



Speed Measuring Device

User's Manual



Foreword

General






This manual introduces the basic information, functions, and operations of the speed measuring device (hereinafter referred to as "the Device"). Read carefully before using the Device, and keep the manual safe for future reference.

Model

DHI-HWS1600D

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
V1.0.0	First release.	August 2022

Privacy Protection Notice

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

About the Manual

- The manual is for reference only. Slight differences might be found between the manual and the product.
- We are not liable for losses incurred due to operating the product in ways that are not in compliance with the manual.
- The manual will be updated according to the latest laws and regulations of related jurisdictions.

For detailed information, see the paper user's manual, use our CD-ROM, scan the QR code or visit our official website. The manual is for reference only. Slight differences might be found between the electronic version and the paper version.

- All designs and software are subject to change without prior written notice. Product updates might result in some differences appearing between the actual product and the manual. Please contact customer service for the latest program and supplementary documentation.
- There might be errors in the print or deviations in the description of the functions, operations and technical data. If there is any doubt or dispute, we reserve the right of final explanation.
- Upgrade the reader software or try other mainstream reader software if the manual (in PDF format) cannot be opened.
- All trademarks, registered trademarks and company names in the manual are properties of their respective owners.
- Please visit our website, contact the supplier or customer service if any problems occur while using the device.
- If there is any uncertainty or controversy, we reserve the right of final explanation.

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



- Pack the Device with packaging provided by its manufacturer or packaging of the same quality before transporting it.
- 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 electric safety code and standards. Make sure that the ambient voltage is stable and meets the power supply requirements of the Device.
- Do not connect the Device to 2 or more kinds of power supplies, to avoid damage to the Device.
- Use the accessories suggested by the manufacturer. Installation and maintenance must be performed by qualified professionals.
- When using a laser beam device, avoid exposing the surface of the Device to laser beam radiation.
- Do not install the Device in an environment that has a large amount of metal, advertising boards, walls or electromagnetic interference. Otherwise, the performance of the Device might be affected
- Do not install 2 devices with the same frequency in the same environment. Otherwise, the Device might not work properly.



- Personnel working at heights must take all necessary measures to ensure personal safety including wearing a helmet and a safety belt.
- 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.
 - 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.
 - Make sure that the Device is installed horizontally, and that there are no items blocking the front of the Device.

Operation Requirements



- Check whether 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 without professional instruction.
- Please do not touch the photosensitive device with your hands. Use an air blower to clean off the dust and filth on the lens.
- 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 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.
- Charge the lithium battery with a standard adapter.
- We recommend you pull out the battery after use to avoid excessive battery consumption.

Maintenance Requirements



- Clean 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 Information

1.1 Introduction

The Device adopts a fully embedded system with functions such as vehicle speed measurement, image capture, video surveillance, and automatic recognition of license plate number, lane, color, and vehicle model. Compared with traditional radar systems that separate industrial PC and IP camera, the Device combines the company's technical advantages in intelligent traffic field to provide you with stable performance, powerful functions, and ease of installation.

1.2 Main Functions

Image Composition

Supports the composition of 4 images at most.

OSD Information

Supports various OSD information such as time, location, lane information, license plate information, vehicle information, speed limit, road direction, capture direction, event information, and GPS coordinates.

Lane Monitoring

Monitors up to 4 lanes.

GPS/BeiDou Positioning

Supports GPS/BeiDou positioning.

WiFi Connection

Supports connection to a Wi-Fi network.

Time Synchronization

Supports NTP/GPS/BeiDou time synchronization and synchronization with PC time.

Storage

- Supports local storage and FTP.
- Supports setting the storage quota of images and videos.

Radar Visualization

- Supports configuring lane width and the installation parameters of the radar.
- Supports displaying the tracing effects and real-time videos.

Radar Calibration

Supports calibrating the radar based on radar and video data, which realizes the auto configuration of lane width and the installation parameters of the radar.

GUI Operations

Supports GUI operations.

2 Structure

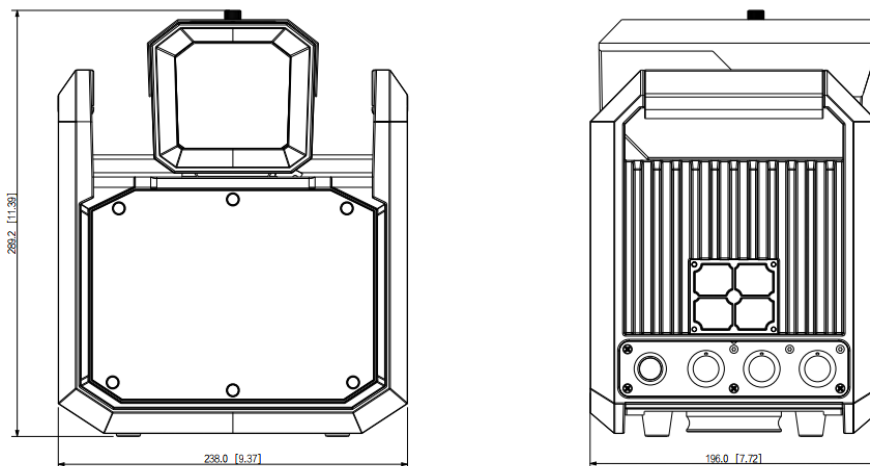
2.1 Appearance

Figure 2-1 Device appearance



2.2 Dimensions

Figure 2-2 Dimensions (mm [inch])



2.3 Panels

2.3.1 Left Panel

Figure 2-3 Left panel



Table 2-1 Port description

No.	Description
1	Power switch
2	24 VDC power input port
3	Ethernet port and USB port
4	RS-232 port and RS-485 port

2.3.2 Right Panel

Figure 2-4 Right panel



2.3.3 Front Panel

Figure 2-5 Front panel

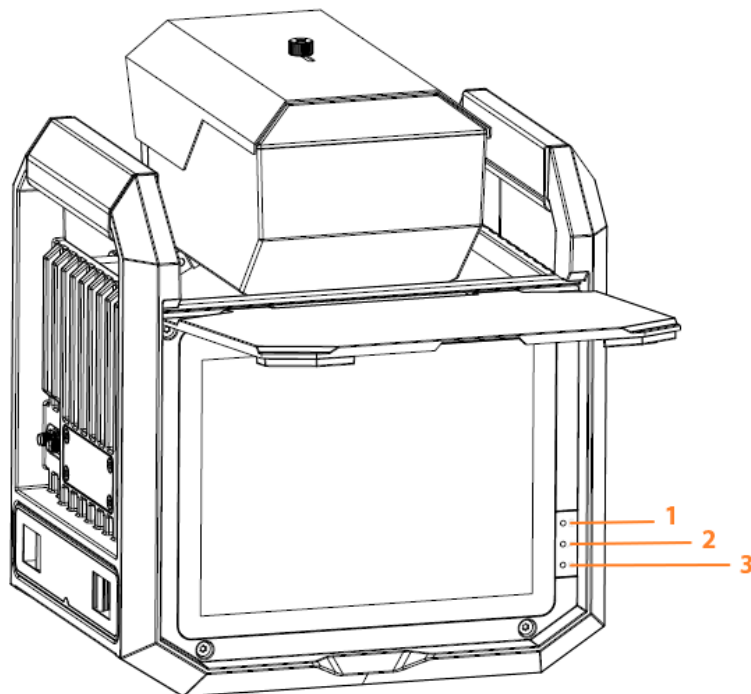





Table 2-2 Indicator light description

No.	Icon	Color	Function
1		Blue	<ul style="list-style-type: none">● Flashing: The lithium battery is being recharged.● On: The recharge is completed.● Off: The lithium battery is not being recharged.
2		Green	<ul style="list-style-type: none">● Flashing: The Device runs normally.● Off: The Device stops working.
3		Red	<ul style="list-style-type: none">● On: The Device is on.● Off: The Device is off.

3 GUI Operations

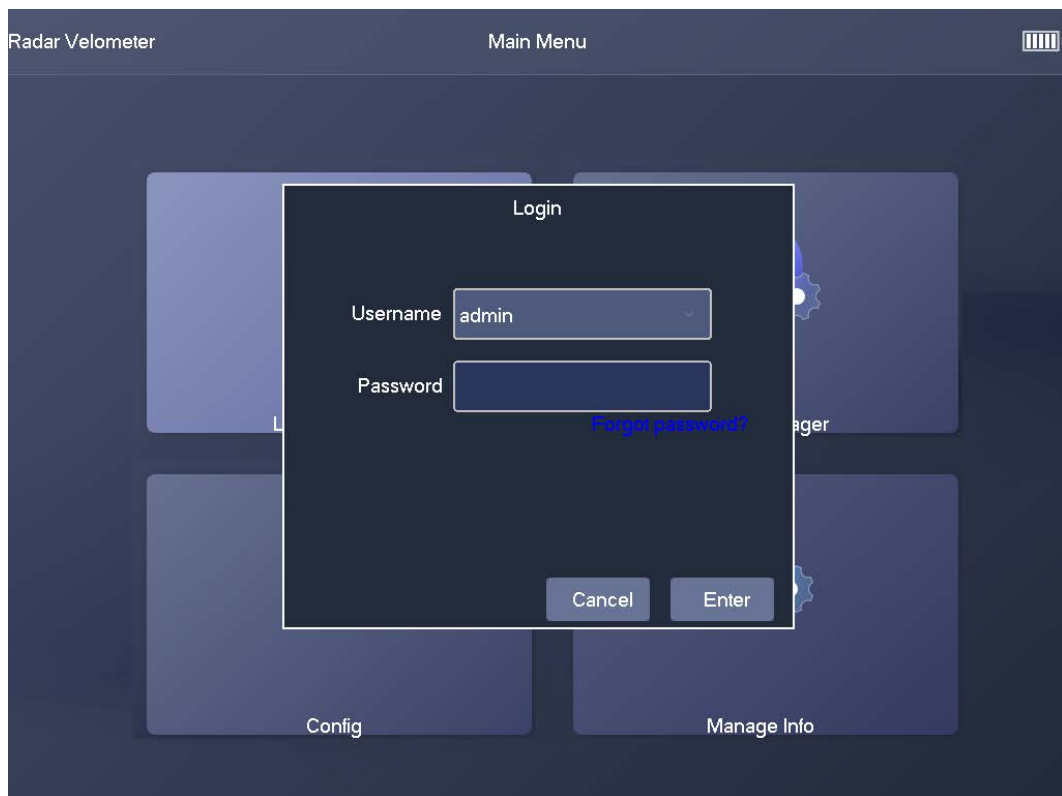
After you install the Device, you can set parameters on the graphic user interface (GUI) of the Device.

3.1 Introduction

3.1.1 Login

- Step 1** Start the Device after it is installed and all wires are connected.
The **Login** dialog box appears.
- Step 2** In the **Login** dialog box, enter the username and password, and then tap **Enter**.

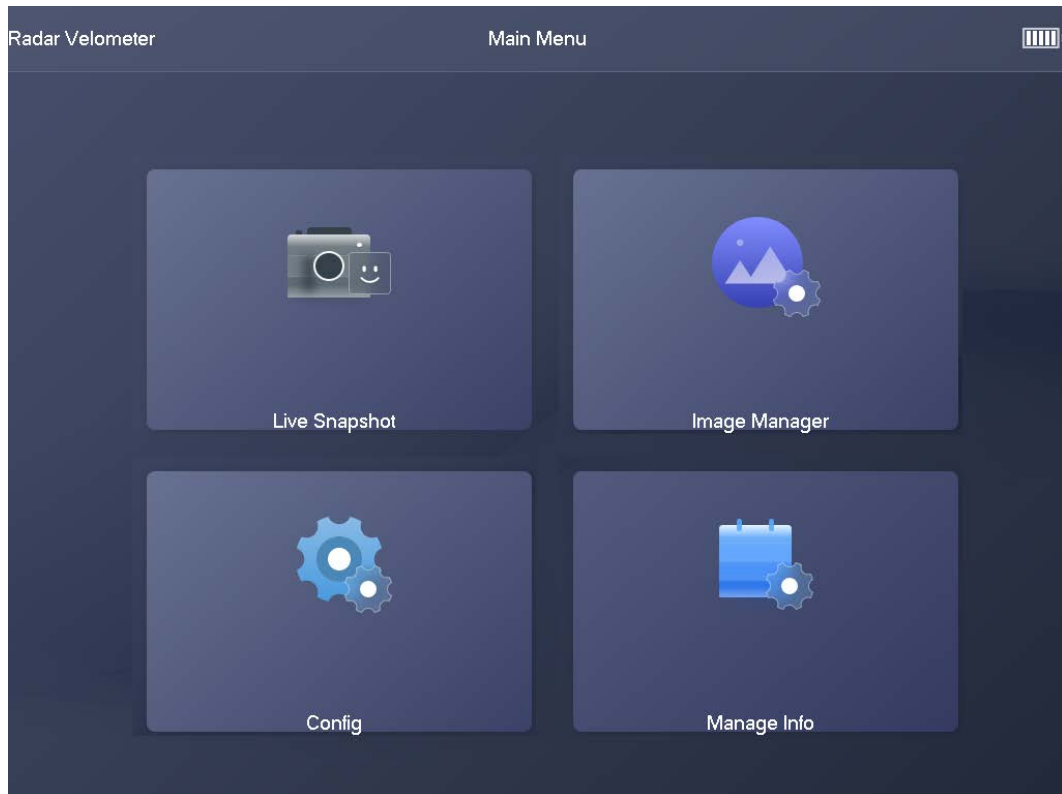
Figure 3-1 Login



3.1.2 Main Interface

The main interface of the GUI includes 4 parts: **Live Snapshot**, **Image Manager**, **Config**, and **Manage Info**.

Figure 3-2 Main interface



- **Live Snapshot:** You can view real-time video and captured images, rotate the PTZ, and configure the parameters of zoom & focus and image display.
- **Image Manager:** You can search for and back up captured images.
- **Config:** You can configure various parameters of the Device.
- **Manage Info:** You can view system information, manage users, and search for logs and traffic flow data.

3.2 Live Snapshot

3.2.1 Live

Tap **Live Snapshot** on the main interface, and the **Live** tab appears.

Figure 3-3 Live

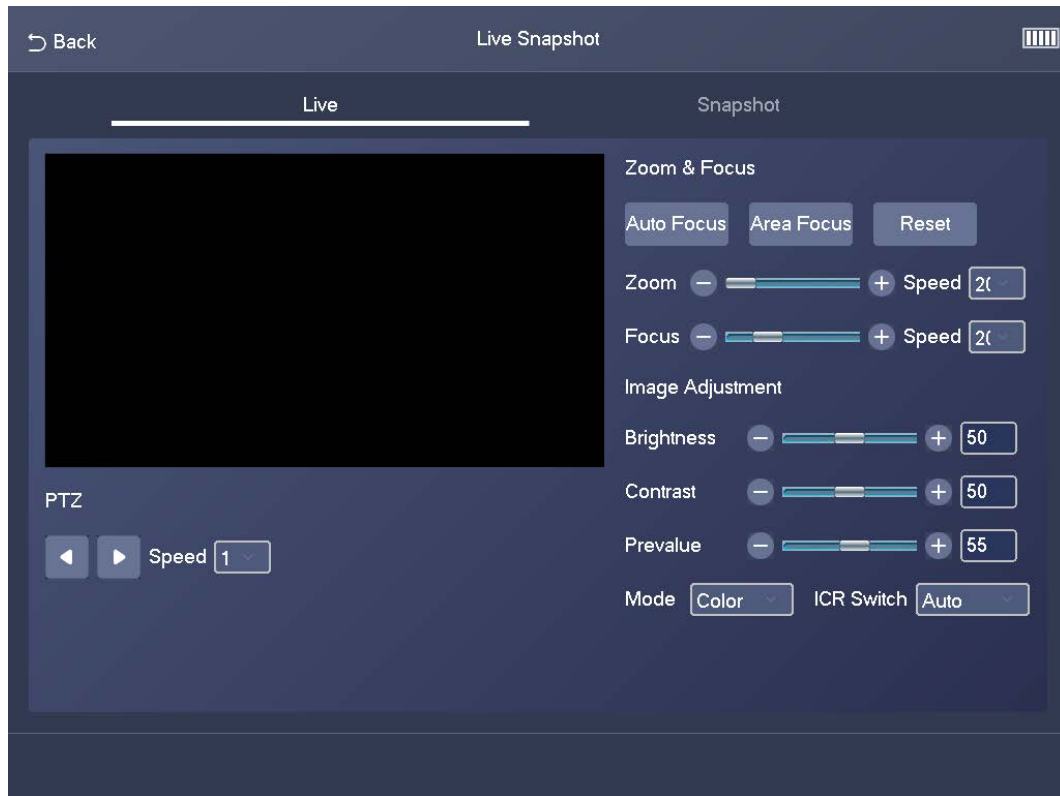


Table 3-1 Parameters on the Live tab

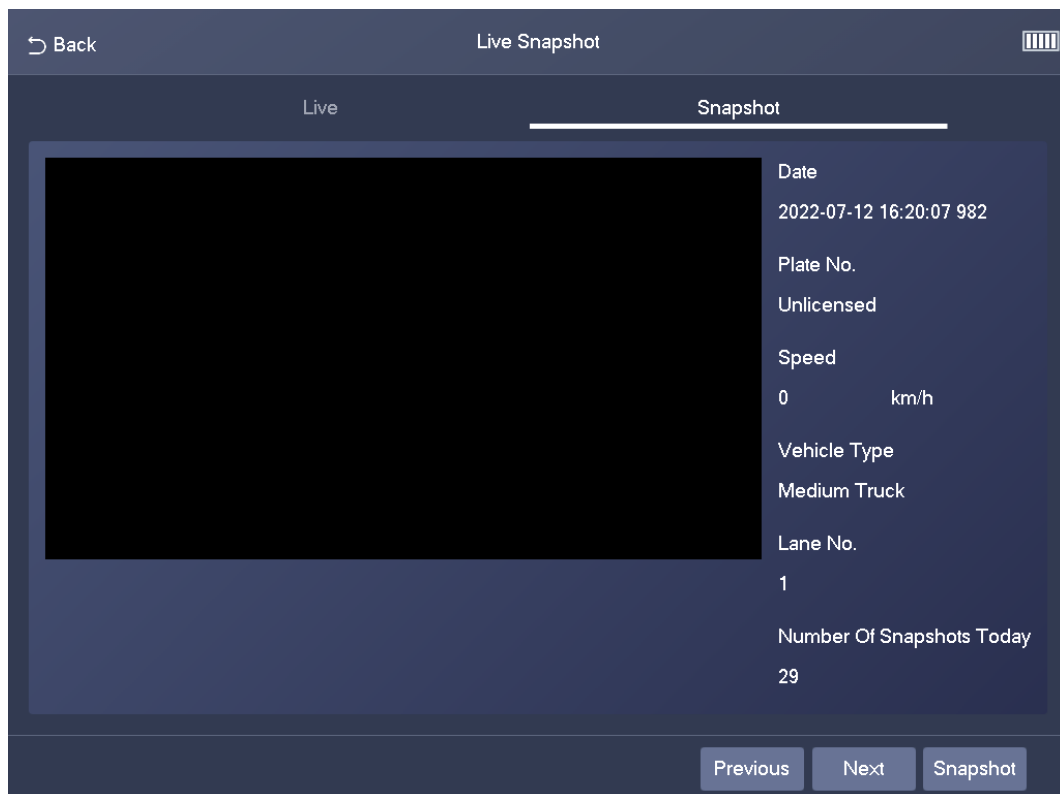
Module	Parameter	Description
PTZ	Speed	The speed at which the PTZ moves. Click or to make the PTZ horizontally move to the left or right.
Zoom & Focus	Auto Focus	After you tap the icon, the system automatically focuses the camera.
	Area Focus	After you tap the icon and select an area on the video, the system focuses the camera for the selected area.
	Reset	After you tap the icon, the system resets zoom and focus parameters.
Image Adjustment	Brightness	The brightness of the image.
	Contrast	The contrast of the image.
	Prevalue	The preset value of brightness.
	Mode	<ul style="list-style-type: none"> • Color: The image is always colored. • Auto: When the brightness is higher than the preset value, the image automatically changes to color. When it is below the preset value, the image changes to black and white. • B/W: The image is always black and white.

Module	Parameter	Description
	ICR Switch	<ul style="list-style-type: none"> • Auto: You need to pre-set the brightness in this mode. When the ambient brightness is higher than the preset value, the polarizer will start to work. • Polarizer: The polarizer is always running. Applicable to scenarios with high brightness. • IR Mode: Applicable to scenarios with low brightness.

3.2.2 Snapshot

Tap **Live Snapshot** on the main interface, and then tap **Snapshot**. The **Snapshot** tab displays snapshots and related information including date, plate number, vehicle speed, vehicle type, lane number, and the number of snapshots on the current day.

Figure 3-4 Snapshot



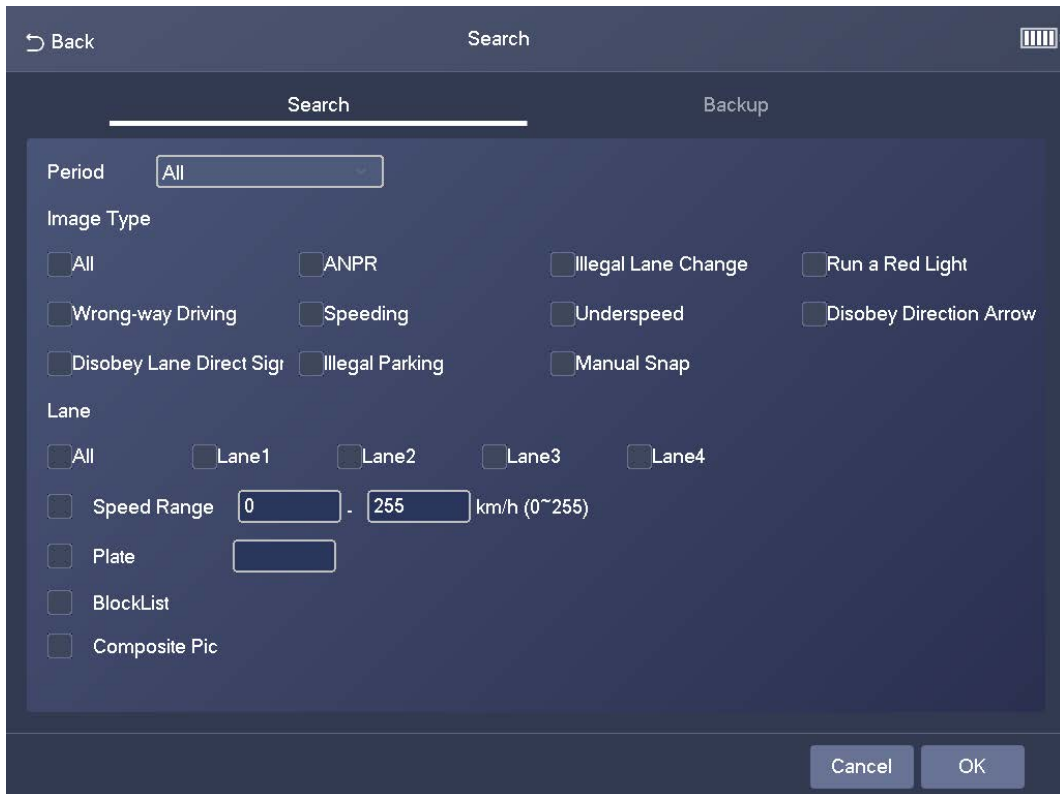
- Tap **Previous** to view the previous snapshot.
- Tap **Next** to view the next snapshot.
- Tap **Snapshot** to take a snapshot.

3.3 Image Manager

3.3.1 Search

Step 1 Tap **Image Manager** on the main interface, and then the **Search** tab appears.

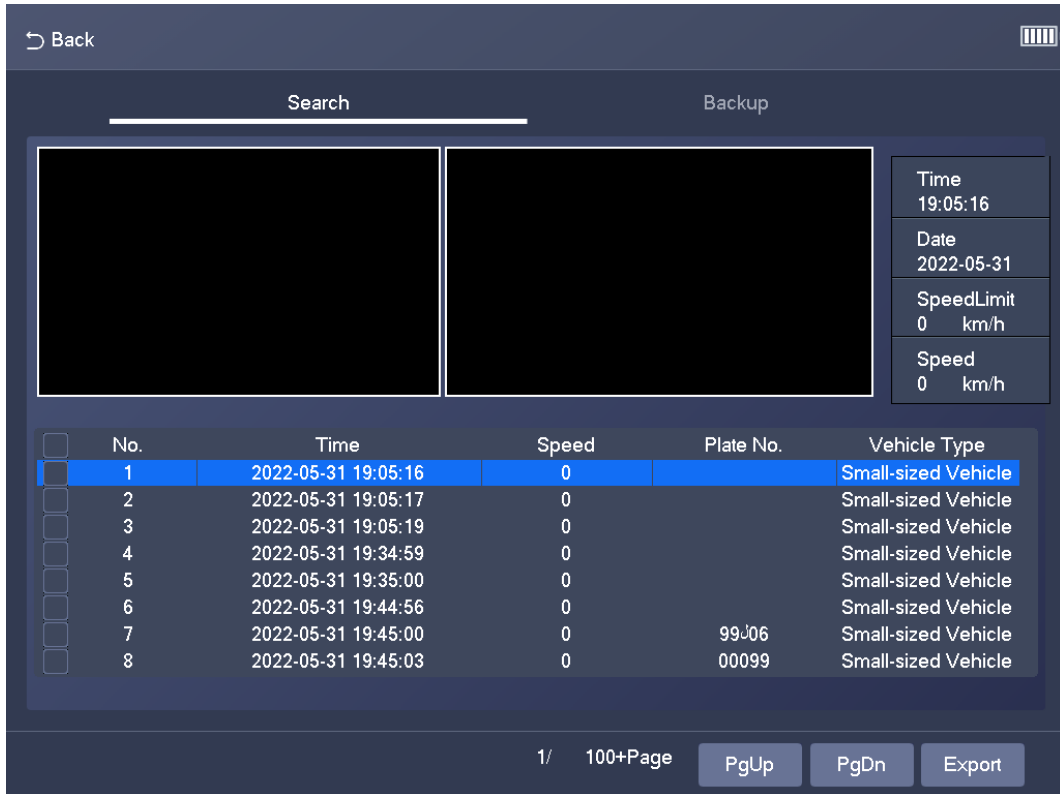
Figure 3-5 Search



Step 2 Set filter conditions, including period, image type, lane number, speed range, and plate number.

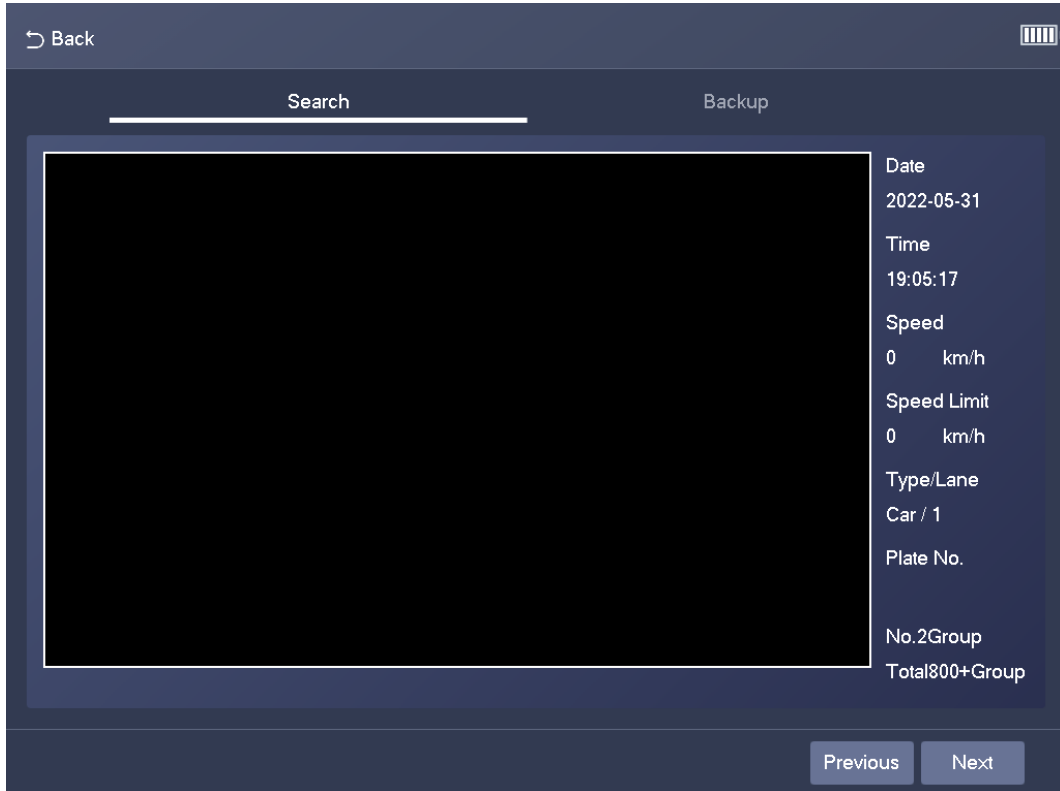
Step 3 Select **BlockList** and **Composite Pic** as needed, and then tap **OK**.
The search results are displayed in a list.

Figure 3-6 Search results



Step 4 Tap a search result, and then the related image and its information are displayed.

Figure 3-7 Image details



3.3.2 Backup

Step 1 Tap **Image Manager** on the main interface, and then tap **Backup**.

Figure 3-8 Backup



Step 2 Set filter conditions, including period, image type, lane number, speed range, and plate number.

Step 3 Select **BlockList** and **Composite Pic** as needed, and then tap **OK**.
The images that meet the filter conditions are backed up.

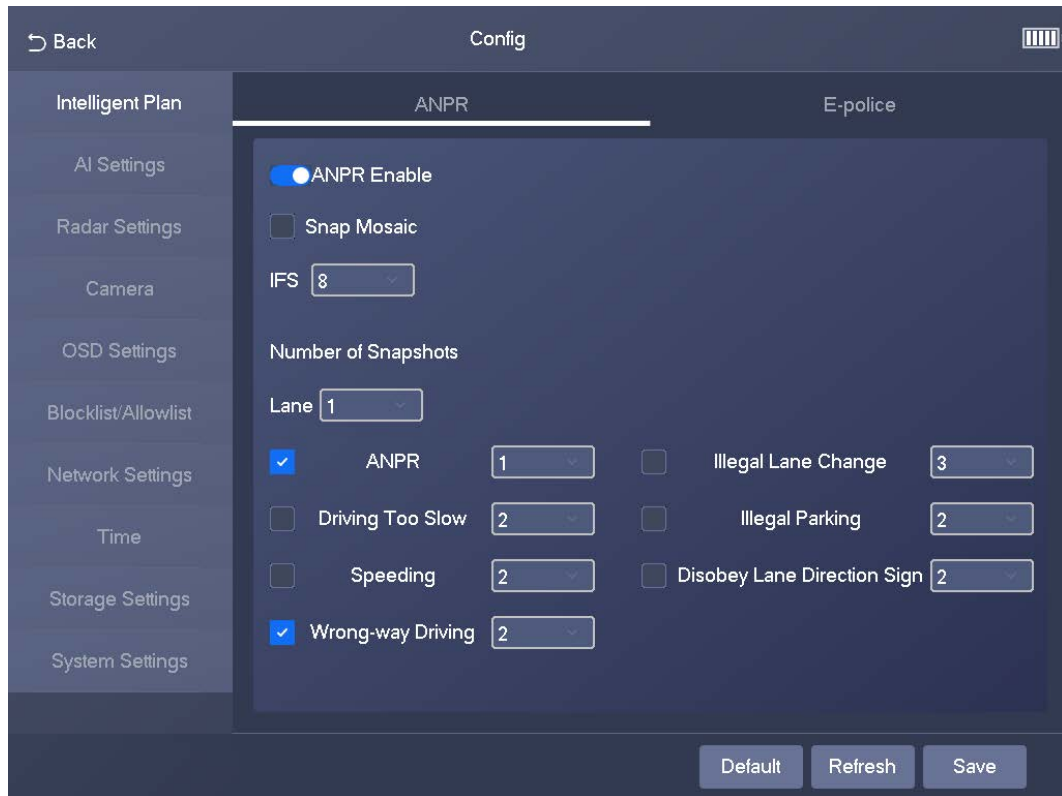
3.4 Config

3.4.1 Intelligent Plan

3.4.1.1 ANPR

Step 1 Select **Config > Intelligent Plan > ANPR**.

Figure 3-9 ANPR



Step 2 Configure the parameters.

Table 3-2 Description of ANPR parameters

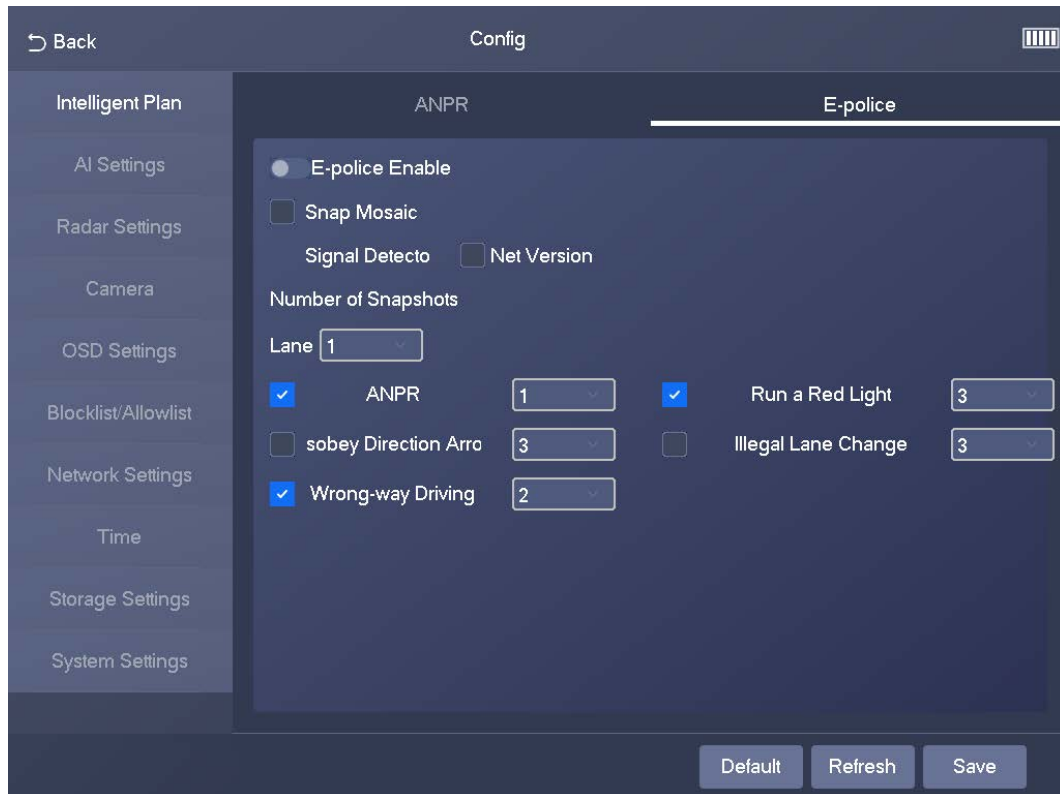
Parameter	Description
ANPR Enable	Specifies whether to enable the ANPR mode.
Snap Mosaic	Specifies whether to enable image mosaic.
IFS	The frame interval of capturing 2 images.

Step 3 Enable traffic rules for different lanes, and then tap **Save**.

3.4.1.2 E-police

Step 1 Select **Config > Intelligent Plan > E-police**.

Figure 3-10 E-police



Step 2 Configure the parameters.

Table 3-3 Description of E-police parameters

Parameter	Description
E-police Enable	Specifies whether to enable E-police mode.
Snap Mosaic	Specifies whether to enable image mosaic.
Signal Detector	Select Net Version to enable the light connected through the network.

Step 3 Enable rules for different lanes, and then tap **OK**.

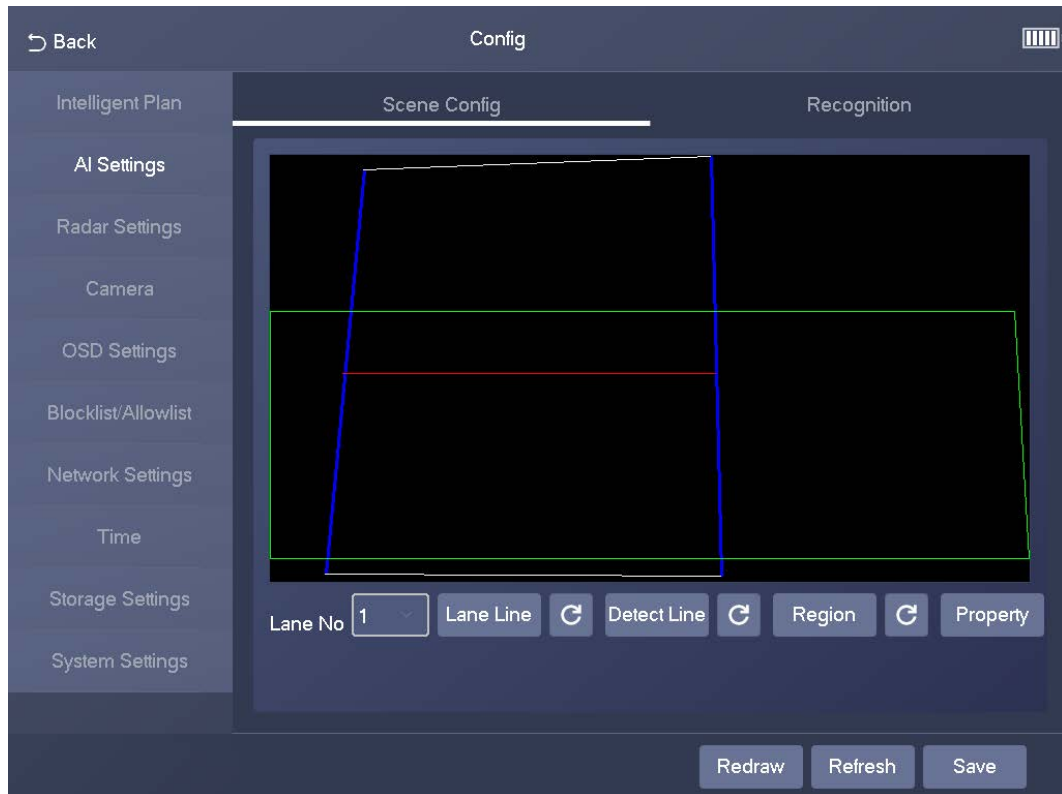
3.4.2 AI Settings


3.4.2.1 Scene Config

Step 1 Select **Config** > **AI Settings** > **Scene Config**.

Step 2 Select a lane for which you want to draw lines or regions.

Figure 3-11 Scene config



- Tap **Lane Line**, and then draw a lane line.
- Tap **Detect Line**, and then draw a detection line.
- Tap **Region**, and then draw a region.
- Tap  to delete the lines or regions you have drawn.

Step 3 Tap **Save**.

3.4.2.2 Recognition

Step 1 Select **Config** > **AI Settings** > **Recognition**.

Step 2 Configure the parameters.

Figure 3-12 Recognition

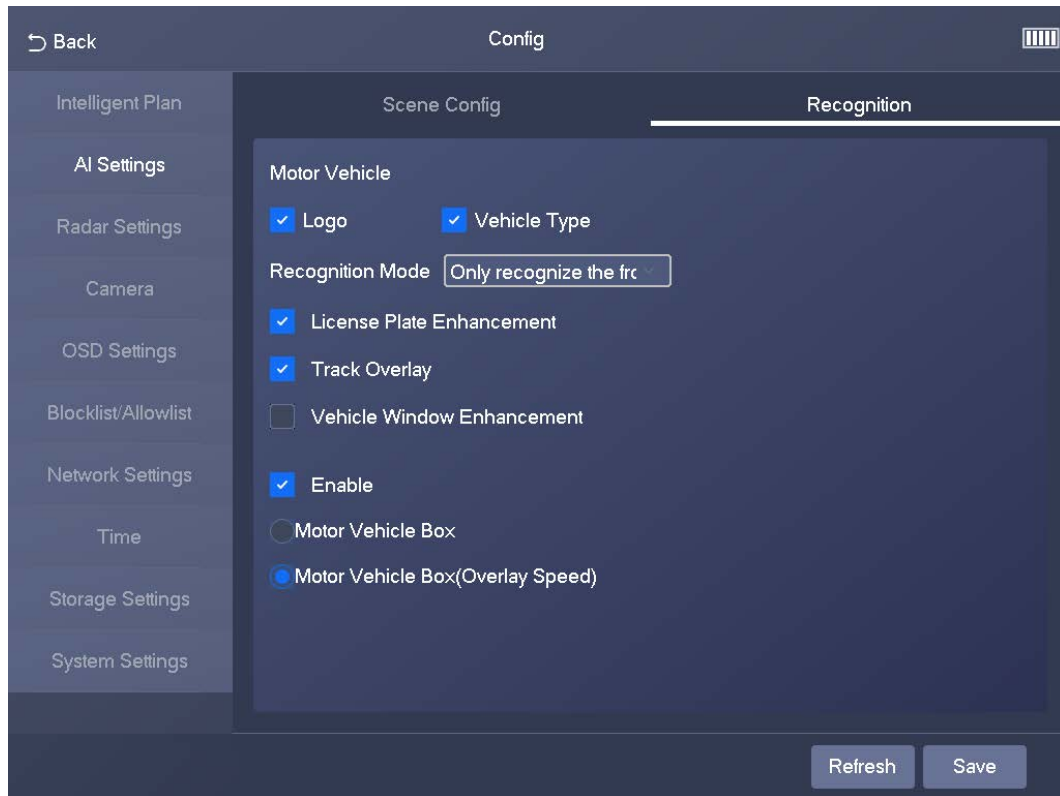


Table 3-4 Description of recognition parameters

Parameter	Description
Motor Vehicle	Supports recognizing vehicle logs and vehicle types.
License Plate Enhancement	Select the checkbox to enhance the effect of license plate images.
Vehicle Window Enhancement	Select the checkbox to enhance the effect of vehicle window images.
Track Overlay	Select the checkbox to enable Track Overlay .
Recognition Mode	<ul style="list-style-type: none"> ● Only recognize the front plate: Recognizes and captures the license plate on the vehicle head. ● Only recognize the rear plate: Recognizes and captures the license plate on the vehicle rear. ● Front plate priority: Head plate has the priority. ● Rear plate priority: Rear plate has the priority.

3.4.3 Radar Settings

3.4.3.1 Parameters

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

Figure 3-13 Parameters

Step 2 Configure the parameters.

Table 3-5 Description of radar parameters

Parameter	Description
Width	The width of the lane.
Detection Direction	The driving direction that triggers detection.
Max Speed	The maximum vehicle speed that can be recognized by the radar.
InstallHeight	The installation height of the Device.
Working Mode	<ul style="list-style-type: none"> • Work Mode: Use this mode in actual situation. • Soak Mode: Use this mode for product certification.
For Size	After you select the checkbox, the Device can distinguish large vehicles from small vehicles.
Highest Speed Limit	The allowed highest vehicle speed. If a vehicle runs over the highest speed, the vehicle is overspeed.
Lowest Speed Limit	The lowest vehicle speed. If a vehicle runs below the lowest speed, the vehicle is underspeed.

Step 3 Tap **Save**.

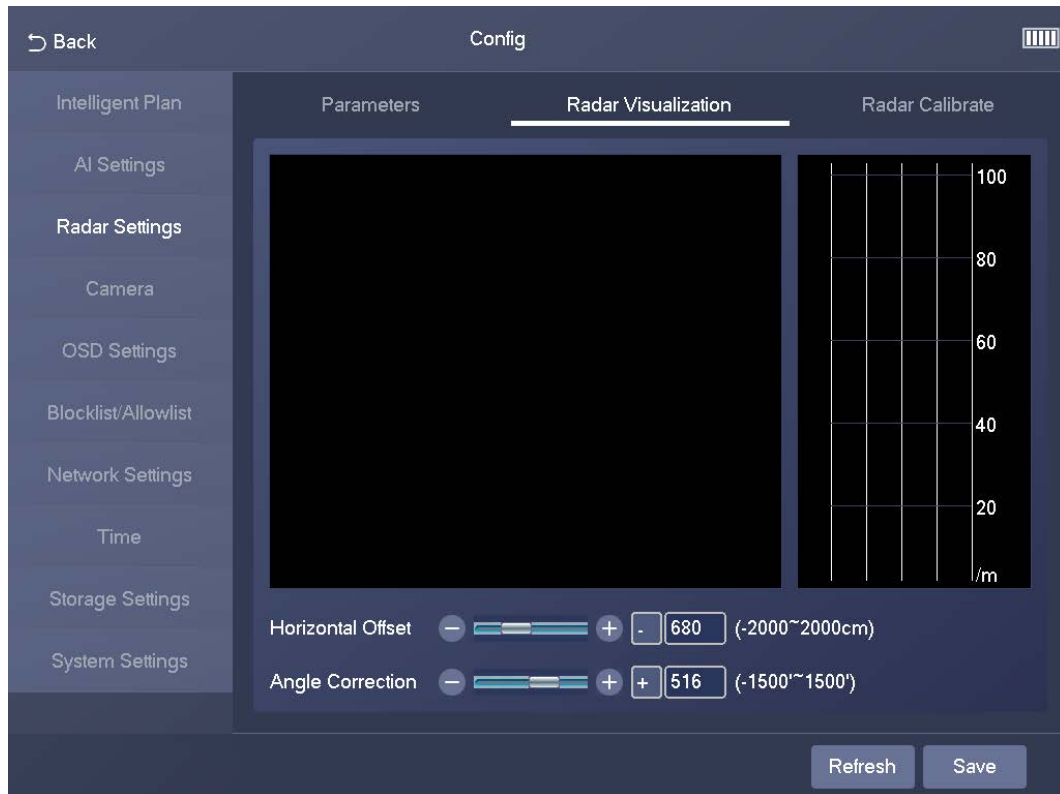
3.4.3.2 Radar Visualization

On the **Radar Visualization** tab, you can view the effect of radar detection in real time and modify some of the radar parameters.

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

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

Figure 3-14 Radar visualization



Step 3 Tap **Save**.

3.4.3.3 Radar Calibration

Make sure that the camera can capture right targets when the radar sends signals to the camera.



Radar calibration on the GUI is similar to that on the webpage. For details on radar calibration, see "4.3.1.1 Calibrating the Radar".

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

Step 2 Set **Area Width** to the width of the actual road.

After you set the width of the calibration area to the width of the actual road, the algorithm will automatically calibrate the radar.

Step 3 Tap **Save**.

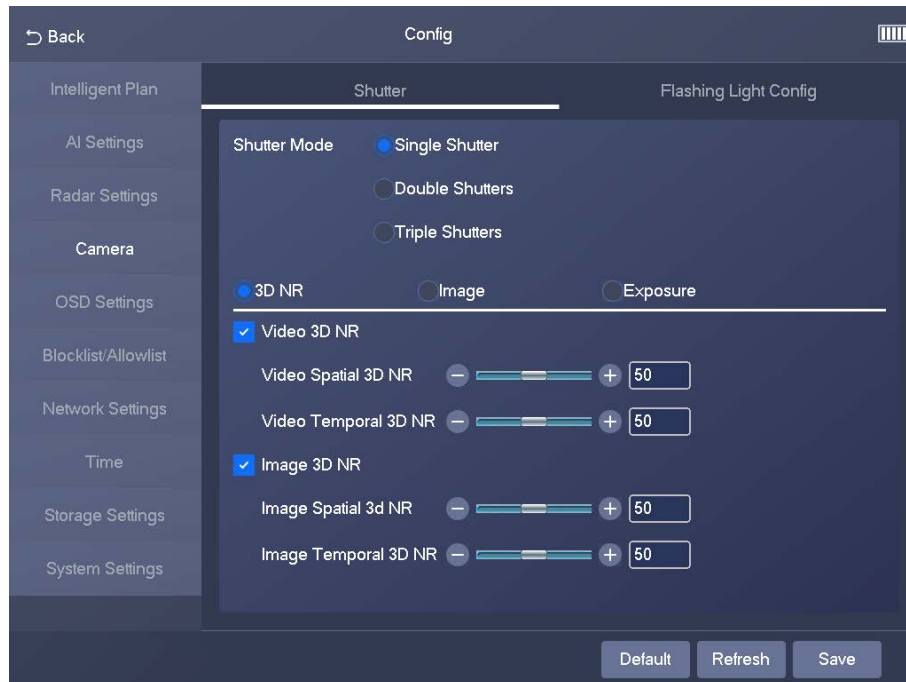
3.4.4 Camera

3.4.4.1 Shutter

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

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

Figure 3-15 Shutter



Step 2 Configure the parameters.

Shutter parameters on the GUI are similar to those on the webpage. For details, see Table 4-30.

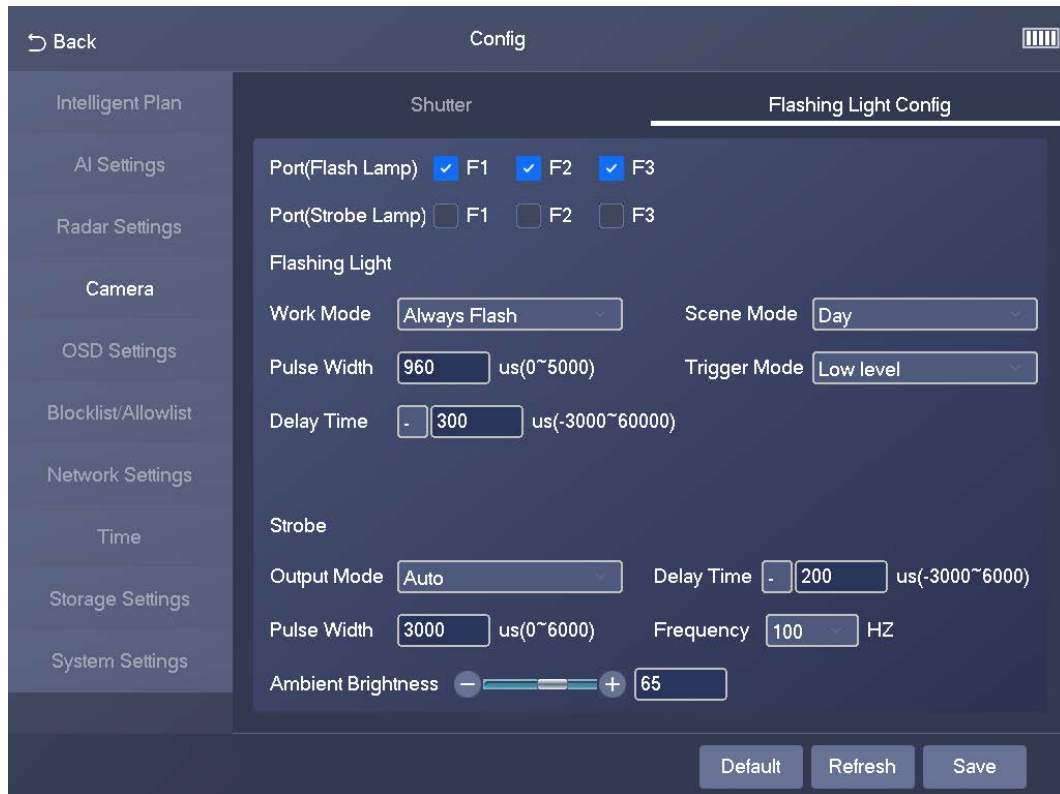
Step 3 Tap **Save**.

3.4.4.2 Flashing Light Config

You can configure the work mode of the flashing lights and strobes connected to the Device.

Step 1 Select **Config** > **Camera** > **Flashing Light Config**.

Figure 3-16 Flashing light config



Step 2 Configure the parameters.

Flashing light parameters on the GUI are similar to those on the webpage. For details on flashing light parameters, see Table 4-37.

Step 3 Tap **Save**.

3.4.5 OSD Settings

3.4.5.1 OSD Road Section

Select **Config > OSD Settings > OSD Road Section**. On the **OSD Road Section** tab, you can configure road information, including road address, road code, road section code, lane number, and passing direction.

Figure 3-17 OSD road section

Config

Intelligent Plan

AI Settings

Radar Settings

Camera

OSD Settings

Blocklist/Allowlist

Network Settings

Time

Storage Settings

System Settings

OSD Road Section

OSD Setting

OSD Option

Road Address

Road Code

Road Section Code

Lane

Passing Direction

1

South to North

Default Refresh Save

3.4.5.2 OSD Setting

Select **Config > OSD Settings > OSD Setting**. On the **OSD Setting** tab, you can configure the font color and font size of OSD information.

Figure 3-18 OSD setting

Config

Intelligent Plan

AI Settings

Radar Settings

Camera

OSD Settings

Blocklist/Allowlist

Network Settings

Time

Storage Settings

System Settings

OSD Road Section

OSD Setting

OSD Option

Font Color

Font Size

White

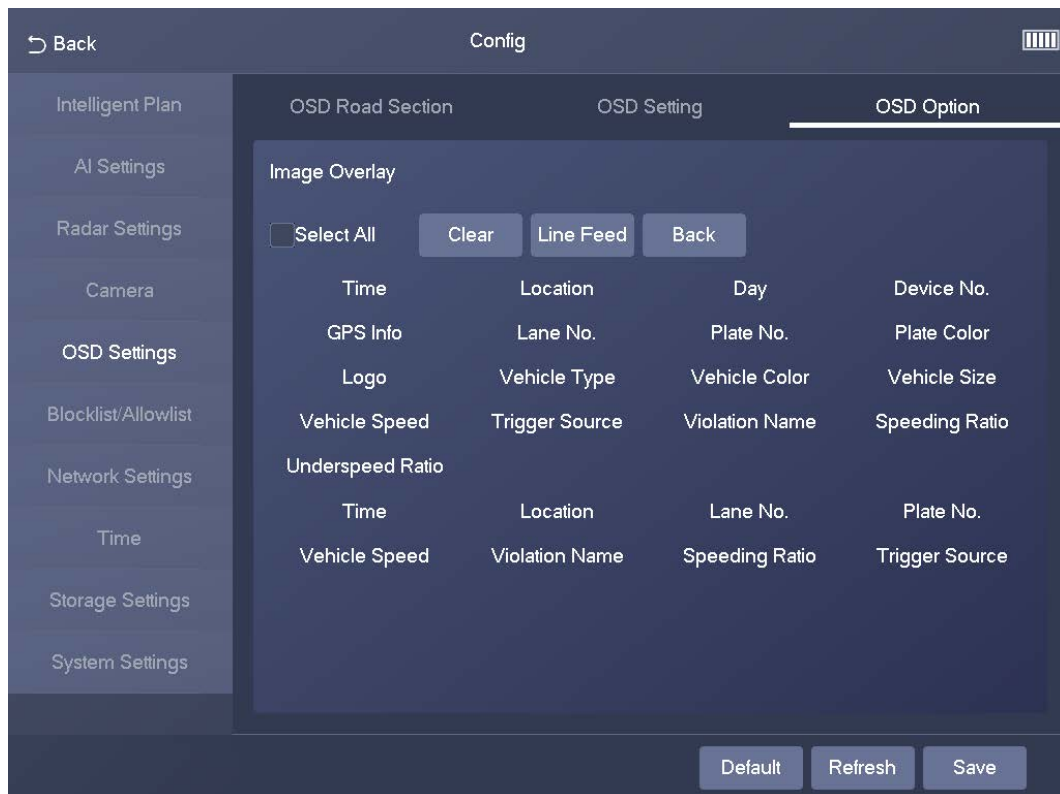
72 Multiple

Default Refresh Save

3.4.5.3 OSD Option

Step 1 Select **Config** > **OSD Settings** > **OSD Option**.

Figure 3-19 OSD information



Step 2 Add OSD options.

- Tap an OSD option to add it.
- Select **Select All** to add all OSD information.

Step 3 Tap **Save**.

3.4.6 Blocklist/Allowlist

Set the allowlist and blocklist of vehicles.

- Allowlist: When vehicles in the allowlist are detected, the Device discards the captured vehicle violation images without any processing.
- Blocklist: When vehicles in the blocklist are detected, the Device triggers linked actions.

3.4.6.1 Allowlist

Step 1 Select **Config** > **Blocklist/Allowlist** > **Allowlist**.

Step 2 Tap **Add**, and then configure the parameters.

Figure 3-20 Add

Step 3 Tap **OK**.



Select **Continue Add**, and then you can continue to add more plate numbers after you tap **OK**.

3.4.6.2 Blocklist

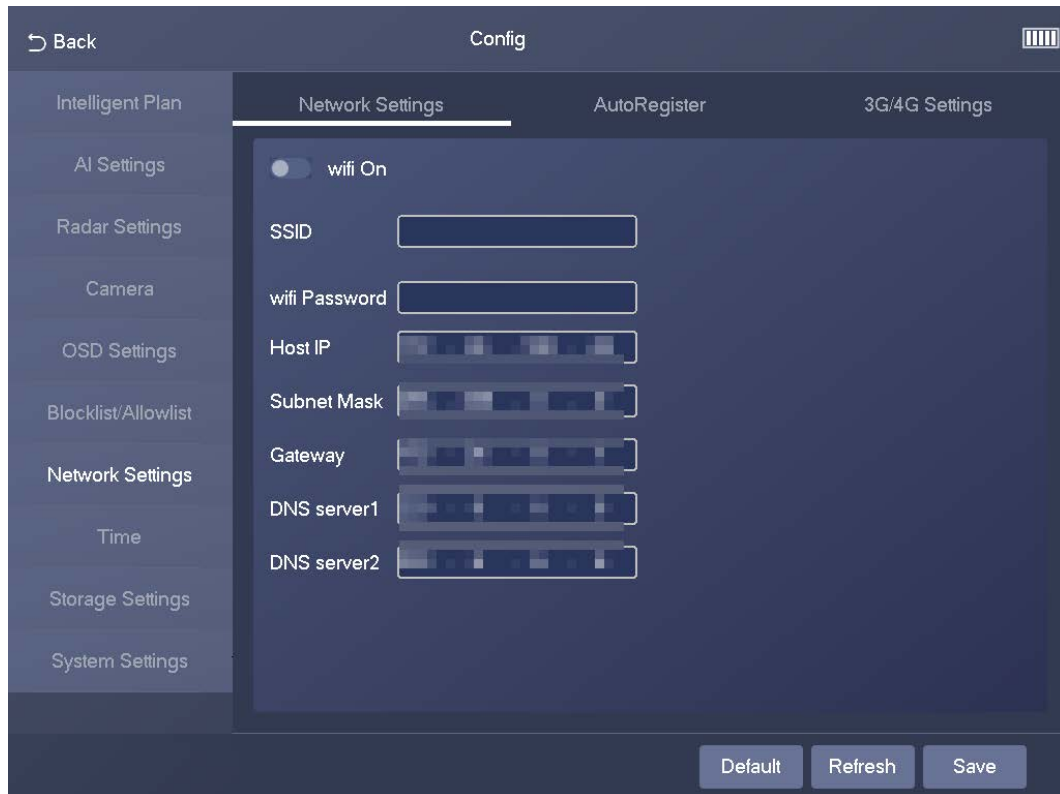
Select **Config > Blocklist/Allowlist > Blocklist**. The setting of a blocklist is similar to that of an allowlist. For details, see "3.4.6.1 Allowlist".

3.4.7 Network Settings

3.4.7.1 Network Settings

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

Figure 3-21 Network settings



Step 2 Tap to enable Wi-Fi.

- **SSID:** the name of the Wi-Fi network.
- **wifi Password:** the password of the Wi-Fi network.

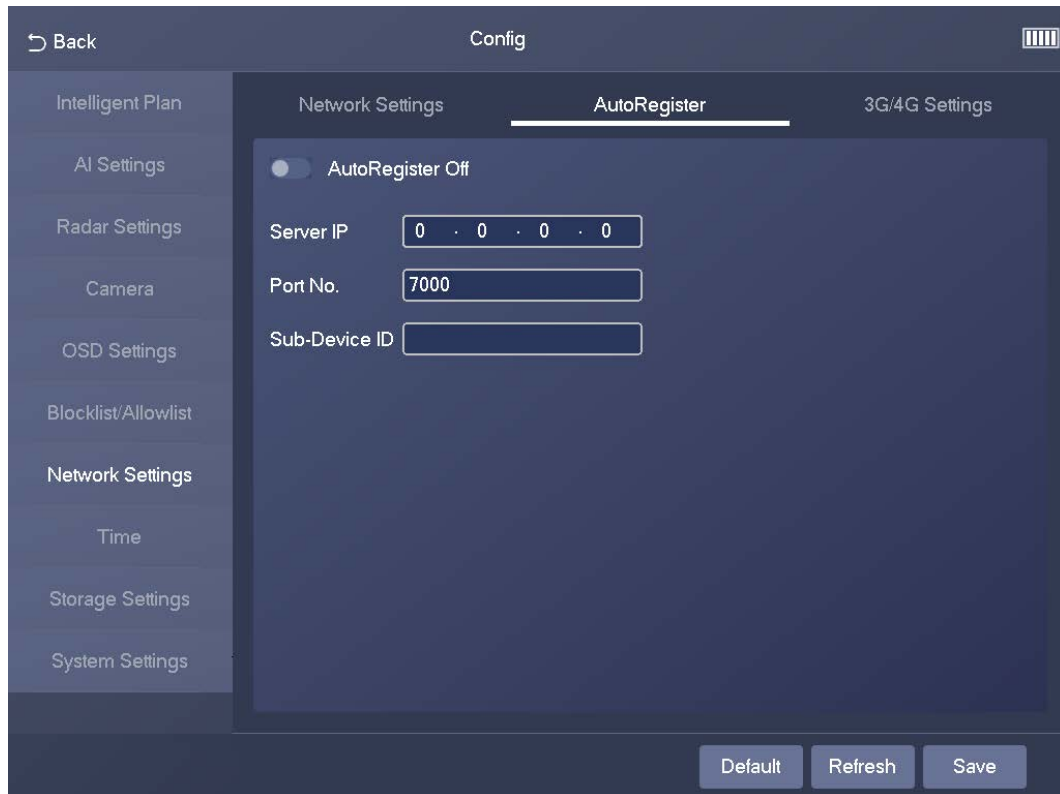
Step 3 Configure the network settings, including host IP address, subnet mask, gateway, and DNS server.

Step 4 Tap **Save**.

3.4.7.2 Auto Register

Step 1 Select **Config > Network Settings > AutoRegister**.

Figure 3-22 Auto register

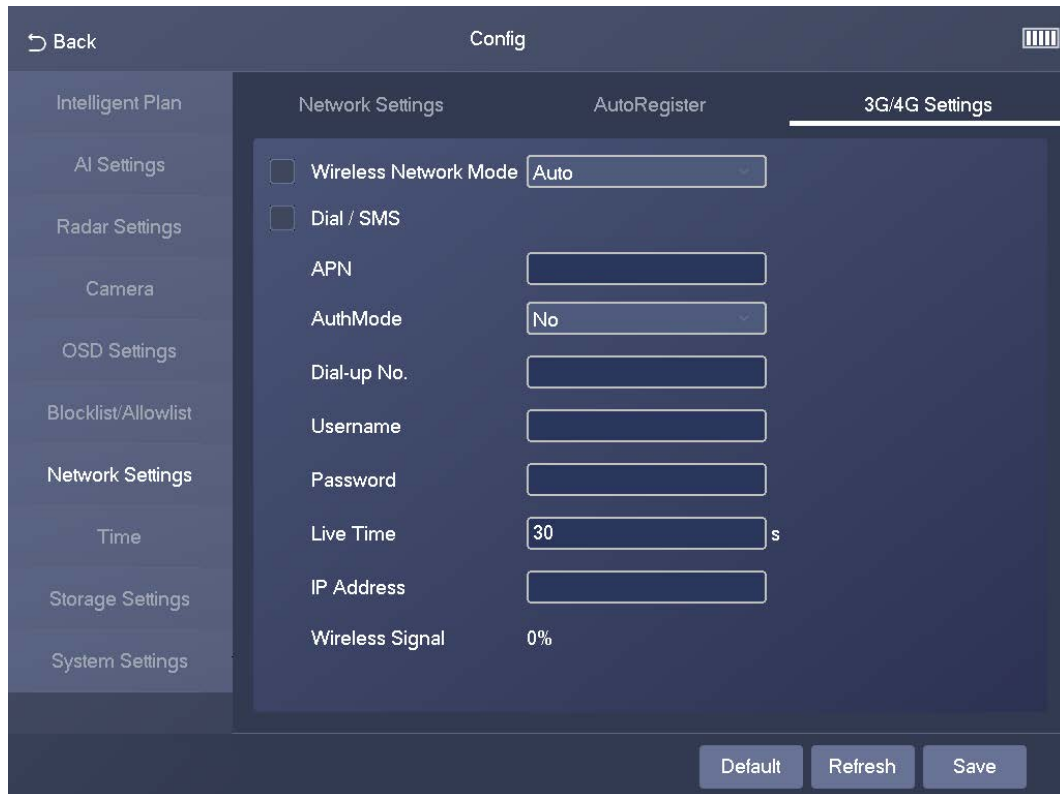


- Step 2 Tap to enable the auto register function.
- Step 3 Enter the IP address of server that needs to be registered, and also the port for auto registration.
- Step 4 Enter the **Sub-Device ID**, which is the device ID assigned by the server for auto registration. Make sure that there are no repeated device IPs.
- Step 5 Tap **Save**.

3.4.7.3 3G/4G Settings

- Step 1 Select **Config > Network Settings > 3G/4G Settings**.

Figure 3-23 3G/4G settings



Step 2 Select **Wireless Network Mode**.



If you set **Wireless Network Mode** to **Auto**, the wireless network automatically changes based on the actual situation.

Step 3 Select **Dial/SMS**, and then configure APN information, such as APN, dial number, username, and password.

Step 4 Tap **Save**.

3.4.8 Time

3.4.8.1 NTP Setting

Step 1 Select **Config** > **Time** > **NTP Setting**.

Step 2 Tap , and then configure the parameters.

Figure 3-24 NTP setting

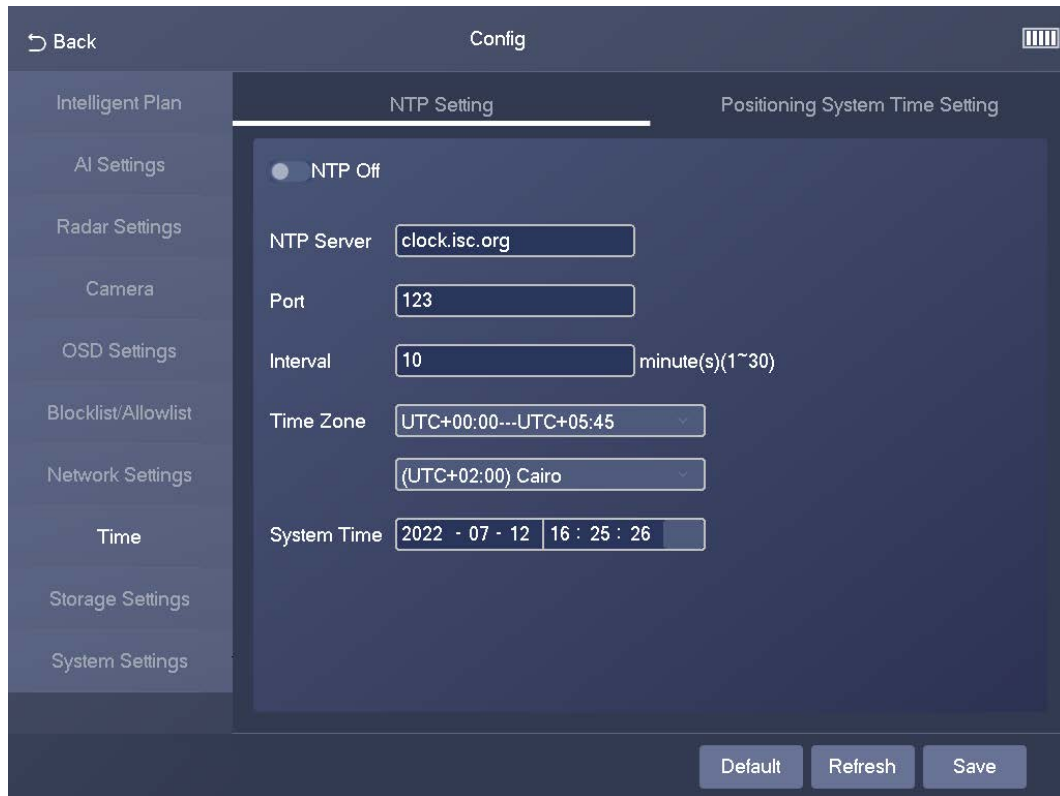


Table 3-6 Description of NTP parameters

Parameter	Description
NTP Server	The IP address and the port number of NTP server.
Port	
Interval	The time synchronization interval of the Device and the NTP or satellite.
Time Zone	The time zone where the Device is located.
System Time	The current time of the Device.

Step 3 Tap **Save**.

3.4.8.2 Positioning System Time Setting

Step 1 Select **Config > Time > Positioning System Time Setting**.

Step 2 Tap , and then configure the parameters.

Figure 3-25 Positioning system time setting

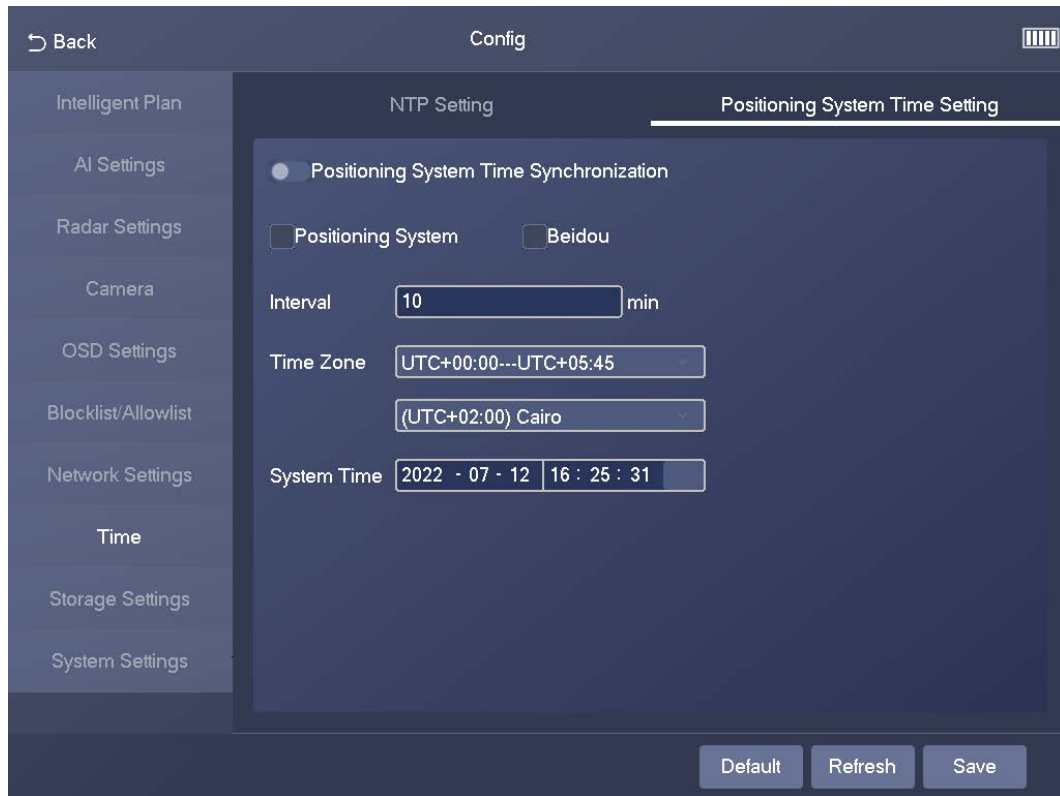


Table 3-7 Description of synchronization parameters

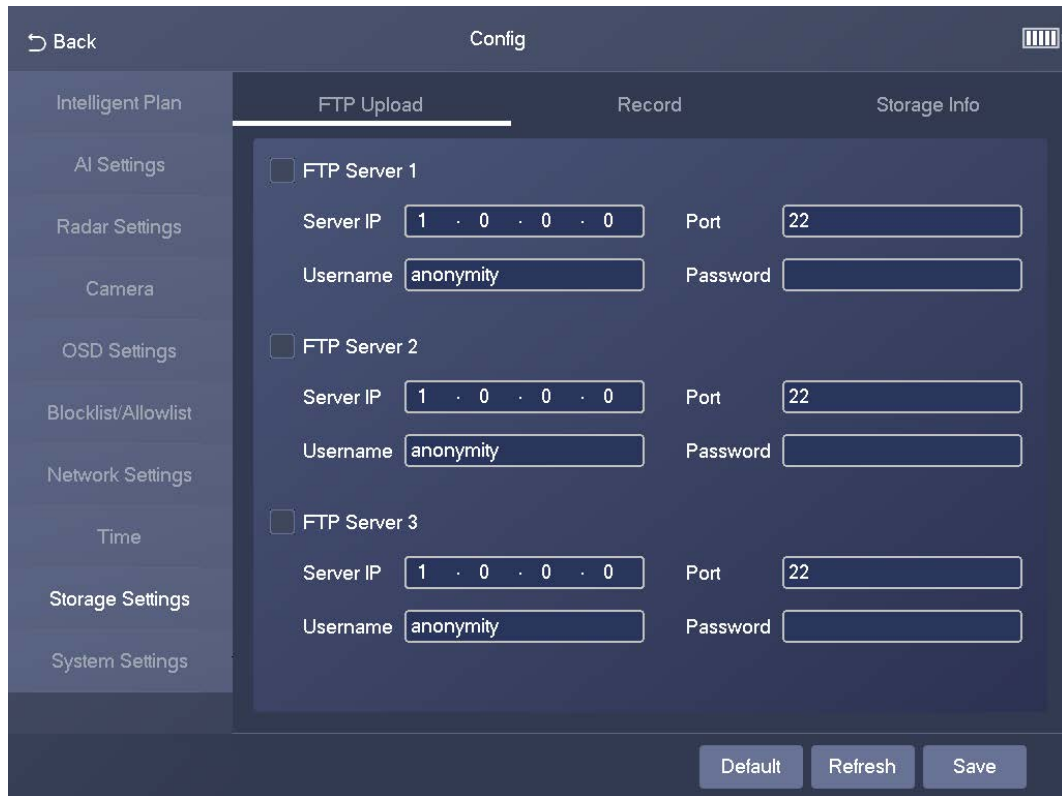
Parameter	Description
Positioning System	Select the checkbox to enable GPS positioning.
Beidou	Select the checkbox to enable Beidou positioning.
Interval	The time synchronization interval of the Device and the NTP or satellite.
Time Zone	The time zone where the Device is located.
System Time	The current time of the Device.

3.4.9 Storage Settings

3.4.9.1 FTP Upload

Select **Config** > **Storage Settings** > **FTP Upload**. On the **FTP Upload** tab, you can configure multiple FTP servers.

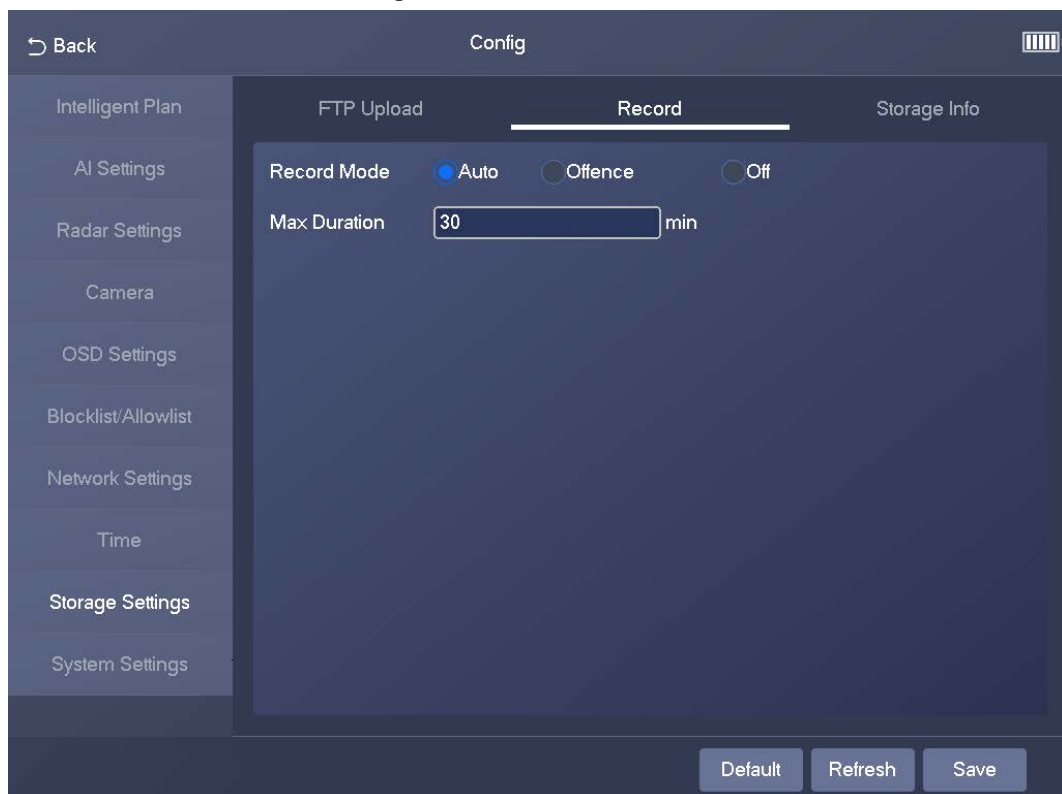
Figure 3-26 FTP server



3.4.9.2 Record

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

Figure 3-27 Record



Step 2 Select the record mode.

- **Auto:** Record videos continuously
- **Offence:** Record videos only when a traffic violation event is detected.
- **Off:** Do not record videos.

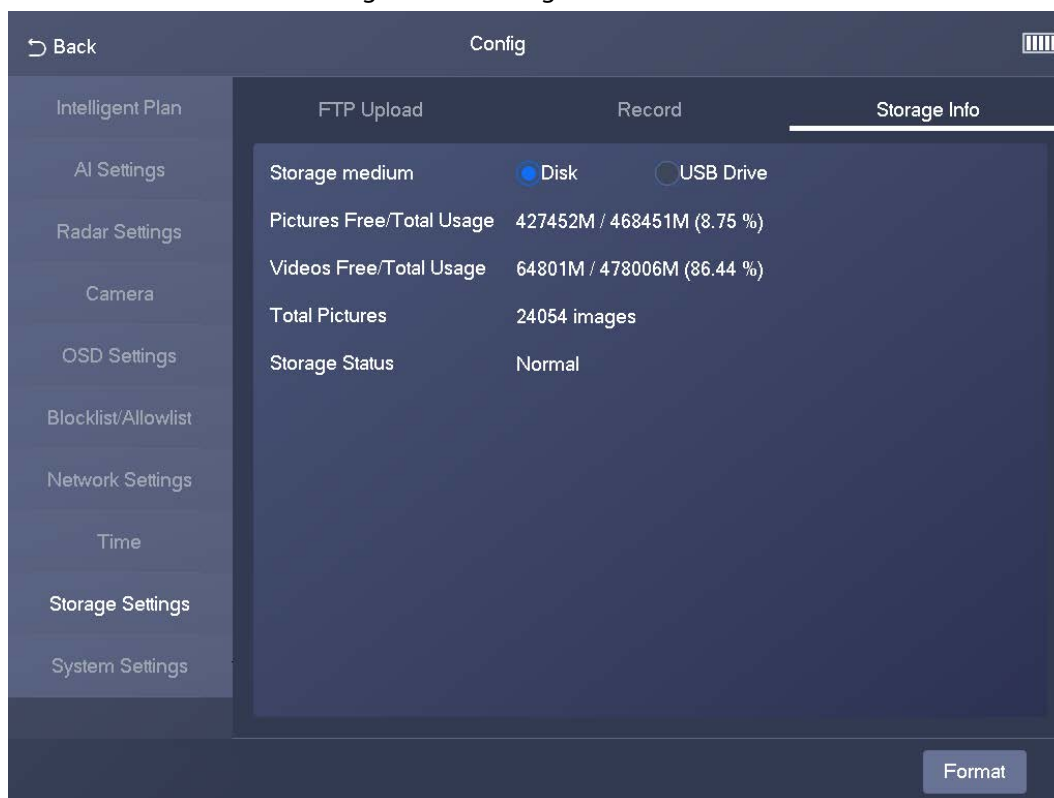
Step 3 Set the maximum duration of recorded videos.

Step 4 Tap **Save**.

3.4.9.3 Storage Info

Select **Config > Storage Settings > Storage Info**. On the **Storage Info** tab, you can view storage information, including storage medium, storage space, storage status, and the total number of images.

Figure 3-28 Storage info

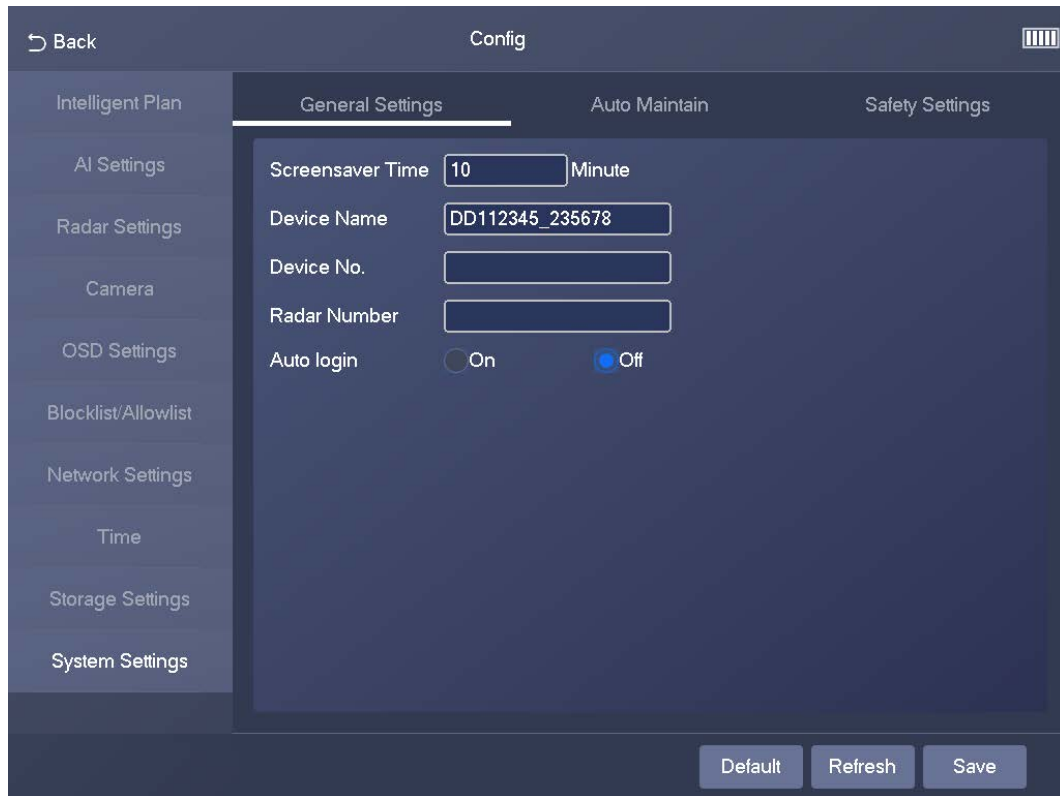


3.4.10 System Settings

3.4.10.1 General Settings

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

Figure 3-29 General settings



Step 2 Configure the parameters.



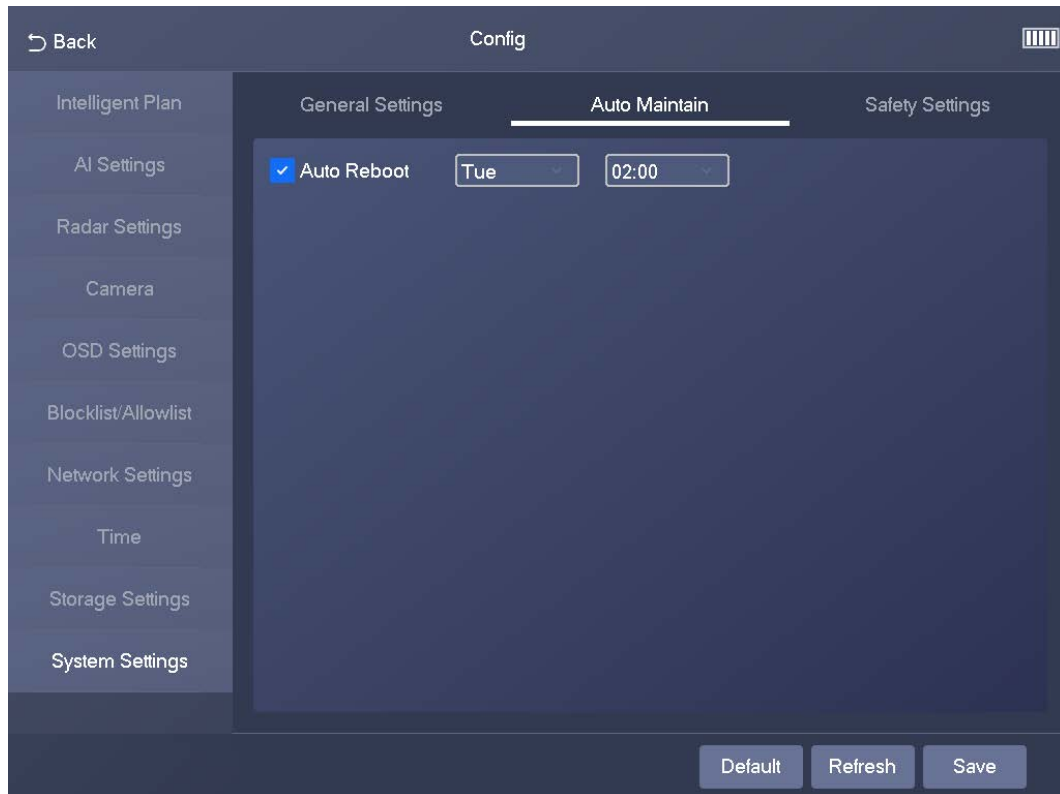
Select **On** to enable auto login.

Step 3 Tap **Save**.

3.4.10.2 Auto Maintain

Step 1 Select **Config** > **System Settings** > **Auto Maintain**.

Figure 3-30 Auto maintain



Step 2 Select **Auto Reboot**, and then configure the day and time. The system will automatically restart at the defined day and time.

Step 3 Tap **Save**.

3.4.10.3 Safety Settings

You can enable multiple system services to secure network safety.

Step 1 Select **Config** > **System Settings** > **Safety Settings**.

Step 2 Enable the services.

Figure 3-31 System service

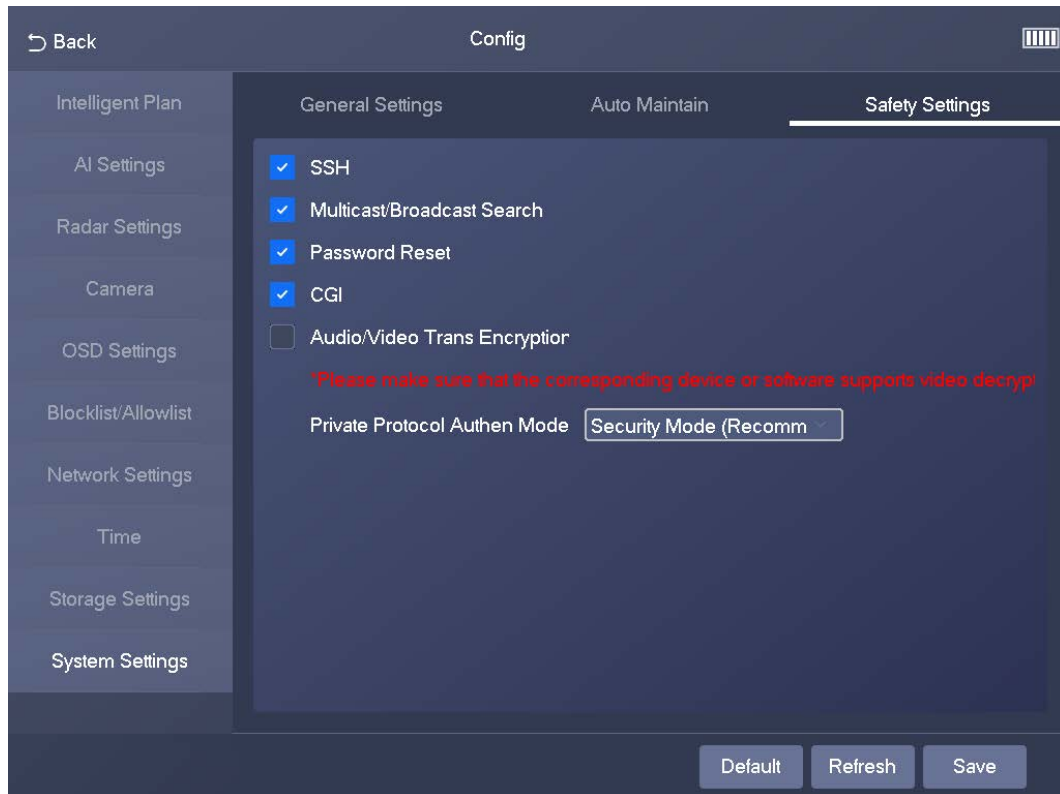



Table 3-8 Description of system service parameters

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.
Audio/Video Trans Encryption	<p>Enable this function to encrypt stream transmitted through private protocol.</p>  <ul style="list-style-type: none"> Make sure that the matched device or software supports the video decryption function. We recommend enabling the encryption service to avoid data leak.
Private Protocol Authen Mode	Security Mode is recommended.

Step 3 Tap **Save**.

3.5 Manage Info

3.5.1 System Info

Tap **Manage Info**, and then the **System Info** page appears. On the **System Info** page, you can view system information, device information, network status, and peripheral information on different tabs.

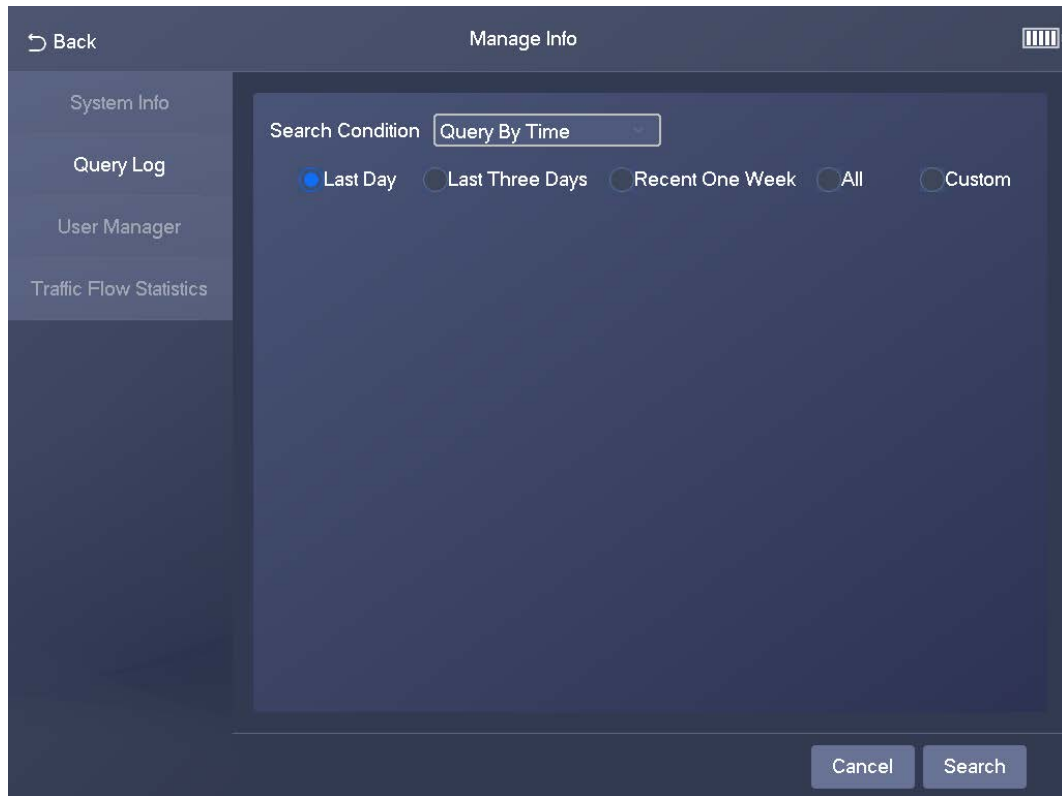
Figure 3-32 System information



3.5.2 Log Search

- Step 1 Select **Config > Query Log**.
- Step 2 Set search conditions, and the tap **Search**.
The search results are displayed in a list.

Figure 3-33 Log search



3.5.3 User Manager

- Step 1 Select **Config > User Manager**.
- Step 2 Tap **Add User**, and then configure user information, including username, password, group, and permissions.

Figure 3-34 Add a user

The screenshot shows a mobile application interface for adding a user. The top bar has a 'Back' button and the title 'Manage Info'. A sidebar on the left contains menu items: 'System Info', 'Query Log', 'User Manager', and 'Traffic Flow Statistics'. The main content area is titled 'Add User' and contains the following fields and options:

- Username:** A text input field.
- Password:** A text input field.
- Confirm Password:** A text input field.
- Group:** A dropdown menu with 'admin' selected.
- Remarks:** A text input field.
- Permission:** A grid of checkboxes for various system functions:
 - Account, System, File Backup, Network, Security
 - Monitor, System Info, Storage, Peripheral, Maintenance
 - Search, Event, Audio/Video Parame, Manual Control

At the bottom right, there are 'Cancel' and 'OK' buttons.

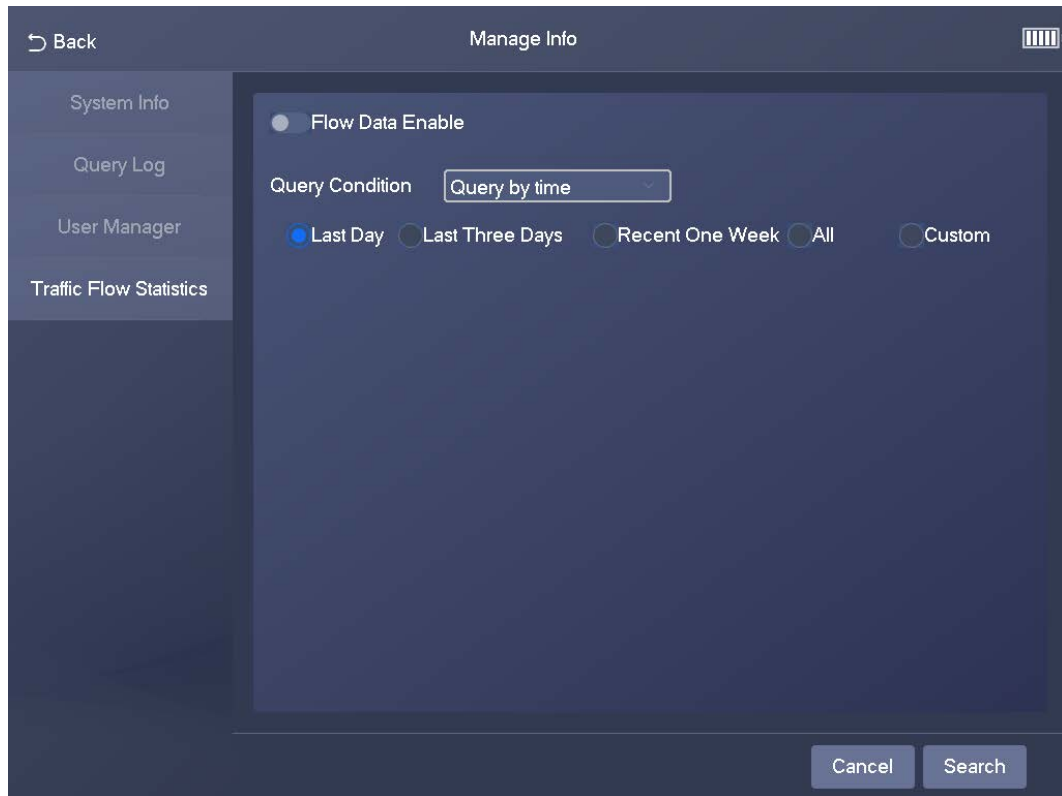
Step 3 Tap **OK**.

3.5.4 Traffic Flow Statistics

Step 1 Select **Manage Info > Traffic Flow Statistics**.

Step 2 Tap to enable flow data collection.

Figure 3-35 Traffic flow statistics



Step 3 Set search conditions, and then tap **Search** to search for traffic flow data.

4 Webpage Operations

4.1 Introduction

Before you use the webpage of the Device, you must initialize the Device and configure its settings on the webpage. The following sections introduce the initialization and webpage functions of the Device.



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

4.1.1 Initialization

The Device is delivered in the uninitialized state. You must initialize the Device before you can use the webpage of the Device.

Step 1 Use ping X.X.X.X (IP address of the Device) command to check whether the network is connected.

Step 2 Open a browser, enter the IP address of the Device in the address bar, and then press the Enter key.



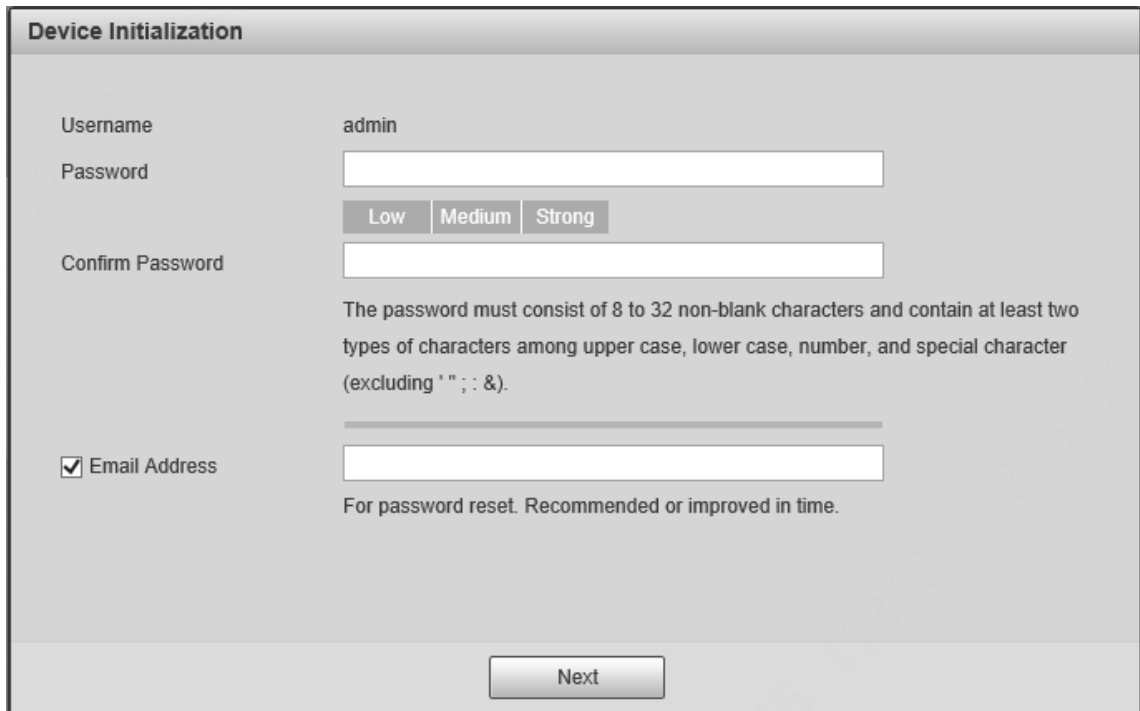
Make sure that the IP address of the PC and that of the Device are on the same network segment.

Step 3 In the **Device Initialization** dialog box, enter your new password.

Step 4 Select **Email Address**, and then enter your email address. This helps you reset your password when you forgot your password.

Step 5 Click **Next**.

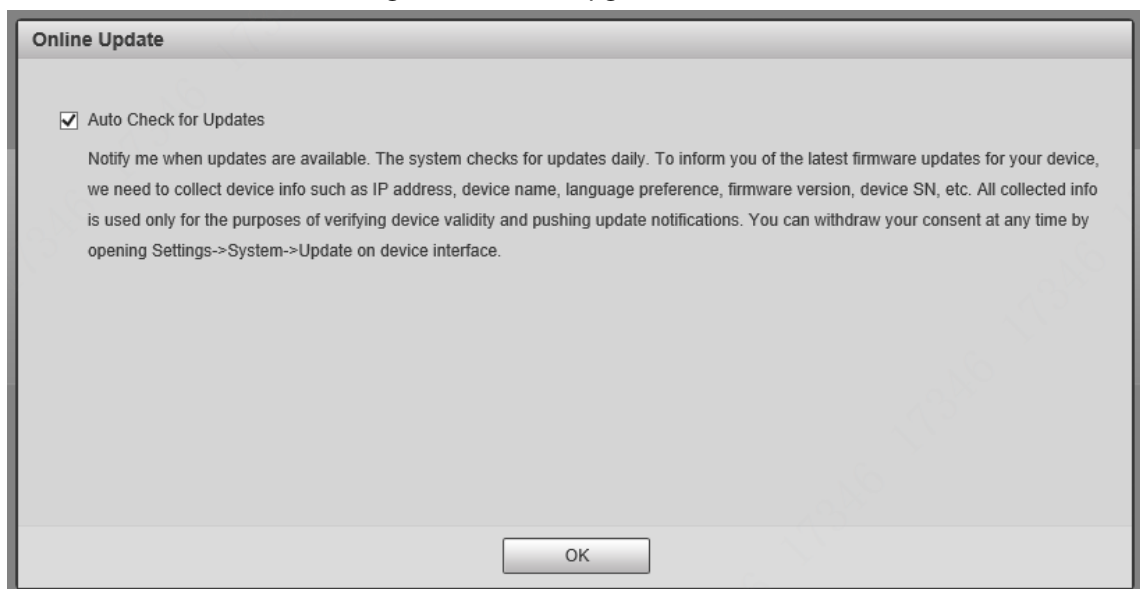
Figure 4-1 Device initialization



The image shows a 'Device Initialization' dialog box. It has a title bar with the text 'Device Initialization'. Below the title bar, there are several input fields and options. The 'Username' field is pre-filled with 'admin'. The 'Password' field is empty, and below it are three buttons labeled 'Low', 'Medium', and 'Strong'. The 'Confirm Password' field is also empty. Below these fields is a text block: 'The password must consist of 8 to 32 non-blank characters and contain at least two types of characters among upper case, lower case, number, and special character (excluding ' ' ; : &).' Below this text is a horizontal line and an 'Email Address' field, which is preceded by a checked checkbox. Below the email field is another text block: 'For password reset. Recommended or improved in time.' At the bottom center of the dialog box is a 'Next' button.

Step 6 In the **Online Upgrade** dialog box, select **Auto-check for updates** and click **Confirm**.

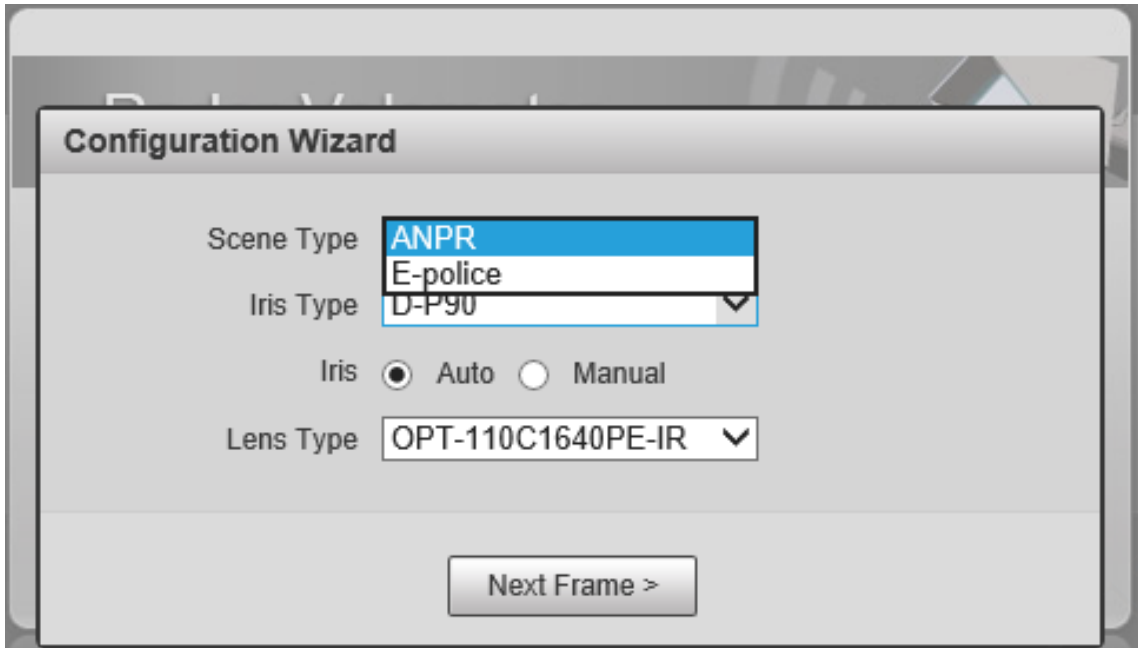
Figure 4-2 Online upgrade



The image shows an 'Online Update' dialog box. It has a title bar with the text 'Online Update'. Below the title bar, there is a checked checkbox labeled 'Auto Check for Updates'. Below the checkbox is a text block: 'Notify me when updates are available. The system checks for updates daily. To inform you of the latest firmware updates for your device, we need to collect device info such as IP address, device name, language preference, firmware version, device SN, etc. All collected info is used only for the purposes of verifying device validity and pushing update notifications. You can withdraw your consent at any time by opening Settings->System->Update on device interface.' At the bottom center of the dialog box is an 'OK' button.

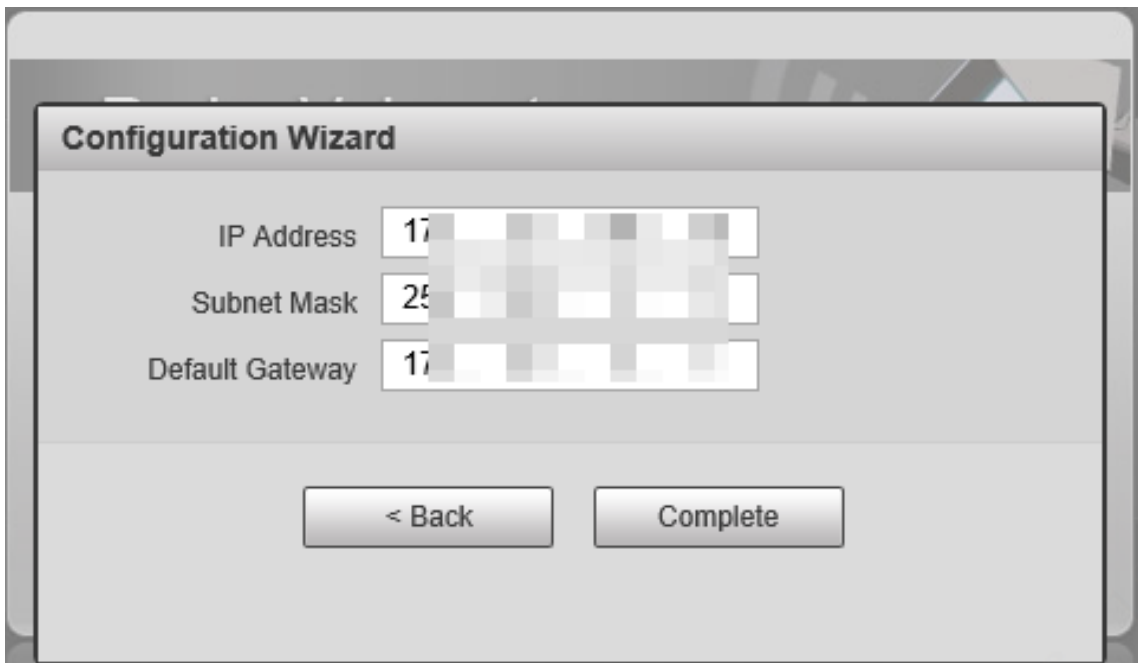
Step 7 In the **Configuration Wizard** dialog box, set the parameters as needed, and then click **Next Frame**.

Figure 4-3 Configuration wizard (1)



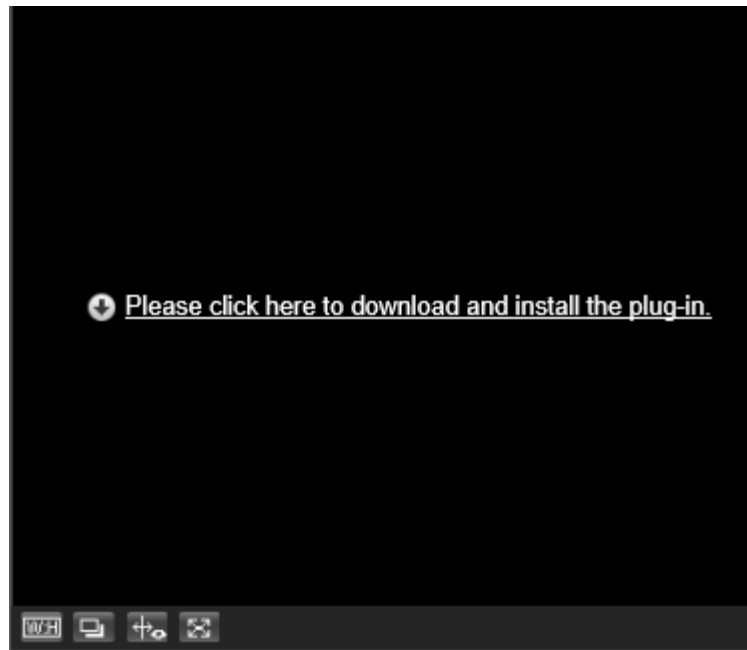
Step 8 Set **IP Address**, **Subnet Mask**, and **Default Gateway**, and then click **Complete**.

Figure 4-4 Configuration wizard (2)



Step 9 For first-time login, click **Please click here to download and install the plug-in**, and then install the plug-in.

Figure 4-5 Install the plug-in



4.1.2 Webpage Functions

Figure 4-6 Top navigation bar

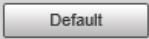

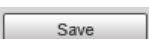


Table 4-1 Webpage functions

Function	Description
Live	You can view real-time video and image, record videos and capture images, and configure video play and image settings. For details, see "4.2 Live".
Radar	You can configure radar settings and debug detection results in a visualized manner. For details, see "4.3 Radar".
Search	You can search for vehicles and recorded videos. For details, see "4.4 Search".
Setting	You can configure intelligent traffic rules, basic information of the Device, network settings, event management, storage management, and system management. For details, see "4.5 Setting".
Alarm	You can configure how the Device responds when alarms occur. For details, see "4.6 Alarm".
Logout	Log out of the webpage.

The following table describes the common buttons on the webpage.

Table 4-2 Common buttons

Button	Description
	Restores the parameters to default values.
	Restores the parameters to the values saved last time.
	Saves the current parameter values.

4.2 Live

The **Live** page is displayed after you log in to the webpage. On this page, you can view real-time video and image, captured license plate, and event details. In addition, you can take snapshots and perform other operations.

Figure 4-7 Live page

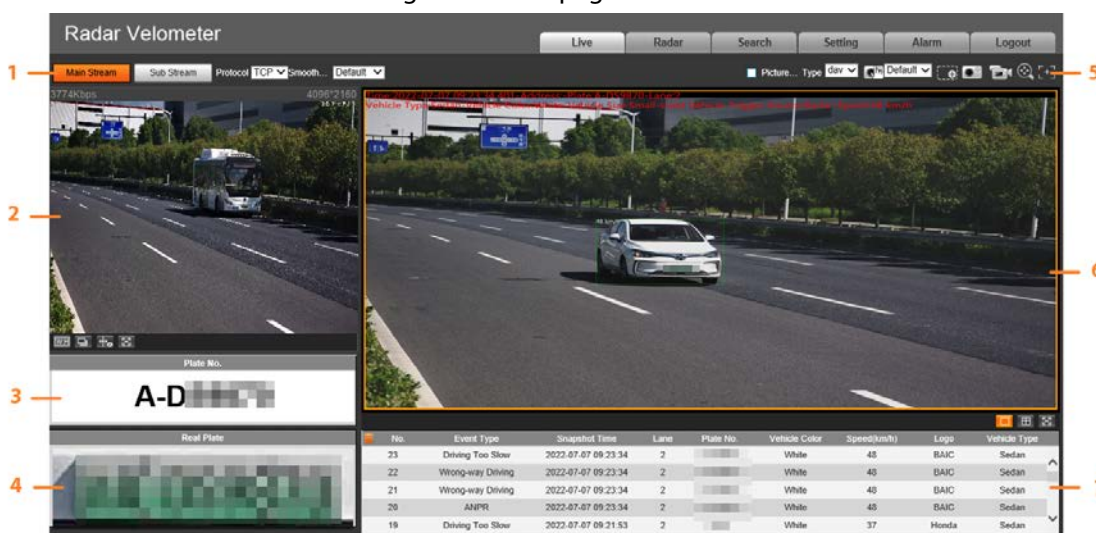


Table 4-3 Description of the Live page

No.	Description
1	Video stream
2	Live view
3	Plate number recognition
4	Plate snapshot
5	Functions on the Live page
6	Vehicle snapshot
7	Event list

4.2.1 Video Stream

- **Main Stream:** Make sure that the Device can record videos and carry out video surveillance when the network is normal. You can configure main stream resolution within the supported range of the Device.
- **Sub Stream:** Replaces the main stream to carry out video surveillance and reduces the network bandwidth usage when network bandwidth is insufficient.
- **Protocol:** The video surveillance protocol. Currently, the system supports only **TCP**.
- **Smoothness Adjustment:** The fluency of viewing the real-time video. The fluency can be set to **High**, **Middle**, **Low**, or **Default** (recommended).

4.2.2 Live View

Displays the real-time video captured by the Device. You can click the icons to change the display mode of live view.

- : After you click the icon, **Original** and **Adaptive** appear.
 - ◇ **Original**: Displays the video in its original size.
 - ◇ **Adaptive**: Displays the video in a self-adaptive window.
- : After you click the icon, a big window appears. To exit the big window, click the icon again.
- : After you click the icon, the image adjustment window appears on the right and the icon becomes . To close the image adjustment window, click .
- : After you click the icon, the video is stretched to fill the window and the icon becomes . To switch back to the original size, click .
- : After you click the icon, smart track detection is enabled. Number plate, vehicle bounding box, and other smart tracking information will be displayed in the video.
- : After you click the icon, the video is displayed in full screen. To exit the full screen, double-click the screen.

Figure 4-8 Image adjustment window

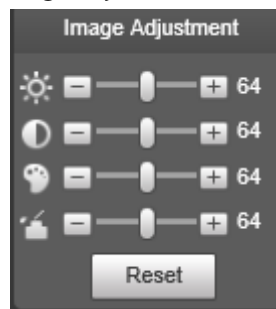


Table 4-4 Image adjustment

Icon	Description
	Adjust the image brightness. Change the value when the image is too bright or too dark. The range is from 0 to 128 (64 by default).
	Adjust the image 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).
	Adjust the image hue. For example, change red to blue. The default value is made by the light sensor. Generally, you do not need to adjust the value. The range is from 0 to 128 (64 by default).
	Adjust the vividness of colors, without influencing the overall brightness of the image. The range is from 0 to 128 (64 by default).
	Click the icon to reset brightness, contrast, saturation, and hue to their default values.



In the image adjustment window, you can only adjust image brightness, contrast, hue, and saturation of local webpage. 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 Device 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 Functions on the Live Page

Table 4-5 Description of functions on the Live page

Icon	Name	Description
	Picture Preview	<p>After you select the checkbox, the Device automatically takes a snapshot when a vehicle passes. The snapshots are displayed next to the real-time video, and related information is displayed at the lower part of the page.</p> <p></p> <p>To configure the storage path of the snapshots, go to Setting > Storage > Storage Path > Path.</p>
	Type	<p>Set the format of the recorded videos (dav by default).</p>
	Manual Snapshot	<p>After you click the icon, the Device takes a snapshot.</p> <p></p> <ul style="list-style-type: none"> To use the function, you must enable Picture Preview first. To configure the storage path of the snapshots, go to Setting > Storage > Storage Path > Path.
	Digital Zoom	<p>After you click the icon, select an area in the video window. Then, the selected area is zoomed into. You can right-click the video window or click  to disable the function.</p>
	Snapshot	<p>After you click the icon, the Device takes a snapshot and the snapshot is displayed on your computer.</p> <p></p> <p>To configure the storage path of the snapshots, go to Setting > Storage > Storage Path > Path.</p>

Icon	Name	Description
	Video	<p>After you click the icon, the Device starts recording. To stop recording, click .</p> <p></p> <ul style="list-style-type: none"> The Device will keep recording until the webpage is closed or you log out of the webpage if the recording is not manually stopped. To configure the storage path of recorded videos, go to Setting > Storage > Storage Path > Path.
	Zoom & Focus	After you click the icon, you can configure zoom and focus parameters.
	Aux Focus	After you click the icon, you can view AF Peak and AF Max in the real-time video. The closer the values of the parameters, the better the focus effect.

4.2.6 Vehicle Snapshot

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

4.2.7 Event List

Select **Picture Preview**, and then event information is displayed, including event types, capture time, lanes, plate numbers, vehicle colors, speeds, vehicle signs, and vehicle types.

4.3 Radar

4.3.1 Radar Settings

4.3.1.1 Calibrating the Radar

Make sure that the camera can capture the right targets when the radar sends signals to the camera.

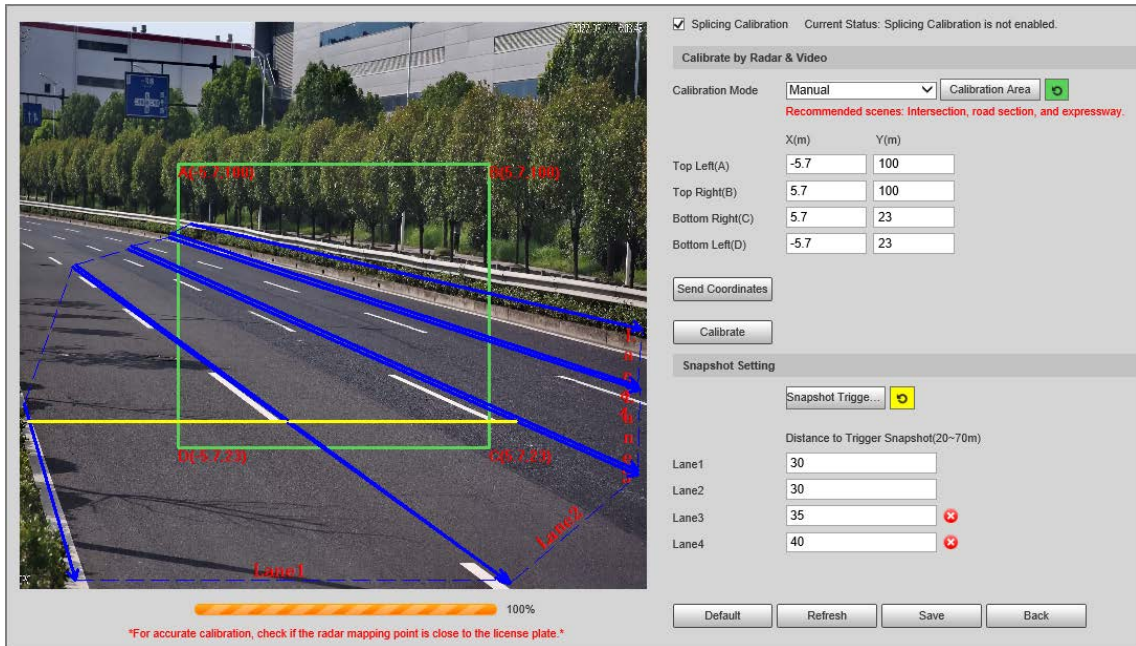
Step 1 Select **Radar > Radar Settings**.

Step 2 In the **Calibration Config** section, click **Calibrate by Radar and Video**.

Step 3 Select **Splicing Calibration**.

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


Figure 4-9 Radar calibration



Step 4 Calibrate the radar.

- Manual calibration

Manually set the coordinates of the calibration area and the trigger distance.

1. Select **Manual** from the **Calibration Mode** drop-down list, and then adjust the calibration area on the image based on the on-site measurement.
You can also click , and then draw a calibration area on the image.
2. Click **Send Coordinates** to set the coordinates of the calibration area.
3. In the **Snapshot Setting** section, click **Snapshot Triggering Line**, and then draw lines on each lane.
The distance between the trigger line and the camera is displayed at the bottom.
4. Click **Calibrate**, and then click **Save**.

- Automatic calibration

Set the width of the calibration area to the width of the actual road. Then, the algorithm will automatically calibrate the radar.

1. Select **Manual Assistance** from the **Calibration Mode** drop-down list.
2. Set **Area Width** to the width of the actual road.
3. Click **Calibrate**, and then click **Save**.

Step 5 Click **Back**.

4.3.1.2 Configuring General Information

Set the parameters of the radar and the lanes.

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

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



We recommend you leave the sensitivity as default to avoid false detections.

Step 2 In the **Road Information Config** section, set the lane width and direction based on the

actual situation.

Figure 4-10 Radar and lane information

Step 3 In the **Installation Settings** section, set the installation information of the Device.

Table 4-6 Installation information

Parameter	Description
Radar Height	The installation height of the Device.
Angle Correction	The installation angle of the Device. Make sure that the angle is the same as that in Radar Visualization .
Horizontal Offset	The horizontal offset of the Device. Make sure that the horizontal offset is the same as that in Radar Visualization .

4.3.2 Radar Visualization

On the **Radar Visualization** tab, you can view the effect of radar detection in real time and modify some of the radar parameters.

Step 1 Select **Radar > Radar Visualization**.

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

You can click the image at the lower-right corner to check correction standards.

Step 3 Click to display the trajectory of detected targets.

Figure 4-11 Radar visualization



Step 4 Click  to view the detection points of the radar on targets.



If a target is large and the detection sensitivity is set high, the radar might recognize it as 2 targets.

4.4 Search

You can set search conditions to search for vehicles or recorded videos, and set file or time as download type to download related data.

4.4.1 Searching for Vehicles

Step 1 Click **Search**, and then select **Vehicles**.

Step 2 Set search conditions.

- Set basic parameters such as start time, end time, and image type.
- Click **OSD Option**, and then select more options as needed.
- Select whether to only search for composed images and vehicles on the blacklist.

Step 3 Click **Search**.

You can click a record on the list to view the image.

Figure 4-12 Search for vehicles

The screenshot shows the 'Radar Velometer' software interface. At the top, there are tabs for 'Live', 'Radar', 'Search', 'Setting', 'Alarm', and 'Logout'. The main area is split into a video feed on the left (showing 'No Video') and a radar image on the right showing a red truck on a highway. Below the video feed is a table of search results. The table has columns for No., Lane, Size, Snapshot Time, Image Type, Plate No., Plate Color, Vehicle Color, Vehicle Type, and Speed. The right sidebar contains search filters and controls, including 'Vehicle' and 'Record' radio buttons, start and end time pickers, 'Image Type' dropdown, 'Combine' and 'Blocklist' checkboxes, 'Download' options for 'File' and 'Time', 'Cutout Type' dropdown, 'Search' and 'Download' buttons, 'OSD Option' and 'Name Format for Do...' dropdowns, 'Export' button with a 'CSV' dropdown, a 'Picture' button with 'M528100' text, 'Record L.' input, and 'Open' and 'Download' buttons.

No.	Lane	Size	Snapshot Time	Image Type	Plate No.	Plate Color	Vehicle Color	Vehicle Type	Speed
1	2	864	2022-07-10 15:52:36	ANPR		Blue	Red	Medium Truck	58
2	2	4979	2022-07-10 15:53:45	ANPR		Yellow	Deep Orange	Medium Truck	20
3	2	1047	2022-07-10 15:54:04	ANPR		Blue	Red	Heavy Truck	52
4	4	1029	2022-07-10 15:54:25	ANPR		Blue	Black	Sedan	76
5	2	1033	2022-07-10 15:54:26	ANPR		Blue	Black	Sedan	61
6	1	985	2022-07-10 15:54:37	ANPR		Blue	Silver Gray	Sedan	56
7	3	3035	2022-07-10 15:54:37	ANPR		Blue	White	Large Bus	41
8	1	939	2022-07-10 15:54:37	ANPR		Blue	Silver Gray	Sedan	42
9	1	998	2022-07-10 15:54:39	ANPR		Unknown	Other	Unknown	153

Step 4 Select the download type, and then click **Download**.

- **File:** Select one or more images to download from the search results.
- **Time:** Download all images captured during the defined period.
- **Cutout Type:** Select the cutout type of images to be downloaded. When downloading images, the related cutout image will be separated and downloaded together.

Step 5 Click **Name Format for Downloaded Images**, click **Help** next to the corresponding image type, and then customize the naming format in the pop-up window.

Figure 4-13 Naming format

Step 6 Click **OK**.

Step 7 Set the duration of **Record Linkage** and then download related videos as needed.

4.4.2 Searching for Recorded Videos

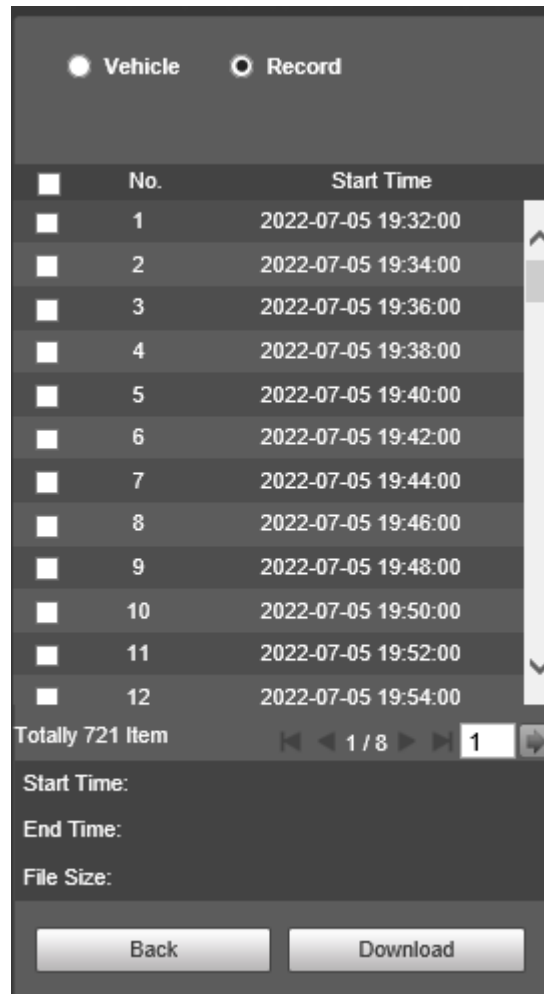
Step 1 Click **Search**, and then select **Record**.

Step 2 Set the search time, and then click **Search**.



After the search time is set, set **Download Format to Time**, and then click **Download to download all videos recorded within this period**.

Figure 4-14 Search results



Step 3 Double-click a result to view the video.

Step 4 Select a video, and then click **Download** to download the selected video to your computer.

4.5 Setting

On the **Setting** page, you can set the parameters of the Device, including intelligent traffic rules, network settings, remote devices, event management, storage management, system management, and system information.

4.5.1 ITC

You can configure intelligent traffic parameters to provide functions such as image composition and OSD configuration.

4.5.1.1 Smart Plan

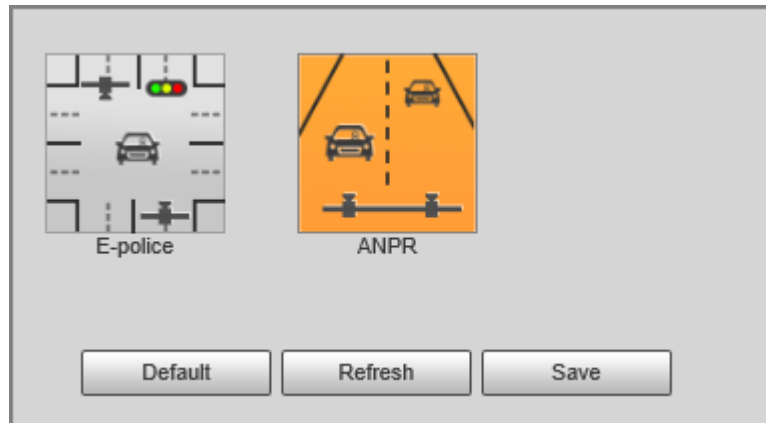
Step 1 Select **Setting** > **ITC** > **Smart Plan**.

Step 2 Click **E-police** or **ANPR**.



- For details on configuration in **ANPR**, see "4.5.1.2 ANPR Snapshot".
- For details on configuration in **E-police**, see "4.5.1.3 E Police".

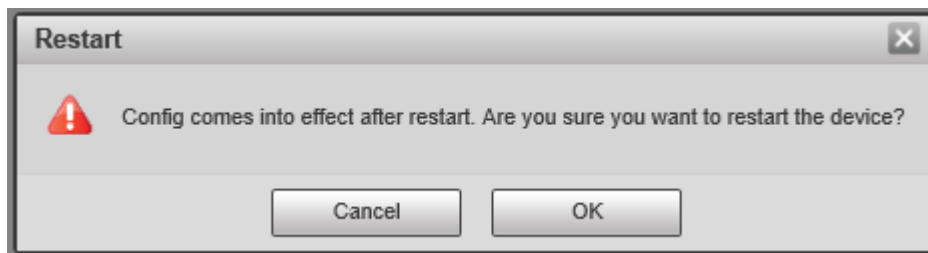
Figure 4-15 Select a smart plan



Step 3 Click **Save**.

When you switch between the smart plans, the system instructs you to restart the Device.

Figure 4-16 Notification



Step 4 Click **OK**, and then log in to the webpage after the Device is restarted.

4.5.1.2 ANPR Snapshot

4.5.1.2.1 Configuring Violation Snapshot

Configure the video detection parameters for detecting traffic violations.



Select a lane from the list in the **Lane Config** section, and then all configurations on the **Violation Snapshot** tab are for this lane.

Lane Parameters

Configure the information of the lanes the Device is monitoring, such as drawing lane lines on the image, selecting the lane direction, and setting the lane line type according to the actual situation.

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

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

- If the default lane lines on the image do not meet the detection requirements, you can draw new lane lines.
 1. Select a lane from the list, and then delete the lane lines by clicking



You can also click the icon next to **Lane Line** or **Detection Line** to delete the corresponding lines on the image.

2. Click **Lane Line** or **Detection Line**, and then draw lines on the image.
When a vehicle reaches a detection line, the Device takes a snapshot of the vehicle.
- You can also adjust lane lines to match the actual lane lines.
 1. Select **Edit Line**, and then select a lane from the list.
 2. Drag to adjust the lane lines and detection lines according to the actual situation.

Figure 4-17 Lane configuration

Lane Config

Lane Direction Vehicle Front Vehicle Back

Traffic Flow...

Edit Line

[Please click here to download and install the plug-in.](#)

No.	<input checked="" type="checkbox"/>	Lane No.	Left Lane Line	Right Lane Line	Lane Type	Delete
1	<input checked="" type="checkbox"/>	1	Solid White Line	Solid White Line	Small-sized Ve...	<input type="button" value="Delete"/>
2	<input checked="" type="checkbox"/>	2	Solid White Line	Solid White Line	Small-sized Ve...	<input type="button" value="Delete"/>
3	<input checked="" type="checkbox"/>	3	Solid White Line	Solid White Line	Small-sized Ve...	<input type="button" value="Delete"/>
4	<input checked="" type="checkbox"/>	4	Solid White Line	Solid White Line	Small-sized Ve...	<input type="button" value="Delete"/>

Step 3 Set **Lane Direction** and **Traffic Flow Direction** for the selected lane.

- **Lane Direction:** The direction of the lane line on the image must be the same as the travelling direction of vehicles.
- **Traffic Flow Direction:** The direction of traffic flow, which is used for traffic flow analysis.

Step 4 Click **Auto Drawing**, and then the system automatically draws lane lines. You can adjust the auto lines as needed.



Install the plug-in before using the **Auto Drawing** function.

Step 5 Double-click the selected lane on the list under **Left Lane Line**, **Right Lane Line**, or **Lane Type** to change the lane lines and lane type as needed.

- Click to display or hide the corresponding lane lines on the image.
- Click to select a lane for the Device to monitor.

Step 6 Click **Save**.

Lane Properties

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

Step 2 Select a lane from the list in the **Lane Config** section.

Step 3 In the **Lane Property** section, configure lane properties.

Figure 4-18 Lane property

Lane Property

Road Direction Passing Direction South to Norl ↑ ↶ ↷ ↵

Distance between Stop Li... cm (-10000~8000)

Upload Image of Violation with Highest P ▼

Road Code

Road Section Code

Table 4-7 Lane property description

Parameter	Description
Road Direction	The direction of the road.
Passing Direction	The geographical direction of the lane.
Distance between Stop Line and Image Bottom	The distance between the stop line and the bottom of the image.
Upload Image of	<ul style="list-style-type: none"> All Violations: Captures and reports all violations of vehicles on the lane. Violation with Highest Priority: If a vehicle triggers multiple violations, the Device reports only the event with the highest priority.
Road Code	The code of the road.
Road Section Code	The code of the road section.

Step 4 Click **Save**.

Rule Configuration

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

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

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

Figure 4-19 Rule configuration

Rule Config

No.	<input type="checkbox"/>	Event Type	Snapshot Quantity	Picture Parameter	Advanced
1	<input checked="" type="checkbox"/>	ANPR	1		
2	<input checked="" type="checkbox"/>	Wrong-way Driving	2		
3	<input type="checkbox"/>	Driving Too Slow	2		
4	<input type="checkbox"/>	Speeding	2		
5	<input type="checkbox"/>	Illegal Lane Change	3		

Figure 4-20 Image parameters

Table 4-8 Description of image parameters

Section	Parameter	Description
Picture Parameter	Original Image	The original image of the vehicle that violates traffic rules.
	Composite Picture	The composite image consisting of multiple images of the vehicle that violates traffic rules.
	Resolution	The resolution of the image.
	Quality	The level of the image quality.
	Size	The maximum size of the image.
	Copy to	Copy the current configuration to rules of the same type or all rules. After selecting an option from Copy to , click Copy .
Snapshot and Composite Picture Settings	I Frame Interval	Set the interval of capturing 2 images to a fixed number of frames.
	Self-adaptive	Set the interval of capturing 2 images to different number of frames based on the vehicle speed.
	Copy to	Copy the current configuration to rules of the same type or all rules. After selecting an option from Copy to , click Copy .

Step 3 Click **OK**.

Step 4 Click , and then configure advanced parameters.

Figure 4-21 Advanced parameters

Table 4-9 Description of advanced parameters

Section	Parameter	Description
Trigger Source	Radar	The method that triggers traffic violations.
	Video	
	Copy to	Copy the current configuration to rules of the same type or all rules. After selecting an option from Copy to , click Copy .
Rule Parameter	Driving Direction to Trigger Snapshot	The driving direction of the vehicles that the Device captures.
	Vehicles that Trigger Snapshots	The types of the vehicles that the Device captures. You can select from Mortorcycle , Unlicensed Motor Vehicle , and Licensed Motor Vehicle .
	Schedule	The period during which alarms can be triggered. To set a period, click Setting , and then drag the cursor over the time table or select days and enter hours in the entry fields.

Section	Parameter	Description
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, if you select F1 from 1st or 4th Image , the flashing light F1 flashes when taking the 1st and 4th snapshots.

Step 5 Click **OK**.

Vehicle Detection

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

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

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




To clear the lines that you have drawn, click .

Figure 4-22 Vehicle detection

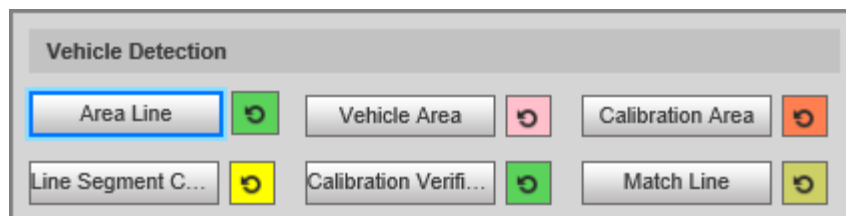


Table 4-10 Description of vehicle detection parameters

Parameter	Description
Area Line	The region of detection.
Vehicle Area	The region for detecting traffic flow.
Calibration Area	The region for analyzing traffic flow.
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 Length , and then click Calibration Verification .
Calibration Verification	Used to verify the accuracy of calibration results.

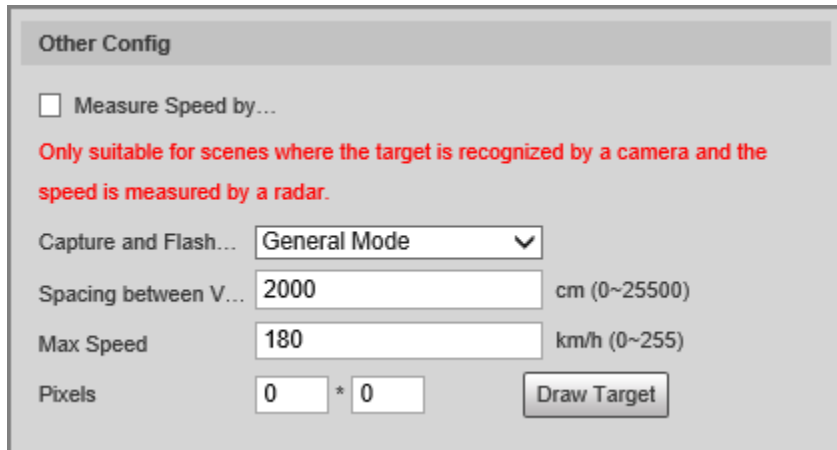
Step 3 Click **Save**.

Other Configuration

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

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

Figure 4-23 Other configuration



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 4-11 Other configuration

Parameter	Description
Measure Speed by Radar	Specifies whether to measure vehicle speed by using the radar.
Capture and Flash Linkage	<ul style="list-style-type: none"> General Mode: Recommended for ANPR mode. Snapshot Line Mode: Recommended for E-police mode.
Spacing between Vehicles	The distance between vehicles when waiting in a line.
Max Speed	If the speed of a vehicle 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 the area.

Step 3 Click **Save**.

4.5.1.2.2 Configuring Intelligent Analysis

Recognition

Step 1 Select **Setting > ITC > ANPR Snapshot > Intelligent Analysis > Recognition**.

Step 2 Configure the parameters.

Figure 4-24 Recognition

Table 4-12 Description of recognition parameters

Parameter	Description
Motor Vehicle	Supports recognizing vehicle logs and vehicle types.
License Plate Enhancement	Select the checkbox to enhance the effect of license plate images.
Vehicle Window Enhancement	Select the checkbox to enhance the effect of vehicle window images.
Track Overlay	Select the checkbox to enable Track Overlay . After you enable the function and click on the Live page, you can see that each vehicle is surrounded by a green box.
Recognition Mode	<ul style="list-style-type: none"> • Only recognize the front plate: Recognizes and captures the license plate on the vehicle head. • Only recognize the rear plate: Recognizes and captures the license 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

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

Figure 4-25 Custom algorithm

Step 2 Configure a custom algorithm.

Step 3 Click **Save**.

Default

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

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

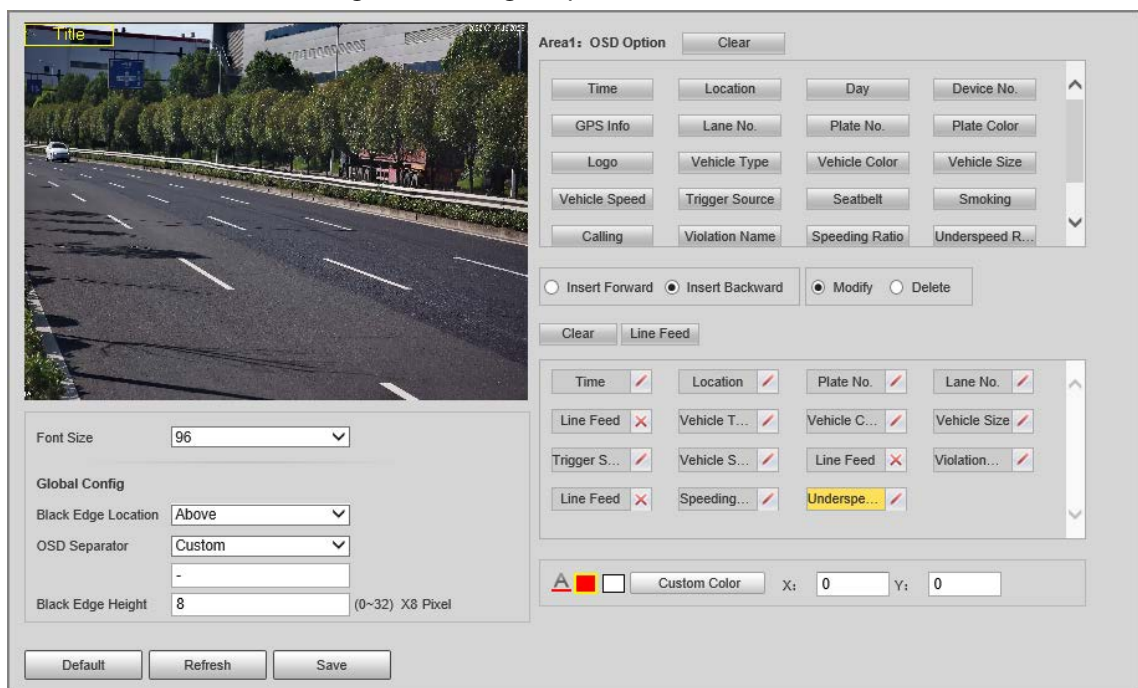
4.5.1.2.3 Configuring Original Picture OSD

Configure OSD content, style, and position for captured images.

Step 1 Select **Setting > ITC > ANPR Snapshot > Original Picture OSD**.

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

Figure 4-26 Original picture OSD



Step 3 Configure the OSD parameters.

Table 4-13 Description of 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 previous 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 previous one.
Modify	Select Modify , and then <input checked="" type="checkbox"/> is displayed next to all the selected OSD options. To edit an OSD option, click <input checked="" type="checkbox"/> next to the OSD option.
Delete	Select Delete , and then <input checked="" type="checkbox"/> is displayed next to all the selected OSD options. To delete an OSD option, click <input checked="" type="checkbox"/> next to the OSD option.
Clear	Delete all the selected OSD options.

Parameter	Description
Line Feed	To start a new line after an OSD option, select the OSD option, and then click Line Feed .

Step 4 Click **Save**.

4.5.1.2.4 Configuring Combination Picture OSD

Step 1 Select **Setting > ITC > ANPR Snapshot > Combination Picture OSD**.

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

Step 3 Configure the OSD parameters. For details, see Table 4-13.

Step 4 Click **Save**.

4.5.1.2.5 Configuring Cutout

Step 1 Select **Setting > ITC > ANPR Snapshot > Cutout Config**.

Step 2 Select the cutout type.

Figure 4-27 Cutout config



Step 3 In the **Target Box** section, specify whether to enable the track box for motor vehicles and non-motor vehicles.

Step 4 Click **Save**.

4.5.1.3 E Police

4.5.1.3.1 Configuring Violation Snapshot

Configure the video detection parameters for detecting traffic violations.



Select a lane from the list in the **Lane Config** section, and then all configurations on the **Violation Snapshot** tab are for this lane.

Lane Parameters

Configure the information of the lanes the Device is monitoring, such as drawing lane lines on the image, selecting the lane direction, and setting the lane line type according to the actual situation.

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

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

Figure 4-28 Lane configuration

Lane Config

Lane Direction Vehicle Front(Video) Vehicle Back

Traffic Flow... Appro Car come in

Edit Line

[Please click here to download and install the plug-in.](#)

No.	<input type="checkbox"/>	Lane No.	Left Lane Line	Right Lane Line	Lane Type	Delete
1	<input checked="" type="checkbox"/>	1	Solid White Line	Solid White Line	Small-sized Vehic...	
2	<input checked="" type="checkbox"/>	2	Solid White Line	Solid White Line	Small-sized Vehic...	
3	<input checked="" type="checkbox"/>	3	Solid White Line	Solid White Line	Small-sized Vehic...	
4	<input type="checkbox"/>	4	Solid White Line	Solid White Line	Small-sized Vehic...	

Table 4-14 Lane parameters

Parameter	Description
Lane Direction	The direction of the lane line must be the same as the travelling direction of vehicles. <ul style="list-style-type: none"> • Vehicle Back: The lane line is upward. • Vehicle Front(Video): The lane line is downward.
Traffic Flow Direction	The direction of traffic flow, which is used for traffic flow analysis.
Edit Line	After you select the checkbox, you can adjust the lane lines by dragging the angles 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 4-15 Lane lines

Line type	Description
Lane Line	Each lane must have 2 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 that triggers the first capture of the vehicle running the red light or traveling on the wrong lane.
Middle Line	The line that triggers the second capture of the vehicle running the red light or 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) or traveling on the wrong lane.



Line type	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 or 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 or 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.

Step 4 Click **Auto Drawing**, and then the system automatically draws lane lines. You can adjust the auto lines as needed.



Install the plug-in before using the **Auto Drawing** function.

Step 5 Double-click the selected lane on the list under **Left Lane Line**, **Right Lane Line**, or **Lane Type** to change the lane lines and lane type as needed.

- Click  to display or hide the corresponding lane lines on the image.
- Click  to select a lane for the Device to monitor.

Step 6 Click **Save**.

Lane Properties

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

Step 2 Select a lane from the list in the **Lane Config** section.

Step 3 In the **Lane Property** section, configure lane properties.

Figure 4-29 Lane property

The screenshot shows the 'Lane Property' configuration window. It contains the following elements:

- Road Direction:** A checkbox that is currently unchecked.
- Enable Vehicle Waiting:** A checkbox that is checked, with four directional arrow icons below it.
- Passing Direction:** A dropdown menu set to 'South to North'.
- Upload Image of:** A dropdown menu set to 'Violation with Highest Priority'.
- Road Code:** An empty text input field.
- Road Section Code:** An empty text input field.

Table 4-16 Lane property description

Parameter	Description
Road Direction	The direction of the road.
Passing Direction	The geographical direction of the lane.
Upload Image of	<ul style="list-style-type: none"> • All Violations: Captures and reports all violations of vehicles on the lane. • Violation with Highest Priority: If a vehicle triggers multiple violations, the Device reports only the event with the highest priority.
Road Code	The code of the road.
Road Section Code	The code of the road section.

Step 4 Click **Save**.

Rule Configuration

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

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

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

Figure 4-30 Rule configuration











No.	<input type="checkbox"/>	Event Type	Snapshot Quantity	Picture Parameter	Advanced
1	<input checked="" type="checkbox"/>	ANPR	1		
2	<input checked="" type="checkbox"/>	Wrong-way Driving	2		
3	<input type="checkbox"/>	Driving Too Slow	2		
4	<input type="checkbox"/>	Speeding	2		
5	<input type="checkbox"/>	Illegal Lane Change	3		

Figure 4-31 Image parameters

Picture Parameter

Event Type: ANPR(Lane 1)

Picture Parameter

Original Image Resolution: Quality: Size: (200-7168)KB

Composite Picture Resolution: Quality: Size: (1024-7168)KB

Use Copy to sync the configurations of save to local storage and report picture. Image resolution, size, and image quality will be automatically copied to all the rules.

Copy to:

Snapshot and Composite Picture Settings

Capture Interval Mode (Supports checkpoint scene and loop mode)

I Frame Interval:

Self-adaptive

0km/h ≤ Low Speed < ≤ Medium ≤ < High Speed ≤ 255km/h

Frame Interval for L...:

Frame Interval for M...:

Frame Interval for H...:

Use Copy to sync the configurations of Close-up Area and Composition Sequence. Parameters under Frame Interval will be automatically copied to all the rules.

Copy to:

Table 4-17 Description of image parameters

Section	Parameter	Description
Picture Parameter	Original Image	The original image of the vehicle that violates traffic rules.
	Composite Picture	The composite image consisting of multiple images of the vehicle that violates traffic rules.
	Resolution	The resolution of the image.
	Quality	The level of the image quality.
	Size	The maximum size of the image.

Section	Parameter	Description
	Copy to	Copy the current configuration to rules of the same type or all rules. After selecting an option from Copy to , click Copy .
Snapshot and Composite Picture Settings	I Frame Interval	Set the interval of capturing 2 images to a fixed number of frames.
	Self-adaptive	Set the interval of capturing 2 images to different number of frames based on the vehicle speed.
	Copy to	Copy the current configuration to rules of the same type or all rules. After selecting an option from Copy to , click Copy .

Step 3 Click **OK**.


Step 4 Click , and then configure advanced parameters.

Figure 4-32 Advanced parameters

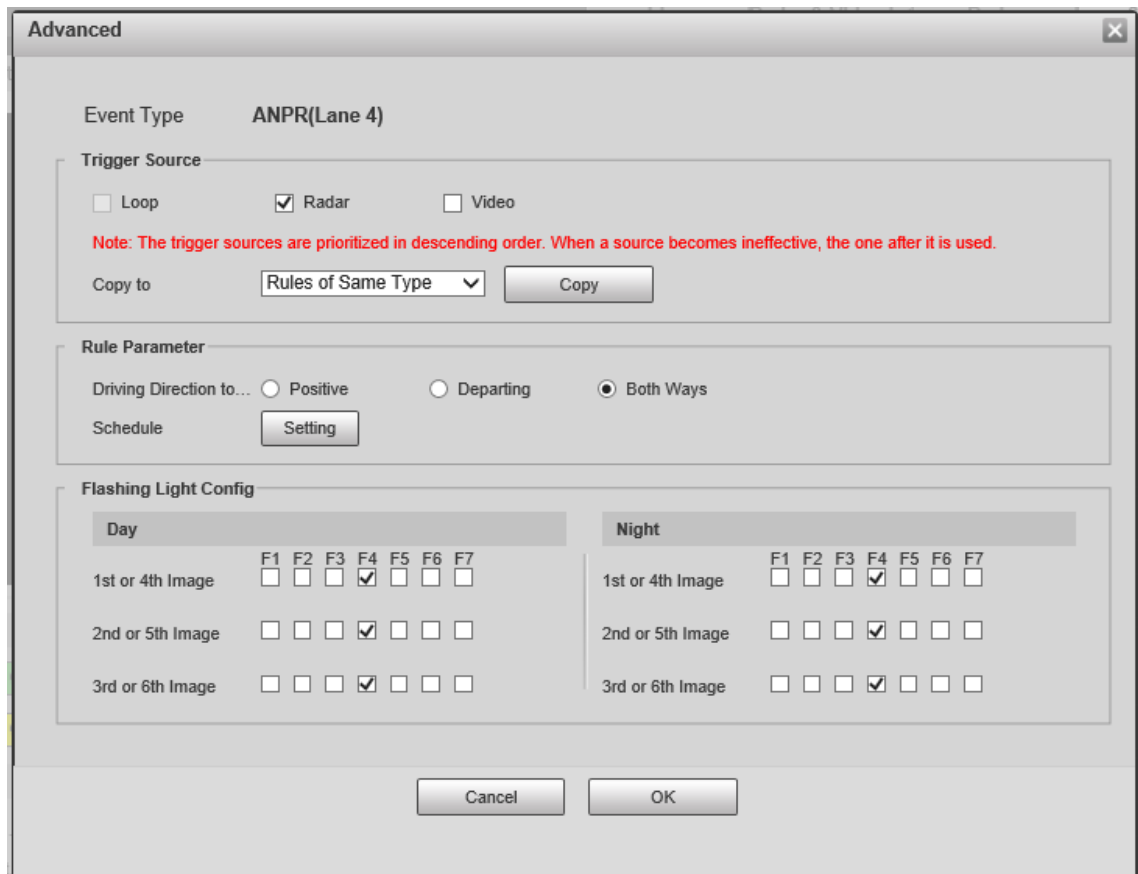


Table 4-18 Description of advanced parameters

Section	Parameter	Description
Trigger Source	Loop	Unavailable
	Radar	The method that triggers traffic violations.
	Video	

Section	Parameter	Description
	Copy to	Copy the current configuration to rules of the same type or all rules. After selecting an option from Copy to , click Copy .
Rule Parameter	Driving Direction to Trigger Snapshot	The driving direction of the vehicles that the Device captures.
	Schedule	The period during which alarms can be triggered. To set a period, click Setting , and then drag the cursor over the time table or select days and enter hours in the entry fields.
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, if you select F1 from 1st or 4th Image , the flashing light F1 flashes when taking the 1st and 4th snapshots.

Step 5 Click **OK**.

Vehicle Detection

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

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

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




To clear the lines that you have drawn, click .

Figure 4-33 Vehicle detection

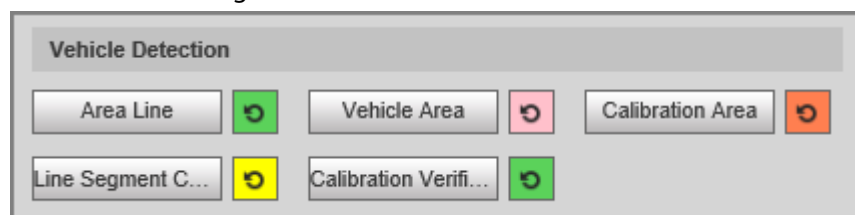


Table 4-19 Description of vehicle detection parameters

Parameter	Description
Area Line	The region of detection.
Vehicle Area	The region for detecting traffic flow.
Calibration Area	The region for analyzing traffic flow.
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 Length , and then click Calibration Verification .
Calibration Verification	Used to verify the accuracy of calibration results.

Step 3 Click **Save**.

Other Configuration

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

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

Figure 4-34 Other configuration

Table 4-20 Other configuration

Parameter	Description
Capture and Flash Linkage	<ul style="list-style-type: none"> • General Mode: Recommended for ANPR mode. • Snapshot Line Mode: Recommended for E-police mode.
Take First Snapshot for Running a Red Light	<ul style="list-style-type: none"> • 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	If the speed of a vehicle 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 the area.

Step 3 Click **Save**.

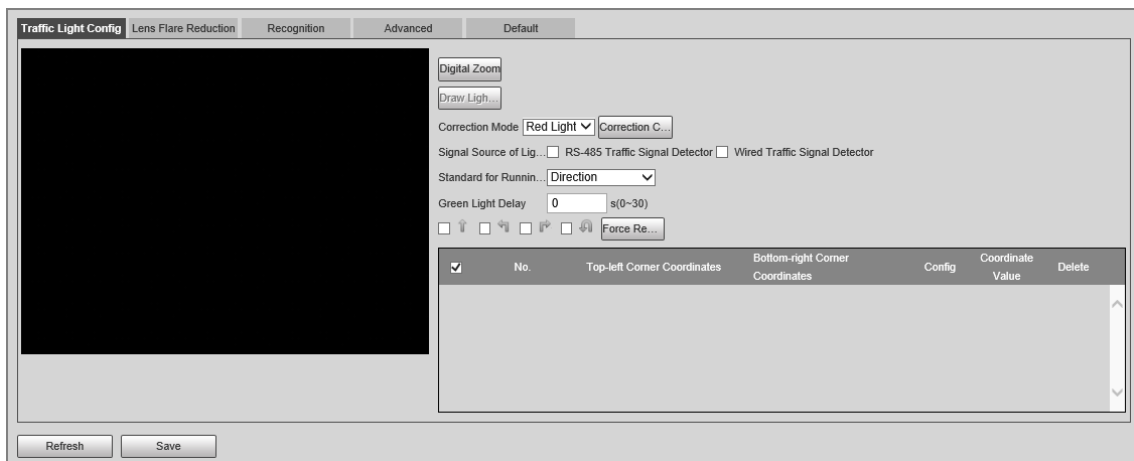
4.5.1.3.2 Configuring Intelligent Analysis

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.

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

Figure 4-35 Traffic light config



Step 2 Click **Digital Zoom**, and then use the mouse to select an area that includes the traffic lights. The area is zoomed into.

Step 3 Click **Draw Light Group Area**, and then use the mouse to draw a frame around the traffic lights.

Step 4 Configure the parameters.

Table 4-21 Description of traffic light parameters

Parameter	Description
Correction Mode	<ul style="list-style-type: none"> • 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. <ol style="list-style-type: none"> 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	<ul style="list-style-type: none"> • 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.

Parameter	Description
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.

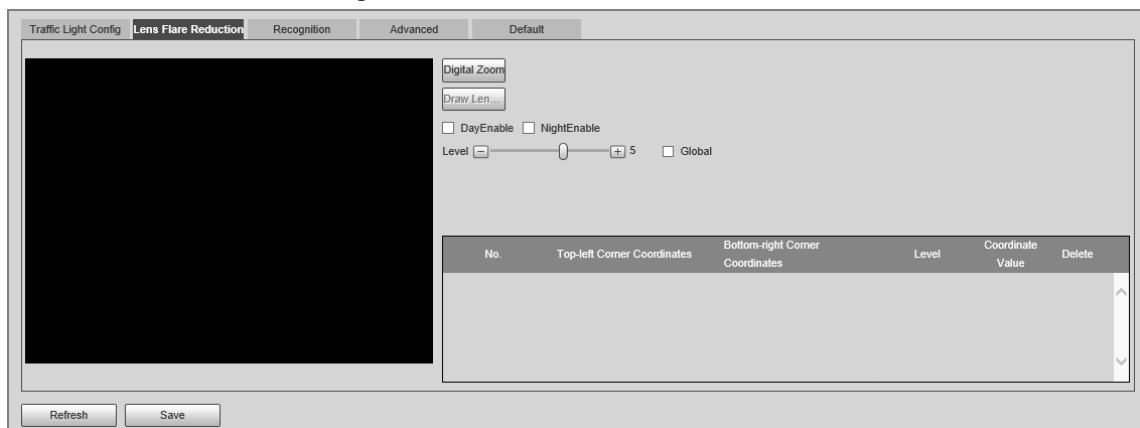
Step 5 Click **Save**.

Lens Flare Reduction

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

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

Figure 4-36 Lens flare reduction



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

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

Step 4 Configure the parameters.

Table 4-22 Description of lens flare reduction parameters

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

Step 5 Click **Save**.

Recognition

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

Step 2 Configure the parameters.

Figure 4-37 Recognition

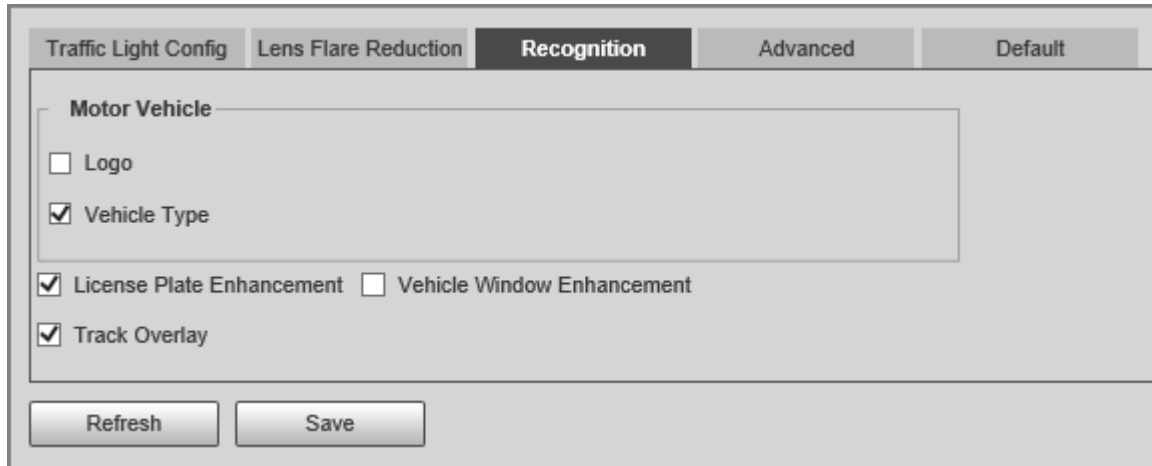



Table 4-23 Description of recognition parameters

Parameter	Description
Motor Vehicle	Supports recognizing vehicle logs and vehicle types.
License Plate Enhancement	Select the checkbox to enhance the effect of license plate images.
Vehicle Window Enhancement	Select the checkbox to enhance the effect of vehicle window images.
Track Overlay	Select the checkbox to enable Track Overlay . After you enable the function and click  on the Live page, you can see that each vehicle is covered by a green box.

Step 3 Click **Save**.

Advanced

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

Step 2 Configure a custom algorithm.

Step 3 Click **Save**.

Default

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

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

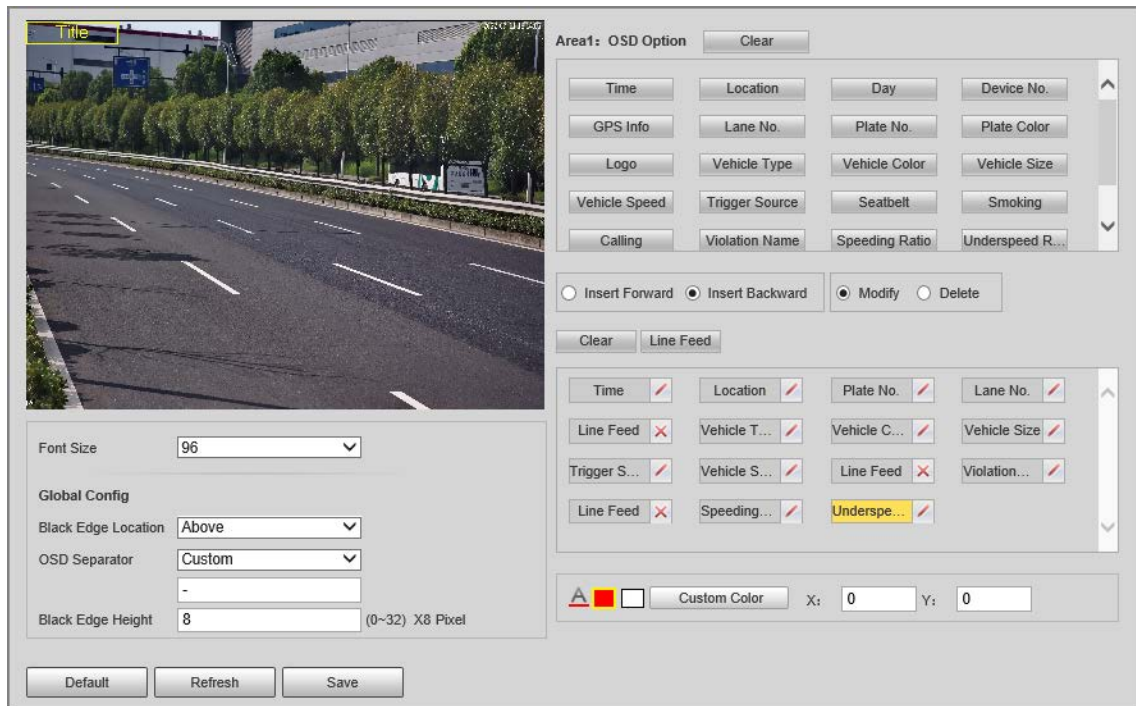
4.5.1.3.3 Configuring Original Picture OSD

Configure OSD content, style, and position for captured images.

Step 1 Select **Setting > ITC > E Police > Original Picture OSD**.

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

Figure 4-38 Original picture OSD



Step 3 Configure the OSD parameters.

Table 4-24 Description of 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 <input checked="" type="checkbox"/> is displayed next to all the selected OSD options. To edit an OSD option, click <input checked="" type="checkbox"/> next to the OSD option.
Delete	Select Delete , and then <input checked="" type="checkbox"/> is displayed next to all the selected OSD options. To delete an OSD option, click <input checked="" type="checkbox"/> next to the OSD option.
Clear	Delete all the selected OSD options.
Line Feed	To start a new line after an OSD option, select the OSD option, and then click Line Feed .

Step 4 Click **Save**.

4.5.1.3.4 Configuring Combination Picture OSD

Step 1 Select **Setting > ITC > E Police > Combination Picture OSD**.

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

Step 3 Configure the OSD parameters. For details, see Table 4-24.

Step 4 Click **Save**.

4.5.1.3.5 Configuring Cutout

- Step 1 Select **Setting** > **ITC** > **E Police** > **Cutout Config**.
- Step 2 Select the cutout type.

Figure 4-39 Cutout config

- Step 3 Click **Save**.

4.5.1.4 Composition & OSD

4.5.1.4.1 Configuring Picture Synthesis

Select violation types and set the combination sequence, picture size, and other parameters to form an image combined with the information you set.

- Step 1 Select **Setting** > **ITC** > **Composition & OSD** > **Picture Synthesis**.

Figure 4-40 Picture synthesis

- Step 2 Select **Enable** to enable image mosaic.
- Step 3 Select **Upload Original Image** as needed. If you do not select this checkbox, no original image is uploaded.
- Step 4 Under **All Violations**, select one or more violation types.
- Step 5 Configure other parameters.

Table 4-25 Description of combination parameters

Parameter	Description
Combination Mode for X Pictures	Select the combination mode for 2, 3, or 4 images.

Parameter	Description
Composite Sequence of One Picture	Select the combination mode for 1 image.
Quality	Select Quality , and then you can set the quality of the images.
Size	Select Size , and then you can set the maximum size of the images.
Close-up Area	<ul style="list-style-type: none"> • Customized Width: the width of the close-up area. • Altitude: the height of the close-up area.

Step 6 Click **Save**.

4.5.1.4.2 Configuring Video OSD

Step 1 Select **Setting > ITC > Composition & OSD > Video OSD**.

Step 2 Click **Channel Title**, and then click **Enable** to enable the OSD type.

Figure 4-41 Video OSD



You can add information including channel, time, GPS, traffic flow, queue information, and custom content as OSD information. In this section, **Channel Title** is used as an example.

Step 3 Set the channel title, coordinates, font size, and font color.

You can also drag the OSD box on the image to change the position of channel title.

Step 4 (Optional) Click **+** next to **Custom1** to add custom OSD information.



You can add up to 8 pieces of custom OSD information.

Step 5 Click **Save**.

4.5.1.5 Transfer Offline

After you enable transfer offline, the Device will continue to upload the images captured during the offline period to the platform when the Device is reconnected to the platform after disconnection.

Step 1 Select **Setting > ITC > Transfer Offline**.

Step 2 Select **ANR** to enable the function.

Figure 4-42 ANR

Step 3 Configure the parameters.

Table 4-26 Description of ANR parameters

Parameter	Description
Type	<ul style="list-style-type: none"> IP: The system identifies the platform through IP address. MAC: The system identifies the platform through MAC address.
Platform	Select a platform to upload images. Click Browse to search for current online platforms.
IP/MAC Address	<ul style="list-style-type: none"> If IP is selected, enter the IP address of the platform. If MAC is selected, enter the MAC address of the platform.

Step 4 Click **Save**.

Step 5 Click **Manual Upload**, select a platform and enter its IP address or MAC address, select image types, and then set a time period to upload images captured during the defined time period to the specified platform.

Figure 4-43 Manual upload

Step 6 Click **Upload**.

During the upload, you can click **End** to stop uploading.

4.5.1.6 Vehicle Allowlist/Blocklist

Set the allowlist and blocklist of vehicles.

- Allowlist: When vehicles on the allowlist are detected, the Device discards the captured vehicle violation images without any processing.
- Blocklist: When vehicles on the blocklist are detected, the Device triggers linked actions.

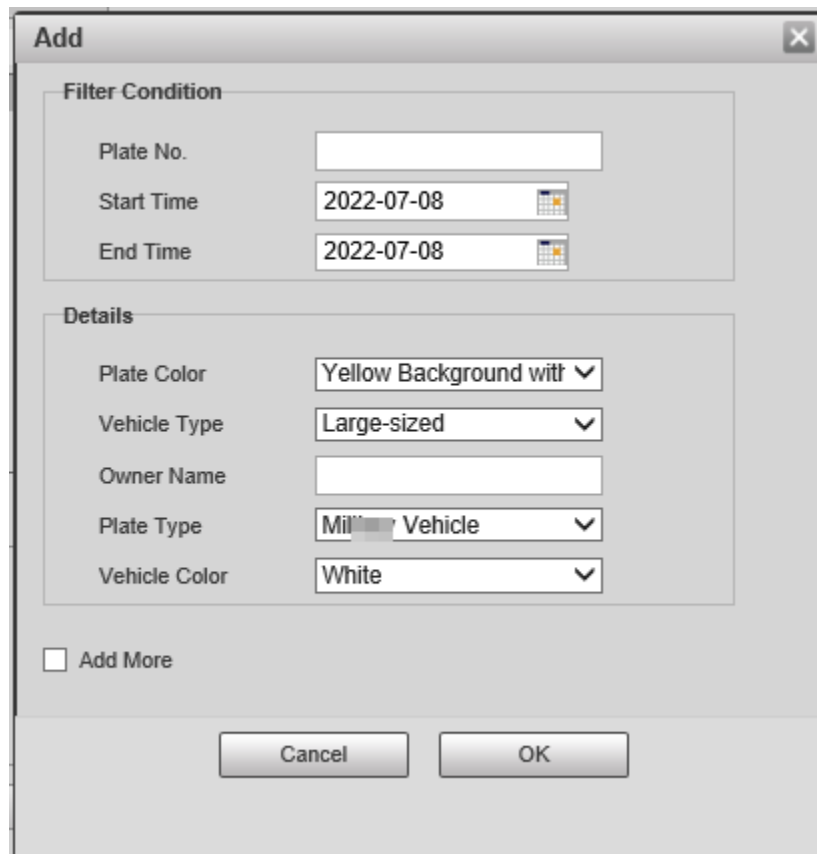
4.5.1.6.1 Setting Allowlist

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

Step 2 Set an allowlist.

- Add one by one.
 1. Click **Add**.
 2. Set filter conditions and details.

Figure 4-44 Add a plate number to the allowlist



3. Click **OK**.



Select **Add More**, and then you can continue to add more plate numbers after you click **OK**.

- Add in batches.
 1. Click **Export** to download an allowlist template.
 2. Fill in the allowlist template.

Table 4-27 Allowlist template

Start Time	End Time	Owner Name	Plate Color	Plate No.	Plate Type	Vehicle Color	Vehicle Type
2022/7/8 00:00	2022/7/8 23:59	Ana	1	A****	3	A	1

- Click **Browse**, and then select the allowlist template that you want to import.
- Click **Import** to import the allowlist template.

4.5.1.6.2 Setting Blocklist

Select **Setting** > **ITC** > **Vehicle Blocklist/Allowlist** > **Blocklist**. The setting of a blocklist is similar to that of an allowlist. For details, see "4.5.1.6.1 Setting Allowlist".

4.5.1.7 Traffic Flow

You can configure traffic flow parameters, including statistical cycle and flow upper limit.

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

Step 2 Configure the parameters.

Figure 4-45 Flow statistics

Table 4-28 Description of traffic flow parameters

Parameter	Description
Statistical Cycle	The statistical cycle of traffic flow.
Flow Upper Limit	The upper limit of traffic flow. If the actual traffic flow data exceeds the upper limit, the upper limit is used as the traffic flow data.
Enable	Select a checkbox to enable traffic flow statistics for corresponding lane.

Step 3 Click **Save**.

Step 4 Click **Flow Data**, and then you can view real-time traffic flow data.



- Click  to clear traffic flow data.
- Click  to export traffic flow data.

Figure 4-46 Flow data

No.	Start Time	Period(sec)	Traffic	Average Vehicle Speed(km/h)	Time Occupancy Rate	Space Occupancy Rate	Time Headway (s/vehicles)	Space Headway (m/vehicles)	Queue Length(m)	Road Status
1	2022-07-08 15:45:00	60	0	0.00	0.00%	0.00%	-	0.00	0.00	Clear

Details						
Unknown:0	Large Bus:0	Heavy Truck:0	Medium Truck:0	Sedan:0	Van:0	Light Truck:0
Tricycle:0	Motorcycle:0	Passerby:0	Medium Bus:0	Dangerous Goods Vehicle:0	SUV:0	MPV:0
Minicar:0	Fuel Tanker:0	Tank Truck:0	Construction Truck:0	Mixer Truck:0	Taxi:0	Police Car:0

Export

4.5.1.8 Watermark

You can verify whether local images and videos were tampered with by checking the watermark.

4.5.1.8.1 Verifying Images

Step 1 Select **Setting > ITC > Watermark > Picture**.

Step 2 Click **Path**, select a folder where the images to be verified is located, and then click **OK**,

Figure 4-47 Image watermark verification

No.	File Name	Creation Time	Size(KB)	Watermark
1	_1_14_0.jpg	2022-07-05 16:59:04	1332	Normal
2	_14_0_plate.jpg	2022-07-05 16:59:04	6	Abnormal
3	_1_19_0.jpg	2022-07-05 16:59:08	1039	Normal
4	_9_0_plate.jpg	2022-07-05 16:59:08	3	Abnormal
5	_1_24_0.jpg	2022-07-05 16:59:11	1166	Normal
6	_24_0_plate.jpg	2022-07-05 16:59:11	2	Abnormal
7	_28_0.jpg	2022-07-05 17:01:15	959	Normal
8	_1_33_0.jpg	2022-07-05 17:01:31	1154	Normal

Open Watermark

Step 3 Select one or more images from the list, and then click **Watermark**.

- If **Normal** is displayed in the **Watermark** column, the image is not tampered.
- If **Abnormal** is displayed in the **Watermark** column, the image is tampered.

Step 4 (Optional) Click **Open** to open the selected image.

4.5.1.8.2 Verifying Videos

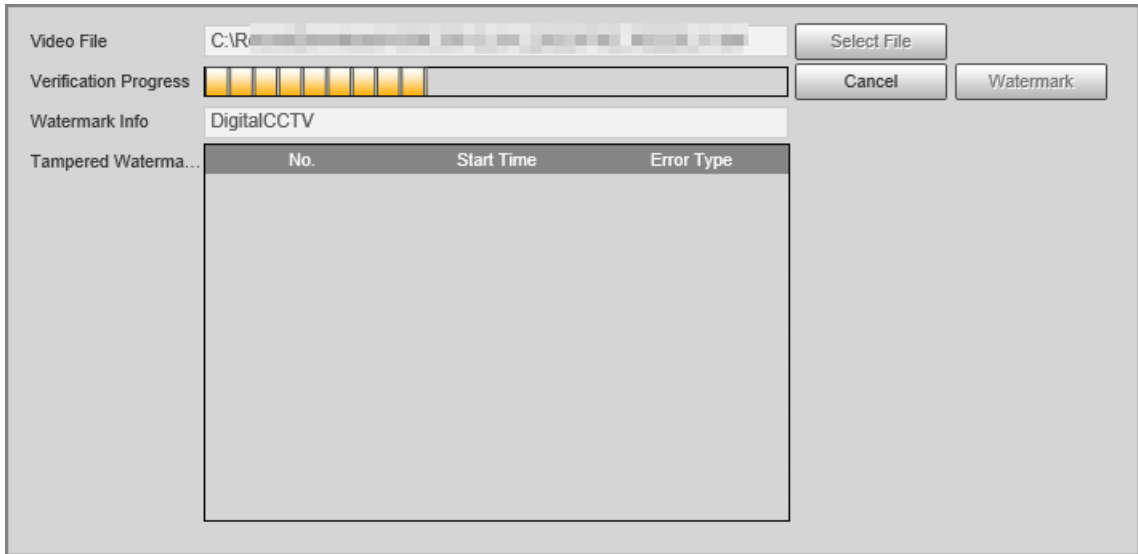
Step 1 Select **Setting > ITC > Watermark > Video**.

Step 2 Click **Select File**, and then select a video to be verified.

Step 3 Click **Watermark**.

- If the video is not tampered, the watermark is displayed next to **Watermark Info**.
- If the video is tampered, you can check the details in **Tampered Watermark Info**.

Figure 4-48 Video watermark verification



4.5.2 Camera

You can configure camera attributes such as the attributes of videos and images.

4.5.2.1 Image

4.5.2.1.1 Configuring General Parameters


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

Figure 4-49 General



Step 2 Configure the parameters.

Table 4-29 Description of general parameters

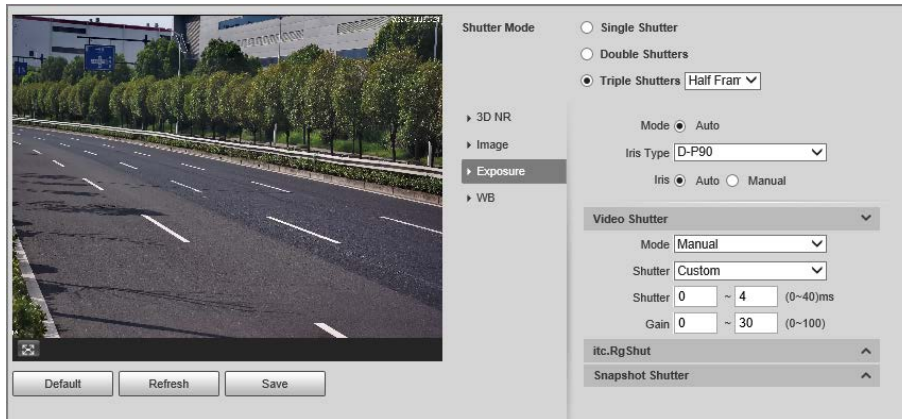
Parameter	Description
Brightness	<ul style="list-style-type: none"> Both the darker areas and the brighter areas will be changed together when adjusting the brightness. The image might become blurry when the value gets bigger. The recommended range is 40–60, and the available range is 0–100. It is 50 by default. The larger the value, the brighter the image.
Contrast	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> The saturation value does not change the overall image brightness. The larger the value, the more saturated the image. The recommended range is 40–60, and the available range is 0–100. It is 50 by default.
Mode	<ul style="list-style-type: none"> Color: The image is always colored. Auto: When the brightness is higher than the preset value, the image automatically changes to color. When it is below the preset value, the image changes to black and white. B/W: The image is always black and white.
ICR Switch	<ul style="list-style-type: none"> Auto: You need to pre-set the brightness in this mode. When the ambient brightness is higher than the preset value, the polarizer will start to work. Polarizer: The polarizer is always running. Applicable to scenarios with high brightness. IR Mode: Applicable to scenarios with low brightness.
Ambient Brightness	The ambient brightness of ICR switch.  This parameter is available only when you set ICR Switch to Auto .

4.5.2.1.2 Configuring Shutter

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

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

Figure 4-50 Shutter






Step 2 Click **Video Shutter**, **Snapshot Shutter**, or **Recognition Shutter** to show the parameters related to the shutter. To configure the parameters, refer to the table below.



Recognition Shutter is only available in **Triple Shutters** mode.

Table 4-30 Shutter parameters

Module	Parameter	Description
Shutter Mode	Single Shutter	Video and snapshot share the same exposure mode.
	Double Shutters	<ul style="list-style-type: none"> • Video Shutter and Snapshot Shutter can be separately configured. • Half Frame Rate: Video and snapshot take half of the frame respectively. • Full Frame Rate: Snapshot takes 1 frame, and video takes the rest of the frames.
	Triple Shutters	<p>Video Shutter and Snapshot Shutter can be separately configured, and Recognition Shutter is added.</p> <p> Triple Shutter mode is available only when General Mode is selected as Capture and Flash Linkage from Setting > ITC > E Police > Other Config.</p>
3D NR	Video/Image 3D NR	When it is Enable , 3D NR is enabled to reduce noise of video/image.
	Video/Image Spatial 3D NR	Spatial video/snapshot denoising. The higher the value, the less the noise.
	Video/Image Temporal 3D NR	Temporal video/snapshot denoising. The higher the value, the less the flicker noise.
Image	Scene	You can change the scene and adjust the sharpness of the corresponding scene. Scenes available: Morning/Dusk , Day , and Night .
	Sharpness	You can set the sharpness of the corresponding scene. The higher the value, the clearer the image. But there will be noise if the sharpness is too high.

Module	Parameter	Description
	WDR	Select Enable to enable WDR (wide dynamic range), which helps provide clear video images in bright and dark light.
Exposure	Mode	Only Auto mode is available.
	Iris Type	Displays the detected iris type.
	Mode	Select the way of adjusting exposure mode. You can select from Manual and Auto .
	Shutter	You can select the shutter value, or select Custom , and then set the shutter range.  You need to configure shutter when Mode is set to Manual .
	Shutter	Set the time range of shutter.  You need to configure shutter when Shutter is set to Custom .
Gain	Set the value range of gain.  You need to configure gain scope when Mode is set to Manual .	
WB	Mode	Set scene mode to adjust the image to its best status.

Step 3 Click **Save**.

4.5.2.1.3 Configuring Metering Zone

Set the measure mode of metering zone.

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

Figure 4-51 Metering



Step 2 Configure the parameters.

Table 4-31 Description of metering parameters

Parameter	Description
Plate Brightness Compensation	When selecting Enable , you can turn ON backlight and frontlight according to scene requirements to improve the backlight and frontlight image brightness.
Backlight Compensation	
Frontlight Compensation	
Metering Mode	<ul style="list-style-type: none"> • Global Metering: Measure the brightness of the whole image area and intelligently adjust the overall image brightness. • Partial Metering: Measure the brightness of selected areas and intelligently adjust the overall image brightness. If the measured area becomes bright, then the whole area becomes dark, and vice versa. <ol style="list-style-type: none"> 1. Drag the mouse to select the measured area and a yellow box displays over the video image. 2. Drag the box to a proper location, and then click Save.

Step 3 Click **Save**.

4.5.2.2 Video

After connecting the Device to the network and viewing the real-time video on the webpage, you can configure encoding parameters when necessary to obtain clear and smooth video.

4.5.2.2.1 Configuring Video Parameters

Configure the parameters of video streams.

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




Figure 4-52 Video stream

The screenshot shows a configuration window for video streams, divided into 'Main Stream' and 'Sub Stream' sections. Both sections have a 'General' dropdown for Stream Type. The Main Stream settings include: Encode Mode (H.264H), Resolution (4096*2160(4096x2160)), Frame Rate (FPS) (12), Bit Rate Type (CBR), Bit Rate (Kb/S) (Custom, 3932), I Frame Interval (24, range 12-150), and a checked Watermark option with a string 'DigitalCCTV'. The Sub Stream settings include: an enabled checkbox, Encode Mode (H.264), Resolution (1920*1080(1080P)), Frame Rate (FPS) (12), Bit Rate Type (VBR), Quality (5), Max Bit Rate (Custom, 1105), and I Frame Interval (24, range 12-150). At the bottom are 'Default', 'Refresh', and 'Save' buttons.

Step 2 Configure the parameters.

Table 4-32 Video stream parameters

Parameter	Description
Encode Mode	You can select H.264B, H.264, H.264H, MJPEG, or H.265.

Parameter	Description
Resolution	<p>The higher the value, the clearer the overall image. For each resolution, the recommended bit stream value is different.</p>  <p>The resolution of sub stream cannot be greater than that of main stream.</p>
Frame Rate (FPS)	<p>The higher the value, the smoother the video image. The frame rate might vary due to different resolutions.</p>
Bit Rate Type	<p>You can select from VBR (variable bitrate) and CBR (constant bitrate).</p> <ul style="list-style-type: none"> • 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 we recommend you use this bitrate type when the network connection is limited to performing at, for example, 320 Kbps.
Quality	<p>6 quality levels are available. The higher the value, the better the quality.</p>  <p>You need to configure the image quality when Bit Rate Type is set to VBR.</p>
Bit Rate(Kb/S)	<p>Higher bit rate signifies greater image or video quality, but also occupies more storage space.</p>  <p>You need to configure the bit rate when CBR is set to Bit Rate Type.</p>
Max. Bit Rate	<p>It is the upper limit of stream in VBR. In CBR, the value is fixed.</p>
I Frame Interval	<p>The number of P-frame between two I-frames. The number varies according to the bit rate. The range is 12–150. We recommend you configure the value to be twice the amount of the bit rate.</p>
Watermark	<p>You can verify the watermark to check whether the video has been tampered.</p> <p>Select the Watermark checkbox to enable watermark verification. The watermark character is DigitalCCTV by default.</p> <p>Watermark character consists of up to 85 characters with numbers, letters and underlines.</p>
Enable	<p>Enable sub stream when your network bandwidth is insufficient or other conditions influence the video smoothness in main stream.</p>

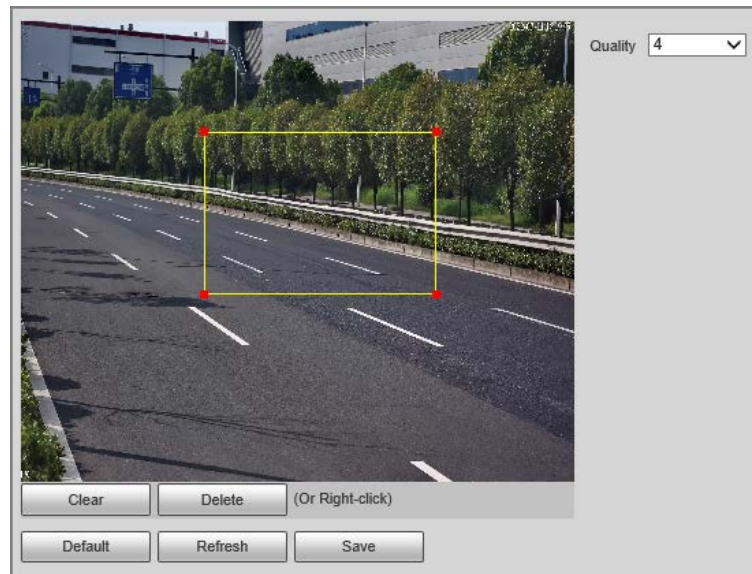
Step 3 Click **Save**.

4.5.2.2.2 Configuring ROI

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

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

Figure 4-53 ROI



Step 2 Drag anywhere in the 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**.

4.5.3 Network Settings

You can configure network parameters such as IP address, subnet mask, and default gateway.

4.5.3.1 Configuring TCP/IP

You can configure host name, IP address, and more.



Some models are designed with 2 network ports. Do not configure the ports to be on the same network segment; otherwise, the network might fail.

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

Figure 4-54 TCP/IP

Step 2 Configure the parameters.

Table 4-33 Description of TCP/IP parameters

Parameter	Description
Host Name	Configure the host name (not exceeding 15 characters).
NIC	Supports wired network only.
Mode	<ul style="list-style-type: none"> • DHCP: The Device automatically assigns IP addresses. In this case, the IP Address, Subnet Mask, and Default Gateway cannot be configured. • Static: The IP Address, Subnet Mask, and Default Gateway need to be manually configured.
MAC Address	Displays host MAC address.
IP Version	IPv4 and IPv6 are available. Both IP versions can be accessed.
IP Address	The IP address of the Device.
Subnet Mask	The subnet mask that masks the IP address of the Device.
Default Gateway	The default gateway corresponding to IP address of the Device.
Preferred DNS	The IP address of preferred DNS.
Alternate DNS	The IP address of alternate DNS.
net.Wifi.Conf	Select Enable to enable Wi-Fi. <ul style="list-style-type: none"> • SSID: the name of the Wi-Fi network. • Password: the password of the Wi-Fi network.

Step 3 Click **Save**.

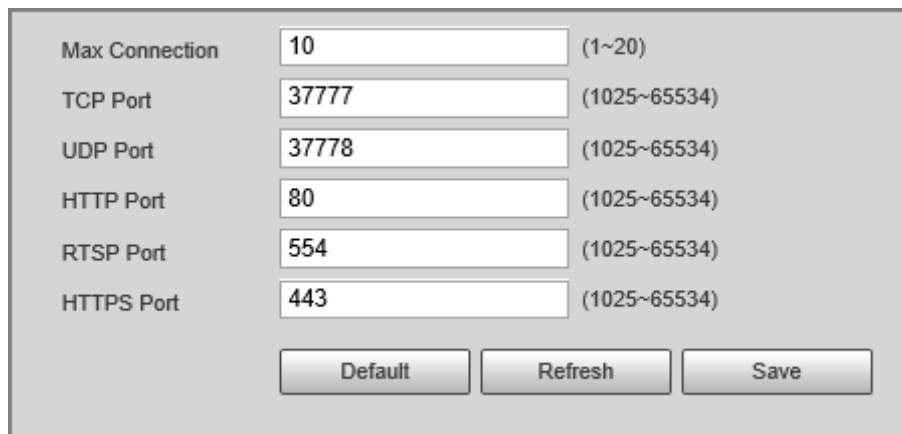
4.5.3.2 Port

4.5.3.2.1 Configuring Port

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

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

Figure 4-55 Port



Max Connection	<input type="text" value="10"/>	(1~20)
TCP Port	<input type="text" value="37777"/>	(1025~65534)
UDP Port	<input type="text" value="37778"/>	(1025~65534)
HTTP Port	<input type="text" value="80"/>	(1025~65534)
RTSP Port	<input type="text" value="554"/>	(1025~65534)
HTTPS Port	<input type="text" value="443"/>	(1025~65534)

Step 2 Configure the port number of the Device for each protocol.

Table 4-34 Description of port parameters

Parameter	Description
Max Connection	The maximum number of clients (such as web client and platform client) that are allowed to access the Device simultaneously. It is 10 by default.
TCP Port	TCP protocol communication port. It is 37777 by default.
UDP Port	User data packet protocol port. It is 37778 by default.
HTTP Port	HTTP communication port. It is 80 by default.
RTSP Port	Media streaming control port. It is 554 by default.
HTTPS Port	HTTPS communication port. It is 443 by default.

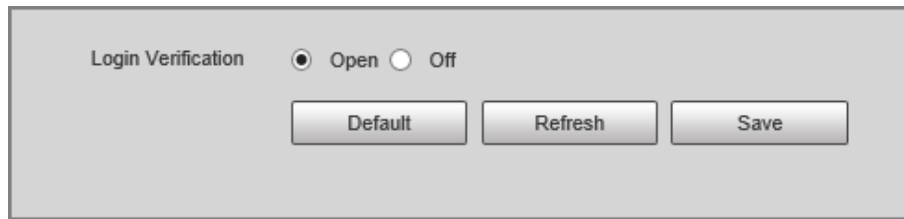
Step 3 Click **Save**.

4.5.3.2.2 Configuring ONVIF

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

Select **Setting > Network Settings > Port > ONVIF**. Verification of username and password will be required for logging in to ONVIF when ONVIF authentication is turned on.

Figure 4-56 ONVIF



4.5.3.2.3 Configuring Auto Registration

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

Step 1 Select **Setting > Network Settings > Register**.

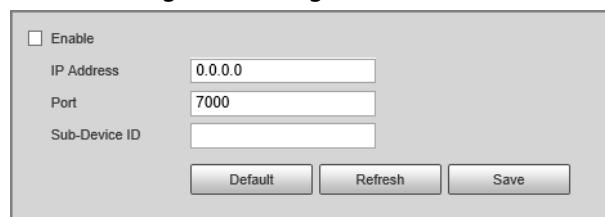
Step 2 Select the **Enable** checkbox to enable auto registration function.

Step 3 Enter the IP address of server that needs to be registered, and also the port for auto registration.

Step 4 Enter the **Sub-Device ID**, which is the device ID assigned by the server for auto registration. Make sure that there are no repeated device IPs.

Step 5 Click **Save**.

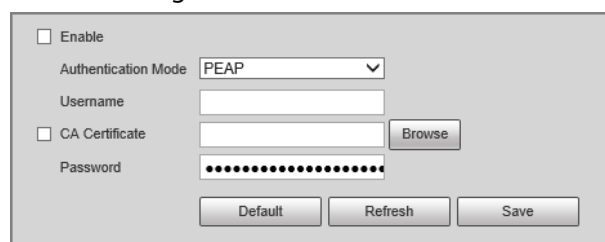
Figure 4-57 Register



4.5.3.2.4 Configuring 802.1x

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

Figure 4-58 802.1x



Step 2 Select **Enable** to enable 802.1x, and then configure the parameters.

Table 4-35 Description of 802.1x parameters

Module	Parameter	Description
Common Parameter	Authentication Mode	<ul style="list-style-type: none"> • PEAP: Ordinarily uses TLS only to authenticate the server to the client, and only the sever is required to have a public key certificate. • EAP-TLS: Provides mutual authentication of client to server, and server to client. Both the client, and the server must be assigned a digital certificate signed by a CA (Certificate Authority) that they both trust.
	CA Certificate	Click Browse to import a CA certificate and then select the CA Certificate to verify whether the certificate is valid.
PEAP	Username	For PEAP method, user authentication is performed by using password-based credentials (username, and password).
	Password	
EAP-TLS	Client Certificate	Click Browse to import a client certificate and a private key for authentication.
	Private Key	

Step 3 Click **Save**.

4.5.4 Event

4.5.4.1 Exception

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

- **Disk Abnormal**: An alarm will be triggered when there is **No SD card**, **SD card error**, or **Memory insufficient**.
- **Network Exception**: An alarm will be triggered when there is **Offline** (the Device is offline) or **IP Conflict**.
- **Invalid Access**: An alarm will be triggered when unauthorized access is detected by the system.
- **Security Exception**: An alarm will be triggered when security problem occurs.

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



The following figure uses **Disk Abnormal** as an example. For other events, refer to the actual page.

Step 2 Configure the parameters.

Figure 4-59 Disk Abnormal

Event Type: No SD card

Enable

Default Refresh Save



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

Table 4-36 Description of exception parameters

Parameter	Description
Enable	Select it to enable alarm of abnormal events.
Login Attempt	Configure the number of login errors allowed. The range is 3–10 times.

Step 3 Click **Save**.

4.5.4.2 Device Location

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

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

4.5.5 Peripheral

4.5.5.1 Device Status

Select **Setting > Peripheral > Peripheral > Device Status**, and then you can view the information of external devices.

4.5.5.2 External Light

You can configure the work mode of the flashing lights and strobes connected to the Device.

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

Figure 4-60 Light config

F1 Flashing Light Strobe F2 Flashing Light Strobe
 F3 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		Strobe	
Working Mode	No Flash	Output Mode	Auto
Scene Mode	Morning/Dusk	Delay Time	-0.2 (-3.0~6.0ms)
Pulse Width	960 us(0 ~ 5000)	Pulse Width	3 0.0~6.0ms
Delay Time	-300 us(-3000 ~ 6000)	Frequency	100 HZ
Trigger Mode	Low level	Ambient Brightness	65

Default Refresh Save

Step 2 Configure the parameters.

Table 4-37 Description of light parameters

Parameter		Description
F1/2/3		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	<ul style="list-style-type: none"> • 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.
Strobe	Output Mode	Same as Working Mode of flashing light.
	Frequency	Set the frequency of the strobe.
	Ambient Brightness	When setting Output Mode to Auto , you need to set the ambient brightness.

Step 3 Click **Save**.

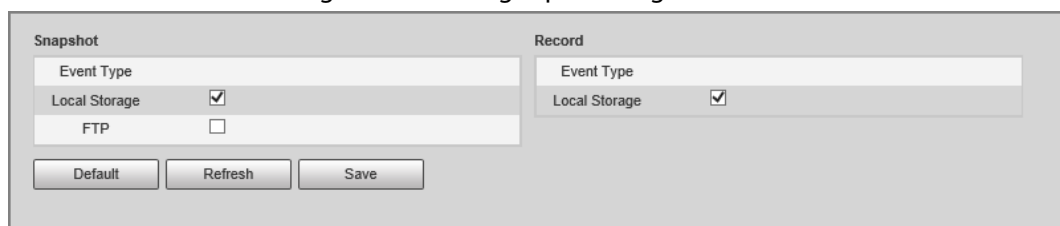
4.5.6 Storage

You can configure the storage path of snapshots and recorded videos.

4.5.6.1 Storage Spot Config

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

Figure 4-61 Storage spot config



Step 2 Select storage path as needed.

- **Local Storage:** Store in the TF card, which has a limited capacity but offers continuous

access to its storage, even during network failure. Videos can only be stored in TF card.

- **FTP:** Store in the FTP server, which offers a greater capacity but it will stop storing when the network fails.

Step 3 Click **Save**.

4.5.6.2 Local Storage

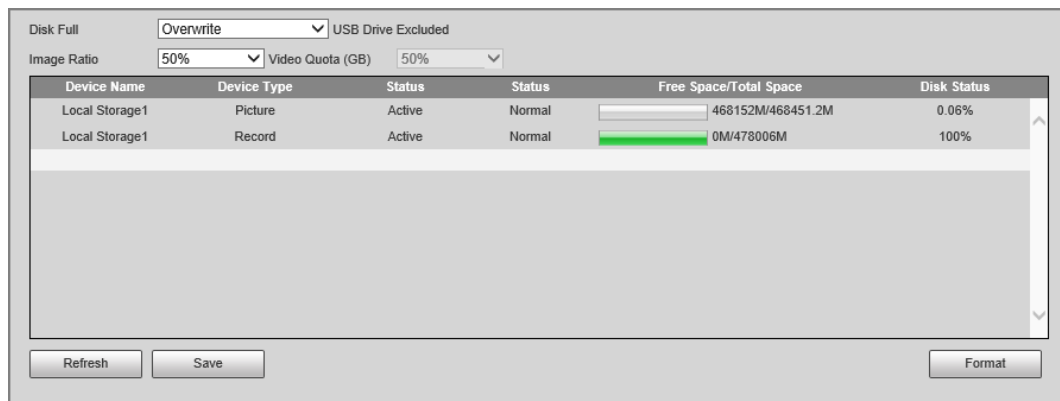
Select **Setting > Storage > Storage > Local Storage**

You can format 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** tab.

Figure 4-62 Local storage



4.5.6.3 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.

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

Figure 4-63 FTP

Step 2 Configure the parameters.

Table 4-38 Description of FTP parameters

Parameter	Description
ANR	<p>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.</p> <p>Make sure that TF card is inserted in the Device; otherwise, the offline transfer function cannot be enabled.</p>
Picture Name Settings	<p>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.</p>
Server1, Server2, Server3	<p>Supports uploading to multiple servers. You can save different types of snapshots to different servers. Select the snapshot types from Upload Picture.</p>
Enable	<p>Enable FTP server storage.</p>
Protocol	<ul style="list-style-type: none"> • SFTP: Secure File Transfer Protocol, a network protocol that 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	<p>The IP address of FTP server.</p>
Encode Mode	<p>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.</p>
Port	<p>The port number of FTP server.</p>

Parameter	Description
Username, Password	The username and password of FTP server.
Upload Picture	Select events and picture types to be uploaded to each FTP server. Different modes support different events, and might differ from the actual page.

Step 3 Click **Save**.

4.5.6.4 Storage Path

You can configure the names and storage paths of snapshots and recorded videos.

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 storage paths of snapshots and recorded videos respectively.

Step 4 Click **Save**.

Figure 4-64 Storage path

4.5.6.5 SMART

SMART (Self-Monitoring Analysis and Reporting Technology) is used to display automatic disk detection results, and discover and predict possible disk problems in time.

Step 1 Select **Setting > Storage > Storage > S.M.A.R.T**.

Step 2 Check the information and health state of the disk.

4.5.7 Record

4.5.7.1 Record Control

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

- Step 2 Select the record mode.
- **Auto:** Record videos continuously
 - **Violation:** Record videos only when a traffic violation event is detected.
 - **Close:** Do not record videos.
- Step 3 Select the record stream. You can select **Main Stream** or **Sub Stream**.
- Step 4 Set the maximum duration of recorded videos.
- Step 5 Click **Save**.

Figure 4-65 Record control

4.5.7.2 Schedule

- Step 1 Select **Setting > Storage > Record > Schedule**.

Figure 4-66 Schedule

- Step 2 Set the record plan records.
- Press and hold the left mouse button, and directly drag to set the period on the timeline corresponding to Sunday to Saturday.
 - Click **Setting** on the right side of Sunday to Saturday. In the **Setting** dialog box, set periods and record types, and then click **OK**.

Figure 4-67 Setting

Step 3 Click **Save**.

4.5.8 System

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

4.5.8.1 General

You can configure display language, video standard, and the time and time zone of the Device.

4.5.8.1.1 General Settings

You can configure the device code, system, video standard, and other general settings.

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

Step 2 Configure the parameters.

Figure 4-68 General

Table 4-39 Description of general parameters

Parameter	Description
Device Name	The name of the Device.
Device No.	The sequence number of the Device.
Language	The display language of the webpage. You need to log in again when switching to another language. Currently, only English is supported.

Parameter	Description
Video Standard	<p>PAL and NTSC are available.</p> <ul style="list-style-type: none"> ● 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 Device.
Device Location	The location where the Device is installed.

Step 3 Click **Confirm**.

4.5.8.1.2 Date & Time

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

Step 2 Configure the parameters.

Figure 4-69 Date & time

Table 4-40 Description of 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. Only 24-Hour is available.
Time Zone	The time zone where the Device is located.
System Time	The current time of the Device.
Sync PC	Synchronize the time of the Device to that of the PC. Click Sync PC , and the settings will immediately take effect.
DST	Select the DST 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 or Positioning System Time Synchronization .

Parameter	Description
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 Device and the NTP or satellite.
Sync Time-Allowlist	Set the type and IP address that need time synchronization, and then click Add .

Step 3 Click **Save**.

4.5.8.2 Account Management

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

4.5.8.2.1 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 perform other operations.

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 4-70 Add user

- 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 4-71 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/user group: Click to delete the corresponding user/user group.



- ◇ The admin and user groups cannot be deleted.
- ◇ A group cannot be deleted if there is any user in the group.

- Modify user/user group 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**.

4.5.8.2.2 ONVIF User

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

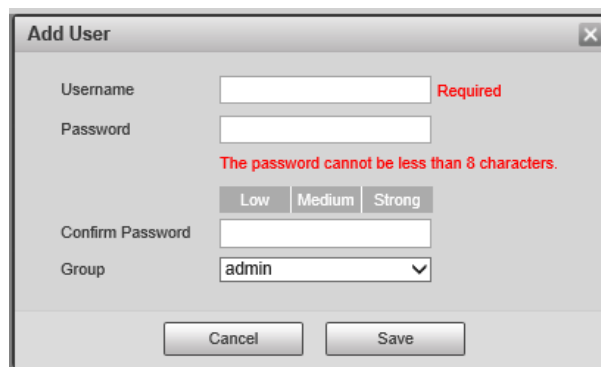
- The system manages both ONVIF users and user groups. The factory settings cover one group: admin. You can set up to 18 ONVIF users.

- 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 4-72 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.

4.5.8.3 Security



4.5.8.3.1 System Service

You can enable multiple system services to secure network safety.

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

Figure 4-73 System service

Table 4-41 Description of 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	<p>Enable this function to encrypt stream transmitted through private protocol.</p>  <ul style="list-style-type: none"> • 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	<p>Enable this function to encrypt stream transmitted through standard protocol.</p>  <ul style="list-style-type: none"> • Make sure that the matched device or software supports video decryption function. • We recommend enabling the encryption service to avoid data leak.
Private Protocol Authentication Mode	Security Mode is recommended.

Step 3 Click **Save**.

4.5.8.3.2 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 webpage, 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.

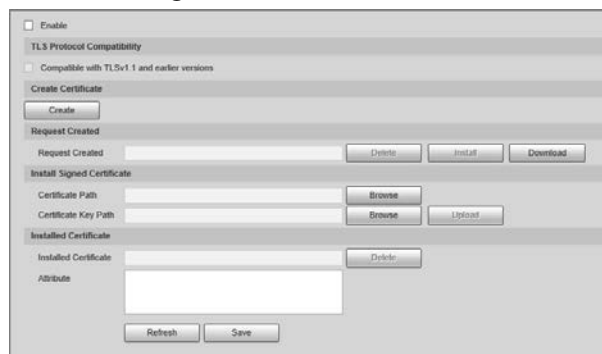
On the **HTTPS** tab, you can make PC log in normally through HTTPS by creating certificate or uploading authenticated certificate. It can ensure security of communication data, and provide guarantee for user information, and device safety through reliable, and stable technical approach.

Procedure

Step 1 Create a certificate or upload the authenticated certificate.

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

Figure 4-74 HTTPS



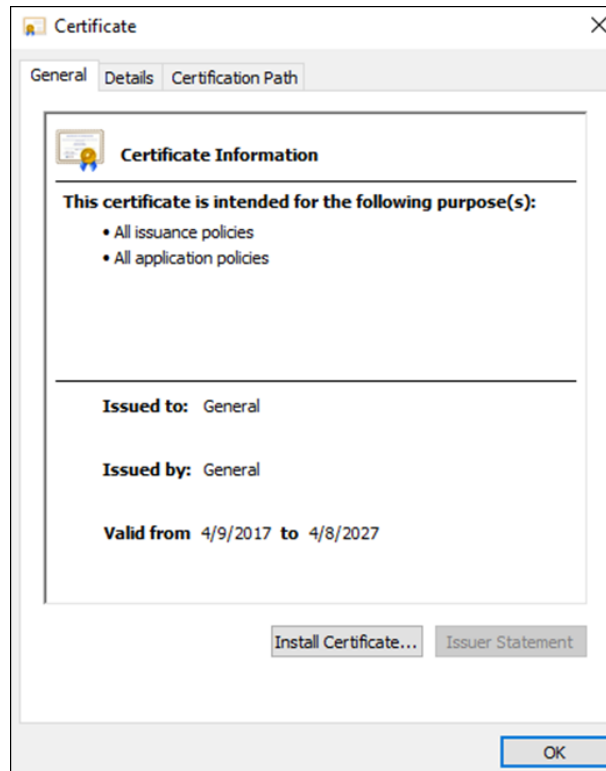
3. Enter the required information such as region, IP or domain name, and then click **Create**.



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

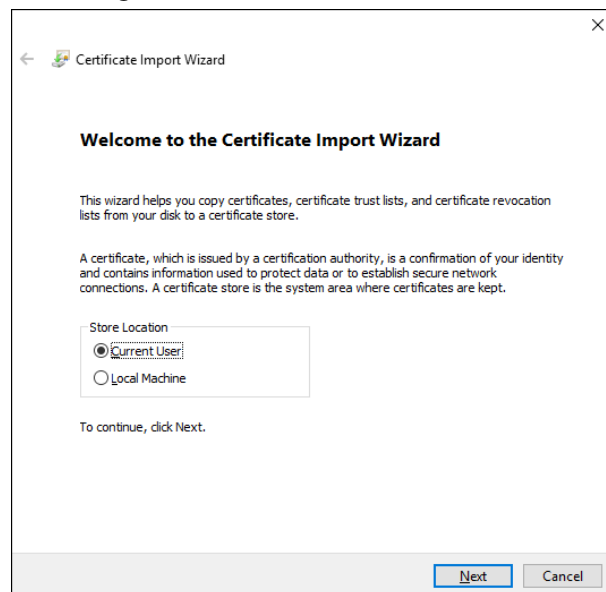
4. Click **Install** under **Request Created**, and then click **Download** to download root certificate.
The system pops up **Save As** dialog box, select storage path, and then click **Save**.
5. Double-click the RootCert.cer icon.
6. Click **Install Certificate...**

Figure 4-75 Install certificate



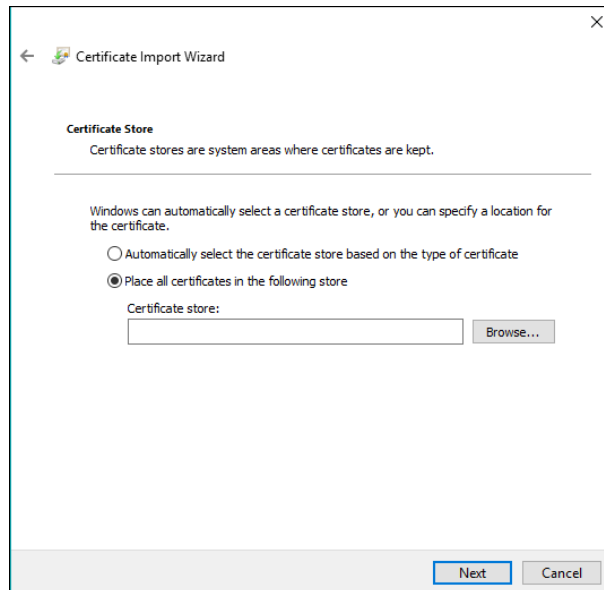
7. Click **Next**.

Figure 4-76 Certificate store



8. Click **Next**.

Figure 4-77 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 Device restarts.

Step 3 Use HTTPS to log in to the Device.

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



IP address is the Device IP address or domain name.

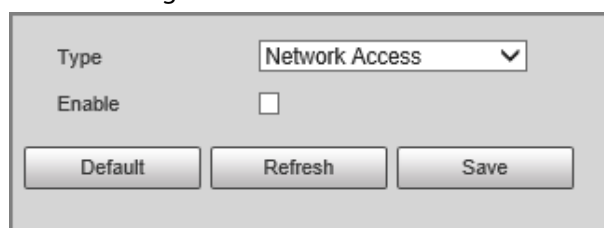
2. Enter the username, and password to log in to the Device.

4.5.8.3.3 Firewall

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

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

Figure 4-78 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.

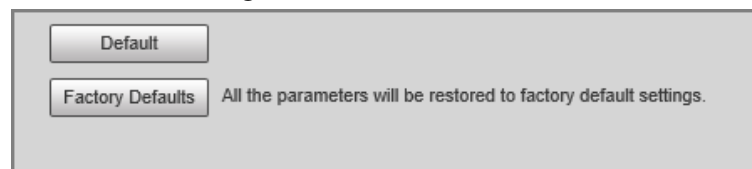
Step 4 Click **Save**.

4.5.8.4 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 4-79 Default

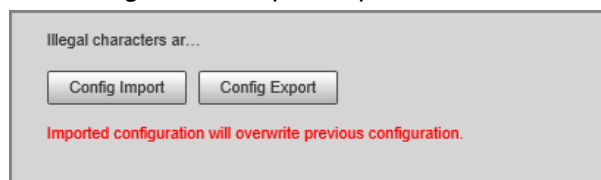


4.5.8.5 Import/Export

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

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

Figure 4-80 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 a path to import files from or export files to.

4.5.8.6 Maintenance Configuration

4.5.8.6.1 Maintenance

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

Figure 4-81 Auto maintain

Step 2 Select a 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 Device.

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

Step 4 Click **Save**.

4.5.8.6.2 Emergency Maintenance

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

Step 2 Select **Enable** to enable emergency maintenance.

Step 3 Click **Save**.

4.5.8.7 Update

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

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 4-82 Update

4.5.9 System Information

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

4.5.9.1 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 flashing light.

4.5.9.2 Log

4.5.9.2.1 System Log

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

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 4-83 Log

The screenshot shows a web interface for searching logs. At the top, there are input fields for 'Start Time' (2022-07-08 11:09:05) and 'End Time' (2022-07-09 11:09:05). Below these is a 'Type' dropdown menu set to 'Storage' and a 'Search' button. A status message reads 'Found 1 log Time 2022-07-08 11:19:52 - 2022-07-08 11:19:52'. Below this is a table with the following data:

No.	Time	Username	Type
1	2022-07-08 11:19:52	System	Hot Swap

Below the table is a 'Details' section with labels for 'Time:', 'Username:', 'Type:', and 'Contents:'. At the bottom, there is a 'Backup' button, an 'Encrypt Log Backup' checkbox, and a pagination control showing '1 / 1'.

4.5.9.2.2 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.

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 4-84 Remote log

4.5.9.3 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.

4.5.9.4 Running Status

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

4.5.9.5 Legal Information

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

4.6 Alarm


Select **Alarm** at the upper-right corner of the webpage, and then you can select the event type to trigger an alarm, and also configure the sound of the alarm.



The alarm type might differ depending on the device model.

Figure 4-85 Alarm

Table 4-42 Alarm parameters

Name	Parameter	Description
Alarm Type	Disk Full	An alarm is triggered when storage is full.
	Disk Error	An alarm is triggered when storage error occurs.
	No SD card	An alarm is triggered when there is no storage space available.
	Traffic Light Alarm	An alarm is triggered when a traffic light fails.  This function is only available in E Police mode.
	Vehicle Blocklist	An alarm is triggered when a license plate in the blocklist is detected.
	Invalid Access	An alarm is triggered when illegal access is detected.
	Security Exception	An alarm is triggered when a network security problem is detected, such as session hijacking.
Operation	Subscribe Alarm	When an alarm is triggered, the Device will inform you on the webpage.
Alarm Tone	Play Alarm Tone	Select the Play Alarm Tone checkbox, and then click Select to select the alarm tone. The system will play the defined alarm tone when an alarm is triggered.
	Tone Path	

Appendix 1 Cybersecurity Recommendations

Cybersecurity is more than just a buzzword: it's something that pertains to every device that is connected to the internet. IP video surveillance is not immune to cyber risks, but taking basic steps toward protecting and strengthening networks and networked appliances will make them less susceptible to attacks. Below are some tips and recommendations from Dahua on how to create a more secured security system.

Mandatory actions to be taken for basic device network security:

1. Use Strong Passwords

Please refer to the following suggestions to set passwords:

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

2. Update Firmware and Client Software in Time

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

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

1. Physical Protection

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

2. Change Passwords Regularly

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

3. Set and Update Passwords Reset Information Timely

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

4. Enable Account Lock

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

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

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

6. **Enable HTTPS**

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

7. **MAC Address Binding**

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

8. **Assign Accounts and Privileges Reasonably**

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

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

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

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

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

10. **Audio and Video Encrypted Transmission**

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

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

11. **Secure Auditing**

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

12. **Network Log**

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

13. **Construct a Safe Network Environment**

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

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

private networks.

- Enable IP/MAC address filtering function to limit the range of hosts allowed to access the device.

More information

Please visit Dahua official website security emergency response center for security announcements and the latest security recommendations.

ENABLING A SAFER SOCIETY AND SMARTER LIVING

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