximum length of 15 characters.
Ethernet Card	Dual Ethernet cards are supported. Select an Ethernet card and then click Set as Default to set it to the default.
Mode	Select a network mode. - DHCP mode: Automatically obtains the IP address. The IP Address, Subnet Mask, and Default Gateway cannot be set when DHCP is enabled. You can check the current IP address regardless if the DHCP takes effect. - Static mode: Manually set IP Address, Subnet Mask, and Default Gateway, and then click Confirm. The web page will automatically go to the login page of the set IP address.
MAC Address	MAC address of the host, which cannot be modified.
IP Version	Only IPv4 is supported.
Address	Enter IP address.
Subnet Mask	Set a subnet mask as needed. The subnet prefix is a number in the range from 1 through 255. The subnet prefix identifies a specific network link and usually contains a hierarchical structure.
Default Gateway	Set a default gateway on the same network segment as the IP address as needed.
Preferred DNS	IP address of DNS.
Alternate DNS	IP address of the alternate DNS.

Step 3 Click **Save**.

4.7.2.2 Port Settings

4.7.2.2.1 Port

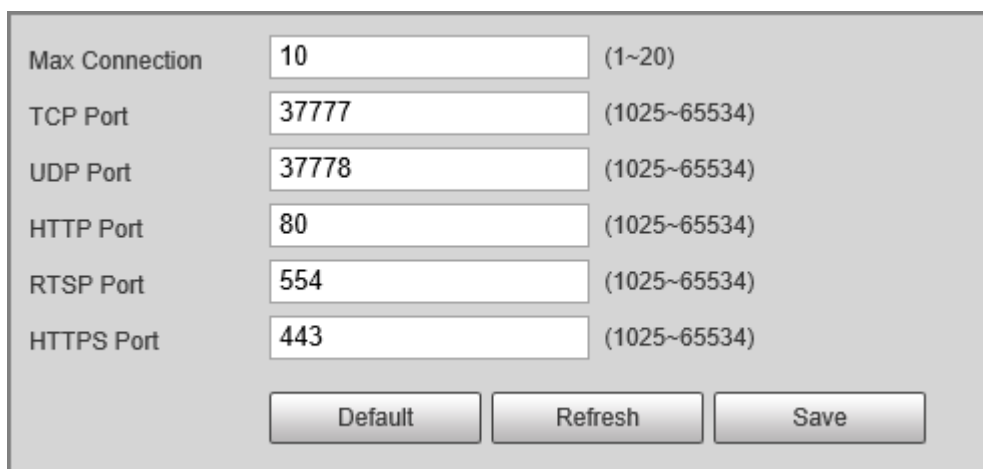
You can set the information of the connected ports to access the Camera through different protocols and configuration tools.

Procedure

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

Step 2 Set the maximum number of clients accessing the Camera at the same time (such as web client and platform client) and each port value of the Camera.

Figure 4-28 Port



Max Connection	10	(1~20)
TCP Port	37777	(1025~65534)
UDP Port	37778	(1025~65534)
HTTP Port	80	(1025~65534)
RTSP Port	554	(1025~65534)
HTTPS Port	443	(1025~65534)

Default Refresh Save

Step 3 Click **Save**.

4.7.2.2.2 ONVIF

Enable ONVIF, and then network video products produced by different manufacturers can communicate with each other.



Login verification is required by default when ONVIF is enabled.

Procedure

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

Step 2 Select **Open** or **Off** as needed.

- By turning on ONVIF authentication, login username and password are required when logging in through ONVIF.
- Login verification is not required when turning off ONVIF authentication.

Step 3 Click **Save**.

4.7.2.3 Registration

Background Information

Configure automatic registration, and the current device location will be reported to the server specified by the user when the Camera is connected to internet, so that the client software can use

the server to access the Camera, and the server can perform operations such as live view, monitoring, and configuration of the parameters of the Device.

Procedure

- Step 1 Select **Setting** > **Network Settings** > **Register**.
- Step 2 Select **Enable** to enable automatic registration, and then enter the address, port, and sub-device ID.

Table 4-19 Auto register parameters

Parameter	Description
Address	Server IP address or server domain that you want to register to.
Port	Port of the server for auto register.
Sub-Device ID	ID of the automatically registered device assigned by the server. Ensure that the ID of the automatically connected device is unique during configuration.

- Step 3 Click **Save**.

4.7.2.4 Multicast

When multiple users preview the video of the same device, unavailability might happen due to network bandwidth restriction. You can fix it by setting up a multicast IP (224.0.0.0–239.255.255.255) to access videos through the multicast protocol.

Procedure

- Step 1 Select **Setting** > **Network Settings** > **Multicast**.
- Step 2 Select the checkbox of **Enable** to enable the function.
- Step 3 Enable main stream or sub stream based on the actual situation and set IP address and port number.
- Step 4 Click **Save**.

4.7.2.5 P2P

If enabled, the camera can be added to other platforms through P2P.

Procedure

- Step 1 Select **Setting** > **Network Settings** > **Platform Access** > **P2P**.
- Step 2 Select the checkbox of **Enable**.
- Step 3 Click **Save**.
You can add the camera to other platforms using its serial number or by scanning its QR code.

4.7.2.6 Routing Settings

The Camera supports configuring routings for dual NICs, and accessing gateways of target network segments.

Procedure

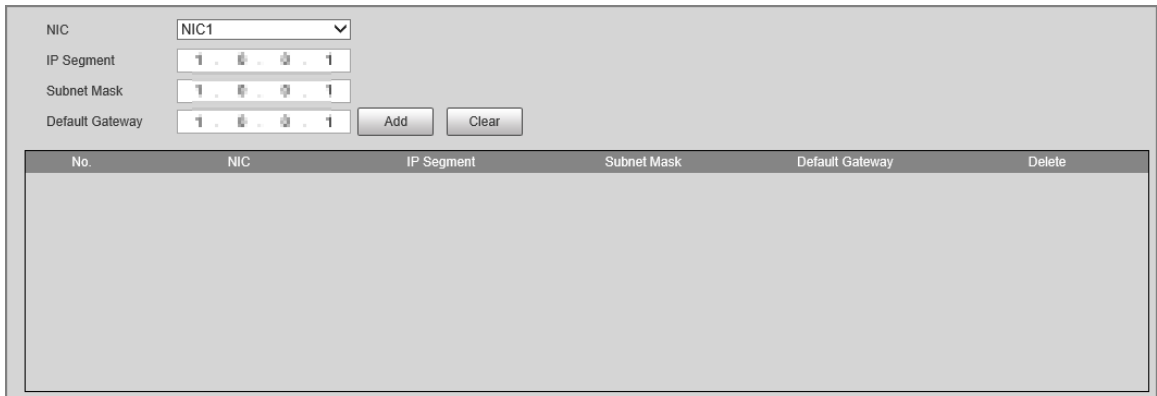
- Step 1 Select **Setting** > **Network Settings** > **Routing Settings**.
- Step 2 Select Ethernet card and enter IP segment, subnet mask and default gateway.

Step 3 Click **Add** , and then **Save Succeeded** appears at the bottom and the routing is added to the list.



- Click  to delete routing one by one.
- Click **Clear** to quickly delete all added routings.

Figure 4-29 Routing settings



4.7.2.7 802.1x

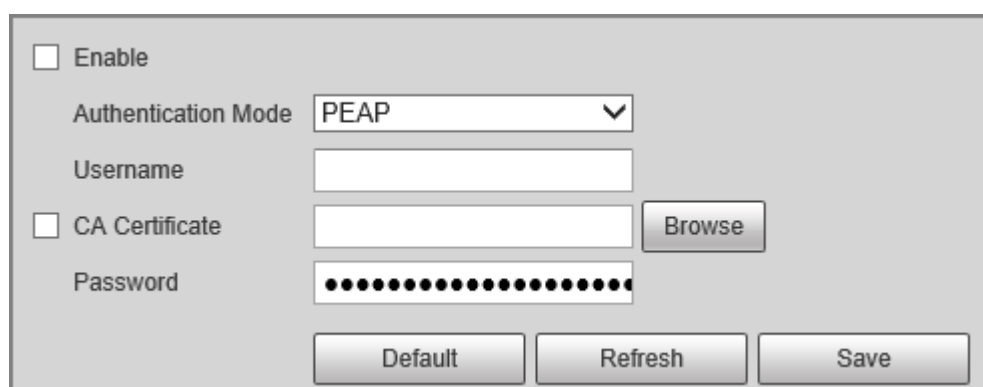
802.1x is a port-based access control and authentication protocol, which can restrict unauthorized devices or users from accessing the LAN through the access port. When the switch in the network is configured with 802.1x, the Camera also needs to be set to 802.1x, otherwise users cannot access the Camera through the network.

Procedure

Step 1 Select **Setting > Network Settings > 802.1x**.

Step 2 Select **Enable**, and then select an Ethernet card. The 802.1x protocol of the NIC is enabled.

Figure 4-30 802.1x



Step 3 Leave the **Authentication Mode** as default, and then enter the username and password for authentication. The username must be the one authorized on the server side.

Step 4 Select **CA Certificate** , click **Browse** to select the CA certificate from local computer.
Contact technical support to obtain the CA certificate.

Step 5 Click **Save**.

4.7.3 Remote Device

Background Information

Remote device (such as enforcement camera or IP camera) information will be displayed on the **Add Camera** page if any of such devices is in use. 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.



This function is available only in **E-Police** mode.

Procedure

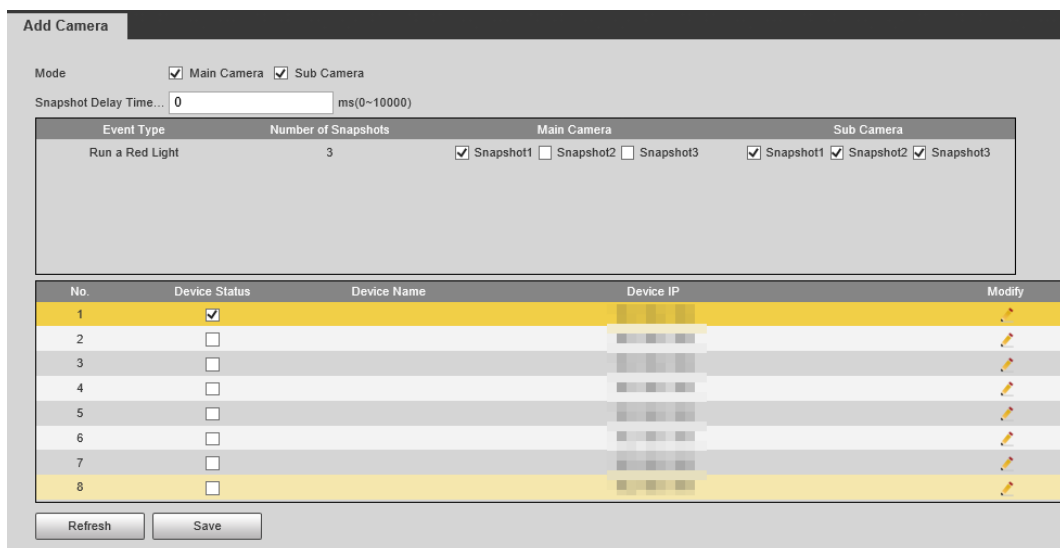
- Step 1** Select **Setting > Add Camera > Remote Config**.
- Step 2** Set the delay time for sub camera in **Snapshot Delay Time for Sub Camera**.
- Step 3** Select a remote device, and then click .
- Step 4** Select **On** to enable using the remote device, and modify other device information such as name, IP address, login username, and password.
- Step 5** Select **Linkage Snapshot** to enable snapshot by the Camera.



If a storage device is used, the snapshots captured by the Camera and the remote device will be composited, and saved to the storage device. If no, the snapshots will be saved to the storage path defined on the web page of each device.

- Step 6** Click **Save**.

Figure 4-31 Add camera



Add Camera

Mode ☒ Main Camera ☒ Sub Camera

Snapshot Delay Time... 0 ms(0~10000)

Event Type	Number of Snapshots	Main Camera	Sub Camera
Run a Red Light	3	☒ Snapshot1 ☐ Snapshot2 ☐ Snapshot3	☒ Snapshot1 ☒ Snapshot2 ☒ Snapshot3

No.	Device Status	Device Name	Device IP	Modify
1	☒			
2	☐			
3	☐			
4	☐			
5	☐			
6	☐			
7	☐			
8	☐			

Refresh Save

4.7.4 Event

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

4.7.4.1 Intelligent Scheme

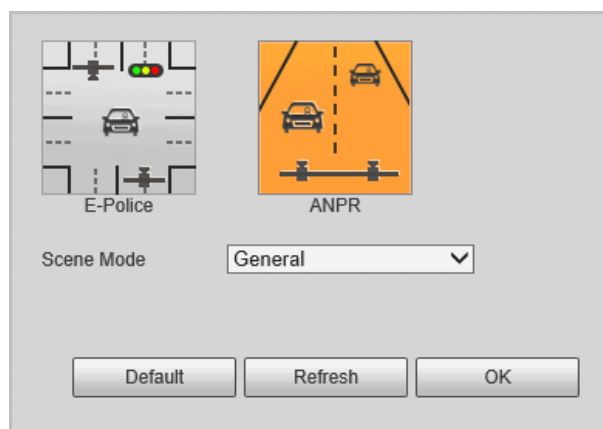
4.7.4.1.1 Switching between E-police and ANPR

Background Information

You can switch the working mode of the Camera between E-police and ANPR.

- **ANPR** is applicable to road sections without signal lights to detect violations such as speeding, driving slow, not wearing seat belt, calling while driving, and more. See "4.7.4.3 Configuring ANPR Snapshot".
- **E-Police** is ideal for intersections with signal lights to detect violations such as running a red light, and more. See "4.7.4.2 Configuring Electronic Police".

Figure 4-32 Select a working mode



Procedure

- Step 1 Select **Setting** > **Event** > **Smart Plan** > **Smart Plan**.
- Step 2 Select **E-police** or **ANPR**.
- Step 3 For ANPR, set **Scene Type**.
 - **General** : For capturing vehicles.
 - **People** : For capturing people and non-motor vehicles.
 - **Non Flashing Light** : For the scenes not using illuminator.
- Step 4 Click **Save**.

4.7.4.1.2 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.

Allowlist Settings

Background Information

You can enable fuzzy matching for allowlist. In this way, if the fuzzy matching result shows that the number plate of a vehicle is in the allowlist, the vehicle will not be captured and there will be no alarm.

Procedure

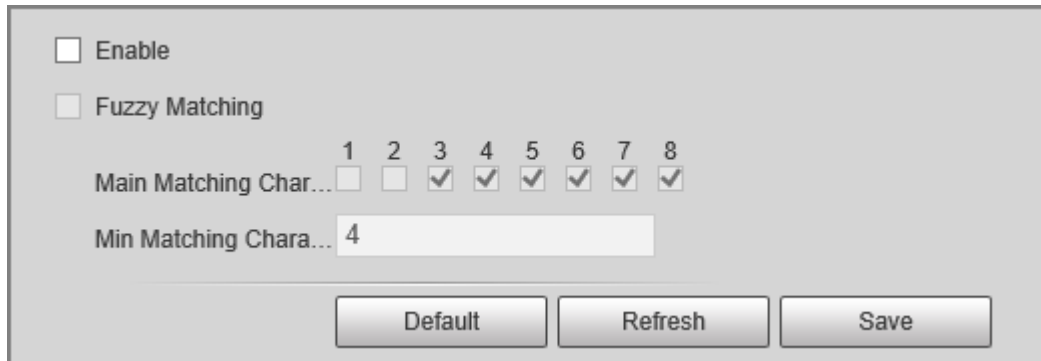
- Step 1 Select **Setting** > **Event** > **Smart Plan** > **Vehicle Blocklist/Allowlist** > **Allowlist Settings**.
- Step 2 Select **Enable** to enable the allowlist.
- Step 3 Select **Fuzzy Matching** to enable fuzzy matching.

Step 4 Configure the matching rule.

- **Main Matching Characters** : The specific digit(s) that should be exactly matched.
- **Min Matching Characters** : The minimum number of digits that should be exactly matched.

For example, if you select 1, 2 and 4 for **Main Matching Characters** and enter 2 for **Min Matching Characters**, the system will successfully recognize a vehicle when any two among digit 1, 2, and 4 are exactly matched.

Figure 4-33 Allowlist settings



Step 5 Click **Save**.

Allowlist

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.

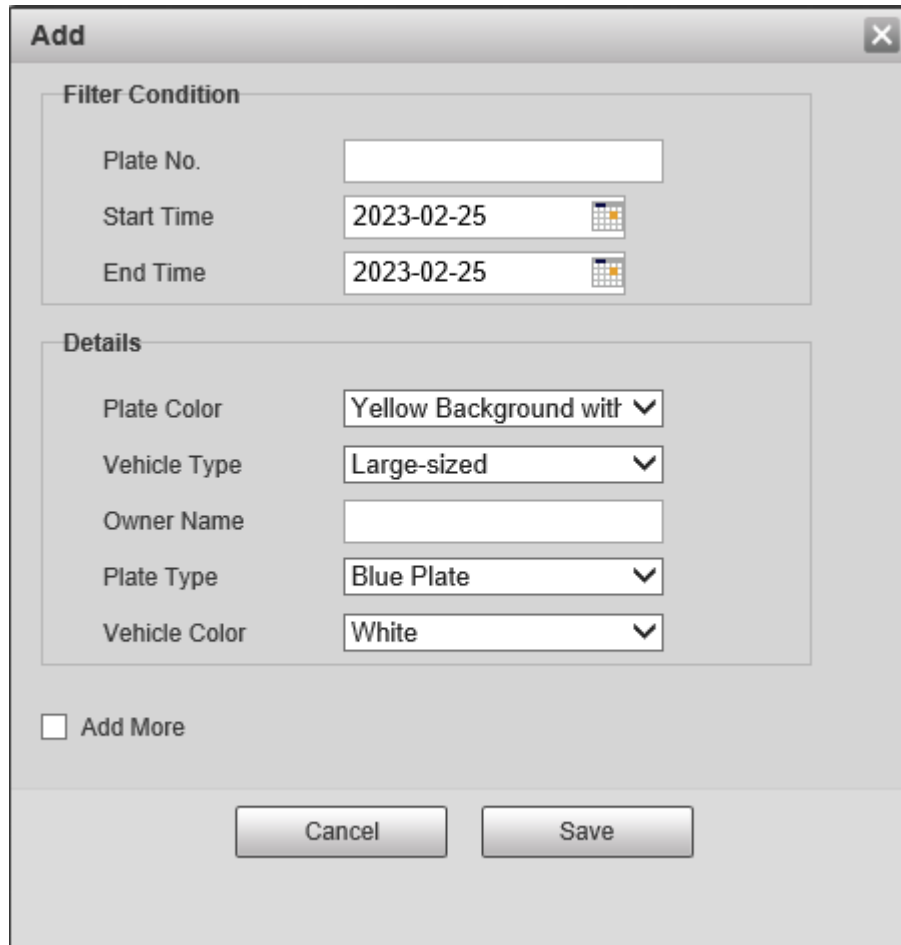
Procedure

Step 1 Select **Setting** > **Event** > **Smart Plan** > **Vehicle Blocklist/Allowlist** > **Allowlist**.

Step 2 Add a number plate.

1. Click **Add**.

Figure 4-34 Add



2. Enter the entire plate number.
3. Set 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.
4. Select the plate color, vehicle type, plate type and vehicle color. Enter the owner of vehicle.
5. Click **Save**.
6. To save and add more, select **Add More** before clicking **Save**.

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.
- Modify plate information: Click **Modify** to modify detailed information of the corresponding plate number. Click **Confirm** to save the settings.
- Delete a plate number: Click **Delete** to delete the corresponding plate number.
- Delete plate number in batches: Click **Clear All**, and then click **Confirm** in the pop-up box to delete all the information in the allowlist.
- Import allowlist plates in batches: Click **Browse**, and then select the path to import the file to. Click **Import** 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.

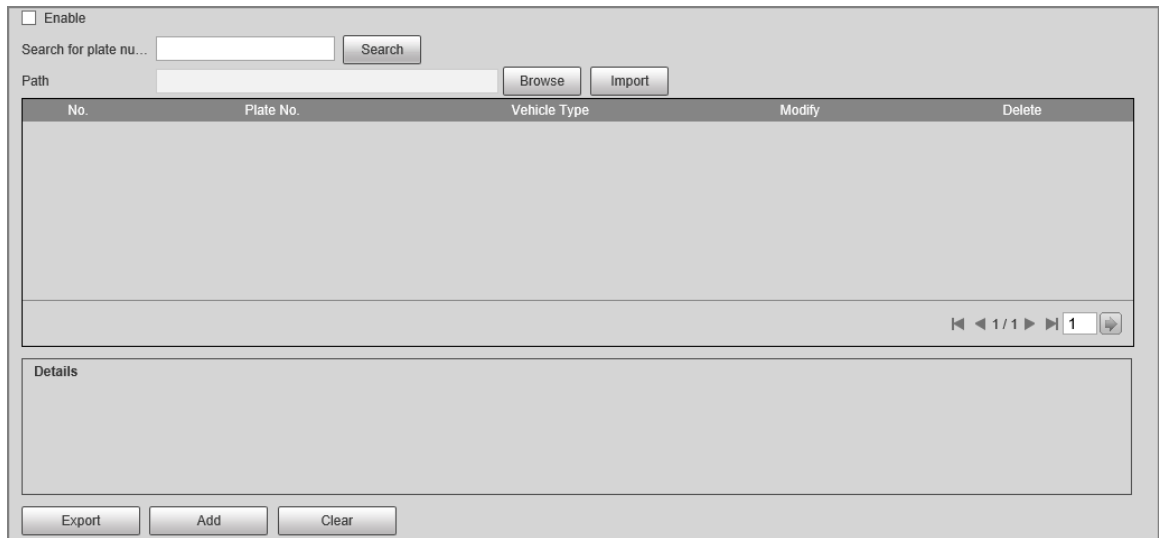
Blocklist

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

Select **Setting** > **Event** > **Smart Plan** > **Vehicle Blocklist/Allowlist** > **Blocklist**, and then select **On** to enable the blocklist function.

The search, import, and export of blocklist are similar to that of allowlist. See "Allowlist".

Figure 4-35 Blocklist search



☐ Enable

Search for plate nu...

Path

No.	Plate No.	Vehicle Type	Modify	Delete

1/1

Details

4.7.4.2 Configuring Electronic Police

Configure electronic police parameters.



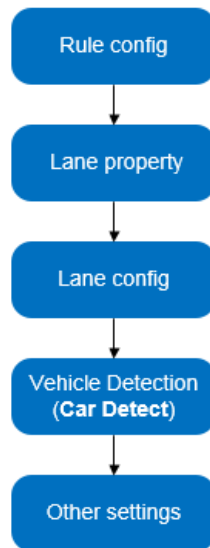
Make sure that you have set **Smart Plan** to **E-police**. For details, see "4.7.4.1.1 Switching between E-police and ANPR".

4.7.4.2.1 Configuring Violation Capture

Configure the video detection parameters for detecting traffic violations.

Follow this order to configure violation capture: Rule config > lane property > lane config > vehicle detection (Car Detect) > other settings. This is described separately in the configuration order below.

Figure 4-36 Configuration order for violation capture



Rule Configuration

You can select the traffic violation types and configure the corresponding parameters of the images of the captured vehicle.

Procedure

- Step 1** Select **Setting** > **Event** > **E Police** > **Violation Snapshot**.
- Step 2** In the **Rule Config** section, click , and then configure picture parameters.

Figure 4-37 Rule configuration (1)

Rule Config					
No.	☐	Event Type	Snapshot Quantity	Picture Parameter	Advanced
1	☒	ANPR	1		
2	☒	Run a Red Light	3		
3	☐	Disobey Direction Arrow	3		
4	☐	Cross Solid White Line	2		
5	☐	Cross Solid Yellow Line	2		



The parameter table describes the parameters involved in all event types, and might differ from the actual page.

Figure 4-38 Configure picture parameters (1)

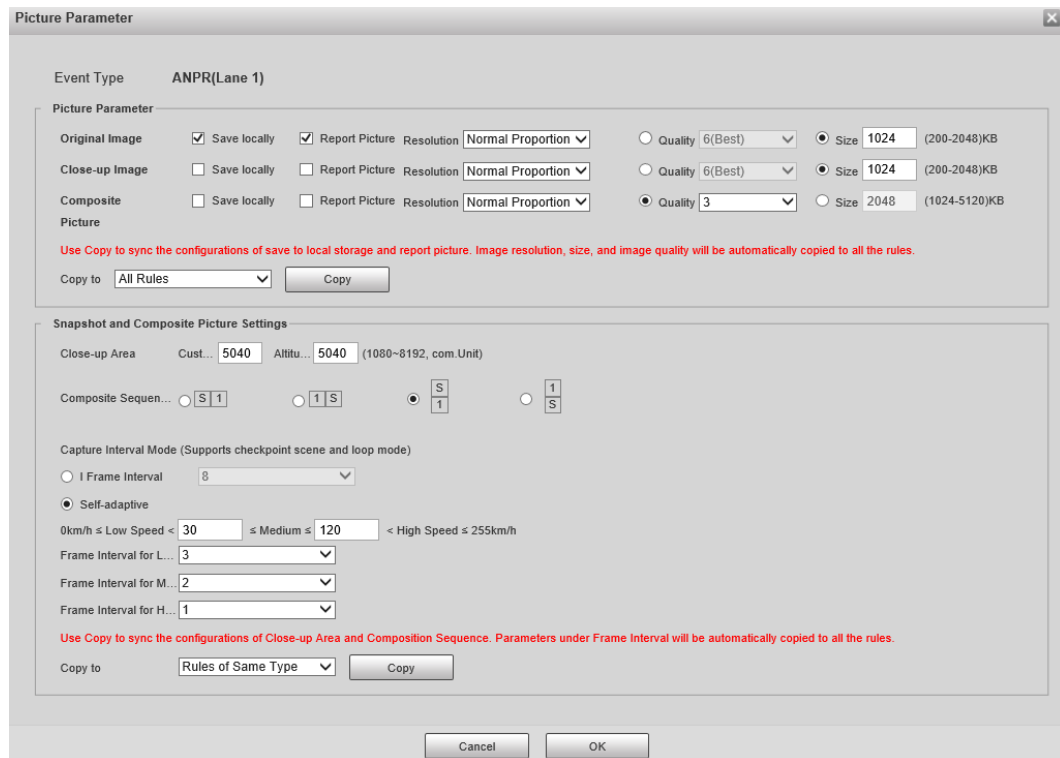


Table 4-20 Picture parameters (1)

Category	Name	Description
Picture Parameter	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.
	Save Locally	Save the vehicle picture locally when an offending vehicle is captured.
	Report Picture	Upload the vehicle picture to the upper-level device or platform when a vehicle is captured.
	Resolution	Select picture resolution.
	Quality	Select the level of picture quality.
	Size	Limit the size of the picture.
	Copy to	Copy the current picture configuration to the same-type rules or all the rules. After selecting an option from Copy to , click Copy .
Snapshot and Picture Synthesis Setting	Feature Region	Centering on the vehicle, enter the height and width of the close-up of the vehicle.
	Compound order of one pictures	● S : Close-up ● 1 : Original images

Step 3 Click **OK**.

Step 4 Click , and then configure advanced parameters.



The parameter table describes the parameters involved in all event types, and might differ from the actual page.

Figure 4-39 Advanced parameters (1)

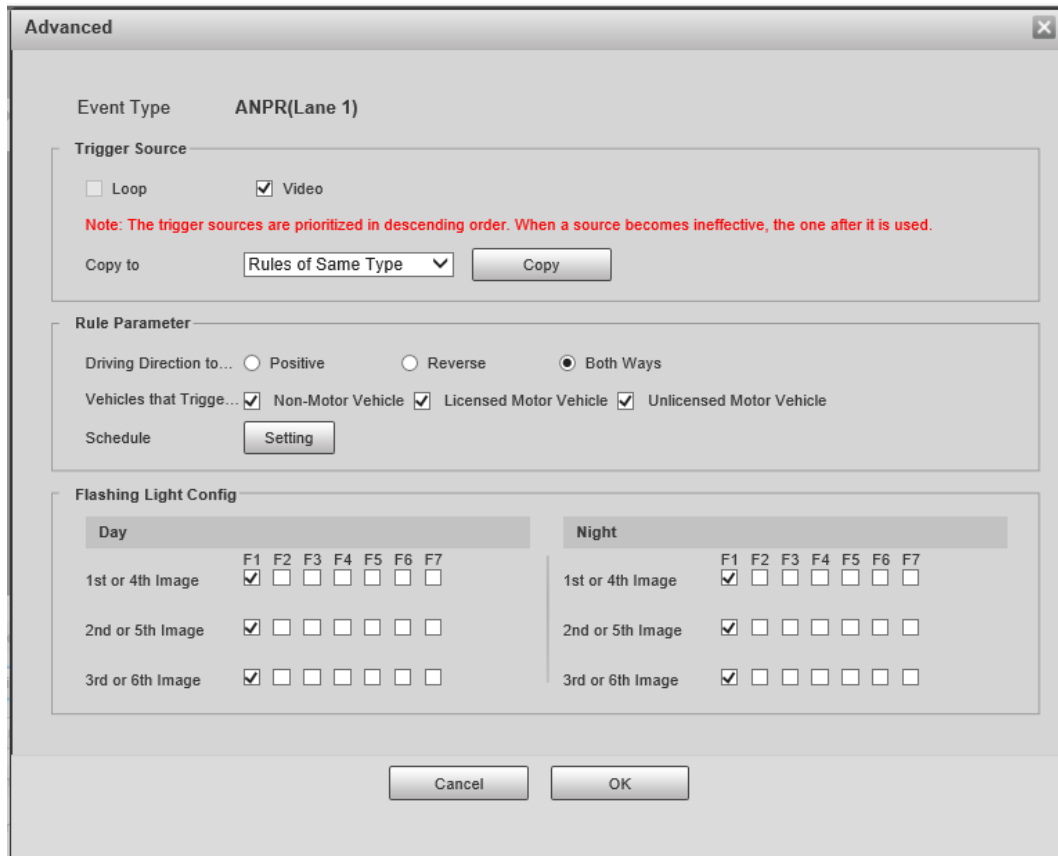


Table 4-21 Advanced parameters (1)

Category	Name	Description
Trigger Source	Loop	Unavailable
	Video	The system analyzes the live video to detect traffic violations. Once a violation is detected, the system automatically captures images of the offending vehicle.
	Copy to	Copy the current picture configuration to the same-type rules or all the rules. After selecting an option from Copy to , click Copy .
Rule Parameter	Driving Direction to Trigger Snapshot	Vehicle driving direction to the camera.
	Schedule	The period during which the alarm is valid. To set a time, you can click Setting, and then drag your cursor over the time table or select days, and enter hours in the entry fields.

Category	Name	Description
	Vehicles that trigger snapshots	The vehicle types to capture.
Flashing Light Config	Day	Select which flashing light flashes when snapshots are taken during daytime or night. A snapshot can be associated with up to 5 flashing lights. For example, select F1 from the 1st or 4th Image section, meaning flashing light F1 flashes when taking the 1st and 4th snapshots.
	Night	

Step 5 Click **Save**.

Lane Property Procedure

Step 1 Select **Setting > Event > E Police > Violation Snapshot**.

Step 2 In the **Lane Property** section, configure lane properties.

Figure 4-40 Lane property (1)

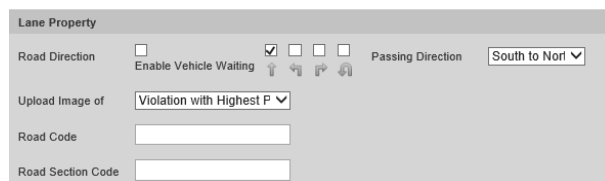


Table 4-22 Lane property parameters (1)

Parameter	Description
Road Direction	The direction of the lane.
Passing Direction	The geographical direction of the lane.
Upload Image of	All Violations : Captures and reports all violations of vehicles on the lane. Violation with Highest Priority : When the vehicle triggers multiple violations, the Camera reports only the event with the highest priority.
Road Code	The code of the roadway and route.
Route Section Code	

Step 3 Click **Save**.

Lane Parameters

Background Information

Configure lane information and events that you want the Camera to detect.

Procedure

Step 1 Select **Setting > Event > E Police > Violation Snapshot**.

Step 2 In the **Lane Config** section, configure lane parameters.

Figure 4-41 Lane configuration

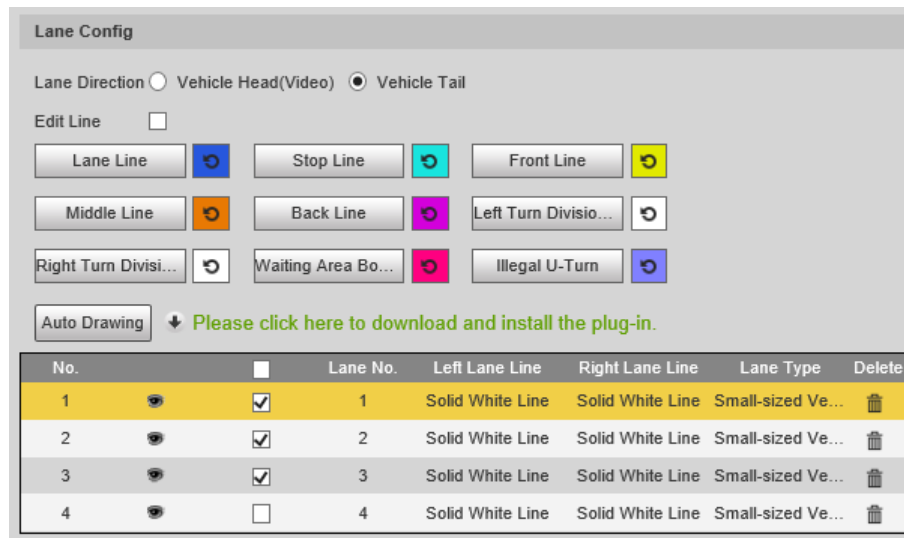


Table 4-23 Lane parameters

Parameter	Description
Lane Direction	The arrow direction of the lane line needs to be the same as that of the travelling vehicle. Vehicle Tail : Lane line arrow points upward. Vehicle Head (Video) : Lane line arrow points downward.
Edit Line	Select the checkbox to enable the function, and then you can adjust the lane lines by dragging the corners on the image.

Step 3 Click a line type, and then draw the lane lines on the image.



To clear the lane lines or regions that you have drawn, click .

Table 4-24 Lane lines

Parameter	Description
Lane Line	Each lane needs to have two lane lines, shown as blue lines with arrows. The arrow indicates the direction in which the vehicles travel. The drawn lines should go along the actual lane line.
Stop Line	The actual stop line on the road.
Front Line	The line which triggers the first capture of the vehicle running the red light and traveling on the wrong lane.
Middle Line	The line which triggers the second capture of the vehicle running the red light and traveling on the wrong lane.
Back Line	Used to judge whether a vehicle is going straight. It triggers the third capture of the vehicle running the red light (straight going) and traveling on the wrong lane.

Parameter	Description
Left Turn Division	Used to judge whether a vehicle is turning left. It triggers the third capture of the vehicle running the red light and traveling on the wrong lane.
Right Turn Division	Used to judge whether a vehicle is turning right. It triggers the third capture of the vehicle running the red light and traveling on the wrong lane.
Waiting Area Boundaries	The end line of the waiting area. Going beyond it will be regarded as running the red light.
Illegal U-Turn	Used to judge whether a vehicle is making a U-turn when not allowed.
Auto Drawing	 Install the plug-in before using the Auto Drawing function. Click Auto Drawing, and then the system automatically draws lane lines. You can adjust the auto lines as needed.

Step 4 Click  to select and show a lane on the video image, and then the configurations of this lane will be enabled.

Step 5 Click **Save**.

Vehicle Detection

Procedure

Step 1 Select **Setting > Event > E Police > Violation Snapshot**.

Step 2 In the **Vehicle Detection** section, click the line or region type, and then draw on the video image.

- To draw a line, click the line type and then drag your mouse cursor on the image.
- To draw a region, click the region type, and then draw the lines by dragging your cursor on the image and make them form a closed region.



To clear the lines that you have drawn, click .

Figure 4-42 Line or region types

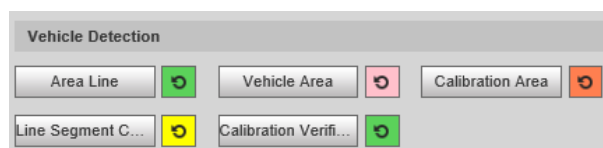


Table 4-25 Vehicle detection parameters

Parameter	Description
Area Line	The region of detection.
Vehicle Area	The region for detecting vehicle volume.
Calibration Area	The region for analyzing vehicle traffic.
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 .

Parameter	Description
Calibration Validation	Used to verify the accuracy of calibration results.

Step 3 Click **Save**.

Other Settings

Procedure

Step 1 Select **Setting > Event > E Police > Violation Snapshot**.

Step 2 In the **Other Config** section, configure parameters.

Figure 4-43 Other settings (1)

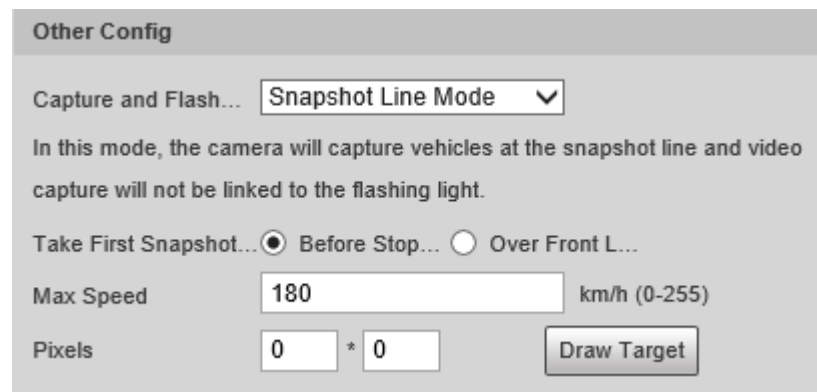


Table 4-26 Other settings (1)

Parameter	Description
Capture and Flash Linkage	● General Mode : Recommended for the ANPR snapshot mode. ● Snapshot Line Mode : Recommended for the e-police mode.
Take First Snapshot for Running a Red Light	● Before Stop Line : The first snapshot of running a red light is taken before the stop line. ● Over Front Line : The first snapshot of running a red light is taken over the front line.
Max Speed	When the travelling speed exceeds this value, the system automatically changes the vehicle speed to a random value in the normal range.
Pixels	Click Draw Target , and then draw a rectangular area on the image to show the pixel size of that area.

Step 3 Click **Save**.

4.7.4.2.2 Configuring Intelligent Analysis

Configure the intelligent functions of the Camera.

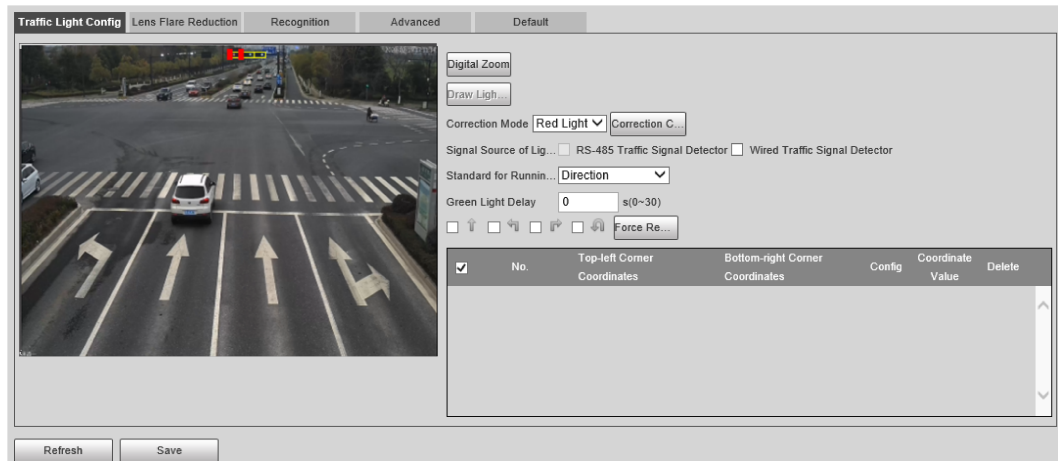
Traffic Light Configuration

Adjust the image color according to the color of the traffic light to avoid abnormalities in the snapshots captured at traffic lights.

Procedure

Step 1 Select **Setting > Event > E Police > Intelligent Analysis > Traffic Light Config**.

Figure 4-44 Traffic light config



- Step 2** Click **Digital Zoom**, use your mouse to draw a frame around the traffic lights on the image, and then the traffic lights are zoomed into.
- Step 3** Click **Draw Light Group Area**, use your mouse to draw the traffic lights frame.
- Step 4** Configure parameters.

Table 4-27 Traffic light parameters

Parameter	Description
Correction Mode	● Red Light Correction : Correct the image color according to the red light signal. ● Force Correction : Correct the image color directly.
Correction Config	Click Correction Config to configure correction parameters. 1. Select Image Correction or Video Correction to determine whether you need to correct images or videos. 2. Configure the level of correction for day and night. 3. Click OK.
Signal Source of Light Group	● RS-485 Traffic Signal Detector : Synchronize external traffic light signals such as signal detectors and traffic light detectors to the current traffic lights. ● Wired Traffic Signal Detector : Synchronize the traffic light scheme of the traffic signal controller to the current traffic lights.
Standard for Running-Red-Light	Capture running a red light depending on the lane direction or travelling direction. At present, three ways are supported: Lane direction, travelling direction, and lane/travelling direction.
Green Light Delay	Do not capture the illegal act of running a red light within seconds after the red light turns on.
Force Red Light	Force the traffic light of the corresponding direction to red.

- Step 5** Click **Save**.

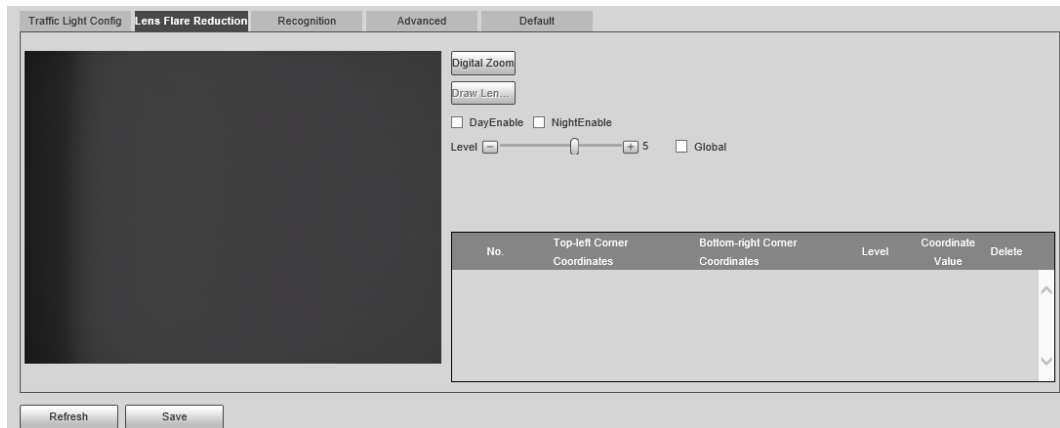
Lens Flare Reduction

To reduce the influence of other light sources and improve the recognition rate, you can reduce the halo.

Procedure

Step 1 Select **Setting** > **Event** > **E Police** > **Intelligent Analysis** > **Lens Flare Reduction**.

Figure 4-45 Lens flare reduction



Step 2 Click **Digital Zoom**, and then select the region for lens flare reduction on the image.

Step 3 Click **Draw Lens Flare Area**, click and drag to select the light source with halo on the image.

Step 4 Configure parameters.

Table 4-28 Parameters of lens flare reduction

Parameter	Description
DayEnable	Enable lens flare reduction for daytime.
NightEnable	Enable lens flare reduction for nighttime.
Global	Apply the same halation control level to all the selected regions.
Level	The level of halation control. The smaller the value, the more obvious the effect.

Step 5 Click **Save**.

Recognition

Procedure

Step 1 Select **Setting** > **Event** > **E Police** > **Intelligent Analysis** > **Recognition**.

Figure 4-46 Recognition (1)



Step 2 Configure parameters.

Table 4-29 Recognition parameters (1)

Parameter	Description
Motor Vehicle	Identifies motor vehicle sign and vehicle type. Select the options that you need to recognize.
Non-Motor Vehicle	Identifies non-motor vehicle attributes such as type, helmet, and rider number.
License Plate Enhancement	Enhances number plate image effect.
Track Overlay	Enables Track Overlay , click  on the left side of the Live page, and then you can see each vehicle is covered by a green frame, which means each vehicle is tracked.

Step 3 Click **Save**.

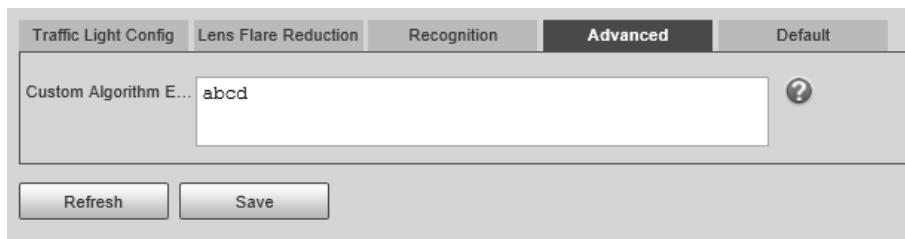
Advanced

You can make a custom algorithm.

Procedure

Step 1 Select **Setting** > **Event** > **E Police** > **Intelligent Analysis** > **Advanced**.

Figure 4-47 Custom algorithm (1)



Step 2 Configure a custom algorithm.

Step 3 Click **Save**.

Default

Procedure

Step 1 Select **Setting** > **Event** > **E Police** > **Intelligent Analysis** > **Default**.

Step 2 Click **Default** to restore settings including lane property, violation capture, and intelligent business to default.

4.7.4.3 Configuring ANPR Snapshot

Configure ANPR parameters.



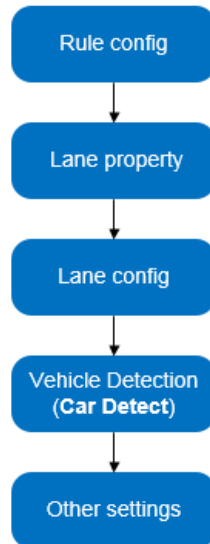
Make sure that you have set **Smart Plan** to **ANPR**. For details, see "4.7.4.1.1 Switching between E-police and ANPR".

4.7.4.3.1 Configuring Violation Capture

Configure the video detection parameters for detecting traffic violations.

Follow this order to configure violation capture: Rule config > lane property > lane config > vehicle detection (Car Detect) > other settings. This is described separately in the configuration order below.

Figure 4-48 Configuration order for violation capture (2)



Rule Configuration

You can select the traffic violation types and configure the corresponding parameters of the images of the offending vehicle.

Procedure

Step 1 Select **Setting > Event > ANPR Snapshot > Violation Snapshot**.

Step 2 In the **Rule Config** section, click , and then configure picture parameters.

Figure 4-49 Rule config (2)

Rule Config					
No.	☐	Event Type	Snapshot Quantity	Picture Parameter	Advanced
1	☒	ANPR	1		
2	☐	Cross Solid White Line	2		
3	☐	Cross Solid Yellow Line	2		
4	☐	Wrong-way Driving	2		
5	☐	Driving Too Slow	2		



The parameter table describes the parameters involved in all event types, and might differ from the actual page.

Figure 4-50 Configure picture parameters (2)

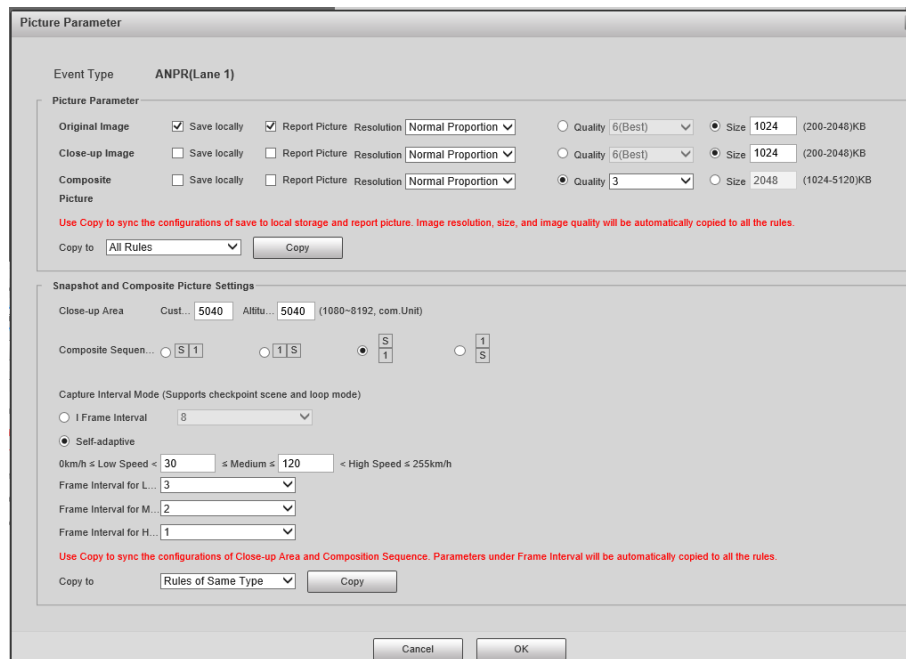


Table 4-30 Picture parameter (2)

Category	Name	Description
Picture Parameter	Original Image	The original picture of the vehicle that is violating traffic rules.
	Composite Image	The compound picture of several sequential images of the vehicle violating the traffic rules.
	Close-up Image	The close-up of the offending vehicle.
	Save Locally	Save the vehicle picture locally when an offending vehicle is captured.
	Report Picture	Upload the vehicle picture to the upper-level device or platform when a vehicle is captured.
	Resolution	Select picture resolution.
	Quality	Select the level of picture quality.
	Size	Limit the size the picture.
	Copy to	Copy the current picture configuration to the same-type rules or all the rules. After selecting an option from Copy to , click Copy .
Snapshot and Composite Picture Settings	Close-up Area	Centering on the vehicle, enter the height and width of the close-up of the vehicle.
	Compound Sequence of One Picture	Select the layout of the compound picture. The picture consists of N original images of the vehicle offending the traffic rule and one close-up of the vehicle. ● S : Close-up ● 1 : Original images

Step 3 Click **OK**.

Step 4 Click , and then configure advanced parameters.



The parameter table describes the parameters involved in all event types, and might differ from the actual page.

Figure 4-51 Advanced parameters (2)

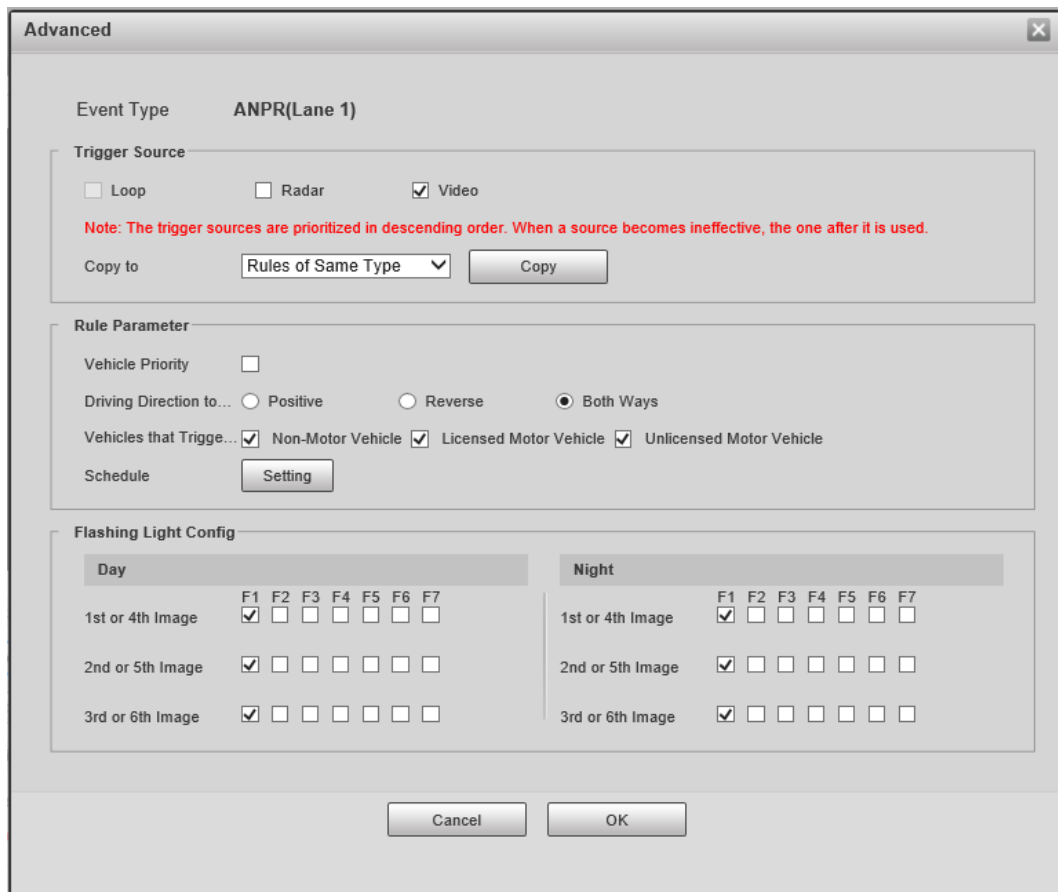


Table 4-31 Advanced parameters (2)

Category	Name	Description
Trigger Source (The way to trigger vehicle capture)	Loop	Unavailable
	Radar	The system captures offending vehicles upon the radar detecting a violation.
	Video	The system analyzes the real time video to detect traffic violations. Once a violation is detected, the system automatically captures images of the offending vehicle.
	Copy to	Copy the current picture configuration to the same-type rules or all the rules. After selecting an option from Copy to , click \ Copy .

Category	Name	Description
Rule Parameter	Driving Direction to Trigger Snapshot	The vehicle driving direction to the camera
	Schedule	The period during which the alarm is valid. To set a time, you can click Setting , and then drag your cursor over the time table or select days, and enter hours in the entry fields.
	Vehicles that Trigger Snapshots	The vehicle types to take a snapshot.
Flashing Light Config	Day	Select which flashing light flashes when snapshots are taken during daytime or night.
	Night	A snapshot can be associated with up to 5 flashing lights. For example, select F1 from the 1st or 4th Image section, meaning flashing light F1 flashes when taking the 1st and 4th snapshots.

Step 5 Click **OK**.

Lane Property

Procedure

Step 1 Select **Setting** > **Event** > **ANPR Snapshot** > **Violation Snapshot**.

Step 2 In the **Lane Property** section, configure lane properties.

Figure 4-52 Lane properties

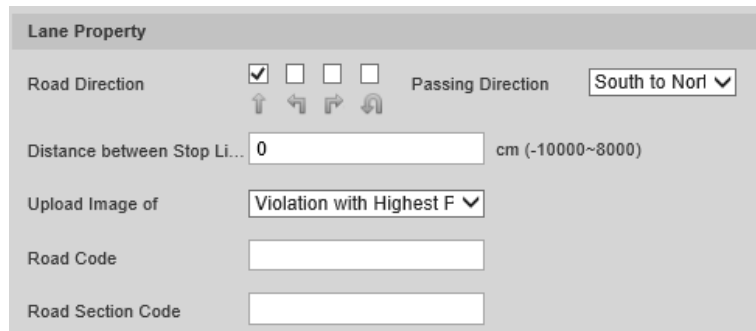


Table 4-32 Lane properties

Parameter	Description
Road Direction	The direction of the lane.
Passing Direction	The geographical direction of the lane.
Distance Between Stop Lane and Image Bottom	The distance between the bottom of the video image and the stop line (where the traffic post is).
Road Code	The code of the roadway and route.
Road Section Code	

Step 3 Click **Save**.

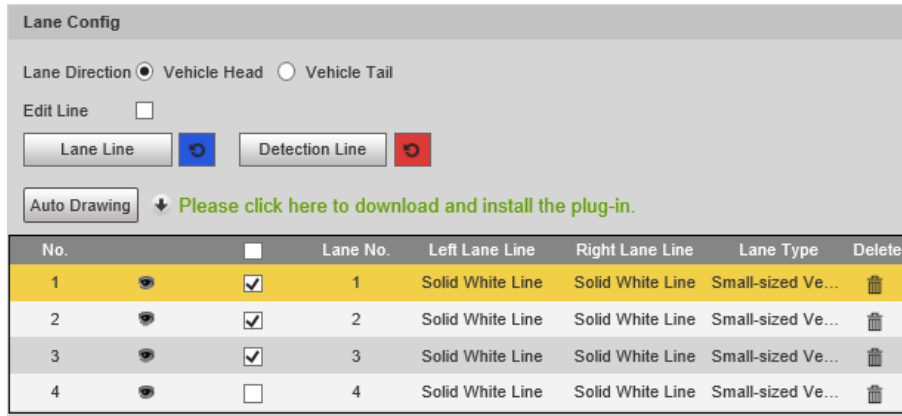
Lane Parameters

Configure lane information and events that you desire the Camera to detect.

Procedure

- Step 1** Select **Setting > Event > ANPR Snapshot > Violation Snapshot**
- Step 2** In the **Lane Config** section, configure lane parameters.

Figure 4-53 Lane config



No.			Lane No.	Left Lane Line	Right Lane Line	Lane Type	Delete
1		☒	1	Solid White Line	Solid White Line	Small-sized Ve...	
2		☒	2	Solid White Line	Solid White Line	Small-sized Ve...	
3		☒	3	Solid White Line	Solid White Line	Small-sized Ve...	
4		☐	4	Solid White Line	Solid White Line	Small-sized Ve...	



Click to select a lane and then all configurations on the **Violation Snapshot** are for this lane.

Table 4-33 Lane config parameters (2)

Parameter	Description
Lane Direction	The arrow direction of the lane line needs to be the same as that of the travelling vehicle. Vehicle Tail : Lane line arrow is upward. Vehicle Head : Lane line arrow is downward.
Edit Line	Select the checkbox to enable the function, and then you can adjust the lane lines by dragging the corners on the image.

- Step 3** Configure lane parameters.
- Step 4** Click a line type, and then draw the lane lines on the image.



To clear the lane lines or regions that you have drawn, click .

Table 4-34 Lane line parameters (2)

Parameter	Description
Lane Line	Each lane needs to have two lane lines, shown as blue lines with arrows indicating the direction in which the vehicles travel. The drawn lines should go along the actual lane line.
Detection Line	The line that will trigger vehicle capture if reached. The detect line is red.

Parameter	Description
Auto Drawing	 Install the plug-in before using the Auto Drawing function. Click Auto Drawing, and then the system automatically draws lane lines. You can adjust the auto lines as needed.

Step 5 Click  to select and show a lane on the video image.

Step 6 Click **Save**.

Vehicle Detection

Procedure

Step 1 Select **Setting** > **Event** > **ANPR Snapshot** > **Violation Snapshot**.

Step 2 In the **Vehicle Detection** section, click the line or region type, and then draw on the video image.

- To draw a line, click the line type and then drag your mouse cursor on the image.
- To draw a region, click the region type, and then draw the lines by dragging your cursor on the image and make them form a closed region.



To clear the lines that you have drawn, click .

Figure 4-54 Line or region types

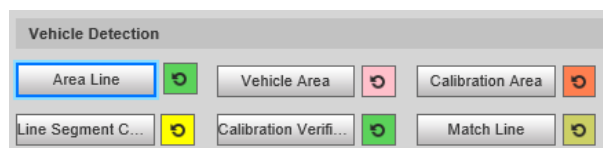


Table 4-35 Vehicle detection parameters

Parameter	Description
Area Line	The region of detection.
Vehicle Area	The region for detecting vehicle volume.
Calibration Area	The region for analyzing vehicle traffic.
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 Verification.
Calibration Verification	Used to verify the accuracy of calibration results.

Step 3 Click **Save**.

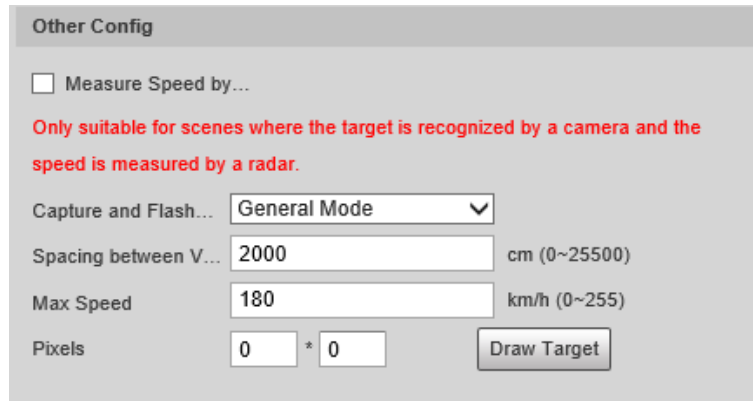
Other Settings

Procedure

Step 1 Select **Setting** > **EventANPR Snapshot Violation Snapshot**.

Step 2 In the **Other Config** section, configure parameters.

Figure 4-55 Other config



Other Config

☐ Measure Speed by...

Only suitable for scenes where the target is recognized by a camera and the speed is measured by a radar.

Capture and Flash... General Mode

Spacing between V... 2000 cm (0~25500)

Max Speed 180 km/h (0~255)

Pixels 0 * 0 Draw Target

Table 4-36 Other config

Parameter	Description
Measure Speed by Radar	Uses a radar to measure vehicle speed.
Capture and Flash Linkage	● General Mode : Recommended for the ANPR snap mode. ● Snapshot Line Mode : Recommended for the e-police mode.
Spacing between Vehicles	Set the distance between vehicles when waiting in a line.
Max Speed	When the travelling speed exceeds this value, the system automatically changes the vehicle speed to a random value in the normal range.
Pixels	Click Draw Target , and then draw a rectangular area on the image to show the pixel size of that area.

Step 3 Click **Save**.

4.7.4.3.2 Configuring Intelligent Analysis

Recognition

Procedure

- Step 1 Select **Setting** > **Event** > **ANPR Snapshot** > **Intelligent Analysis** > **Recognition**.
- Step 2 Configure the parameters.

Figure 4-56 Recognition



Motor Vehicle

☐ Logo

☒ Vehicle Type

☒ Seatbelt ☒ Driver's Face

☐ Smoking ☒ Calling

☒ Vehicle Window

☒ Left-hand Drive ☐ Right-hand Drive

Non-Motor Vehicle

☐ Passenger count, vehicle ty...

ANPR Mode

☒ With Strobe ☐ Without Strobe

Detection Mode

☒ Mode A ☐ Mode B

☐ License Plate Enhancement ☐ Vehicle Window Enhancement

☒ Track Overlay

Recognition Mode Only recognize the fron ▼

Refresh Save

Table 4-37 Recognition parameters

Parameter	Description
Motor Vehicle	Identifies motor vehicle sign and vehicle type. Select the options that you need to recognize.
Non-Motor Vehicle	Identify non-motor vehicle attributes such as type, helmet, and rider number.
Detection Mode	Select detection mode from mode A and mode B.
ANPR Mode	Select ANPR mode with strobe or without strobe.
License Plate Enhancement	Enhance number plate image effect.
Vehicle Window Enhancement	Enhance vehicle window image effect.
Track Overlay	Enable Track Overlay , click  on the left side of the Live page, and then you can see each vehicle is covered by a green frame, which means each vehicle is tracked.

Parameter	Description
Recognition Mode	● Only recognize the front plate : Recognize and snap the number plate on the vehicle head. ● Only recognize the rear plate : Recognize and snap the number plate on the vehicle rear. ● Front plate priority : Head plate has the priority. ● Rear plate priority : Rear plate has the priority.

Step 3 Click **Save**.

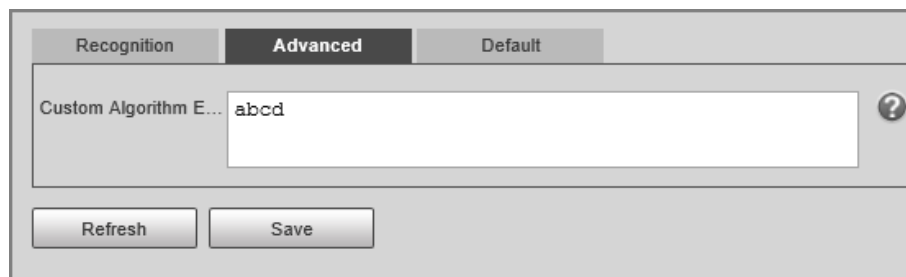
Advanced

You can make a custom algorithm.

Procedure

Step 1 Select **Setting** > **Event** > **ANPR Snapshot** > **Intelligent Analysis** > **Advanced**.

Figure 4-57 Advanced



Step 2 Configure a custom algorithm.

Step 3 Click **Save**.

Default

Procedure

Step 1 Select **Setting** > **Event** > **ANPR Snapshot** > **Intelligent Analysis** > **Default**.

Step 2 Click **Default** to restore settings including lane property, violation capture and intelligent business to default.

4.7.4.4 Configuring OSD

4.7.4.4.1 Configuring Original Picture OSD

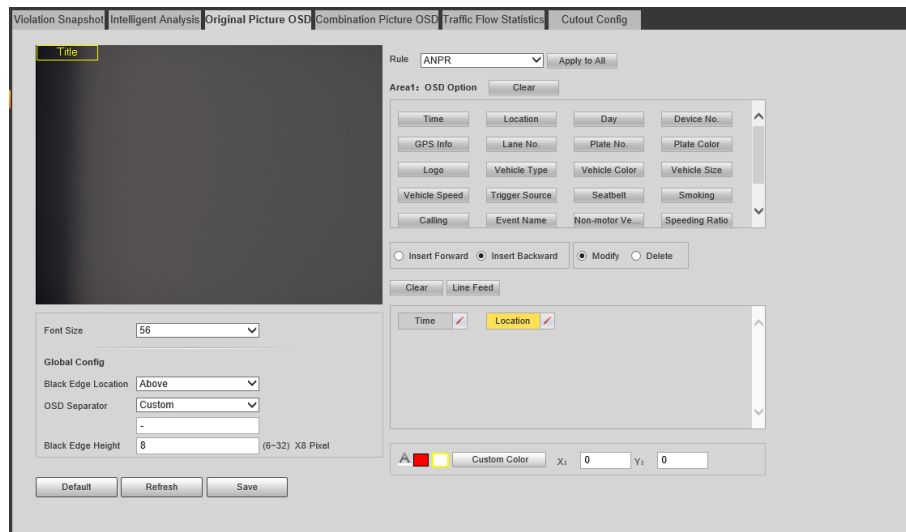
Configure OSD content, style and position for captured image.

Procedure

Step 1 Select **Setting** > **Event** > **Name of Selected Smart Plan** > **Original Picture OSD**.

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

Figure 4-58 Original picture OSD



Step 3 Select a rule type.

Step 4 Configure OSD parameters.

Table 4-38 OSD parameters

Parameter	Description
Insert Forward	Select an OSD option, select Insert Forward , and then select another OSD option. The new OSD option will be inserted before the original one.
Insert Backward	Select an OSD option, select Insert Backward , and then select another OSD option. The new OSD option will be inserted after the original one.
Modify	Select Modify , and then  is displayed next to all the selected OSD options. To edit an OSD option, click the corresponding  .
Delete	Select Delete , and then  is displayed next to all the selected OSD options. To delete an option, click the corresponding  .
Clear	Delete all the selected OSD options.
Line Feed	To start a new line after a certain OSD option, click the OSD option, and then click Line Feed .

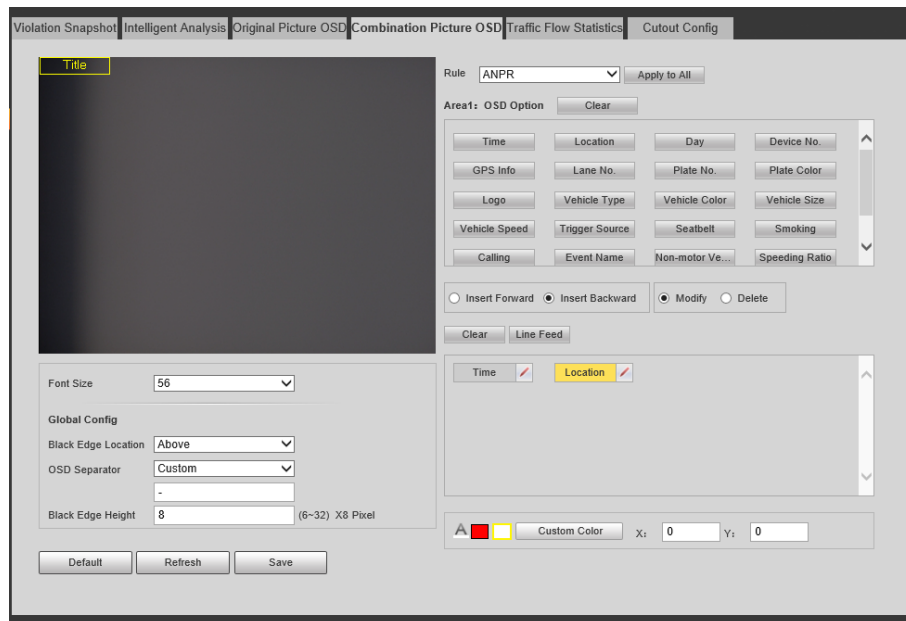
Step 5 Click **Save**.

4.7.4.4.2 Configuring Combination Picture OSD

Procedure

Step 1 Select **Setting > Event > Name of Selected Smart Plan > Combination Picture OSD**.

Figure 4-59 Combination picture OSD



Step 2 Configure the parameters. For details, see "4.7.4.4.1 Configuring Original Picture OSD".

Step 3 Click **Save**.

4.7.4.5 Configuring Traffic Flow Analysis

4.7.4.5.1 Statistics Parameters Configuration

Configure parameters for pedestrian and vehicle flow statistics, including statistical cycle, flow upper limit of pedestrian flow.

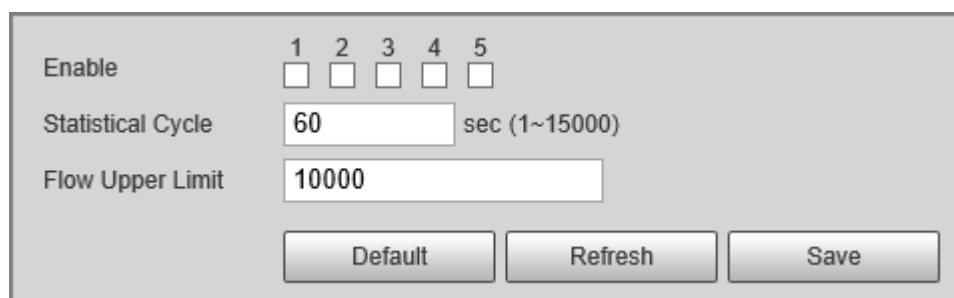
Procedure

Step 1 Select **Setting > Event > Name of Selected Smart Plan > Traffic Flow Statistics > Statistics Parameters Config**.

Step 2 Select the lane that you want to make flow statistics. Set statistical cycle and flow upper limit of pedestrian flow.

Step 3 Click **Save**.

Figure 4-60 Statistics parameters config



4.7.4.5.2 Flow Data

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

- Click  to clear the flow information.
- Click **Export** to export the flow information to local computer.

4.7.4.6 Configuring Cutout

4.7.4.6.1 Snapshot Cutout

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

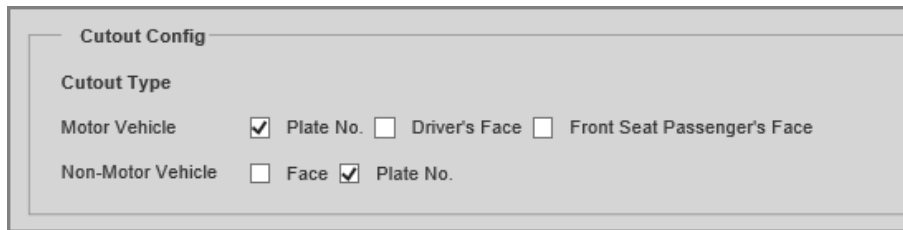


The page and function might vary in **ANPR** and **E-Police**, and might differ from the actual page and function.

Procedure

- Step 1 Select **Setting** > **Event** > **Name of Selected Smart Plan** > **Cutout Config**.
- Step 2 Select the cutout type.
- Step 3 Click **Save**.

Figure 4-61 Snapshot cutout (ANPR mode)



Cutout Config			
Cutout Type			
Motor Vehicle	☒ Plate No.	☐ Driver's Face	☐ Front Seat Passenger's Face
Non-Motor Vehicle	☐ Face	☒ Plate No.	

4.7.4.6.2 Target Box

Set whether to overlay track box on the driver of non-motor vehicles.

Procedure

- Step 1 Select **Setting** > **Event** > **Name of Selected Smart Plan** > **Cutout Config** > **Target Box**.
- Step 2 Select **ANPR** or **Other** as needed.
- Step 3 Select a target type.
- Step 4 Select **Enable** to enable the overlaying track box.
- Step 5 For non-motor vehicle, select overlaying track box on the **All** body or only **Face** of the non-motor vehicle driver.
- Step 6 Click **Save**.

4.7.4.6.3 Face Overlap

Configure whether to enable overlapping face picture on the snapshots. If overlap is enabled, you can configure the overlap position and size of driver face and front-seat passenger face.

Procedure

- Step 1** Select **Setting** > **Event** > **Name of Selected Smart Plan** > **Cutout Config** > **Face Overlay**.
- Step 2** For motor vehicles, select **Driver** and/or **Front Seat Passenger** (front-seat passenger) to enable face overlay of the driver and the front-seat passenger.
- 
- Face Overlay** for motor vehicles is only available in **ANPR** mode.
- Step 3** For non-motor vehicles, select **Enable** to enable face overlay of the driver.
- Step 4** Configure the overlay position and size of driver face and front-seat passenger face.
- Step 5** Click **Save**.

4.7.4.7 Device Location

You can view the device position information, such as its longitude and latitude.

Select **Setting** > **Event** > **Device Location**.

4.7.5 Alarm

You can configure how the Camera responds when alarms occur.

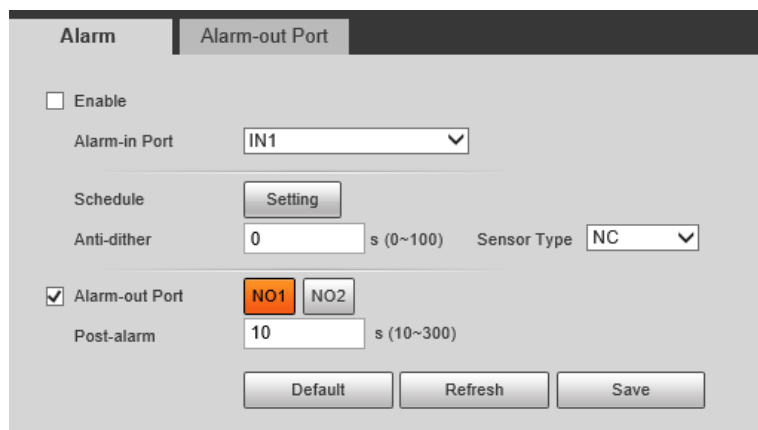
4.7.5.1 Alarm Settings

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

Procedure

- Step 1** Select **Setting** > **Event** > **Alarm** > **Alarm**.
- Step 2** Select the **Enable** checkbox to enable alarm input.

Figure 4-62 Alarm



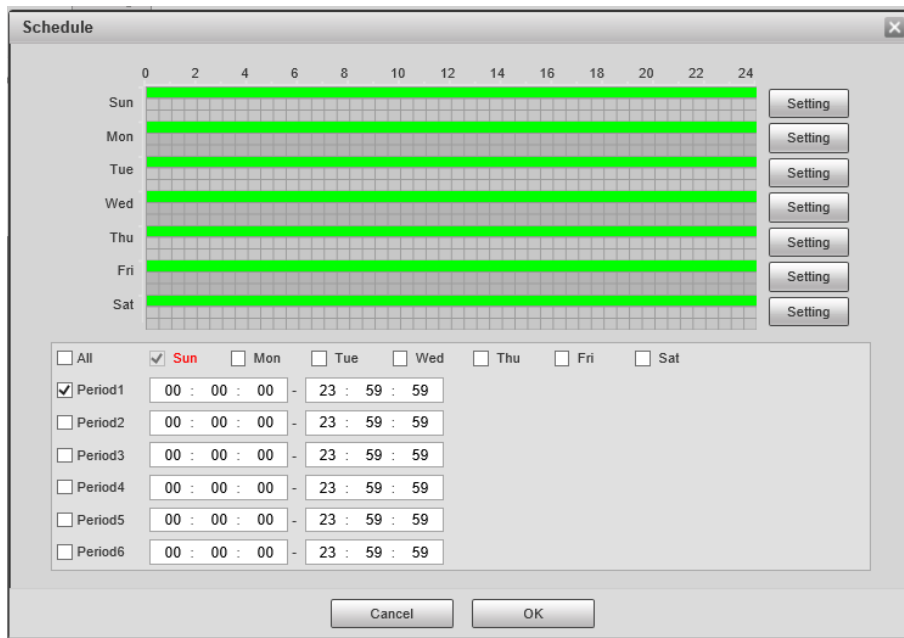
- Step 3** Configure the parameters.

Table 4-39 Alarm parameters

Parameter	Description
Alarm-in Port	Currently, only 4 channels support alarm input.

Parameter	Description
Schedule	Configure the time of arming and disarming. Click Setting and configure the day and period of arming. Click OK to save the period settings.
Anti-dither	The system records only one alarm event within the defined time, and the time range is 0 s–100 s.
Sensor Type	NO (normally open) and NC (normally closed) are available.
Alarm-out Port	Select the alarm output port.
Post-alarm	The alarm linkage keeps running for the defined time after alarm ends. The time range is 10 s–300 s.

Figure 4-63 Schedule setting



Step 4 Click **Save**.

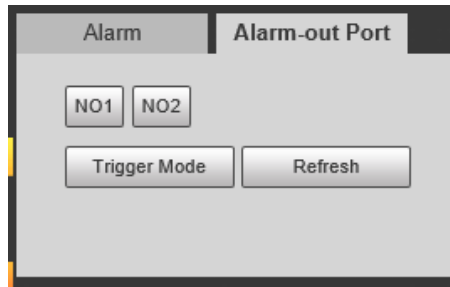
4.7.5.2 Alarm-out Port

You can simulate to trigger alarm output signal.

Procedure

- Step 1 Select **Setting** > **Event** > **Alarm** > **Alarm-out Port**.
- Step 2 Click **NO1** or **NO2** to configure one-channel alarm output.
- Step 3 Click **Trigger Mode** to trigger alarm output.
- Step 4 Click **Refresh** to view the status of alarm output.

Figure 4-64 Alarm-out port



4.7.6 Exception

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**, **SD card error**, or **Memory insufficient**.
- **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.



- 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.

Procedure

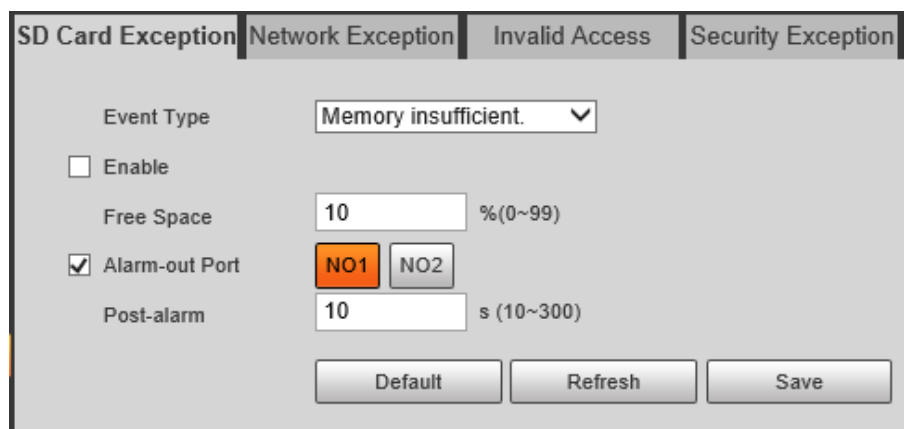
Step 1 Select **Setting** > **Event** > **Exception**.



The following figure uses **SD Card Exception** as an example. For other events, refer to the actual page.

Step 2 Configure the parameters.

Figure 4-65 SD card event



Refer to the actual page to view the parameters that you need to configure for each abnormality.

Table 4-40 Parameters of abnormal events

Parameter	Description
Enable	Select it to enable alarm of abnormal events. Select Alarm for Traffic Light Fault event in E-Police mode.
Alarm-out Port	Select it to enable the corresponding alarm output of event, and select the corresponding port.
Post-alarm	The alarm linkage keeps running for the defined time after alarm ends. The time range is 10 s–300 s.
Max Time to Not Switch	Configure the maximum time that traffic light remains unchanged.  This parameter is required only for Traffic Light Fault in E-Police mode.
Login Attempt	Configure the number of login errors allowed. The range is 3–10 times.

Step 3 Click **Save**.

4.7.7 Peripheral

4.7.7.1 Device Status

Select **Setting** > **Peripheral** > **Peripheral** > **Device Status**, and then you can view the information related to the external device.

4.7.7.2 Serial Port

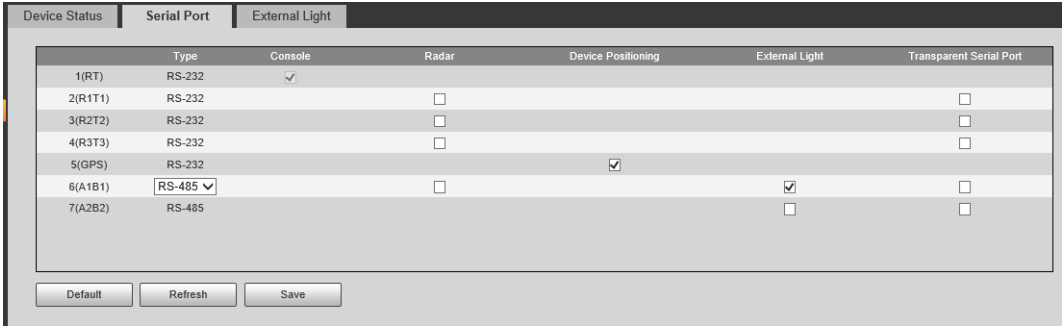
This section displays all serial ports of the Camera, and integrates all devices which can be connected so you can configure them on one page. At present, the Camera supports configuring radar, positioning method, external light and transparency serial.

Procedure

Step 1 Select **Setting** > **Peripheral** > **Peripheral** > **Serial Port**.

Step 2 Configure external devices.

Figure 4-66 Serial port settings



Type	Console	Radar	Device Positioning	External Light	Transparent Serial Port
1(RT)	RS-232 ☒				
2(R1T1)	RS-232	☐			☐
3(R2T2)	RS-232	☐			☐
4(R3T3)	RS-232	☐			☐
5(GPS)	RS-232		☒		
6(A1B1)	RS-485	☐		☒	☐
7(A2B2)	RS-485	☐		☐	☐

Default Refresh Save



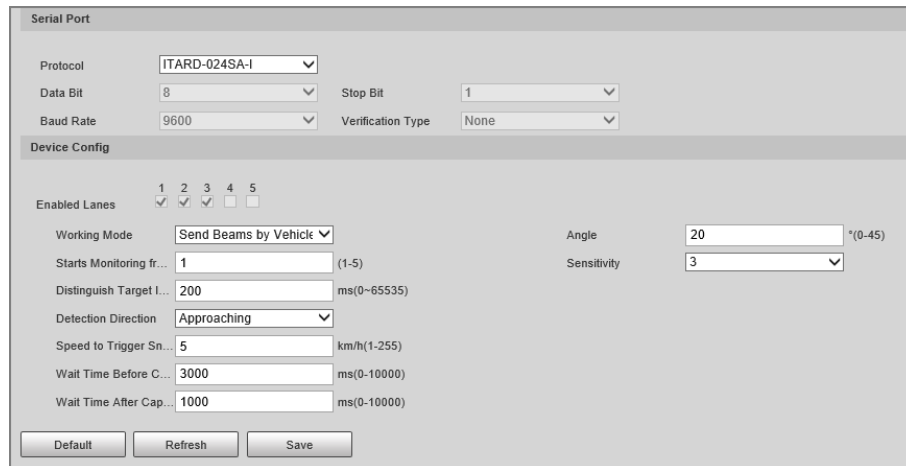
- One serial port can only enable one external device.

- RS-485 and RS-232 ports are supported.
 - ◇ RS-232 port can enable radar for single lane, and RS-485 enables radar for multiple lanes.
 - ◇ You cannot enable single lane and multiple lanes at the same time.
- Only one external device can be enabled for one port at the same time.

● Radar

1. Select **Radar**.

Figure 4-67 Radar configuration (single lane)



2. Configure radar parameters.

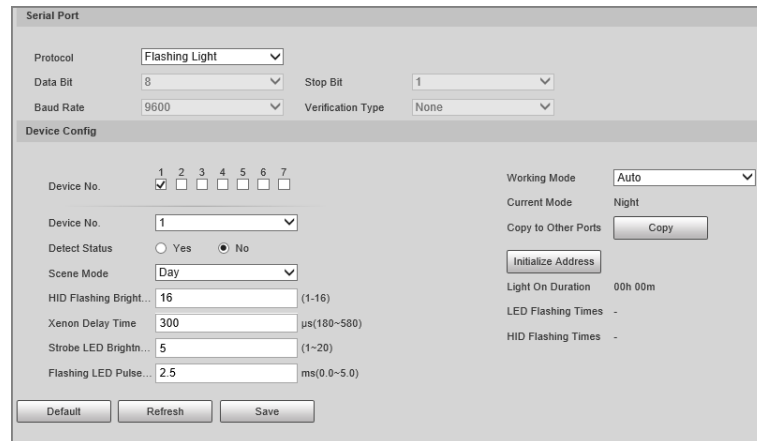
Table 4-41 Radar parameters

Parameter	Description
Enabled Lanes	The number of lanes on which the radar has been enabled.
Working Mode	Select the work mode of the radar from Speed Measurement , Calculation Mode , Send Beams by Vehicles , Send Continuous Beams and Manually Send Beams .
Starts Monitoring from Lane	The lane number on which the radar starts detecting.
Distinguish Target Intervals	During the interval, the radar only detects one object.  This function works together with a special program.
Detection Direction	The direction of radar detection.
Speed to Trigger Snapshot	The low speed limit that triggers the radar to send a capture signal to the Camera. Once the vehicle exceeds the limit, the Camera takes a snapshot.
Wait Time Before Capture	During the speed wait, if the Camera reads the speed from the radar, it is the vehicle speed; Otherwise, the displayed vehicle speed is a random value within the speed limit.
Wait Time After Capture	
Angle	The angle between the radar beam and vehicle driving direction.

Parameter	Description
Sensitivity	Supports adjusting the sensitivity of the radar capture. 5 is the most sensitive.

3. Select **RS-485** to enable multi-lane radar detection.

Figure 4-68 Radar configuration (multiple lanes)



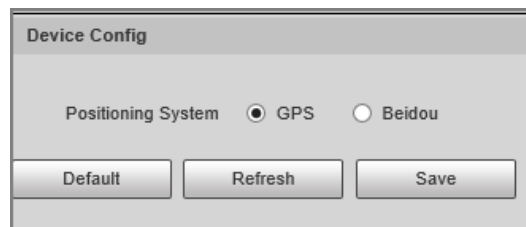
The screenshot shows the 'Serial Port' and 'Device Config' windows. In the 'Serial Port' window, 'Flashing Light' is selected for Protocol, Data Bit is 8, Baud Rate is 9600, Stop Bit is 1, and Verification Type is None. In the 'Device Config' window, Device No. 1 is selected. The 'Detect Status' is set to 'No'. The 'Scene Mode' is 'Day'. The 'HID Flashing Brightness' is 16, 'Xenon Delay Time' is 300, 'Strobe LED Brightness' is 5, and 'Flashing LED Pulse' is 2.5. The 'Working Mode' is 'Auto' and 'Current Mode' is 'Night'. There are buttons for 'Default', 'Refresh', 'Save', 'Copy to Other Ports', 'Initialize Address', 'Light On Duration', 'LED Flashing Times', and 'HID Flashing Times'.

4. Click **Save**.

- Positioning

1. Select **Device Positioning**.

Figure 4-69 Positioning configuration



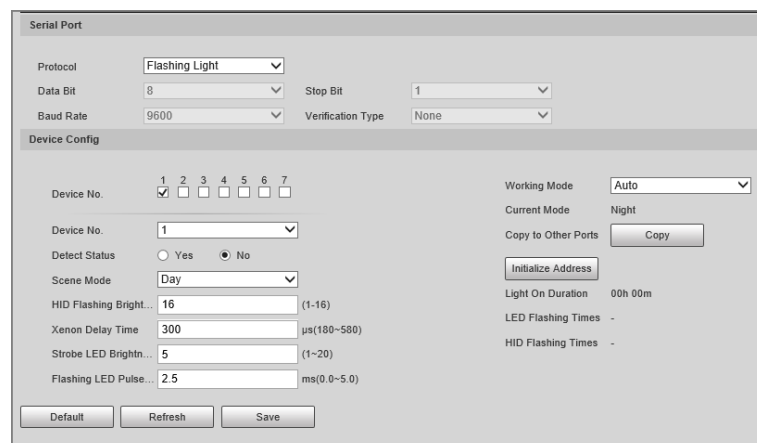
The screenshot shows the 'Device Config' window with the 'Positioning System' section. The 'GPS' radio button is selected, and the 'Beidou' radio button is unselected. There are buttons for 'Default', 'Refresh', and 'Save'.

2. Select the positioning method from **GPS** and **Beidou** as needed.
3. Click **Save**.

- External Light

1. Select **External Light**.

Figure 4-70 External light configuration



The screenshot shows the 'Serial Port' and 'Device Config' windows. In the 'Serial Port' window, 'Flashing Light' is selected for Protocol, Data Bit is 8, Baud Rate is 9600, Stop Bit is 1, and Verification Type is None. In the 'Device Config' window, Device No. 1 is selected. The 'Detect Status' is set to 'No'. The 'Scene Mode' is 'Day'. The 'HID Flashing Brightness' is 16, 'Xenon Delay Time' is 300, 'Strobe LED Brightness' is 5, and 'Flashing LED Pulse' is 2.5. The 'Working Mode' is 'Auto' and 'Current Mode' is 'Night'. There are buttons for 'Default', 'Refresh', 'Save', 'Copy to Other Ports', 'Initialize Address', 'Light On Duration', 'LED Flashing Times', and 'HID Flashing Times'.

2. Configure external light parameters.

Table 4-42 External light parameters

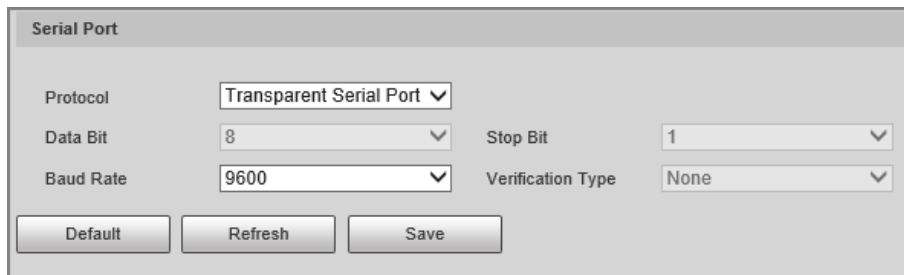
Parameter	Description
Protocol	Select from Flashing Light, Strobe and Continuous Light.
Device No.	Select device number as needed.
Device No.	Select external light number based on the selected device number.
Detect Status	Select Yes to enable external light status check.
Scene Mode	Select the working environment of the external light.
HID Flashing Brightness	Set as needed.
Xenon Delay Time	
Strobe LED Brightness	
Flashing LED Pulse Width	
Working Mode	Select the work mode of the external light from Force Set IR , Force Set White and Auto .
Copy to Other Ports	Click Copy to copy the configuration of the current light to other ports.
Initialize Address	Click Initialize Address to restore the RS-485 address of the external light to default.

3. Click **Save**.

- Transparent Serial Port

1. Select **Transparent Serial Port**.

Figure 4-71 Transparent serial port



2. Set **Transparent Serial Port** as **Protocol**, and configure **Baud Rate** as needed.
3. Click **Save**.

4.7.7.3 External Light

You can configure the work mode of the flashing lights and strobes connected through RS-485 to the Camera in this section.

Procedure

- Step 1 Select **Setting** > **Peripheral** > **Peripheral** > **External Light**.

Figure 4-72 External light

F1 ☒ Flashing Light ☐ Strobe

F2 ☒ Flashing Light ☐ Strobe

F3 ☒ Flashing Light ☐ Strobe

F4 ☒ Flashing Light ☐ Strobe

F5 ☒ Flashing Light ☐ Strobe

F6 ☒ Flashing Light ☐ Strobe

F7 ☐ Flashing Light ☒ Strobe

Note: The type of light that was selected must be the same as the actual one that is connected. Otherwise, the light can become damaged.

Flashing Light

Working Mode

Always Flash

Scene Mode

Morning/Dusk

Pulse Width

960

us(0 ~ 5000)

Delay Time

-300

us(-3000 ~ 6000)

Trigger Mode

Low level

Strobe

Output Mode

Auto

Delay Time

-0.2

-3.0~6.0ms

Pulse Width

1

0.0~6.0ms

Frequency

100

HZ

Ambient Brightness

-

+

65

Default

Refresh

Save

Step 2 Configure parameters.

Table 4-43 Illuminator parameter description

Parameter		Description
F1/2/3/4/5/6/7		Select the light type connected to each port.  The light type must be the same as the actual connected light type. Otherwise, the light might be damaged.
Flashing Light	Working Mode	No Flash : The light is normally off. Always Flash : The light is normally on. Auto Flash : Configure the preset value of brightness. If the ambient brightness is lower, the light automatically turns on; if higher, the light automatically turns off.
	Scene Mode	Select the scene mode for the flashing light from Morning/Dusk , Day and Night , indicating different brightness of the light which suits the environment the best.
	Pulse Width	Configure the pulse width of flashing light. The higher the value, the brighter the light.
	Delay Time	Configure the delay time of the light to keep the snapshot in sync with the flash.
	Trigger Mode	You can select the level that triggers the flashing light. Currently, only Low level is supported.
	Ambient Brightness	When setting Working Mode to Auto Flash , you need to set the brightness prevalue.
Strobe	Output Mode	Same as Work Mode of flashing light.
	Frequency	Set the frequency of the strobe.

Step 3 Click **Save**.



The light type in this section is for reference only, and might differ from the actual model.

4.7.8 Storage

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

4.7.8.1 Storage Spot Configuration

Set the storage path of snapshots and video recordings.

Procedure

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

Figure 4-73 Storage spot configuration



Snapshot		Record	
Event Type		Event Type	
Local Storage	☒	Local Storage	☒
FTP	☐		

Default Refresh Save

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 **Save**.

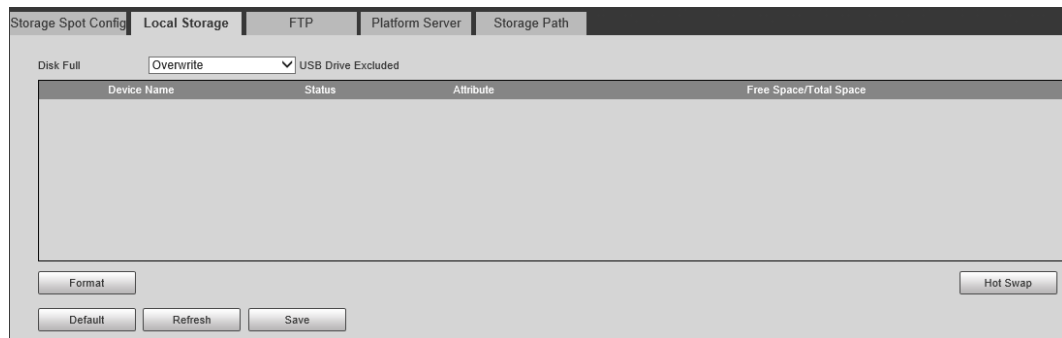
4.7.8.2 Local Storage

Select **Setting** > **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 4-74 Local storage



4.7.8.3 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 **Setting** > **Storage** > **Storage** > **FTP**.

Figure 4-75 FTP

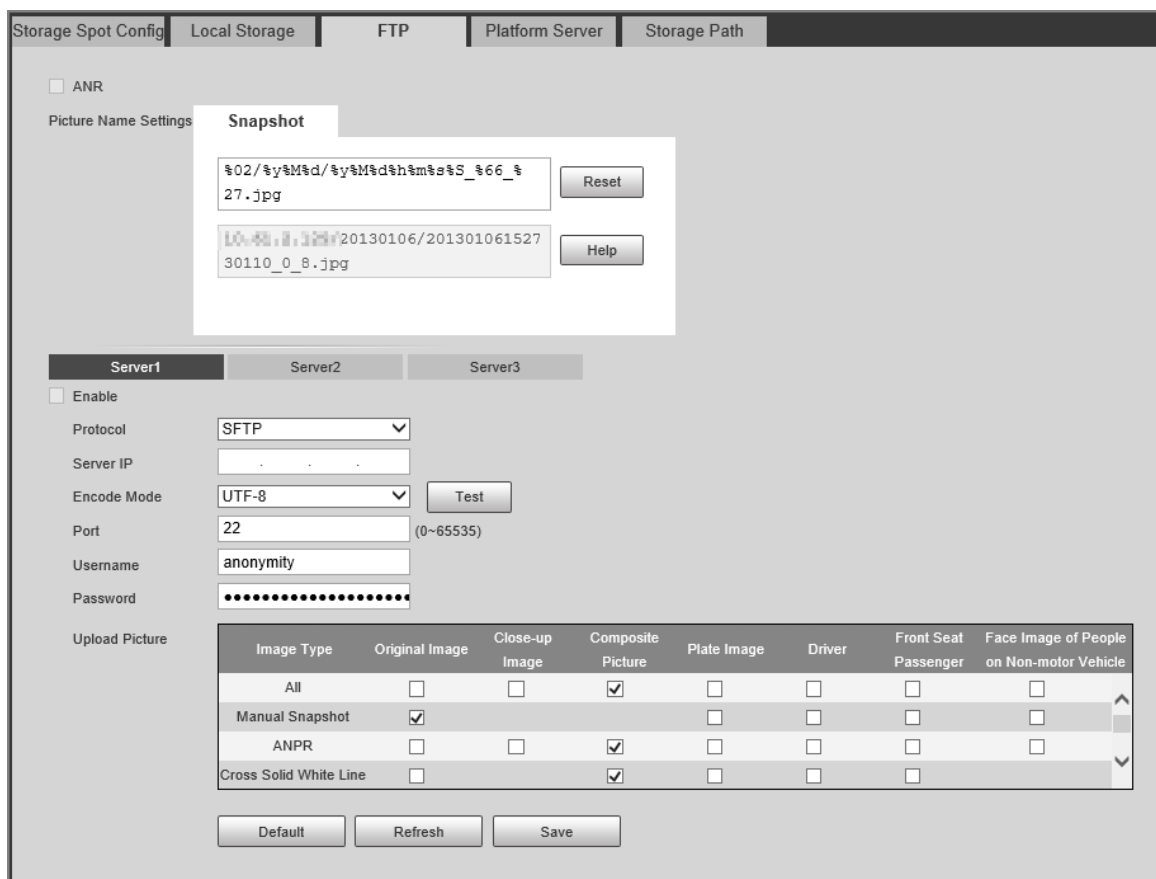


Image Type	Original Image	Close-up Image	Composite Picture	Plate Image	Driver	Front Seat Passenger	Face Image of People on Non-motor Vehicle
All	☐	☐	☒	☐	☐	☐	☐
Manual Snapshot	☒	☐	☐	☐	☐	☐	☐
ANPR	☐	☐	☒	☐	☐	☐	☐
Cross Solid White Line	☐	☐	☒	☐	☐	☐	☐

Step 2 Configure the parameters.

Table 4-44 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.
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 .
Enable	Enable FTP server storage.
Protocol	● SFTP : 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.
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.
Port	The port number of FTP server.
Username, Password	The username and password of FTP server.
Upload Picture	Select event(s) and picture type(s) to be uploaded to each FTP server. Different modes (ANPR , E-Police , and Yield to Pedestrians) support different events, and might differ from the actual page.

Step 3 Click **Save**.

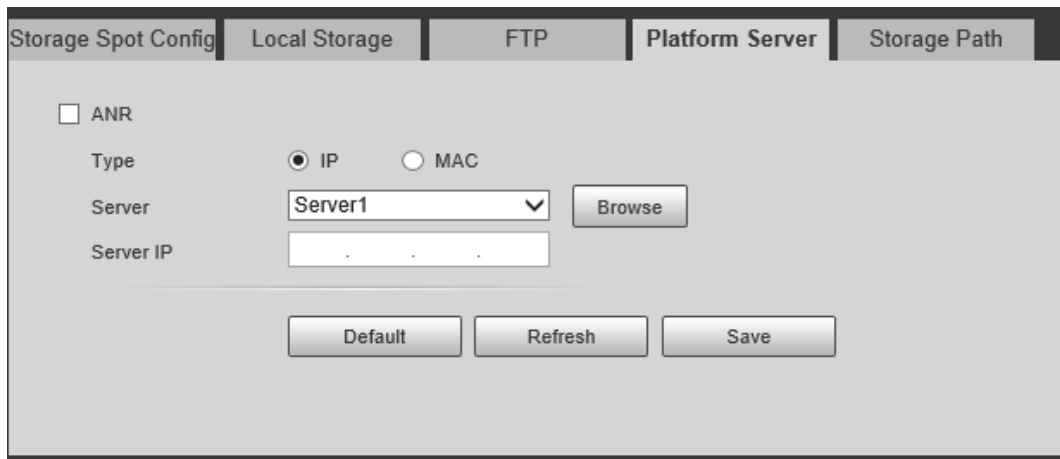
4.7.8.4 Platform Server

You can set the parameters of storing to the client, which generally refers to the platform. You need to install and log in to platform first before you can store snapshots to platform server.

Procedure

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

Figure 4-76 Platform server



Step 2 Configure the parameters.

Step 3 Click **Save**.

4.7.8.5 Storage Path

You can configure the names and storage paths of snapshots and video recordings.

Procedure

Step 1 Select **Setting > Storage > Storage > Storage Path**.

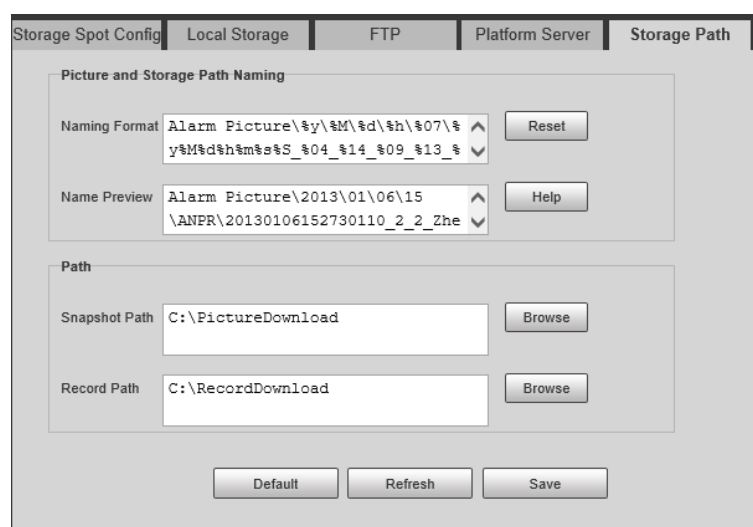
Step 2 Name the snapshots in the **Naming Format** section. You can click **Help** to view the **Image Naming Rules**, or click **Reset** to restore the naming rule to the default.

After setting the naming rule, you can preview an example of the name in the **Name Preview** section.

Step 3 Click **Browse** to set the save paths of snapshots and video recordings respectively.

Step 4 Click **Save**.

Figure 4-77 Storage path



4.7.8.6 Record Control

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

Procedure

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

Step 2 Select the record mode.

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



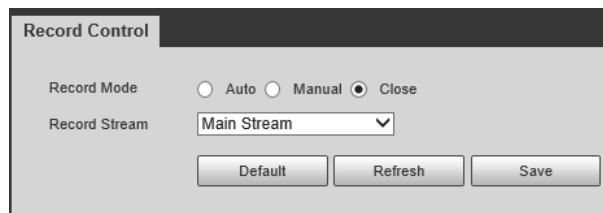
After enabling auto recording, go to **Setting** > **Event** > **ANPR Snapshot**, in the **Rule Config** section, under **Advanced**, select a lane (**Event Type** is not **ANPR**) and then enable **Record Linkage** to automatically record the corresponding lanes. In addition, select **Local Storage** from **Setting** > **Storage** > **Storage** > **Storage Spot Config**.

- **Manual** : Record videos continuously.
- **Close** : Do not record videos.

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

Step 4 Click **Save**.

Figure 4-78 Record control



4.7.9 System

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

4.7.9.1 General

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

4.7.9.1.1 General Settings

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

Procedure

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

Step 2 Configure the parameters.

Figure 4-79 General

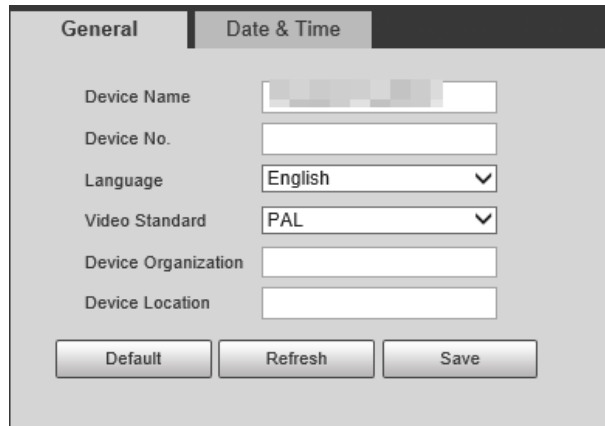


Table 4-45 General parameters

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. Currently, only English is supported.
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 **Save**.

4.7.9.1.2 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 4-80 Date & time

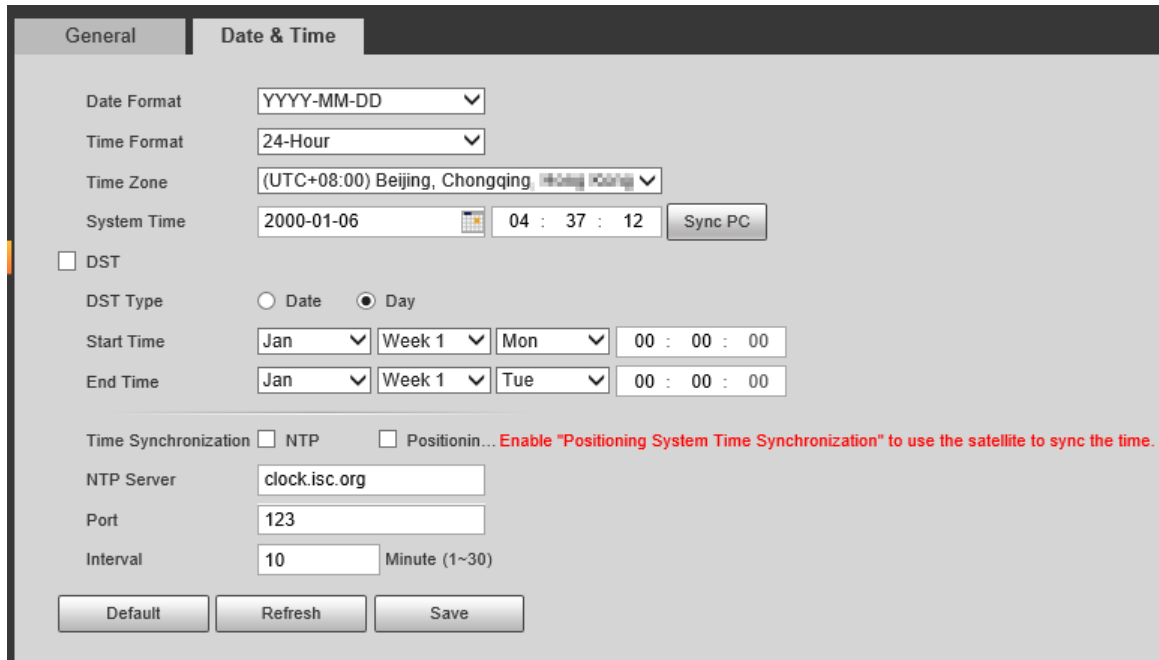


Table 4-46 Date & time parameters

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.
Sync PC	Synchronize the time of the Camera to that of the PC. Click Sync PC , and the settings will immediately take effect.
DST	Select the DST (means daylight saving time) checkbox, set the DST Type by Date or by Day , 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 .
NTP Server	The IP address and the port number of NTP server.
Port	Required when NTP is set to Time Synchronization .
Interval	The time synchronization interval of the Camera and the NTP or satellite.

Step 3 Click **Save**.

4.7.9.2 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.

4.7.9.2.1 Account

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 **Setting** > **System** > **Account** > **Account** > **Username**.
- Step 2 Add a user.
1. Click **Add User**.
 2. In the **Add User** dialog box, configure user information including username, password, group name, memo, and operation permissions.

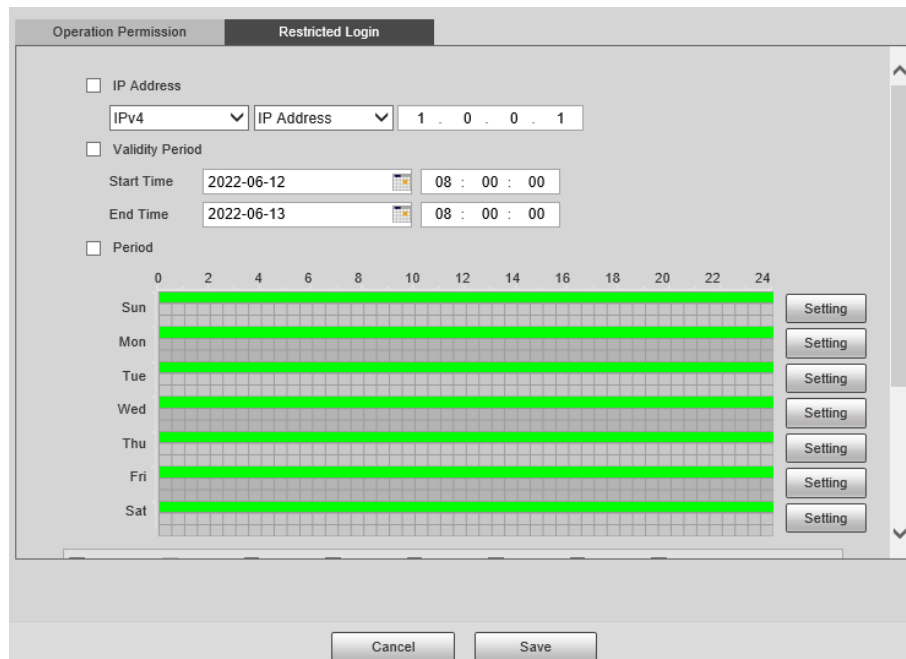
Figure 4-81 Add user

The 'Add User' dialog box contains the following fields and options:

- Username:** Text input field with a red 'Required' label.
- Password:** Text input field with a red note: 'The password cannot be less than 6 characters.'
- Confirm Password:** Text input field.
- Group:** Dropdown menu with 'admin' selected.
- Remarks:** Text input field.
- Operation Permission:** A list of checkboxes with the following items: All, Account, Live, Search, System, System Info, Manual Control, Backup, Storage, Event, Network, Peripheral, Camera, Security, Maintenance, and Camera. All are checked.
- Restricted Login:** A tab that is currently inactive.
- Buttons:** 'Cancel' and 'Save' at the bottom.

3. Set login restrictions (if necessary), and then the restricted IP address will be unable to log in to the Camera during the restricted period.

Figure 4-82 Set log restriction



4. Click **Save** to save the settings.

Step 3 Select **Setting** > **System** > **Account** > **Account** > **Group**.

Step 4 Add a group.

1. Click **Add Group**.
2. Configure the **Group** and **Permission** of the group.
3. Click **Save**.

Related Operations

- Delete a user/usergroup: Click  to delete the corresponding user/usergroup.

 - ◇ The admin and user groups cannot be deleted.
 - ◇ A group cannot be deleted if there is any user in the group.
- Modify user/usergroup information: Click  corresponding to the user. You can modify information such as username, password, email address, group name, and memo. Click **Save** to save the settings.
- Change password: On the **Modify User** page, select the **Change Password** checkbox. Enter the old and new passwords, and confirm password. Click **Save** after configuration.


The password must consist of 8–32 non-blank characters and contain at least two types of the following characters: Uppercase, lowercase, numbers, and special characters (excluding ' " ; : &). Configure the password according to the password strength prompt.
- Clear all user information: Click **Clear user** under **Setting** > **System** > **Account** > **Account** > **Clear User**.

4.7.9.2.2 ONVIF User

ONVIF users can be separately managed from account users and user groups.

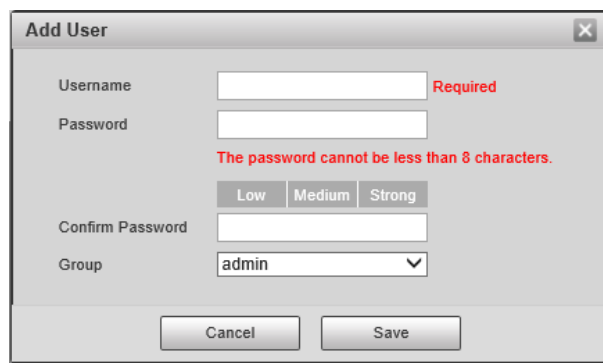
- The system manages both ONVIF users and user groups. The factory settings cover one group: admin. You can set up to 18 ONVIF users.

- ONVIF username cannot be repeated. Each ONVIF user must belong to a group, and can only belong to one group. The username can be 31 characters at most, consisting of letters, numbers, "_", "@" and ".".
- The default ONVIF username and password are both admin. There is one admin by default which has the highest authority.

Procedure

- Step 1** Select **Setting** > **System** > **Account** > **ONVIF User**.
- Step 2** Click **Add User**.
- Step 3** Configure user information such as username, password, and group name.

Figure 4-83 Add user



- Step 4** Click **Save**.

Related Operations

- Modify ONVIF user information: Click  corresponding to the user, and then you can modify information such as username, password, and group name.
- Modify password: On the **Modify User** page, select the **Change Password** checkbox. Enter the old and new passwords, and confirm password.



The password must consist of 8–32 non-blank characters and contain at least two types of the following characters: Uppercase, lowercase, numbers, and special characters (excluding ' " ; : &). Configure the password according to the password strength prompt.

4.7.9.3 Security

4.7.9.3.1 System Service

You can enable multiple system services to secure network safety.

Procedure

- Step 1** Select **Setting** > **System** > **Security** > **System Service**.
- Step 2** Enable the services.

Figure 4-84 System service

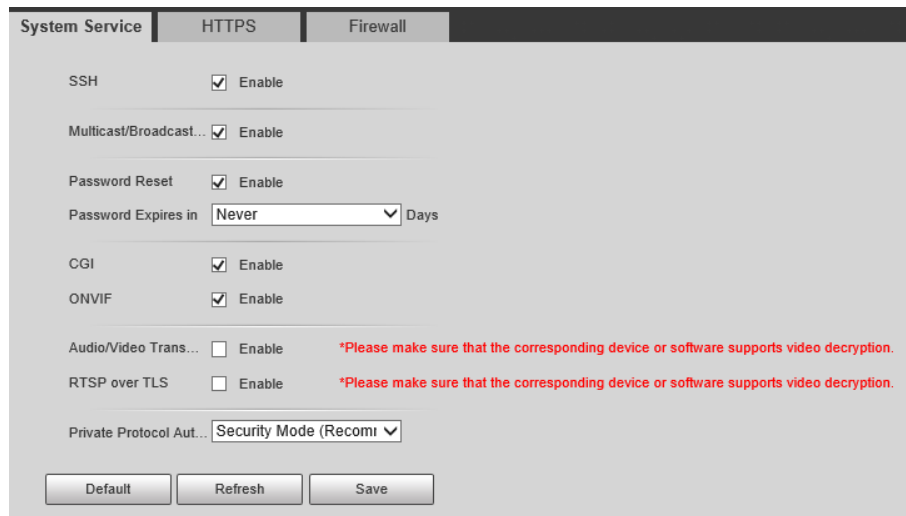


Table 4-47 System service parameters

Parameter	Description
SSH	Secure Shell (SSH) is a cryptographic network protocol for operating network services securely over an unsecure network. It is a method for secure remote login, providing secure access for users.
Multicast/Broadcast Search	Multicast identifies logical groups of computers group members. This allows a single message to be sent to the group. Broadcast allows all devices on the same network segment to see the same message.
Password Reset	Enable it so that you can reset the password.
CGI	Select the Enable checkbox to enable Common Gateway Interface (CGI) service.
ONVIF	Select the Enable checkbox to enable Open Network Video Interface Forum (ONVIF) service.
Audio/Video Transmission Encryption	Enable this function to encrypt stream transmitted through private protocol.  - Make sure that the matched device or software supports the video decryption function. - We recommend enabling the encryption service to avoid data leak.
RTSP over TLS	Enable this function to encrypt stream transmitted through standard protocol.  - Make sure that the matched device or software supports video decryption function. - We recommend enabling the encryption service to avoid data leak.

Parameter	Description
Private Protocol Authentication Mode	Leave it as default.

Step 3 Click **Save**.

4.7.9.3.2 HTTPS

Prerequisites

- For first-time use of HTTPS or after changing device IP address, you need to create server certificate, and install root certificate.
- After creating server certificate, and installing root certificate, if you change a computer to log in to the web client, then you need to download and install the root certificate again on the new computer or copy the downloaded root certificate on the new computer, and install it.

Background Information

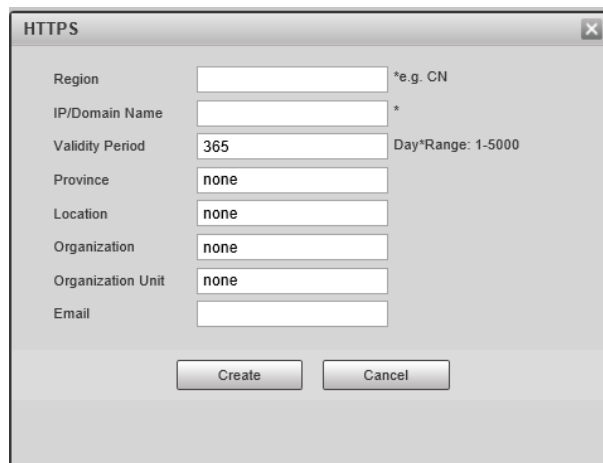
On the **HTTPS** page, users can make PC log in normally through HTTPS by creating certificate or uploading authenticated certificate. It can ensure security of communication data, and provide guarantee for user information, and device safety through reliable, and stable technical approach.

Procedure

Step 1 Create a certificate or upload the authenticated certificate.

- Create Certificate.**
 - Select **Setting > System > Security > HTTPS**.
 - Click **Create**.

Figure 4-85 HTTPS



- Enter the required information such as region, IP or domain name, and then click **Create**.



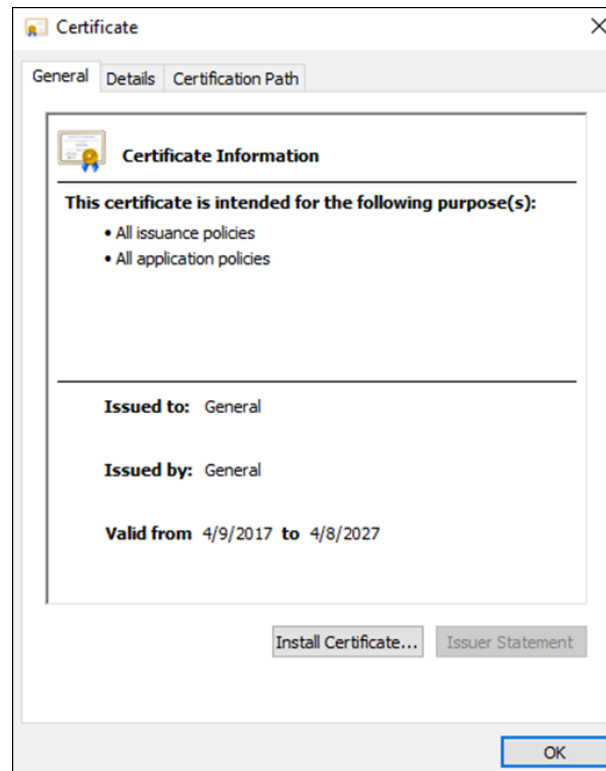
The entered **IP/Domain Name** must be the same as the IP or domain name of the Camera.

- Click **Install** under **Request Created**, and then click **Download** to download root certificate.

The system pops up **Save As** dialog box, select storage path, and then click **Save**.

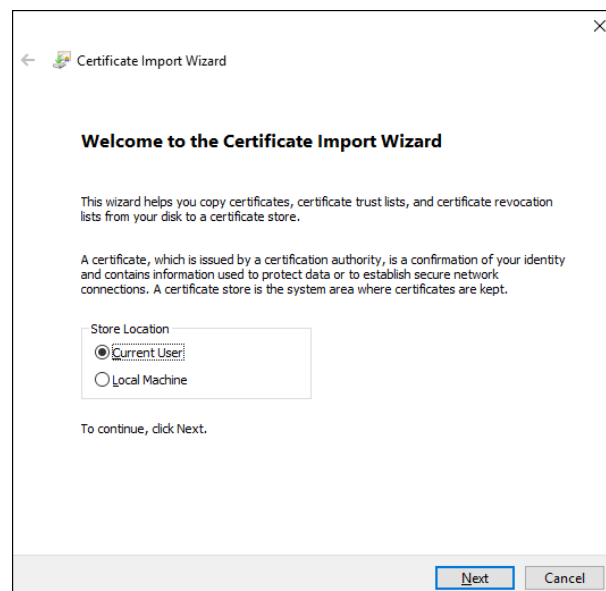
- Double-click the RootCert.cer icon.
- Click **Install Certificate...**

Figure 4-86 Install certificate



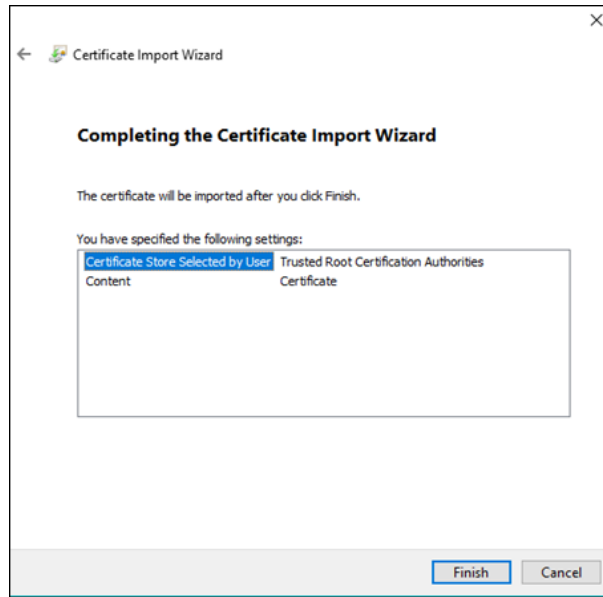
7. Click **Next**.

Figure 4-87 Certificate store



8. Click **Next**.

Figure 4-88 Complete the certificate import wizard



9. Click **Finish**.

10. Click **Yes**, and then click **OK** on the pop-up window.

● **Install Signed Certificate.**

1. Select **Setting** > **System** > **Security** > **HTTPS**.

2. Select **Enable**, and **Compatible with TLSv1.1 and earlier versions**.

3. Click **Browse** to upload the signed certificate, and certificate key, and then click **Upload**.

4. To install the root certificate, see operation steps from 4 to 10 in **Create Certificate**.

Step 2 Select **Enable**, and click **OK**.

The configuration takes effect until the Camera restarts.

Step 3 Use HTTPS to log in to the Camera.

1. Enter `https://IP address` in the browser.



IP address is the Camera IP address or domain name.

2. Enter the username, and password to log in to the Camera.

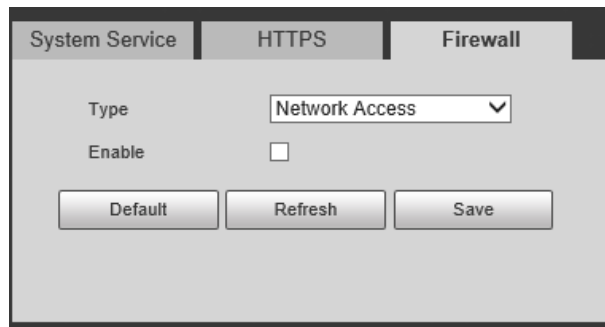
4.7.9.3.3 Firewall

Set the security rules to protect the safety of your camera system.

Procedure

Step 1 Select **Setting** > **System** > **Security** > **Firewall**.

Figure 4-89 Firewall



Step 2 Select **Type**.

- **Network Access** : Add the IP address to allowlist or blocklist to allow or restrict it from accessing the corresponding ports of the device.
- **PING Prohibited** : IP address of your camera is prohibited from ping. This helps to prevent unauthorized attempts at accessing your network system.
- **Anti Half Connection** : Prevents half-open SYN attacks.

Step 3 Select **Enable** to enable the rule type that you selected.

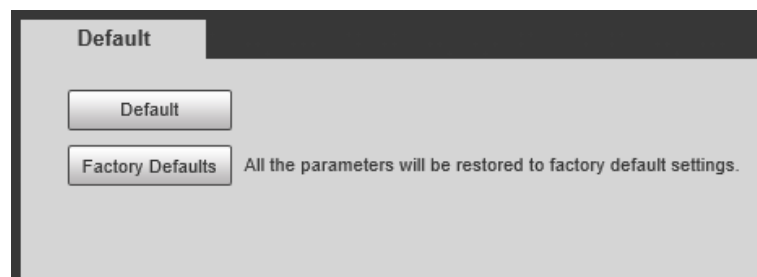
Step 4 Click **Save**.

4.7.9.4 Default

Select **Setting** > **System** > **Default**, and then you can:

- Click **Default** to restore most configurations of the Camera to default settings (except information such as IP address, account, and log).
- Click **Factory Defaults** to restore all configurations of the Camera to default settings, including IP address.

Figure 4-90 Default



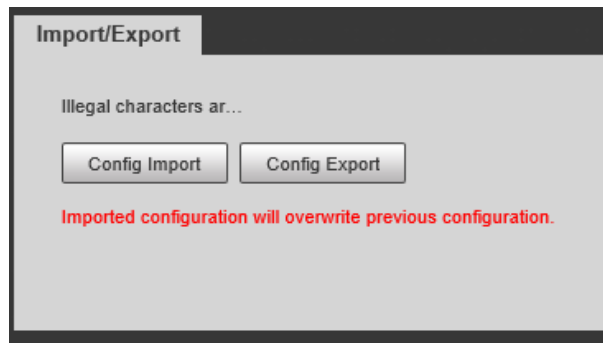
4.7.9.5 Import/Export

The system supports exporting the configurations from the web to local PC, and importing the configuration files from local backup.

Procedure

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

Figure 4-91 Import/Export



Step 2 Click **Config Import** or **Config Export**.

- **Config Import** : Import the configuration files from local backup.
- **Config Export** : Export the configuration from the web page to your local computer.



The imported and exported files should be in the format of .backup.

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

4.7.9.6 Configuring Maintenance

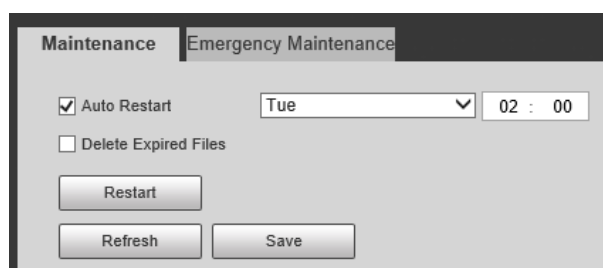
You can select to either automatically restart the Camera at the defined day and time, or manually restart the Camera to solve problems such as stuck images.

4.7.9.6.1 Maintenance

Procedure

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

Figure 4-92 Auto maintain



Step 2 Select the restart mode.

- **Auto Restart** : Select the **Auto Restart** checkbox, and then configure the day and time. The system will automatically restart at the defined day and time.
- **Restart** : Click it to manually restart the Camera.

Step 3 Select the **Delete Expired Files** checkbox, and the system will automatically delete the old files.

Step 4 Click **Save**.

4.7.9.6.2 Emergency Maintenance

Procedure

- Step 1 Select **Setting** > **System** > **Maintenance** > **Emergency Maintenance**.
- Step 2 Select **Enable** to enable emergency maintenance.
- Step 3 Click **Save**.

4.7.9.7 Update

You need to update the firmware to the latest version to make the Camera run properly. Import the update file in the format of .bin to the system, and then update the system.

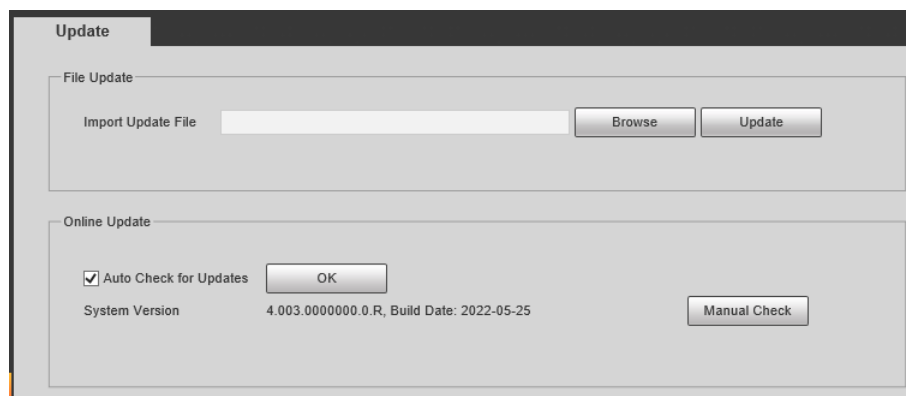


- **Update** function is currently not available.
- Do not disconnect the power or network, or restart or shut down the Camera during update. Incorrect update programs might result in the Camera being unable to work.

Procedure

- Step 1 Select **Setting** > **System** > **Update**.
- Step 2 Click **Browse** to select the firmware update file (.bin).
- Step 3 Click **Update** to update the firmware.

Figure 4-93 Update



4.7.10 System Information

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

4.7.10.1 Version Information

- Select **Setting** > **System Info** > **Version** to view information such as device model, and the version of the hardware, system, and software.
- Select **Setting** > **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.

4.7.10.2 Log

4.7.10.2.1 System Log

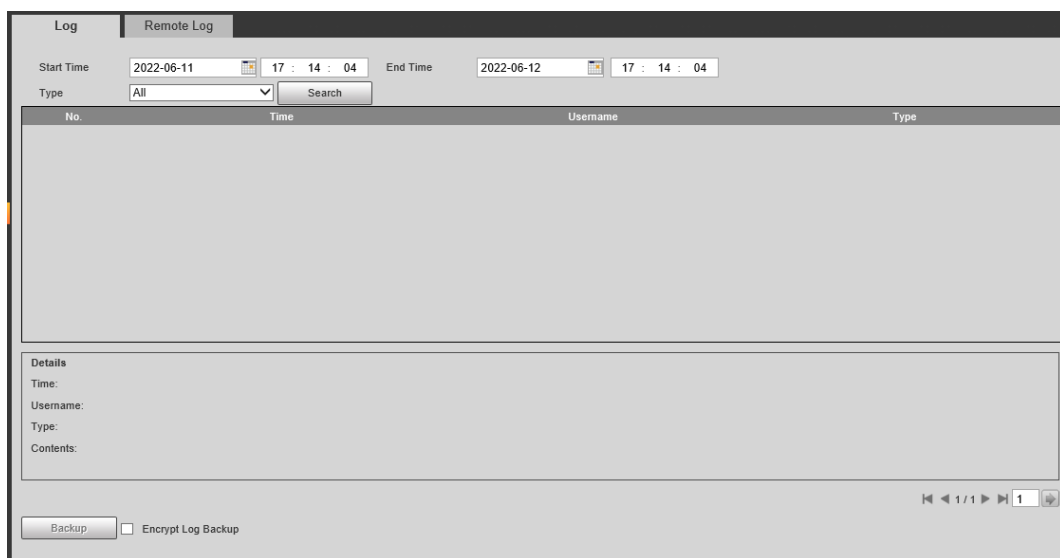
You can search for and view logs by the time and type, and backup the logs. The log type includes **All**, **System**, **Setting**, **Data**, **Event**, **Record**, **Account**, and **Safety**.

Procedure

- Step 1 Select **Setting** > **System Info** > **Log** > **Log**.
- Step 2 Set **Start Time** and **End Time**, 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 4-94 Log



The screenshot shows the 'Log' interface with the 'Log' tab selected. The 'Remote Log' tab is also visible. The search filters are set to 'Start Time: 2022-06-11 17:14:04' and 'End Time: 2022-06-12 17:14:04'. The 'Type' dropdown is set to 'All'. A 'Search' button is present. Below the filters is a table with columns: No., Time, Username, and Type. The table is currently empty. Below the table is a 'Details' section with fields for Time, Username, Type, and Contents. At the bottom, there is a 'Backup' button and a checkbox for 'Encrypt Log Backup'.

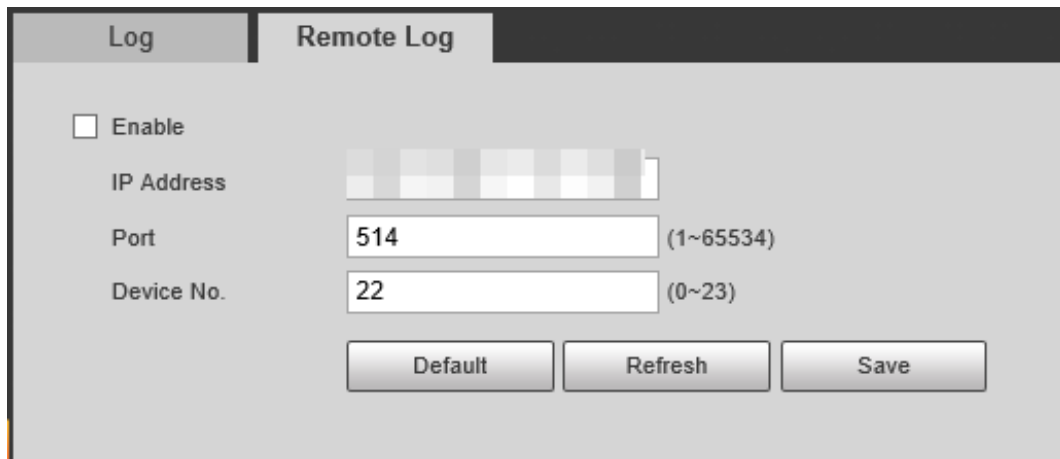
4.7.10.2.2 Remote Log

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 **Setting** > **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 **Save**.

Figure 4-95 Remote log



4.7.10.3 Online User

Select **Setting** > **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 4-96 Online user

Online User					
No.	Username	Group	IP Address	User Login Time	Login Type
1	admin	admin		2000-01-06 02:33:08	DVRIP
2	admin	admin		2000-01-06 04:01:29	Web3.0
3	admin	admin		2000-01-06 04:01:30	DVRIP

4.7.10.4 Running Status

Select **Setting** > **System Info** > **Running Status**, and then you can view device work status, including CPU, memory and temperature.

4.7.10.5 Legal Information

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

4.8 Logout

Click **Logout** at the upper-right side of the web page to log out. You can enter the username and password to log in again.

Appendix 1 Reference for Filling in Allowlist and Blocklist Template

Appendix Table 1-1 Plate color number

Plate Color	Plate Color No.
Yellow Plate with Black Text	1
Blue Plate with White Text	2
Black Plate with White Text	3
White Plate with Black Text	4
Black	5
Blue	6
Cyan	7
Red	8
Gradient Green	9
White	10
Yellow and Green	11
Yellow	12

Appendix Table 1-2 Vehicle color number

Vehicle Color	Vehicle Color No.
White	A
Black	B
Red	C
Yellow	D
Gray	E
Green	F
Blue	G
Pink	H
Purple	I
Brown	J
Yellow Green	K
Cyan	L
Dark Blue	M
Dark Brown	N
Dark Cyan	O
Dark Golden	P

Vehicle Color	Vehicle Color No.
Dark Green	Q
Dark Olive	R
Dark Orange	S
Dark Pink	T
Dark Purple	U
Dark Red	V
Dull Purple	W
Dark Yellow	X
Deep Sky Blue	Y
Others	Z
Dark Gray	a
Forest Green	b
Golden	c
Green Yellow	d
Chestnut	e
Light Rosy	f
Olive	g
Orange	h
Ocean Green	i
Silver Gray	j
Tomato Red	k
White Smoke	l

Appendix Table 1-3Vehicle type number

Vehicle Type	Vehicle Type No.
Large Vehicle	1
Small Vehicle	2
Tractor	14
Bus	23
Heavy Truck	24
MPV	25
Light Truck	26
Van	27
Medium Bus	28
Medium Truck	29
Minicar	30

Vehicle Type	Vehicle Type No.
Two-wheeled Vehicle	31
Tank Truck	32
Public Bus	33
Pickup	34
SUV	35
Sedan	36
SUV-MPV	37
Taxi	38
Tricycle	39
Unknown	40
Ambulance	41
Mixer Truck	42
Construction Truck	43
Fire Truck	44
General	45
Engineering Truck	46
Fuel Tank Truck	47
Police Car	48
Pulverized Material Vehicle	49
Tank Truck	50
Sewage Suction Truck	51
Hazardous Chemicals Truck	52
Sanitation Truck	53

Appendix 2 Security Commitment and Recommendation

Dahua Vision Technology Co., Ltd. (hereinafter referred to as "Dahua") attaches great importance to cybersecurity and privacy protection, and continues to invest special funds to comprehensively improve the security awareness and capabilities of Dahua employees and provide adequate security for products. Dahua has established a professional security team to provide full life cycle security empowerment and control for product design, development, testing, production, delivery and maintenance. While adhering to the principle of minimizing data collection, minimizing services, prohibiting backdoor implantation, and removing unnecessary and insecure services (such as Telnet), Dahua products continue to introduce innovative security technologies, and strive to improve the product security assurance capabilities, providing global users with security alarm and 24/7 security incident response services to better protect users' security rights and interests. At the same time, Dahua encourages users, partners, suppliers, government agencies, industry organizations and independent researchers to report any potential risks or vulnerabilities discovered on Dahua devices to Dahua PSIRT, for specific reporting methods, please refer to the cyber security section of Dahua official website.

Product security requires not only the continuous attention and efforts of manufacturers in R&D, production, and delivery, but also the active participation of users that can help improve the environment and methods of product usage, so as to better ensure the security of products after they are put into use. For this reason, we recommend that users safely use the device, including but not limited to:

Account Management

1. Use complex 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: 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 repeating characters, such as 111, aaa, etc.

2. Change passwords periodically

It is recommended to periodically change the device password to reduce the risk of being guessed or cracked.

3. Allocate accounts and permissions appropriately

Appropriately add users based on service and management requirements and assign minimum permission sets to users.

4. Enable account lockout function

The account lockout function is enabled by default. You are advised to keep it enabled to protect account security. After multiple failed password attempts, the corresponding account and source IP address will be locked.

5. Set and update password reset information in a timely manner

Dahua device supports password reset function. To reduce the risk of this function being used by threat actors, if there is any change in the information, please modify it in time. When setting security questions, it is recommended not to use easily guessed answers.

Service Configuration

1. Enable HTTPS

It is recommended that you enable HTTPS to access Web services through secure channels.

2. Encrypted transmission of audio and video

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

3. Turn off non-essential services and use safe mode

If not needed, it is recommended to turn off some services such as SSH, SNMP, SMTP, UPnP, AP hotspot etc., to reduce the attack surfaces.

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

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

4. Change HTTP and other default service ports

It is recommended that you change the default port of HTTP and other services to any port between 1024 and 65535 to reduce the risk of being guessed by threat actors.

Network Configuration

1. Enable Allow list

It is recommended that you turn on the allow list function, and only allow IP in the allow list to access the device. Therefore, please be sure to add your computer IP address and supporting device IP address to the allow list.

2. MAC address binding

It is recommended that you bind the IP address of the gateway to the MAC address on the device to reduce the risk of ARP spoofing.

3. Build a secure network environment

In order to better ensure the security of devices and reduce potential cyber risks, the following are recommended:

- Disable the port mapping function of the router to avoid direct access to the intranet devices from external network;
- According to the actual network needs, partition the network: if there is no communication demand between the two subnets, it is recommended to use VLAN, gateway and other methods to partition the network to achieve network isolation;
- Establish 802.1x access authentication system to reduce the risk of illegal terminal access to the private network.

Security Auditing

1. Check online users

It is recommended to check online users regularly to identify illegal users.

2. Check device log

By viewing logs, you can learn about the IP addresses that attempt to log in to the device and key operations of the logged users.

3. **Configure network log**

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

Software Security

1. **Update firmware in time**

According to the industry standard operating specifications, the firmware of devices needs to be updated to the latest version in time in order to ensure that the device has the latest functions and security. If the device is connected to the public network, it is recommended to enable the online upgrade automatic detection function, so as to obtain the firmware update information released by the manufacturer in a timely manner.

2. **Update client software in time**

We recommend you to download and use the latest client software.

Physical Protection

It is recommended that you carry out physical protection for devices (especially storage devices), such as placing the device in a dedicated machine room and cabinet, and having access control and key management in place to prevent unauthorized personnel from damaging hardware and other peripheral equipment (e.g. USB flash disk, serial port).

ENABLING A SMARTER SOCIETY AND BETTER LIVING

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