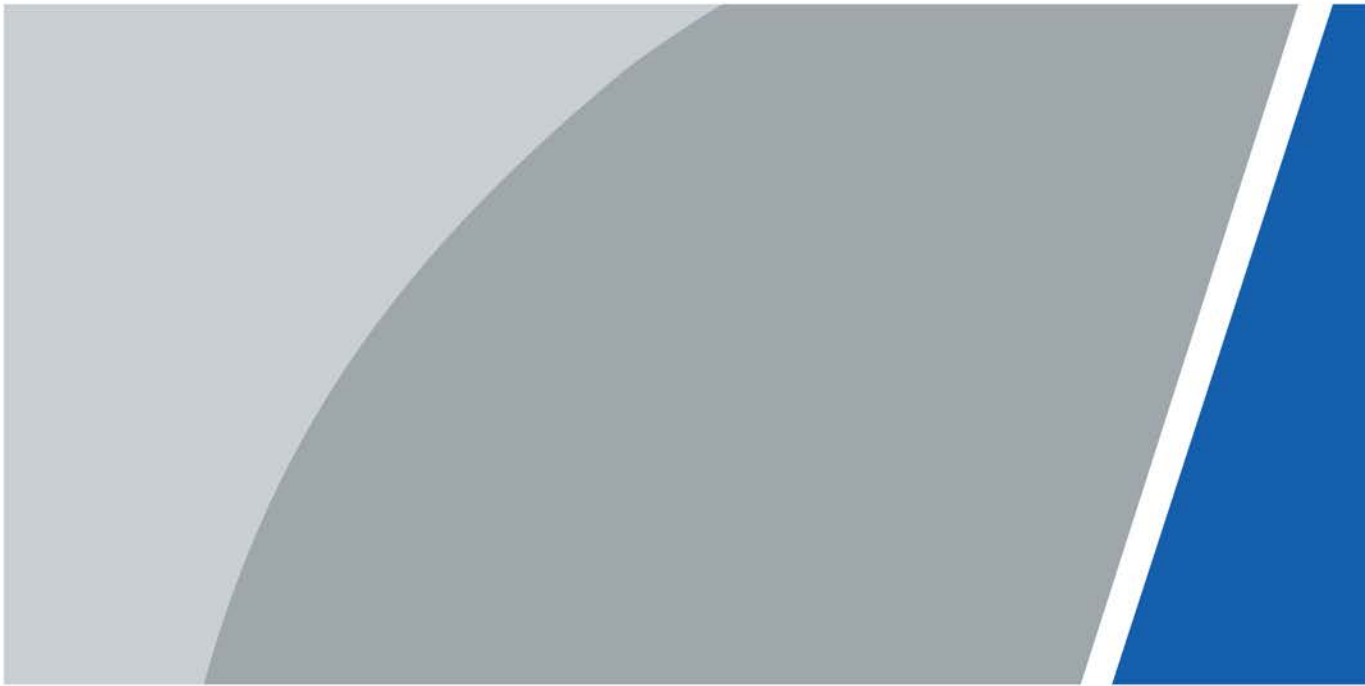


# **Access ANPR Camera**

## **Web Operation Manual**








# Foreword

## General

This manual introduces the functions and operations of the access ANPR camera (hereinafter referred to as "the Camera").

## Safety Instructions

The following signal words might appear in the manual.

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

## Revision History

Revision Content	Revision Content	Release Time
V1.1.0	Updated functions under ITC.	November 2021
V1.0.2	Updated the focal length of 437 and 415 models of camera.	July 2021
V1.0.1	Added camera models.	March 2021
V1.0.0	First release.	November 2019

## 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, comply with the guidelines when using it, and keep the manual safe for future reference.

## Transportation Requirements



Transport the device under allowed humidity and temperature conditions.

## Storage Requirements



Store the device under allowed humidity and temperature conditions.

## Installation Requirements



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



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

## 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.

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# 1 Introduction

## 1.1 Overview

The access ANPR camera adopts intelligent deep learning algorithm. It supports vehicle detection, license plate recognition, logo recognition, model recognition, and color recognition, and encoding mode such as H.265.

The Camera consists of protective housing, illuminator, and intelligent HD camera. The intelligent HD camera adopts progressive scanning CMOS, which owns several features such as high definition, low illuminance, high frame rate, and excellent color rendition.

The Camera is extensively applied to vehicle capture, and recognition of community road, parking lot, and other entrance, and exit surveillance.

## 1.2 Features



The features are available on select modes, and might differ from the actual camera.

### Permission Management

- Each user group owns permissions. Permissions of a user cannot exceed the permissions of its group.
- 2 user levels.
- Permission of opening barrier, and blocklist alarm function.
- Device configuration, and permission management through Ethernet.

### Storage

- Stores corresponding video data onto the central server according to the configuration (such as alarm, and timing settings).
- Users can record through web according to their requirements. The recorded video file will be stored on the computer where client is located.
- Supports local hot swapping of storage card, and storage when network disconnected. It overwrites stored pictures, and videos automatically when memory becomes insufficient.
- Stores 1024 log records, and user permission control.
- Supports FTP storage, and automatic network replenishment (ANR).

### Alarm

- It can trigger alarm upon camera operation exceptions through network, such as memory card damage.
- Some devices can connect to various alarm peripherals to respond to external alarm input in real time (within 200 ms). It can correctly deal with various alarms according to the linkage predefined by users, and generate corresponding voice prompt (users are allowed to record voice in advance).

## Network Monitoring

- Transmits video data of single channel compressed by device to network terminal, and make it reappear after decompression through network. Keep delay within 500ms when bandwidth is allowed.
- Supports maximum 10 users online at the same time.
- Supports system access, and device management through web.
- Video data transmission adopts HTTP, TCP, UDP, MULTICAST, and RTP/RTCP.

## Capture, and Recognition

- Recognition of number plate, and other vehicle information, including vehicle color, logo, model, and other vehicle features.
- Supports setting OSD information, and configuring location of channel, and picture.
- Supports picture capture, and encoding. Supports picture watermark encryption to prevent pictures from being tampered.
- The captured pictures can automatically record vehicle time, location, license plate, vehicle color, and more.

## Peripheral Control

- Peripheral control: Supports setting various peripheral control protocols, and connection pages.
- Connects to external devices such as vehicle detector, signal detector, and more.

## Auto Adjustment

- Auto iris: Automatically adjusts the iris opening to the changing light throughout the day.
- Auto white balance: Accurately displays the object color when light condition changes.
- Auto exposure: Automatically adjusts shutter speed according to the exposure value of the image measured by the metering system, and according to shutter, and iris exposure set by factory defaults.
- Auto gain: Automatically increases camera sensitivity when illuminance is very low, enhancing image signal output so that the Camera can acquire clear, and bright image.

# 2 Web Configuration

It supports logging in to device web page through browser on PC, and realizes device configuration, operation, and management.



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

## 2.1 Web Login

### 2.1.1 Recommended System Requirements

You can access the Camera through browsers which support plugin download and browsers without plugin.



Browsers without plugin have limitations on certain functions.

- When using a browser which supports plugins, you can get a better and more complete experience.



We recommend using IE browser.

Table 2-1 Recommended system requirements-with plugin

PC Component	Recommended System Requirements
Operating System	Windows 7, and later
CPU	Intel core i3, and faster processor
Graphics	Intel HD Graphics, and later
RAM	2 GB, and larger
Monitor	1024 × 768, and higher
Browser	Internet Explorer 9/11, Chrome 33/41, Firefox 49

- If IE browser is not available, you can switch to Chrome. For Chrome, make sure the system attributes meet the requirements included in the table below.



- ◇ If you are using a system which is at a lower performance, we recommend you use substream to eliminate video lags.
- ◇ When using a 4 MP camera, adjust the video frame rate to 15 fps.

Table 2-2 Recommended system requirements-without plugin

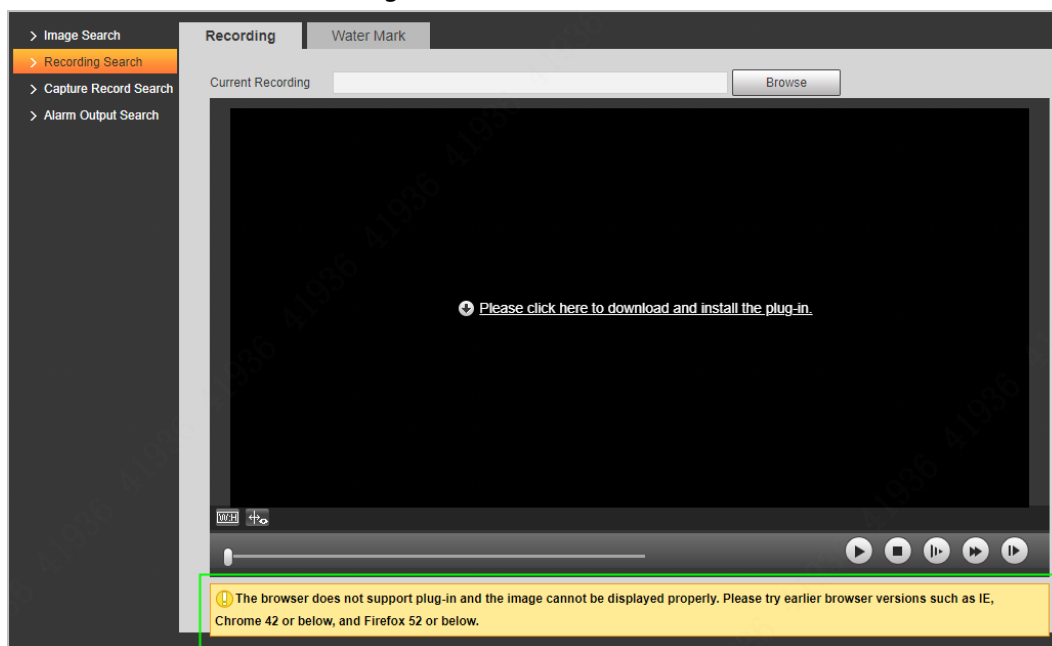
PC Component	Recommended System Requirements
Operating System	Windows 7, and later
CPU	Intel core i5 6500, and faster

PC Component	Recommended System Requirements
Graphics	Intel HD Graphics, and later
RAM	16 GB, and larger
Monitor	1024 × 768, and higher
Browser	Chrome 92 and newer



Browsers that do not support plug-in might have trouble displaying certain videos and images, or downloading data in batches. The Camera reminds you when that happens.

Figure 2-1 Reminder



## 2.1.2 Device Initialization

The Camera is delivered uninitialized by default. You need to initialize it, and change its password before further operations.

Before initialization, make sure that both PC IP, and device IP are on the same network segment, otherwise it might fail to enter the initialization page.

**Step 1** Set IP address, subnet mask, and gateway of PC, and device respectively.



- If there is no router in the network, distribute IP address of the same segment.
- If there is router in the network, configure the corresponding gateway, and subnet mask.

The IP address is 192.168.1.108 by default.

**Step 2** Use ping x.x.x.x (device IP address) command to check whether network is connected.

**Step 3** Open browser, enter the IP address of the Camera in the address bar, and then press the Enter key.

**Step 4** Enter and confirm the password.

- The new password must consist of 8 to 32 characters, and contain at least two types from upper case, lower case, number, and special characters (excluding ' " ; , and &).

- If you want to change your password again, go to **Setting > System > Account > Account**.

**Step 5** Select the **Email Address** checkbox, and then enter your email address (recommended to set for resetting your password).

**Step 6** Click **Confirm**.

Figure 2-2 Device Initialization

**Step 7** Enter the username, and password, and then click **Login**.

Figure 2-3 Login



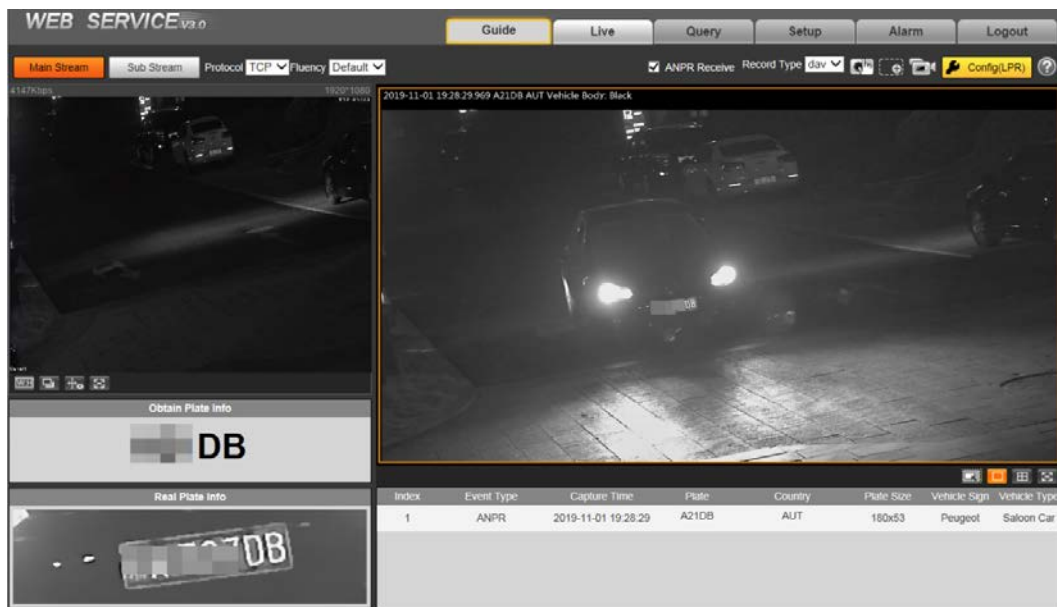
- The Camera prompts when the username or password is incorrect to reminds you of remaining attempts.
- The account will be locked for 300 s if you enter incorrect username or password for 5 times consecutively.

**Step 8** Click **Please click here to download**, and install the plug-in in the video window. The system automatically downloads webplugin.exe, and installs it according to prompt.



Before installing plug-in, make sure that the associated plug-in option of active has been modified as **Enable** or **Prompt** in **Internet Option > Security > Settings** .

Figure 2-4 Web page



The Camera prompts authorization failed when there is no operation on the web page for a long time. In this case, you need to log in again.

## 2.1.3 Login

You can log in to the web page by following the steps below. For first-time login or login after restoring factory default settings, see "2.1.2 Device Initialization".

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

**Step 2** Enter your login username, and password, and then click **Login**.

## 2.1.4 Resetting Password

Reset the password when you forget or want to change it.

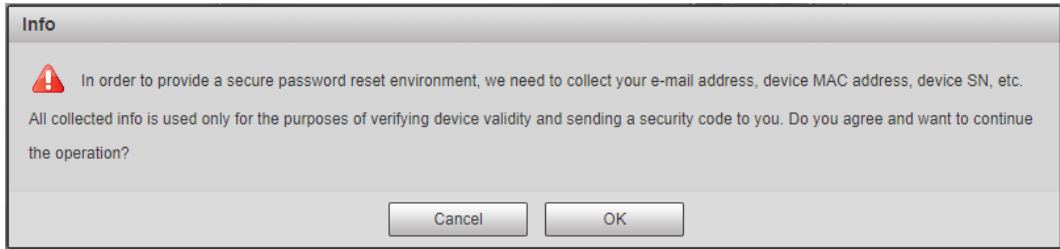


- When scanning QR code to acquire the security code, one QR code supports up to 2 acquisition.
- the security code received through email is only valid for 24 hours.
- One device can generate up to 10 security codes in one day, so you can change the password 10 times at most in one day.
- Email address must be filled in during device initialization; otherwise you will not receive the security code. The email address of admin can be modified under **Setting > System > Account > Account**.

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

**Step 2** Click **Forgot password?**

Figure 2-5 Information



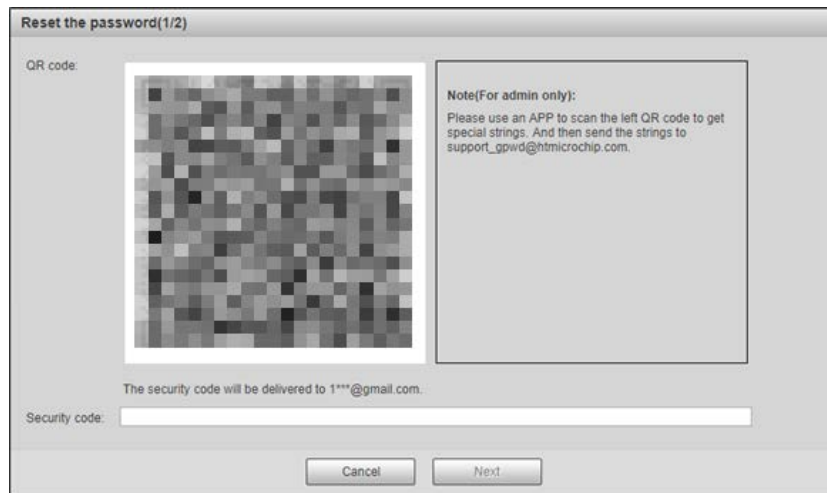
**Step 3** Click **OK**.



If you use IE browser, the system might prompt **Stop running the script**, click **No**, and continue to run the script.

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

Figure 2-6 Reset password (1)

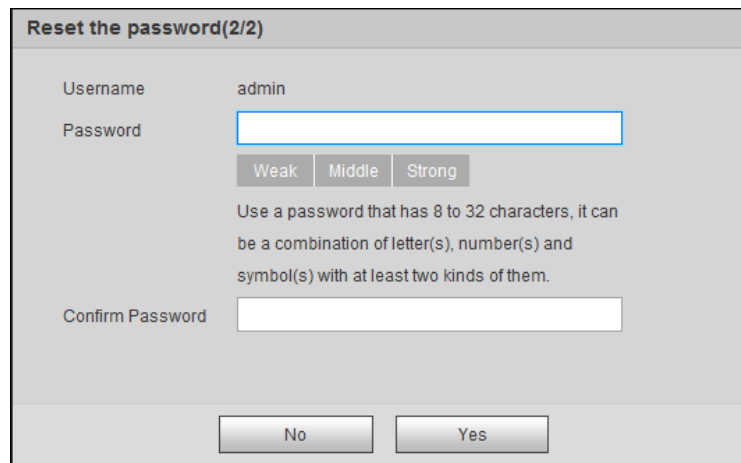


Scan the actual QR code.

**Step 5** Enter the received security code.

**Step 6** Click **Next**.

Figure 2-7 Reset password (2)



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

**Step 8** Click **Yes**.

## 2.1.5 Web Functions

This section mainly introduces the following 6 functions on the web page.

Figure 2-8 Tab






Table 2-3 Tab function description

Tab	Function
Guide	Quick configuration of plate pixel, recognition region, and more.
Live	View, and record live video, and image, adjust the video and image window, set client image parameter, and more.
Query	Search for different types of pictures and videos, and configure watermark verification of videos.
Setting	Set traffic event rules, basic attributes of the Camera , network, storage, and system, and view system information.
Alarm	Set alarm prompt.
Logout	Log out of the web client.

The following buttons are very common on the web page.

Table 2-4 Common buttons description

Button	Description
	Restore all parameters to system defaults.
	Refresh the parameters to the latest value.
	Save the settings.

## 2.2 Guide

On the **Guide** page, you can configure capture scenarios, and get assistance with setting installation scenario.



You can click  at the upper-right corner of the **Guide** page to exit.

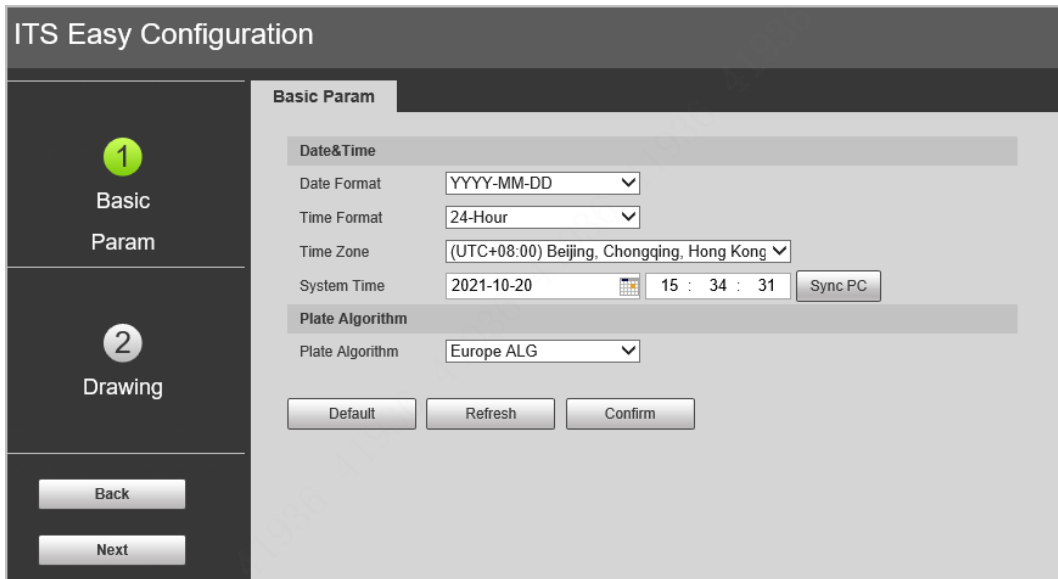
**Step 1** Click the **Guide** tab.

**Step 2** Select the basic date and time format and system time of the Camera, and then click **Confirm**.

- You can manually enter the time, or click **Sync PC** to synchronize time from the server.
- Select **Plate Algorithm** based on the actual region to get better recognition effect.

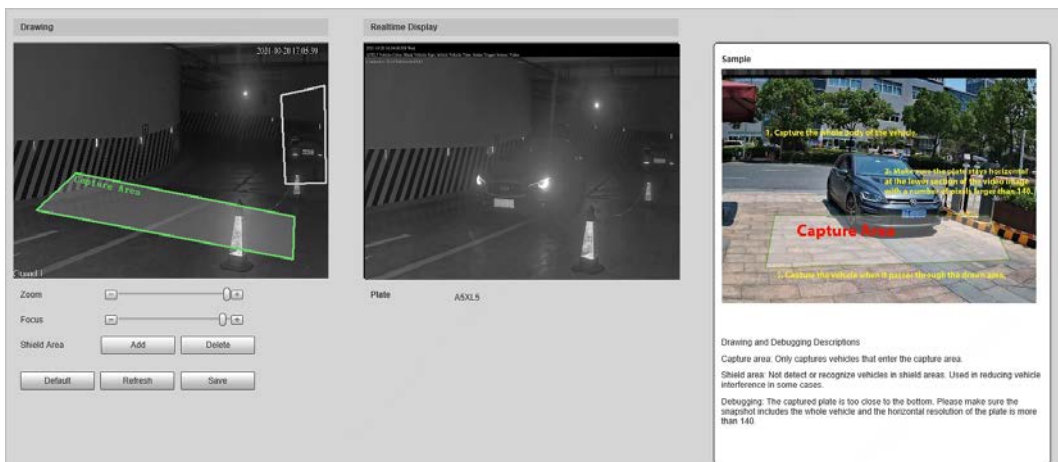


Figure 2-9 Basic parameter



**Step 3** Click **Drawing** to see whether the video image is properly zoomed, and focused by checking the plate pixel.

Figure 2-10 Drawing



- 1) Drag zoom, and focus bar to adjust the video image until the image is clear.
- 2) Follow the tips on the figure on the right side, draw the capture area of entering vehicles.
- 3) Click **Add** next to **Shield Area** to draw areas where the Camera does not recognize. Click **Delete** to delete the area.
- 4) **Realtime Display** window in the middle displays the plate recognition result cutout at the upper-left corner and vehicle image in real-time.
- 5) Click **Save**.

**Step 4** Click **Finish**, and then click **Finish** in the middle to exit the **Guide** page.



You can always click **Back** to go back to the last step during the guide.

## 2.3 Live

Click the **Live** tab.

On this page, it can realize several functions such as live video, live picture, real-time capture, record, and config (LPR), and more.

Figure 2-11 Live

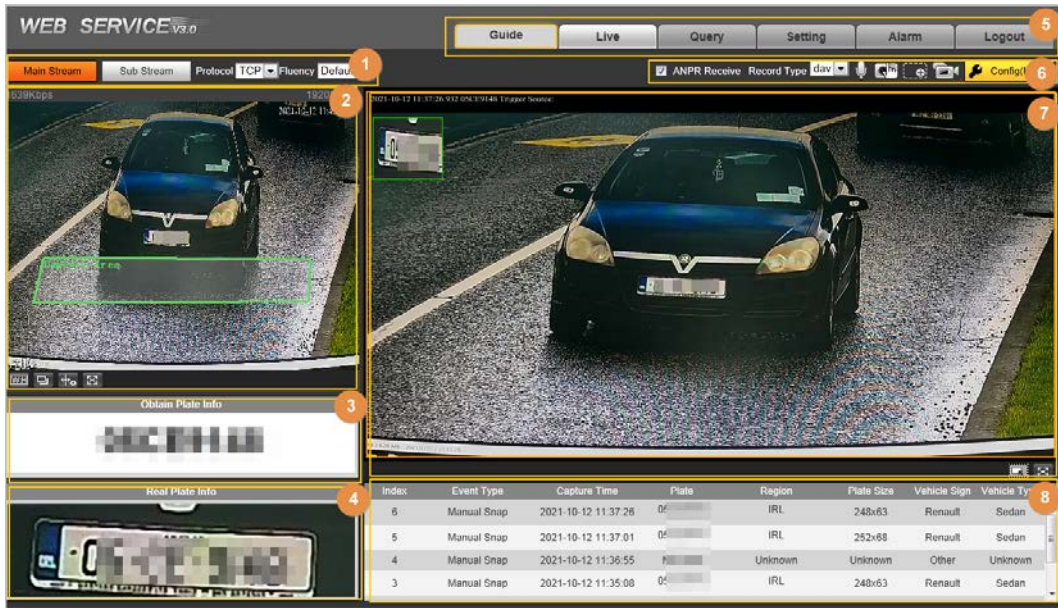


Table 2-5 Live page description

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

### 2.3.1 Video Stream

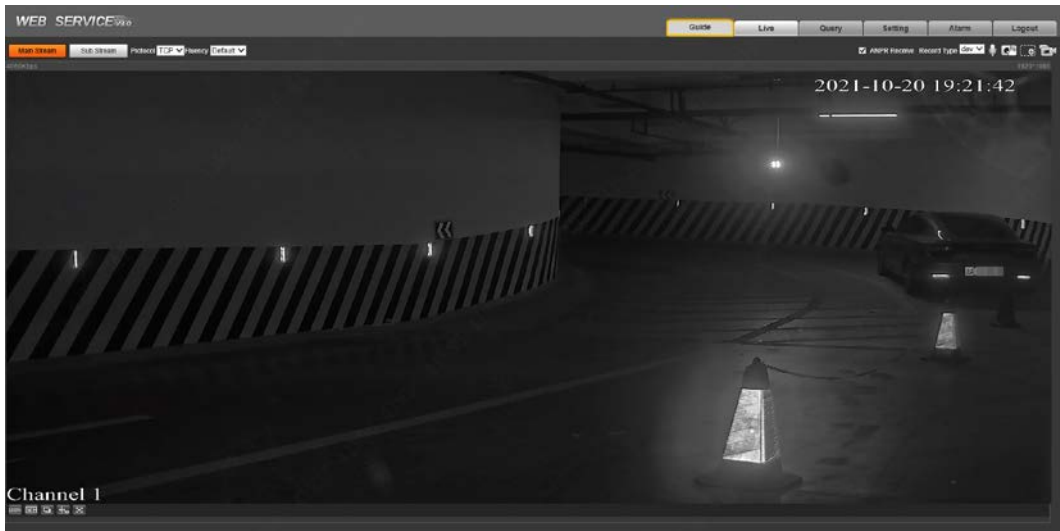
- **Main Stream:** Make sure that the Camera can record video, and carry out network surveillance when the network is normal. You can configure main stream resolution within the supported range of the Camera.
- **Sub Stream:** Replaces main stream to make network surveillance, and reduce the network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



### 2.3.2 Live View

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

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

Figure 2-12 Big window



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

### 2.3.3 Recognized Plate Number

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

### 2.3.4 Plate Snapshot

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

### 2.3.5 System Functions

Click the tabs to set system functions, including playback, video recording, and snapshot query, intelligent rules setting, alarm event setting, and system logout.


### 2.3.6 Functions of the Live Page










This section introduces operations such as image and video capture, zoom, record, and talk.

Figure 2-13 General function option column



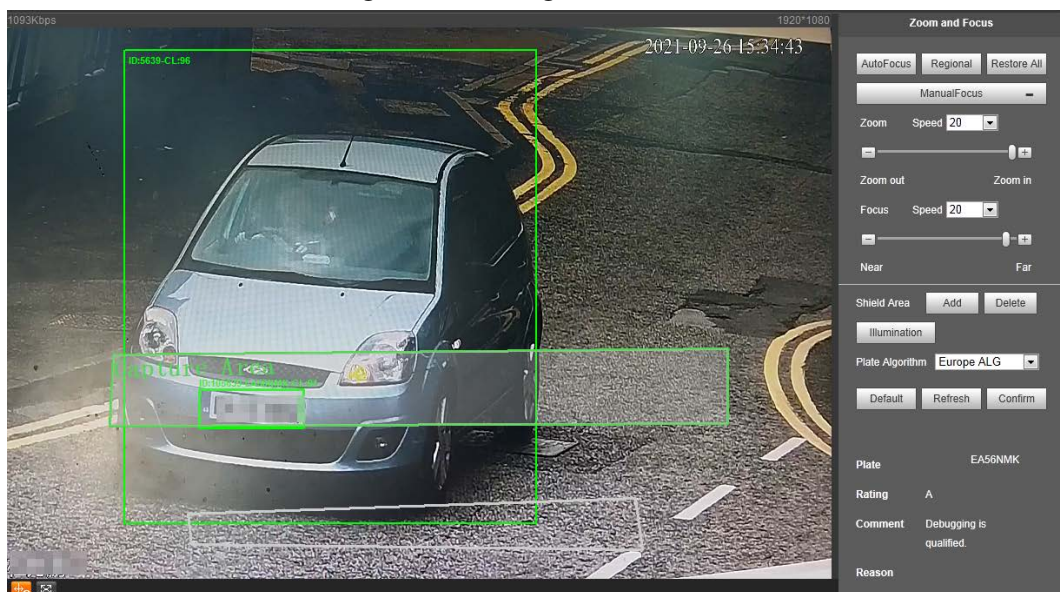
Table 2-6 General function option

Icons	Name	Description
	ANPR Receive	Select the checkbox, and the Camera automatically receives vehicle snapshots, and detects event information triggered by sources such as radar or video detection, and displays such snapshots, and information at the lower part of the page. The snapshots are saved in the storage path defined in <b>Setting &gt; Storage &gt; Destination &gt; Save Path</b> .

Icons	Name	Description
	Record Type	Select the format of video recordings ( <b>dav</b> by default).
	Talk	Click <b>Talk</b> , and you can communicate with people on site through the camera.
	Manual Snapshot	Click to take a snapshot when a vehicle passes. The snapshot is saved in the storage path.  <ul style="list-style-type: none"> <li>• Enable <b>ANPR Receive</b> first.</li> <li>• To change the storage path of snapshots, go to <b>Setting &gt; Storage &gt; Destination &gt; Save Path</b>.</li> </ul>
	Digital Zoom	Drag to select any area in the video window, and then the area will be zoomed in. In any area of the video window, click  or right-click to exit.
	Video Recording	Click it to start recording. Click  again to stop recording. You can set the storage path of video recordings in <b>Setting &gt; Storage &gt; Destination &gt; Save Path</b> .
	Config (LPR)	You can draw the area of plate detection, adjust camera's focal length, and set applicable region.

**Step 1** Click  to configure LPR.





Figure 2-14 Config (LPR)



**Step 2** Set the focus and zoom mode, which is used to recognize vehicle.

Table 2-7 Focus parameter description

Parameter	Description
Auto Focus	Auto adjust camera lens, and make the scenario clearly focused.
Regional	Click <b>Regional</b> , and then draw a box in the video image to focus the defined region in the box.

Parameter	Description
Manual Focus	<ul style="list-style-type: none"> <li>• <b>Zoom:</b> Click  to zoom in, click  to zoom out. You can also directly drag the adjustment bar.</li> <li>• <b>Focus:</b> Click  to focus on far places, click  to focus on near places. You can also directly drag the adjustment bar to set focal length.</li> <li>• <b>Speed:</b> There are 3 levels to be selected. The higher the speed, the more obvious the adjustment.</li> </ul>
Restore All	Restore all configurations to default settings.
Shield Area	Click <b>Add</b> to draw a shield area on the video image where the Camera does not detect.
Illumination	Click <b>Illumination</b> , and the page is directed to the Camera attribute. You can set the illumination there.
Plate Algorithm	Select the algorithm to recognize the plate. The recognized result is displayed below.

Step 3 Click **Confirm** to save the configuration.

## 2.3.7 Vehicle Snapshot

Select **ANPR Receive**, and then snapshots will be displayed when vehicles pass.

## 2.3.8 Event List

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

## 2.4 Query

Click the **Query** tab, and the system displays query page where you can search for pictures, and video recordings.

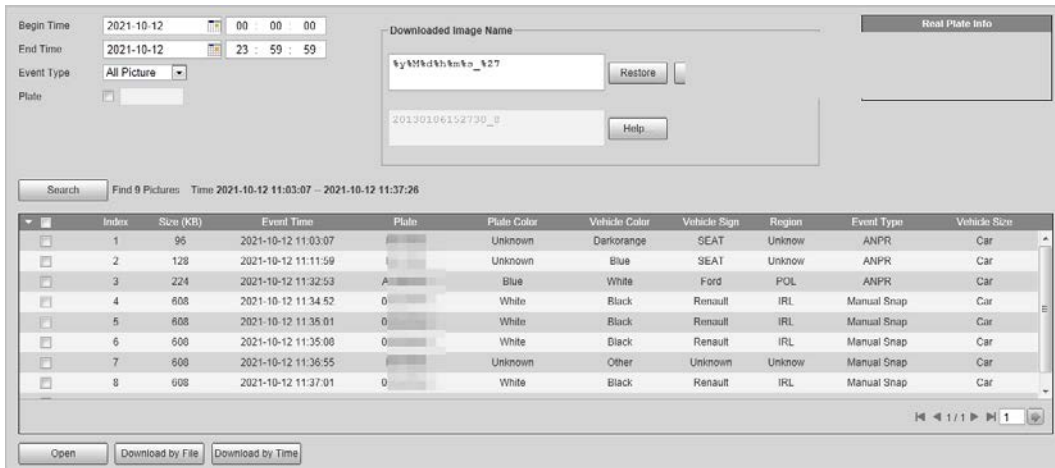
### 2.4.1 Image Search

#### 2.4.1.1 SD Picture

Search conditions can be set in this section. You can search for event, and plate information of the SD card within the set period.

Step 1 Select **Query > Image Search > SD Card Image**.

Figure 2-15 SD Picture



**Step 2** Set the search conditions.

- Set the begin and end time of search period.
- Select **Event Type**.
- Select **Plate** to enter plate number.

**Step 3** Click **Search**, and it displays the results which conform to search conditions.

- Select a file on the list, and the captured image of the plate will be displayed in **Real Plate Info**.
- Select pictures, and then click **Open** to see the corresponding vehicle snapshot.

**Step 4** Select one or more pictures to be downloaded to local PC.

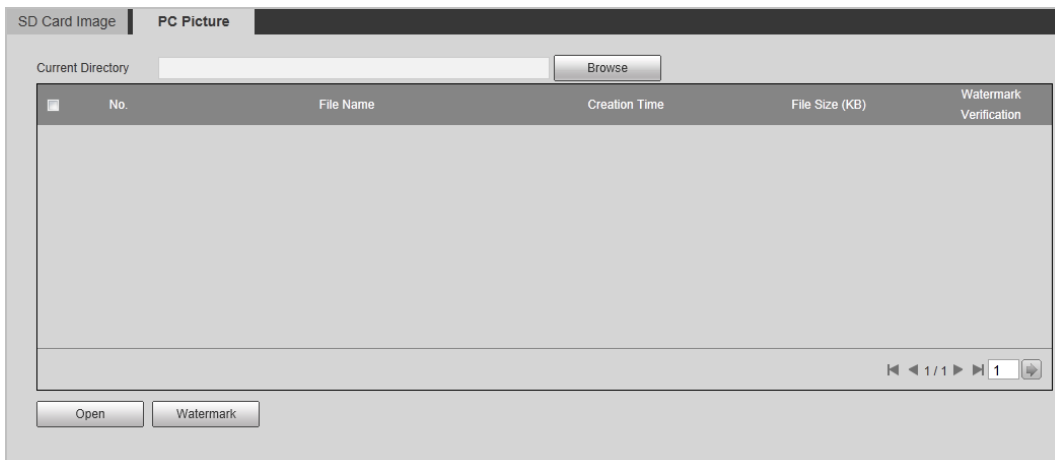
- Click **Download by File**, the selected pictures will be downloaded to the defined path.
- Click **Download by Time**, all the results which are captured within the set period will be downloaded to the defined path.

### 2.4.1.2 PC Picture

The section introduces the way of checking whether the watermark of PC picture is tampered.

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

Figure 2-16 PC picture



**Step 2** Click **Browse**, and select the folder where the verified picture is located.

**Step 3** Select the picture which needs to be verified, and then click **Open**.

**Step 4** Click **Watermark**. The Camera starts verifying whether the picture has watermark and displays the results on the picture list under **Watermark Verification**.



Select pictures and click **Open** or double-click the picture if you need to preview the picture.

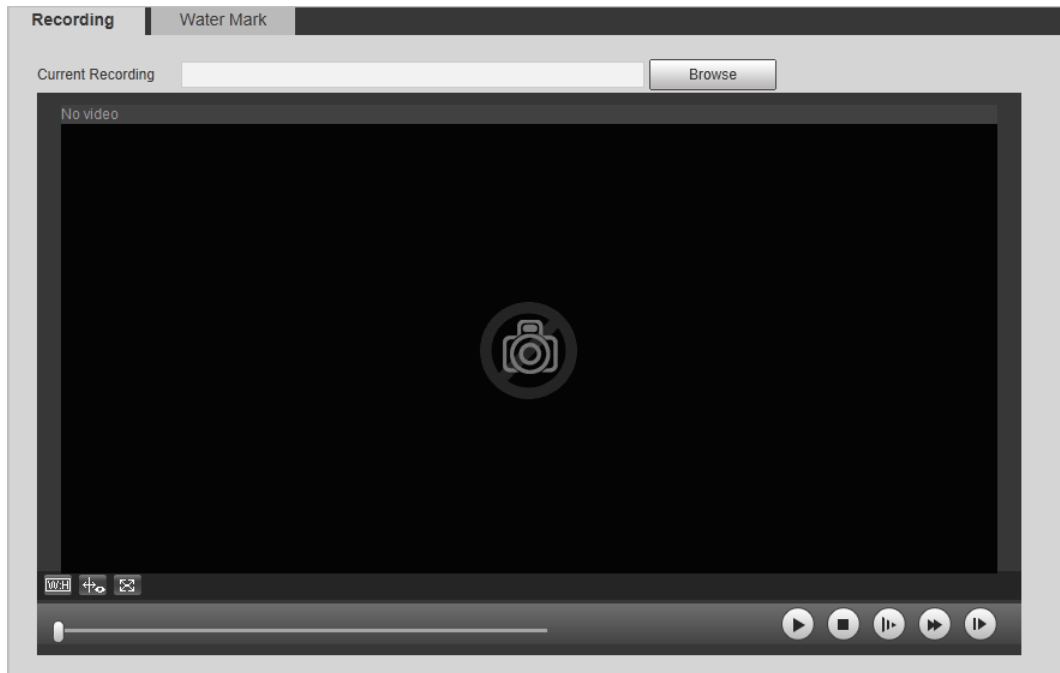
## 2.4.2 Recording Search

### 2.4.2.1 Recording

You can set video play of local PC on this page.

Step 1 Select **Query > Recording Search > Recording**.

Figure 2-17 Recording



Step 2 Click **Browse**, select record path, click **Open**, and view the video.

Table 2-8 Play function description

Icon	Description
	<ul style="list-style-type: none"><li>• : Play video.</li><li>• : Pause.</li></ul>
	Stop playing video.
	Slow down video playing.
	Speed up video playing.
	Next frame.

### 2.4.2.2 Watermark

You can verify whether the watermark of local recordings is tampered.



Go to **Setting > Camera > Video > Video**, and select **Watermark Settings** to enable the function, and set the corresponding **Watermark Character**. The default character is DigitalCCTV.

**Step 1** Select **Query > Recording Search > Water Mark**.

Figure 2-18 Watermark

No.	Begin Time	Error Type
-----	------------	------------

**Step 2** Click **Browse**, and select a file that you want to verify.

**Step 3** Click **Watermark**, and the system displays verifying progress and normal watermark. The page of **Watermark Verification Completed** appears after verification, and the results show under **Tampered Watermark**.

## 2.4.3 Capture Record Search

Search for the vehicle record within the defined period according to the defined direction.



- It supports max 10,000 records or 1,024 records respectively when the Camera is installed with or without TF card.
- If the passing vehicle records are unreadable in Excel after being imported, change them into UTF-8 encoding document in txt, and then they can be opened normally.

**Step 1** Select **Query > Capture Record Search**.

**Step 2** Set **Begin Time**, and **End Time**, and then set the **Direction** (vehicle movement direction, including **Approaching**, **Departing**, and **Unknown**).

**Step 3** Click **Search** to search for the plates that meet the search conditions.



Figure 2-19 Capture records

Index	Event Time	Region	Plate	Vehicle Direction	Allowlist	Blocklist	Direction
1	2021-09-26 15:21:41	GBR	R	Vehicle Head	No	No	Approaching
2	2021-09-26 15:24:01	GBR	Y	Vehicle Head	No	No	Approaching
3	2021-09-26 15:24:50	GBR	Y	Vehicle Head	No	No	Approaching
4	2021-09-26 15:25:02	GBR	Y	Vehicle Head	No	No	Approaching
5	2021-09-26 15:25:24	GBR	E	Vehicle Head	No	No	Approaching
6	2021-09-26 15:38:55	GBR	E	Vehicle Head	No	No	Approaching
7	2021-09-26 15:39:13	GBR	E	Vehicle Head	No	No	Approaching
8	2021-09-26 15:40:01	GBR	E	Vehicle Head	No	No	Approaching
9	2021-09-26 15:40:14	GBR	E	Vehicle Head	No	No	Approaching
10	2021-09-26 15:41:28	GBR	E	Vehicle Head	No	No	Approaching

**Step 4** Click **Export All** or **Export by Time** to export all results or the searched results based on the conditions to PC.

## 2.4.4 Alarm Output Search

Set the search conditions to search alarm output.



Make sure that all the external devices are connected with the Camera through RS-485 port.

**Step 1** Select **Query > Alarm Output Search**.

**Step 2** Set the start time and end Time.

**Step 3** Click **Search**.

Figure 2-20 Alarm output search

Index	Event Time	Signal Source	Alarm Type	Alarm Output	Plate	Time Consumed
1	2021-09-15 19:36:46	local	Open Barrier (Licensed V ehicle)	1	A	0
2	2021-09-15 19:37:34	local	Open Barrier (Licensed V ehicle)	1	1	0
3	2021-09-15 20:48:10	10	Forced alarm	1		0
4	2021-09-15 20:48:10	10	Forced alarm	2		0
5	2021-09-15 20:51:30	10	Forced alarm	1		0
6	2021-09-15 20:51:30	10	Forced alarm	2		0



Click **Export All** or **Export by Time** to export all results or the searched results.

## 2.5 Setting

You can configure several parameters such as ITC, camera, network, event, storage, system, and system information.

## 2.5.1 ITC

You can set intelligent parameters of the Camera.

### 2.5.1.1 Setting Snapshot

You can set snapshot rule of the Camera.

Step 1 Select **Setting > ITC > Snapshot Settings**.

Figure 2-21 Snapshot settings-video mode

**General Parameters**

Snap Mode: Video

Number of Snapshots: 1

Capture Direction: Approaching

Same Plate Filtering: 5 s(0~120)

Time

**Video Mode Parameters**

Scene: Small Vehicle

Unlicensed Motor: ON

Category

Licensed Vehicle: 1

Frame Threshold

Unlicensed Vehicle: 10

Frame Threshold

Default Refresh Confirm

Figure 2-22 Snapshot settings-loop mode

**General Parameters**

Snap Mode: Loop

Number of Snapshots: 1

Capture Direction: Approaching

Same Plate Filtering: 5 s(0~120)

Time

**Loop Mode Parameters**

Scheme: Single\_in\_1

Loop Mapping: Setting

Loop1: Fall Edge




Loop2: Not Triggered



Max Pass Time: 5 s(0~120)

Default Refresh Confirm

Step 2 Configure the parameters.

Table 2-9 Description of capture parameters

Type	Parameter	Description
General Parameters	Snap Mode	<ul style="list-style-type: none"> <li>● <b>Loop:</b> Use loop to take snapshots.</li> <li>● <b>Video:</b> Use video to take snapshots.</li> <li>● <b>Mix Mode:</b> Use both loop and video to take snapshots.</li> </ul>
	Number of Snapshots	It can take 1–2 snapshot(s).
	Capture Direction	<ul style="list-style-type: none"> <li>● <b>Approaching:</b> Only captures vehicles that approach.</li> <li>● <b>Departing:</b> Only captures vehicles that depart.</li> <li>● <b>Two-way:</b> Captures vehicles that approach or depart.</li> </ul>
	Same Plate Filtering Time	Set the time interval during which one plate can only be captured once.
Video Mode Parameters  Only available when the <b>Snap Mode</b> is set to <b>Video</b> .	Scene	Select <b>Small Vehicle</b> or <b>Large Vehicle</b> as needed.
	UnlicensedMotor Category	Click to enable the capture towards unlicensed motor vehicles.
	Licensed Vehicle Frame Threshold	Configure the frame number of capturing licensed vehicle. <b>1</b> (default) means to capture when detecting one frame of licensed vehicle passing detection area.
	Unlicensed Vehicle Frame Threshold	Configure the frame number of capturing unlicensed vehicle. <b>10</b> (default) means to capture when detecting 10 frames of unlicensed vehicle passing detection area.
Loop Mode Parameters  Only available when the <b>Snap Mode</b> is set to <b>Loop</b> .	Scheme	Set the scheme of snapshots triggered by the loop. <ul style="list-style-type: none"> <li>● <b>Single_in_1:</b> Lay single loop, and it will take a snapshot when the vehicle enters a loop.</li> <li>● <b>Double_in_1:</b> Lay double loops, and it will take a snapshot when the vehicle enters the first loop.</li> <li>● <b>Double_in_2:</b> Lay double loops, and it will take a snapshot when the vehicle enters the second loop.</li> </ul>
	Loop Mapping	Select the corresponding relationship between logical loop and physical loop.  <ul style="list-style-type: none"> <li>● When the scheme is <b>single_in_1</b>, only need to select the physical loop corresponds to logical loop 1.</li> <li>● You need to configure this in mix mode.</li> </ul>
	Loop1	Set the loop trigger mode.

Type	Parameter	Description
	Loop2	<ul style="list-style-type: none"> <li>• <b>Not triggered:</b> No capture is triggered.</li> <li>• <b>Rise Edge:</b> Capture is triggered when the vehicle enters loop.</li> <li>• <b>Fall Edge:</b> Capture is triggered when the vehicle exits the loop.</li> </ul>  <p>When the scheme is <b>single_in1-snap</b>, then loop 2 cannot be set.</p>
	Max Pass Time	<p>Set a time period, during which a vehicle enters the first loop and triggers the second, the Camera only takes snapshots for the first trigger.</p>  <p>Applicable for double loops.</p>

Step 3 Click **Confirm**.

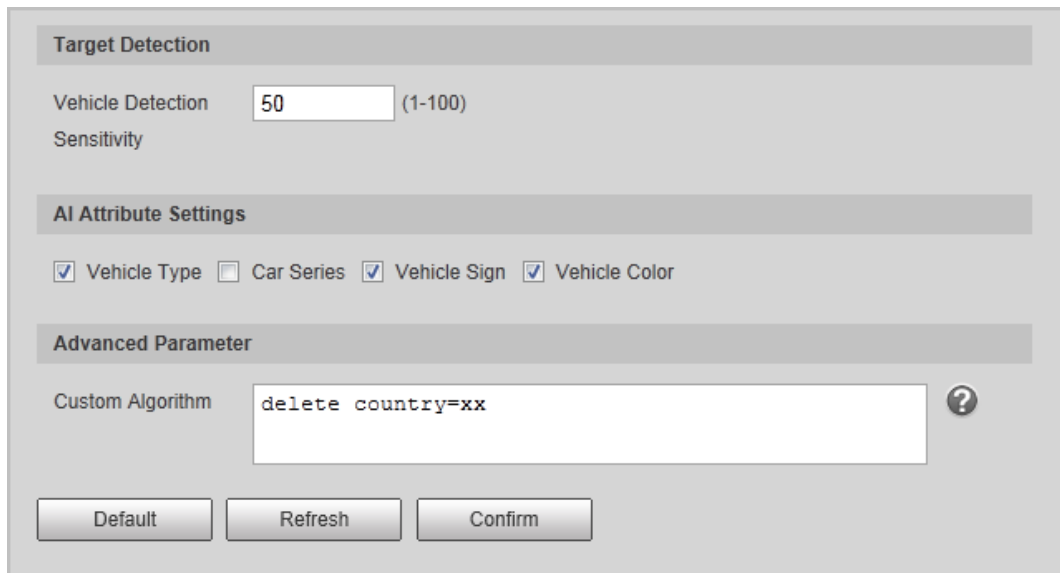
## 2.5.1.2 Intelligence

### 2.5.1.2.1 Configuring Intelligent Analysis

You can set vehicle recognition parameter, recognition mode, and some other functions.

Step 1 Select **Setting > ITC > Intelligence > Intelligent Analysis**.


Figure 2-23 Intelligent analysis



Step 2 Configure parameters.

Table 2-10 Intelligent analysis parameters description

Parameter	Description
Target Detection	Set the sensitivity of vehicle detection. The higher the value, the more sensitive the detection.
AI Attribute Settings	Select parameters such as vehicle type, car series, vehicle sign and vehicle color which can be recognized by the Camera.

Parameter	Description
Advanced Parameter	Configure advanced vehicle recognition function through algorithm. Click  to view the advanced algorithm formula.

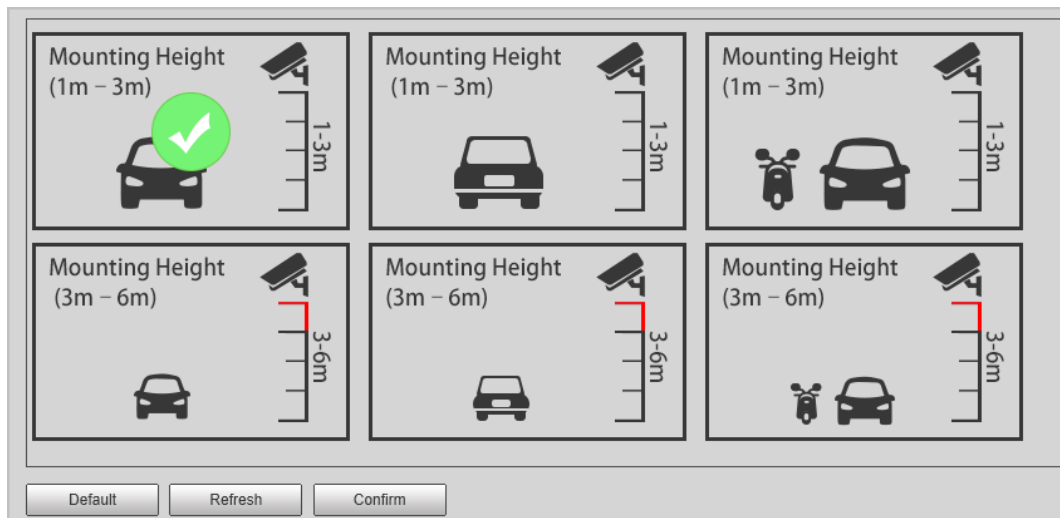
**Step 3** Click **Confirm**.

### 2.5.1.2.2 Selecting Recognition Scene

You can configure the advanced functions of plate recognition, and customize special functions.

**Step 1** Select **Setting** > **ITC** > **Intelligence** > **Scene**.

Figure 2-24 Scene



**Step 2** Select detection scene as needed.

- Head first: Higher recognition sensitivity towards plate on head.
- Tail first: Higher recognition sensitivity towards plate on tail.
- Bicycle (electric bicycle or motorcycle): Higher recognition sensitivity towards electric bicycle or motorcycle plate.
- Mounting height: Higher recognition sensitivity when the Camera is installed on higher place.

**Step 3** Click **Confirm**.

### 2.5.1.3 Configuring OSD

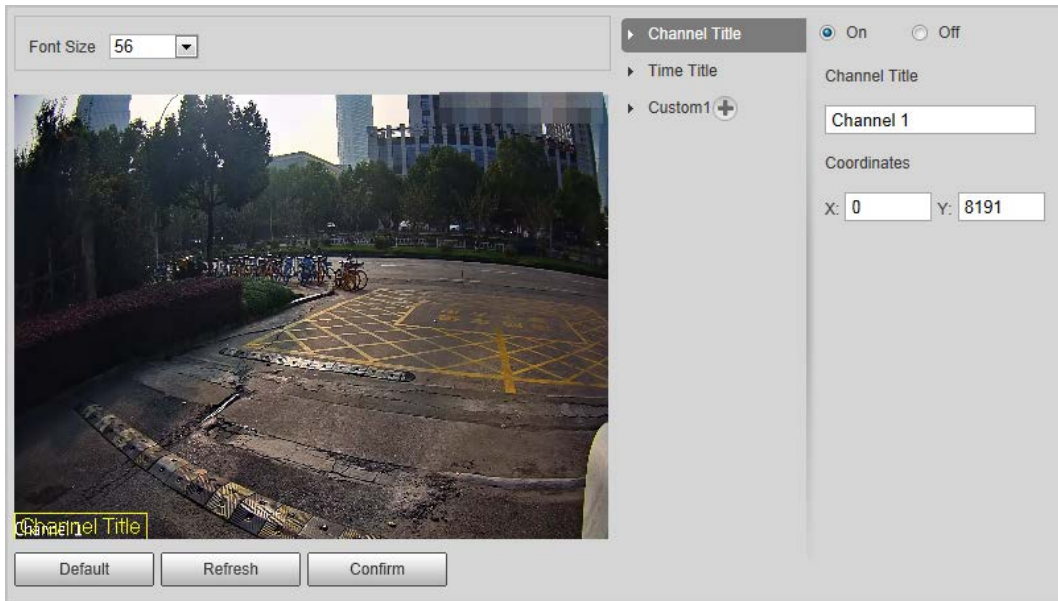
Set the overlapping OSD (On-screen Display) information on video and image.

#### 2.5.1.3.1 Video OSD

Set OSD information of video channel.

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

Figure 2-25 Video OSD



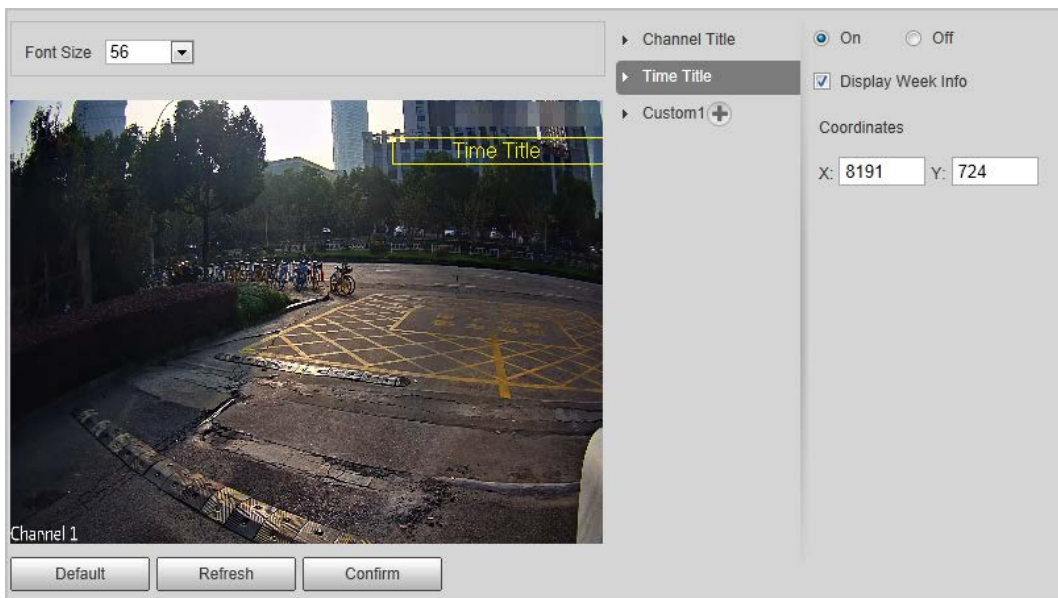
Step 2 Select font size.

Step 3 Set channel title and coordinates.

- 1) Click **Channel Title**.
- 2) Select **On**.
- 3) Enter channel name.
- 4) Drag the yellow box or enter coordinate directly to set the location of channel title.

Step 4 Set time title and location.

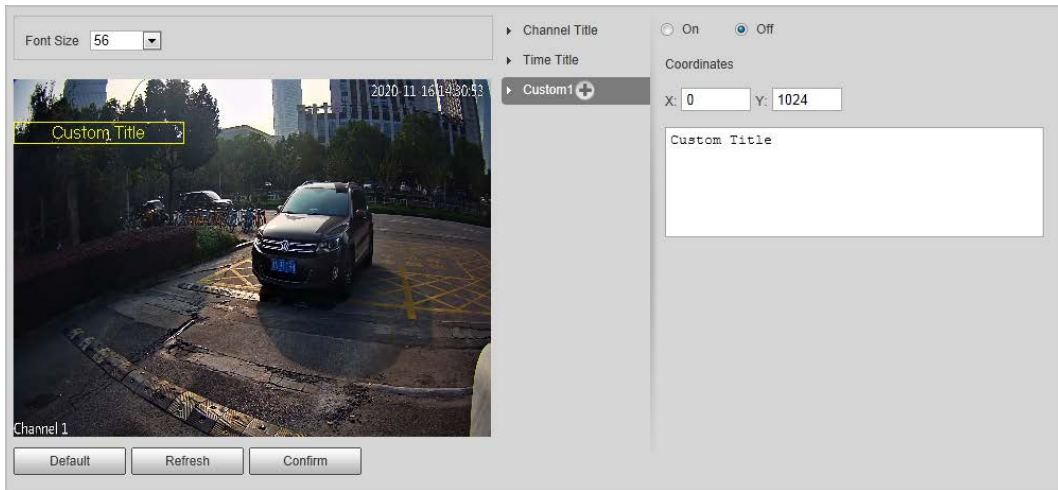
Figure 2-26 Time title



- 1) Click **Time Title**.
- 2) Select **On**, and select **Display Week Info**.
- 3) Drag the yellow box or enter coordinate directly to set the location of time title.

Step 5 Click **Custom1**, select **On**, and then set OSD information and its display location according to requirement.

Figure 2-27 Custom



Click **+** to add more custom OSD information. The system supports up to 6 customized regions.

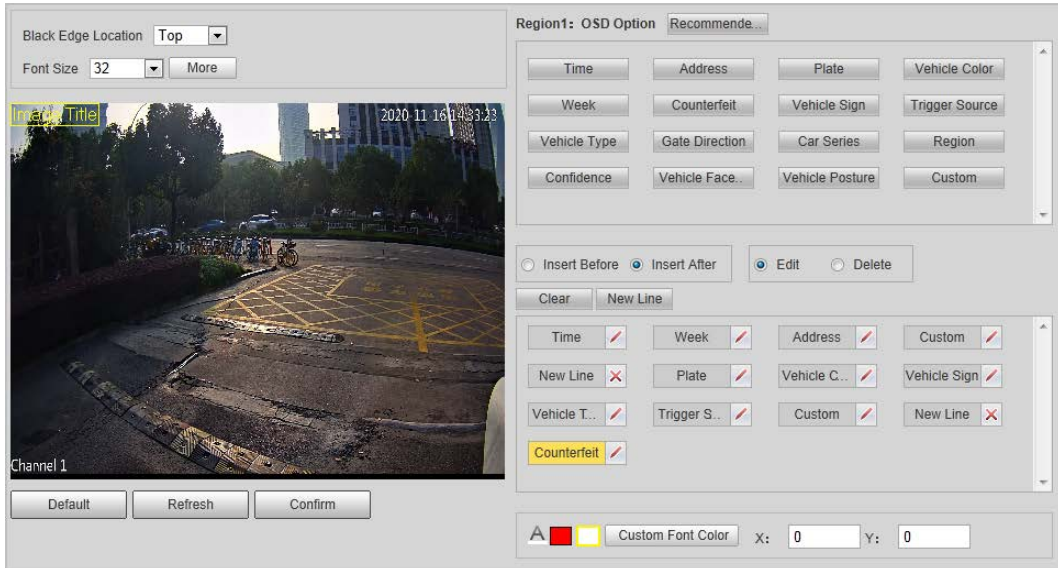
**Step 6** Click **Confirm**.

### 2.5.1.3.2 Snapshot OSD

You can set OSD information of pictures.

**Step 1** Select **Setting > ITC > OSD > Snapshot OSD**.

Figure 2-28 Snapshot OSD



**Step 2** Move the title box to displayed location, or manually enter coordinate value into the X/Y box at the lower-right corner of the page.

**Step 3** Select **Black Edge Location**, and then you can set the position of the OSD black strip. You can select from **Top**, **Bottom**, and **None**.

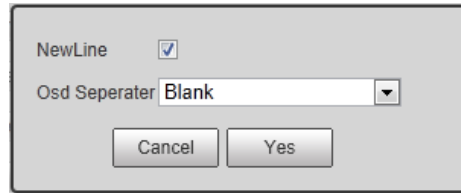
**Step 4** Set the font size and color of OSD information in **Custom Font Color**.

**Step 5** Click **More**.

**Step 6** Select **NewLine**, and then select separator types of OSD information.







Figure 2-29 Add a new line



You can manually enter other separators when selecting **Custom** from **Osd Separator**.

**Step 7** Set OSD options.

Table 2-11 Snap OSD parameters description

Parameter	Description
Insert Before	Select one OSD option, click <b>Insert Before</b> , and select other OSD options. The new OSD options will be displayed before original OSD option.
Insert After	Select one OSD option, click <b>Insert After</b> , and select other OSD options. The new OSD option will be displayed after the original OSD option.
Edit	Click it, and all the OSD information status is displayed as  except <b>New Line</b> . Click  to modify the prefix, suffix, content, and separator of corresponding OSD option.
Delete	Click it, and all the selected OSD information status is displayed as  , click  to delete corresponding OSD option.
Clear	Delete all the OSD information.
New Line	After selecting some OSD information, click <b>New Line</b> , and the OSD information inserted after <b>NewLine</b> will be displayed in a new line on the picture.

**Step 8** Click **Confirm**.

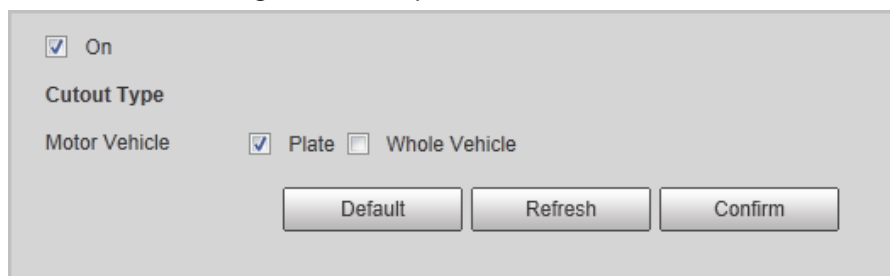
## 2.5.1.4 Configuring Cutout

### 2.5.1.4.1 Snapshot Cutout

Enable plate cutout function, and the system will cut out the recognized plate picture, and save it to the storage path.

**Step 1** Select **Setting > ITC > Cutout > Cutout**.

Figure 2-30 Snapshot cutout



**Step 2** Select **On** to enable **Plate** and **Whole Vehicle** cutout.



You can select both.

**Step 3** Click **Confirm**.



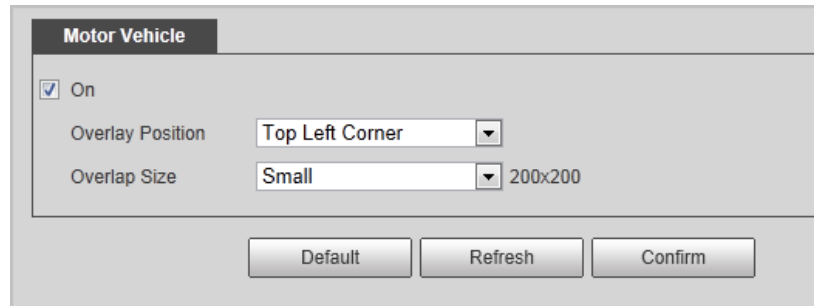
## 2.5.1.4.2 Plate Overlay

You can select whether to overlap the plate image onto the snapshot, and set the overlap position and size.

Step 1 Select **Setting > ITC > Cutout > Plate Overlay**.

Step 2 Configure parameters.

Figure 2-31 Plate overlay



Step 3 Click **Confirm**.

## 2.5.1.5 Setting Blocklist and Allowlist

### 2.5.1.5.1 Allowlist

Add vehicles into the allowlist and if the barrier control is set to **Allowlist Open (Camera)**, only vehicles on the allowlist can pass.

#### Procedure

Step 1 Select **Setting > ITC > Allowlist > Blocklist and Allowlist**.

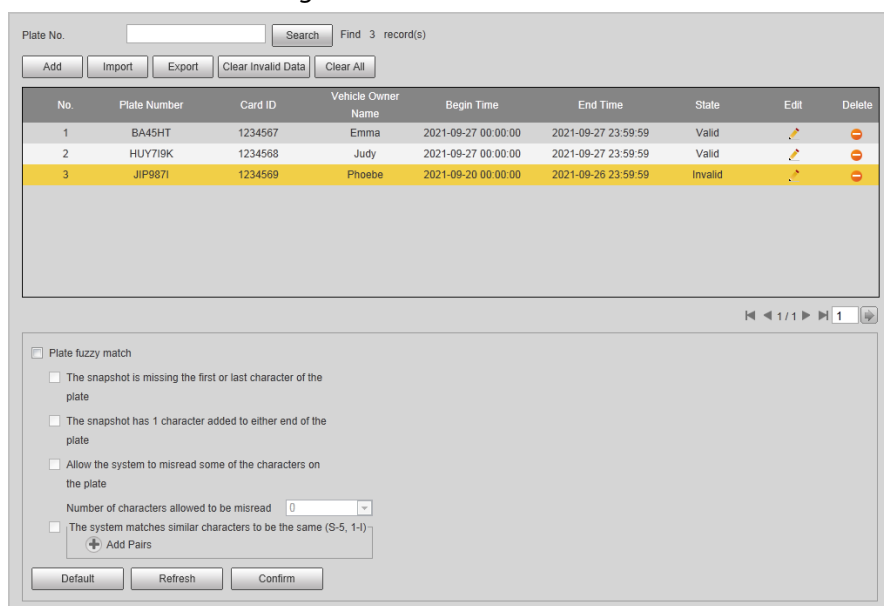
Step 2 Enter a plate number and then click **Search**.

If the plate is on the allowlist, its detailed information will be displayed.



Directly click **Search** to display all records on the allowlist.

Figure 2-32 Allowlist



No.	Plate Number	Card ID	Vehicle Owner Name	Begin Time	End Time	Slate	Edit	Delete
1	BA45HT	1234567	Emma	2021-09-27 00:00:00	2021-09-27 23:59:59	Valid		
2	HUY719K	1234568	Judy	2021-09-27 00:00:00	2021-09-27 23:59:59	Valid		
3	JIP987I	1234569	Phoebe	2021-09-20 00:00:00	2021-09-26 23:59:59	Invalid		

- Step 3** Click **Add**, and enter details of a plate to add it into the allowlist.  
 Select **Continue Adding**, and click **Save** to continue adding another plate.

Figure 2-33 Add

- Step 4** Click **Save**.
- Step 5** Click **Import**, and then click **Download** on the pop-up window to obtain the import template.

Figure 2-34 Import

- Step 6** Fill in the template and click **Import** again.
- Step 7** On the pop-up window, click **Browse**, select the template and then click **Confirm** to import the template.  
 All the plate information you have filled in the template are imported to the Camera.
- Step 8** Click **Export**.
- Step 9** Select **Open** or **Off** to encrypt the exported allowlist or not, and then click **Confirm**.

Figure 2-35 Encrypt config

- Step 10** Select **Plate Fuzzy Match**, and then based on the actual situation, select options below



which clarify the rules of fuzzy matching.

- You can select the number of allowed misread characters (1–2).
- Click **Add Pairs** to add more pairs of allowed misread characters, such as the pair of S-5.



**Allow the system to misread some of the characters on the plate** is enabled by default.

## Related Operations

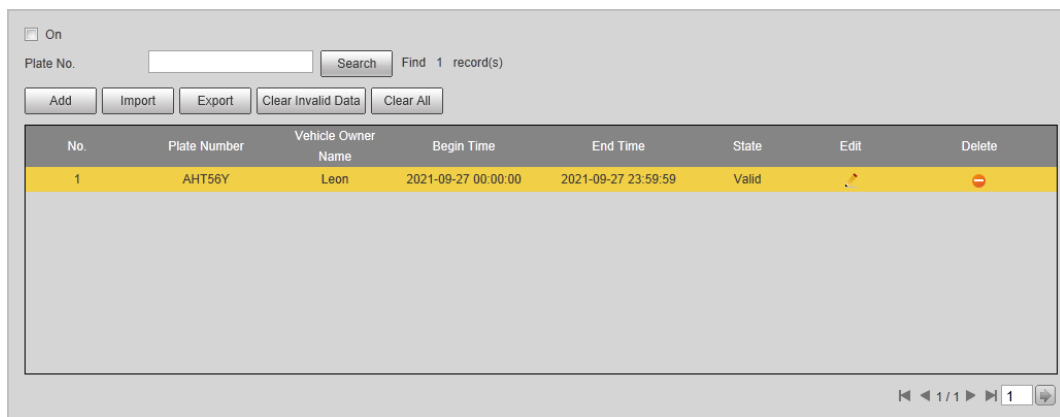
- Edit plate information: Click  of the corresponding plate number searched, and edit the plate number. Click **Save**.
- Delete single plate number: Click  of the corresponding plate number searched, and delete it from the allowlist.
- Delete plate number in batches: click **Clear All**, and then click **Confirm** in the pop-up window to delete all the allowlist information.
- Click **Clear Invalid Data** to delete vehicles whose allowlist permissions have expired.

### 2.5.1.5.2 Blocklist



When a vehicle is on the blocklist, and the Camera recognizes it, an alarm will be triggered.

Step 1 Select **Setting > ITC > Blocklist and Allowlist > Blocklist**.

Figure 2-36 Blocklist



The screenshot shows a software interface for managing a blocklist. At the top, there is a search bar with the text "Plate No." and a "Search" button. Below the search bar are several action buttons: "Add", "Import", "Export", "Clear Invalid Data", and "Clear All". The main area contains a table with the following columns: "No.", "Plate Number", "Vehicle Owner Name", "Begin Time", "End Time", "State", "Edit", and "Delete". A single record is displayed in a yellow row: No. 1, Plate Number AHT56Y, Vehicle Owner Name Leon, Begin Time 2021-09-27 00:00:00, End Time 2021-09-27 23:59:59, State Valid. The "Edit" column for this record contains a pencil icon, and the "Delete" column contains a red minus icon. At the bottom right of the table, there are navigation controls showing "1 / 1" and a "1" in a box.

No.	Plate Number	Vehicle Owner Name	Begin Time	End Time	State	Edit	Delete
1	AHT56Y	Leon	2021-09-27 00:00:00	2021-09-27 23:59:59	Valid		

Step 2 The search, import, and export of blocklist is similar to those of allowlist. For details, see "2.5.1.5.1 Allowlist".

### 2.5.1.6 Configuring Barrier Control


You can set the barrier control mode, and configure information of opening, and closing barrier.

Step 1 Select **Setting > ITC > Barrier Control**.

Figure 2-37 Barrier control

**Step 2** Configure parameters.

Table 2-12 Barrier control parameter description

Parameter	Description
Barrier Always Open	Select it, and enable the function of barrier always open. Configure the period of barrier always open. The barrier will not close during the defined period.
On	Select it to enable barrier control, and configuration.
Barrier Opening Control	Triggers alarm through different modes, and remotely controls the barrier opening and close. <ul style="list-style-type: none"> <li>● <b>Every Trigger (Camera)</b>: When the Camera captures any vehicle, it outputs an open barrier signal.</li> <li>● <b>Every Plate (Camera)</b>: When the Camera captures any plate, it outputs an open barrier signal.</li> <li>● <b>Allowlist Open (Camera)</b>: When the Camera captures vehicles that are on the allowlist or conform to fuzzy matching, it outputs an open barrier signal.</li> <li>● <b>Order (Server)</b>: The Camera outputs an open barrier signal when it receives a command from the platform.</li> <li>● Click <b>Manually Open</b> or <b>Manually Close</b> to manually control the barrier.</li> </ul>  <p>You can set barrier opening control to <b>Allowlist Open (Camera)</b>, and <b>Order (Server)</b> at the same time. <b>Allowlist Open (Camera)</b> takes priority.</p>
Barrier Opening Config	<ul style="list-style-type: none"> <li>● <b>Relay-out</b>: Alarm linkage output port. You can select any one of the 3 ports.</li> </ul>
Barrier Closing Config	<ul style="list-style-type: none"> <li>● <b>Signal Duration</b>: The duration that the barrier opening or closing signal lasts.</li> </ul>

**Step 3** Click **Confirm**.

### 2.5.1.7 Configuring RS-485

You can configure RS-485 serial protocol of external devices. After configuration, you can set related parameters of the device on the web client of the Camera.

**Step 1** Select **Setting > ITC > RS-485 > Trigger Mode.**

**Step 2** Configure parameters.

The Camera supports multiple protocols.

- DHRS

Figure 2-38 DHRS parameters

You can select external devices on the right side which support DHRS protocol.



Wiegand is only available for DHRS protocol.

- RS-485 transparent transmission

The third party platform can control the RS-485 output of the Camera through RS-485 transparent transmission, and then you can connect external devices.

Trigger capture through transmitting capture command. To test the RS-485 transparent transmission sending and receiving conditions, select **Hexadecimal Sending**, and then click **Open** on the right side of **Receiving Area**.

Figure 2-39 RS-485 Transparent transmission

- Serial port push

You can configure the serial port push information. The Camera pushes the snapshots to the third serial collection device through RS-485.



When there are two ports, serial port push protocol is unavailable for port 1.

Figure 2-40 Serial port push

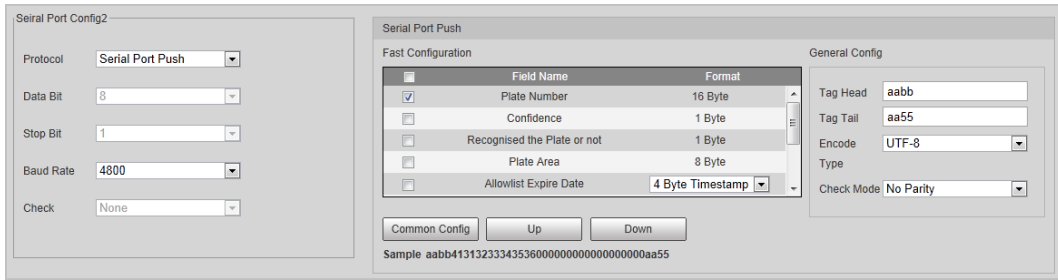



Table 2-13 Serial port push parameter description

Parameter		Description
Fast Configuration	Field Name	<ul style="list-style-type: none"> <li>Select fields to send to the third serial collection device.</li> <li>Select the checkbox next to <b>Field Name</b> to select all the fields.</li> </ul>  <p>Hover over the fields, you can see the explanations.</p>
	Format	Format of the fields.
	Common Config	Fields selected by default.
	Up/Down	Click to move the field position up or down.
General Config	Tag Head	The tag head of data package. It is <b>aabb</b> by default.
	Tag Tail	The tag tail of data package. It is <b>aa55</b> by default.
	Encode Type	Select encode type from <b>UTF-8</b> (default) and <b>GB2312</b> .
	Check Mode	Select check mode from <b>No Parity</b> , <b>Checksum</b> and <b>XOR Check</b> .

Step 3 Click **Confirm**.

### 2.5.1.8 Configuring RS-485 External

You can view the status of external devices connected to the Camera through RS-485. Certain configurations of external illuminators are also available.

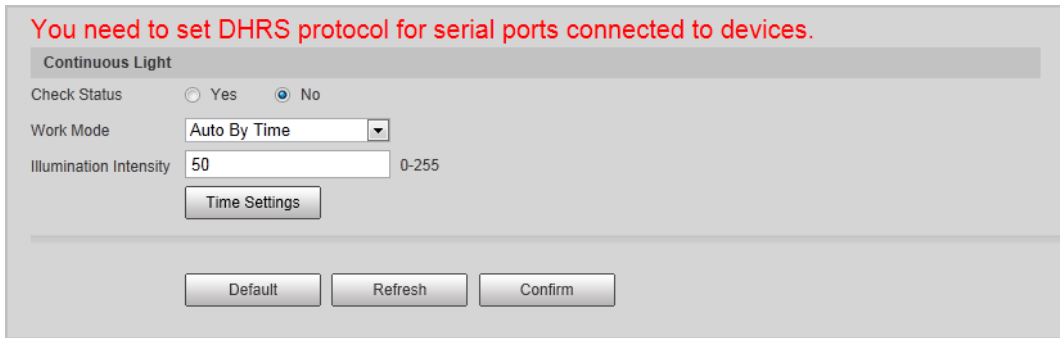
Step 1 Select **Setting > ITC > RS485 External**.

Step 2 Select **Status of Connected Devices**, and you can see the detailed information of devices connected to the Camera.

Click **Refresh** can update the current status of external devices.

Step 3 Select **External Light (RS-485)** to set the continuous light.

Figure 2-41 External light



1. Select **Yes** next to **Check Status** to enable the status checking of the connected continuous lights.
2. Set the **Work Mode** of the continuous light, which can be **Always On**, **Always Off**, **Auto by Time** and **Auto by Ambient Brightness**.
  - When setting **Work Mode** to **Auto by Time**, you need to set the time schedule for the continuous light to follow. Refer to "2.5.1.9 Setting Time Schedule" for details.
  - When setting **Work Mode** to **Auto by Ambient Brightness**, you need to set the brightness prevalue of for the continuous light to follow.

Step 4 Set the **Illumination Intensity** of the continuous light.

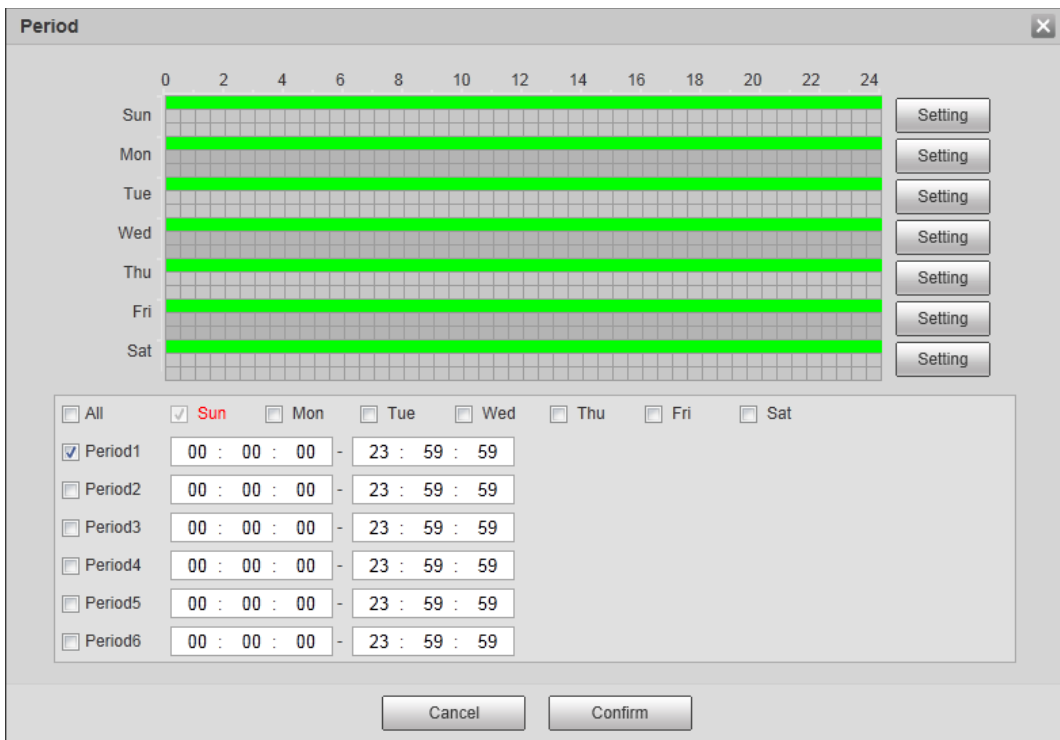
Step 5 Click **Confirm**.

### 2.5.1.9 Setting Time Schedule

This section introduces the method of setting time schedule, which can be used when setting the work mode of continuous light and other situations.

Step 1 Click **Setting** to start setting the time schedule.

Figure 2-42 Time settings



Step 2 Double-click each green line to clear the schedule for each day based on the actual situation, and then you can set the schedule as needed.

1. Draw the period on the time bar, and then click **Setting**.
2. The drawn periods are synced to the table below, which shows all periods on one day.
3. You can manually change the time for each period.

**Step 3** Click **Confirm**.

## 2.5.1.10 Setting RS-485 LED Display

Connect the LED display with the Camera through RS-485, and then you can configure the status, display type, display color, action, speed, and more parameters of the LED.

**Step 1** Select **Setting > ITC > RS-485 LED Display**.

Figure 2-43 RS-485 LED display

The screenshot shows the configuration page for the RS-485 LED display. It includes a 'Device Status' section with a grid of metrics: Work State (Offline), Ambient Brightness (Unknown), Fault Type (Unknown), Uptime (Unknown), Screen Temperature (Unknown °C), Faulty Screen No. (Unknown), Serial Port No. (Unknown), Version (Unknown), and Last Self Check Time (Unknown). Below this is the 'Control Settings' section with radio buttons for 'Working Mode' (Standalone Mode, Partially Managed Mode (Platform), Managed Mode (Platform)). The 'Display Status' section has a dropdown for 'LED Display Status' (Passing Vehicle Status) and a table with 4 rows. The table columns are Row No., Type, Display Color, and Display Action. The rows are: 1. Plate Number, Red, Self-adpative; 2. User Type, Red, Self-adpative; 3. System Date, Red, Self-adpative; 4. System Time, Red, Self-adpative. The 'Full Screen' section includes 'Rolling Speed' (Medium), 'Passing Vehicle Info' (30 s), 'Brightness Adjustment' (Ambient Adaptive) with a slider set to 5 (1-10), and 'Self Check' (Never). At the bottom are 'Default', 'Refresh', and 'Confirm' buttons.

**Step 2** Configure parameters.

Table 2-14 LED parameters description

Section	Parameter	Description
Device Status		Displays the status of the LED, such as work state, ambient brightness, screen temperature and more.
Control Settings		<p>Set the LED work mode.</p> <ul style="list-style-type: none"> <li>• <b>Standalone Mode:</b> Display as configured, and not controlled by any platforms.</li> <li>• <b>Partially Managed Mode (Platform):</b> Select this to allow the platform to control part of the LED display information.</li> <li>• <b>Managed Mode (Platform):</b> Grant the platform complete control over the display information on the LED.</li> </ul>



Section	Parameter	Description
Display Status		Set the color and action of display information when vehicles pass under normal state. The LED screen will display information as configured during the period of either status.
Full Screen	Rolling Speed	The rolling speed of the information on LED.
	Passing Vehicle Info Retained	The display duration of the passing vehicle information on LED.
	Brightness Adjustment	<ul style="list-style-type: none"> <li>• <b>Ambient Adaptive:</b> The LED adjusts its brightness according to the ambient brightness. Set the <b>Augment Brightness</b>, the higher the value, the bigger the brightness change.</li> <li>• <b>Manual:</b> Manually adjust the LED brightness by setting the <b>Intensity</b>.</li> </ul>
	Self Check	<ul style="list-style-type: none"> <li>• <b>Auto:</b> Set the time interval for the LED to do self-check.</li> <li>• <b>Never:</b> The LED does no self-check.</li> </ul>

Step 3 Click **Confirm**.

## 2.5.1.11 Configuring Voice Broadcast

You can configure the voice broadcast content, volume, and encoding of the Camera.

### 2.5.1.11.1 Broadcast Content

Configure the broadcast content, and the Camera will broadcast the content when vehicles pass.



Some devices do not support voice.

Step 1 Select **Setting > ITC > Voice Broadcast > Broadcast Content**.

Step 2 Select broadcast options as needed.



If the **Barrier Control** is set as **Order (Server)** and the voice broadcast is controlled by the platform, **Parking Fee, Parking Duration, Expires at, Entry Time** and **Exit Time** will be available.

Figure 2-44 Broadcast content

**Step 3** Configure parameters.

Table 2-15 Broadcast content parameters description

Parameter	Description
Insert Before	Insert an option before the selected one on the display area.
Insert After	Insert an option after the selected one on the display area.
Edit	Click  next to the broadcast option to edit the prefix and suffix of the option.
Delete	Click  next to the broadcast option to delete the option.
Clear	Delete all broadcast options.

**Step 4** Click **Confirm**.

### 2.5.1.11.2 Volume/Encoding

Configure the volume of voice broadcast.

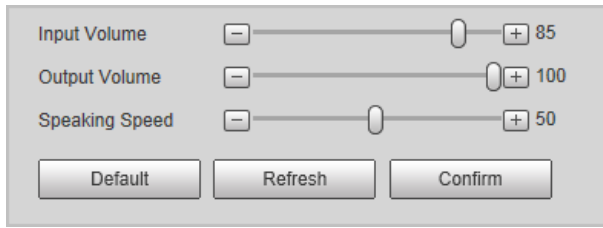


Only available for selected models.

**Step 1** Select **Setting > ITC > Voice Broadcast > Volume/Encoding**.

**Step 2** Configure the input volume, output volume, and speaking speed as needed.

Figure 2-45 Volume/Encoding



**Step 3** Click **Confirm**.

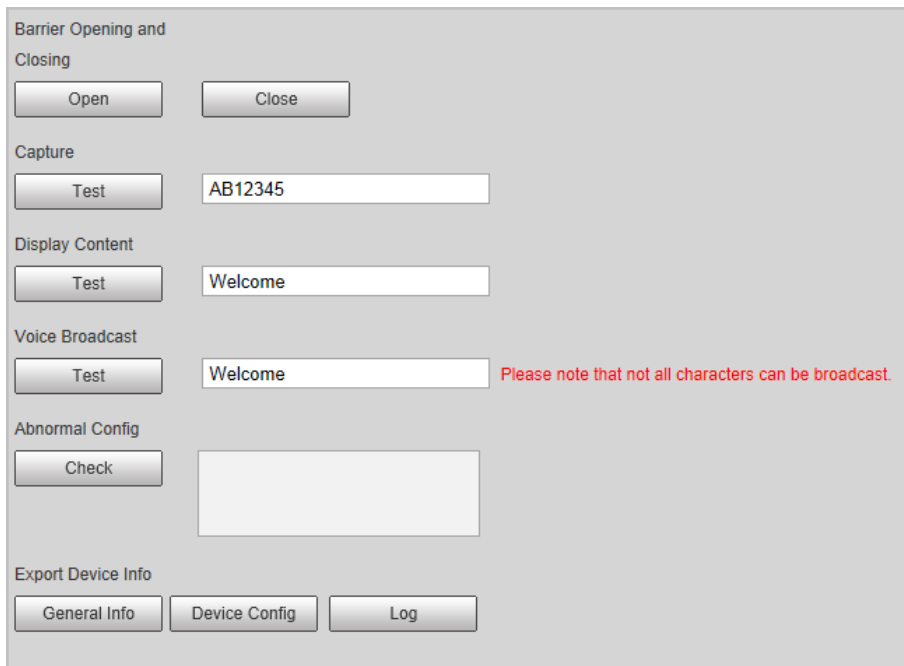
## 2.5.1.12 Setting Device Test

### 2.5.1.12.1 Device Test

You can test the barrier opening and closing, capture, display content, voice broadcast, and abnormal configuration modules to see if they work as configured. You can also export related device information.


**Step 1** Select **Setting > ITC > Device Test > Device Test**.

Figure 2-46 Device test



**Step 2** Configure parameters.

Table 2-16 Device test parameter description

Parameter	Description
Barrier Opening and Closing	Click <b>Open</b> or <b>Close</b> to test the barrier.
Capture	Click <b>Test</b> to trigger capture, and view the snapshot in <b>Live</b> page.
Display Content	Click <b>Test</b> , and view whether the LED screen displays as configured.
Voice Broadcast	Click <b>Test</b> to check whether the device plays sound normally.  Voice broadcast is available on select models.

Parameter	Description
Abnormal Config	Click <b>Check</b> , and system checks abnormality automatically.
Export Device Info	Select device information as needed, and export in batches.

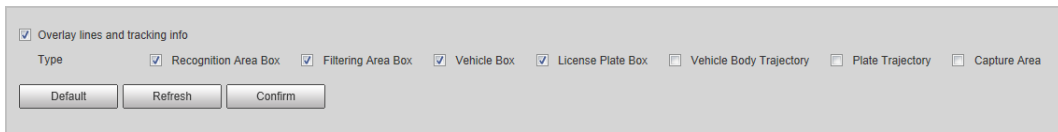
### 2.5.1.12.2 Capturing Commissioning

You can overlay recognition area box, snap line, filtering area box, vehicle box, and license plate box on the snapshots to help check the effect of the capturing commissioning.


**Step 1** Select **Setting > ITC > Device Test > Capturing Commissioning**.

**Step 2** Select **Overlay lines and tracking info** checkbox, and then select types as needed.

Figure 2-47 Capturing commissioning



**Step 3** Click **Confirm**.

**Step 4** Go to **Live** page, and then click  to manually capture plate. On the snapshot, you can see the selected line information, and you can adjust the capture line, and others as needed.

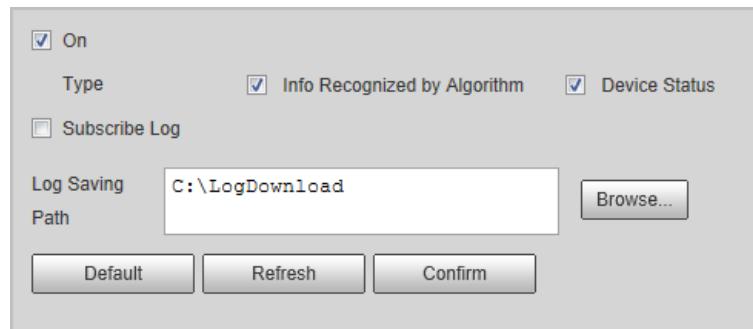
### 2.5.1.12.3 Operation Log Collection

The Camera supports collecting operation logs to track back when error happens.

**Step 1** Select **Setting > ITC > Device Test > Operation Log Collection**.

**Step 2** Select **On** to enable collecting operation logs.

Figure 2-48 Operation log collection



**Step 3** Select the **Type** of logs to collect.

**Step 4** Select **Subscribe Log**, and then you cannot change the log saving path.

**Step 5** Clear **Subscribe Log**, and then click **Browse** to select the path where the operation logs are saved.

**Step 6** Click **Confirm**.

## 2.5.2 Camera

You can configure image, video, and stream parameters.

## 2.5.2.1 Configuring Camera Attributes

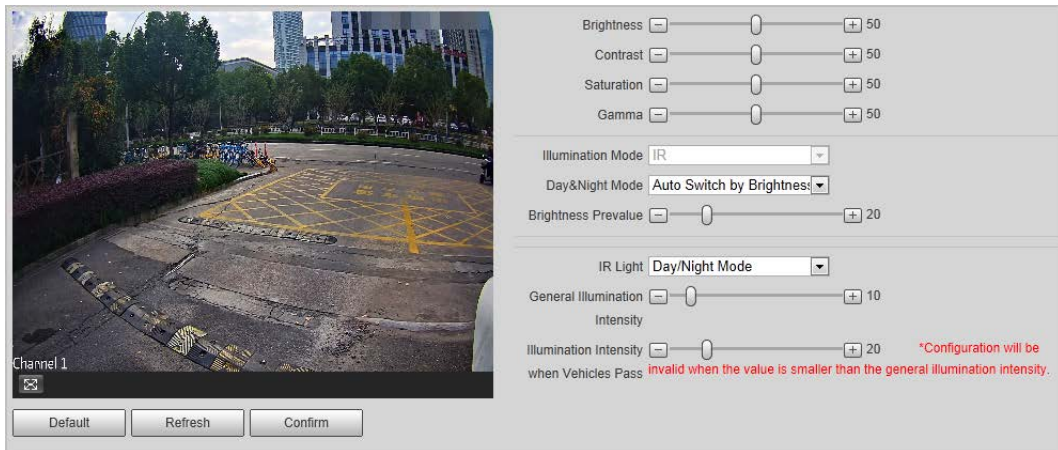
You can adjust the brightness, contrast, saturation of the video image, and set shutter parameters to get clear videos and recordings that you want.

### 2.5.2.1.1 General

This section provides guidance on configuring parameters such as image brightness, contrast, saturation, and hue.

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


Figure 2-49 General settings



**Step 2** Configure parameters.

Table 2-17 General parameters description

Parameter	Description
Brightness	<p>Adjust the overall image brightness. Change the value when the image is too bright or too dark.</p> <p>The bright and dark areas will have equal changes. The image becomes blurry when the value is too high. The recommended value is from 40 to 60. The range is from 0 to 100.</p> <p>It is 50 by default. The higher the value is, the brighter the image becomes.</p>
Contrast	<p>Change the value when the image brightness is proper but contrast is not enough.</p> <ul style="list-style-type: none"> <li>If the value is too big, the dark area is likely to become darker, and the bright area is likely to be overexposed.</li> <li>The picture might be blurry if the value is set too small. The recommended value is from 40 to 60, and the range is from 0 to 100.</li> </ul> <p>It is 50 by default. The higher the value is, the more obvious the contrast between the bright area, and dark area will become.</p>
Saturation	<p>Adjust the color vividness, and will not influence the image overall brightness.</p> <ul style="list-style-type: none"> <li>The image becomes too flamboyant if the value is too big.</li> <li>The image is not flamboyant enough if the value is too small. The recommended value is from 40 to 60, and the range is from 0 to 100.</li> </ul> <p>It is 50 by default. The higher the value is, the more flamboyant the image becomes.</p>

Parameter	Description
Gamma	Adjust the image brightness level. The higher the value, the brighter, and blurry the image.
Illumination Mode	Only supports IR illumination.
Day&Night Mode	<ul style="list-style-type: none"> <li>• <b>Color:</b> Applicable in the day, image shows in colors.</li> <li>• <b>B/W:</b> Applicable at night, the image is black and white.</li> <li>• <b>Auto Switch by Brightness:</b> Set the brightness prevalue. When the brightness is higher or lower than the prevalue, the image shows in colors or black and white respectively.</li> </ul>
Brightness Prevalue	Prevalue of brightness. You can drag the slider to adjust the value. The higher the value, the brighter the video image.
IR Light	<ul style="list-style-type: none"> <li>• <b>Always Off:</b> Set the IR light to always on.</li> <li>• <b>Always On:</b> Set the IR light to always off.</li> <li>• <b>Day/Night Mode:</b> Automatically turn on or off the IR light according to the configured Day/Night mode.</li> </ul>  Available on some devices.
General Illumination Intensity	Set the illumination intensity when there are no vehicles passing.
Illumination Intensity when Vehicles Pass	Set the illumination intensity when there are vehicles passing.

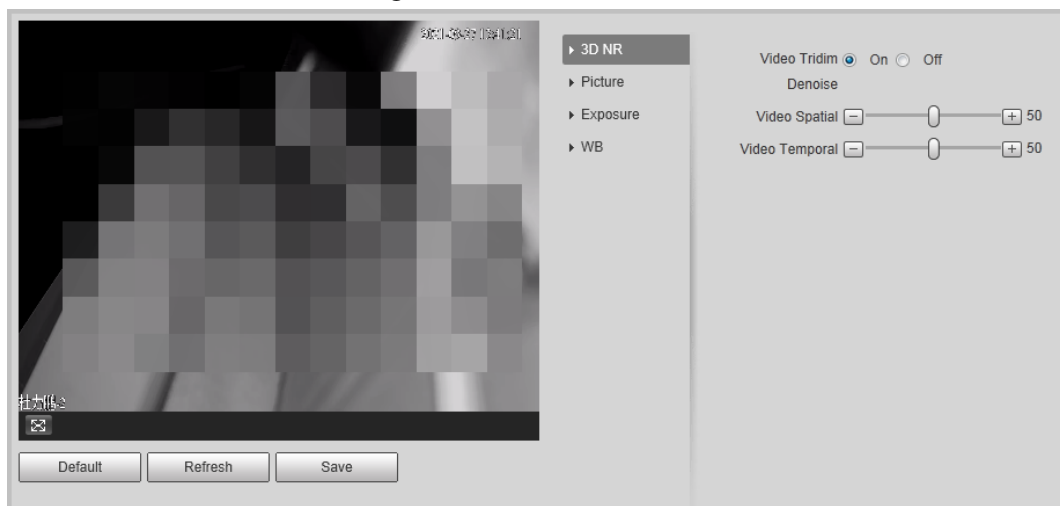
Step 3 Click **Confirm**.

### 2.5.2.1.2 Shutter

This section provides guidance on configuring camera shutter, including shutter mode, exposure mode, gain mode, and scene mode.




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

Figure 2-50 Shutter



**Step 2** Configure parameters.

Table 2-18 Shutter parameters description

Parameter	Description
3D NR	
Video Tridim Denoise	When it is <b>On</b> , 3D NR is enabled to reduce noise of video.
Video Spatial	Spatial video denoising. The higher the value, the fewer the noise.
Video Temporal	Temporal video denoising. The higher the value, the fewer the flicker noise.
Picture	
Scene	You can change the scene, and adjust the sharpness of corresponding scene. Scenes available: <b>Dawn/Dusk, Daytime, and Night</b> .
Sharpness	You can set the sharpness of corresponding scene. The higher the value, the clearer the image. But there will be noise if sharpness is too high.
WDR	Select <b>On</b> to enable WDR (wide dynamic range), which helps provide clear video images in bright and dark light.
Exposure	
Iris Adjust Mode	Select the iris adjust mode from <b>Off</b> , and <b>Auto</b> .
Mode	Select the way of adjusting exposure mode. You can select from <b>Manual</b> , and <b>Auto</b> .
Shutter	 You need to set shutter when set <b>Mode</b> to <b>Manual</b> . You can select the shutter value, or select <b>Customized Range</b> , and then set the shutter range.
Shutter Scope	 You need to set shutter when <b>Customized Range</b> is set as <b>Shutter</b> . Set the time range of shutter.
Gain Scope	 You need to set gain scope when set <b>Mode</b> to <b>Manual</b> . Set the value range of gain.
WB	
Mode	Set scene mode to adjust the image to its best status.

**Step 3** Click **Save**.

### 2.5.2.1.3 Metering Zone

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

**Step 1** Select **Setting > Camera > Attribute > Metering Zone**.

Figure 2-51 Metering Zone



**Step 2** Configure parameters.

Table 2-19 Metering zone parameter description

Parameter	Description
Plate Light	When selecting <b>Enable</b> , you can turn <b>ON</b> or <b>OFF</b> backlight, and frontlight according to scene requirement, and then improve the backlight image brightness.
Backlight	
Frontlight	
Measure Mode	<ul style="list-style-type: none"> <li>● <b>Global Measure</b>: Measure the brightness of the whole image area, and intelligently adjust the overall image brightness.</li> <li>● <b>Partial Measure</b>: Measure the brightness of sensitive area, and intelligently adjust the overall image brightness. If the measured area becomes bright, then the whole area becomes dark, and vice versa.</li> </ul>

**Step 3** Drag to select the measured area, and the system displays a yellow box. Drag the box to a proper location.



Only need to draw measuring areas when setting **Measure Mode** to **Partial Measure**.

**Step 4** Click **Confirm**.

## 2.5.2.2 Configuring Video Parameters

### 2.5.2.2.1 Video

You can set the camera stream information.

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





Figure 2-52 Video

Main Stream	Sub Stream
Stream Type: Normal	<input checked="" type="checkbox"/> Enable
Encode Mode: H.265	Stream Type: Normal
Resolution: 1920*1080(1080P)	Encode Mode: H.264M
Frame Rate(FPS): 15	Resolution: 704*576(D1)
Bit Rate Type: VBR	Frame Rate(FPS): 25
Quality: Good	Bit Rate Type: VBR
Reference Bit Rate: 664-3981Kb/S	Quality: Better
Max Bit Rate: 2048	Reference Bit Rate: 216-1298Kb/S
I Frame Interval: 30 (15~150)	Max Bit Rate: 768
<input checked="" type="checkbox"/> Watermark Settings	I Frame Interval: 50 (25~150)
Watermark Character: DigitalCCTV	
<input type="button" value="Default"/> <input type="button" value="Refresh"/> <input type="button" value="Confirm"/>	

**Step 2** Configure parameters.

Table 2-20 Video parameters description

Parameter	Description
Encode Mode	Currently it only supports H.264M, H.264H, H.265, and MJPEG.
Resolution	Select the video resolution.  The resolution of sub stream cannot be greater than that of the main stream.
Bit Rate Type	Include <b>VBR</b> , and <b>CBR</b> .  Image quality can only be set in VBR mode.
I Frame Interval	Frame or time interval between two I frames. The bigger the interval, the smaller space taken by the decompressed video. The system default is set twice as big as frame rate.
Watermark Settings	Set the watermarks, which will be added into videos of the Camera. <ul style="list-style-type: none"> <li>• Select <b>Watermark Settings</b> to enable the watermark adding.</li> <li>• <b>Watermark Character</b> is DigitalCCTV by default.</li> <li>• The watermark character can only consist of number, letter, underline, and maximum length contains 85 characters.</li> </ul>

**Step 3** Click **Confirm**.

### 2.5.2.2.2 Snapshot

You can set the picture stream, including resolution, quality or picture size.

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


Figure 2-53 Snapshot

The screenshot shows a configuration window for snapshots. It includes the following elements:

- Snapshot Type:** A dropdown menu set to "General Snap".
- Resolution:** A dropdown menu set to "1920\*1080(1080P)".
- Image Size:** A text field containing "1920\*1080(1080P)".
- Quality:** A radio button is selected, with a dropdown menu set to "Good".
- Picture Coding Size (KB):** A radio button is unselected, with a dropdown menu set to "300".
- Buttons:** Three buttons are located at the bottom: "Default", "Refresh", and "Confirm".

**Step 2** Configure parameters.

Table 2-21 Snapshot parameters description

Parameter	Description
Snapshot Type	Currently it only supports general snapshot.
Resolution	The snapshot resolution.
Image Size	It is in accordance with resolution value.
Quality	Set the snapshot quality which includes 6 levels optional.
Picture Coding Size (KB)	Select picture coding size from 8 options, or select <b>Custom</b> to define the size (50–1024).  You can only select one between picture quality and picture coding size to set the configuration.

**Step 3** Click **Confirm**.

### 2.5.2.2.3 Interest Area

Set interest area in the image, and then the selected image will display with configured quality.



- It supports up to 3 areas at the same time.
- The image quality is displayed by level: **Worst, Worse, Bad, Good Better, or Best.**
- Click **Clear**, and delete all the area boxes; Select one box, and then click **Delete** or right-click to delete it.

**Step 1** Select **Setting > Camera > Video > Interest Area**.

**Step 2** Draw a rectangle on the video image as the interest area.

You can adjust the image quality, clear all drawn areas or delete them one by one through clicking **Delete** or right-click the area.

**Step 3** Click **Confirm**.

## 2.5.3 Network

You can set IP address, port, and other parameters.

### 2.5.3.1 Configuring TCP/IP

Configure the IP address of the Camera, and DNS server so that the Camera can connect with other devices in the same network.



Some models support dual network port. Do not set them in the same network segment; otherwise it might cause network error.

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

Step 2 Configure parameters based on the actual situation.

Figure 2-54 TCP/IP

Host Name	Camera
Ethernet Card	Wire(Default)
Mode	<input checked="" type="radio"/> Static <input type="radio"/> DHCP
MAC Address	6c
IP Version	IPv4
IP Address	1
Subnet Mask	2
Default Gateway	1
Preferred DNS	8
Alternate DNS	8
<input type="button" value="Refresh"/> <input type="button" value="Confirm"/>	

Step 3 Click **Confirm**.

### 2.5.3.2 Configuring Port

You can set the maximum number, and value of the ports.

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

Step 2 Set the maximum number of connections of the Camera, and then configure each port.

Figure 2-55 Port

Max Connection	10	(1~20)
TCP Port	37777	(1025~65535)
UDP Port	37778	(1025~65534)
HTTP Port	80	
RTSP Port	554	
HTTPS Port	443	
<input type="button" value="Default"/> <input type="button" value="Refresh"/> <input type="button" value="Confirm"/>		

Step 3 Click **Confirm**.

### 2.5.3.3 Configuring DDNS

#### Prerequisites

Confirm the server type which supports domain name analysis.



- After enabling DDNS, your device information might be collected by the third party servers.
- When a user registers and logs in to the DDNS website, you can view all the connected device information.

#### Procedure

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

**Step 2** Select **Server Type** to enable DDNS, and then enter the server information.

**Keep Alive Time (s)** means the update interval of the connection between the server and the device.

Figure 2-56 DDNS

Server Type  After enabling DDNS function, third-party server may collect your device info.

Server IP

Port  (1~65535)

HostName

Username

Password

Keep Alive Time(s)  minute(s) (1~500)

**Step 3** Click **Confirm**.

### 2.5.3.4 Configuring Auto Register

Through auto register function, when the device is connected with external network, system will report its current location to the server so that client platform can access device through server.

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

**Step 2** Check **On** to enable the function.

Figure 2-57 Auto register

On

Address

Port

Sub-Device ID

**Step 3** Configure parameters.

Table 2-22 Auto register parameter description

Parameter	Description
Address	The IP address of the server on which the device registers.
Port	The port of the server for auto registration.
Sub-Device ID	The device ID distributed by the server for auto registration. Make sure that the ID is unique during auto registration.

**Step 4** Click **Confirm**.

### 2.5.3.5 Configuring Multicast

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

#### Procedure

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

**Step 2** Check **On** to enable the function.

Figure 2-58 Multicast

**Step 3** Enable main stream or sub stream based on the actual situation and set IP and port.

**Step 4** Click **Confirm**.

### 2.5.3.6 Configuring SMTP (Email)

Configure the email, and when alarms or abnormal events are triggered, an email will be sent to the recipient server through SMTP server. The recipient can log in to the incoming mail server to receive emails.



After enabling this function, system will send the device data to the given server. There is data leakage risk.

**Step 1** Select **Setting > Network > SMTP (Email)**.

Figure 2-59 SMTP (email)

**Step 2** Select **On** and then configure parameters of the email

Table 2-23 SMTP (Email) parameter description

Parameter	Description
SMTP Server	IP address of the outgoing mail server that complies with SMTP protocol.
Port	Port number of the outgoing mail server complying with SMTP protocol. It is 25 by default.
Anonymity	For servers supporting anonymous email, you can log in anonymously without entering username, password, and sender information.
Username	Username and password of the sender mailbox.
Password	
Sender	Email address of the sender.
Encryption Type	Select encryption type from <b>None</b> , <b>SSL</b> , and <b>TLS</b> .
Title	You can enter no more than 63 characters in English letters, and numbers.
Mail Receiver	Email address of the receiver. Supports 3 addresses at most.
Attachment	Select the checkbox to support attachment in the email.
Test	Test whether the email function is normal. If the configuration is correct, the email address of the receiver will receive the test email. Save the email configuration before running rest.

**Step 3** Click **Save**.

## 2.5.3.7 Configuring SNMP

### Prerequisites

- Install the toll software for monitoring and managing SNMP (Simple Network Management Protocol) device.
- Get the corresponding version of MIB file from technical support.

Set SNMP and connect to the Camera through tool such as MIB Builder and MG-SOFT MIB Browser, and then you can manage and monitor the Camera on the tool.

### Procedure

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

Step 2 Select the version of SNMP to enable it.

- **V1**: The device can only process the information of version 1.
- **V2**: The device can only process the information of version 2.
- **V3**: Set the username, password and authentication type to enable safety verification when the server accesses the device.

Step 3 Enter the IP address of the PC on which the MIB software is installed as **Trap Address**, and leave other parameters as default.

Figure 2-60 SNMP

The screenshot displays the SNMP configuration page. At the top, the 'Version' section has three radio buttons: 'v1', 'v2', and 'v3'. The 'v3' option is selected and marked as '(Recommended)'. Below this, there are several input fields: 'SNMP Port' (161), 'Read Community', 'Write Community', 'Trap Address', and 'Trap Port' (162). The 'Read-only Username' is set to 'public'. Under 'Authentication Type', 'MD5' is selected. The 'Authentication Password' field is filled with dots. The 'Encryption Type' is set to 'CBC-DES', and the 'Encryption Password' field is also filled with dots. There is a 'Read&write Username' field set to 'private'. Below this, there are two more sections for authentication and encryption, both with 'MD5' selected and password fields filled with dots. At the bottom, there are three buttons: 'Default', 'Refresh', and 'Confirm'.

Step 4 Click **Confirm**, and then you can view the device configurations through MIB software.

## 2.5.3.8 Configuring IEEE802

Step 1 Select **Setting > Network > IEEE802**.

Figure 2-61 IEEE802

**Step 2** Select **On** to enable IEEE802, and then configure parameters.

Table 2-24 IEEE802 parameters description

Parameter	Description
Authentication	<ul style="list-style-type: none"> <li>● <b>PEAP</b>: Ordinarily uses TLS only to authenticate the server to the client, and only the sever is required to have a public key certificate.</li> <li>● <b>EAP-TLS</b>: 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.</li> </ul>
CA Certificate	Select <b>CA Certificate</b> checkbox, and then click <b>Browse</b> to import the CA certificate to verify whether the switch 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 <b>Browse</b> to import the client certificate, and private key files for authentication.
Private Key	

**Step 3** Click **Confirm**.

### 2.5.3.9 Configuring PPPoE

- The device is connected to public network.
- The username and password of PPPoE are provided.



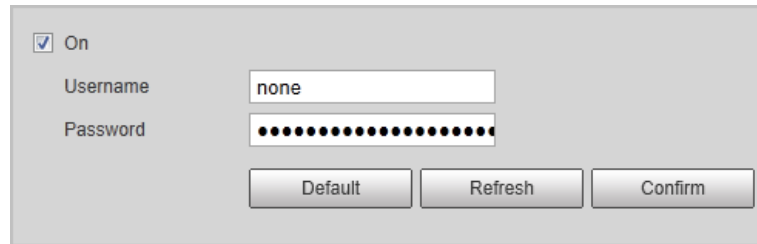
- Disable UPnP when using PPPoE.
- You cannot change device IP on web client after connected through PPPoE.

Connect to the network through PPPoE, and the device can automatically obtain a dynamic IP on public network.

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



Figure 2-62 PPPoE



Step 2 Select **On** to enable PPPoE, and then enter username and password.

Step 3 Click **Confirm**.

## 2.5.3.10 Configuring Platform

### 2.5.3.10.1 ONVIF

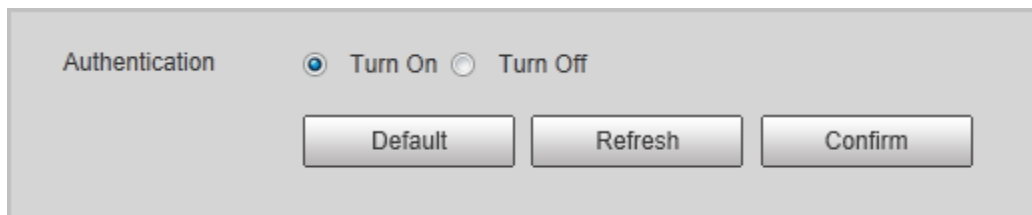
You can enable the Open Network Video Interface Forum (ONVIF) function to make network video products of different manufacturers interworking.



ONVIF login authentication is enabled by default.

Step 1 Select **Setting** > **Network** > **Platform** > **ONVIF**.

Figure 2-63 ONVIF



Step 2 Select the **Turn on**.

Step 3 Click **Confirm**.

### 2.5.3.10.2 Info Push Platform

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

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



IO multiplexing must be available on the server.

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

Step 1 Select **Setting** > **Network** > **Platform** > **Info Push Platform**.

Step 2 Select **On** to enable information push and then configure parameters.

Figure 2-64 Info push platform

Table 2-25 Info push description

Section	Parameter	Description
Basic configuration	Keep Alive Circle	Update interval of the connection between the server and the device.
	Max Keep-alive Request	Set the maximum number of heartbeats of the connection between the server and the device. When the set number is exceeded, the device has disconnected.
	Data Type	Select the data type to be uploaded.
	Uploading Info	Select the specific information to be uploaded.
Picture Config	Filter Condition	Select whether to upload information of unlicensed vehicles.
	Upload Type	Select the type of pictures to be uploaded.

Step 3 Click **Confirm**.

## 2.5.4 Event

This section provides guidance on configuring alarm, and abnormality.

### 2.5.4.1 Alarm

#### 2.5.4.1.1 Relay Activation

You can set several parameters of relay activation such as relay-in, period, anti-dither, and sensor type. When an alarm is triggered, the system sends the alarm signal to external devices to trigger, for example, buzz.

Step 1 Select **Setting > Event > Alarm > Relay Activation**.

Figure 2-65 Relay activation

**Step 2** Select **On** to enable alarm input for the current channel.

**Step 3** Select alarm input channel.

**Step 4** Click **Setting** next to **Period** to set the period of alarm input. Refer to "2.5.1.9 Setting Time Schedule" for more details.

**Step 5** Set other parameters.

Table 2-26 Relay activation parameter

Parameter	Description
Anti-dither	Enter anti-dither time (1 s–100 s). System will only record one when there are multiple alarms during the defined time.
Sensor Type	Select relay-in type according to the connected alarm input device. <ul style="list-style-type: none"> <li>• <b>NO</b>: Low level valid.</li> <li>• <b>NC</b>: High level valid.</li> </ul>
Relay-out	Optocoupler output. Select the checkbox to activate corresponding alarm output device when alarm occurs.
Signal Duration	The time that delays alarm when alarm occurs.

**Step 6** Click **Confirm**.

### 2.5.4.1.2 Relay-out

You can trigger one alarm output signal.

**Step 1** Select **Setting > Event > Alarm > Relay-out**.

Figure 2-66 Relay-out

**Step 2** Click **1**, **2** or **3** to set one alarm channel.

**Step 3** Set alarm output.

- Click **Trigger** to output relay-out signal. For example, the Camera connects with an external buzzer, when you click **Trigger**, the buzzer buzzes, meaning the alarm output works properly.
- Click **Refresh** to refresh alarm output status.

## 2.5.4.2 Abnormality

Set relay-out mode of different events. When abnormality happens, system triggers alarm.

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

Step 2 Select an event from SD card, network error, illegal access, security exception, blocklist car and backing and leaving as needed.

**Backing and Leaving** refers to captured vehicles back away and leave.

Step 3 (Optional) Select an event type. You only need to select this for SD card and network error.






Figure 2-67 No storage card


The screenshot shows a configuration window for the 'No Storage' event type. It includes a dropdown menu for 'Event Type' set to 'No Storage', an 'On' checkbox, a checked 'Relay-out' checkbox, and three buttons labeled 'NO1', 'NO2', and 'NO3'. A red note states: '\*Please note that alarm outputs 1 and 2 are generally used to control the barrier.' Below this is a 'Signal Duration' field set to '10' with a unit 's (10~300)'. At the bottom are 'Default', 'Refresh', and 'Confirm' buttons.

Step 4 Click **On** to enable various abnormalities.

Step 5 Configure parameters of each event as needed.

Table 2-27 Abnormality parameters description

Parameter	Description
On	Select to enable the corresponding abnormality event.
Relay-out	Select to enable the corresponding alarm output of abnormality event, and select the corresponding port.  <b>Backing and Leaving</b> does not support relay-out.
Signal Duration	The alarm linkage keeps running for the defined time after alarm ends.  <b>Backing and Leaving</b> does not need to set the parameter.
Original Image	Configure the storage available that triggers abnormality alarm.  Only need to configure when setting <b>Event Type</b> to <b>Scarcity of Storage Space in SD Card</b> .
Original Image	
Plate Cutout	Only need to configure when selecting <b>Blocklist Car</b> .
Login Error	Configure the number of login error allowed. The range is 3–10 times.  Only need to configure when setting <b>Illegal Access</b> .

Parameter	Description
Send Email	<p>The system sends an email to the defined email address when an alarm is triggered. To set the email address, go to <b>Setting &gt; Network &gt; SMTP(Email)</b>.</p> <p> Only need to configure when setting <b>Illegal Access</b> and <b>Blocklist Car</b>.</p>

Step 6 Click **Confirm**.

## 2.5.5 Storage

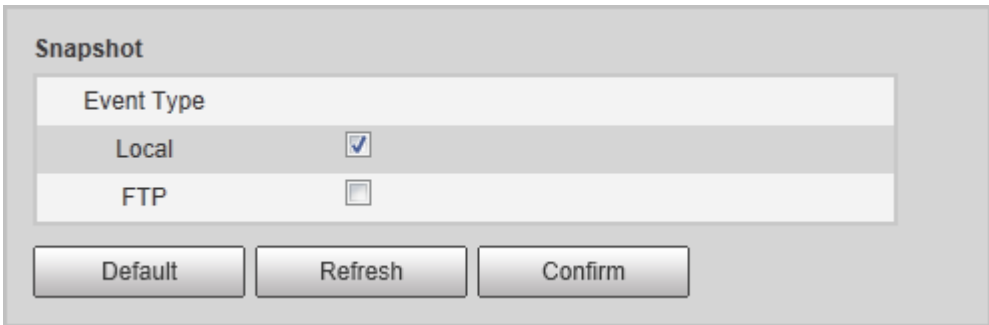
This section provides guidance on setting associated information of storage, and record control.

### 2.5.5.1 Point

Set the storage path of snapshots.

Step 1 Select **Setting > Storage > Destination > Point**.

Figure 2-68 Point



Snapshot	
Event Type	
Local	<input checked="" type="checkbox"/>
FTP	<input type="checkbox"/>

Default Refresh Confirm

Step 2 Select **Event Type** as needed.

- **Local**: Store on the TF card.
- **FTP**: Store on the FTP server.

Step 3 Click **Confirm**.

### 2.5.5.2 Local

Display the information on the local SD card. You can set hot swap, and format SD card.

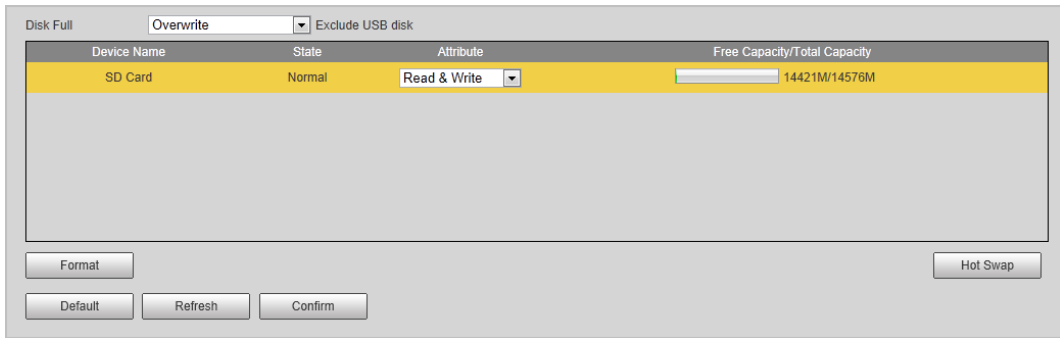


Format the SD card before use.

Step 1 Select **Setting > Storage > Destination > Local**.

- Select **Overwrite** or **Stop** from **Disk Full**, meaning overwrite the records or stop storing new pictures or videos respectively when disk is full.
- View the storage information of the card.
- Click **Hot Swap**, and then you can pull out the SD card.
- Click **Format**, and then you can format the SD card.

Figure 2-69 Local configuration parameter description



**Step 2** Click **Confirm**.

### 2.5.5.3 FTP

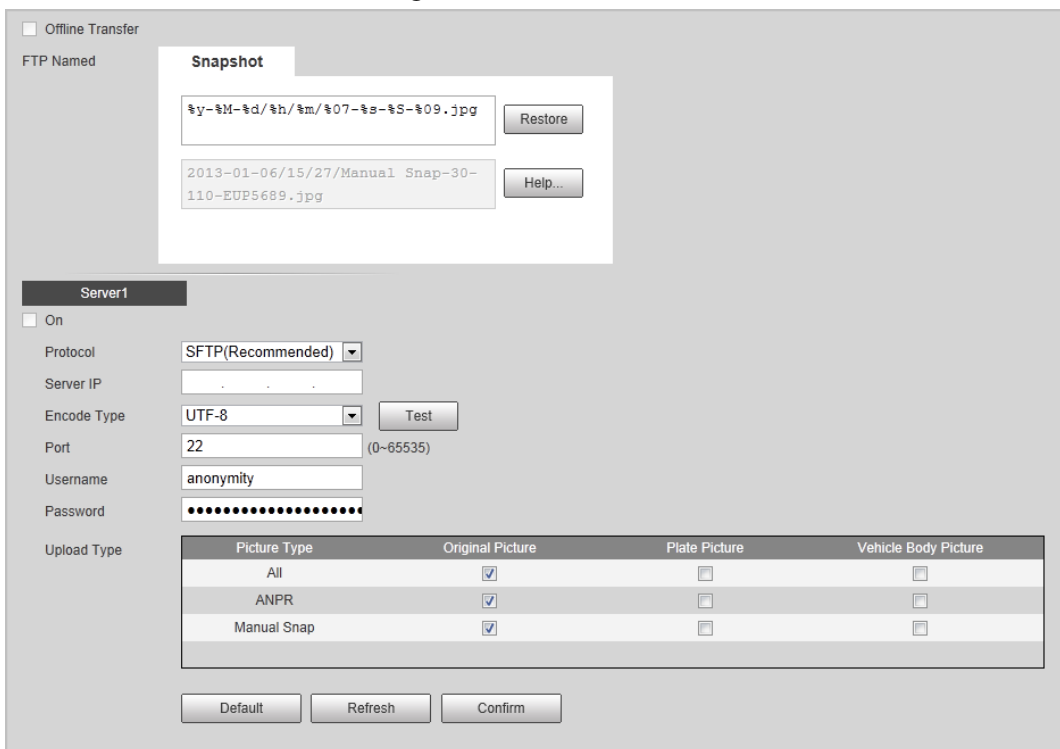
FTP function can be enabled only when it is selected as destination path. When the network does not work, you can save all the files to the internal SD card for emergency.



You can set picture name, and storage path. Click **Help...** to view naming rule.

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

Figure 2-70 FTP



**Step 2** Configure parameters.

Table 2-28 FTP configuration parameter description

Parameter	Description
Offline Transfer	<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 Camera; otherwise, the offline transfer function cannot be enabled.</p>

Parameter	Description
FTP Named	Set the naming rule of snapshots to be saved in FTP server. You can click <b>Help...</b> to view the <b>Picture Naming Help</b> , or click <b>Restore</b> to restore the default naming rule.
On	Enable FTP server storage.
Protocol	<ul style="list-style-type: none"> <li>• <b>SFTP (Recommended)</b>: Secure File Transfer Protocol, a network protocol allows file access, and transfer over a secure data stream.</li> <li>• <b>FTP</b>: 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.</li> </ul>
Server IP	The IP address of FTP server.
Encode Type	Refers to the encode mode of Chinese characters when naming pictures. Two modes are available: <b>UTF-8</b> , and <b>GB2312</b> . After configuring <b>Server IP</b> , and <b>Port</b> , click <b>test</b> to check whether the FTP server works.
Port	The port number of FTP server.
Username	The username, and password of FTP server.
Password	
Upload Type	Select event(s), and picture type(s) to be uploaded to the FTP server.

Step 3 Click **Confirm**.

## 2.5.5.4 Client

You can set the parameters of storing to client.

Step 1 Select **Setting > Storage > Destination > Client**.

Figure 2-71 Client

Step 2 Configure parameters.

Table 2-29 Client configuration parameter description

Parameter	Description
Offline Transfer	When network is disconnected or failed, you can store the picture into local storage card, and it will automatically upload to platform server after network resumes.
Type	Select connection type with platform server. <ul style="list-style-type: none"> <li>• IP: Connect to platform server through IP address.</li> <li>• MAC: Connect to platform server through MAC address.</li> </ul>

Parameter	Description
Server	Select server, which includes <b>Server1</b> , and <b>Server2</b> .
Server IP	<ul style="list-style-type: none"> <li>When the type is set to <b>IP</b>, you need to fill in IP address of the server.</li> <li>When the type is set to <b>MAC</b>, you need to fill in MAC address of the server.</li> </ul>

Step 3 Click **Confirm**.

## 2.5.5.5 Save Path

This section provides guidance on configuring picture, record naming, and storage path.

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

Figure 2-72 Storage path

Step 2 According to your actual requirements, set the name of picture, and storage path. Click **Help...** for more details.

Step 3 Set the root path of record, and snapshot as needed.

Step 4 Click **Confirm**.

## 2.5.6 System

You can configure general information, add user, restore to default settings, and configure import & export file.

### 2.5.6.1 General

#### 2.5.6.1.1 General Setup

This section provides guidance on configuring device SN, language, and video standard.

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



Figure 2-73 General

The screenshot shows a configuration window with the following fields and buttons:

- Device Name: Text input field containing "7F".
- Device Code: Empty text input field.
- Language: Dropdown menu set to "English".
- Video Standard: Dropdown menu set to "PAL".
- Machine Group: Empty text input field.
- Machine Address: Empty text input field.
- Buttons: "Default", "Refresh", and "Confirm".

**Step 2** Configure parameters.

Table 2-30 General parameters description

Parameter	Description
Device Name	The ID number of the Camera. Supports English letters and numbers.
Device Code	The code of the Camera. It cannot be used as OSD information.
Language	The language displayed on web. The language will be automatically switched after logging in to web again. Currently it only supports English.
Video Standard	<ul style="list-style-type: none"> <li>● <b>PAL</b>: Phase Alternating Line. Currently most countries around the world (including most countries in Europe, Africa, Australia, and China) adopt this standard.</li> <li>● <b>NTSC</b>: National Television System Committee. The main countries which adopt this standard include America, Canada, and Japan.</li> </ul>
Machine Group	The company group information of the Camera.
Machine Address	Set the location information of device capture.

**Step 3** Click **Confirm**.

### 2.5.6.1.2 Date & Time

You can set date, and time format, system time, DST (Daylight Saving Time) or NTP server, and more.

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

Figure 2-74 Date & time

The screenshot shows the Date & Time configuration page with the following settings:

- Date Format: YYYY-MM-DD
- Time Format: 24-Hour
- Time Zone: GMT+08:00
- System Time: 2021-09-27 15 : 58 : 25 (with a calendar icon and a "Sync PC" button)
- DST
  - DST Type:  Date  Week
  - Begin Time: Jan 1 00 : 00 : 00
  - End Time: Jan 2 00 : 00 : 00
- NTP Setting
  - NTP Server: clock.isc.org
  - Port: 123
  - Interval: 10 minute(s) (1~30)
- Buttons: "Default", "Refresh", and "Confirm".

**Step 2** Configure parameters.

Table 2-31 Date & time parameter description

Parameter	Description
Date Format	Select date format.
Time Format	Select 24h or 12h system.
Time Zone	The time zone where the Camera is located.
System Time	Set current system time of the Camera. It becomes valid immediately after setting.
Sync PC	Sync the time of the Camera with the time on PC.
DST	Enable the function, and then set begin time, and end time of DST according to date or week.
NTP Setting	Select to enable the function of network time synchronization.
NTP Server	Time server address.
Port	Port number of time server.
Interval	The sync interval between device and time server.

**Step 3** Click **Confirm**.

## 2.5.6.2 Account

### 2.5.6.2.1 Account

The system supports configuring operation user of web. You need to configure user group before configuring user account.



- The user with **Account** control authority can also change the password of other users.
- We recommend you give fewer authorities to normal users than premium users to make user management convenient.
- You cannot delete the user in login status.

You can add, delete or modify user.

### Procedure

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

Figure 2-75 Username

No.	Username	Group Name	Memo	Restricted Login	Edit	Delete
1	admin	admin	admin's account	/		

Authority					
User	Live	System	System Info	File Backup	Storage
Event	Network	Peripheral	AV Parameter	Safety	Maintenance
Manual Control					

Add User

**Step 2** Click **Add User**.

Figure 2-76 Add user

Step 3 Configure parameters.

Table 2-32 Add user parameters description

Parameter	Description
Username	Username contains up to 15 characters, consisting of number, letter, underline, and hyphen. It cannot be the same as the existed username.
Password	Enter and confirm the new password.
Confirm Password	<ul style="list-style-type: none"> <li>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 ' " ; : &amp;).</li> <li>Follow the password security prompt to set a high security level password.</li> <li>Password should be the same as <b>Confirm Password</b>.</li> </ul>

Parameter	Description
Group Name	Select the group to which new users belong. Each group has different permissions.
Memo	Remarks of the user.
Operation Permission	Select the permissions that you want assign to the user.
Restricted Login	Set the IP address that is restricted to log in, and the restriction time.

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

**Step 5** Select **Setting > System > Account > Account > Group Name**.

You can add new group, delete added group or modify group permission, and memo.



- The system supports up to 8 user groups, and the default user groups are **admin** and **user**.
- You can modify, and delete the added user group, but not the default user group.

Figure 2-77 User group

Username		Group Name			
No.	Group Name	Memo	Edit	Delete	
1	admin	administrator group			
2	user	user group			

Authority					
User	Live	System	System Info	File Backup	Storage
Event	Network	Peripheral	AV Parameter	Safety	Maintenance
Manual Control					

Add Group

**Step 6** Click **Add Group**, and then enter the name of user group, and configure group authority.

- **Group Name** contains up to 15 characters, consisting of number, letter, underline, and hyphen.
- **Group** must be unique.

Figure 2-78 Add group

**Add Group** ✕

Group Name  Must



Memo

Authority  All

Live  
 System  
 System Info  
 File Backup

**Step 7** Click **Save**.

## Related Operations

After adding user or user group, click  to change the user or user group information; click  to delete the added user or user group.



Admin user/group cannot be deleted.

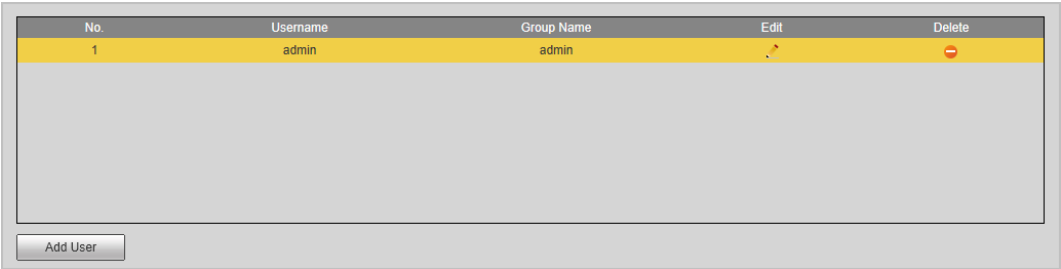
### 2.5.6.2.2 ONVIF User



You can add, delete, and modify ONVIF on the user management page.

## Procedure

Step 1 Select **Setting > System > Account > Onvif User**.

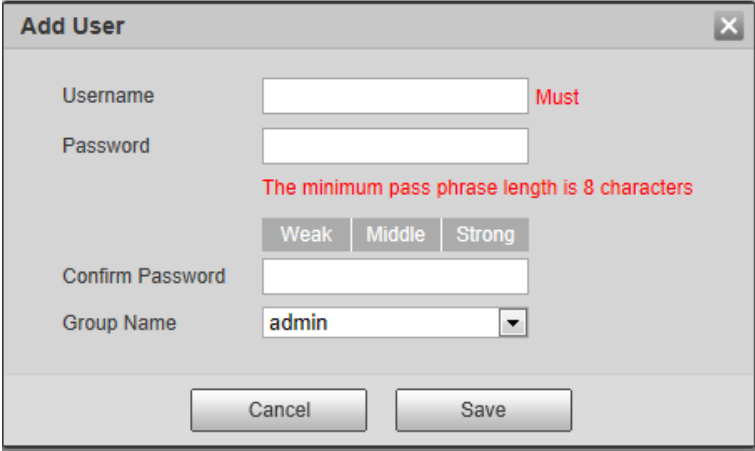
Figure 2-79 Onvif user



No.	Username	Group Name	Edit	Delete
1	admin	admin		

Step 2 Click **Add User**.

Figure 2-80 Add user



**Add User** [X]

Username  **Must**

Password

**The minimum pass phrase length is 8 characters**

Confirm Password

Group Name  ▼

Step 3 Configure parameters. For details of the parameters, see Table 2-32.

Step 4 Click **Save**.

## Related Operations

After adding user, click  to change user information; click  to delete the added user.



Admin user cannot be deleted.

## 2.5.6.3 Safety

### 2.5.6.3.1 System Service

Select to enable system services as needed.

Step 1 Select **Setting > System > Safety > System Service**.

Figure 2-81 System Service

SSH	<input checked="" type="checkbox"/> On
Multicast/Broadcast Search	<input checked="" type="checkbox"/> On
Password Reset	<input checked="" type="checkbox"/> On
CGI Service	<input checked="" type="checkbox"/> On
Onvif Service	<input checked="" type="checkbox"/> On
Audio and Video Transmission Encryption	<input type="checkbox"/> On <small>*Please make sure matched device or software supports video decryption function.</small>
RTSP over TLS	<input type="checkbox"/> On <small>*Please make sure matched device or software supports video decryption function.</small>
Private Protocol Authentication Mode	Security Mode (Recommended)

Default Refresh Confirm

Step 2 Select needed system service.

Table 2-33 System service parameters description

Parameter	Description
SSH	SSH (Secure Shell) implements data encrypted transmission, and effectively avoid information leakage during remote management.
Multicast/Broadcast Search	<ul style="list-style-type: none"> <li>• <b>Multicast:</b> It realizes point-to-multipoint network connection between sender, and receiver.</li> <li>• <b>Broadcast Search:</b> Broadcast data packet in IP subnet, all the hosts in the subnet will receive these data packets.</li> </ul>
Password Reset	When you forget the password of admin user, you can set new password through password reset function.
CGI Service	CGI is the port between external application program, and web server.
Onvif Service	Realizes network video framework agreement to make different network video products interconnected.
Audio and Video Transmission Encryption	Enable this function to encrypt streams transmitted through private protocols.
RTSP over TLS	Enable this function to encrypt stream transmitted through standard protocol. We recommend you keep the function on.
Private Protocol Authentication Mode	Keep the recommended <b>Security Mode</b> .

Step 3 Click **Confirm**.

## 2.5.6.3.2 HTTPS

### Prerequisites

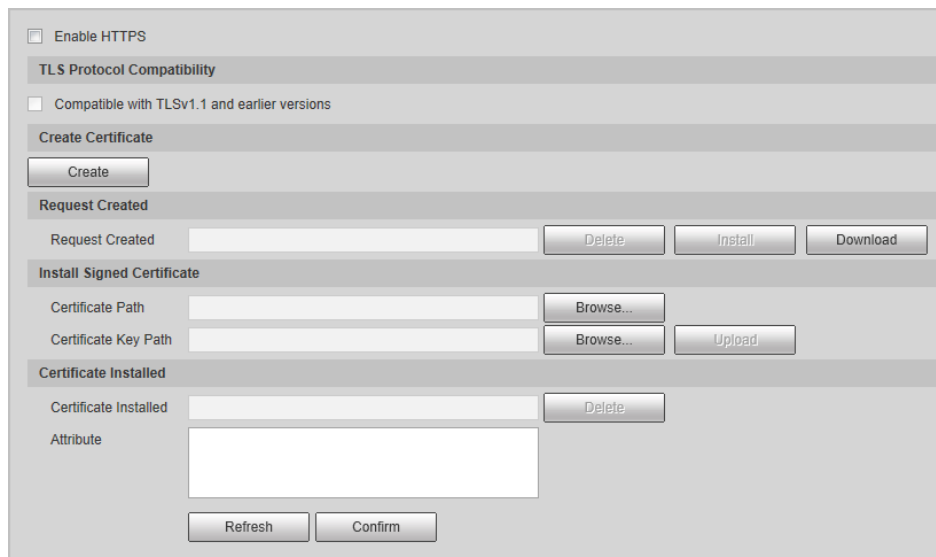
- For first-time use of HTTPS or after changing device IP address, you need to create server certificate, and install root certificate.
- After creating server certificate, and installing root certificate, if you replace the PC for logging in to the web page, you need to download, and install the root certificate again on the new PC or copy the downloaded root certificate on the new PC, and install.

On the **HTTPS** page, 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 certificate or upload the authenticated certificate.
- If you select **Create Certificate**, follow the steps below.
    1. Select **Setting > System > Safety > HTTPS**.

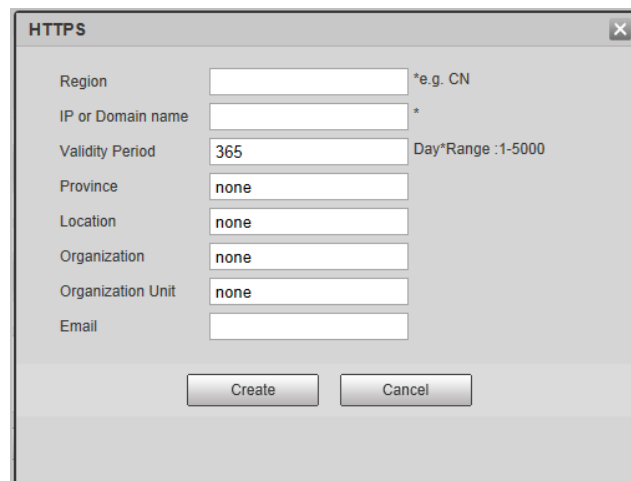
Figure 2-82 HTTPS



The screenshot shows the HTTPS configuration interface. At the top, there is a checkbox for 'Enable HTTPS'. Below it is the 'TLS Protocol Compatibility' section with a checkbox for 'Compatible with TLSv1.1 and earlier versions'. The 'Create Certificate' section contains a 'Create' button. The 'Request Created' section shows a table with columns for 'Request Created', 'Delete', 'Install', and 'Download'. The 'Install Signed Certificate' section has fields for 'Certificate Path' and 'Certificate Key Path', each with a 'Browse...' button, and an 'Upload' button. The 'Certificate Installed' section has a table with columns for 'Certificate Installed' and 'Delete', and an 'Attribute' field. At the bottom, there are 'Refresh' and 'Confirm' buttons.

2. Click **Create**.

Figure 2-83 HTTPS



The screenshot shows the 'HTTPS' configuration dialog box. It has a title bar with a close button. The fields are: 'Region' (with a hint '\*e.g. CN'), 'IP or Domain name' (with a hint '\*'), 'Validity Period' (with a value of '365' and a hint 'Day\*Range :1-5000'), 'Province', 'Location', 'Organization', 'Organization Unit', and 'Email'. All these fields have 'none' or empty values. At the bottom, there are 'Create' and 'Cancel' buttons.

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



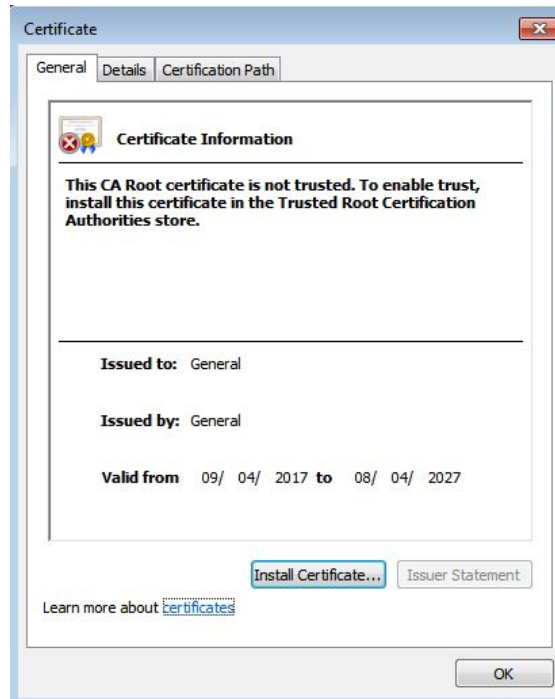
The entered **IP or Domain name** must be the same as the IP or domain name of the Camera.

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...**

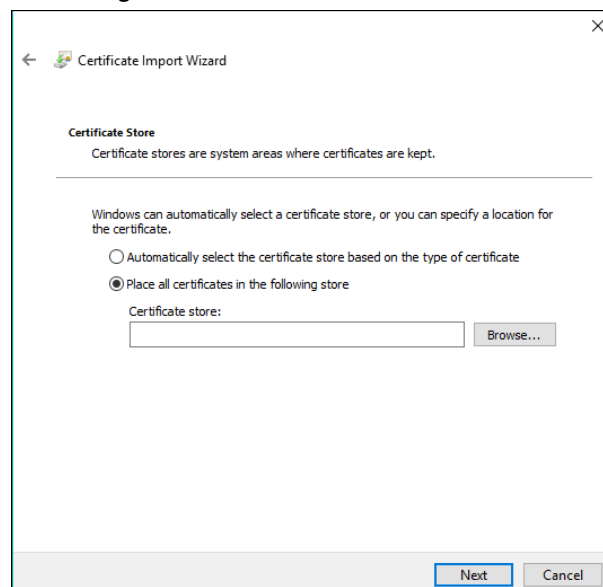
Figure 2-84 Install certificate



7. Click **Next**.

The **Certificate Store** page is displayed. You can select **Automatically select the certificate store based on the type of certificate** or **Place all certificates in custom certificate store**.

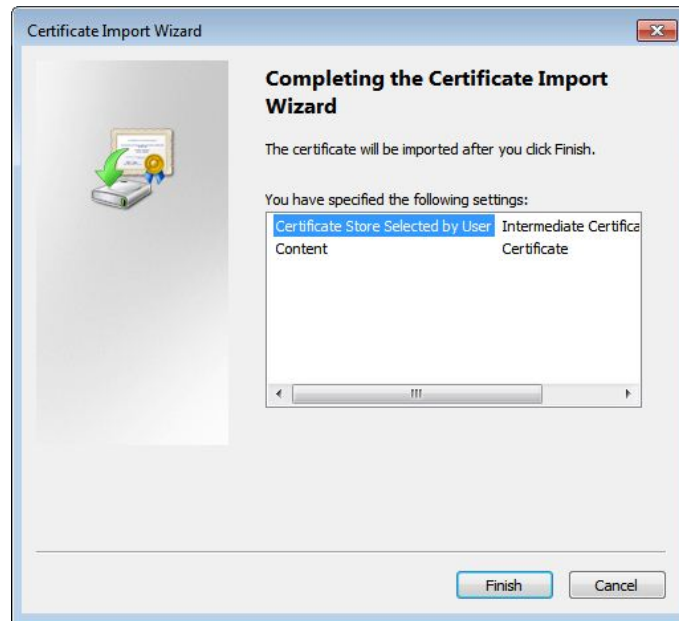
Figure 2-85 Certificate store





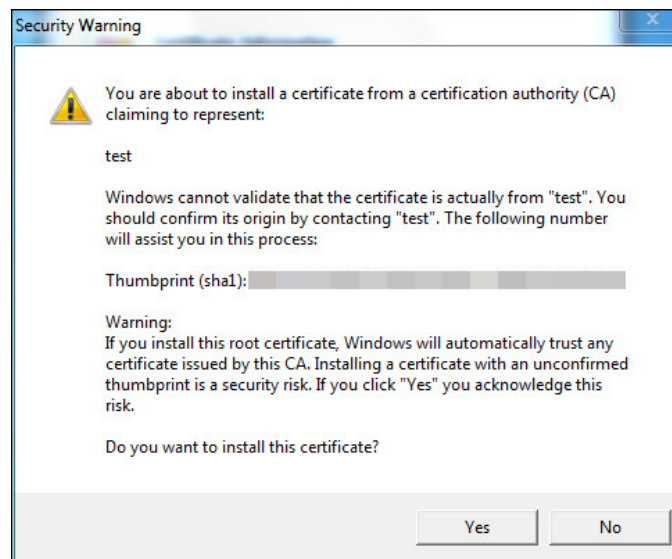
8. Click **Next**.

Figure 2-86 Completing certificate import wizard



9. Click **Finish**.

Figure 2-87 Security warning

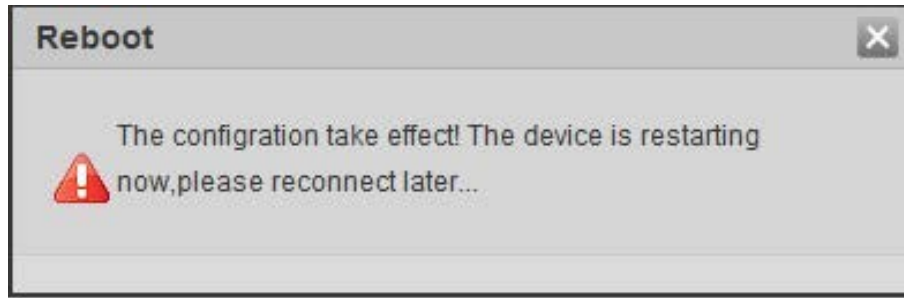


10. Click **Yes**, and then click **OK** on the pop-up window.
- If you select **install signed certificate**, follow the steps below.
    1. Select **Setting Safety > System > Safety > HTTPS**.
    2. Select **Enable HTTPS**, and **Compatible with TLSv1.1, and earlier versions**.
    3. Click **Browse** to upload the signed certificate, and certificate key, and then click **Upload**.
    4. To install the root certificate, see operation steps from [1.d](#) to [1.j](#) in **Create Certificate**.

Step 2 Select **Enable HTTPS**, and click **Confirm**.

The configuration takes effect until the Camera restarts.

Figure 2-88 Restart device



**Step 3** Use HTTPS to log in to the Camera.

1. Enter `https://xx.xx.xx.xx` in the browser.



`xx.xx.xx.xx` is the device IP address or domain name.

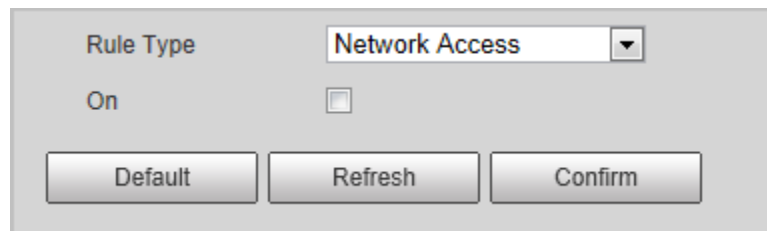
2. Enter the username, and password to log in to the Camera.  
The browser will prompt certificate error if certificate is not installed.

### 2.5.6.3.3 Firewall

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

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

Figure 2-89 Firewall



**Step 2** Select **Rule Type**.

- **Network Access:** Add the IP address to allowlist or blocklist to allow or restrict it to access corresponding ports of the device.
- **PING Prohibited:** IP address of your camera is prohibited from ping. This helps prevent attempt of accessing your network system without permission.
- **Prevent Semijoin:** Prevents half-open SYN attacks.

**Step 3** Select **On** to enable the selected rule type.

**Step 4** Click **Confirm**.

### 2.5.6.4 Default Settings

You can restore the device to default settings or factory defaults.

Select **Setting > System > Default**, and then select **Default** or **Factory Default** as needed.

- **Default:** Restore your settings to default value. In this case, network IP address information of the Camera will not restore to default settings.
- **Factory Default:** Restore the system to factory default settings. In this case, the Camera will restart, and you need to initialize the Camera before any further operation.

## 2.5.6.5 Import/Export

Export the system configuration file to back up the system configuration; import system configuration file to make quick configuration or recover system configuration.

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

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

- **Import:** Import the local system configuration file to the system.
- **Export:** Export associated configuration to local, and save as file whose suffix is .backup.

Step 3 Select the imported file path or exported folder.

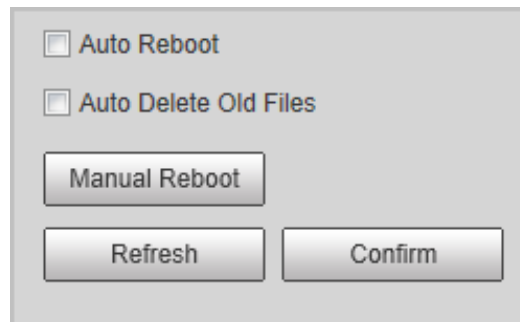
Step 4 Click **Open** or **Save**, and view import and export result on the web page.

## 2.5.6.6 System Maintenance

You can set the time of auto restart, and automatically delete old files.

Step 1 Select **Setting > System > Auto Maintain**.

Figure 2-90 Auto maintain



Step 2 Configure parameters.

Table 2-34 Auto maintain parameter description

Parameter	Description
Auto Reboot	<ul style="list-style-type: none"> <li>• Select <b>Auto Reboot</b>, and then set the restart period, and time.</li> <li>• The system will automatically restart within the defined period and time.</li> </ul>
Auto Delete Old Files	Customize time, and delete all the old files before the time.
Manual Reboot	Manually restart the Camera.

Step 3 Click **Confirm**.

Step 4 Click **Emergency Maintenance**, and then select **On** to enable emergency maintenance of the Camera.

Step 5 Click **Save**.

## 2.5.6.7 System Upgrade

Upgrade system of the Camera to keep it always up to date. You can upgrade the system by using upgrade file or through online upgrade.



- Upgrading the wrong program might result in the Camera not working properly.
- During upgrading, do not disconnect the Camera from power and network, or restart or shut down the web.

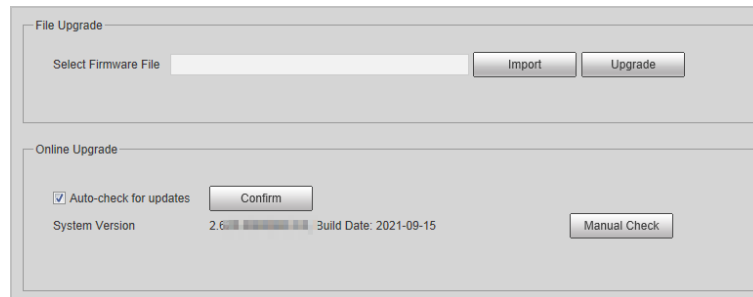
**Step 1** Select **Setting > System > Upgrade**.

**Step 2** Click **Import**, and import upgrade file (.bin).

**Step 3** Click **Upgrade**.

The system starts to upgrade firmware.

Figure 2-91 System upgrade



**Step 4** Click **Manual Check** to manually check the system version.

## 2.5.7 Information

You can view system information such as version, user, and log, and more.

### 2.5.7.1 Version


You can view the version information of the Camera.

Select **Setting > Information > Version**.



- Versions of different devices might vary depending on the actual web page.
- Algorithm recognition is available when algorithm is authorized (when the icon is displayed in green). If algorithm is not authorized, the Camera will not be able to recognize vehicle series, model, and logo. License plate recognition is always supported.

Figure 2-92 Version

Device Type	ITC215-PW6M-IRLZF-C2
Hardware Version	1.00
Algorithm Version	V3.0  Algorithm is authorized
System Version	2.62
Software Version	2.62
Soft Build Time	2021-09-15 10:00:00
WEB Version	3.1.6
S/N	7F04
Security Baseline	V2.1
Version	
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## 2.5.7.2 Log

### 2.5.7.2.1 System Log

You can view log information such as system, configuration, data, event, record and user management.



The earliest log records will be overwritten when the number of log records reaches 1024.

**Step 1** Select **Setting > Information > Log > Log**.

**Step 2** Enter **Start Time**, and **End Time**, and then select log type.

**Step 3** Click **Search**.

Figure 2-93 Log

The screenshot shows a web interface for viewing system logs. At the top, there are input fields for 'Start Time' (2021-09-26 16:35:06) and 'End Time' (2021-09-27 16:35:06), a 'Type' dropdown menu set to 'All', and a 'Search' button. Below these is a search result summary: 'Find 138 log Time 2021-09-27 11:01:13 -- 2021-09-27 16:17:06'. The main part of the interface is a table with the following columns: 'No.', 'Log Time', 'Username', and 'Log Type'. The table contains 10 rows of log entries. Below the table is a 'Detailed Information' section with fields for 'Time:', 'Username:', 'Type:', and 'Content:'. At the bottom right of the interface are navigation controls: '1/2' and a '1' button.

No.	Log Time	Username	Log Type
1	2021-09-27 16:17:06	System	Event Begin
2	2021-09-27 16:17:06	System	Event End
3	2021-09-27 16:17:05	System	Lock Account
4	2021-09-27 16:15:30	System	Event Begin
5	2021-09-27 16:15:30	System	Event End
6	2021-09-27 16:15:20	System	Event Begin
7	2021-09-27 16:15:20	System	Event End
8	2021-09-27 16:15:20	System	Event Begin
9	2021-09-27 16:15:20	System	Event End
10	2021-09-27 16:15:13	System	Event Begin

**Step 4** Click a searching result to view its details.

### 2.5.7.2.2 Remote log

You can save your important logs to log server. This helps provide important clues to the source of security incidents. Log server needs to be deployed in advance by a professional or system administrator.

**Step 1** Select **Setting > Information > Log > Remote Log**.

Figure 2-94 Remote log

The screenshot shows the 'Remote Log' configuration interface. It starts with a checkbox labeled 'On'. Below it are three input fields: 'IP Address' with the value '192 . 168 . 0 . 108', 'Port' with the value '514' and a range '(1~65534)', and 'Device Number' with the value '22' and a range '(0~23)'. At the bottom are three buttons: 'Default', 'Refresh', and 'Confirm'.

**Step 2** Select **On** to enable remote log.

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

**Step 4** Click **Confirm**.

### 2.5.7.3 Online User

Select **Setting > Information > Online User** to view the information of all the online users.  
Click **Refresh** to view the latest status.

Figure 2-95 Online user

No.	Username	User Local Group	Address	User Login Time	Login Type
1	admin	admin	172.24.2.188	2021-09-27 10:59:46	DVRIP
2	admin	admin	10.34.98.132	2021-09-27 16:40:19	Web3.0
3	admin	admin	10.34.98.132	2021-09-27 16:40:20	DVRIP

Refresh

### 2.5.7.4 Running Status

Select **Setting > Information > Running Status** to view the system running status.  
Click **Refresh** to get the latest details.

Figure 2-96 Running status

CPU Used	94%
Number of CPUs	1
Total Working Time	11 day(s) 2 hour(s) 55 minute(s)
Running Time After Power on	9 day(s) 0 hour(s) 26 minute(s)
Update Times	2

Refresh

## 2.6 Alarm

Click the **Alarm** tab, and then you can select alarm type, operation, and alarm tone.

Figure 2-97 Alarm

<b>Alarm Type</b> <input type="checkbox"/> Storage Full <input type="checkbox"/> External Alarm <input type="checkbox"/> Blocklist <input type="checkbox"/> Security Exception <input type="checkbox"/> Storage Error <input type="checkbox"/> No Storage <input type="checkbox"/> Illegal Access	<b>Operation</b> <input type="checkbox"/> Listen Alarm	<b>Alarm Tone</b> <input type="checkbox"/> Play Alarm Tone	<b>Tone Path</b> <input type="text"/> <input type="button" value="Choose"/>	
<b>No.</b>	<b>Time</b>	<b>Alarm Type</b>	<b>Alarm Channel</b>	<b>Source Ip</b>

Table 2-35 Alarm parameters description

Type	Parameter	Description
Alarm Type	Storage Full	It triggers alarm when storage card is full.
	Storage Error	It triggers alarm when storage card fault occurs.
	External Alarm	It generates alarm through peripheral device when alarm is triggered.
	No Storage	It triggers alarm when there is no storage card.
	Blocklist	It triggers alarm when the blocklist vehicle appears.
	Illegal Access	It triggers alarm when the times of login password error reach the max value.
	Security Exception	It triggers alarm when there is security exception.
Operation	Listen Alarm	The web will prompt user when device alarm occurs.
Alarm Tone	Play Alarm Tone	It generates alarm prompt tone when alarm occurs. Alarm tone supports customized settings.
	Tone Path	The path of customized alarm tone.

## 2.7 Logout

Click **Logout** to exit the system. You need to log in again for access.

### 3 FAQ

Question	Solution
Device error, unable to start or operate normally	Press and hold the Reset button for 5 seconds to restore the Camera to factory default settings.
TF card hot swapping	Stop recording, and image capturing, and then wait for at least 15 seconds before removing the TF card. This helps ensure data integrity, and avoid losing all the data of the card.
TF card read/write limit	Do not set the TF card as the storage media of pre-set recording. It might reduce the TF card duration.
TF card cannot be used as storage media	When the TF card hibernates or its capacity is null, format the card through web first.
Network upgrade failed	Check whether the right upgrade program (such as version, compatibility) is used.
Recommended TF card	We recommend you use TF card of 16 GB or larger. This helps avoid data loss arising from insufficient capacity. You can use card of 16 GB, 32 GB, 64 GB, and 128 GB.
Failed to pop up the installation dialog box of web control webrec.cab	Set the security level of IE browser as <b>Low</b> , and <b>Active Plug-in, and Control</b> is set as <b>Enable</b> .



# Appendix 1 Cybersecurity Recommendations

## **Mandatory actions to be taken for basic equipment 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 equipment (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 equipment 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 equipment network security:**

### **1. Physical Protection**

We suggest that you perform physical protection to equipment, especially storage devices. For example, place the equipment 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 equipment (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 equipment, 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 equipment 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 equipment, 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 equipment 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.