Thermal Network Camera

Web Operation Manual

V2.0.4

Foreword

General

This user's manual (hereinafter referred to as "the Manual") introduces the characteristics, basic configurations, daily operation and maintenance of the thermal camera (hereinafter referred to as "the Camera"). Read carefully before using the device, and keep the manual safe for future reference. This manual is mainly for the thermal cameras such as bullet camera, explosion-proof bullet cameras, anti-corrosion bullet cameras, eyeball cameras, cube cameras, and intrinsic safety cameras.

Ports

The Manual is mainly about on the web page, how to operate your Camera. For description of ports such as ports connection and ports debugging, contact technical staffs.

Safety Instructions

The following signal words might appear in the manual.

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

Revision History

Version	Revision Content	Release Time
V2.0.4	• Updated "Configuring Temperature Measurement Rules". • Updated "Configuring IVS". • Add "Configuring Temperature Information". • Add "Packet capture".	November 2024
V2.0.3	• Updated "Configuring IVS". • Updated "Temperature Measurement". • Updated "Configuring Heat Warning".	April 2024
V2.0.2	• Updated "Configuring Heat Warning". • Updated "Configuring IVS".	November 2023
V2.0.1	Updated "Playback".	March 2023

Version	Revision Content	Release Time
V2.0.0	• Updated some pictures in the document. • Updated "Smart Thermal"	December 2022
V1.0.3	• Modified function of safety management. • Modified parameters of camera. • Updated some pictures in the document. • Added GDPR requirements.	July, 2018
V1.0.2	• Added Camera initialization. • Updated some pictures in the document. • Added description of reserved spots' input and output. • Added safety management.	February, 2017
V1.0.1	Added "Cybersecurity Recommendations".	October, 2017
V1.0.0	First release.	January, 2017

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.

Statement

About the Manual

To simplify the description, the following conventions are made in this manual for common functions, names, and more.

- This manual is suitable for multiple models of products, and functions and pages vary from models. This manual uses the hybrid camera for example. The monocular camera does not support the functions of the visible channel.
- To protect personal privacy and security, personal information such as faces and license plates appearing in this document has been masked.
- To ensure the security of devices, the IP address, MAC address, serial number and other information appearing in this document have been masked.

About the Format

Format	Description	Example
>	Menu cascade.	Select **Setting** > **Smart Thermal** > **IVS**.
Bold	Page names, control names, specification terms, and more.	Click **Add Excluded Area** to draw an excluded area on surveillance image. Right-click to end drawing.

About the Icon/Button

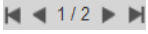
Icon/Button	Description
	Text box. You can enter numbers, letters, Chinese characters, symbols and other characters.
	Drop-down box. Click the icon to display the drop-down menu.
	Calendar. Click  , and then select the date as needed.
	Click the icon to select the corresponding item.  indicates that the item is selected. Click to cancel the selection.
	Click the icon to select the corresponding item.
	• Click  to go to the previous or next page. • Click  to go to the first or last page.
	Adjust the value. Click  or drag  to adjust the value.
	Click the button to save the configuration.
	Click the button to display the latest configuration.
	Click the button to restore the configuration to the factory configuration.

Table of Contents

Foreword I

Statement III

1 Product Introduction 1

1.1 Overview 1

1.2 Features 1

1.3 Functions 2

2 Configuration Flow 7

3 Basic Settings 8

3.1 Initializing Camera 8

3.2 Changing IP Address 9

3.2.1 Changing One IP Address 9

3.2.2 Changing Several IP Addresses 10

3.3 Logging in to Web Page 11

3.4 Resetting Password 12

4 Daily Operation 14

4.1 Live 14

4.1.1 Introduction to Live Page 14

4.1.2 Function Bar 15

4.1.3 Window Adjustment 16

4.1.3.1 Image Adjustment 16

4.1.3.2 Display of Rule Information 16

4.1.3.3 Optical Axis Calibration 17

4.1.3.4 Real-time Reports 17

4.1.4 Real-time Spot Temperature Measurement 17

4.1.5 Laser Ranging 18

4.2 PTZ 18

4.2.1 Configuring Protocol 19

4.2.2 Configuring PTZ Functions 19

4.2.2.1 Configuring Preset 19

4.2.2.2 Configuring Scan 20

4.2.2.3 Configuring Tour Group 20

4.2.2.4 Configuring Pattern 21

4.2.2.5 Turing on Wiper 22

4.2.3 Operating PTZ 22

4.3 Playback 23

4.3.1 Prerequisite 23
4.3.2 Playback Page 24
4.3.3 Playing back Video or Picture 25
4.3.4 Clipping Video 27
4.3.5 Downloading Video or Picture 27
4.4 Reports 27
4.5 Alarm 28
4.5.1 Introduction to Alarm Types 28
4.5.2 Subscribing Alarm Information 29
5 AI function 31
5.1 Event 31
5.1.1 Configuring Alarm 31
5.1.1.1 Configuring Alarm-in 31
5.1.1.2 Configuring Alarm Linkage 34
5.1.1.2.1 Setting Period 34
5.1.1.2.2 Record Linkage 35
5.1.1.2.3 Snapshot Linkage 35
5.1.1.2.4 Alarm-out Linkage 35
5.1.1.2.5 Email Linkage 36
5.1.1.2.6 Audio Linkage 36
5.1.1.2.7 Warning Light Linkage 36
5.1.2 Configuring Video Detection 37
5.1.2.1 Configuring Motion Detection 37
5.1.2.2 Configuring Video Tampering 38
5.1.2.3 Configuring Scene Changing 39
5.1.3 Configuring Audio Detection 40
5.1.4 Configuring Abnormality 41
5.1.4.1 Configuring SD Card Abnormality 41
5.1.4.2 Configuring Network Abnormality 42
5.1.4.3 Configuring Illegal Access 42
5.1.4.4 Configuring Burn Alarm 43
5.1.4.5 Configuring High Humidity Alarm 44
5.1.4.6 Configuring Security Exception 44
5.1.5 Configuring Disarming 45
5.2 Temperature Measurement 46
5.2.1 Note 46
5.2.2 Configuration Flow 46
5.2.3 Configuring Thermal Image 46

5.2.4 Configuring Burn Alarm 49
5.2.5 Configuring Temperature Measurement Parameters 50
5.2.5.1 Configuring Temperature Measuring Rules 50
5.2.5.2 Configuring Temperature Contrast 53
5.2.5.3 Configuring Shield Area 54
5.2.5.4 Configuring Global Setup 54
5.2.6 Configuring Temperature Alarm 56
5.2.7 Verification 57
5.2.8 Isotherm 59
5.3 Configuring IVS 60
5.3.1 Installation Requirements on Perimeter Protection 60
5.3.1.1 Site Selection 60
5.3.1.2 Typical Scenes 61
5.3.1.3 Scene Confirmation 62
5.3.2 Configuration Flow 63
5.3.3 Configuring Smart Plan 63
5.3.4 Configuring Intelligent Rules 64
5.3.5 Configuring Global Setup 67
5.3.6 Configuring Rule Group 68
5.4 Call Detection 68
5.4.1 Configuration Flow 69
5.4.2 Configuring Smart Plan 69
5.4.3 Configuring Detection Rule 69
5.4.4 Configuring Global Setup 70
5.5 Smoking Detection 71
5.5.1 Configuration Flow 71
5.5.2 Configuring Smart Plan 71
5.5.3 Configuring Detection Rule 72
5.5.4 Configuring Global Setup 73
5.6 Configuring Heat Warning 74
5.6.1 Configuring Heat Rule 74
5.6.2 Configuring Smoke and Heat Detection Mode 75
5.7 Configuring Hot Trace 76
5.8 Configuring Pic in Pic 78
5.9 Configuring Thermal Map Acquisition 78
6 Setting 80
6.1 Configuring Camera 80
6.1.1 Configuring Camera Conditions 80

6.1.1.1 Configuring Visible Image 80
6.1.1.1.1 Configuring Picture Parameters 80
6.1.1.1.2 Configuring Exposure Parameters 82
6.1.1.1.3 Configuring Backlight Parameters 84
6.1.1.1.4 Configuring White Balance Parameters 85
6.1.1.1.5 Configuring Day & Night Parameters 85
6.1.1.1.6 Configuring Defog Parameters 86
6.1.1.2 Configuring Thermal Image 87
6.1.1.3 Configuring Defective Pixel Correction 92
6.1.1.4 Configuring Profile Management 92
6.1.2 Configuring Video Parameters 93
6.1.2.1 Configuring Video Streaming 93
6.1.2.2 Configuring Image Streaming 95
6.1.2.3 Configuring Video Overlay 96
6.1.2.3.1 Configuring Privacy Masking 96
6.1.2.3.2 Configuring Channel Title 97
6.1.2.3.3 Configuring Time Title 98
6.1.2.3.4 Configuring Text Overlay 98
6.1.2.3.5 Configuring Font 99
6.1.2.3.6 Configuring Picture Overlay 100
6.1.2.3.7 Configuring Voltage Information 101
6.1.2.3.8 Configuring Temperature Information 102
6.1.2.4 Configuring ROI 102
6.1.2.5 Configuring Storage Path 103
6.1.3 Configuring Audio 104
6.1.3.1 Configuring Audio Parameters 104
6.1.3.2 Configuring Alarm Audio 106
6.2 Configuring Network 107
6.2.1 Configuring TCP/IP 107
6.2.2 Configuring Port 109
6.2.3 Configuring PPPoE 111
6.2.4 Configuring DDNS 112
6.2.5 Configuring SMTP 113
6.2.6 Configuring UPnP 114
6.2.7 Configuring SNMP 115
6.2.8 Configuring Bonjour 118
6.2.9 Configuring Multicast 118
6.2.10 Configuring Auto Registration 119

6.2.11 Configuring 802.1X 120
6.2.12 Configuring QoS 120
6.2.13 Platform Access 121
6.2.13.1 P2P 121
6.2.13.2 ONVIF 122
6.2.13.3 RTMP 123
6.3 Storage 124
6.3.1 Configuring Schedule 124
6.3.1.1 Configuring Record Plan 124
6.3.1.2 Configuring Snapshot Plan 125
6.3.1.3 Configuring Holiday Schedule 126
6.3.2 Configuring Storage Method 127
6.3.2.1 Configuring Storage Path 127
6.3.2.2 Configuring Local Storage 128
6.3.2.3 Configuring FTP Server 128
6.3.2.4 Configuring NAS Server 129
6.3.3 Setting Record Control 130
6.4 Peripheral 131
6.4.1 Configuring Illuminator 131
6.4.2 Configuring Wiper 131
6.4.3 Configuring Fan 132
6.4.4 Configuring Heater 132
6.5 System Management 133
6.5.1 General Settings 133
6.5.1.1 Configuring General Information 133
6.5.1.2 Configuring Date and Time 133
6.5.1.3 Configuring Position System 134
6.5.2 User Management 135
6.5.2.1 Adding a User 135
6.5.2.2 Adding a Group 138
6.5.2.3 Modifying User Password 139
6.5.3 Adding ONVIF User 141
6.5.4 Safety Management 141
6.5.4.1 Configuring RTSP Authentication 141
6.5.4.2 Configuring System Service 142
6.5.4.3 HTTPS 143
6.5.4.4 Firewall 148
7 System Maintenance 150

7.1 Maintenance Requirements 150
7.2 Maintenance Management 150
7.2.1 Auto Maintenance 150
7.2.2 Emergency Maintenance 151
7.2.3 Packet Capture 151
7.3 Backing Up and Restoring 151
7.3.1 Importing and Exporting 151
7.3.2 Default Settings 152
7.4 Upgrading Firmware 152
7.5 Information 153
7.5.1 Version 153
7.5.2 Log 153
7.5.3 Remote Log 154
7.5.4 Online User 155
7.5.5 Legal Information 155
Appendix 1 Cybersecurity Recommendations 156

1 Product Introduction

1.1 Overview

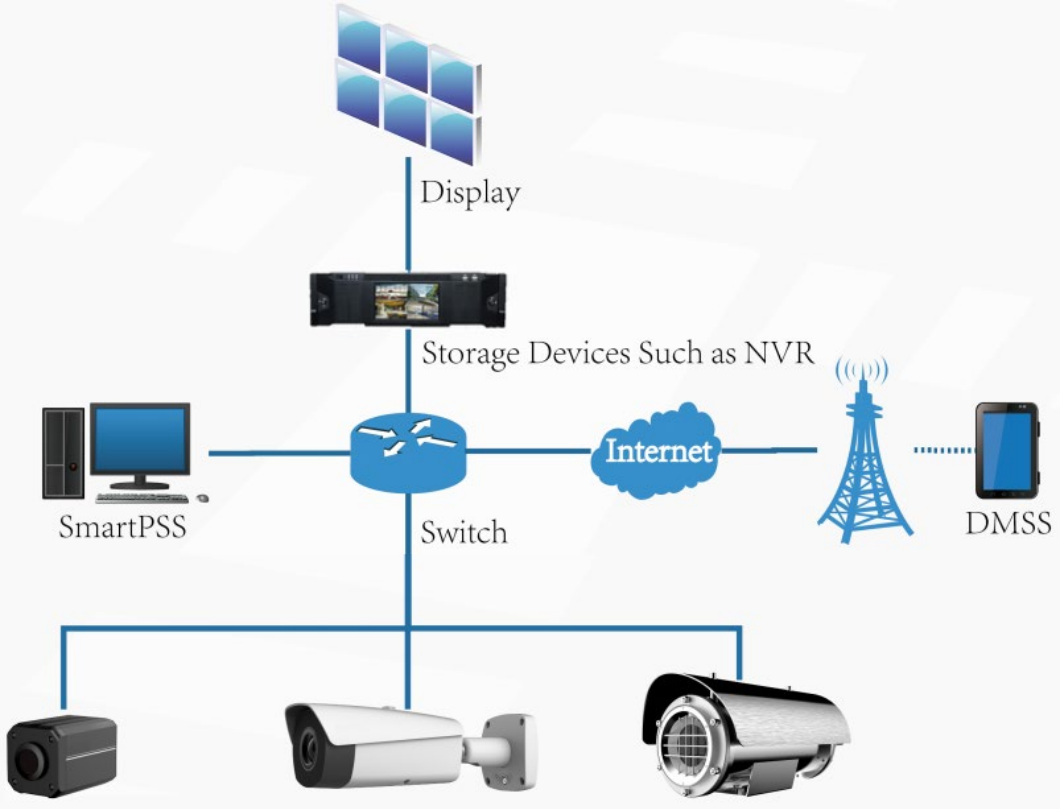
The Camera is based on requirements such as temperature measurement, fire prevention, safety protection and night vision. It can help you view videos, record videos of objects, measure temperature, warn the potential fire, track a cold/hot spot and analyze a special behavior. The Camera can be used in energy industry, transportation, building, power system, public security, government, enterprises, and other fields (such as science, education, culture and health). You can use the Camera alone or combine the Camera with other storage devices to provide solutions for intelligence city, production safety, safety protection of residential buildings and public area safety.

1.2 Features

- Safe and stable.
- With a full embedded system, this Camera can implement all-day monitoring in a stable way.
- A long detection distance.
- Wide monitoring range and long detection distance. Used for surveillance of wide range and long distance.
- Strong detection ability.
- With night vision ability, this Camera can clearly distinguish different objects in the dark and can tell camouflage and hidden objects.
- Strong anti-interference ability.
- This Camera can get rid of interference of light intensity under backlight or strong light environment.
- Adaptive capacity to complex environment.
- Applicable to such environment as smoke, smog, rain, snow, and dust which will block your eyes and is very confusing in colors.

This product can be used in various scenarios and the "small application scenarios" is used as an example here for detailed description. See Figure 1-1.

Figure 1-1 Application scenarios



1.3 Functions

Live

Table 1-1 Function description

Function	Description
Live	You can view both the visible images and thermal images. You can use thermal images to identify an object, and then use visible images to view more details of the object.
PTZ operation	For cameras with an external PTZ, you can set the PTZ functions such as preset, tour and pattern, to enlarge the surveillance range and identify details of an object.
Voice intercom	For cameras with voice intercom function, you can talk indoors with a person near the outdoor monitor to facilitate problem solution.
Snapshot	During live view, you can capture an abnormal image for further check and handling.
Local recording	During live view, you can record abnormal images for further check and handling.
Reports	For cameras with the temperature measurement function, you can check the real-time temperature data of the monitoring area.
Real-time spot temperature measurement	For cameras with the temperature measurement function, you can check the real-time temperature data of any spot in the monitoring area.

Function	Description
Laser ranging	For cameras with the laser ranging function, you can measure the distance between the Camera and the object in the middle of the image.
Additional functions	• Switch video bit stream or streaming protocol. • The visible image will be adjusted to the relevant location when you zoom in or out the thermal image. • Mark information as needed in the surveillance image. • Check whether there is any alarm output. • Magnify part of the surveillance image. Or, scroll the mouse to zoom the whole surveillance image. • You can help the Camera focus manually on the web page. • Set a smart rule. When the rule is broken and an alarm is triggered, you can track the target manually. • Adjust display effect of the surveillance images. • Enable or disable the intelligent rule display.

Playback

Table 1-2 Description of playback function

Function	Description
Manual recording	When playing back a video, you can record the key information of the video for further check and handling.
Planned recording	After you set a recording plan, the system will automatically record as scheduled.
Video playback and download	• Play back a video to find some valuable video fragments. • Download the valuable video fragments for further judgment.
Picture playback	Play back images that you have captured to find something valuable.
Alarm linkage	When there is an alarm, the system will automatically link the corresponding channel to record videos.

Report

Follow certain rules such as time sequence to check history data of temperature stored in the Micro SD card of the Camera.

Alarm

- Set prompting mode (sound, for example) based on the alarm type.
- View alarm information.

Account Management

Table 1-3 Function description

Function	Description
Management of user group	• Add, modify or delete an account group. • Manage user permissions based on user groups.

Function	Description
User Management	• Add, modify or delete a user account. • Set the user permissions.
Change password	Change users' password.

Peripheral Management

You can manage your camera's external devices such as heater, illuminator and wiper.

Smart Thermal

Table 1-4 Function description

Function	Description
IVS	• Both visible channel and thermal channel support intelligent rules, including tripwire and intrusion. • When there is an alarm, the system performs linkage actions such as video recording, alarm output, sending email, PTZ operation and capturing images. • Supports adding detection area and exclusion area.
Calling Behavior Detection	• Available in visible channel. • When the Camera detects calling behavior, an alarm is triggered, and the system performs linkage actions such as audio alarm, white light, sending email and recording.
Smoking Detection	• Available in visible channel. • When the Camera detects smoking behavior, an alarm is triggered, and the system performs linkage actions such as audio alarm, white light, sending email and recording.
Boat Detection	• Available in thermal channel. • When the Camera detects unexpected boat, an alarm is triggered, and the system performs linkage actions such as relay-out, sending email and recording.
Fire Warning	• Available in thermal channel. • When there is an alarm, the system performs linkage actions such as linkage video recording, alarm output, sending email, PTZ operation and capturing images.
Cold/hot spot tracking	• Only thermal channel can implement the cold/hot spot tracking operation. • Supports real-time display of the cold spot and hot spot by different colors on the live image. • When there is an alarm, the system performs linkage actions such as video recording, alarm output, sending email, PTZ operation and capturing images.
Picture in picture	• Only visible channel can implement the picture in picture operation. • You can put the thermal image into the visible image.

Event

Table 1-5 Function description

Function	Description
Video detection	• You can implement operation of motion detection and video masking detection. • When there is an alarm, the system performs linkage actions such as video recording, alarm output, sending email, PTZ operation and capturing images.
Audio detection	• Supports detection of input exception and mutation of acoustic intensity. • When there is an alarm, the system performs linkage actions such as video recording, alarm output, sending email, PTZ operation and capturing images.
Temperature alarm	• When temperature satisfies the alarm conditions of temperature testing rules, an alarm is triggered. • When there is an alarm, the system performs linkage actions such as linkage video recording, alarm output, sending email, PTZ operation and capturing images.
Alarm settings	• The alarm is triggered when there is an alarm from external cameras. • When there is an alarm, the system performs linkage actions such as video recording, alarm output, sending email, PTZ operation and capturing images.
Abnormality	• Supports detection of SD card, network abnormality and illegal access. • When there is SD card abnormality, network abnormality or illegal access, the system performs linkage actions such as video alarm output, and sending email. • When there is an alarm of network abnormality, the system performs linkage actions such as video recording, and alarm output.

Temperature Measuring Settings

This function is available on select models.

Table 1-6 Function description

Function	Description
Temperature measuring rules	• Supports measuring average temperature, maximum temperature and minimum temperature of spot, line, polygon and ellipse's. This function is available on select models. • Supports outputting alarm based on different conditions. • Supports setting different alarm output conditions to different objects that need to be measured.

Function	Description
Temperature contrast	• Supports temperature contrast of different objects that needs to be measured. • Supports outputting alarm based on different conditions. • Supports setting different alarm output conditions to different temperature contrast rules.
Heat map	Supports outputting real-time heat map information. Then, you can do the further analysis through the heat map tools.
Additional functions	• Supports enabling or disabling temperature testing rules. • Supports enabling or disabling isotherm. • Supports enabling or disabling color code articles.

2 Configuration Flow

For the device configuration flow, see Figure 2-1. For details, see Table 2-1. Configure the device according to the actual situation.

Figure 2-1 Configuration flow

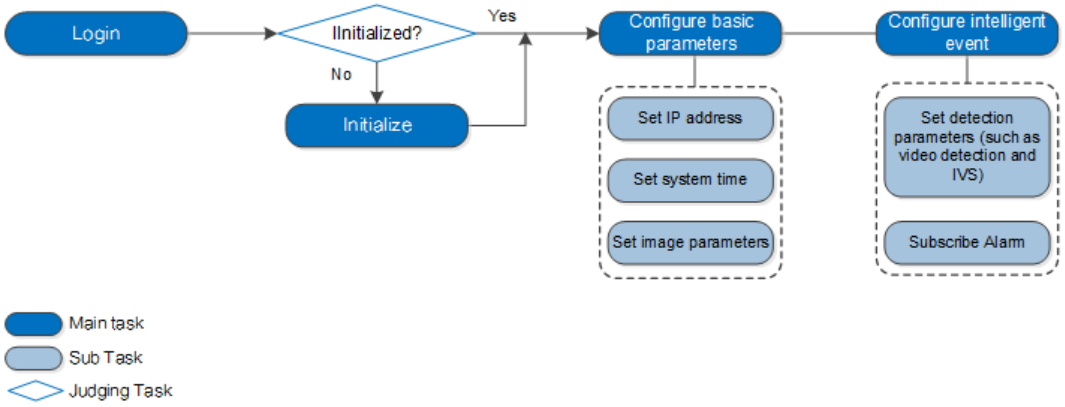


Table 2-1 Description of flow

Configuration		Description	Reference
Login		Open IE browser and enter IP address to log in to the web interface, The camera IP address is 192.168.1.108 by default.	"3.3 Logging in to Web Page"
Initialization		Initialize the camera when you use it for the first time.	"3.1 Initializing Camera"
Basic parameters	IP address	Change IP address according to network planning for the first use or during network adjustment.	"3.2 Changing IP Address"
	Date & time	Set date and time to ensure the recording time is correct.	"6.5.1.2 Configuring Date and Time"
	Image parameters	Adjust image parameters according to the actual situation to ensure the image quality.	"6.1.1 Configuring Camera Conditions"
Intelligent Event	Detection rules	Configure the necessary detection rules, such as video detection and IVS.	"5 AI function"
	Subscribe alarm	Subscribe alarm event. When the subscribed alarm is triggered, the system will record the alarm on the alarm tab.	"4.5.2 Subscribing Alarm Information"

3 Basic Settings

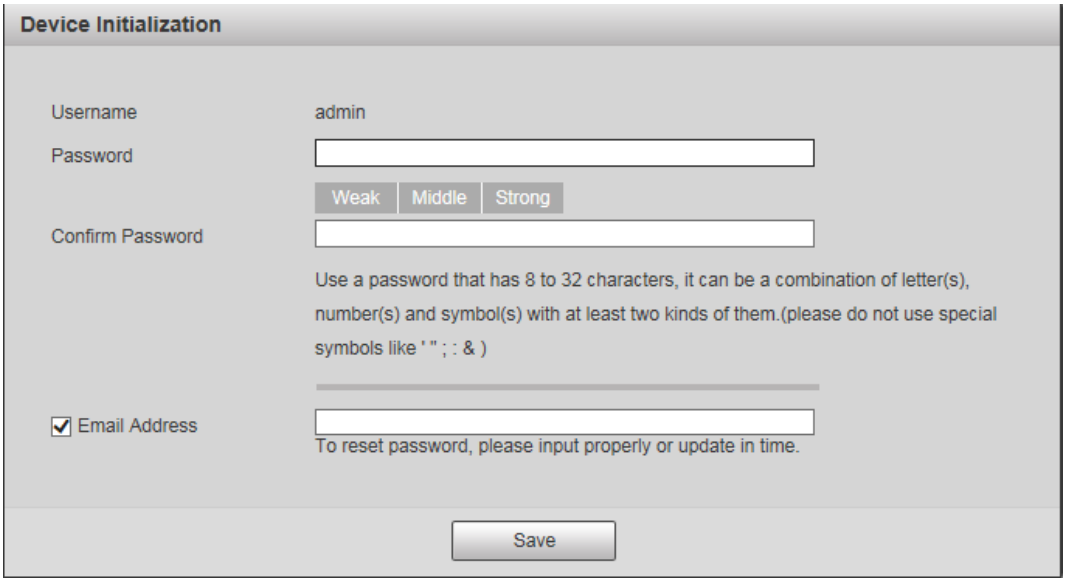
3.1 Initializing Camera

Initialize your Camera and set the user password when you are logging in for the first time or after you have restored your camera to default settings. Initialize the Camera by ConfigTool or through web page. This section takes web for example.

- Ensure your Camera IP address (192.168.1.108 by default) and the IP address of your computer are in the same network segment.
- To secure the Camera data, keep admin password well after initialization and modify it regularly.

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

Figure 3-1 Initializing camera



Step 2 Set the login password for admin account.

Table 3-1 Password setting description

Parameter	Description
Password	Enter your password and enter it again to confirm it. Use strong password. The password must consist of 8 to 32 non-blank characters and contain at least two types of characters among upper case, lower case, number, and special character (excluding ' " ; : &).
Confirm Password	
Email Address	Enter an email address to reset password when you forget it.

Step 3 Click **Save**.

3.2 Changing IP Address

Change the Camera IP address and ensure it is fitted to the actual network segment to get the Camera access network.

You can change one or several IP addresses through ConfigTool. You can also log in to the web to change IP addresses.

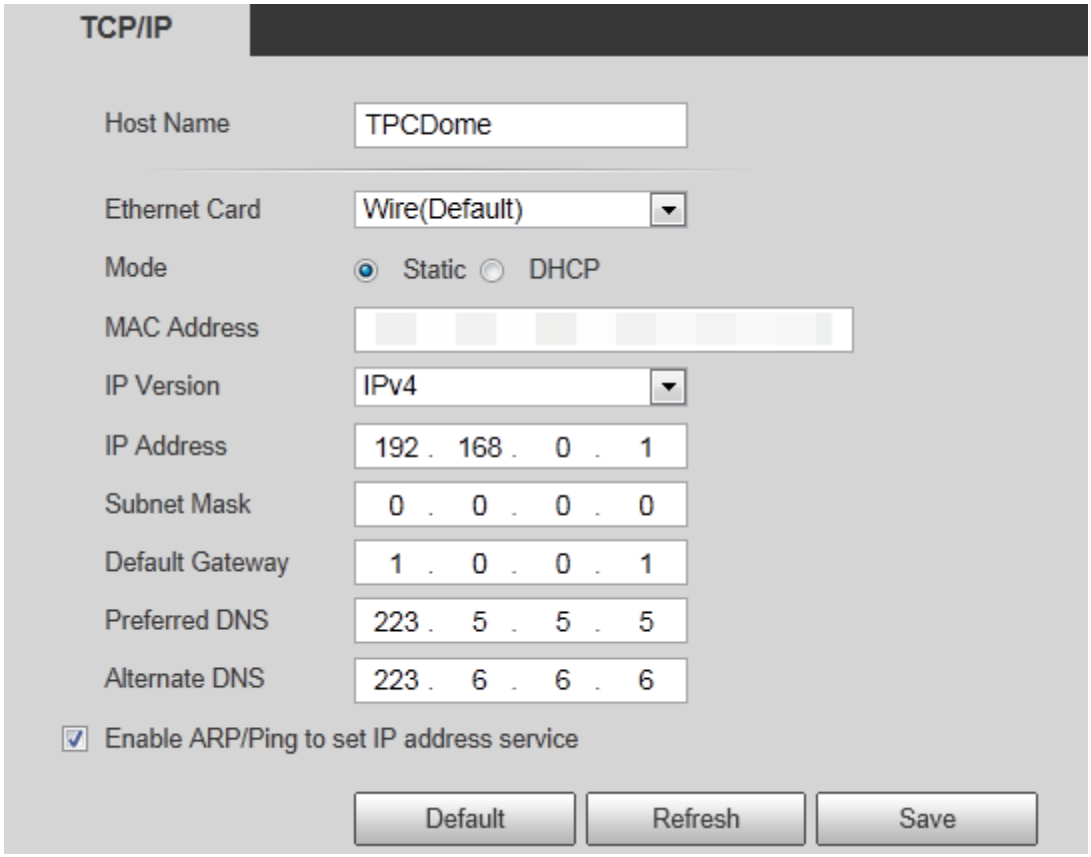
3.2.1 Changing One IP Address

When there are only a few cameras or the login passwords of the cameras are different, change one IP address at one time. The chapter uses logging in to web page to change IP addresses as an example.

Step 1 Log in to the Camera web page.

Step 2 Select **Setting** > **Network** > **TCP/IP**.

Figure 3-2 TCP/IP



Step 3 Configure TCP/IP parameters.

Table 3-2 TCP/IP parameters

Parameter	Description
Host Name	Give your Camera a name (TPCDome, for example) to help others, (a router operator, for example), know the camera information such as shape information—dome thermal camera.
IP Address, Subnet Mask and Default Gateway	Enter the three item values according to the actual network segment.

Parameter	Description
Ethernet Card, Mode, MAC Address, IP Version, Preferred DNS and Alternate DNS	Leave them as default.

Step 4 Click **Save**.

3.2.2 Changing Several IP Addresses

When there are several cameras and the login passwords of cameras are the same, you can change several IP address at the same time through the ConfigTool.

Prerequisites

- You have obtained the installation package of ConfigTool. To obtain the installation package, consult technical support staffs.
- You have connected the camera with the computer with ConfigTool installed.

Procedure

Step 1 Click .

Step 2 Click **Search Settings**.

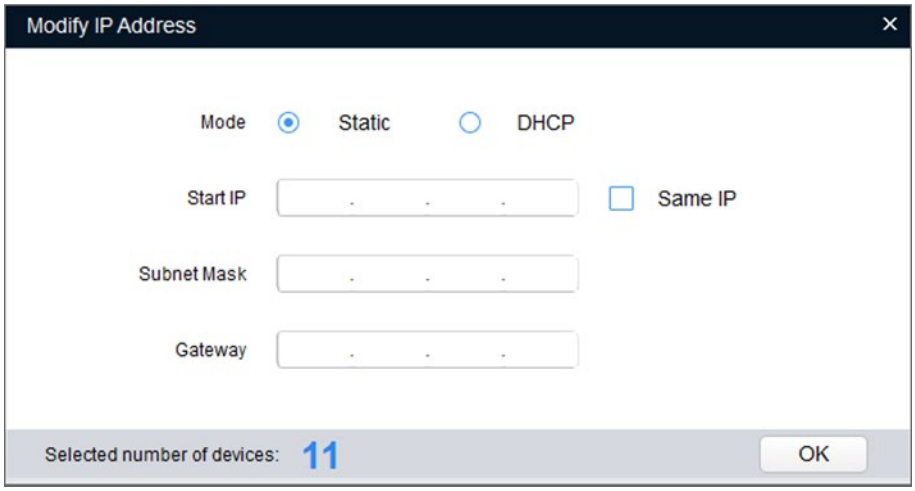
Step 3 Set the network segment of the Camera, admin and password. Then click **Save**.

After the search, the system displays the cameras that have been searched.

The user name and password are both admin by default.

Step 4 Select the cameras whose IP addresses need to be changed and click **Batch change IP**.

Figure 3-3 Change IP address



Step 5 Select the mode of IP address based on the actuality.

- DHCP mode: When there is a DHCP server in the network, set the **Mode** as **DHCP** and the Camera obtains IP addresses from the DHCP server automatically.
- Manual mode: Set **Mode** as **Static** and enter **Starting IP**, **Subnet Mask** and **Gateway**. Then, IP addresses of Cameras are incrementally modified from the start IP address.

Select the **Same IP** checkbox, the IP address of the selected devices will be set to the same one. You can use this function when setting the IP addresses to default in batches.

Step 6 Click **Save**.

3.3 Logging in to Web Page

After you have changed the IP addresses, you can log in to the web page of the Camera through a browser to operate, configure and maintain the Camera.

To log in to the Camera successfully, make sure that the computer connected to the Camera satisfies the following requirements.

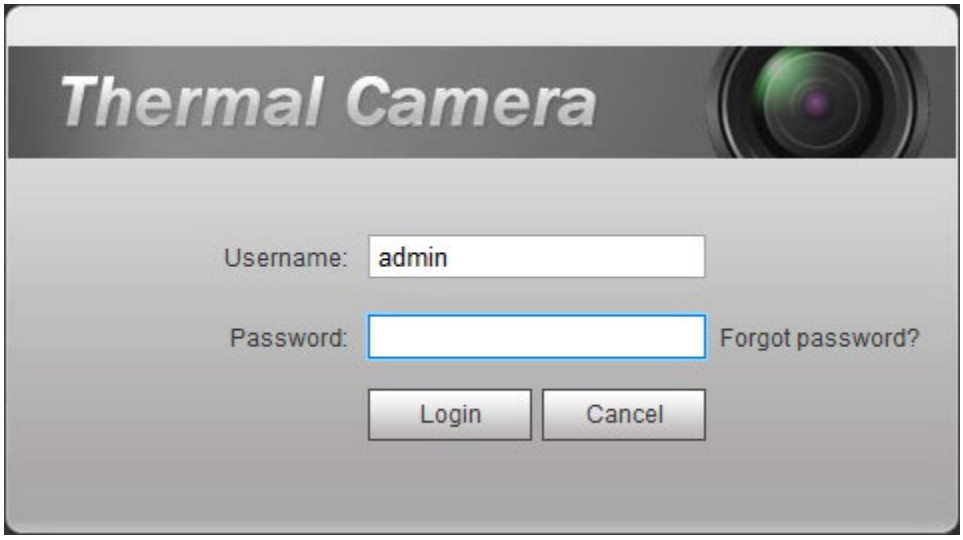
Table 3-3 Recommended PC configuration

PC items	Recommended configuration
Operation system	≥ Windows 7
CPU	≥ Intel core i3
Graphics card	≥ Intel HD Graphics
Storage	≥ 2GB
Display	≥ 1024 × 768 Resolution
Browser	Internet Explorer 9/10/11

Procedure

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

Figure 3-4 Login



Step 2 Enter username and password, and click **Login**.

- The user is admin by default. The password is the one that was configured during initialization.
- It will prompt you to install plug-in for the first system login. Please download and install plug-in according to the prompt.
- Functions might vary from different cameras.

Related Operations

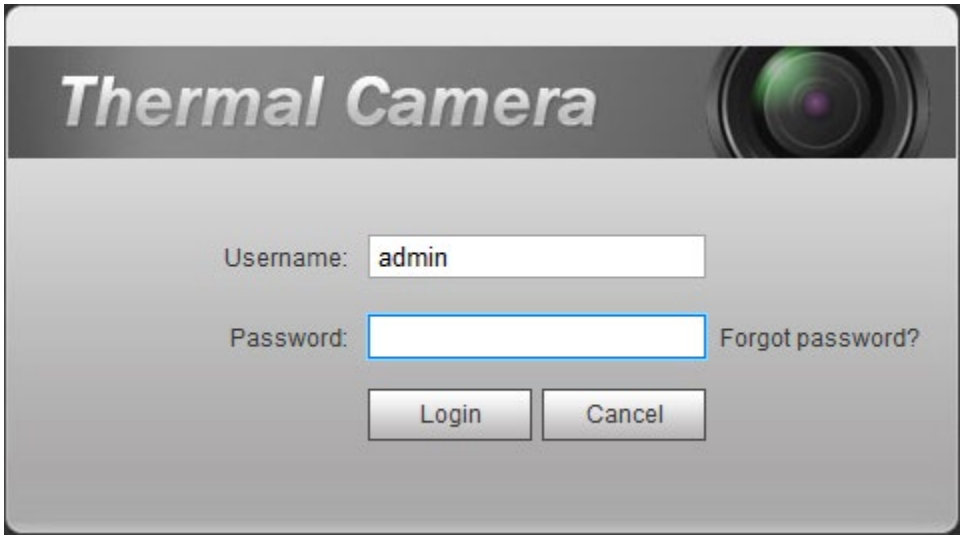
Click **Logout** on the upper right corner to exit the page.

3.4 Resetting Password

If you forget the password, you can use the reserved e-mail address to achieve password resetting.

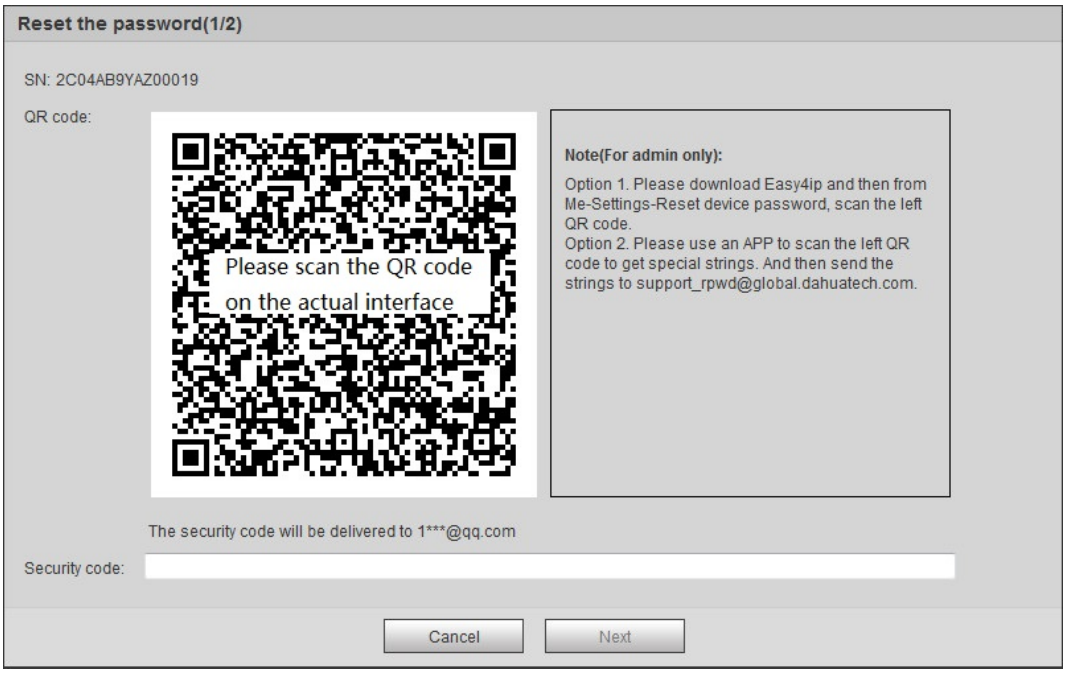
Step 1 Open IE browser, type the camera IP, and then press Enter.

Figure 3-5 Logging in the Camera



Step 2 Click **Forgot Password?**

Figure 3-6 Reset the password (1/2)



Step 3 Reset the password.

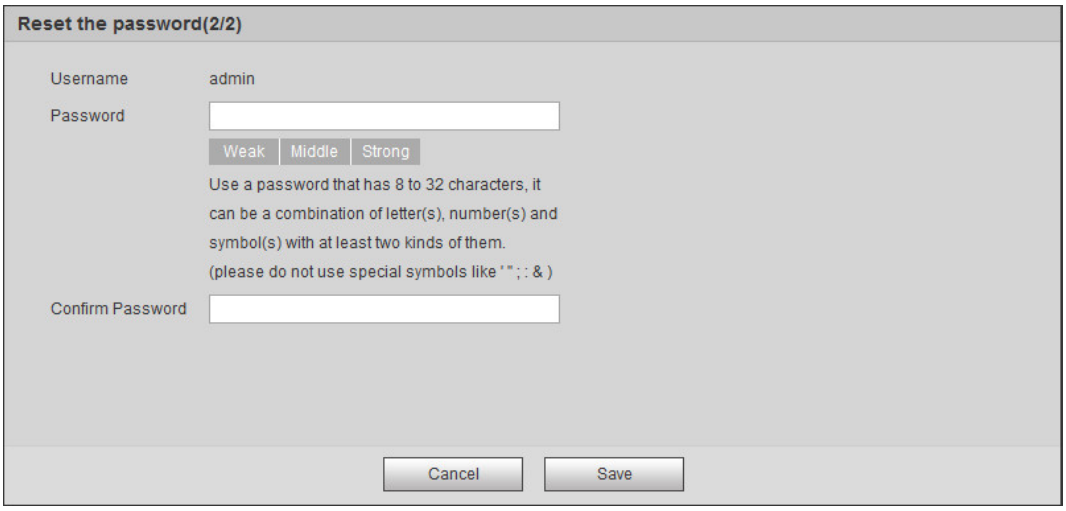
Scan the QR code, and the security code will be sent to the email address that you have configured. Type the security code.

- Reset the password in time when you receive the security code, because the security code will be invalid within 24 hours.
- If you get security codes twice but do not use them, when you get the security code for the third time, the system will prompt failure. To solve this problem, you need to

restore your Camera to default settings or wait 24 hours to get a new one.

Step 4 Click **Next**.

Figure 3-7 Resetting the password (2/2)



Step 5 Enter a new password and confirm it.

The password is made up of characters for 8–32 digits and the password must contain two of the three forms (number, letter, and the common characters. **'**, **"**, **;**, **:**, **&** are not included.) You should obey the prompt of the password's security level and set a password with high security level.

Step 6 Click **Save**.

The login page is displayed.

4 Daily Operation

4.1 Live

Cameras of different models might have different functions.

On the **Live** page, you can do operations to the real-time surveillance images such as viewing, capturing images and recording videos.

- Image channel with a box around is the one that you have selected. All your operations are valid only to this channel.
- Double-click an image channel and the image channel is displayed in a full video display area. Double-click the image channel again and the channel will be displayed in a full screen. Right-click the full-screen image and the image returns to its previous state.

4.1.1 Introduction to Live Page

Click the **Live** tab.

Figure 4-1 Live page

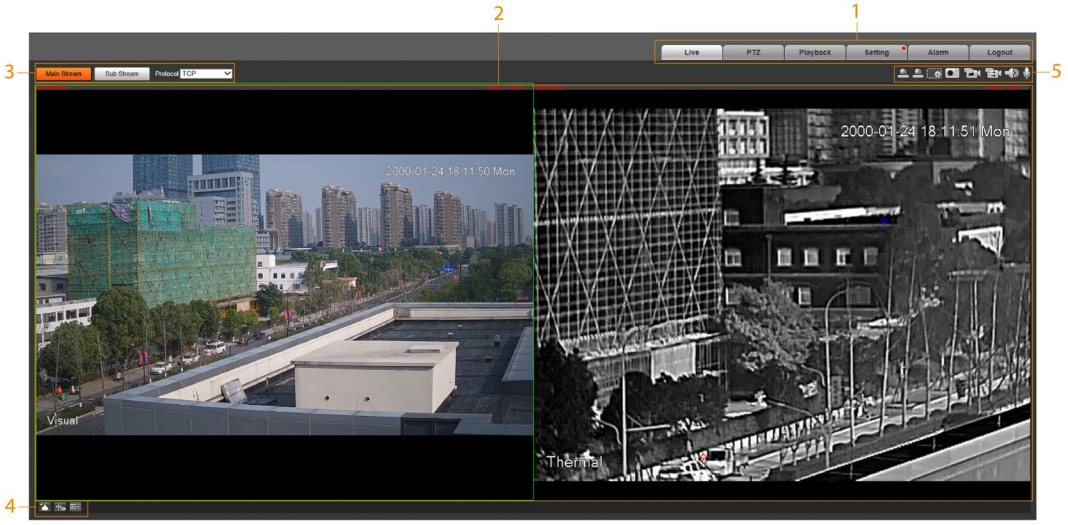


Table 4-1 Description of function bar

No.	Name	Description
1	System menu	Click each function tab in the system menu to go to the corresponding page.
2	Live view	Displays the real-time monitoring image.

No.	Name	Description
3	Encode bar	Select the bit stream type and streaming protocol when viewing a video. ● Main Stream: It has large bit stream value and image with high resolution, but also requires large bandwidth. This option is normally used for storage and surveillance. ● Sub Stream: It has small bit stream value and smooth image, and requires little bandwidth. This option is normally used to replace main stream when bandwidth is not enough. ● Protocol: A network transmission protocol, supports TCP (Transmission Control Protocol), UDP (User Datagram Protocol) and Multicast.
4	Adjustment bar of video window	For functions and operations on live view. For details, see "4.1.3 Window Adjustment".
5	Live view function bar	Supports adjusting clarity of video images, displaying intelligent rules, zooming with focusing at the same time, checking real-time reports. See "4.1.2 Function Bar".

4.1.2 Function Bar

Figure 4-2 Live view function

Table 4-2 Live view function description

Icon	Name	Description
	Relay-out	Shows alarm output state. Click the icon to force enable or force disable alarm output. Alarm output state description: ● Red: Alarm output. ● Grey: Alarm over.
	Zoom in	You can zoom in video image with two operations: ● Click the icon to enlarge part of visible light or thermal images. Right-click to resume. ● Click the icon to zoom a video image by scrolling the mouse.
	Snapshot	Click the icon to capture a live image and save it under the path you have set. To check or change the storage path, see "6.3.2.1 Configuring Storage Path".

Icon	Name	Description
	Single-channel video recording	Select visible image or thermal image. Then click this icon to start video recording. To check or change the storage path, see "6.3.2.1 Configuring Storage Path".

4.1.3 Window Adjustment

Figure 4-3 Window adjustment

4.1.3.1 Image Adjustment

Adjust brightness, contrast, hue and saturation of video images on the web page.

Click , and the **Image Adjustment** page is displayed at the right side of the live page.

Figure 4-4 Image adjustment page

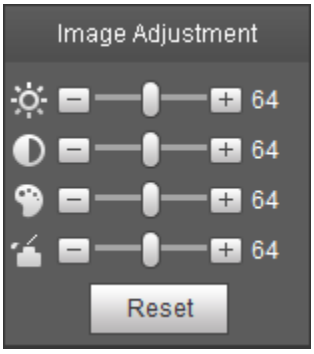


Table 4-3 Image adjustment configuration

Icon	Function	Description
	Brightness	Adjusts the overall image brightness, change the value when the image is too bright or too dark. The bright and dark areas have equal changes.
	Contrast	Change the value when the image brightness is proper but contrast is not enough.
	Hue	Makes the color deeper or lighter. The default value made by the light sensor is recommended.
	Saturation	Adjusts color depth. This value does not change the overall image brightness.
Reset	Reset	Click the icon to reset brightness, contrast, hue and saturation to their default values.

4.1.3.2 Display of Rule Information

You can control whether rule information is displayed on the live page. The rule information is displayed by default.

After configuring the AI functions, click , and then select the **Enable** checkbox to display rule

information and detection box; select the **Disable** checkbox to hide the rule information and detection box.

4.1.3.3 Optical Axis Calibration

Used only for calibrating the Camera lens when the Camera is being debugged in the factory. You do not need to operate this function.

4.1.3.4 Real-time Reports

Records the changes of the average temperature of the spot, lines and area that you have selected within the configured time. This function is available on Cameras with the temperature measurement function.

Prerequisites

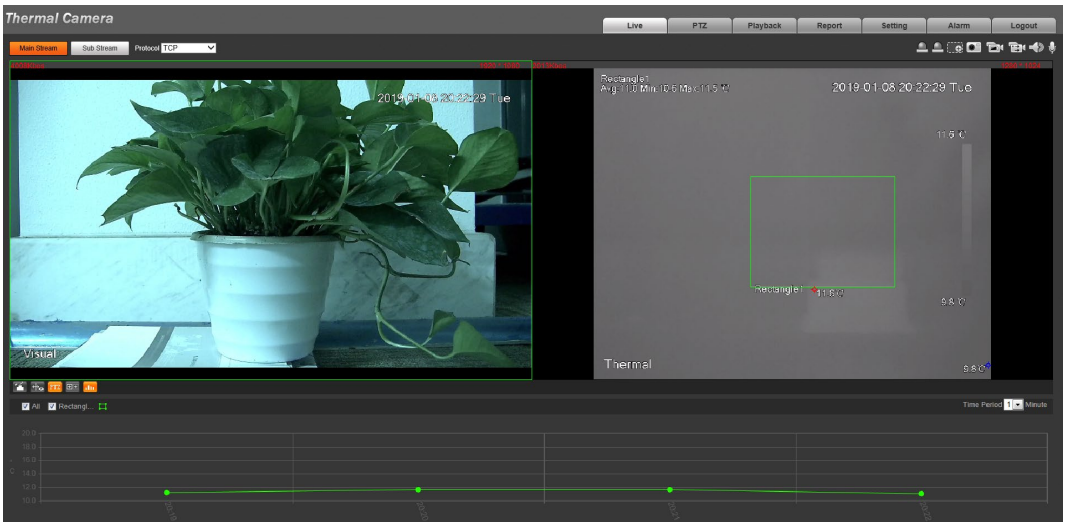
You have configured the temperature measurement rules. For detailed operation, see "5.2.5.1 Configuring Temperature Measuring Rules".

Procedure

Step 1 Click .

Step 2 Select the temperature measurement program and set the time period.
The real-time temperature change is displayed.

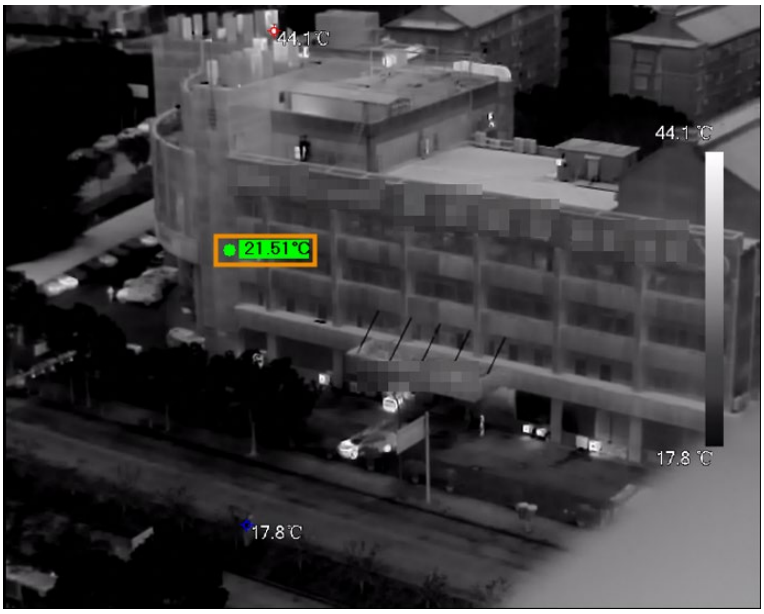
Figure 4-5 Temperature recording area



4.1.4 Real-time Spot Temperature Measurement

This function is available on Cameras with the temperature measurement function.
Click any spot on the video image, and the real-time temperature of this spot is displayed.

Figure 4-6 Real-time spot temperature measurement



4.1.5 Laser Ranging

This function is available on the cameras with the laser ranging function.

WARNING

- The laser can cause permanent damage to human eyes and skin within safe distance. Keep the Camera a safe distance away from humans while installing or operating the device.
- Laser radiation can ignite flammables. Do not directly expose objects (excluding scattered or absorber) to the laser beam, and do not place volatile flammables (such as alcohol) in the working area of laser radiation products, to avoid producing laser beams or fire caused by sparks from high voltage discharge.

Mind the distance during laser ranging. Less than 50 m will result in a damaged laser.

- Laser ranging does not perform well to those objects (such as glass and marble) with strong reflection ability. During laser ranging, select those objects with rough surface as your target.
- Do not use the distance measurer to measure the distance of targets that are within 50 m of the laser. The laser can permanently damage the device.

Log in to the web page, and then click **Start Ranging**. The Camera starts to measure the distance from the object in the middle of the image to it (as indicated with the red cross sign).

4.2 PTZ

PTZ setting is used for controlling external PTZ Camera. Connect the Camera to external PTZ through RS-485 port before using this function.

4.2.1 Configuring Protocol

If you want to control the external PTZ by the Camera, you need to set the PTZ protocol first and then connect PTZ to the Camera.

Step 1 Select **Setting** > **System Management** > **PTZ Setting**.

Step 2 Configure PTZ parameters.

Figure 4-7 PTZ settings

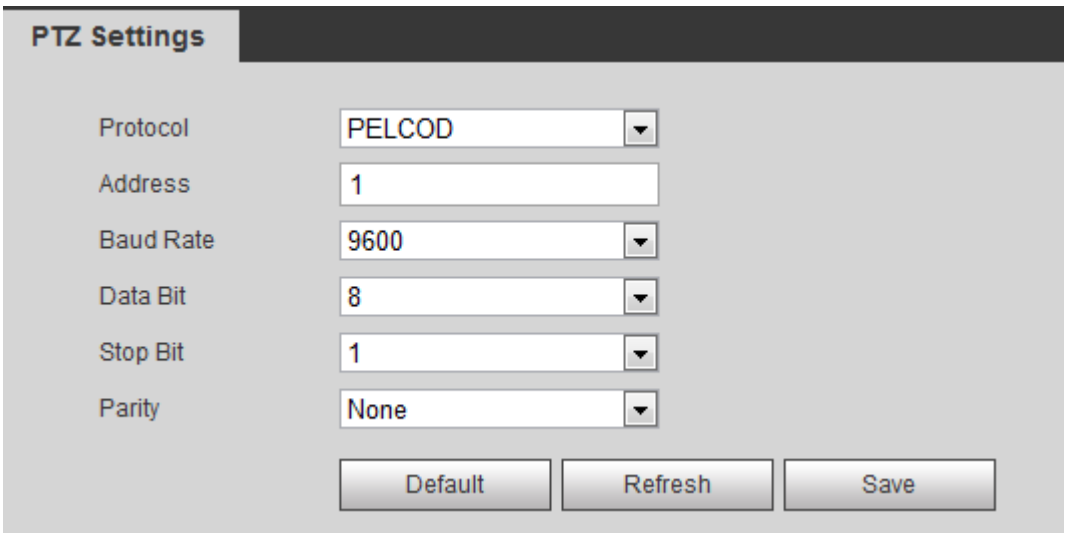


Table 4-4 Parameter description

Parameter	Description
Protocol	Matches with the PTZ protocol.
Address	Enter the corresponding camera address. The address must be the same with the address configured on the PTZ; otherwise the Camera cannot control the PTZ.
Baud rate	Configure camera baud rate.
Data bit	It is 8 by default.
Stop bit	It is 1 by default.
Parity	It is None by default.

Step 3 Click **Save**.

4.2.2 Configuring PTZ Functions

- The protocol setting has been completed. For details, see "4.2.1 Configuring Protocol".
- View the image that represents the effect of external PTZ through the external PTZ, not the Camera.
- The following functions are available only when the Camera is connected to the external PTZ.

4.2.2.1 Configuring Preset

Preset means a certain position that the Camera can make quick orientation to. It includes PTZ pan

and tilt angles, camera focus, and location.

Step 1 Click the **PTZ** tab and select **Preset** in the **PTZ Function** setting list.

Step 2 Click **Set Preset**.

Figure 4-8 Preset

Step 3 Click the direction button to move the Camera to the surveillance direction that you need.

Step 4 In the preset box, enter the preset number.

Range of the preset number is limited by the PTZ protocol.

Step 5 Click **Add** to add a preset.

Step 6 Enter a preset number and click **Go to**. The Camera turns to the corresponding position.

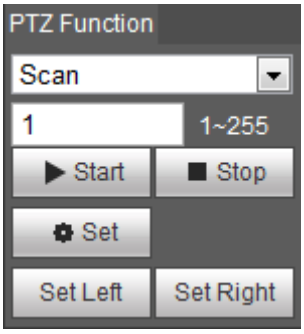
4.2.2.2 Configuring Scan

The Camera scans on the horizontal direction between the left and right borders.

Step 1 Click the **PTZ** tab and select **Scan** in the PTZ function setting list.

Step 2 Click **Set**.

Figure 4-9 Scan



Step 3 Set the left and right border.

1) Click the direction button to move the Camera to the left border that you want and then click **Set Left**.
2) Click the direction button to move the Camera to the right border that you want and then click **Set Right**.

Step 4 Click **Start** to start the scan; click **Stop** to stop it.

4.2.2.3 Configuring Tour Group

Tour means a series of movements that the Camera makes along several presets. By configuring tour, you can put the presets to the auto tour group to make the Camera move back and forward quickly and automatically according to the presets.

Prerequisites

You have set several presets.

Procedure

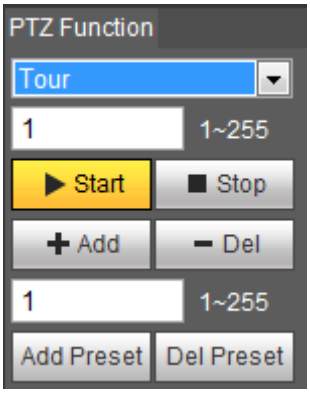
Step 1 Click the **PTZ** tab and select **Tour** in the **PTZ Function** setting list.

Step 2 In the tour typing box, enter the tour number.

Range of the preset number is limited by the PTZ protocol.

Step 3 Click **Add**.

Figure 4-10 Tour



Step 4 In the preset typing box, enter the preset number.

Step 5 Click **Add Preset** to add a preset in the tour.

Repeat Step4 to Step5 to add several presets in the tour.

Enter a preset number and then click **Delete Preset** to delete preset it in the tour group.

Step 6 Enter a tour number. Click **Start** to start touring; click **Stop** to stop it.

4.2.2.4 Configuring Pattern

Pattern means a recording of a series of operations that you make to the Camera, and when pattern starts, the camera performs the operations repeatedly. The operations include horizontal and vertical movements, zoom and preset calling. Record and save the operations, and then you can call the pattern path directly.

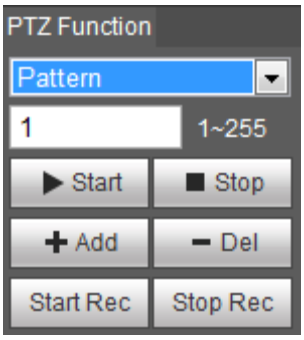
Step 1 Click the **PTZ** tab and select **Pattern** in the **PTZ Function** setting list.

Step 2 In the pattern typing box, enter a pattern number.

Range of the pattern number is limited by the PTZ protocol.

Step 3 Click **Add**.

Figure 4-11 Pattern



Step 4 Click **Start Rec**.

Step 5 By operating the PTZ control panel, you can control the Camera's surveillance direction, zoom images or change the focal length.

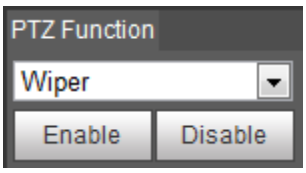
Step 6 Click **Stop Rec** to complete setting of the pattern.

Step 7 Select a pattern number. Click **Start** to start the pattern; click **Stop** to stop it.

4.2.2.5 Turing on Wiper

Step 1 Click the **PTZ** tab and select **Wiper** in the **PTZ Function** setting list.

Figure 4-12 Wiper



Step 2 Click **Enable** to enable the wiper; click **Disable** to disable it.

4.2.3 Operating PTZ

- The corresponding protocol setting and function setting have been completed. For details, see "4.2.1 Configuring Protocol" and "4.2.2 Configuring PTZ Functions".
- View the image that represents the effect of external PTZ through the external PTZ, not the Camera.

Click the **PTZ** tab and the PTZ control panel is displayed on the right side of the PTZ page.

Figure 4-13 PTZ control panel

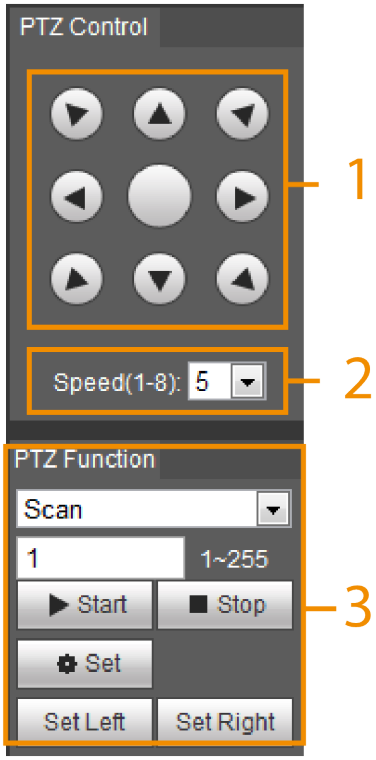


Table 4-5 Parameter description

No.	Function	Description
1	Direction button	Eight directions are contained: up, down, left, right, upper left, upper right, lower left, and lower right.
2	Speed	Controls the PTZ rotation speed. The bigger the value is, the faster the movement will be.
3	PTZ function	For detailed operations of PTZ, see "4.2.2 Configuring PTZ Functions".

4.3 Playback

This section introduces playback related functions and operations, including video playback and picture playback.

4.3.1 Prerequisite

- Before playing back video, configure record time range, record storage method, record schedule and record control. For details, see "6.3.1.1 Configuring Record Plan".
- Before playing back picture, configure snapshot time range, snapshot storage method, and snapshot plan. For details, see "6.3.1.2 Configuring Snapshot Plan".
- If you want to store videos and pictures in an SD card, make sure that you have inserted the SD card in the Camera.

4.3.2 Playback Page

Click the **Playback** tab.

Figure 4-14 Video playback

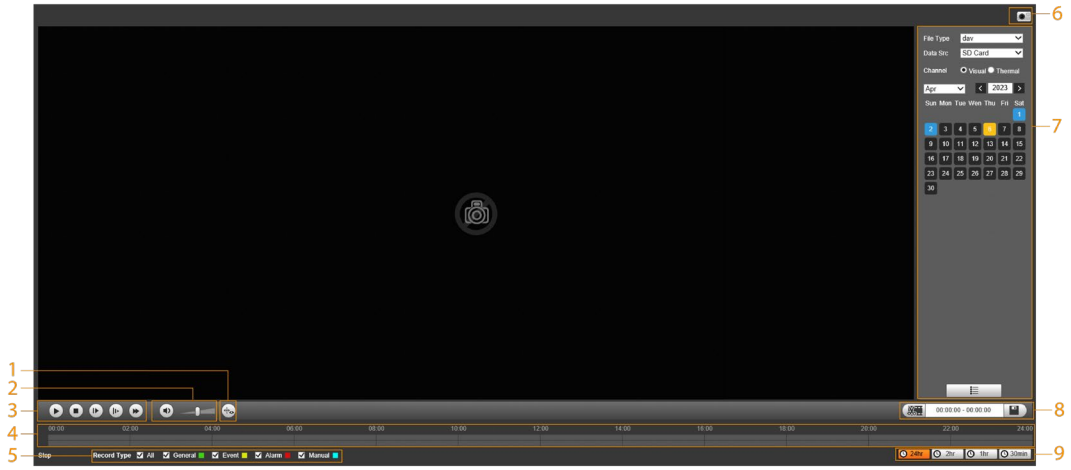


Figure 4-15 Picture playback

Table 4-6 Playback page description

No.	Function	Description
1	Rules Info	Click , intelligent rules and object detection box are displayed. It is enabled by default. Rules Info is valid only when you enabled the rule during recording.
2	Sound	Controls the sound during playback. • : Mute mode. • : Vocal state. You can adjust the sound.
3	Play control bar	Controls playback. • : Click the icon to play back recorded videos. • : Click the icon to stop playing back recorded videos. • : Click the icon to play the next frame. • : Click the icon to slow down the playback. • : Click the icon to speed up the playback.

No.	Function	Description
4	Progress bar	Displays the record type and the corresponding period. ● Click any point in the colored area, and the system will play back the recorded video from the selected moment. ● Each record type has its own color, and you can see their relations in **Record Type** bar.
5	Record/Snapshot Type	Select the record type or snapshot type. ● Record type includes **General**, **Event**, **Alarm**, **Manual**. ● Snapshot type includes **General**, **Event**, **Alarm**.
6	Assistant	Click the icon to capture one picture of the current video, and it will be saved to the configured storage path.
7	Playback video	You can select the file type, data source, and record date.
8	Video clip	Clip a certain recorded video and save it. For details, see "4.3.4 Clipping Video".
9	Time format of progress bar	Includes 4 time formats: 24hr, 2hr, 1hr, 30min. Take 24hr as an example, the whole progress stands for 24 hours.

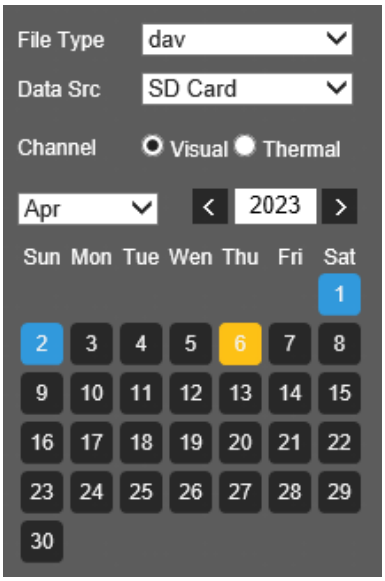
4.3.3 Playing back Video or Picture

This section introduces the operation of video playback and picture playback. This section uses video playback as an example.

Step 1 Select **dav** from the **Record Type** drop-down list and **SD card** from the **Data Src** drop-down list.

Select **jpg** from **Record Type** drop-down list when playing back pictures, and you do not need to select data source.

Figure 4-16 File type selection



Step 2 Select the channel as needed.

Step 3 Select the record type in **Record Type**.

Figure 4-17 Record type selection

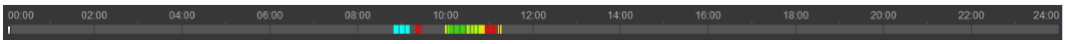
Step 4 Select the month and year of the video that you want to play.

Those dates with blue color indicate there were videos recorded in those days.

Step 5 Play video.

- Click in the control bar.
  The system plays the recorded video of the selected date (in the order of time).
- Click any point in the colored area on the progress bar.
  The playback starts from that moment.

Figure 4-18 Progress bar



- Click , the video files of the selected date will be listed. Enter the start time and end time, and then click to search all files between the start time and end time. Double-click the file in the list, and the system plays the video and displays file size, starting time, and ending time.

Figure 4-19 Playback file list

4.3.4 Clipping Video

Step 1 Click the **Playback** tab.

Step 2 Click , the video files of the selected date are listed.

Step 3 Select **dav** or **mp4** in **Download Format**.

If you select **dav**, the rule information can be displayed when playing back the video.

Step 4 Click on the progress bar to select the start time of the target video, and then click .

Figure 4-20 Clip video

Step 5 Click again on the progress bar to select the end time of the target video, and then click .

Step 6 Click to download the video.

The system will prompt that you cannot download the file and play back at the same time.

Step 7 Click **OK**.

The playback stops and the clipped file is saved in the configured storage path. For the configuration of storage path, see "6.1.2.5 Configuring Storage Path".

4.3.5 Downloading Video or Picture

Download video or picture to a defined path. This section uses downloading video as an example.

- Playback and downloading at the same time is not supported.
- Operations might vary with different browsers.
- For details of viewing or setting storage path, see "6.1.2.5 Configuring Storage Path".

Step 1 Click the **Playback** tab.

Step 2 Select **dav** from the **Record Type** drop-down list and **SD card** from the **Data Src** drop-down list.

Select **jpg** from **Record Type** drop-down list when playing back pictures, and you do not need to select data source.

Step 3 Click , the video files of the selected date are listed.

Step 4 Select **dav** or **mp4** in **Download Format**. Click next to the file to de download.

The system starts to download the file and save it to the configured path. When downloading pictures, you do not need to select the download format.

4.4 Reports

You can follow certain rules such as time sequence, and check history data of temperature stored in the Micro SD card.

- You have configured the temperature measurement rules (including spots, lines and area). For details, see "5.2.5.1 Configuring Temperature Measuring Rules".
- You have inserted a SD card to the Camera.

This function is only available on some select models.

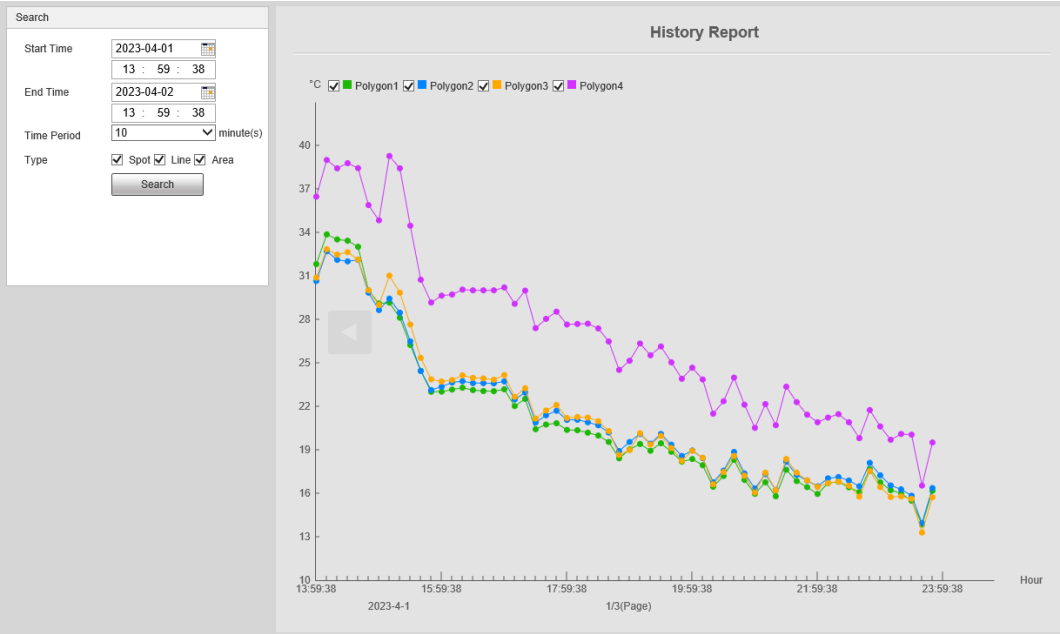
Procedure

Step 1 Click the **Report** tab.

Step 2 Set the conditions for searching and click **Search.**

The searched temperature data is displayed.

Figure 4-21 History report



4.5 Alarm

You can select alarm type as needed. When the selected alarms are triggered, the system would record detailed alarm information at the right side of the page.

Function of different Cameras might vary.

4.5.1 Introduction to Alarm Types

Table 4-7 Alarm type description

Alarm Type	Description	Condition
Motion detection	An alarm is triggered when a moving object is detected.	You have enabled motion detection. For details, see "5.1.2.1 Configuring Motion Detection".
Disk full	An alarm is triggered when the free space in the SD card is lower than the configured percentage.	You have enabled detection to lack of SD card storage space. For details, see "5.1.4.1 Configuring SD Card Abnormality".

Alarm Type	Description	Condition
Disk error	An alarm is triggered when there is SD card error or abnormality.	You have enabled detection to SD card storage space. For details, see "5.1.4.1 Configuring SD Card Abnormality".
External alarm	An alarm is triggered when there is an alarm from external Camera.	There is an alarm input port and the external alarm is enabled. For details, see "5.1.1.1 Configuring Alarm-in".
Illegal access	An alarm is triggered when the login password has been wrongly entered for more than the set times.	You have enabled detection to illegal access. For details, see "5.1.4.3 Configuring Illegal Access".
Audio detection	An alarm is triggered when there is an audio input error.	You have enabled detection to audio errors. For details, see "5.1.3 Configuring Audio Detection".
Smart thermal	An alarm is triggered when the IVS, call detection, smoking detection or boat detection is triggered.	● You have enabled IVS. For details, see "5.3 Configuring IVS". ● You have enabled call detection. For details, see "5.4 Call Detection". ● You have enabled smoking detection. For details, see "5.5 Smoking Detection".
Heat warning	An alarm is triggered when a fire point is detected.	You have enabled fire alarm. For detailed operation, see "5.6 Configuring Heat Warning".
Temperature alarm	When temperature satisfies alarm conditions stipulated by temperature testing rules, an alarm is triggered.	You have enabled temperature alarm. For detailed operations, see "5.2.5.1 Configuring Temperature Measuring Rules".
Temperature difference alarm	When temperature difference satisfies alarm condition you have set, an alarm is triggered.	You have enabled temperature comparison alarm. For detailed operations, see "5.2.5.2 Configuring Temperature Contrast".
Hot spot alarm	When temperature of a hot spot satisfies alarm condition you have set, an alarm is triggered.	You have enabled hot/cold spot tracing. For detailed operations, see "5.7 Configuring Hot Trace".
Cold spot alarm	When temperature of a cold spot satisfies alarm condition you have set, an alarm is triggered.	

4.5.2 Subscribing Alarm Information

You can enable alarm prompts and define alarm sound according to your preference.

Step 1 Click the **Alarm** tab.

Figure 4-22 Alarm

Step 2 Select an alarm type.

Step 3 Select **Prompt**, and the system prompts and records alarm information as needed.

- If you are not on the **Alarm** page when alarm events that you have subscribed are triggered, is displayed on the **Alarm** tab and the alarm information will be recorded. Click the **Alarm** tab, and the sign disappears.
- If you are on the **Alarm** page when the selected alarm is triggered, there will be detailed alarm information displayed at the right side of the page.

Step 4 Select the **Enable** checkbox in **Disarming** to enable the one-click disarming function. After enabling disarming, the system will not perform any linkage actions, and no alarm records will still be generated.

Step 5 Select the **Play Alarm Tone** checkbox, and then select an audio file.
System would play the audio file that you have selected, when alarm events that you have subscribed are triggered.

Click **Clear** to remove all the alarm information.

5 AI function

5.1 Event

5.1.1 Configuring Alarm

5.1.1.1 Configuring Alarm-in

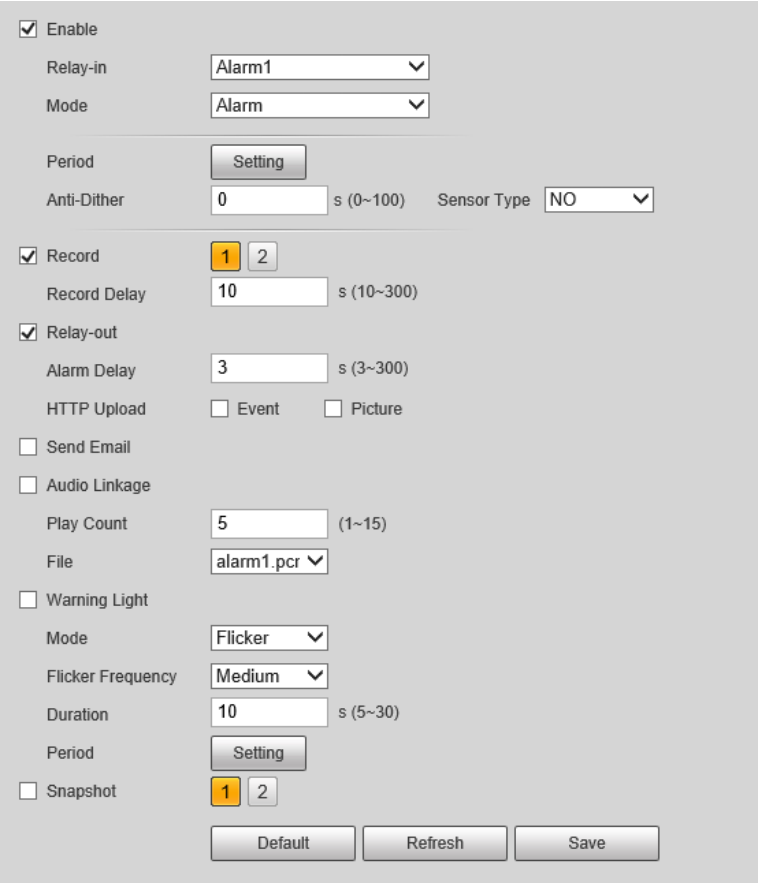
When the configured alarm is triggered in the configured arming period, the camera generates an alarm and performs the linkage actions.

Pages might vary with different models.

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

Step 2 Select the **Enable** checkbox.

Figure 5-1 Alarm linkage



Step 3 Select the relay-in port.

Step 4 Select the alarm mode.

- Alarm: When the configured alarm is triggered in the configured arming period, the camera generates an alarm and performs the linkage actions.
  1. Click **Setting** next to **Period** to set the arming periods, for details, see "5.1.1.2.1 Setting Period". Configure alarm linkage actions, for details, see "5.1.1.1 Configuring Alarm-in".

2. Set the anti-dither time and sensor type.
   - ◇ Anti-Dither: After the anti-dither time is configured, the system only records one motion detection event in the period.
   - ◇ Sensor Type: Select **NO** (normally open) or **NC** (normally closed) according to the sensor type of external alarm device.

- Arming/Disarming: When the device is directly connected to a third-party alarm platform, and an alarm is triggered, the camera automatically enables the one-click disarming function.
  1. Select the sensor type.
  2. Select the **Arming/Disarming** checkbox to enable the arming/disarming mode.

Step 5 Configure the parameters of alarm linkage.

Figure 5-2 Alarm linkage

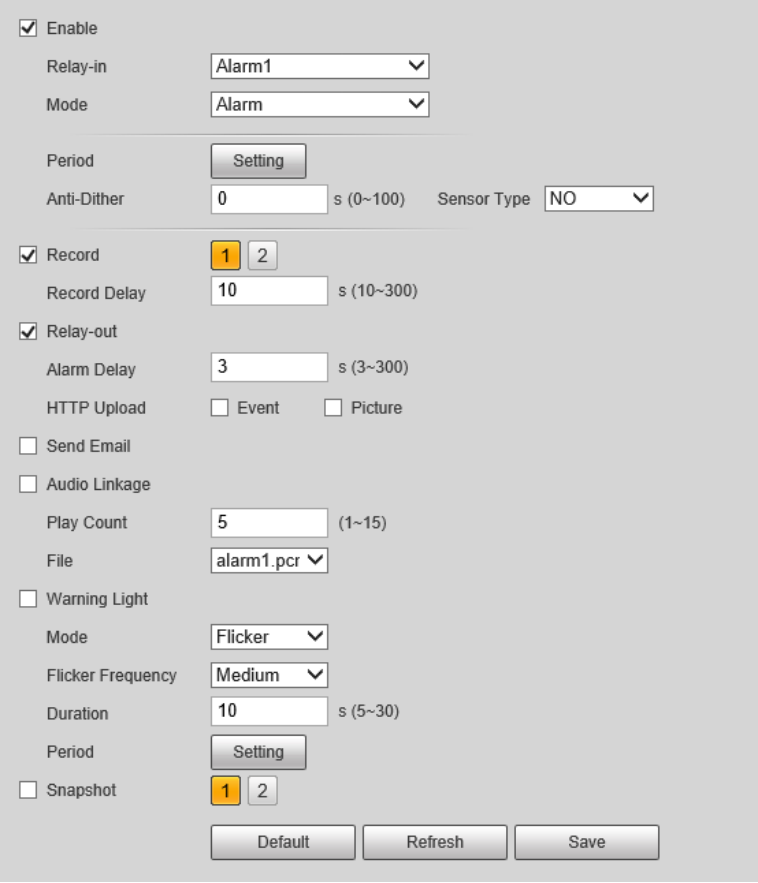


Table 5-1 Description of alarm linkage parameters

Parameter	Description
Relay-in	Select the external alarm device.
Period	Set arming periods. For details, see "5.1.1.2.1 Setting Period".
Anti-Dither	After the anti-dither time is configured, the system only records one motion detection event in the period.
Sensor Type	Select **NO** (normally open) or **NC** (normally closed) according to the sensor type of external alarm device.

Parameter	Description
Record	• Record: Select the channel number. The system can link record channel when an alarm event occurs. • Record Delay: After alarm, the system stops recording after an extended time period according to the configured time.  • To use the record linkage function, configure record plan for motion detection alarm and enable auto recording in record control. For details, see "6.3 Storage". • For the configuration of storage path, see "6.1.2.5 Configuring Storage Path".
Relay-out	• Relay-out: When an alarm is triggered, the system can automatically link with relay-out device. • Alarm Delay: When alarm delay is configured, the alarm continues for an extended period after the alarm ends.  Before enabling this function, make sure that you have connected alarm devices (such as light and siren) to the Camera.
Send Email	When an alarm is triggered, the system will automatically send an email to users.  Email linkage takes effect only when SMTP is configured. For details, see "6.2.7 Configuring SNMP".
Audio	• The system broadcasts alarm audio file when an alarm event occurs. • Play mode: Select and configure **Play Duration** and **Play Count** according to the play mode. • File: Select **Setting** > **Camera** > **Audio** > **Alarm Audio** to set alarm audio file.
Warning Light	When an alarm is triggered, the system can automatically enable the warning light. • **Mode**: The display mode of the warning light when an alarm is triggered. It includes **Normally on** and **Flicker**. When setting **Flicker** as the mode, you need to set the flicker frequency.  For the Camera with red and blue alarm light, you can only select **Flicker** in **Mode**. • **Duration**: After setting warning light duration, the warning light is turned off after an extended time of period after an alarm. It is 5 seconds–30 seconds. • **Period**: The period for using warning light. When an alarm triggered during the configured period, the system links warning light. For the configuration, see "5.1.1.2.1 Setting Period".

Parameter	Description
Snapshot	After snapshot linkage is configured, the system can automatically alarm and capture images when an alarm is triggered. For the configuration of storage path, see "6.1.2.5 Configuring Storage Path".

Step 6 Click **Save**.

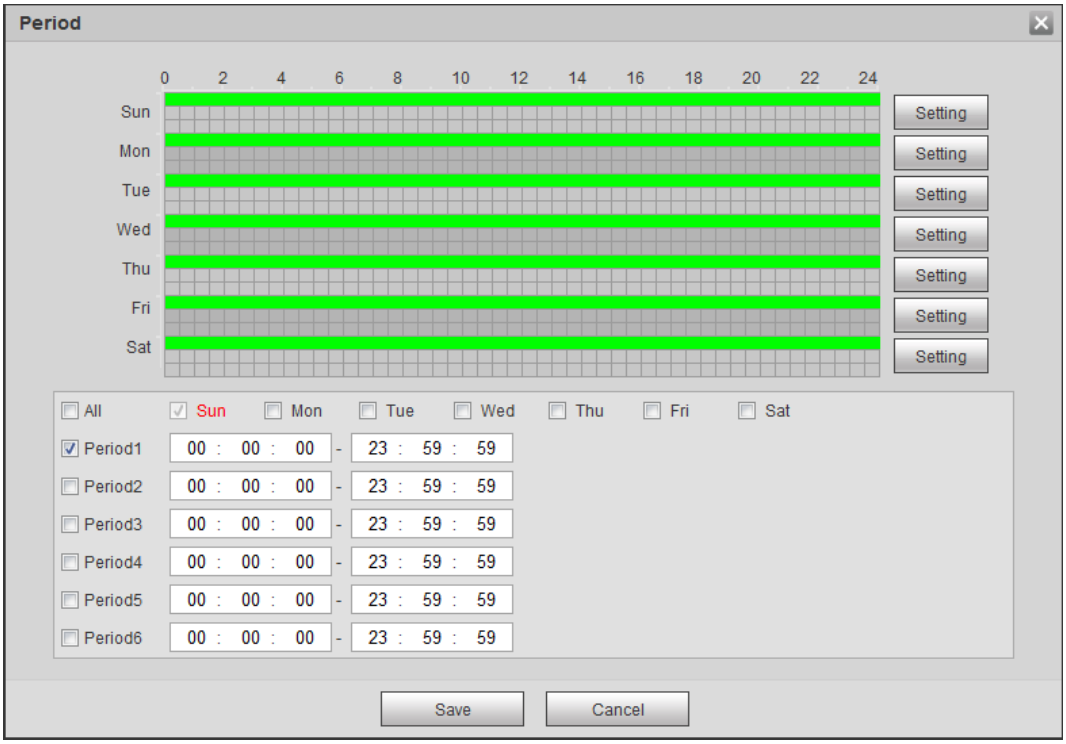
5.1.1.2 Configuring Alarm Linkage

5.1.1.2.1 Setting Period

Set arming periods. The Camera only performs corresponding linkage action in the configured period.

Step 1 Click **Setting** next to **Period**.

Figure 5-3 Period



Step 2 Set arming periods. Alarms will be triggered in the time period in green on the timeline.

- Method one: Directly press and drag the left mouse button on the timeline.
- Method two: Enter an actual time period.
  1. Click **Setting** next to a day.
  2. Select a time period to be enabled.
  3. Enter the start time and end time of a time period.

     - Select **All** or the checkboxes of some days to set the time period of multiple days at one time.
     - You can set 6 time periods per day.

Step 3 Click **Save**.

5.1.1.2.2 Record Linkage

The system can link record channel when an alarm event occurs. After alarm, the system stops recording after an extended time period according to the configured time.

Prerequisites

- After the corresponding alarm type (**General**, **Motion**, or **Alarm**) is enabled, the record channel links recording. For details, see "6.3.1.1 Configuring Record Plan".
- Enable auto record mode, the record linkage will take effect. For details, see "6.3.3 Setting Record Control".

Setting Record Linkage

On the **Alarm** page, select the **Record** checkbox to enable record linkage, select the channel as needed, and set **Post-Record** to set alarm linkage and record delay.
After **Post-Record** is configured, alarm recording continues for an extended period after the alarm ends.

Figure 5-4 Record linkage

5.1.1.2.3 Snapshot Linkage

After snapshot linkage is configured, the system can automatically alarm and take snapshots when an alarm is triggered.

Prerequisites

After the corresponding alarm type (**General**, **Motion**, or **Alarm**) is enabled, the snapshot channel links recording. For details, see "6.3.1.2 Configuring Snapshot Plan".

Setting Record Linkage

On the **Alarm** page, select the **Record** checkbox to enable record linkage, select the channel as needed, and set **Post-Record** to set alarm linkage and record delay.
After **Post-Record** is configured, alarm recording continues for an extended period after the alarm ends.

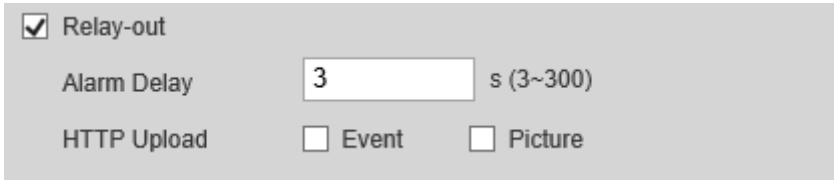
Figure 5-5 Record linkage

5.1.1.2.4 Alarm-out Linkage

When an alarm is triggered, the system can automatically link with alarm-out device.
On the **Alarm** page, select the **Relay-out** checkbox to enable alarm-out linkage, select the channel as needed, and then configure **Record Delay**.
When alarm delay is configured, alarm continues for an extended period after the alarm ends.

- For the Camera with multiple alarm output channels, select the linked alarm output channel.
- For the Camera with HTTP uploading function, select the corresponding linkage: **Event** or **Picture**.

Figure 5-6 Alarm-out linkage



5.1.1.2.5 Email Linkage

When an alarm is triggered, the system will automatically send an email to users.
Email linkage takes effect only when SMTP is configured. For details, see "6.2.5 Configuring SMTP".

Figure 5-7 Email linkage

5.1.1.2.6 Audio Linkage

When an alarm is triggered, the system can automatically produce audio for warning.
On the **Alarm** page, select the **Audio Linkage** checkbox to enable alarm-out linkage, and then set the play count and audio file.

Figure 5-8 Audio linkage

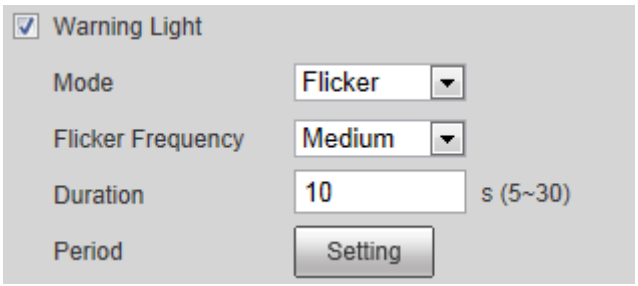
5.1.1.2.7 Warning Light Linkage

When an alarm is triggered, the system can automatically enable the warning light.
Set **Mode**, **Flicker Frequency**, **Duration**, and **Period**.

- **Mode**: The display mode of the warning light when an alarm is triggered. It includes **Normally on** and **Flicker**. When set **Flicker** as the mode, you need to set the flicker frequency.

  For the camera with red and blue alarm light, you can only select **Flicker** in **Mode**.
- **Duration**: After setting warning light duration, the warning light is turned off after an extended time of period after an alarm. It is 5 seconds–30 seconds.
- **Period**: The period for using warning light. When an alarm triggered during the configured period, the system links warning light. For the configuration, see "5.1.1.2.1 Setting Period".

Figure 5-9 Warning light linkage



5.1.2 Configuring Video Detection

Check whether there are considerable changes on the video by analyzing video images. In case of any considerable change on the video (such as moving object, fuzzy image), the system performs an alarm linkage.

5.1.2.1 Configuring Motion Detection

When the moving object appears on the image and its moving speed reaches the preset sensitivity, the Camera performs an alarm linkage.

Step 1 Select **Setting** > **Event** > **Video Detection** > **Motion Detection**.

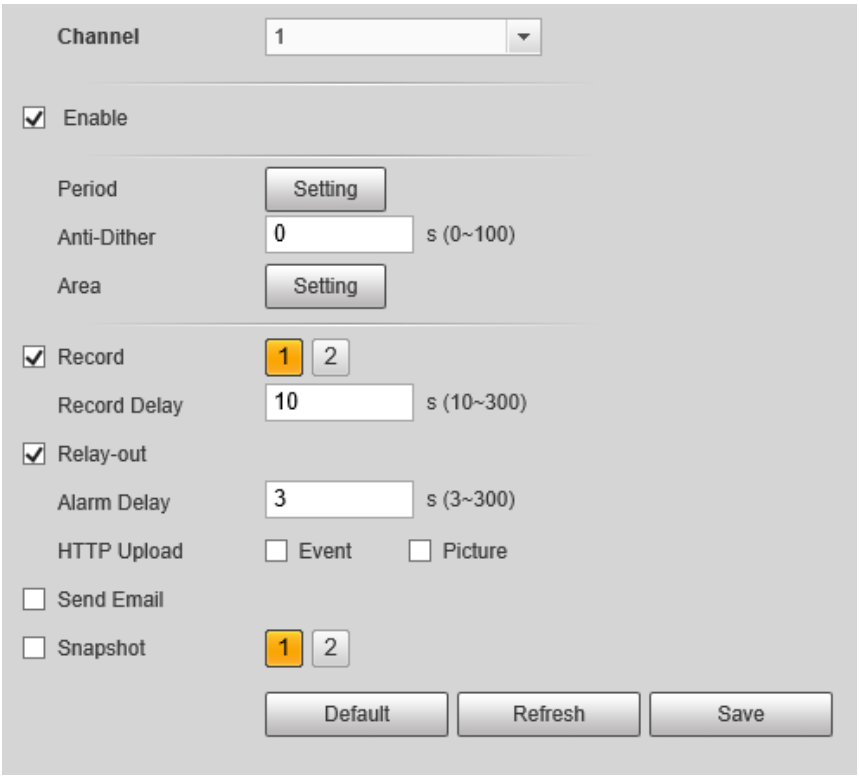
Step 2 Select the channel.

- Select **1** in **Channel** to configure the rule for the visible channel.
- Select **2** in **Channel** to configure the rule for the thermal channel.

The monocular camera does not support channel selection.

Step 3 Select the **Enable** checkbox.

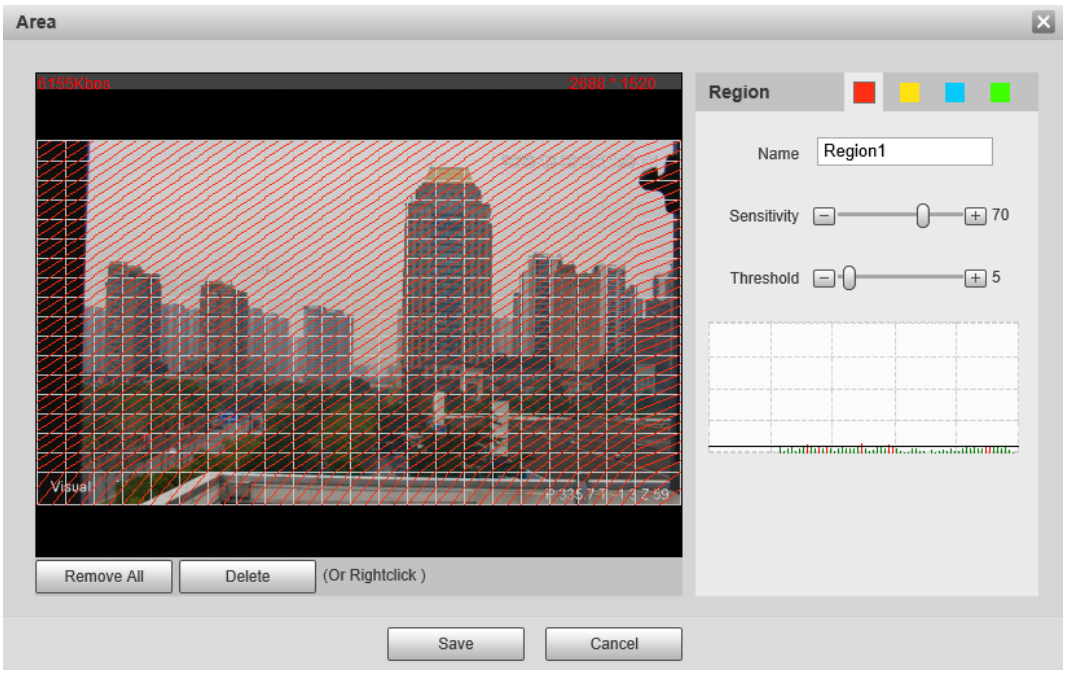
Figure 5-10 Motion detection



Step 4 Configure a motion detection area.

1) Click **Setting** next to **Area**.

Figure 5-11 Area configuration



2) Select a color and set the region name. Select an effective area for Motion Detection in the image and set **Sensitivity** and **Threshold**.
   - Select a color from to set different detection parameters for each region.
   - Sensitivity: Sensitive degree of changes. The higher the sensitivity is, the easier the alarm is triggered.
   - Threshold: Effective area threshold for Motion Detection. The smaller the threshold is, the easier the alarm is triggered.
   - The whole video image is the effective area for Motion Detection by default.
   - The red line in the waveform indicates that the Motion Detection is triggered, and the green one indicates that there is no motion detection. Adjust sensitivity and threshold according to the waveform.
3) Click **Save**.

Step 5 Configure arming periods and alarm linkage action. For details, see "5.1.1.1 Configuring Alarm-in" and "5.1.1.2.1 Setting Period".

Step 6 Click **Save**.

5.1.2.2 Configuring Video Tampering

When the lens is covered or video output is mono-color screen caused by light and other reasons, the Camera performs alarm linkage.

Step 1 Select **Setting** > **Event** > **Video Detection** > **Video Tampering**.

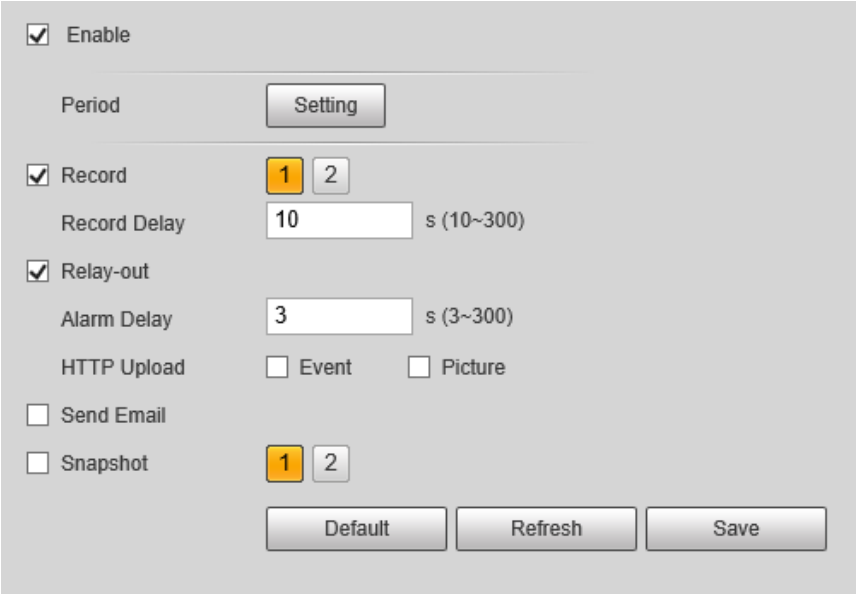
Step 2 Select the channel.

- Select **1** in **Channel** to configure the rule for the visible channel.
- Select **2** in **Channel** to configure the rule for the thermal channel.

The monocular camera does not support channel selection.

Step 3 Select the **Enable** checkbox.

Figure 5-12 Video tampering



Step 4 Configure arming periods and alarm linkage action. For details, see "5.1.1.1 Configuring Alarm-in" and "5.1.1.2.1 Setting Period".

Step 5 Click **Save**.

5.1.2.3 Configuring Scene Changing

The system performs alarm linkage when the image switches from the current scene to another one.

Step 1 Select **Setting** > **Event** > **Video Detection** > **Scene Changing**.

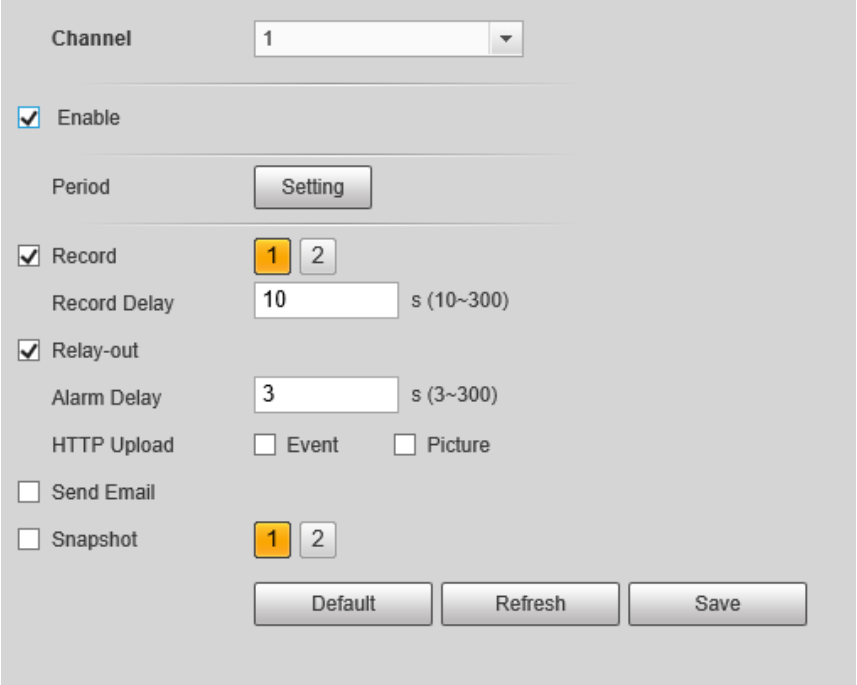
Step 2 Select the channel.

- Select **1** in **Channel** to configure the rule for the visible channel.
- Select **2** in **Channel** to configure the rule for the thermal channel.

The monocular camera does not support channel selection.

Step 3 Select the **Enable** checkbox.

Figure 5-13 Video tampering



Step 4 Configure arming periods and alarm linkage action. For details, see "5.1.1.1 Configuring Alarm-in" and "5.1.1.2.1 Setting Period".

Step 5 Click **Save**.

5.1.3 Configuring Audio Detection

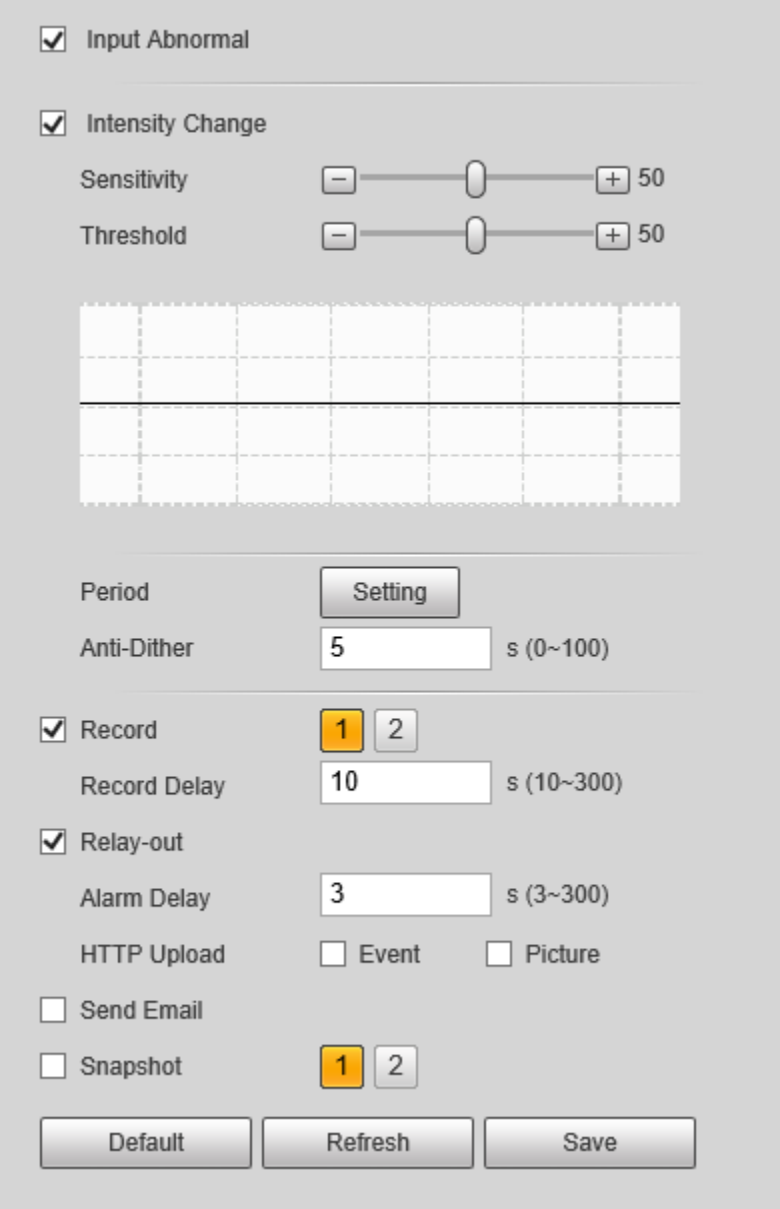
When vague voice, tone change, or sound intensity rapid change is detected, the Camera performs alarm linkage.

Step 1 Select **Setting** > **Event** > **Audio Detection**.

Step 2 Configure parameters of audio detection.

- Input abnormal: Select the **Enable Input Abnormal** checkbox, and the alarm is triggered when the system detects abnormal sound input.
- Intensity change: Select the **Enable Intensity Change** checkbox and then set **Sensitivity** and **Threshold**. The alarm is triggered when the system detects that the sound intensity exceeds the configured threshold.
  - ◇ It is easier to trigger the alarm with higher sensitivity or smaller threshold. Set a high threshold for noisy environment.
  - ◇ The red line in the waveform indicates audio detection is triggered, and the green one indicates no audio detection. Adjust sensitivity and threshold according to the waveform.

Figure 5-14 Audio detection settings



Step 3 Configure arming periods and alarm linkage action. For details, see "5.1.1.1 Configuring Alarm-in" and "5.1.1.2.1 Setting Period".

Step 4 Click **Save**.

5.1.4 Configuring Abnormality

Abnormality includes SD card, network, illegal access, burn alarm, high humidity alarm, and security exception.

The "No SD Card", "SD Card Error" and "Capacity Warning" events are available only on models that support SD card.

5.1.4.1 Configuring SD Card Abnormality

In case of SD card abnormality, the system performs alarm linkage. The event types include **No SD Card**, **Capacity Warning**, and **SD Card Error**.

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

Step 2 Select the event type from the **Event Type** drop-down list, and then select the **Enable** checkbox to enable the SD card detection function.

When setting **Capacity Warning** as **Event Type**, set **Capacity Limit**. When the remaining space of SD card is less than the configured value, an alarm is triggered.

Figure 5-15 SD card

Step 3 Set alarm linkage actions. For details, see "5.1.1.1 Configuring Alarm-in".

Step 4 Click **Save**.

5.1.4.2 Configuring Network Abnormality

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

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

Step 2 Select the event type from the **Event Type** drop-down list, and then select the **Enable** checkbox to enable the network detection function.

Figure 5-16 Network

Step 3 Set alarm linkage actions. For details, see "5.1.1.1 Configuring Alarm-in".

Step 4 Click **Save**.

5.1.4.3 Configuring Illegal Access

If the password is continuously wrongly typed and the mistakes have reached the maximum that

you have configured, an alarm will be triggered and linked activities will be executed.

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

Step 2 Select the **Enable** checkbox.

Figure 5-17 Illegal access

Step 3 Set **Login Error**.

If you consecutively enter a wrong password more than the configured value, the account will be locked.

Step 4 Set alarm linkage actions. For details, see "5.1.1.1 Configuring Alarm-in".

Step 5 Click **Save**.

5.1.4.4 Configuring Burn Alarm

When the lenses are watching directly towards the sun and face the potential burning, an alarm will be triggered.

This function is available on select models.

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

Step 2 Select the **Enable** checkbox.

Step 3 Configure **Sensitivity** and **Energy Threshold**.

Figure 5-18 Burn alarm

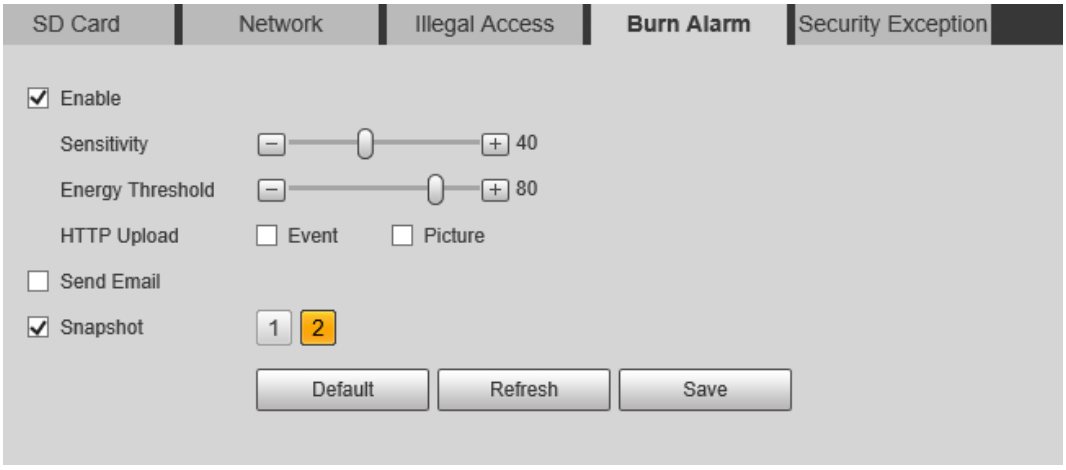


Table 5-2 Description of burn alarm parameters

Parameter	Description
Sensitivity	Sensitivity for the Camera to recognize whether the lenses are watching towards the sun. The larger the value is, the easier the Camera will be to recognize the sun.
Energy Threshold	Filters the targets with low temperature. The larger the value is, the harder the alarm will be triggered.

Step 4 Set alarm linkage actions. For details, see "5.1.1.1 Configuring Alarm-in".

Step 5 Click **Save**.

5.1.4.5 Configuring High Humidity Alarm

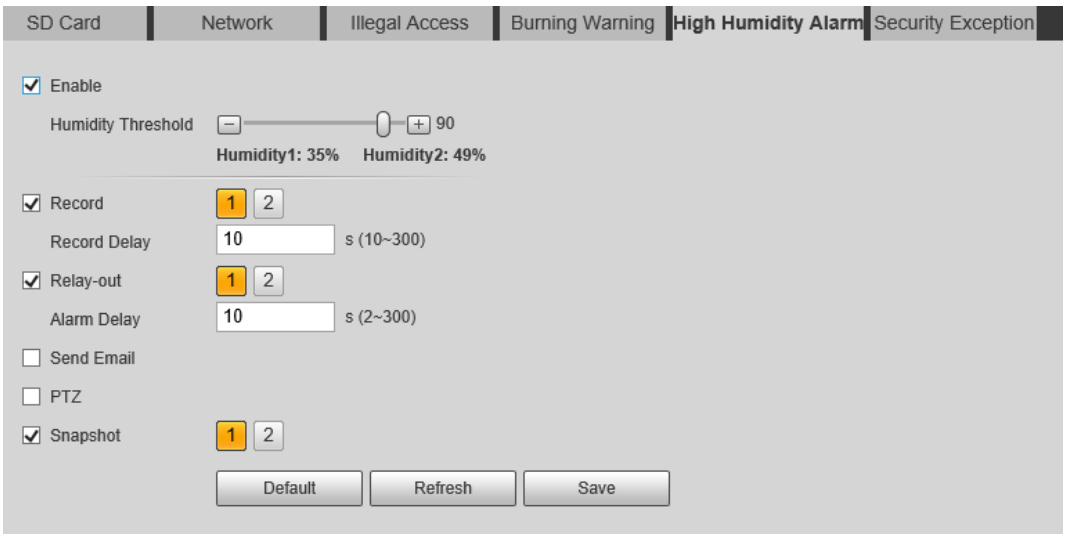
When the humidity in the Camera is detected too high, the Camera performs alarm linkage actions.

Step 1 Select **Setting** > **Event** > **Abnormality** > **High Humidity Alarm**.

Step 2 Select the **Enable** checkbox.

Step 3 Set the humidity threshold.

Figure 5-19 High humidity alarm



Step 4 Set alarm linkage actions. For details, see "5.1.1.1 Configuring Alarm-in".

Step 5 Click **Save**.

5.1.4.6 Configuring Security Exception

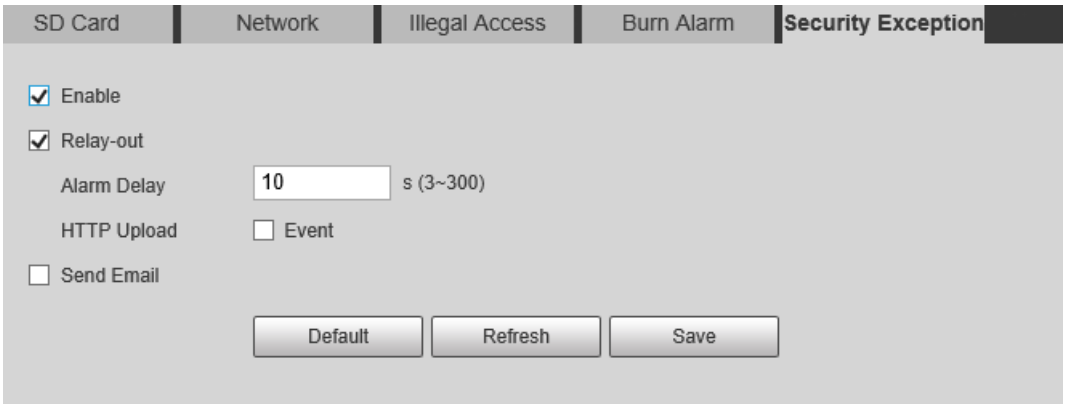
When a hostile attack is detected, the Camera performs alarm linkage.

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

Step 2 Select the **Enable** checkbox.

Step 3 Set the humidity threshold.

Figure 5-20 High humidity alarm



Step 4 Set alarm linkage actions. For details, see "5.1.1.1 Configuring Alarm-in".

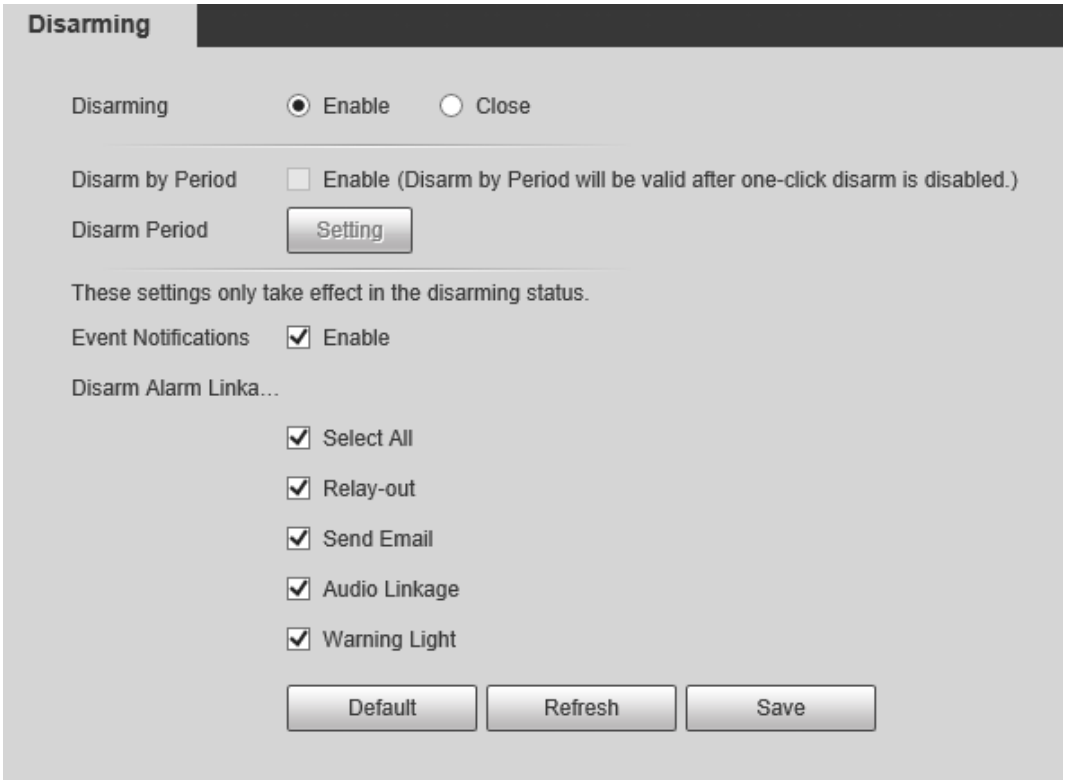
Step 5 Click **Save**.

5.1.5 Configuring Disarming

You can disable the linkage actions through the app on your smart phone, and then the system will not perform any linkage action, but alarm records will still be generated.

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

Figure 5-21 Disarming



Step 2 Select the **Enable** checkbox next to **Disarming**.

Step 3 (Optional) Select the **Enable** checkbox next to **Disarm by Period** to enable the Disarm by Period function, and then you can disarm by period. For setting disarm period, see "5.1.1.2.1 Setting Period".

This function is only valid when **Disarming** is disabled.

Step 4 Select alarm linkage actions as needed.

Step 5 Click **Save**.

5.2 Temperature Measurement

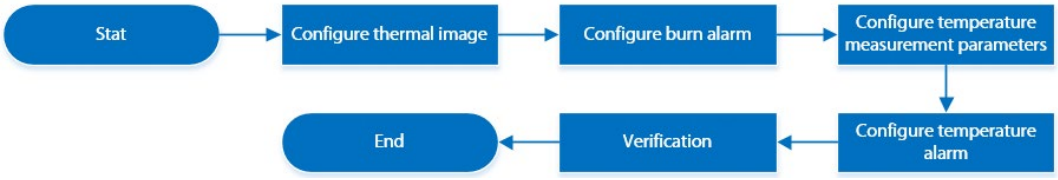
This function is available on the models with the temperature measurement function.

5.2.1 Note

- We recommend that the measuring distance is shorter than 50 m. Long-distance measurement will affect the measurement accuracy because of the humidity and transmissivity of atmosphere, reflection of the sun and heat source.
- For small targets, we recommend you install the Camera facing to the target.

5.2.2 Configuration Flow

Figure 5-22 Configuration Flow



5.2.3 Configuring Thermal Image

Configure a specific scenario where you use the Camera, including indoor scenario, outdoor scenario, and adaptive scenario. You can select a scenario as needed, and configure and check the scenario.

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

Step 2 Select **2** in **Channel**.

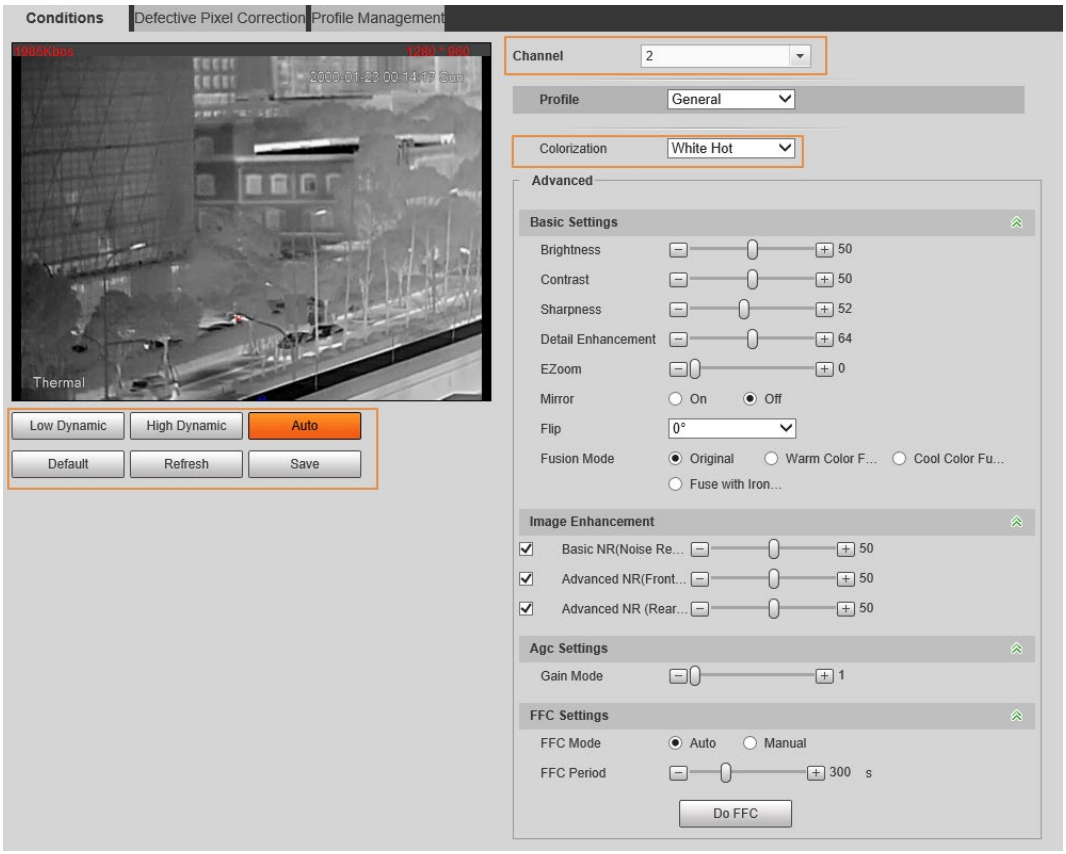
Step 3 Select the scenario.

Select the image mode according to the environment. It is **Auto** by default.

We recommend you select **Low Dynamic** for indoor environment, and **High Dynamic** for outdoor environment (stand out the details). When you select **High Dynamic** and the details are not clear, you can adjust the threshold of **Sharpness** and **Detail Enhancement**, but the noise will be larger.

Step 4 Select the colorization.

Figure 5-23 Thermal image page



Step 5 Configure advanced parameters.

Table 5-3 Description of Parameter lens

Classification	Parameter	Description
Basic Settings	Brightness	Changes the value to adjust the picture brightness. The larger the value is, the brighter the picture will be, and the smaller the darker. The picture might be hazy if the value is configured too large.
	Contrast	Changes the contrast of the picture. The larger the value is, the more the contrast will be between bright and dark areas, and the smaller the less. If the value is set too large, the dark area would be too dark and bright area easier to get overexposed. The picture might be hazy if the value is set too small.
	Sharpness	Changes the sharpness of picture edges. The larger the value is, the clearer the picture edges will be. If the value is set too large, picture noises are more likely to appear.
	Detail Enhancement	Stands out the details of the target. The larger the value is, the more obvious the details will be.
	EZoom	Enlarges the thermal image according to the zoom time that you have configured.
	Mirror	Select **On**, and the picture will be displayed with left and right side reversed.

Classification	Parameter	Description
	Flip	Changes the display direction of the picture, see the options below. • 0°: Normal display. • 90°: The picture rotates 90° clockwise. • 180°: The picture rotates 90° counterclockwise. • 270°: The picture flips upside down. This function is available on select models. For some models, please set the resolution to be 1080p or lower when using 90° and 180°. For details, see "6.1.2 Configuring Video Parameters".
	Fusion Mode	Displays the image with the gray scale information of the visible channel, and marks temperatures with color palettes, which makes the image of the thermal channel clearer. • **Original**: Displays the image of the thermal channel. • **Warm Color**: Combines the data of the visible channel and the thermal channel, and displays the image in warm color. • **Cold Color**: Combines the data of the visible channel and the thermal channel, and displays the image in cold color. • **Fusion Rate**: It ranges from 0 to 100. The larger the value, the larger the proportion of the visible channel. • **Dual-lens Calibration Adjustment**: You can adjust the misaligned images through direction keys. • **Speed**: The moving speed of the lens when adjusting the image. To get a better fusion effect, keep the distance 3 m between the Camera and the targets.
Image Enhancement	Basic NR (Noise Reduction	Compares one frame to the next and removes any oddity that does not appear in each frame. The larger the value is, the fuzzier the image will be.
	Advanced NR (Front Module)	Removes the grainy fuzzy appearances of low light images, will handle moving objects without leaving

Classification	Parameter	Description
	Advanced NR (Rear Chip)	tails behind, and in low light, it makes an image clearer and sharper. ● Advanced NR (Front Module): The module handles noise reduction. ● Advanced NR (Rear Chip): The back-end program handles noise reduction. Generally, you can select **Basic NR (Noise Reduction)** and **Advanced NR (Front Module)**. If the image is not clear, select **Advanced NR (Rear Chip)**, and configure the parameters.
Agc settings	Auto Gain	The larger the gain value, the more unstable the image.
	Gain Mode	Low-temperature mode and high-temperature mode are contained.
FFC Settings	FFC Mode	Method of correcting the shutter. ● Auto: According to the switch period that you have configured, the shutter will be corrected regularly. ● Manual: Correct the shutter by yourself.
	FFC Period	You can configure this parameter only when **FFC Mode** is set to be **Auto**. Adjust time gap of correcting the shutter automatically.
	Do FFC	Click **Do FFC** to trigger the shutter correcting for this time.

Step 6 Click **Save**.

5.2.4 Configuring Burn Alarm

When the lenses are watching directly towards the sun and face the potential burning, an alarm will be triggered.

This function is available on select models.

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

Step 2 Select the **Enable** checkbox.

Step 3 Configure **Sensitivity** and **Energy Threshold**.

Figure 5-24 Burn alarm

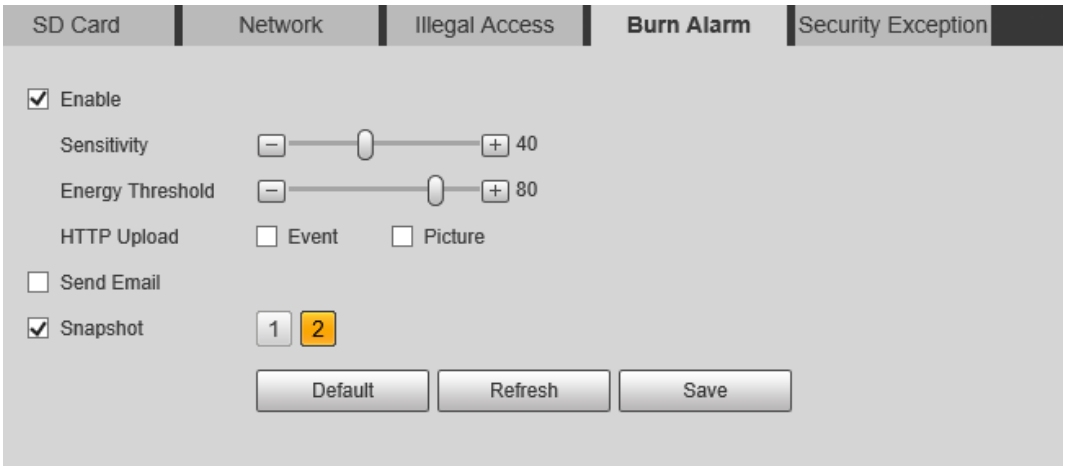


Table 5-4 Description of burn alarm parameters

Parameter	Description
Sensitivity	Sensitivity for the Camera to recognize whether the lenses are watching towards the sun. The larger the value is, the easier the Camera will be to recognize the sun.
Energy Threshold	Filters the targets with low temperature. The larger the value is, the harder the alarm will be triggered.

Step 4 Set alarm linkage actions. For details, see "5.1.1.1 Configuring Alarm-in".

Step 5 Click **Save**.

5.2.5 Configuring Temperature Measurement Parameters

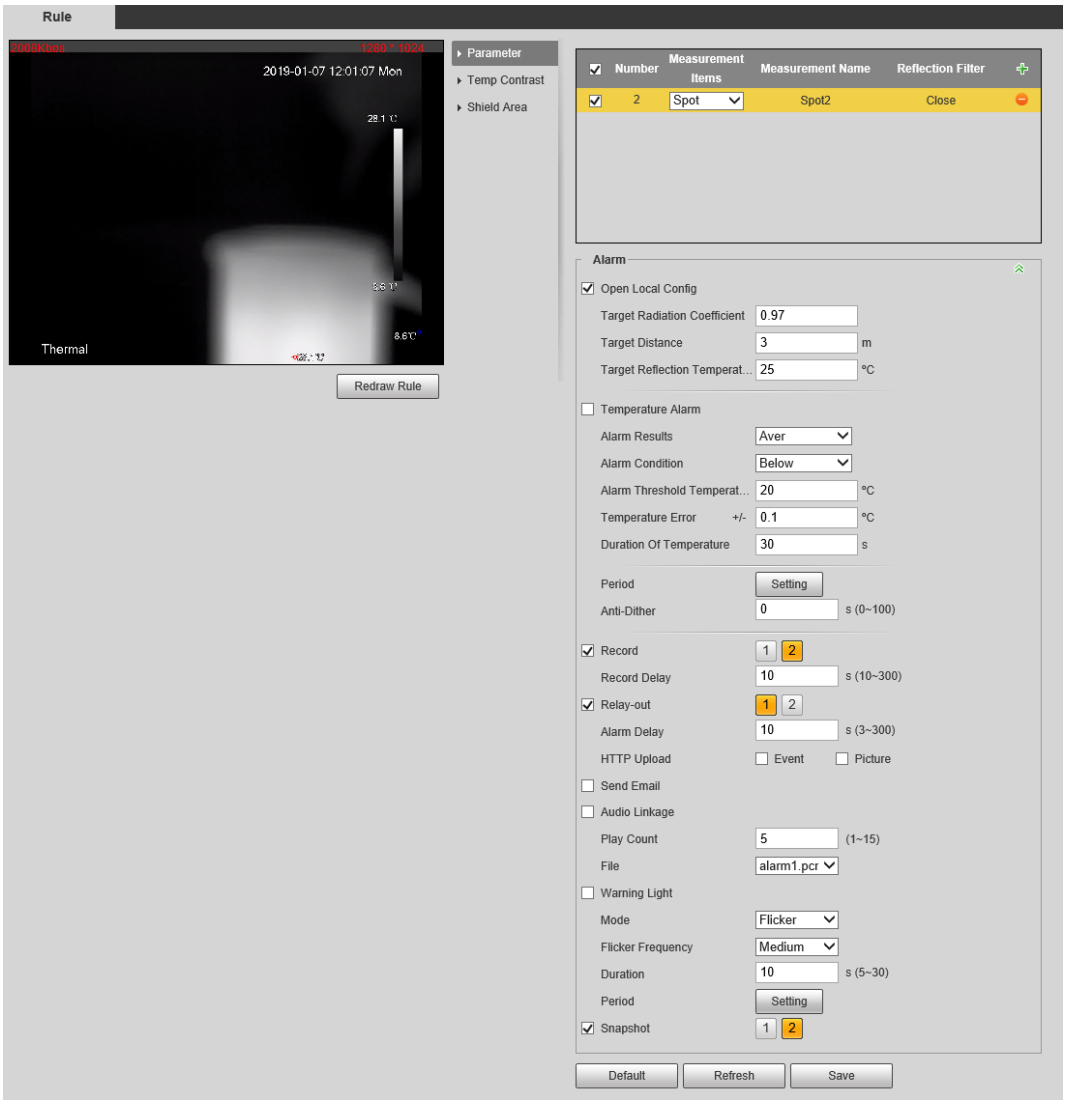
Configure temperature measurement rules and when alarm conditions are met, an alarm will be triggered.

5.2.5.1 Configuring Temperature Measuring Rules

You can set multiple regular temperature measurement rules, including spot, line, polygon, rectangle and ellipse. Based on the configured temperature measurement rules, you can calculate the temperature of each spot according to the gray value of each pixel in the regular area, and the maximum temperature, minimum temperature and average temperature will be displayed.

Step 1 Select **Setting** > **Temperature** > **Rule** > **Parameter**.

Figure 5-25 Parameter



Step 2 Configure temperature measurement parameters.

1) Click to add a rule.
2) Double-click the added rule to select measurement items and edit the measurement name.
3) Draw the rules.

   Select **Measurement Items** as **Spot**, and you can click a position on the surveillance image and a spot is formed.

   Select **Measurement Items** as **Line**, **Rectangle** or **Ellipse**, and you can hold the left mouse button to draw rules that you need on the surveillance image.

   Select **Measurement Items** as **Polygon**, and you can hold the left mouse button to draw rules that you need on the surveillance image. Right-click to end your drawing.

   - You can draw 12 rules at most.
   - Select a rule that you have drawn and click **Redraw Rule**. Then you can delete the rule and draw a new one.

4) (Optional) Enable the reflection file function, and then set the sensitivity.

   Enabling the reflection file function can reduce the false alarms caused by reflection.

This function is only supported by some select models.

5) Select the **Open Local Config** checkbox and configure parameters of each rule.
If you do not enable **Open Local Config**, alarms are triggered according to the global configuration.

Table 5-5 Description of local configuration parameter

Parameters	Description
Target Radiation Coefficient	Radiation coefficient of targets that are shot by this Camera. It ranges from 0.5 to 1.
Target Distance	Distance from the Camera to targets that are shot. It ranges from 0 m to 10000 m.
Target Reflection Temperature	Temperature of targets that are shot by this Camera. It ranges from –50 °C to +327.7 °C.

6) Select the **Relay-out** checkbox and configure the parameters.

Table 5-6 Description of relay-out parameter

Parameter	Description
Alarm Results	The display items of temperature. ● Select **Measurement Items** as **Spot**, and average temperature and temperature slope will be displayed. ● Select **Measurement Items** as **Line**, **Rectangle**, **Ellipse** or **Polygon**, and maximum/minimum/average temperature, temperature slope and temperature difference are displayed. ● Temperature difference refers to the difference between maximum and minimum temperatures under rules you have set. ● Temperature slope refers to the change rate of the average temperature with the configured rules.
Alarm Condition	Set alarm conditions, covering **Below**, **Match** and **Above**.
Alarm Threshold Temperature	It ranges from –40 °C to +550 °C. You can set this value when you select **Alarm Results** as **Max**, **Min**, **Aver**, or **Temperature Difference**.
Temperature Slope	The temperature difference in each minute. Ranges from –600 °C/min to +600 °C/min. You can set this value when you select **Alarm Results** as **Slope**.
Temperature Error	Set a temperature error value and if the alarm threshold temperature or temperature slope is within the value that you have set, alarms will still be triggered. It ranges from –10 °C to +10 °C.
Duration of Temperature	You can set the duration of abnormal temperature after which alarms will be triggered. It ranges from 0–1000 s.

Step 3 Set the anti-dither time.
After the anti-dither time is configured, the system only records one motion detection event in the period.

Step 4 Configure arming periods and alarm linkage action. For details, see "5.1.1.1 Configuring

Alarm-in" and "5.1.1.2.1 Setting Period".

Step 5 Click **Save**.

You can view temperature changes under the rules that you have configured.

5.2.5.2 Configuring Temperature Contrast

Compares temperature of the selected spots, lines or area and displays comparison results on the live page.

Prerequisites

You have configured at least two temperature measurement rules. For details, see "5.2.5.1 Configuring Temperature Measuring Rules".

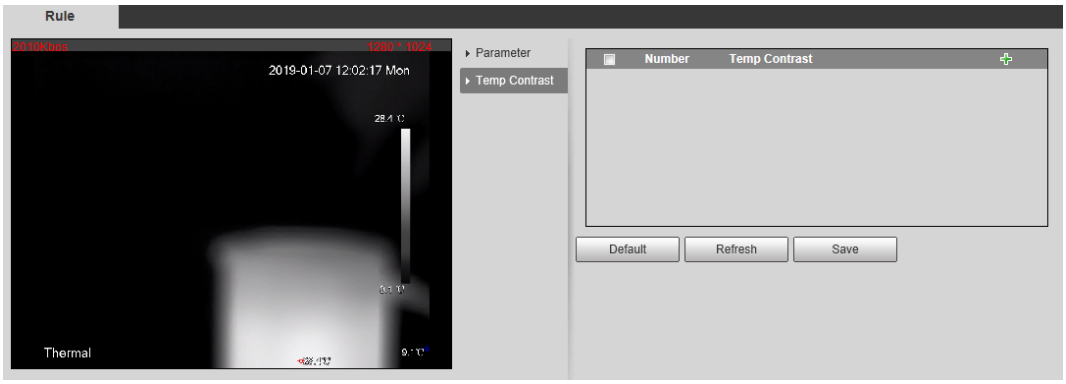
Procedure

Step 1 Select **Setting** > **Temperature** > **Rule** > **Temp Contrast**.

Step 2 Set temperature contrast rules

1) Click to add a temperature contrast rule.

Figure 5-26 Add temperature contrast rules



2) Double-click the added temperature contrast rule, and then select the contrasting rules.

3) Set alarm parameters.

Table 5-7 Description of temperature contrast parameters

Parameter	Description
Alarm Results	You can select from the following three options to determine a standard of triggering an alarm. ● Average temperature: Compares average temperatures of two rules. ● Maximum temperature: Compares maximum temperatures of two rules. ● Minimum temperature: Compares minimum temperatures of two rules. When one of the two rules refers to a spot, both maximum temperature and minimum temperature are actually average temperature.
Alarm Condition	Contains **Lower**, **Matched** and **Higher**.

Parameter	Description
Alarm Threshold Temperature	Temperature of triggering an alarm. It ranges from 0–550 °C.

Step 3 Click **Save**.

On the live image, you can view temperature contrast results of the select objects.

5.2.5.3 Configuring Shield Area

After configuring shield areas, the fixed false alarm sources can be excluded.

This function is only available on some select models.

Step 1 Select **Setting** > **Temperature** > **Rule** > **Shield Area**.

Step 2 Click to add a shield area.

- You can add 12 shield area at most.
- Click to delete the shield area.

Step 3 Double-click the name to modify the shield name.

Step 4 Set the mode.

- Manual: Select **Manual** as the mode, and then set the begin time and end time. The shield time is valid during the configured time.
- Auto: Select **Auto** as the mode, and the shield area takes effect according to the day & night mode of the visible channel. The shield area is valid during the day time (when ICR is in color), and it is not valid during the night time (when ICR switches black and white.

Figure 5-27 Configure shield area

Step 5 Click **Save**.

5.2.5.4 Configuring Global Setup

After enabling the temperature measurement rules, the configured rules take effect, and the rules are displayed on the live view.

Step 1 Select **Setting** > **Temperature** > **Global Setup** > **Temperature**.

Step 2 Configure the global setup parameters.

Figure 5-28 Global setup

Table 5-8 Parameter description of global setup

Parameter	Description
Temperature Switch	Select the checkbox to enable this function.
Temperature Unit	Includes °C and °F.
Relative Humidity	Relative humidity of environment. Ranges from 0RH–100%RH.
Atmospheric Temperature	Temperature of our environment. Ranges from –50 °C to 327.7 °C.
Target Radiation Coefficient	Set Radiation coefficient of targets that are shot by this Camera. Ranges from 0.5–1.
Target Distance	Distance from the Camera to targets that are shot. Ranges from 0 m–10,000 m.
Target Reflection Temperature	The temperature radiation of the objects around the target. It reflects to the Camera through target surface to affect the test results.
Temperature Range	Select the temperature range. • **Low Temperature**: The temperature range is –20 °C to 150 °C. • **High Temperature**: The temperature range is 0 °C to 550 °C. • **Auto**: Automatically switch between high and low temperature modes. We recommend use default parameter values. Select the mode (low temperature or high temperature) according to the temperature of the main target.
Advanced	Configure the Isotherm function as needed. For details, see "5.2.8 Isotherm".

Step 3 Click **Save**.

Result

After successfully configuration, you can view the results on the live view.

Figure 5-29 Temperature switch

5.2.6 Configuring Temperature Alarm

When the temperature meets the defined alarm condition, an alarm is triggered and the Camera performs alarm linkage.

Prerequisites

You have set the temperature measurement rules. See "5.2.5 Configuring Temperature Measurement Parameters" for detailed operation.

This function is available on models with temperature measurement function.

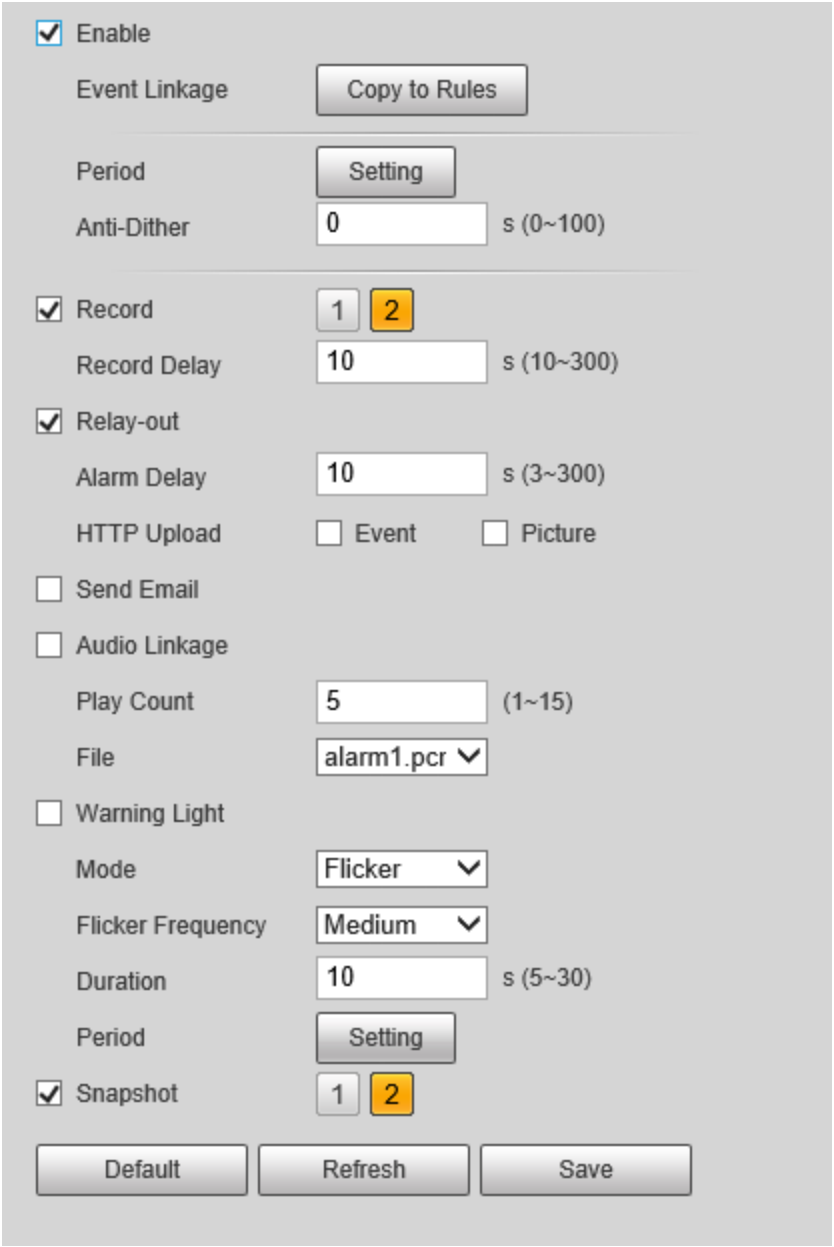
Procedure

Step 1 Select **Setting** > **Temperature** > **Global Setup** > **Alarm**.

Step 2 Select the **Enable** checkbox.

Configure the threshold of temperature alarm in **Setting** > **Temperature** > **Rule** > **Parameter**. The Camera will perform alarm according to the configuration.

Figure 5-30 Temperature alarm



Step 3 Configure arming periods and alarm linkage action. For details, see "5.1.1.1 Configuring Alarm-in" and "5.1.1.2.1 Setting Period".

Step 4 Click **Save**.

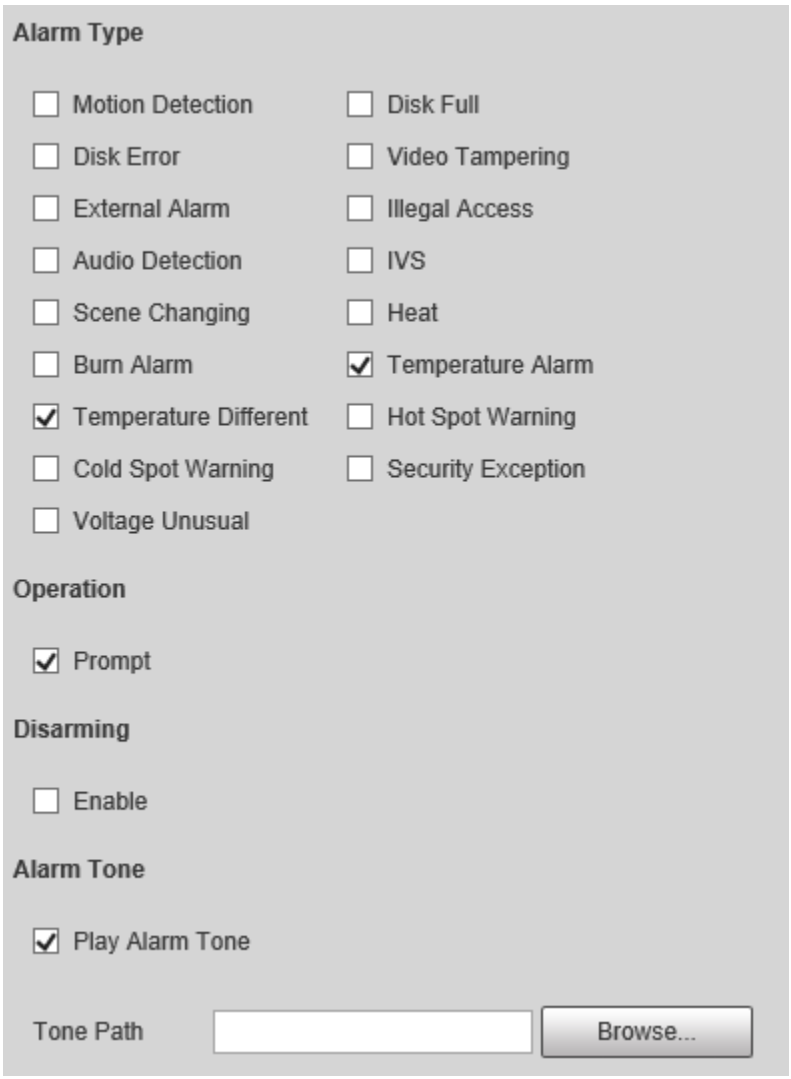
5.2.7 Verification

After configuration, enable **Temperature Alarm**, **Prompt**, and **Play Alarm Tone**. When an alarm is triggered, the Camera prompts and records alarm according to the actual situation.

Step 1 Click the **Alarm** tab.

Step 2 Select **Temperature Alarm**.

Figure 5-31 Alarm



Step 3 (Optional) Select **Prompt**, and the system prompts and records alarm information as needed.

- If you are not on the **Alarm** page when alarm events that you have subscribed are triggered, is displayed on the **Alarm** tab and the alarm information will be recorded. Click the **Alarm** tab, and the sign disappears.
- If you are on the **Alarm** page when the selected alarm is triggered, there will be detailed alarm information displayed at the right side of the page.

Step 4 (Optional) Select the **Disarming** checkbox next to **Disarming** to enable the one-click disarming function.

After enabling disarming, the system will not perform any linkage actions, but alarm records will still be generated.

Step 5 (Optional) Select the **Play Alarm Tone** checkbox, and select an audio file.

System would play the audio file that you have selected, when the subscribed alarm events are triggered.

Click **Clear** to remove all the alarm information.

5.2.8 Isotherm

Stands out the temperature range of the image.

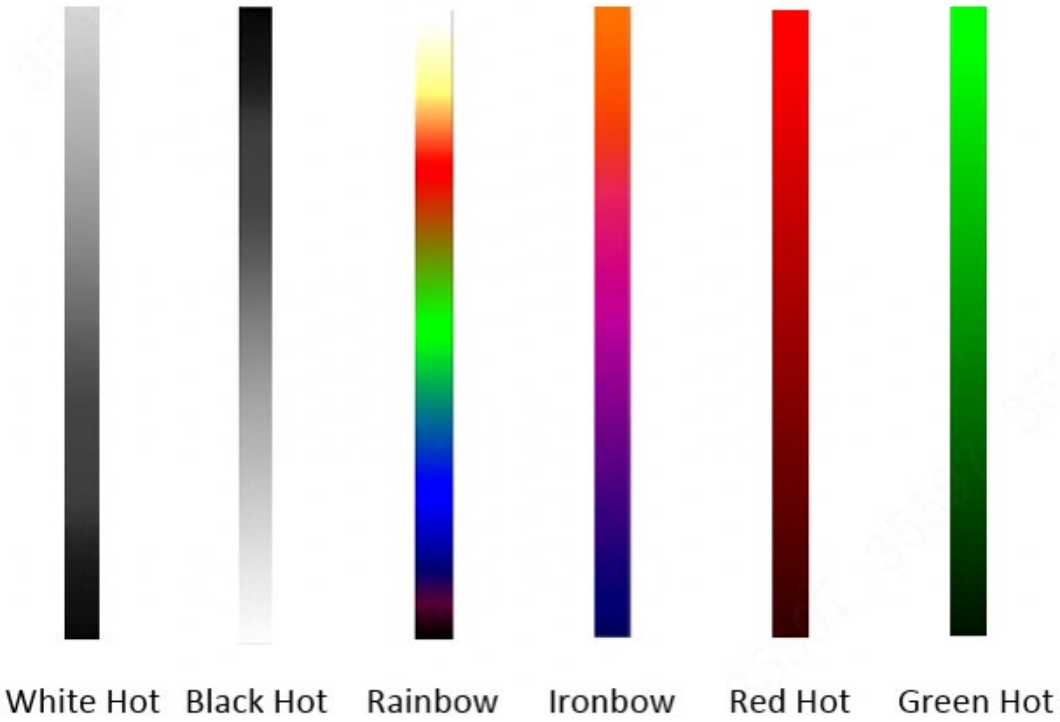
- Isotherm: Used to highlight an object in images of high brightness. Isotherm is based on median temperature, with highest temperature and lowest temperature as its range. The part of an object whose temperature is higher than min limit temperature will be represented in a bright color and the part of an object whose temperature is lower than min limit temperature will be represented in a black/white color. After enabling Isotherm, you have to make sure that min limit temperature <= max limit temperature <= ceiling temperature <= saturation temperature.
- Color Code: Enable this function, and a color code is displayed on the right side of surveillance images to show the change of color between minimum temperature and maximum temperature.

The Camera is equipped with a color palette. Different from the traditional palette, the palette can correspond to the temperature, and different colors correspond to different temperature ranges. Different temperature ranges are displayed in different colors, thus realizing the isotherm display function. There are two types of palettes for displaying different temperatures. You can determine which type of palette to use by the color bars in the image.

Colored palettes

All the colors in the selected palette are used to color the image, but they cannot highlight the temperature. The vertical color bar in the image displays the selected palette.

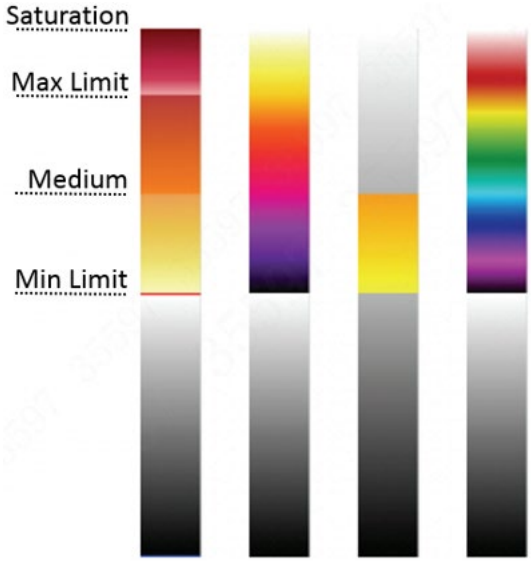
Figure 5-32 Colored palettes



Isotherm palettes

The isotherm palette can be used to isolate the predetermined temperature. The vertical color bar in the image displays the selected palettes and the input temperature standard. When exceeding the configured temperature standard, the target will be highlighted according to the configured color of the tone.

Figure 5-33 Isotherm palettes



For example, you have configured temperature limit for the target, all areas with temperature exceeding this configured threshold will be highlighted with specific colors. After receiving the alarm, you can quickly determine the alarm source through the isotherm image.

Figure 5-34 Isotherm

5.3 Configuring IVS

5.3.1 Installation Requirements on Perimeter Protection

5.3.1.1 Site Selection

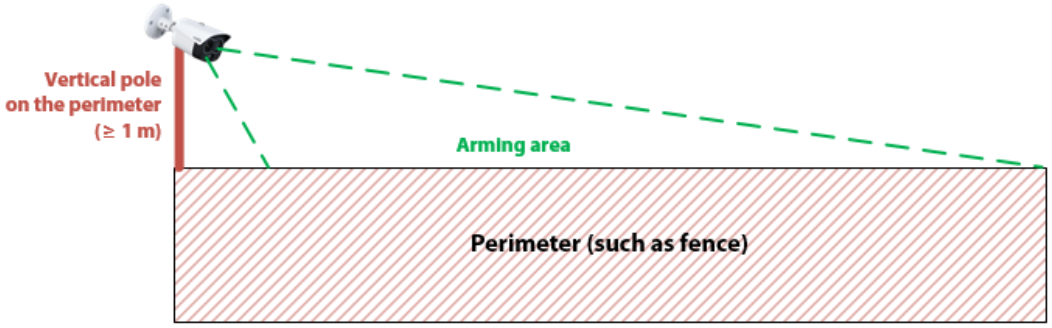
- When installing the Camera, keep a depression angle (10°–40°) to avoid obstruction or overlap between the targets caused by parallel view, which can reduce the false alarms and missed alarms.
- The recommended installation height is 3 m–5 m. (In the detection area, we recommended high-point installation rather than low-point installation).

- Install the Camera horizontally and firmly to guarantee the analysis result.
- To get a clearer movement of the target, make the monitoring direction vertical to the moving direction. Make sure that the target is continuously present in the image, and has crossing action. Make sure that there is no obstruction in the detection area, and leave some space at both sides of the rule line, otherwise the target might rush out of the image because of the fast speed.

5.3.1.2 Typical Scenes

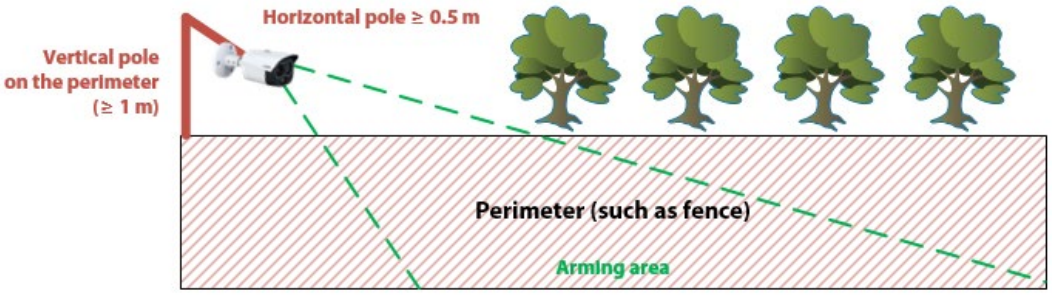
- When there is no obstruction around the perimeter, install a vertical pole (≥ 1 m) on the perimeter, and then install the Camera on the vertical pole.

Figure 5-35 Typical scene (1)



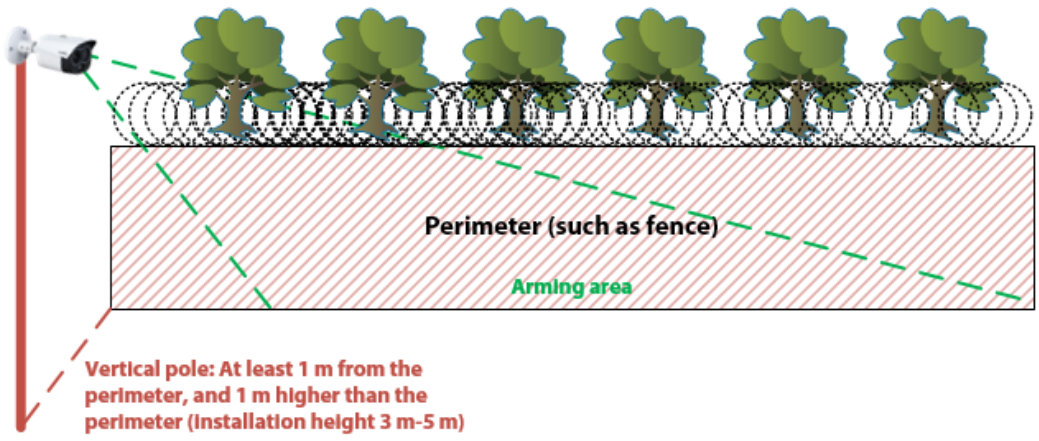
- When there are obstructions (such as trees and vegetation) around the perimeter, install an L pole (horizontal pole ≥ 0.5 m) on the perimeter, and then install the Camera on the L pole.

Figure 5-36 Typical scene (2)



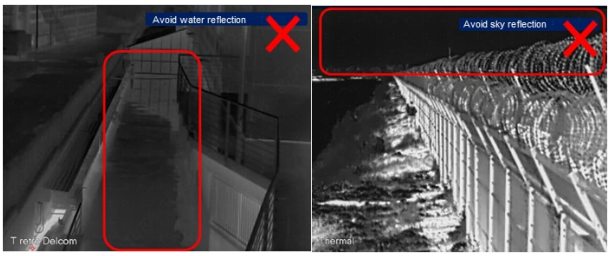
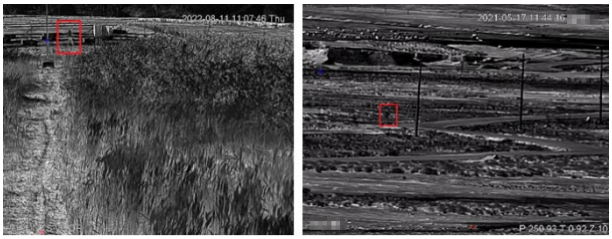
- When there are obstructions (such as trees and vegetation) around the perimeter, and wire netting on the perimeter, install a vertical pole separately. Keep the pole 1 m from the perimeter, and 1 m higher than the perimeter (installation height 3 m-5 m).

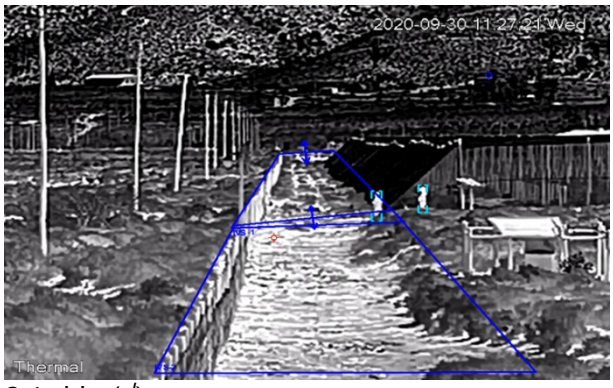
Figure 5-37 Typical scene (3)



5.3.1.3 Scene Confirmation

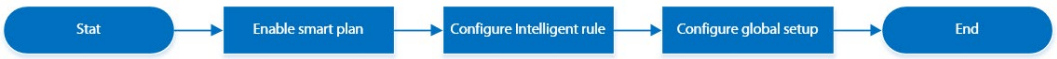
Table 5-9 Scene Confirmation

Item	Standard	Example
Burn Alarm	• To avoid damaging the thermal detector, do not aim the lens at intense radiation sources (such as the sun, molten iron and heat sources) during the storage, installation or operation, and avoid direct sunlight and reflection for outdoor use. • Avoid sky and water reflection.	 Not suitable. The camera lens might be burnt. (×)
Wide view and no obstructions	• The monitoring scene should be with a wide view. • No obstructions, such as trees, vegetation, and wire netting in the detection area.	 Not suitable. The target is blocked. (×)
Background complexity	• In scenes with complex background, the target is hard to be identified, and the detection distance will be shorter. • The larger the temperature difference between the target and the background, the better the detection result will be.	 Not suitable. False alarm and missed alarm might be caused, and the detection distance will be shorter. (×)

Item	Standard	Example
Target size	The maximum width and height of the target should be no more than 2/3 that of the image.	 Not suitable. False alarm and missed alarm might be caused. (×)
Suitable scene	• No sky in the image. • The detection area should be with a wide view and no obstructions. • The background is simple. • Drawing multiple rule boxes from far to near.	 Suitable. (√)

5.3.2 Configuration Flow

Figure 5-38 Configuration Flow



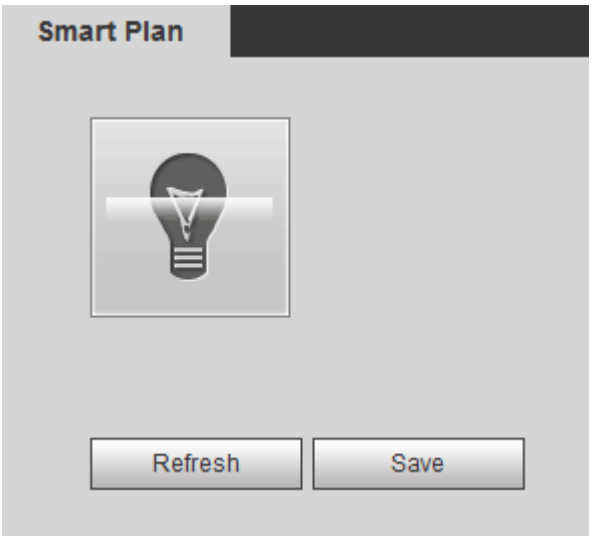
5.3.3 Configuring Smart Plan

You need to enable smart plan before intelligent rules function.

We recommend white hot for IVS. For details, see "6.1.1.2 Configuring Thermal Image".

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

Figure 5-39 Smart Plan



Step 2 Click on the **Smart Plan** page.

You might need to disable other smart plans before enabling it.

- The icon that you have selected will be lighted.
- Click the icon again to cancel the smart plan.

Step 3 Click **Save**.

5.3.4 Configuring Intelligent Rules

Set rule for IVS, including tripwire and intrusion.

Background Information

For the functions and applications of the rules, see Table 5-10. This section uses configuring tripwire as an example.

Table 5-10 Description of IVS functions

Rule	Description	Applicable Scene
Tripwire	When the target crosses tripwire from the defined motion direction, an alarm is triggered, and then the system performs configured alarm linkages.	Scenes with sparse targets and no occlusion among targets, such as the perimeter protection of unattended area.
Intrusion	When the target enters, leaves, or appears in the detection area, an alarm is triggered, and the system performs configured alarm linkages.	

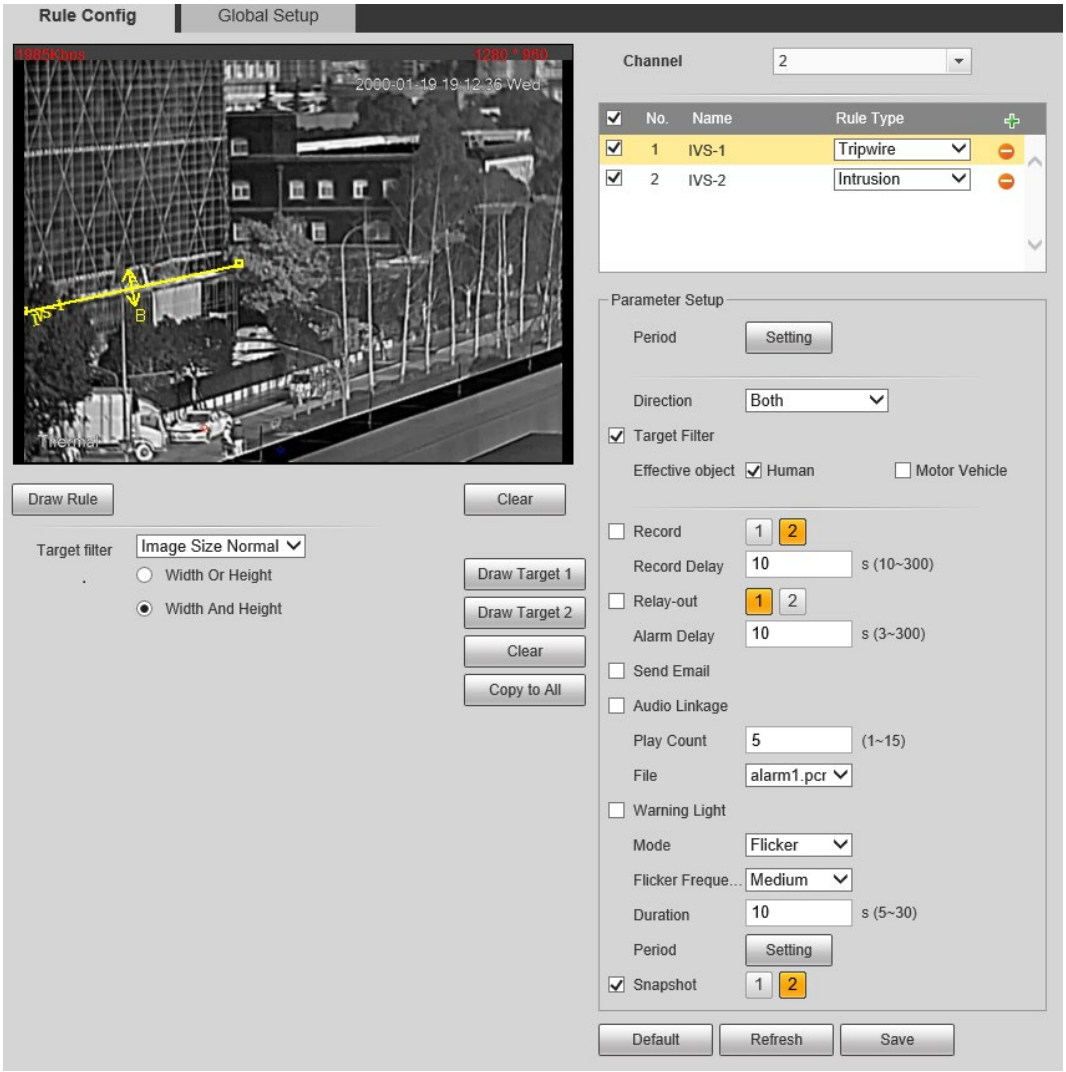
Procedure

Step 1 Select **Setting** > **Smart Thermal** > **IVS** > **Rule Config**.

After entering the **Rule Config** page, the PTZ locking function is automatically enabled. The locking time is 180 seconds. During the locking period, you can only control the PTZ manually. Click **Unlock** at the lower-left corner of the **Rule Config** page to manually

unlock the PTZ. Click again after unlocking to re-lock the PTZ.

Figure 5-40 Rule configuration



Step 2 Select the channel.

- Select **1** in **Channel** to configure the rule for the visible channel.
- Select **2** in **Channel** to configure the rule for the thermal channel.

The monocular camera does not support channel selection.

Step 3 Click to add a rule.

Step 4 Double-click the added rule to edit the rule name, and select **tripwire** as the type.

Step 5 Click **Draw Rule** to draw a rule line in the image. Right-click to finish drawing. After finishing drawing, drag the ends of the line to adjust the detection areas.

- Tripwire: Draw a detection line.
- Intrusion: Draw a detection area.

Click **Clear** to delete the drawn rule.

Step 6 (Optional) Filter targets.

- Image size: You can draw one suit of filter boxes (one maximum size + one minimum size) on the image.
  1. Select **Image Size** from the **Target Filter** drop-down list, and then click **Draw**

Target.

2. Select **Max Size** or **Min Size**, click **Draw Target**, and then drag the corners of the filter box to make the box larger or smaller. When the target size is smaller than the maximum size and larger than the minimum size, and alarm will be triggered.

- Image size normalization: On the image, draw a filtering model for the rule. Draw two lines with different heights according to the size of the same human target at different distances. The Camera will automatically calculate the height of the human target at different distances according to the drawn lines. This function is only available on the thermal channel.
  1. Select **Image Size Normalization** from the **Target Filter** drop-down list.
  2. Draw the target.
     - ◇ Target 1: When the human target is standing near the Camera, click **Draw Target 1**, and then press and hold the left mouse button to draw a line from the target's neck to feet.
     - ◇ Target 2: When the human target is standing far away from the Camera, click **Draw Target 2**, and then press and hold the left mouse button to draw a line from the target's neck to feet.
  3. Click **Calibration Validation**to verify calibration.
     When the target height is higher than the calculated height, the alarm is triggered, and the calibration is successful.

- Click **Clear** to delete all drawn detection lines.
- Click **Copy to all** to copy the drawn filter box to other IVS rules

Step 7 Configure the parameters.

Table 5-11 Description of IVS parameters

Parameter	Description
Direction	Set the direction of rule detection. ● When setting tripwire, select **A->B**, **B->A**, or **A<->B**. ● When setting intrusion, select **Enter**, **Exit**, or **Both**.
Action	When setting intrusion action, select **Appears** or **Cross**.
Track Time	Select **Alarm Track** and set the tracking time. When an alarm is triggered, the Camera automatically tracks the person or object that triggers the alarm. Tracking time is the duration that the Camera automatically tracks the object.
Target Filter	Select **Target Filter** to enable this function. ● When you select **Human** as the alarm target, an alarm will be triggered when the system detects persons triggering the rule. ● When you select **Motor Vehicle** as the alarm target, alarm will be triggered when the system detects vehicle triggering the rule.

Step 8 Configure arming periods and alarm linkage action. For details, see "5.1.1.1 Configuring Alarm-in" and "5.1.1.2.1 Setting Period".

Step 9 Click **Save**.

If you want to view the alarm details on the **Alarm** page, subscribe alarm information. For details, see "4.5.2 Subscribing Alarm Information".

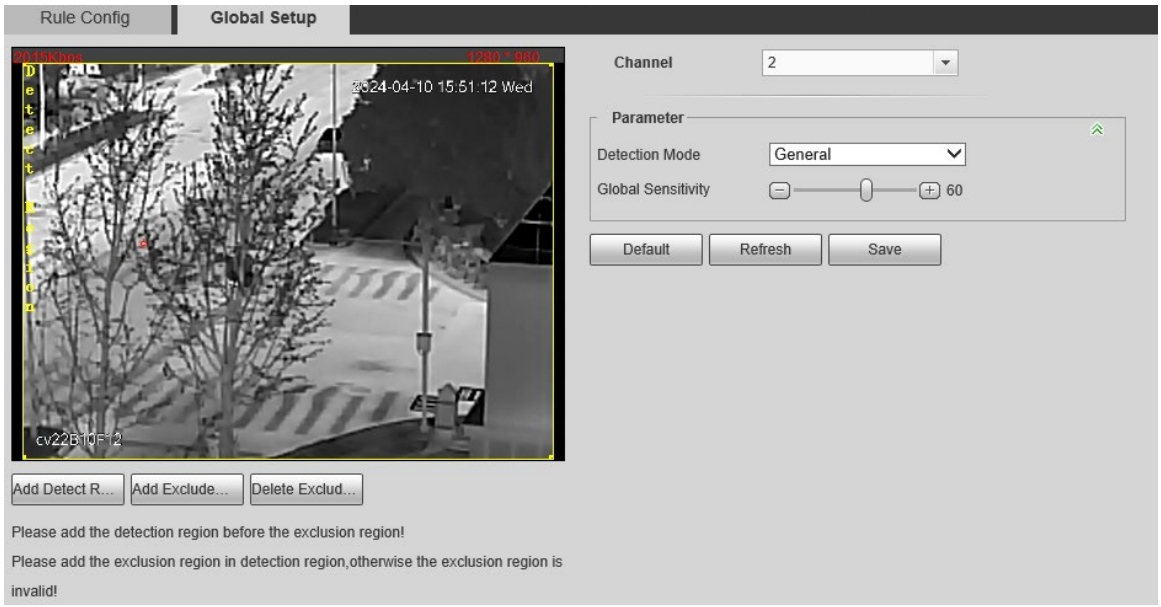
5.3.5 Configuring Global Setup

Configure global rules for IVS. You can draw the detection area and exclusion areas. When the configured rules are triggered in the detection areas (out of the exclusion areas), an alarm will be triggered. For the thermal channel, you can also configure the sensitivity.

Procedure

Step 1 Select **Setting** > **Smart Thermal** > **IVS** > **Global Setup**.

Figure 5-41 Global setup



Step 2 Select the channel.

- Select **1** in **Channel** to configure the rule for the visible channel.
- Select **2** in **Channel** to configure the rule for the thermal channel.

The monocular camera does not support channel selection.

Step 3 Add detected area and excluded area.

1) Click **Add Detect Region** to draw a detected area on the image. Right-click to end drawing.

Click **Add Detect Region** again to re-draw.

2) Click **Add Exclude Region** to draw an excluded area on the monitoring image. Right-click to end drawing.

- Click **Delete Excluded Area** to delete the excluded area.
- An excluded area takes effect only when it has been drawn in the detected area.
- Multiple excluded areas can be drawn in the detected area.

Step 4 Select the detection mode.

- General: For the short range scene, select general mode, which is better for the classification of human, vehicles, and small targets.
- High Sensitivity: In scene of perimeter detection, when the scene needs to be detected

at a distance of 10 times, select the high sensitivity mode.

- Parking Lot: When you install the Camera in a parking lot, select the parking lot mode as the detection mode to avoid false alarms caused by the movement of the frame position when the outline of the stationary vehicle is not clear, which can greatly reduce false alarms.

Step 5 Configure the global sensitivity. We recommend you set the sensitivity to be 60. The higher the sensitivity, the easier the target will be detected, but the false alarms will increase.

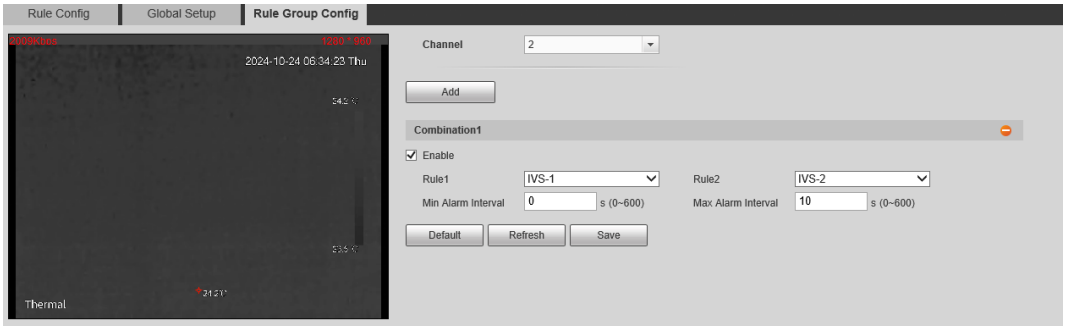
Step 6 Click **Save**.

5.3.6 Configuring Rule Group

After configuring the rule group, false alarms caused by inaccurate target classification in distant scenes can be reduced through the variable of time.

Step 1 Select **Setting** > **Smart Thermal** > **IVS** > **Rule Group Config**.

Figure 5-42 Rule Group Configuration



Step 2 Click the **Rule Group Config** tab.

Step 3 Click **Add** to add a new rule group.

- You can add 5 rule groups at most.
- The 2 rules in a group cannot be the same. Error example: Combination 1: Rule 1, Rule 1.
- Different group cannot contain the same rule combination. Error examples: Combination 2: Rule 2, Rule 1; Combination 3: Rule 2, Rule 1.

Step 4 Click **Rule 1** and **Rule 2** to select the rule.

You can set the combinations of intrusion and intrusion, tripwire and tripwire, and tripwire and intrusion.

Step 5 Set the minimum alarm interval and maximum alarm interval. For example, the minimum alarm interval is set to be 0 s and the maximum alarm interval is 10 s, when the target across the two lines in 10 s, an alarm is triggered.

Step 6 Click **Save**.

5.4 Call Detection

Configure call detection to help you monitor the calling behavior at locations such as gas stations.

Once a calling is detected, alarm will be triggered.

This function is only available on the visible channel.

5.4.1 Configuration Flow

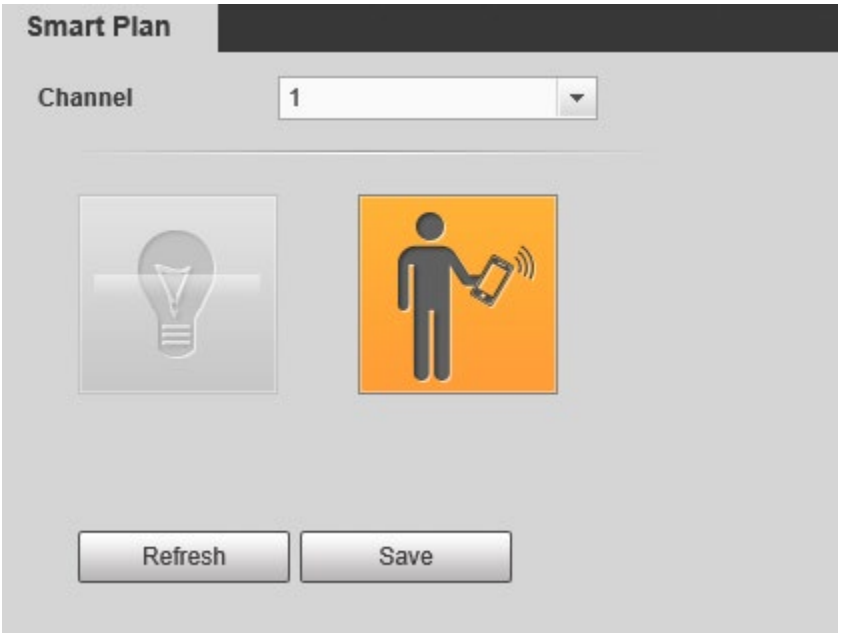
Figure 5-43 Configuration Flow

5.4.2 Configuring Smart Plan

You need to enable smart plan before intelligent rules function.

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

Figure 5-44 Smart Plan



Step 2 Select **1** in **Channel**.

Step 3 Click on the **Smart Plan** page.

You might need to disable other smart plans before enabling it.

- The icon you have selected will be lighted.
- Click the icon again to cancel the smart plan.

Step 4 Click **Save**.

5.4.3 Configuring Detection Rule

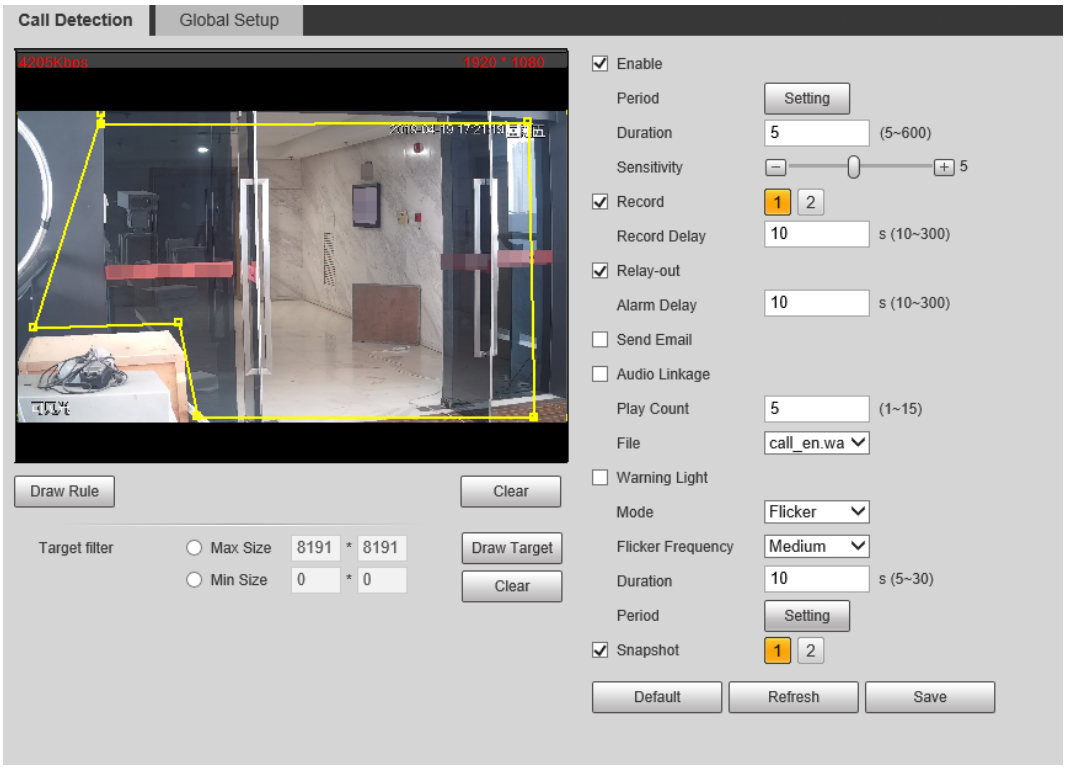
Configure the rule for calling in the visible channel. When a call action is detected, an alarm is triggered., and then the Camera performs linkages actions.

Step 1 Select **Setting** > **Smart Thermal** > **Call Detection**.

Step 2 Click **Draw Rule**, drag the corners of the rectangle to adjust the detection areas.

- The whole image is the detection area by default.
- Click **Clear** to delete the drawn rules.

Figure 5-45 Rule configuration



Step 3 (Optional) Select **Max Size** or **Min Size**, click **Draw Target**, and then drag the corners of the filter box to make the box larger or smaller.

Click **Clear** to delete all drawn detection lines.

Step 4 Select **Enable**, and then set the interval and sensitivity.

- Interval: The time that calling behavior lasts. When the Camera detects the calling time beyond the configured value, an alarm is triggered.
- Sensitivity: The larger the value is, the more sensitive the call detection is. However, setting the value too large might cause false alarm.

Step 5 Configure arming periods and alarm linkage action. For details, see "5.1.1.1 Configuring Alarm-in" and "5.1.1.2.1 Setting Period".

Step 6 Click **Save**.

Result

According to the configured rules, when call action is detected in the detection area, an alarm is triggered, and the Camera performs linkage actions.

Click the **Alarm** tab on the main page, and then select **IVS**. When an alarm is trigged, you can view the details on the **Alarm** page.

5.4.4 Configuring Global Setup

Configure global rules for call detection. You can draw the detection area and exclusion areas. When

the configured rules are triggered in the detection areas (out of the exclusion areas), an alarm will be triggered.

Procedure

Step 1 Select **Setting** > **Smart Thermal** > **Call Detection** > **Global Setup**.

Step 2 Add detected area and excluded area.

1) Click **Add Detect Region** to draw a detected area on the image. Right-click to end drawing.

Click **Add Detect Region** again to re-draw.

2) Click **Add Exclude Region** to draw an excluded area on the monitoring image. Right-click to end drawing.

- Click **Delete Exclude Region** to delete the excluded area.
- An excluded area takes effect only when it has been drawn in the detected area.
- Multiple excluded areas can be drawn in the detected area.

Step 3 Click **Save**.

5.5 Smoking Detection

Configure global rules for smoking detection. You can draw the detection area and exclusion areas. When the configured rules are triggered in the detection areas (out of the exclusion areas), an alarm will be triggered.

This function is only available on the thermal channel.

5.5.1 Configuration Flow

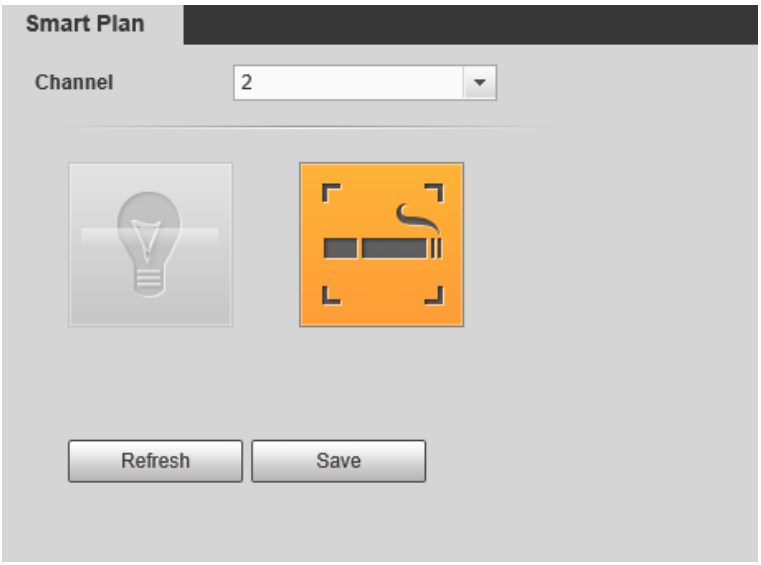
Figure 5-46 Configuration Flow

5.5.2 Configuring Smart Plan

You need to enable smart plan before intelligent rules function.

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

Figure 5-47 Smart Plan



Step 2 Select **2** in **Channel**.

Step 3 Click the icon on the **Smart Plan** page.

You might need to disable other smart plans before enabling it.

- The icon you have selected will be lighted.
- Click the icon again to cancel the smart plan.

Step 4 Click **Save**.

5.5.3 Configuring Detection Rule

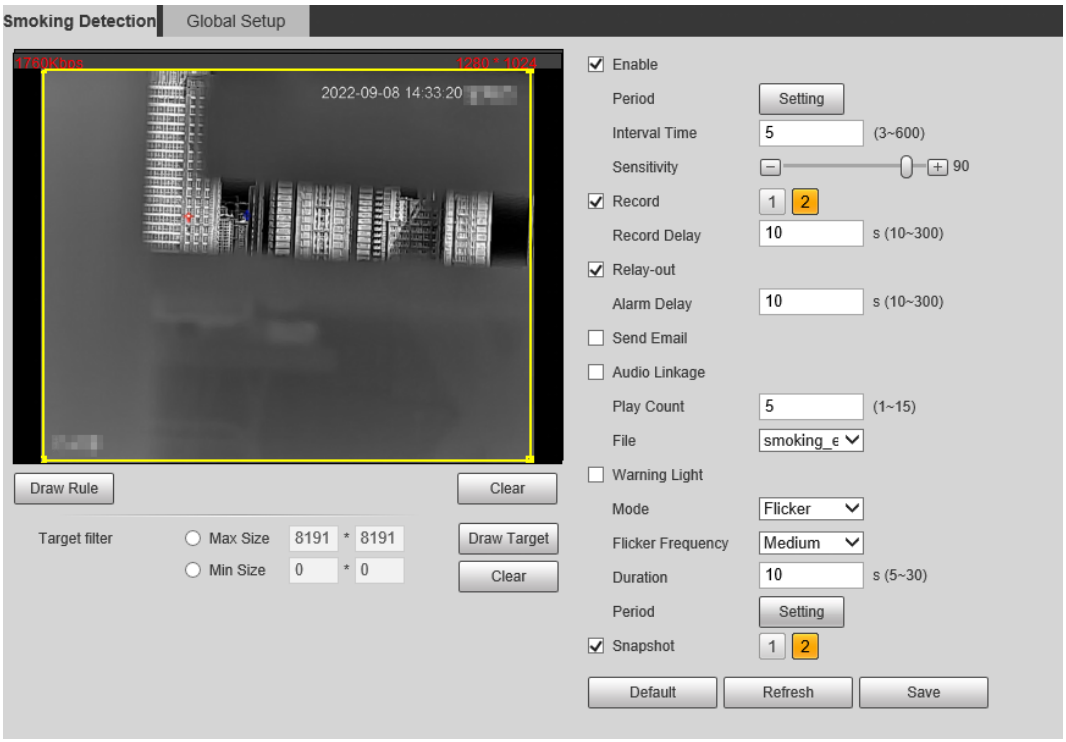
Configure the rule for smoking detection in the thermal channel. When a smoking action is detected, an alarm is triggered., and the system performs linkages such as recording, alarm output, sending email, and snapshot.

Step 1 Select **Setting** > **Smart Thermal** > **Smoking Detection**.

Step 2 Click **Draw Rule**, drag the corners of the rectangle to adjust the detection areas.

- The whole image is the detection area by default.
- Click **Clear** to delete the drawn rules.

Figure 5-48 Rule configuration



Step 3 (Optional) Select **Max Size** or **Min Size**, click **Draw Target**, and then drag the corners of filter box to make the box larger or smaller.

Click **Clear** to delete all drawn detection lines.

Step 4 Select **Enable**, and then set the interval and sensitivity.

- Interval: The time that calling behavior lasts. When the Camera detects the calling time beyond the configured value, an alarm is triggered.
- Sensitivity: The larger the value is, the more sensitive the call detection is. However, setting the value too large might cause false alarm.

Step 5 Configure arming periods and alarm linkage action. For details, see "5.1.1.1 Configuring Alarm-in" and "5.1.1.2.1 Setting Period".

Step 6 Click **Save**.

Result

According to the configured rules, when call action is detected in the detection area, an alarm is triggered, and the Camera performs linkage actions.

Click the **Alarm** tab on the main page, and then select **IVS**. When an alarm is trigged, you can view the details on the **Alarm** page.

5.5.4 Configuring Global Setup

Configure global rules for smoking detection. You can draw the detection area and exclusion areas. When the configured rules are triggered in the detection areas (out of the exclusion areas), an alarm will be triggered.

Procedure

Step 1 Select **Setting** > **Smart Thermal** > **Smoking Detection** > **Global Setup**.

Step 2 Add detected area and excluded area.

1) Click **Add Detect Region** to draw a detected area on the image. Right-click to end drawing.

Click **Add Detect Region** again to re-draw.

2) Click **Add Exclude Region** to draw an excluded area on surveillance image. Right-click to end drawing.

- Click **Delete Exclude Region** to delete the excluded area.
- An excluded area takes effect only when it has been drawn in the detected area.
- Multiple excluded areas can be drawn in the detected area.

Step 3 Click **Save**.

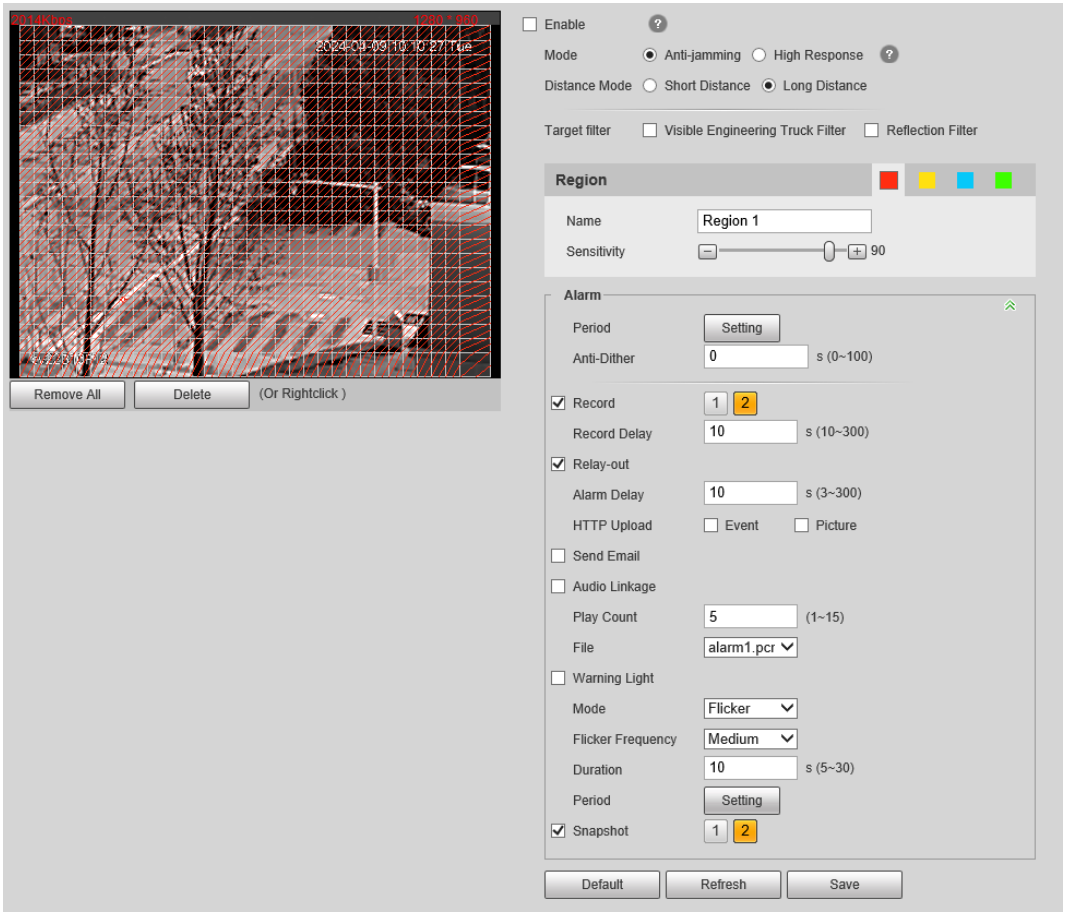
5.6 Configuring Heat Warning

5.6.1 Configuring Heat Rule

When the Camera detects a heat point, an alarm is triggered and then the Camera performs linkages such as recording, alarm output, sending email, audio, alarm light, and snapshot.

Step 1 Select **Setting** > **Smart Thermal** > **Heat** > **Heat**.

Figure 5-49 Heat



Step 2 Select the **Enable** checkbox.

Step 3 Select the heat point warning mode as needed.

- Anti-jamming: Detects suspected heat several times. The detection accuracy is higher, but the detection speed is lower.
- High Response: Detects heat quickly, but the detection accuracy is lower.

Step 4 Select the detection mode.

- Short distance: It is suitable for scenarios with high false alarm targets and low detection distance requirements, such as parking lots, warehouses.
- Long distance: It is suitable for forest fire prevention scenarios.

Step 5 (Optional) Filter targets.

When you select **Anti-jamming** in **Mode**, you can filter targets as needed.

- **Visible Engineering Truck Filter**: When engineering vehicles are working, the temperatures of chimney and engine are high, which might cause false alarms. Selecting checkbox can reduce false alarms caused by engineering vehicles and improve detection accuracy. This function is mainly used in scenes with good lighting conditions.
- **Reflection Filter**: The temperature of reflection caused by the smooth planes (such as glass or mirrors) is high, which night cause false alarms. Selecting the checkbox can reduce false alarms and improve detection accuracy.

Step 6 Select a color in , set the area name and sensitivity, and then drag the mouse on the image.

- The higher the sensitivity is, the easier a fire will be triggered.
- The whole image is the detection area by default. You can draw multiple detection areas.

Step 7 Configure arming periods and alarm linkage action. For details, see "5.1.1.1 Configuring Alarm-in" and "5.1.1.2.1 Setting Period".

Step 8 Click **Save**.

5.6.2 Configuring Smoke and Heat Detection Mode

Step 1 Select **Setting** > **Smart Thermal** > **Heat** > **Smoke and Heat Detection Mode**.

Step 2 Select the smoke and heat detection mode. We recommend you select **Heat or Smoke**.

Figure 5-50 Smoke and heat detection mode

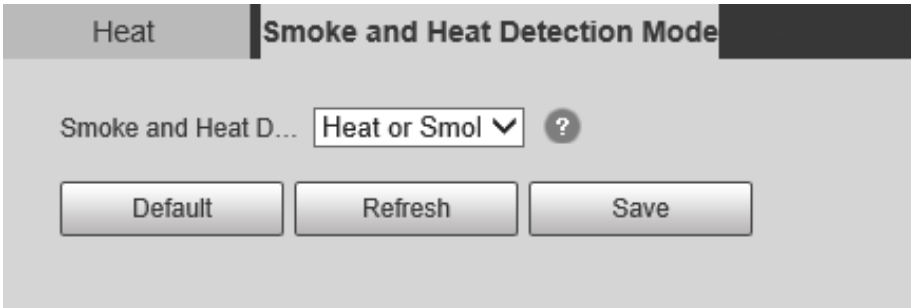


Table 5-12 Parameters of smoke and heat detection mode

Parameter	Description
Heat or Smoke	When the visible channel detects smoke or the thermal channel detects heat point, an alarm will be triggered.

Parameter	Description
Heat Only	When the thermal channel detects heat point, an alarm will be triggered.
Smoke Only	When the visible channel detects smoke, an alarm will be triggered.
Heat and Smoke	When the visible channel detects smoke and the thermal channel detects heat point at the same time, an alarm will be triggered.

Step 3 Click **Save**.

5.7 Configuring Hot Trace

After enabling **Cold Hot Spot**, spot with the highest temperature and spot with the lowest temperature are displayed with different colors.

Step 1 Select **Setting** > **Smart Thermal** > **Hot Trace**.

Step 2 Select the **Enable** checkbox.

The pages might vary according to different models.

Figure 5-51 Hot trace (Security)

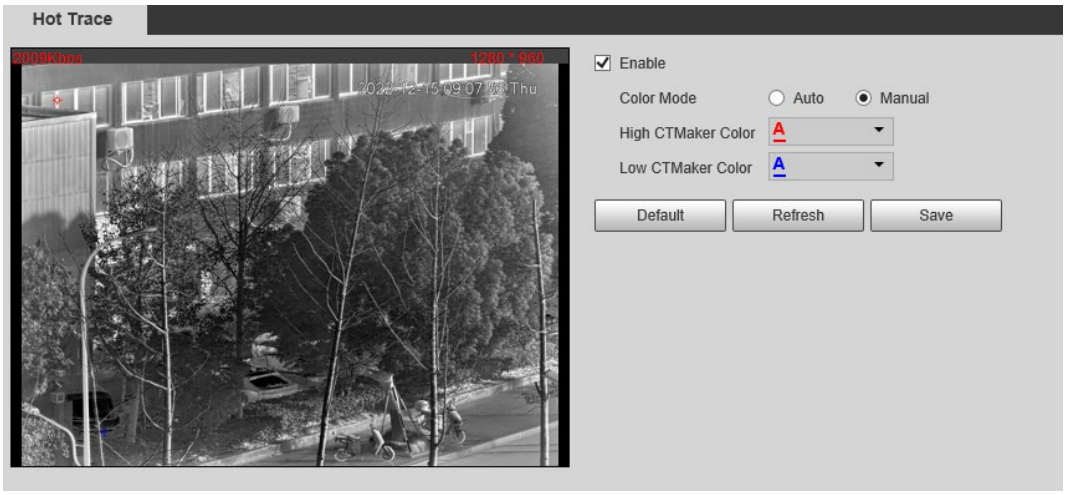
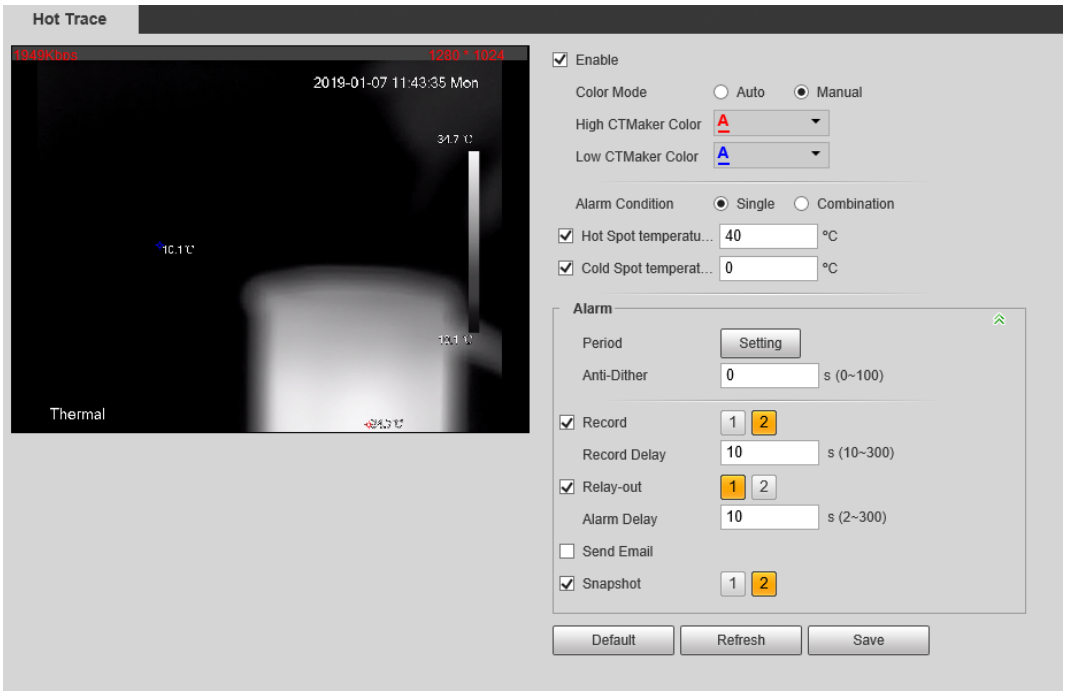


Figure 5-52 Hot trace (Radiometry)



Step 3 Configure the parameters.

Table 5-13 Parameters of hot trace

Parameters	Description
Color Mode	Select a color for cold and hot spots. ● Auto: The hot spot color is red, and the cold spot color is blue by default. ● Manual: You can customize the colors for the hot spot and cold spot.
Alarm Condition	Conditions under which an alarm is triggered. ● **Single** ◇ Select the **Hot Spot temperature more than** checkbox and when the highest temperature is larger than the configured temperature, an alarm is triggered. ◇ Select the **Cold Spot temperature less than** checkbox and when the lowest temperature is smaller than the configured temperature, an alarm is triggered. ◇ If you select both conditions above at one time, an alarm is triggered once any one condition is satisfied. ● **Combination** ● Only when the highest temperature is larger and the lowest temperature is smaller than the configured temperature, an alarm is triggered.
Anti-Dither	Only one event is recorded within the time that you have set.

Step 4 Configure arming periods and alarm linkage action. For details, see "5.1.1.1 Configuring Alarm-in" and "5.1.1.2.1 Setting Period".

Step 5 Click **Save**.

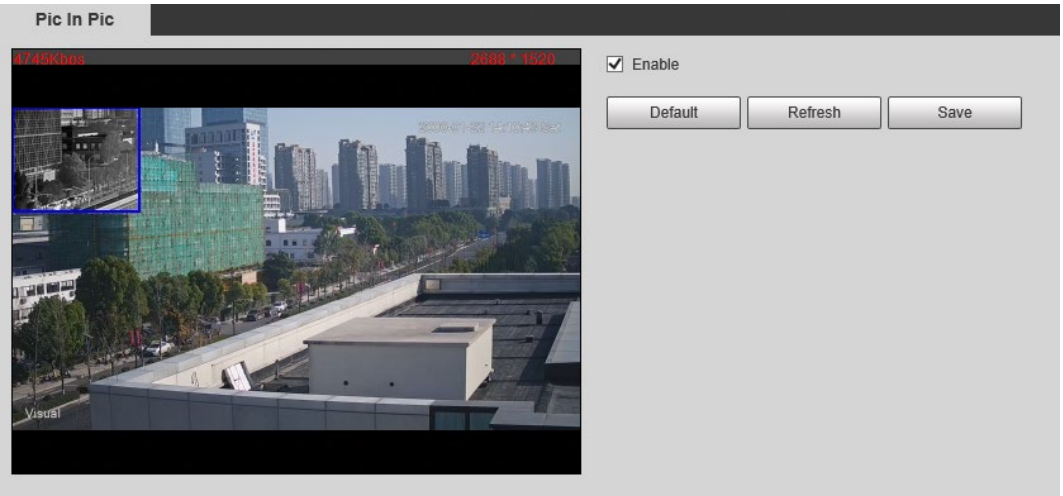
You can view the effect of hot trace on the **Live** page.

5.8 Configuring Pic in Pic

Overlays the thermal image on the visible image.

Step 1 Select **Setting** > **Smart Thermal** > **Pic in Pic**.

Figure 5-53 Pic in pic



Step 2 Select the **Enable** checkbox.

Step 3 Drag the corners the blue box to enlarge the box. Drag the box to adjust the its location.

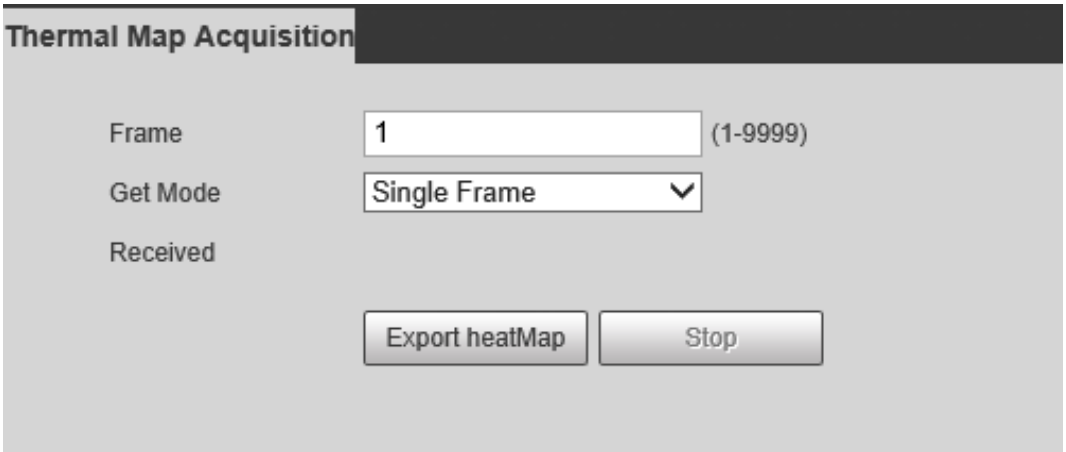
Step 4 Click **Save**.

5.9 Configuring Thermal Map Acquisition

Gets temperature of every pixel on thermal images, and you can export the heat map.

Step 1 Select **Setting** > **Smart Thermal** > **Thermal Map Acquisition**.

Figure 5-54 Thermal map acquisition



Step 2 Configure the parameters.

- **Frame**: The frame of the thermal map that you can acquire.
- **Get Mode**
  - **Single Frame**: Acquires thermal map by single frame. There is interval between the previous frame and next frame.
  - **Continuous**: Acquires thermal map by continuous frame. There is no interval between the previous frame and next frame.

Step 3 Export **Export heatMap**.

Gets the grayscale data and the data file required for temperature calculation according to a certain format, and analyzes and calculates the thermal image data through a special thermal imaging analysis tool on the PC to obtain the heat map and calculate the temperature of each pixel in the image. By analyzing the heat map, the functions such as temperature measurement according to the configured rules, temperature proportion statistics, temperature alarm, isotherm, pseudo color can be realized.

Thermal map files will be saved under the path that you have configured. For details, see "6.1.2.5 Configuring Storage Path".

6 Setting

- Functions of different Cameras might vary.
- Click **Default**, and the Camera is restored to default configuration. Click **Refresh** to view the latest configuration.

6.1 Configuring Camera

Configure the components of the Camera such as lens, video and audio to ensure proper surveillance.

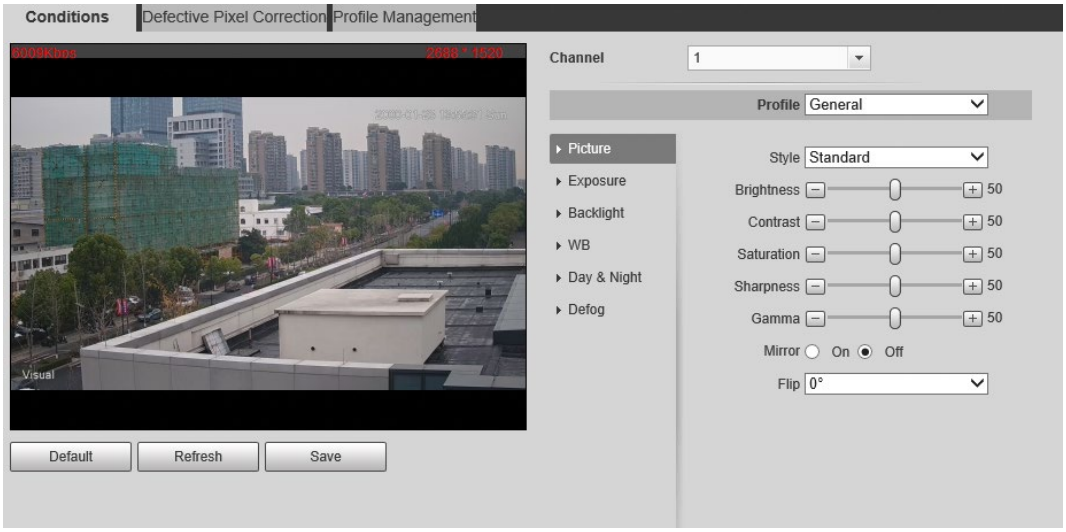
6.1.1 Configuring Camera Conditions

6.1.1.1 Configuring Visible Image

Configure the visible image of the Camera, and adjust the image parameters to achieve a better image effect.

Select **Setting** > **Camera** > **Conditions** > **Conditions**, select **1** in **Channel**, and configure the profile. For details, see "6.1.1.4 Configuring Profile Management".

Figure 6-1 Visible channel



6.1.1.1.1 Configuring Picture Parameters

You can configure the picture parameters including brightness, contrast, saturation, Chroma CNT, sharpness CNT and gamma.

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

Step 2 Select **1** in **Channel**.

Step 3 Click the **Picture** tab.

Step 4 Configure picture parameters.

Figure 6-2 Picture

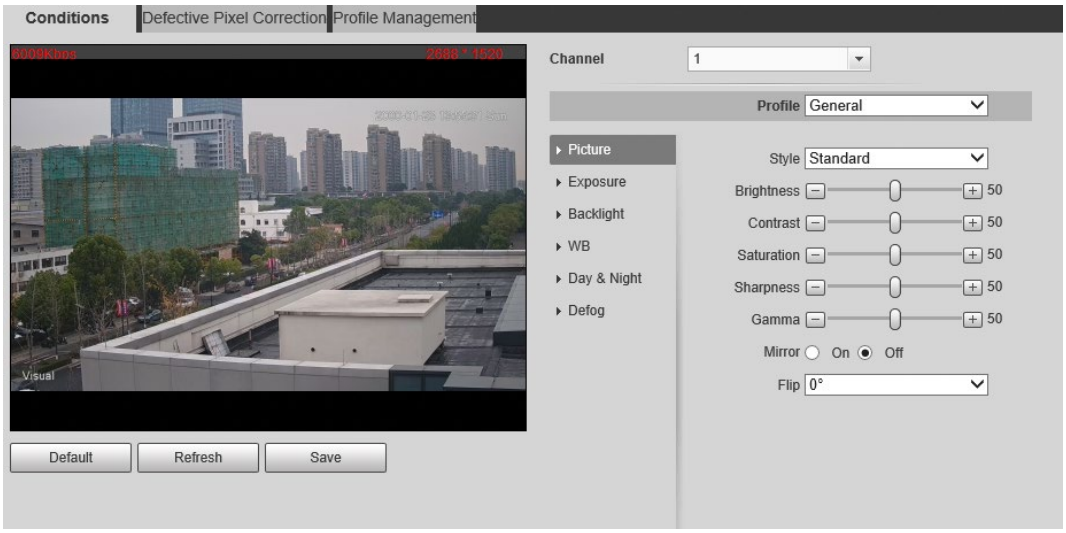


Table 6-1 Description of picture parameters

Parameter	Description
Style	Select display style of the video image, including **Soft**, **Standard** and **Vivid**.
Brightness	Changes the value to adjust the picture brightness. The bigger the value is, the brighter the picture will be.
Contrast	Changes the contrast of the picture. The bigger the value is, the more the contrast will be between bright and dark areas.
Saturation	Makes the color deeper or lighter. The bigger the value is, the deeper the color will be. Saturation value will not change image brightness.
Chroma CNT	Reduces the image color and prevents it from being too strong. The bigger the value, the better the effect.
Sharpness	Changes the sharpness of picture edges. The bigger the value is, the clearer the picture edges will be, and if the value is set too big, picture noises are more likely to appear.
Sharpness CNT	The bigger the value, the stronger the sharpness CNT.
Gamma	Changes the picture brightness and improves the picture dynamic range in a non-linear way. The bigger the value is, the brighter the picture will be.
Flip	Changes the display direction of the picture, see the options below. ● 0°: Normal display. ● 90°: The picture rotates 90° clockwise. ● 180°: The picture rotates 90° counterclockwise. ● 270°: The picture flips upside down. This function is available on select models. For some models, please set the resolution to be 1080p or lower when using 90° and 180°. For details, see "6.1.2 Configuring Video Parameters".

Parameter	Description
Optical Dejittering	The lens vibration is sensed by the gyroscope sensor, and the corresponding compensation is calculated using the intelligent anti-shake algorithm. The movable parts inside the lens are driven to offset the vibration, which greatly reduces blurring of the image caused by the vibration.
Lens Lock	Select **On** to lock the lens.
Picture Freeze	When you call a preset, the image displays the preset location, not the rotation image.

Step 5 Click **Save**.

6.1.1.1.2 Configuring Exposure Parameters

Configure iris and shutter to improve image clarity.

Cameras with true WDR do not support long exposure when WDR is enabled in **Backlight**.

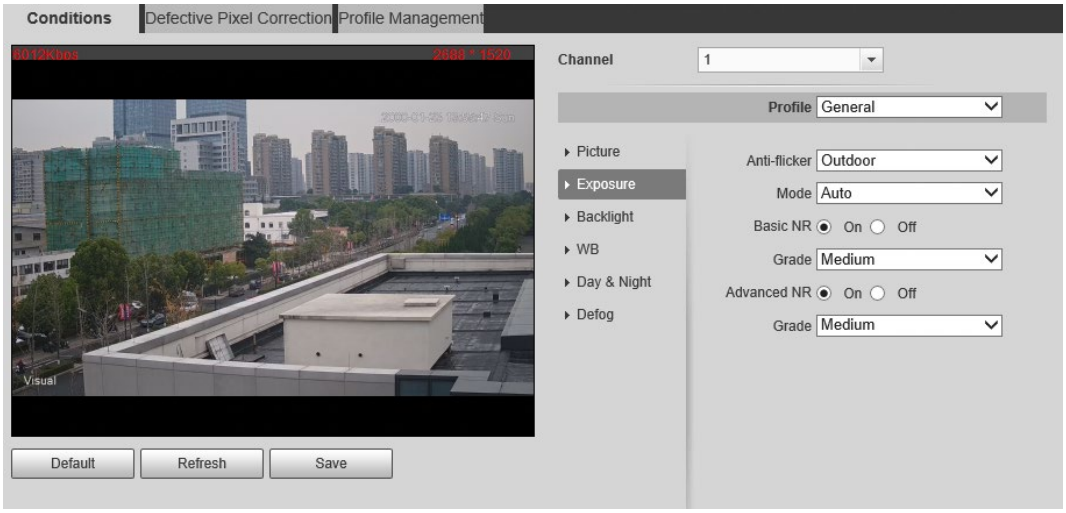
Step 1 Select **Setting** > **Camera** > **Conditions** > **Conditions**.

Step 2 Select **1** in **Channel**.

Step 3 Click the **Exposure** tab.

Step 4 Configure exposure parameters.

Figure 6-3 Exposure



Parameters and its description in Table 6-2 are based on the condition that you have selected **Standard** as **Profile**.

Table 6-2 Description of exposure parameters

Parameter	Description
Anti-flicker	You can select from 50 Hz, 60 Hz and Outdoor. ● 50 Hz: When the electric supply is 50 Hz, the system adjusts the exposure according to ambient light automatically to ensure that there is no stripe appears. ● 60 Hz: When the electric supply is 60 Hz, the system adjusts the exposure according to ambient light automatically to ensure that there is no stripe appears. ● Outdoor: You can select any exposure mode as needed.
Mode	Device exposure modes. ● Auto: Adjusts the image brightness according to the actual condition automatically. ● Aperture priority: The iris value is set to a fixed value, and the Camera adjusts shutter value then. If the image brightness is not enough and the shutter value has reached upper or lower limit, the system adjusts gain value automatically to ensure the image at ideal brightness. ● Shutter priority: When the exposure range is normal, the system prefers the configured shutter range when auto adjusting according to the ambient lighting condition. If the image brightness is not enough and the shutter value has reached upper or lower limit, the system adjusts gain value automatically to ensure the image at ideal brightness. ● Gain Priority: When the exposure range is normal, the system prefers the configured gain range when auto adjusting according to the ambient lighting condition. If the image brightness is not enough and the gain has reached upper or lower limit, the system adjusts shutter value automatically to ensure the image at ideal brightness. You can configure gain range to adjust gain level when using gain priority mode. ● Manual: Configure gain and shutter value manually to adjust image brightness.
Iris	When selecting **Manual** or **Aperture Priority** as the **Mode**, you can configure the iris parameter.
Exposure Comp	When selecting **Manual**, **Aperture Priority** or **Shutter Priority** as the **Mode**, you can configure the exposure compensation parameter.
AE (Auto Exposure) Recovery	Set a recovery time. After you adjust the shutter manually, the exposure mode will be restored to the default one after the time that you have set. In the selection box of **AE Recovery**, you can select **Off** to turn off AE recovery.
Gain	When selecting **Gain Priority** or **Manual** in **Mode**, you can set Gain. With minimum illumination, the Camera increases Gain automatically to get clearer images.

Parameter	Description
Shutter	When selecting **Manual** or **Shutter Priority** in **Mode**, you can set Shutter. Set the effective exposure time. The smaller the value, the shorter the exposure.
Basic NR	Select the **On** checkbox to enable this function. Aiming at single-frame image, 2D NR averages the pixel points (points that are with image noise) with other common pixel points to decrease the image noise and achieve an acceptable and good image display effect. The higher the grade, the better the noise suppression effect.
Advanced NR	Select the **On** checkbox to enable this function. Aiming at multiple-frame image, 3D NR handles information between two frames to reduce the image noise. The higher the grade, the better the noise suppression effect.
Grade	You can select the grade from **Low**, **Medium**, and **High**.

Step 5 Click **Save**.

6.1.1.1.3 Configuring Backlight Parameters

You can select backlight mode from Off, BLC, WDR, and HLS.

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

Step 2 Select **1** in **Channel**.

Step 3 Click the **Backlight** tab.

Step 4 Configure backlight parameters.

There might be a few seconds of video loss when the Camera is switching to WDR mode from other modes.

Figure 6-4 Backlight

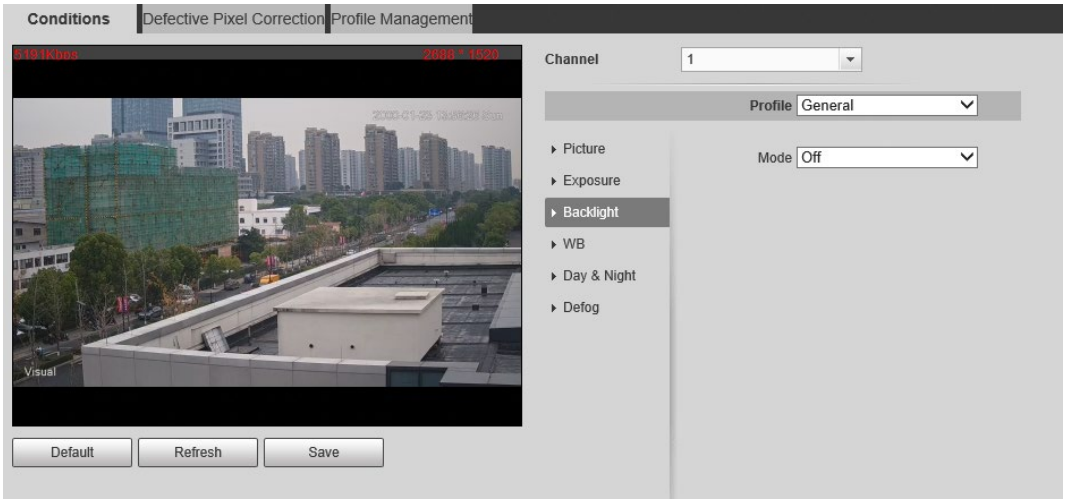


Table 6-3 Backlight mode description

Backlight Mode	Description
Off	Disable the backlight function.
BLC	The system adjusts exposure according to ambient lighting condition automatically to ensure the clarity of the darkest area.
WDR	The system dims bright areas and compensates dark areas to ensure the clarity of all the area.

Backlight Mode	Description
HLS	The system constrains bright areas and reduces halo size to dim the overall brightness.

Step 5 Click **Save**.

6.1.1.1.4 Configuring White Balance Parameters

White balance function makes the image color display precisely as it is. When in white balance mode, white objects would always display white color in different environments.

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

Step 2 Select **1** in **Channel**.

Step 3 Click the **WB** tab.

Step 4 Configure white balance parameters.

Figure 6-5 White balance

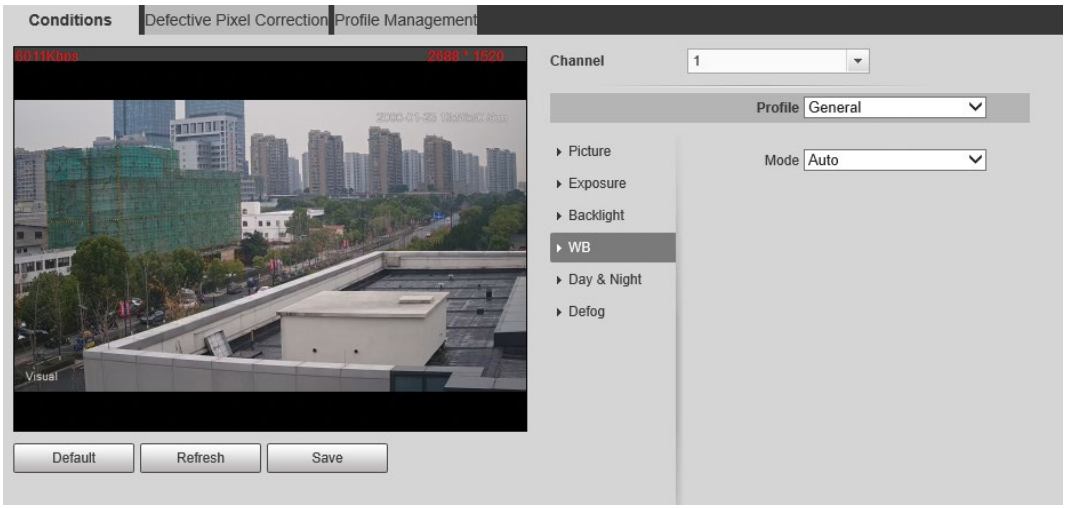


Table 6-4 White balance mode description

WB Mode	Description
Auto	The system compensates WB according to light condition to ensure color precision.
Outdoor	The system auto compensates WB to most outdoor environments with natural or artificial light to ensure color precision.
Manual	Configure red and blue gain manually; the system auto compensates WB according to color temperature.
Natural	The system auto compensates WB to environments without artificial light to ensure color precision.
Street Lamp	The Camera will implement white balance to ensure precision and clarity of the video image.

Step 5 Click **Save**.

6.1.1.1.5 Configuring Day & Night Parameters

Configure the display mode of the image. The system switches between color and black-and-white mode according to the actual condition.

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

Step 2 Select **1** in **Channel**.

Step 3 Click the **Day & Night** tab.

Step 4 Configure day & night parameters.

Figure 6-6 Day & night

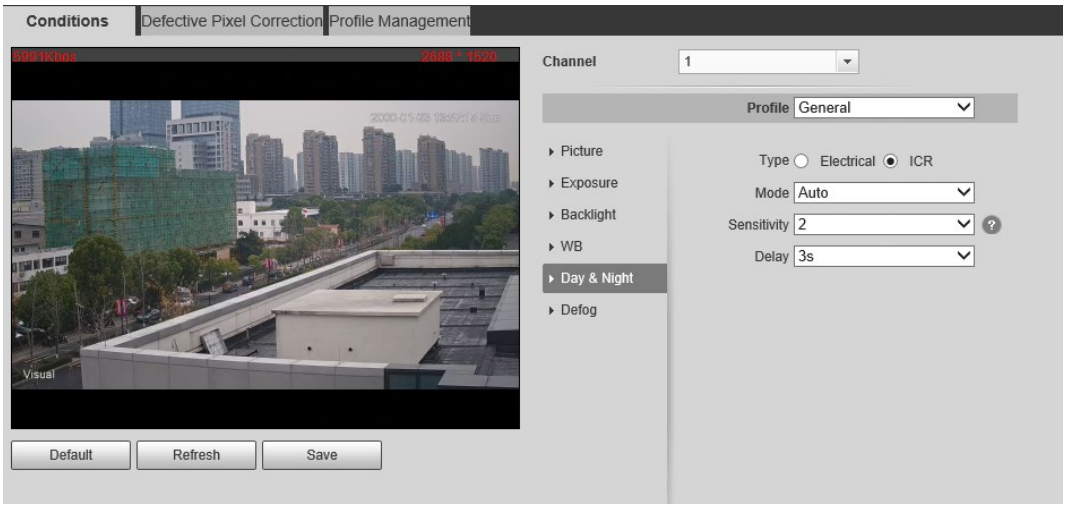


Table 6-5 Day & night mode description

Parameter	Description
Type	Select the type from **Electrical** and **ICR**.
Mode	You can select camera display mode from **Color**, **Auto** and **B/W**. Day & night configuration is independent from profile management configuration. • **Color**: The system displays color image. • **Auto**: The system switches between color and black-and-white display according to the actual condition. • **B/W**: The system displays black-and-white image.
Sensitivity	Select **Auto** as the **Mode**. Then you can configure this parameter. You can configure the camera sensitivity for switching between color and black-and-white mode.
Delay	This configuration is available only when you set **Auto** in **Mode**. You can configure the delay when the Camera switching between color and black-and-white mode. The lower the value is, the faster the Camera switches between color and black-and-white mode.

6.1.1.1.6 Configuring Defog Parameters

The image quality is compromised in foggy or hazy environment, and defog can be used to improve image clarity.

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

Step 2 Select **1** in **Channel**.

Step 3 Click the **Defog** tab.

Step 4 Configure the defogging settings.

Figure 6-7 Defog

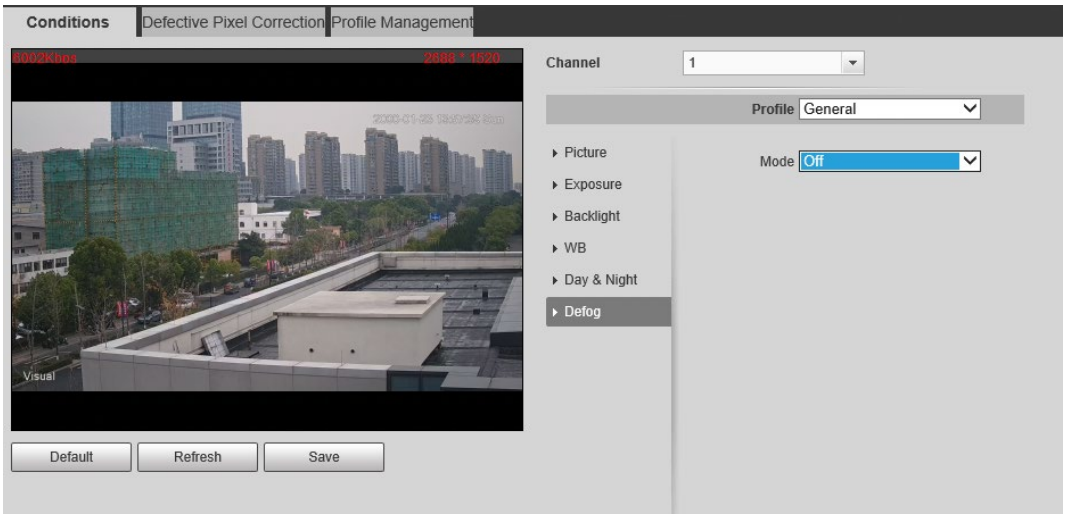


Table 6-6 Defogging settings description

Defogging Settings	Description
Auto	The system adjusts image clarity according to the actual condition.
Manual	Configure function intensity manually, and then the system adjusts image clarity accordingly. Set the intensity higher when the image is not clear.
Off	Defog function is disabled.

Step 5 Click **Save**.

6.1.1.2 Configuring Thermal Image

Configure a specific scenario where you use the Camera, including indoor scenario, outdoor scenario, and adaptive scenario. You can choose a scenario as needed, and configure and check the scenario.

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

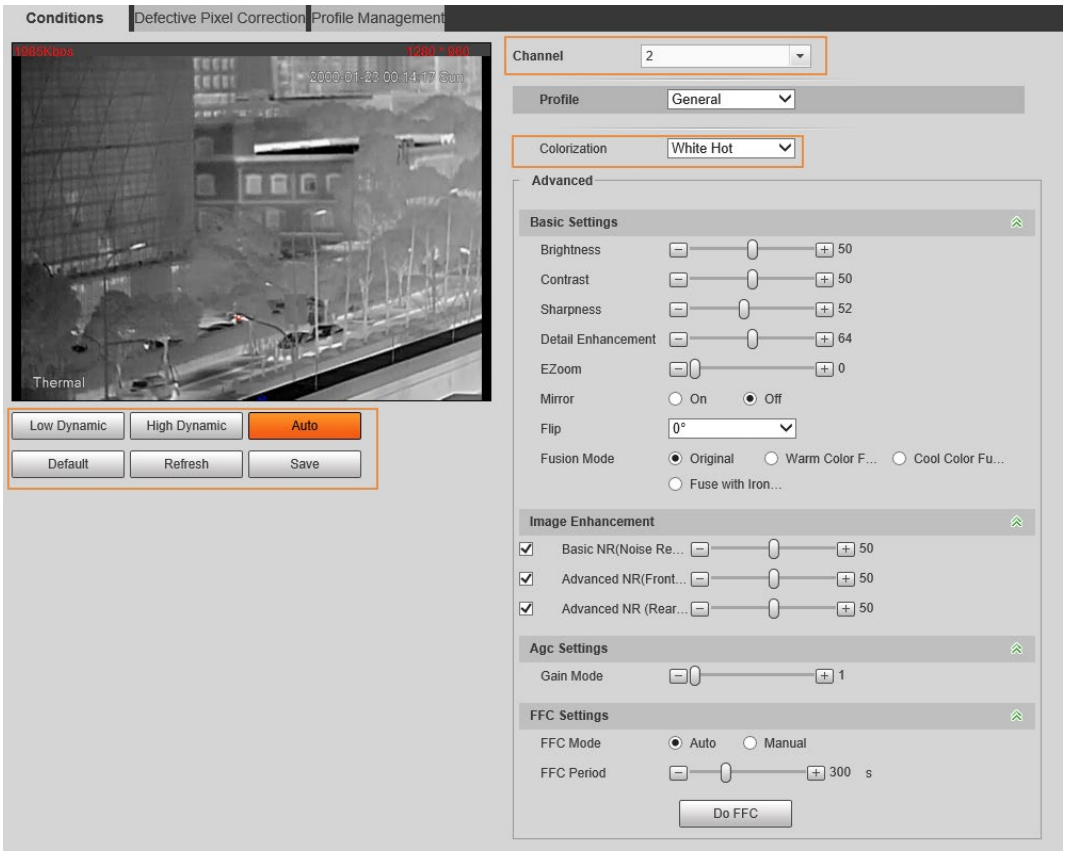
Step 2 Select **1** in **Channel**.

Step 3 Configure the profile. For details, see "6.1.1.4 Configuring Profile Management".

Step 4 Select the colorization and scenario.

The thermal image page might vary with different models.

Figure 6-8 Thermal image



Step 5 Configure lens parameters.

Table 6-7 Description of lens parameters

Parameter	Description
Scene Type	Select the duplicate frame and set the frequently used video parameter as the user-defined scene. Or you can select the default scene and set the display of the thermal image. • **Low Dynamic**: Thermal images will be displayed based on the configuration of low dynamic scene. • **High Dynamic**: Thermal images will be displayed based on the configuration of high dynamic scene. • **Auto**: Thermal images will be displayed based on the configuration of auto scene • **None**: Do not set the scene.
Profile	**Normal**, **Day** and **Night** can be selected.

Parameter	Description
Colorization	Add color to the thermal image and use color to indicate the temperature. **White Glow** is the default color. ● White glow: Lighter when the temperature is higher in gray image. ● Black glow: Lighter when the temperature is lower in gray image. ● Fusion: Color is concentrated on the range of purple- red-yellow. More purple when the temperature is lower and more yellow when the temperature is higher. ● Rainbow: Color is concentrated on the range of blue- green-red-yellow. Bluer when the temperature is lower and more yellow when the temperature is higher. ● Golden autumn: Color is concentrated on the range of red- yellow. Redder when the temperature is lower and more yellow when the temperature is higher. ● Midday: Color is concentrated on the range of blue- green-red-yellow. Bluer when the temperature is lower and more yellow when the temperature is higher. ● Iron oxide red: Its color range is similar to that of Midday, but its brightness is lower than Midday. ● Amber: It's mainly represented as brown. Brighter when the temperature is higher. ● Boulder: Color is concentrated on the range of purple - red- yellow-green- blue. More purple when the temperature is lower and bluer when the temperature is higher. ● The setting sun: Color is concentrated on the range of blue- red-yellow. Bluer when the temperature is lower and more yellow when the temperature is higher. ● Ice and fire: In color image, high temperature objects show red and low temperature objects show blue. Ice and fire is usually used to give a warning. ● Oil painting: Color is concentrated on the range of purple-blue-green- yellow-red. More purple when the temperature is lower and redder when the temperature is higher. ● Pomegranate: It is mainly represented as wine red. Brighter when the temperature is higher. ● Green jade: It is mainly represented as aquamarine. Brighter when the temperature is higher.

Step 6 (Optional) Configure the advanced parameters.

When the scene cannot meet the scene requirements, configure the advanced parameters manually.

Table 6-8 Advanced parameter description

Classification	Parameter	Description
Basic Settings	Brightness	Change the overall image brightness through linear mode. The bigger the value is, the brighter the image will be, and the smaller the darker.

Classification	Parameter	Description
	Contrast	Changes the contrast of the image. The higher the value is, the more the contrast will be between bright and dark areas, and the smaller the less. If the value is set too big, the dark area would be too dark and bright area easier to get overexposed. The image might be hazy if the value is set too small.
	Sharpness	Change the sharpness of image edges. The larger the value, the more obvious the image edge. Do not make the value too large to prevent image noise.
	DDE	Makes the details of the image clear. The bigger the value is, the clearer the details will be.
	Digital Zoom	Enlarge the thermal image according to the zoom time you have set.
	Mirror	Open the mirror image and the monitor image will reverse from left to right.
	Flip	Changes the display direction of the picture, see the options below. ● 0°: Normal display. ● 90°: The picture rotates 90° clockwise. ● 180°: The picture rotates 90° counterclockwise. ● 270°: The picture flips upside down.  This function is available on select models. For some models, configure the resolution to be 1080p or lower when using 90° and 180°. For details, see "6.1.2.1 Configuring Video Streaming".

Classification	Parameter	Description
	Fusion Mode	Displays the image with the gray scale information of the visible channel, and marks temperatures with color palettes, which makes the image of the thermal channel clearer. • **Original**: Displays the image of the thermal channel. • **Warm Color**: Combines the data of the visible channel and the thermal channel, and displays the image in warm color. • **Cold Color**: Combines the data of the visible channel and the thermal channel, and displays the image in cold color. • **Fusion Rate**: It ranges from 0 to 100. The larger the value, the larger the proportion of the visible channel. • **Dual-lens Calibration Adjustment**: You can adjust the misaligned images through direction keys. • **Speed**: The moving speed of the lens when adjusting the image.  To get a better fusion effect, keep the distance 3 m between the Camera and the targets.
Noise Reduction	Basic NR (Noise Reduction)	Compares one frame to the next and removes any oddity that does not appear in each frame. The larger the value is, the fuzzier the image will be.
	Advanced NR (Front Module)	Removes the grainy fuzzy appearances of low light images, will handle moving objects without leaving tails behind, and in low light, it makes an image clearer and sharper. • Basic 3D NR: The module handles noise reduction. • Advanced 3D NR: The back-end program handles noise reduction.  Generally, you can select **Basic NR (Noise Reduction)** and **Advanced NR (Front Module)**. If the image is not clear, select **Advanced NR (Rear Chip)**, and configure the parameters.
	Advanced NR (Rear Chip)	
Gain settings	Auto Gain	The larger the gain value, the more unstable the image.
FFC Settings	FFC Mode	Method of correcting the shutter. • Auto: According to the switch period that you have configured, the shutter will be corrected regularly. • Manual: Correct the shutter by yourself.
	FFC Period	You can configure this parameter only when **FFC Mode** is set to be **Auto**. Adjust time gap of correcting the shutter automatically.
	Do FFC	Click **Do FFC** to trigger the shutter correcting for this time.

Step 7 Click **Save**.

6.1.1.3 Configuring Defective Pixel Correction

When there are a few defective pixels to be corrected, you can correct them manually.

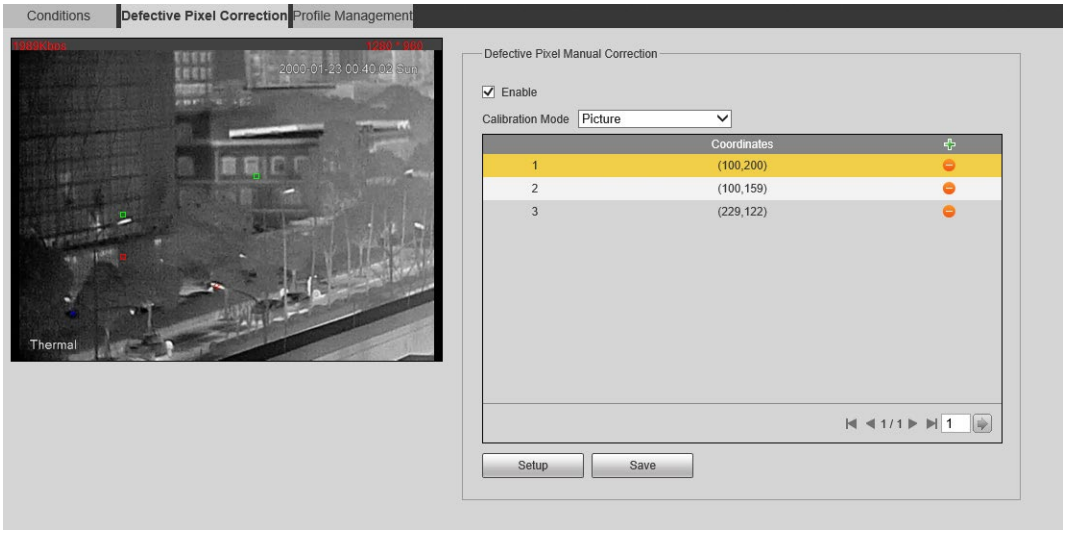
Step 1 Select **Setting** > **Camera** > **Conditions** > **Defective Pixel Correction**.

Step 2 Select the **Enable** checkbox.

Step 3 Select the calibration mode. Generally, you can select **Picture**, and for the image with defective pixels that appears occasionally, select **Video**.

Step 4 Click  to add the point of Defective Pixel Correction.

Figure 6-9 Thermal image



Step 5 Click a defective pixel on the image, and  is displayed near the defective pixel.

Step 6 Roll the mouse wheel to zoom in the image.

Step 7 Click the defective pixel again, and  overlaps the defective pixel.

Step 8 Click **Calibration Confirmed**.

Step 9 Click **Setting**.

Step 10 Click **Save**.

To correct multiple defective pixels at the same time, calibrate one defective pixel, repeat Step1–Step8, and then do Step9–Step10.

6.1.1.4 Configuring Profile Management

When configuring the profile management, you can select from **Normal**, **Full Time** and **Schedule**.

Step 1 Select **Setting** > **Camera** > **Conditions** > **Profile Management**.

Step 2 Select the channel.

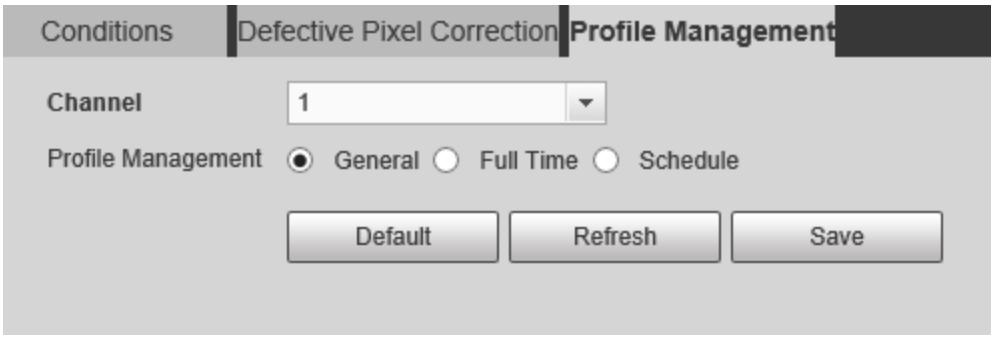
- Select **1** in **Channel** to configure the profile management for the visible channel.
- Select **2** in **Channel** to configure the profile management for the thermal channel.

The monocular camera does not support channel selection.

Step 3 Configure profile management.

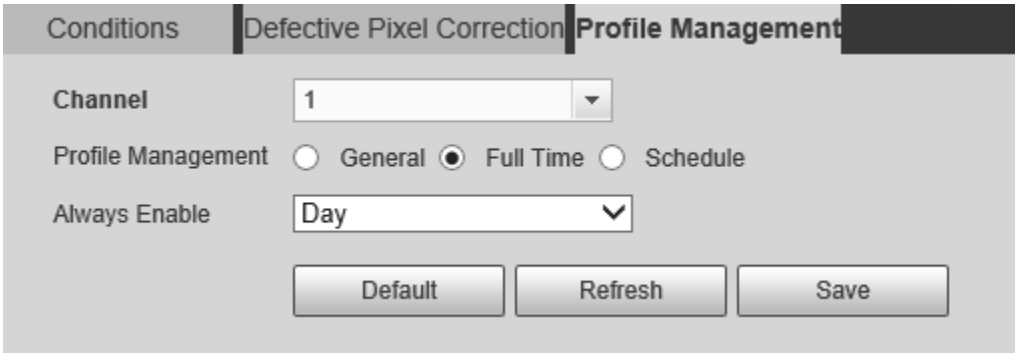
- When **Profile Management** is set as **Normal**, the surveillance system works under normal configuration.

Figure 6-10 Common setting



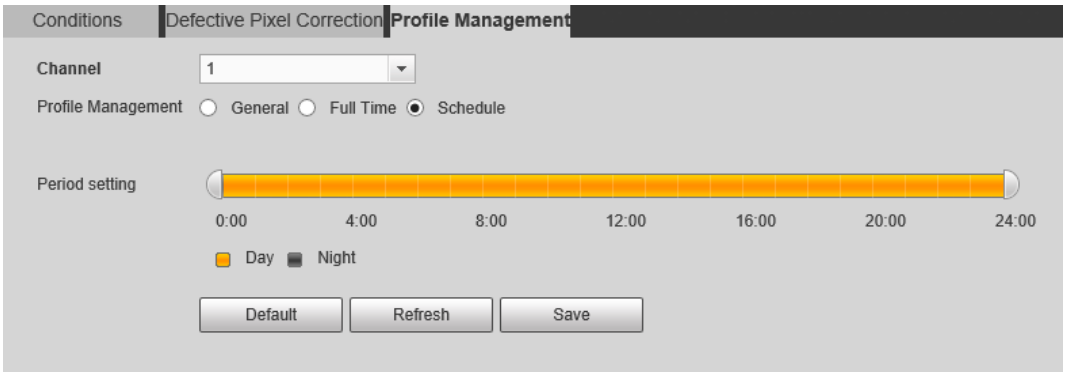
- When **Profile Management** is set as **Full Time**, you can select **Day** or **Night** as **Always Enable**, and the surveillance system works under **Always Enable**.

Figure 6-11 Full time setting



- When **Profile Management** is set as **Schedule**, you can drag the slide block to set certain time as Day or Night. For example, set 8:00–5:00 PM as day, and 0:00–8:00 and18:00–24:00 as night. System works under corresponding configuration in different time.

Figure 6-12 Switching based on time



Step 4 Click **Save**.

6.1.2 Configuring Video Parameters

6.1.2.1 Configuring Video Streaming

Configure video stream parameters, such as compression, resolution, frame rate, bit rate type, bit rate, I frame interval, SVC, and watermark.

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

Step 2 Select the channel.

- Select **1** in **Channel** to configure the video parameters for the visible channel.
- Select **2** in **Channel** to configure the video parameters for the thermal channel.

The monocular camera does not support channel selection.

Step 3 Configure video streaming parameter.

Figure 6-13 Video

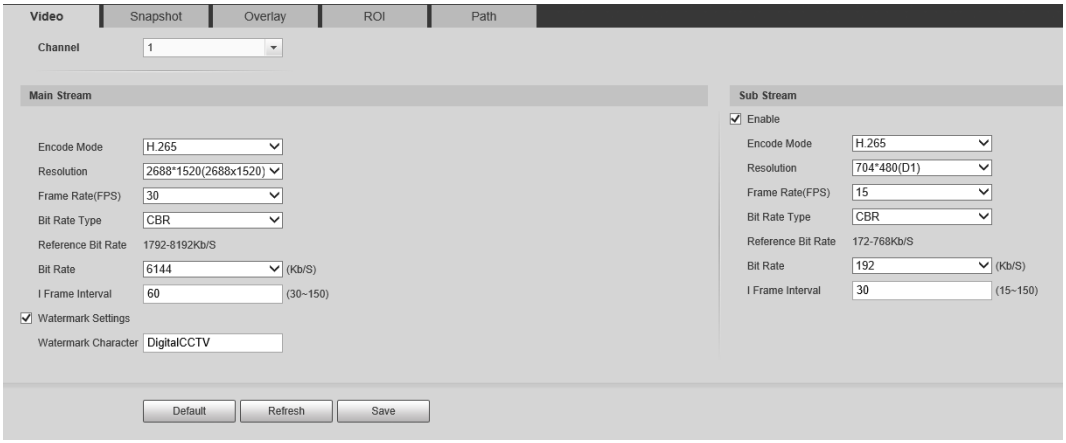


Table 6-9 Parameter description

Parameter	Description
Enable	Select the checkbox to enable sub stream (enabled by default). Enabling sub stream 1 and sub stream 2 at the same time are supported.
Encode Mode	Encode mode of video. ● H.264: Main profile encode mode. ● H.264H: High profile encode mode. ● H.264B: Baseline profile encode mode. ● MJPEG: Under this mode, the higher streaming value is required to ensure the clarity of images. And we recommend you use the maximum streaming value that we have offered.
Resolution	The resolution of the video. The max resolution of different Cameras might be different.
Frame Rate (FPS)	The number of frame in one second of video The higher the FPS is, the clearer and smoother the video will be.
Bit Rate Type	You can select bit rate type: ● Fixed: the bit rate changes little and keeps close to the configured bit rate value. ● Changeable: the bit rate changes as monitoring scene changes. Bit rate type can only be set as **Fixed** when **Encode Mode** is set as **MJPEG**.
Quality	This parameter can be configured only when the bit rate type is set as **VBR**.

Parameter	Description
Reference Bit Rate	According to resolution and frame rate that you have configured, we have offered you a reference bit rate value, which is also the best value that you can adopt.
Bit Rate	This parameter can be configured only when the bit rate type is set as **Fixed**. If you select the bit rate value according to **Reference Bit Rate value**, the streaming changes little and keeps close to the bit rate value you have selected. Select **Customized** and you can configure bit rate value manually.
Maximum Bit Rate	This parameter can be configured only when bit rate type is set as **VBR**. You can select the max value of the bit rate according to the reference bit rate value, and the bit rate changes with monitoring scenes, but the max bit rate keeps close to the value you set.
I Frame Interval	The number of P frame between two I frames, and the I Frame Interval range changes as FPS. It is recommended to set I Frame Interval twice as big as FPS.
SVC	Scaled video coding, able to encode a high quality video bit stream that contains one or more subset bit streams. The default value is 1, which means no layered coding.
Watermark Settings	Select the checkbox to enable watermark. Then you can check if the video has been tampered by verifying the watermark.
Watermark character	The default character is Digital CCTV. You can configure at most 128 watermark characters which are composed of number, letter, underline and dash.
Stream Smooth	The larger the stream smooth value is, the larger the I Frame is.

Step 4 Click **Save**.

6.1.2.2 Configuring Image Streaming

Configure parameters of image streaming which cover snapshot type/interval, image size/quality.

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

x

Step 2 Select the channel.

- Select **1** in **Channel** to configure the video parameters for the visible channel.
- Select **2** in **Channel** to configure the video parameters for the thermal channel.

The monocular camera does not support channel selection.

Step 3 Configure snapshot streaming.

Figure 6-14 Snapshot

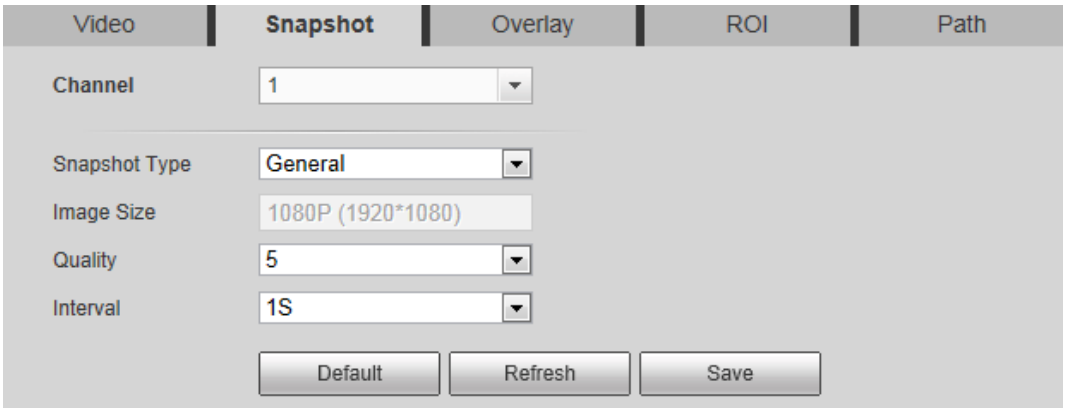


Table 6-10 Parameter description

Parameter	Description
Snapshot type	You can select **General** or **Event.** • **General** means the system takes snapshot as scheduled • **Event** means snapshot functions when video\audio detection, event or alarm is triggered.
Image Size	The same resolution with main stream.
Quality	Snapshot quality. The bigger the value, the better the snapshot quality.
Interval	Snapshot frequency. Select **Customized** to manually configure snapshot frequency.

Step 4 Click **Save**.

6.1.2.3 Configuring Video Overlay

Configure overlay information, and it will be displayed on the **Live** page.

6.1.2.3.1 Configuring Privacy Masking

You can enable this function when you need to protect the privacy of some area on the image.

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

Step 2 Select the channel.

- Select **1** in **Channel** to configure the parameters for the visible channel.
- Select **2** in **Channel** to configure the parameters for the thermal channel.

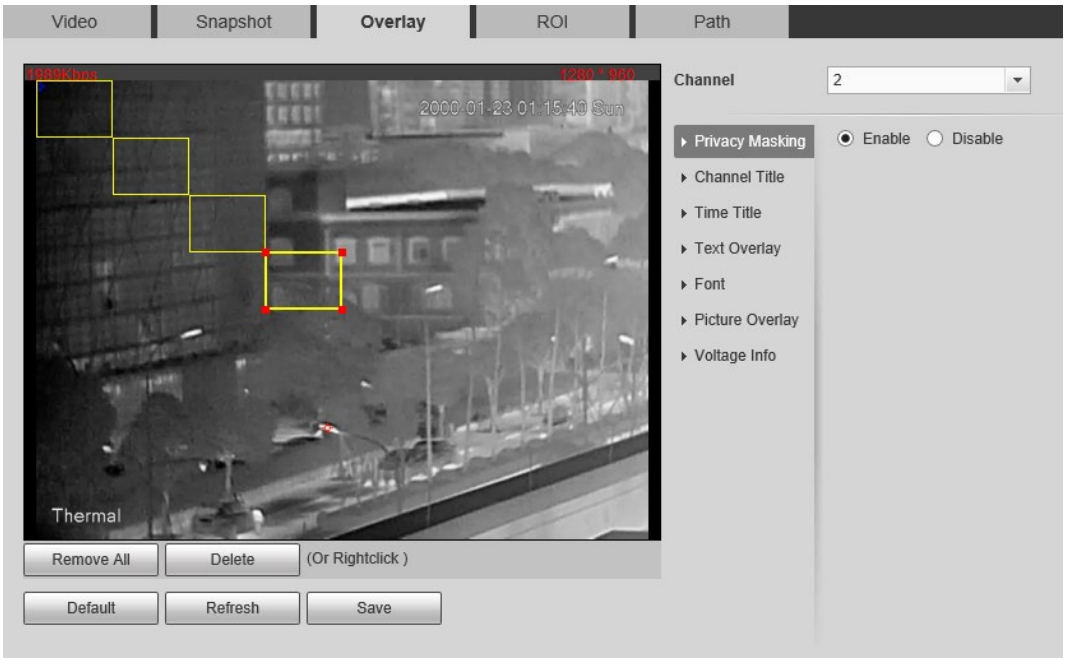
The monocular camera does not support channel selection.

Step 3 Click the **Privacy Masking** tab.

Step 4 Select the **Enable** checkbox, drags the corners of the blocks to adjust the block size, and then drag the block to the area that you need to cover.

Click **Remove All** to delete all the area boxes; you can also just select one box, and click **Delete** or right-click to delete it.

Figure 6-15 Privacy masking



Step 5 Click **Save**.

6.1.2.3.2 Configuring Channel Title

You can enable this function if you need to display Channel title in the video image.

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

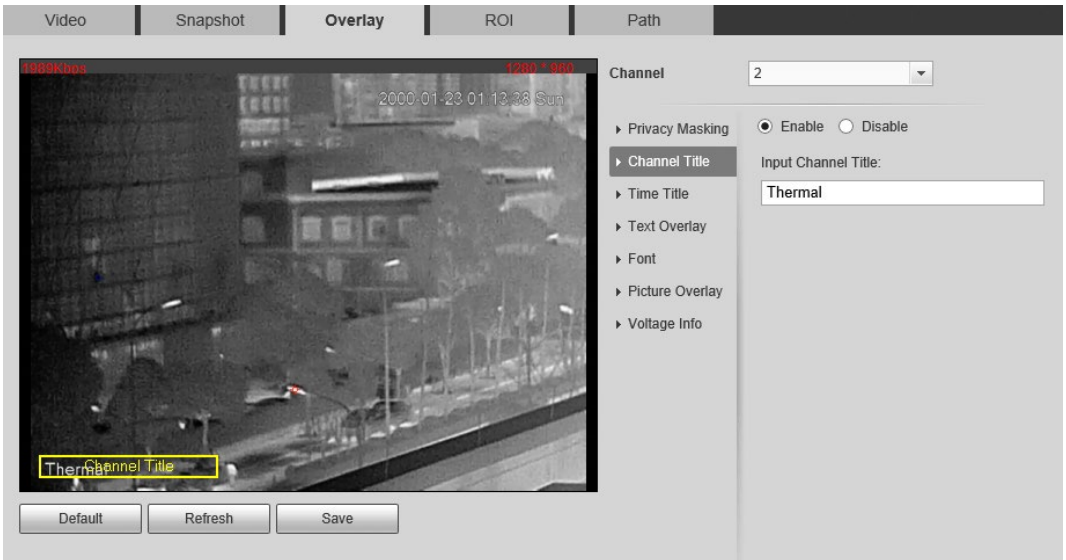
Step 2 Select the channel.

- Select **1** in **Channel** to configure the parameters for the visible channel.
- Select **2** in **Channel** to configure the parameters for the thermal channel.

The monocular camera does not support channel selection.

Step 3 Click **Channel Title**.

Figure 6-16 Channel title



Step 4 Select the **Enable** checkbox, and then enter channel title. The title displays in the video image.

You can drag the **Channel Title** box on the video image with your mouse to adjust the location of the box.

Step 5 Click **Save**.

6.1.2.3.3 Configuring Time Title

You can enable this function if you need to display time on the video image.

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

Step 2 Select the channel.

- Select **1** in **Channel** to configure the parameters for the visible channel.
- Select **2** in **Channel** to configure the parameters for the thermal channel.

The monocular camera does not support channel selection.

Step 3 Click **Time Title**.

Figure 6-17 Time title

Step 4 Select the **Enable** checkbox, and the time is displayed on the video image.

Step 5 Click **Week Display**, and then the week information is displayed on the video image.

You can drag the **Time Title** box on the video image with your mouse to adjust the box's location.

Step 6 Click **Save**.

6.1.2.3.4 Configuring Text Overlay

You can enable this function if you want to display words on the video image.

Text Overlay and **Picture Overlay** cannot work at the same time.

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

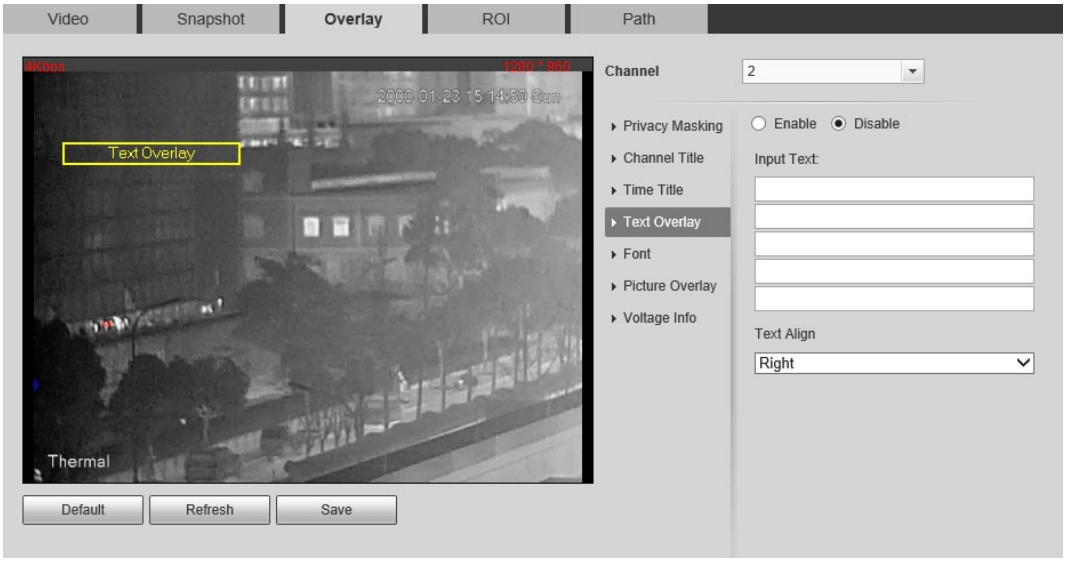
Step 2 Select the channel.

- Select **1** in **Channel** to configure the parameters for the visible channel.
- Select **2** in **Channel** to configure the parameters for the thermal channel.

The monocular camera does not support channel selection.

Step 3 Click **Text Overlay**.

Figure 6-18 Text overlay



Step 4 Select the **Enable** checkbox, and then enter text as needed. Then select the text align method, and the **Text Overlay** box is displayed on the video image.

You can drag the **Text Overlay** box on the video image with your mouse to adjust the location of the box.

Step 5 Click **Save**.

6.1.2.3.5 Configuring Font

You can adjust size and color of the font on the video images based on your own needs.

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

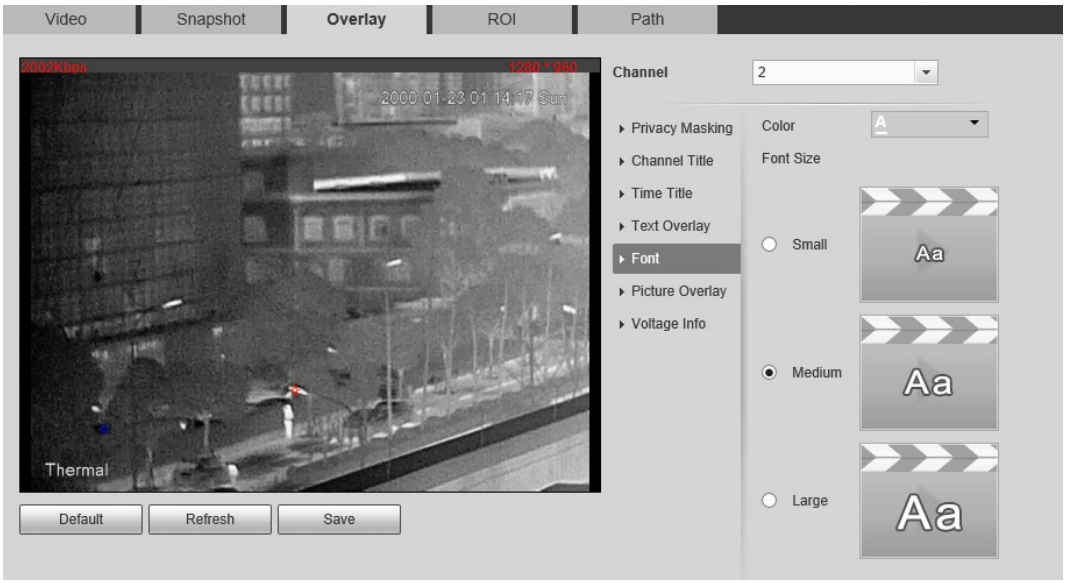
Step 2 Select the channel.

- Select **1** in **Channel** to configure the parameters for the visible channel.
- Select **2** in **Channel** to configure the parameters for the thermal channel.

The monocular camera does not support channel selection.

Step 3 Click the **Font** tab.

Figure 6-19 Font setting



Step 4 Select color and size of the font as needed.

Step 5 Click **Save**.

6.1.2.3.6 Configuring Picture Overlay

You can enable this function if you need to display picture information on the video image.

Text overlay and picture overlay cannot work at the same time.

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

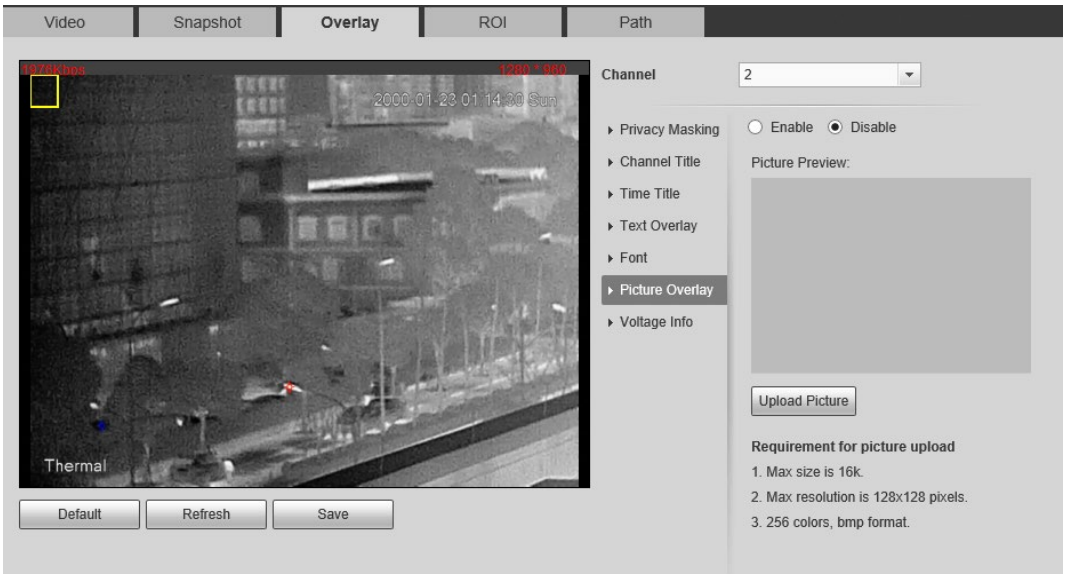
Step 2 Select the channel.

- Select **1** in **Channel** to configure the parameters for the visible channel.
- Select **2** in **Channel** to configure the parameters for the thermal channel.

The monocular camera does not support channel selection.

Step 3 Click the **Picture Overlay** tab.

Figure 6-20 Picture overlay



Step 4 Select the **Enable** checkbox.

You will be informed that OSD information is to be closed. Click **Save**.

Step 5 Click **Upload Picture**, and select a picture. The picture is displayed in video images.

You can drag the **Picture Overlay** box in the video image with your mouse to adjust the box's location.

Step 6 Click **Save**.

6.1.2.3.7 Configuring Voltage Information

After enabling this function, the voltage information will be displayed on the image when the camera voltage is abnormal.

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

Step 2 Select the channel.

- Select **1** in **Channel** to configure the parameters for the visible channel.
- Select **2** in **Channel** to configure the parameters for the thermal channel.

The monocular camera does not support channel selection.

Step 3 Click the **Voltage Info** tab.

Step 4 Select **On**.

The picture overlay function will be disabled after the voltage information function is enabled.

Figure 6-21 Voltage information

Step 5 Click **Save**.

When the camera voltage is abnormal, the voltage information will be displayed om the image.

For example, for a Camera requires 12V voltage, when the voltage exceeds ± 15%, the abnormal voltage information will be displayed on the image, prompting the customer to check the voltage.

6.1.2.3.8 Configuring Temperature Information

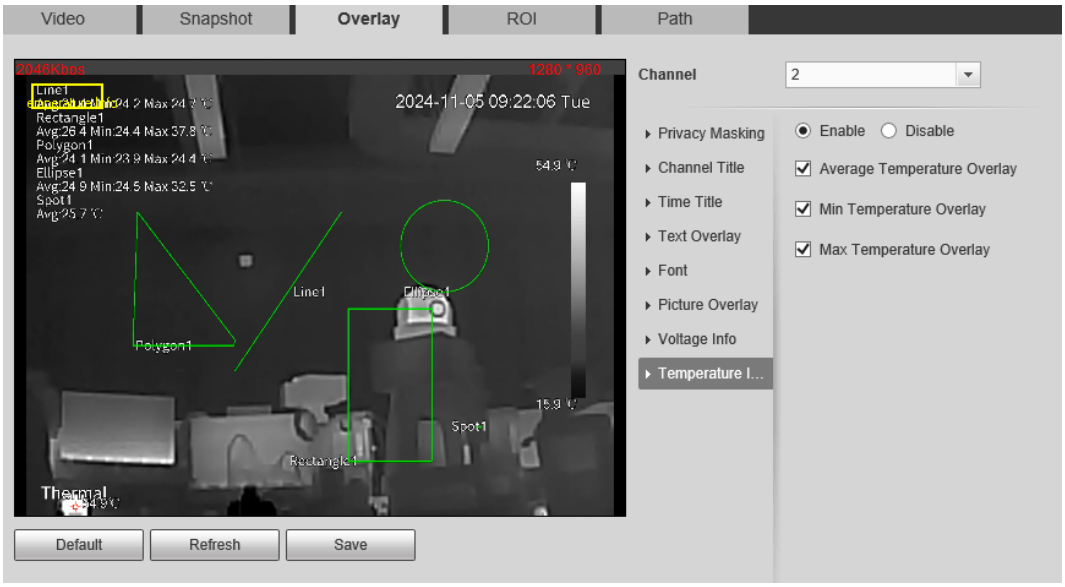
After enabling this function, the temperature information will be displayed on the thermal image when the temperature measurement function is enabled. This function is only available on the thermal channel.

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

Step 2 Select the channel 2.

Step 3 Click the **Temperature Info** tab.

Figure 6-22 Temperature information



Step 4 Select the **Enable** checkbox, and then select average temperature, minimum temperature and maximum temperature as needed.

You can drag the **Temperature Info** box on the video image with your mouse to adjust the location of the box.

Step 5 Click **Save**.

6.1.2.4 Configuring ROI

Select ROI in the image, and then the selected image would display with configured quality.

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

Step 2 Select the channel

- Select **1** in **Channel** to configure the parameters for the visible channel.
- Select **2** in **Channel** to configure the parameters for the thermal channel.

The monocular camera does not support channel selection.

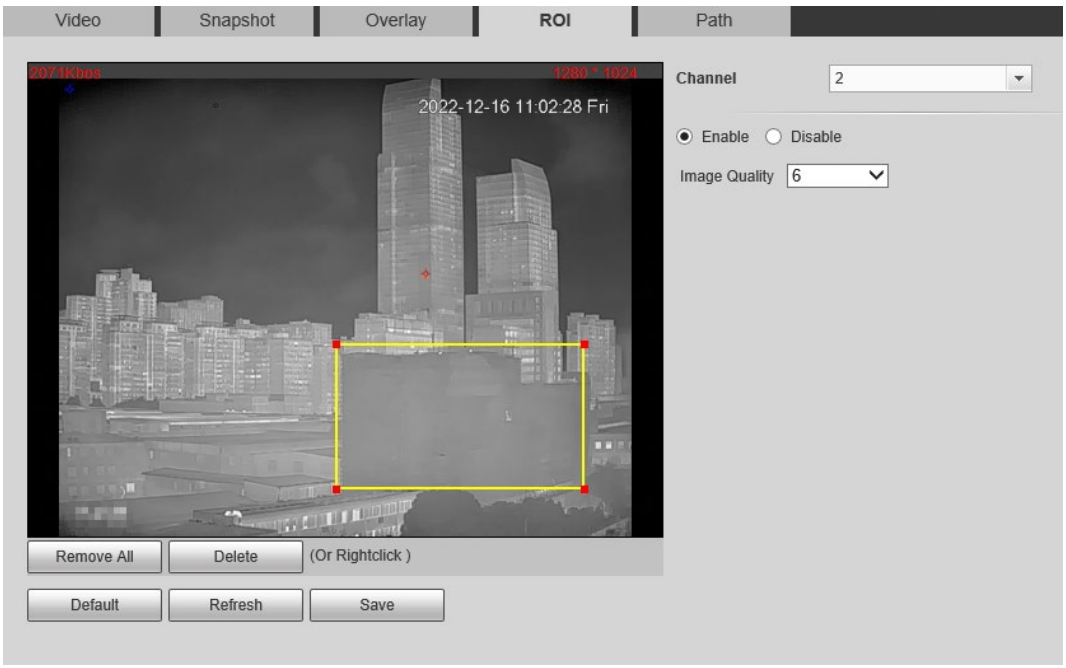
Step 3 Select the **Enable** checkbox.

Step 4 Hold the left mouse button to draw a ROI area on video images. You can also configure the display quality OF ROI.

- You can draw at most four ROI areas.

- Click **Remove All** to delete all the area boxes; you can also just select one box, and click **Delete** or right-click to delete it.

Figure 6-23 ROI page



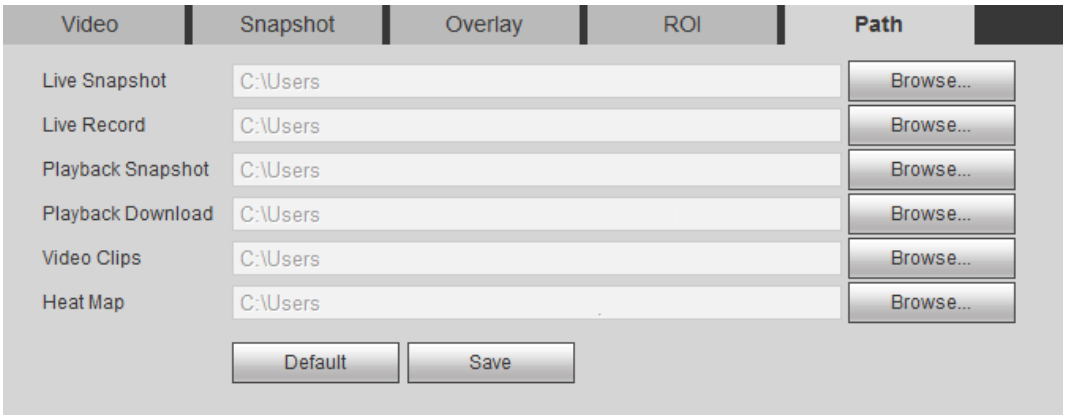
Step 5 Click **Save**.

6.1.2.5 Configuring Storage Path

Configure storage paths covering **Live Snapshot**, **Live Record**, **Playback Snapshot**, **Playback Download**, **Video Clips**, and **Heat Map**.

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

Figure 6-24 Storage path



Step 2 Click **Browse**, and configure storage paths of live snapshot, live record, playback snapshot, playback download, video clips, and heat map.

Table 6-11 Storage path description

Path	Description
Live Snapshot	Live snapshot refers to the snapshot of live page. C:\Users\admin\WebDownload\LiveSnapshot is the default path.

Path	Description
Live Record	Live record refers to the recorded video of live page. C:\Users\admin\WebDownload\LiveSnapshot is the default path.
Playback Snapshot	Playback snapshot refers to the snapshot of playback page. C:\Users\admin\WebDownload\LiveSnapshot is the default path.
Playback Download	Playback download refers to the downloaded video of playback page. C:\Users\admin\WebDownload\LiveSnapshot is the default path.
Video Clips	Video clips refer to the clipped video of playback page. C:\Users\admin\WebDownload\LiveSnapshot is the default path.
Heat Map	Heat map comes from the location **Setting** > **Temperature**. C:\Users\admin\WebDownload\LiveSnapshot is the default path.

Administrator in the default path is the user account.

Step 3 Click **Save**.

6.1.3 Configuring Audio

Configure audio parameters and alarm audio.

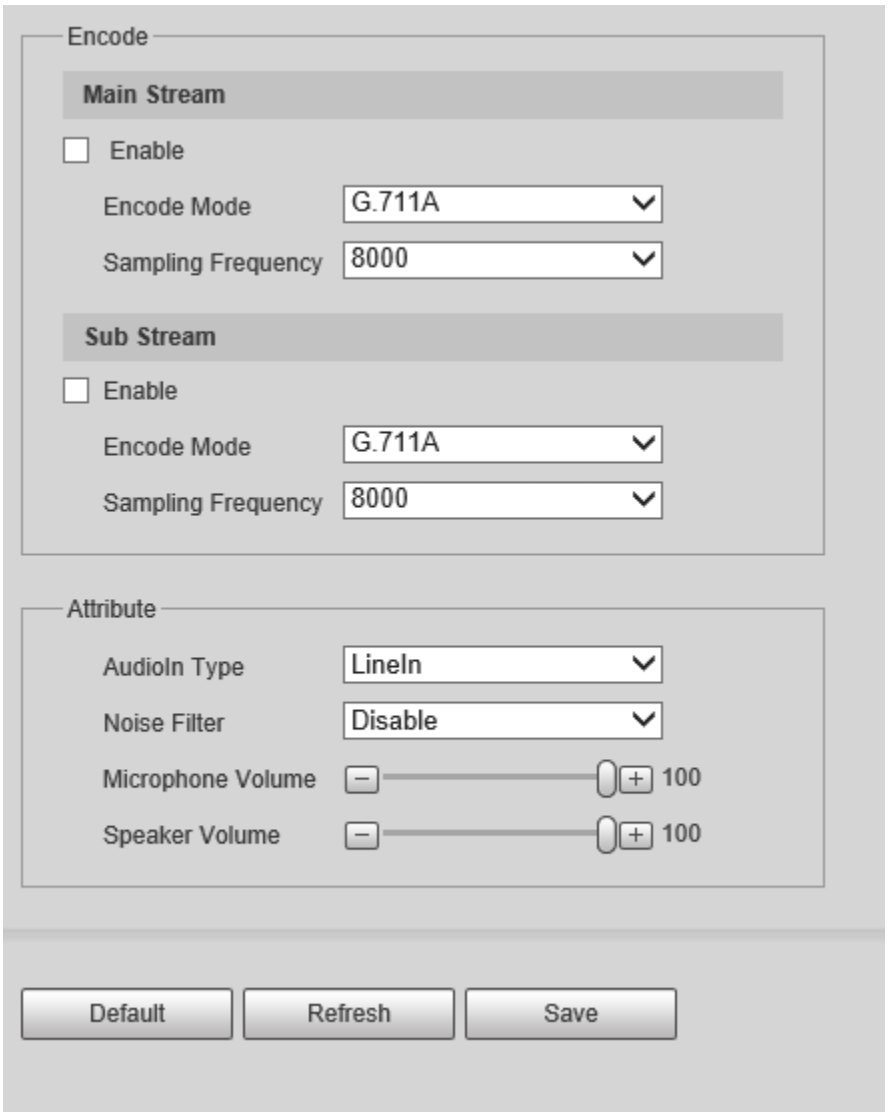
6.1.3.1 Configuring Audio Parameters

Configure audio parameters covering **Encode Mode**, **Sampling Frequency**, **Audio in Type**, and **Noise Filter**.

Functions of different cameras might vary.

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

Figure 6-25 Audio



Step 2 Configure audio parameters.

Table 6-12 Parameters

Parameters	Description
Enable	Audio can be enabled only when video is enabled. Enable **Main Stream** or **Sub Stream**, and the network stream is composed of both audio and video streams. If you do not select **Main Stream** or **Sub Stream**, then only video images are transmitted.
Encode Mode	You can select audio encode mode. G.711A, G.711Mu, and AAC are included. The configured audio encode mode applies to audio and intercom.
Sampling Frequency	Audio's sampling frequency. 8K and 16K are included.
Audioin Type	Two audio types are selectable. • **LineIn**: External audio input source is required. • **Mic**: External audio input source is not required.
Noise Filter	Enable this function, and the system auto filters ambient Noise.

Parameters	Description
Microphone Volume	Adjusts microphone volume. This function is available on select models.
Speaker Volume	Adjusts speaker volume. This function is available on select models.

Step 3 Click **Save**.

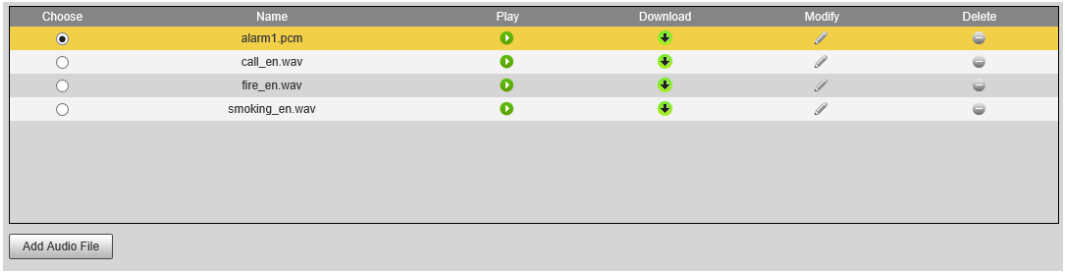
6.1.3.2 Configuring Alarm Audio

You can record or upload alarm audio file. The audio file will be played when the alarm is triggered.

Procedure

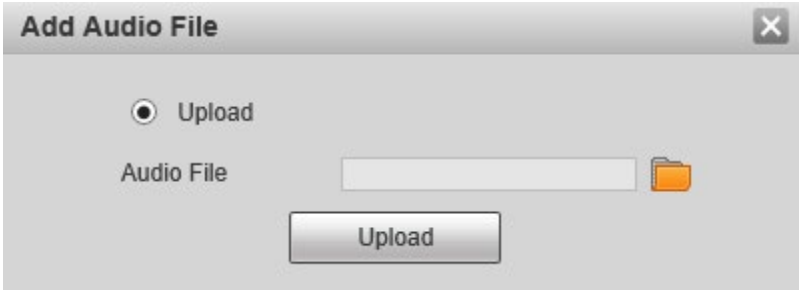
Step 1 Select **Setting** > **Camera** > **Audio** > **Alarm Audio**.

Figure 6-26 Alarm audio



Step 2 Click **Add Audio File**.

Figure 6-27 Add audio file



Step 3 Upload the audio file.

Select **Upload**, click to select the audio file to be uploaded, and then click **Upload**.

You can upload audio files in .pcm format, .wav in standard .pcm format, .mp3 format or .aac format.

Step 4 Select the file that you need.

Related Operations

- Click to play the selected audio.
- Click to download the audio to local storage.

6.2 Configuring Network

6.2.1 Configuring TCP/IP

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

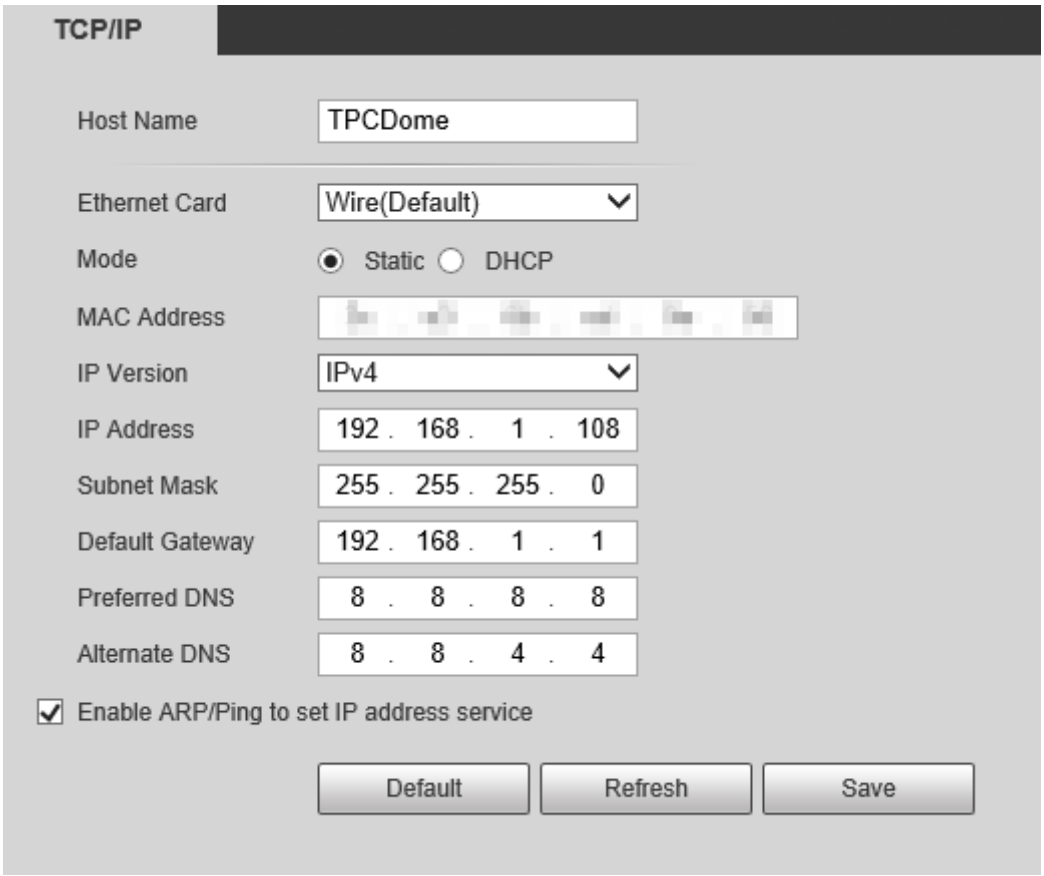
Prerequisites

You have connected the Camera to network.

Procedure

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

Figure 6-28TCP/IP



Step 2 Configure TCP/IP parameters.

Table 6-13 TCP/IP parameters

Parameter	Description
Host Name	Enter the host name, 15 characters at most.
Ethernet Card	**Wire (Default)** is set by default.

Parameter	Description
Mode	• Static: You need to manually configure **IP Address**, **Subnet Mask** and **Default Gateway**. • DHCP: Obtains IP address automatically. With DHCP enabled, **IP Address**, **Subnet Mask** and **Default Gateway** cannot be configured. You can check the current IP address whether the DHCP takes effect or not.
MAC Address	Host's MAC address, cannot be modified.
IP Version	Select IPv4 or IPv6.
IP Address	Enter the IP address and subnet mask according to your own needs.  All the IPv6 addresses will be validated, so ensure IP address and subnet mask are in the same network segment, which means the front parts of the IP address and the default gateway are the same one.
Subnet Mask	
Default Gateway	Configure it as needed, the default gateway must be in the same network segment with the IP address.
Preferred DNS	IP address of the preferred DNS.
Alternate DNS	IP address of the alternate DNS.

Parameter	Description
Enable ARP/Ping to set IP address service.	Select the checkbox, get the camera MAC address, and then you can modify and configure the camera IP address with ARP/ping command. It is enabled by default. During restarting, you will have no more than two minutes to configure the camera IP address with a ping packet which has certain length. The server will be turned off in 2 minutes, or it will be turned off immediately after IP address configuration. If it is not enabled, the IP address cannot be configured with ping packet. **A demonstration of configuring IP address with ARP/Ping.** To obtain a free IP address, you need to ensure that the Camera and your PC are in the same LAN. Get MAC address from the Camera label. Open command editor on your PC and enter the following command. Windows syntax arp –s <IP Address> <MAC> ping –l 480 –t <IP Address> Windows example arp -s 192.168.0.125 11-40-8c-18-10-11 ping -l 480 -t 192.168.0.125 UNIX/Linux/Mac syntax arp –s <IP Address> <MAC> ping –s 480 <IP Address> UNIX/Linux/Mac example arp -s 192.168.0.125 11-40-8c-18-10-11 ping -s 480 192.168.0.125 Restart through power or network. Check your PC command line. If there is information such as "Reply from 192.168.0.125…", you have done configuration successfully. Turn it off then. Enter http://(IP address) in the browser address bar to log in.

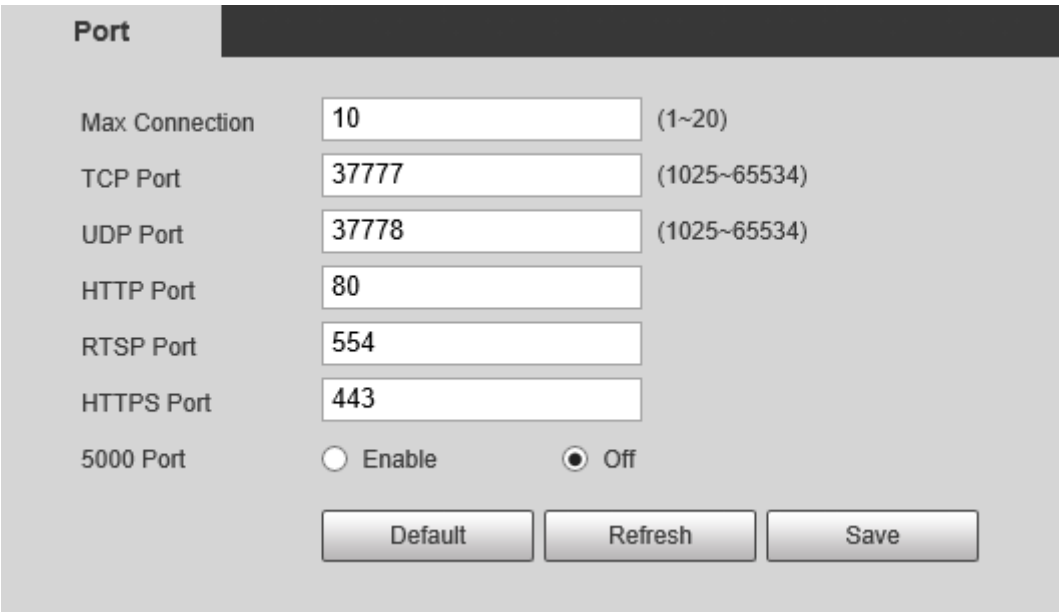
Step 3 Click **Save**.

6.2.2 Configuring Port

Configure the port numbers and the maximum number of users (includes web, platform client, and mobile phone client) that can connect to the device simultaneously.

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

Figure 6-29 Port



Step 2 Configure parameters.

- 0–1024, 1900, 3800, 5000, 5050, 9999, 37776, 37780–37880, 39999, 42323 are occupied for specific uses.
- Do not use the same value of any other port during port configuration.

Table 6-14 Port parameter description

Parameter	Description
Max Connection	The maximum number of users (web client, platform client or mobile phone client) that can connect to the Camera simultaneously, the value is 10 by default.
TCP Port	Port of transmission control protocol. The value is 37777 by default.
UDP Port	User datagram protocol port, the value is 37778 by default.
HTTP Port	HTTP communication port. The default value is 80. If you have modified the default value, when logging in through a browser, you need to add the latest port number to the end of IP address.

Parameter	Description
RTSP Port	• 554 is the default port number. If you play live view through Apple's QuickTime or VLC, the following format is available. This function is also available for Blackberry. • When the URL format requiring RTSP, you need to specify channel number and bit stream type in the URL, and also user name and password if needed. • When playing live view with Blackberry smart phone, you need to turn off the audio, and then set the code mode to H.264B and resolution to CIF. • Username: admin, for example. • password • IP: your Camera IP. • Port: leave it if the value is 554 by default. • Channel 1: Channel number, starts from 1. For example, if you are using channel 2, then the channel=2. • Subtype refers to Bit stream type; 0 means main stream (Subtype=0) and 1 means sub stream (Subtype=1). rtsp://ip:port/cam/realmonitor?channel=1&subtype=0
HTTPS Port	Real Time Messaging Protocol. The port that RTMP provides service. It is 1935 by default.
HTTPS Port	HTTPS communication port. It is 443 by default.
5000 Port	The service port for Windows XP. It is **Off** by default.

Step 3 Click **Save**.

The configuration of **Max Connection** takes effect immediately, and others will take effect after restart the Camera.

6.2.3 Configuring PPPoE

Point-to-Point Protocol over Ethernet, is one of the protocols that device uses to connect to the internet. Get the PPPoE username and password from the internet service provider, and then set up network connection through PPPoE, the camera will acquire a WAN dynamic IP address.

Prerequisites

- The Camera has connected to the network.
- You have gotten the account and password from Internet Service Provider.

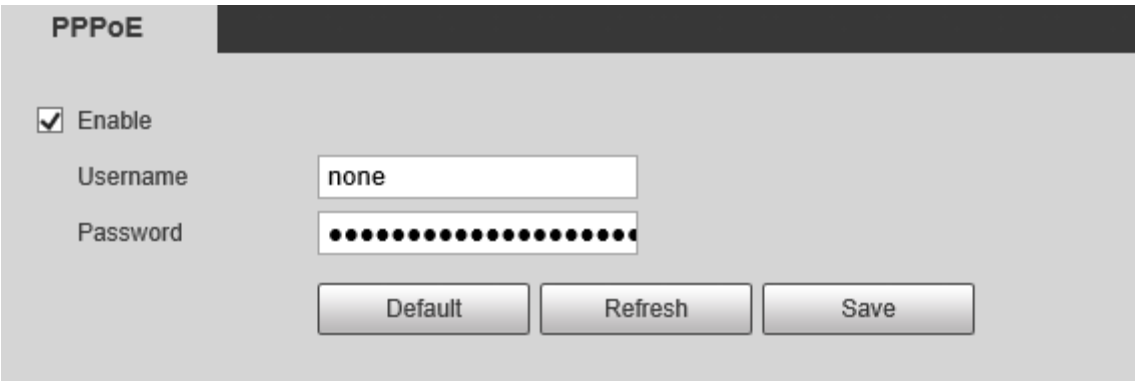
Procedure

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

Step 2 Select the **Enable** checkbox, and then enter the user name and password.

- Disable UPnP while using PPPoE to avoid possible influence.
- After making PPPoE connection, the camera IP address cannot be modified through web page.

Figure 6-30 PPPoE



Step 3 Click **Save**.

The successful prompt displays, and then the real-time WAN IP address is displayed. You can visit the Camera through this IP address.

6.2.4 Configuring DDNS

Properly configure DDNS, and then the domain name on the DNS server matches your IP address and the matching relation refreshes in real time. You can always visit the Camera with the same domain name no matter how the IP address changes.

Prerequisites

Check the DNS server types that the Camera supports.

- Third party server might collect your device information after DDNS is enabled.
- Register and log in to the DDNS website, and then you can view the information of all the connected devices in your account.

Procedure

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

Step 2 Select the **Type** checkbox, and then configure the parameters as needed.

Figure 6-31 DDNS

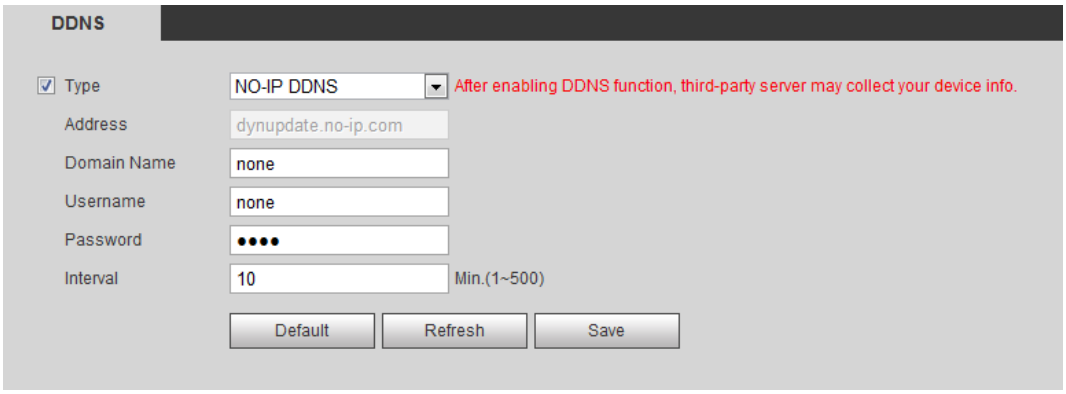


Table 6-15 DDNS parameters

Parameter	Description
Type	See the name and web site of DDNS service provides below:

Parameter	Description
Address	• "members.dyndns.org" is the IP address of Dyndns DDNS. • "dynupdate.no-ip.com" is the IP address of NO-IP DDNS. • "members.3322.org" is the IP address of CN99 DDNS.
Domain name	The domain name that you registered on the DDNS website.
User name	Enter the user name and password that you got from DDNS service provide. You need to register an account (with user name and password) on the DDNS service provides' website.
Password	
Update period	The update cycle of the connection between your Camera and the server. 10 minutes are set by default.

Step 3 Click **Save**.

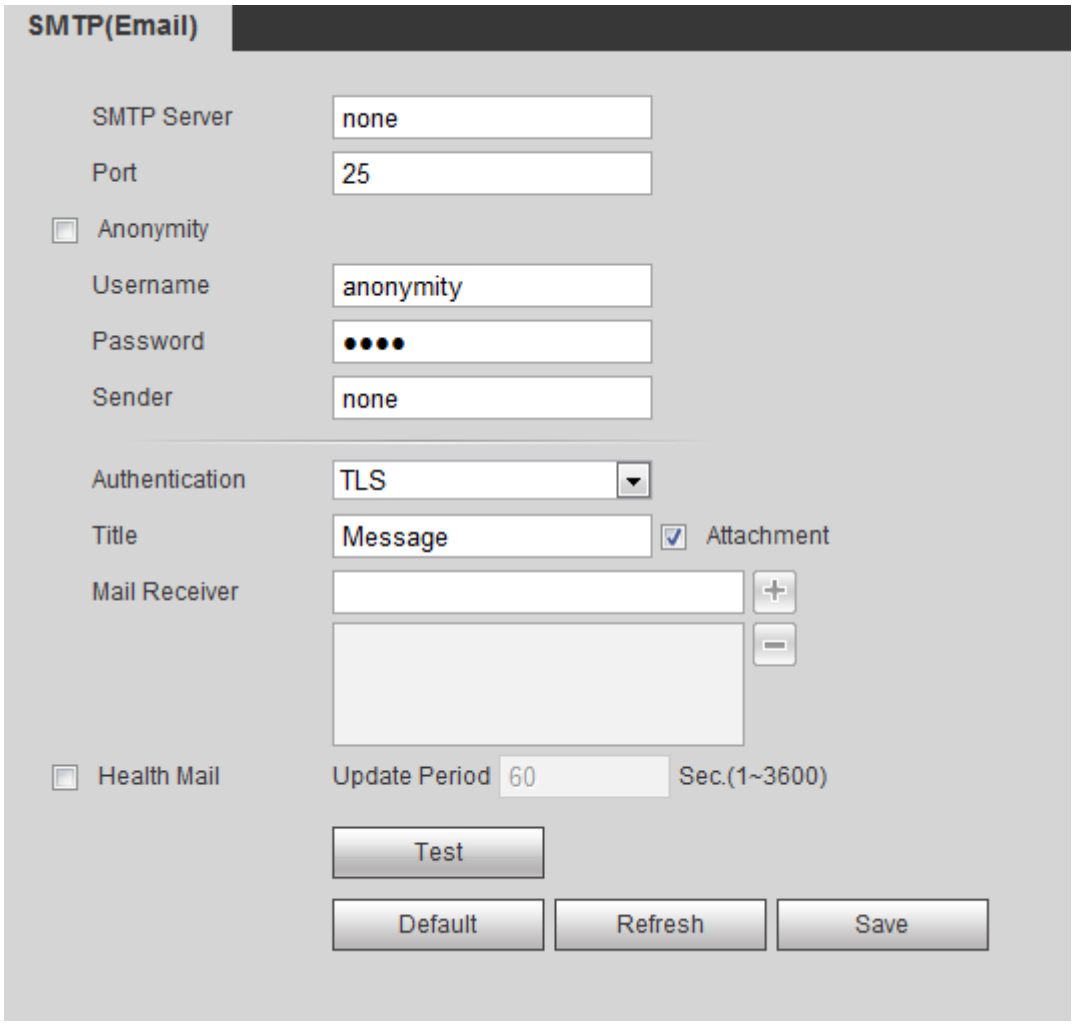
Open your browser, and type the domain name into address bar. Press Enter. If a web page is displayed, the configuration is finished successfully.

6.2.5 Configuring SMTP

Configure **SMTP (Email)** parameter and enable email linkage. The system sends email to the defined address when the corresponding alarm is triggered.

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

Figure 6-32 SMTP (Email)



Step 2 Configure the parameters to be configured.

Table 6-16 SMTP (Email) parameter description

Parameter	Description	
SMTP Server	SMTP server address	For details, see Table 6-17.
Port	The port number of the SMTP server.	
Username	The account of SMTP server.	
Password	The password of SMTP server.	
Anonymous	Select the ckeckbox, and the sender's information is not displayed in the email.	
Sender	Sender's email address.	
Encryption Type	Select from **None**, **SSL** and **TLS**. For details, see Table 6-17.	
Subject	Enter maximum 63 characters in Chinese, English, and Arabic numerals. Click **+** to select title type, including **Device Name**, **Device ID**, and **Event Type**, and you can set maximum 2 titles.	
Attachment	Select the checkbox to support attachment in the email.	
Receiver	• Receiver's email address. Supports 3 addresses at most. • After entering the receiver's email address, the **Test** button is display. Click **Test** to test whether the emails can be sent and received successfully.	
Health Mail	The system sends test mail to check if the connection is successfully configured. Click the checkbox and configure the **Sending Interval**, and then the system sends test mail as the set interval.	

For the configuration of major mailboxes, see Table 6-17.

Table 6-17 Description of major mailbox configuration

Mailbox	SMTP server	Authentication	Port	Description
gmail	smtp.gmail.com	SSL	465	You need to enable SMTP service in your mailbox.
		TLS	587	

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

Step 4 Click **Test** to test whether the email works normally.

6.2.6 Configuring UPnP

UPnP (Universal Plug and Play) is a protocol that establishes mapping relation between local area and wide area networks. This function enables you to visit local area device through wide area IP address.

Prerequisites

- Make sure that the UPnP service is installed in the system.
- Log in to the router, and configure WAN IP address to set up internet connection.
- Enable UPnP in the router.
- Connect your Camera to the LAN port of the router.
- Set IP address of your router as that of your Camera, or select DHCP to obtain IP address

automatically.

Procedure

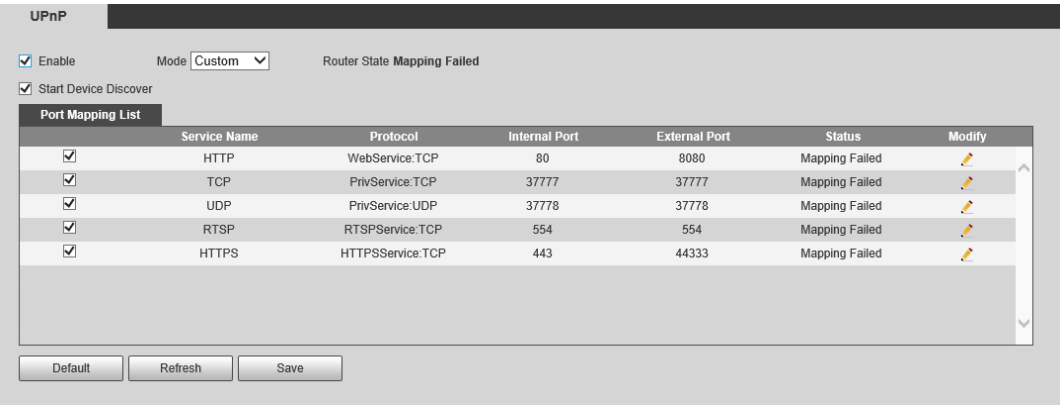
Step 1 Select **Setting** > **Network** > **UPnP**.

Step 2 Select the **Enable** checkbox.

Step 3 Select the mode, and service name in the port mapping list, and UPnP can be classified as custom mode and default mode.

- Select **Custom**, click , and then you can change external port as needed.
- Select **Default**, and then the system finishes mapping with unoccupied port automatically, and you cannot edit mapping relation.
- Select the **Start Device Discover** checkbox to search for the devices through PC network neighbors, and the device name is the serial number.

Figure 6-33 UPnP



Step 4 Click **Save**.

Type "http://*external network IP address*:*external port number*" to access Cameras in Intranet whose ports correspond to your router.

6.2.7 Configuring SNMP

SNMP (Simple Network Management Protocol), which can be used to enable software such as MIB Builder and MG-SOFT MIB Browser to connect to the Camera and manage and monitor the Camera.

Prerequisites

- Install SNMP monitoring and managing tools such as MIB Builder and MG-SOFT MIB Browser.
- You can contact technical support for the MIB file that matches the current version.

Procedure

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

Figure 6-34 SNMP (1)

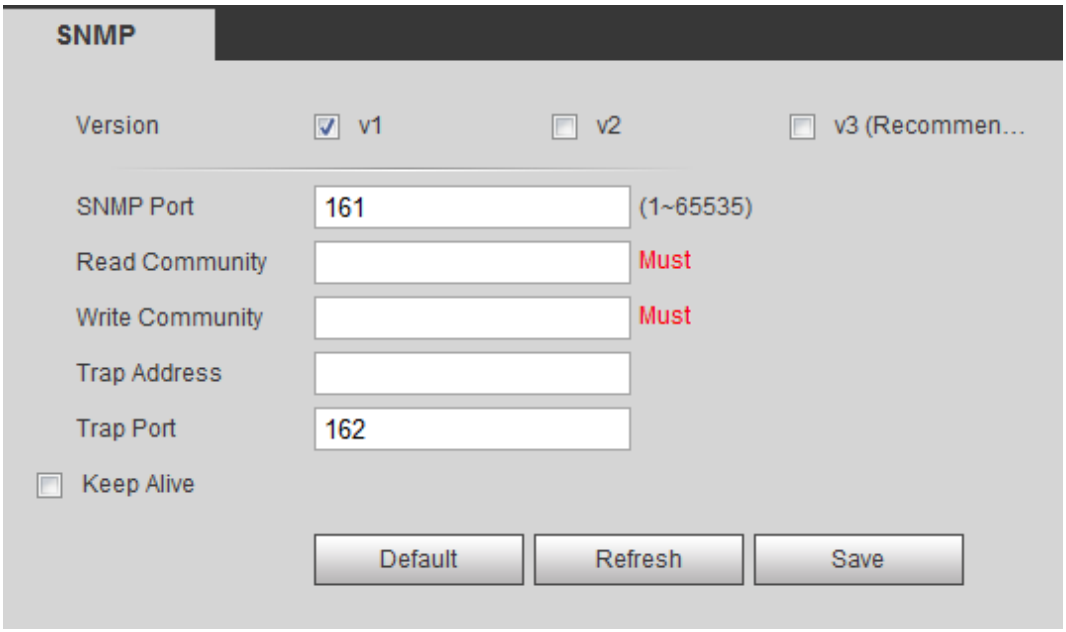
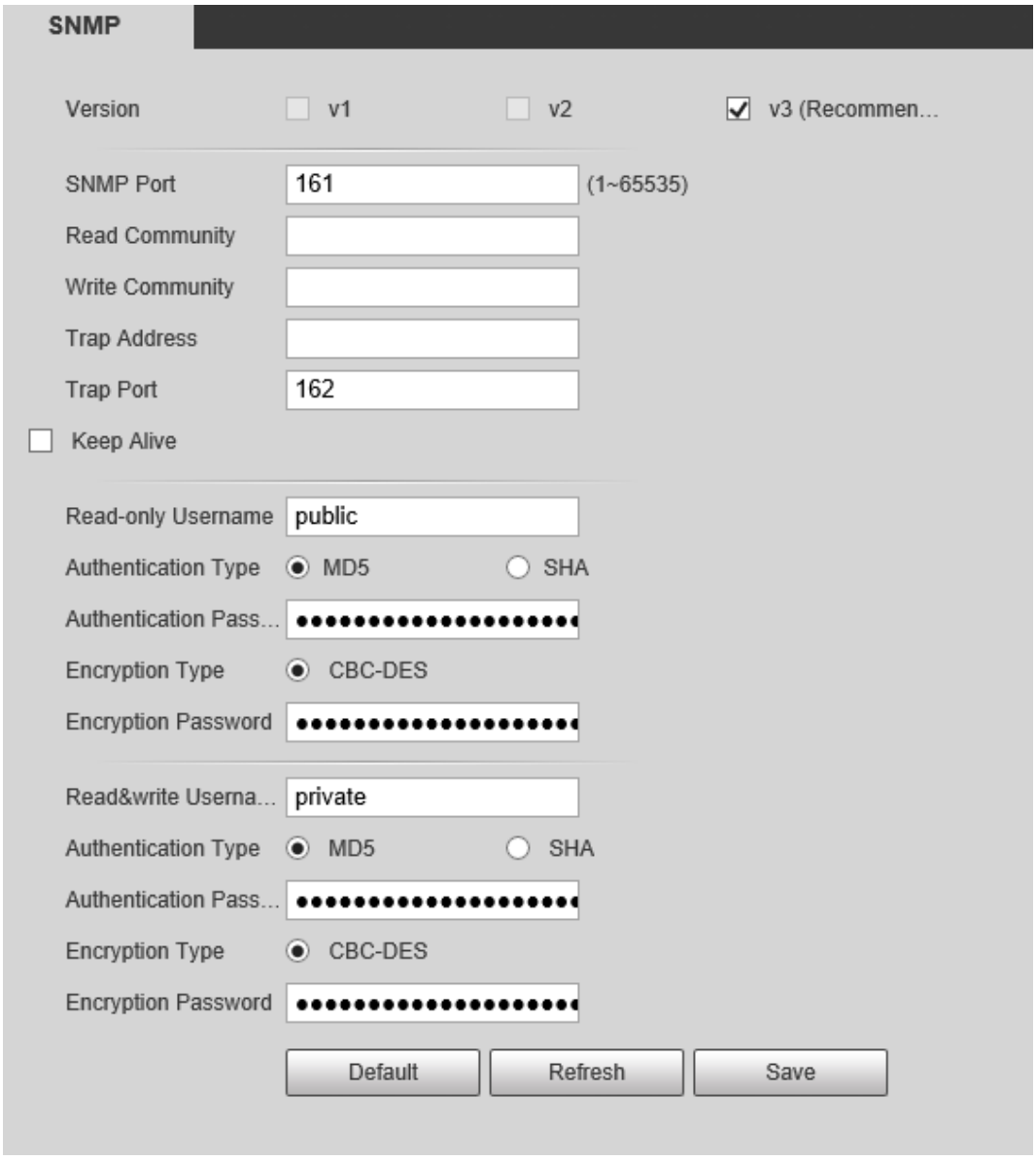


Figure 6-35 SNMP (2)



Step 2 Select SNMP version to enable SNMP.

- Select **V1**, and the system can only process information of V1 version.
- Select **V2**, and the system can only process information of V2 version.
- Select **V3**, and then **V1** and **V2** become unavailable. You can configure username, password and authentication type. It requires corresponding username, password and authentication type to visit your device from the server.

Using **V1** and **V2** might cause data leakage, and **V3** is recommended.

Step 3 In **Trap Address**, enter the IP address of the PC that has MIB Builder and MG-SOFT MIB Browser installed, and leave other parameters to the default.

Table 6-18 SNMP parameter description

Parameter	Description
SNMP Port	The listening port of the software agent in the device.
Read Community, Write Community	The read and write community string that the software agent supports. You can enter number, letter, underline and dash to form the name.
Trap Address	The target address of the Trap information sent by the software agent in the device.
Trap Port	The target port of the Trap information sent by the software agent in the device.
Keep Alive	Select the checkbox, and then set the period. During the configured period, the system checks whether the camera is online.
Read-only Username	Set the read-only username accessing device, and it is **public** by default. You can enter number, letter, and underline to form the name.
Read&Write Username	Set the read/write username access device, and it is **private** by default. You can enter number, letter, and underline to form the name.
Authentication Type	You can select from **MD5** and **SHA**. It is **MD5** by default.
Authentication Password	It should be no less than 8 digits.
Encryption Type	It is CBC-DES by default.
Encryption Password	It should be no less than 8 digits.

Step 4 Click **Save**.

Result

View device configuration through MIB Builder or MG-SOFT MIB Browser.

1. Run MIB Builder and MG-SOFT MIB Browser.
2. Compile the two MIB files with MIB Builder.
3. Load the generated modules with MG-SOFT MIB Browser.
4. Enter the IP address of the device that you need to manage in the MG-SOFT MIB Browser, and

then select version to search.

5. Unfold all the tree lists displayed in the MG-SOFT MIB Browser, and then you can view the configuration information, video channel amount, audio channel amount, and software version.

Use PC with Windows and disable SNMP Trap service. The MG-SOFT MIB Browser will display prompt when alarm is triggered.

6.2.8 Configuring Bonjour

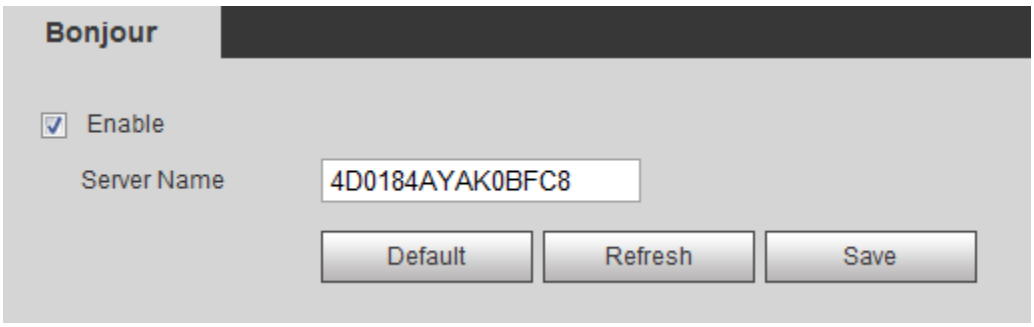
Enable this function, and the OS and clients that support Bonjour would find the Camera automatically. You can have quick visit to the Camera with Safari browser.

Bonjour is enabled by default.

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

Step 2 Select the **Enable** checkbox, and then configure the server name.

Figure 6-36 Bonjour



Step 3 Click **Save**.

Result

In the OS and clients that support Bonjour, follow the steps below to visit the network camera with Safari browser.

1. Click **Show All Bookmarks** in Safari.
2. Enable **Bonjour**. The OS or client automatically detects the network cameras with Bonjour enabled in the LAN.
3. Click the camera to visit the corresponding web page.

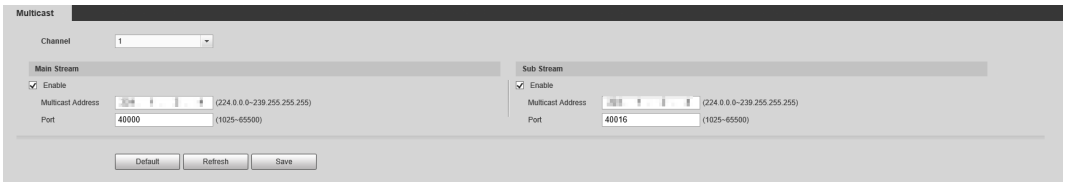
6.2.9 Configuring Multicast

When multiple users are viewing the device video image simultaneously through network, it might fail due to limited bandwidth. You can solve this problem by setting up a multicast IP (224.0.1.0–238.255.255.255) for the Camera and adopt the multicast protocol.

Procedure

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

Figure 6-37 Multicast



Step 2 Select the channel

- Select **1** in **Channel** to configure the parameters for the visible channel.
- Select **2** in **Channel** to configure the parameters for the thermal channel.

The monocular camera does not support channel selection.

Step 3 Select **Enable**, and then enter IP address and port number.

Table 6-19 Multicast

Parameter	Description
Multicast Address	The multicast IP address of **Main Stream**/**Sub Stream** is 224.1.2.4 by default, and the range is 224.0.0.0–239.255.255.255.
Port	The multicast port of corresponding stream: **Main Stream**: 40000; **Sub Stream1**: 40016; **Sub Stream2**: 40032, and all the range is 1025–65500.

Step 4 Click **Save**, and the login page is displayed. The configuration finishes.

Result

On the **Live** page, select **RTSP** in **Multicast**, and then you can view the video image with multicast protocol.

6.2.10 Configuring Auto Registration

After you enable this function, when the Camera is connected into Internet, it will report the current location to the specified server which acts as the transit to make it easier for the client software to access the Camera.

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

Step 2 Select the **Enable** checkbox.

Step 3 Set auto registration parameters.

Figure 6-38 Auto registration

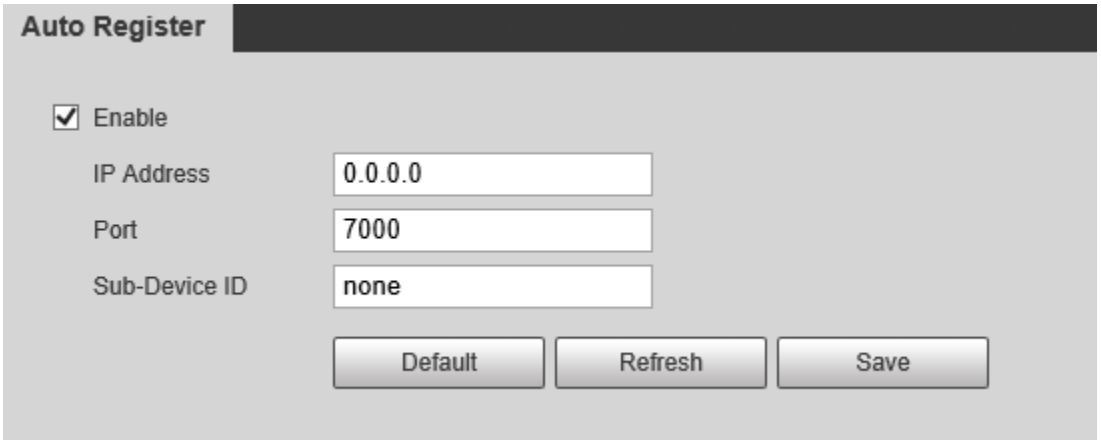


Table 6-20 Auto registration parameter description

Parameter	Description
IP Address	IP address or domain name to which the camera transmits its location.
Port	The port for auto registration.
Sub-Camera ID	Your Camera ID given by the server.

Step 4 Click **Save**.

6.2.11 Configuring 802.1X

802.1X can control the Camera's access to LAN.

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

Step 2 Select the **Enable** checkbox.

Step 3 Set 802.1x parameters.

Figure 6-39 802.1x

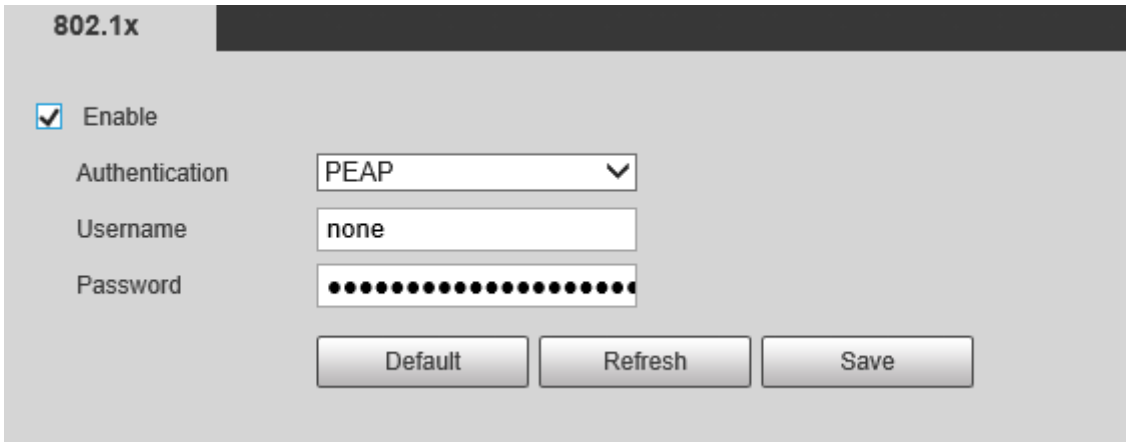


Table 6-21 Parameters of 802.1x

Parameter	Description
Authentication	PEAP (protected EAP protocol).
Username	The username that was authenticated on the server.
Password	Password of your username.

Step 4 Click **Save**.

6.2.12 Configuring QoS

You can solve problems such as network delay and congestion with this function. It helps to assure bandwidth, reduce transmission delay, packet loss rate, and delay jitter to improve experience.

0–63 means 64 degrees of priority; 0 for the lowest and 63 the highest.

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

Step 2 Set QoS parameters.

Figure 6-40 QoS

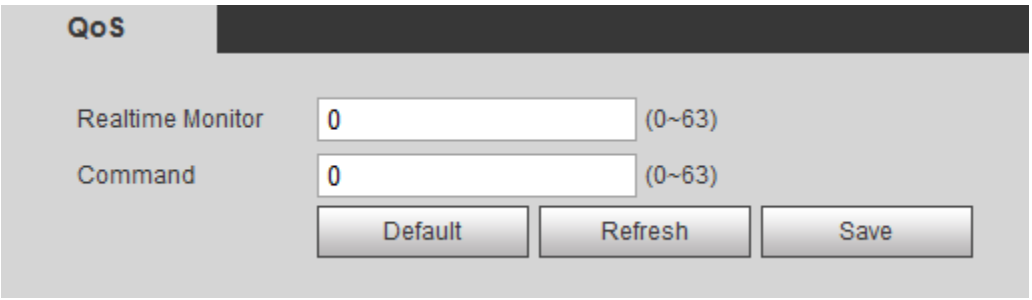


Table 6-22 QoS parameter description

Parameters	Description
Real-time Monitor	Configure the priority of the data packets that used for network surveillance. 0 for the lowest and 63 the highest.
Command	Configure the priority of the data packets that used for configure or checking.

Step 3 Click **Save**.

6.2.13 Platform Access

6.2.13.1 P2P

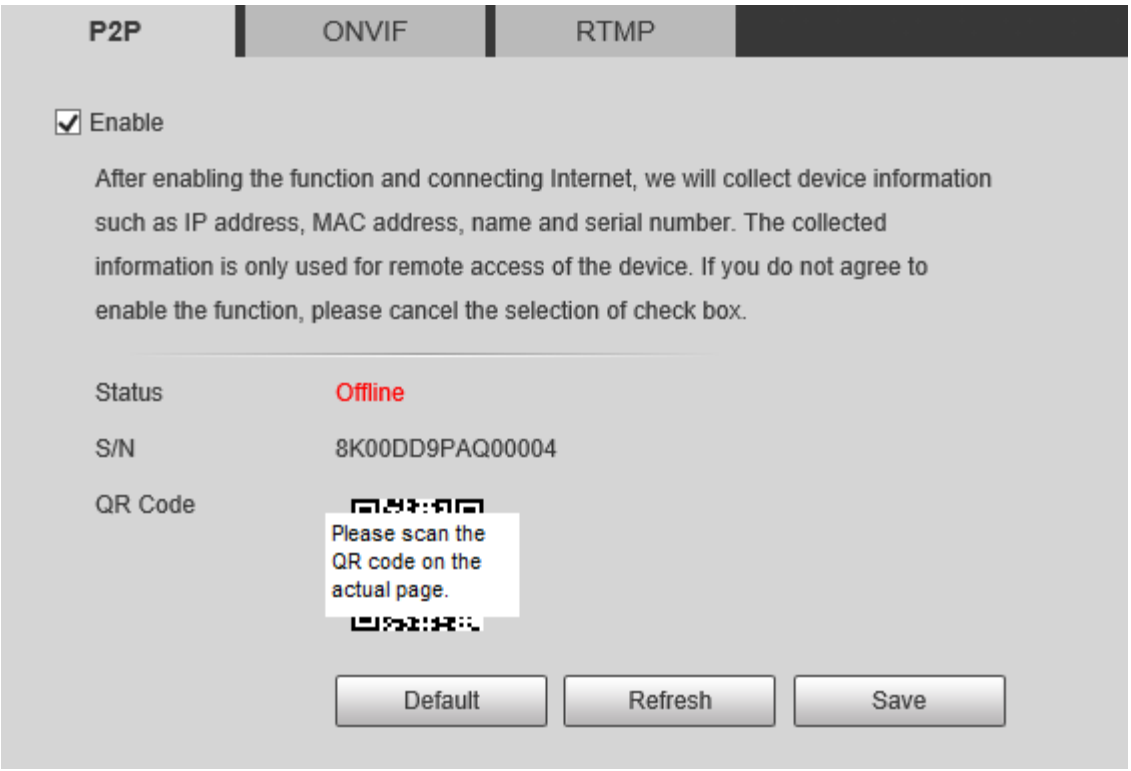
P2P (peer-to-peer) technology enables users to manage devices easily without requiring DDNS, port mapping or transit server.

Scan the QR code with your smart phone, and then you can add and manage more devices on the mobile phone client.

Step 1 Select **Setting** > **Network** > **Access Platform** > **P2P**.

- When P2P is enabled, remote management on device is supported.
- When P2P is enabled and the device accesses to the network, the status shows online. The information of the IP address, MAC address, device name, and device SN will be collected. The collected information is for remote access only. You can cancel the **Enable** selection to reject the collection.

Figure 6-41 P2P



Step 2 Log in to mobile phone client and tap **Device management**.

Step 3 Tap **+** at the upper-right corner.

Step 4 Scan the QR code on the **P2P** page.

Step 5 Follow the instructions to finish the settings.

6.2.13.2 ONVIF

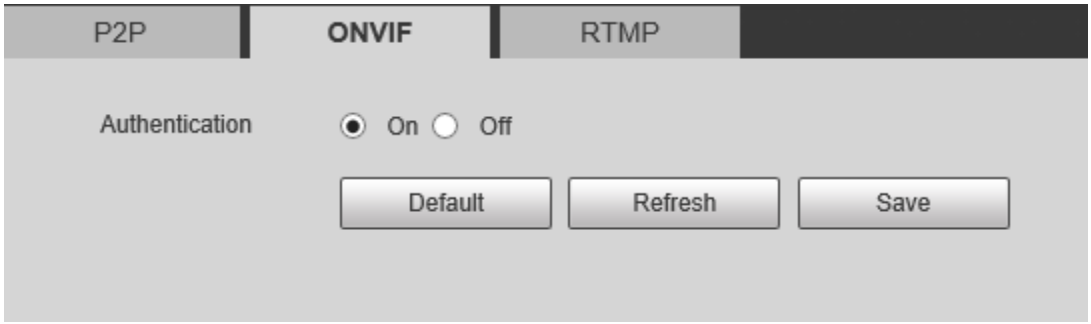
The ONVIF verification is enabled by default, which allows the network video products (including video recording device and other recording devices) from other manufacturers to connect to your device.

ONVIF is enabled by default.

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

Step 2 Select **On**.

Figure 6-42 ONVIF



Step 3 Click **Save**.

6.2.13.3 RTMP

Through RTMP, you can access the third-party platform (such as Ali and YouTube) to realize video live view.

- RTMP can be configured by admin only.
- RTMP supports the H.264, H.264 B and H.264H video formats, and the AAC audio format only.

Step 1 Select **Setting** > **Network** > **Access Platform** > **RTMP**.

Step 2 Select the **Enable** checkbox.

Make sure that the IP address is trustable when enabling RTMP.

Step 3 Configure RTMP parameters.

Figure 6-43 ONVIF

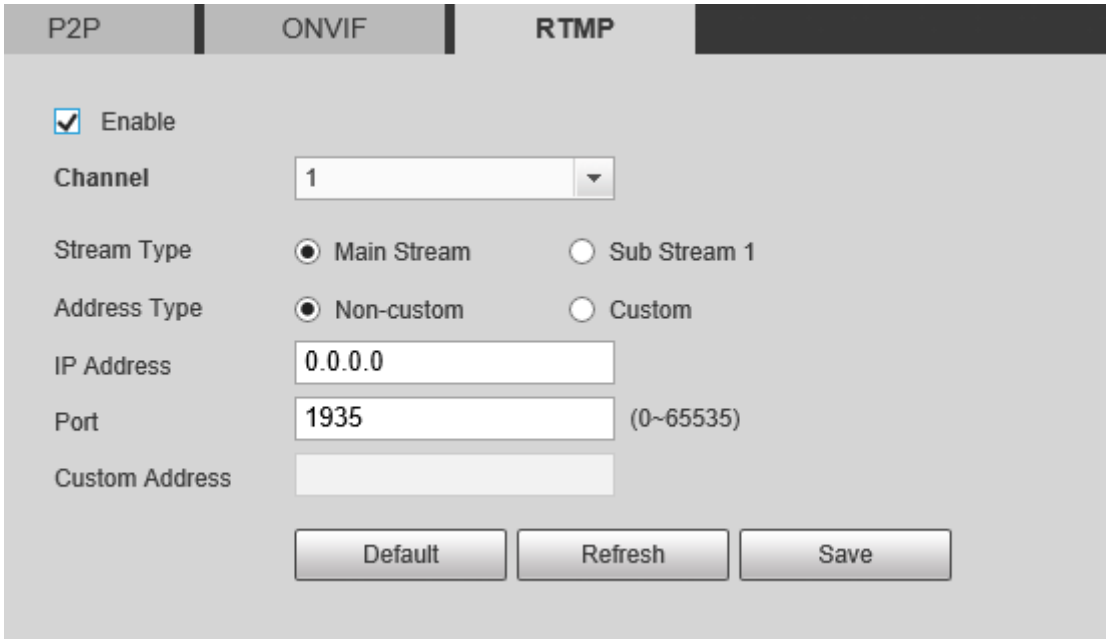


Table 6-23 Description of RTMP parameters

Parameter	Description
Stream Type	The stream for live view. Make sure that the video format is the H.264, H.264 B and H.264H, and the audio format is AAC.
Address Type	Includes **Non-custom** and **Custom**. • **Non-custom**: Enter the server IP and domain name. • **Custom**: Enter the path allocated by the server.
IP Address	When selecting **Non-custom**, you need to enter server IP address and port. • **IP address**: Support IPv4 or domain name. • **Port**: We recommend that you use the default one.
Port	
Custom Address	When selecting **Custom**, you need to enter the path allocated by the server.

Step 4 Click **Save**.

6.3 Storage

The system can link record channel when an alarm event occurs. After alarm, the system stops recording after an extended time period according to the **Record Delay** setting.
To use the record linkage function, set record plan for motion detection alarm and enable auto recording in record control.

6.3.1 Configuring Schedule

6.3.1.1 Configuring Record Plan

After the corresponding alarm type (**Normal**, **Motion**, or **Alarm**) is enabled, the record channel links recording.

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

Step 2 Select the channel

- Select **1** in **Channel** to configure the parameters for the visible channel.
- Select **2** in **Channel** to configure the parameters for the thermal channel.

The monocular camera does not support channel selection.

Step 3 Set record plan.

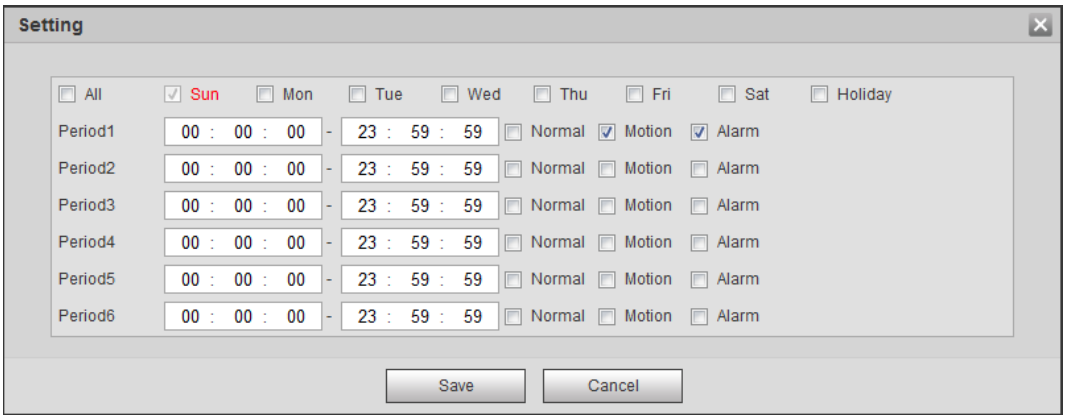
Green represents normal record plan (such as timing recording); yellow represents motion record plan (such as recording triggered by intelligent events); red represents alarm record plan (such as recording triggered by alarm-in).

- Method one: Select a record type, such as **General**, and directly press and drag the left mouse button to set the time period for normal record on the timeline.

Figure 6-44 Record

- Method two: Enter an actual time period.
  1. Click **Setting** next to a day.

Figure 6-45 Setting (record time period)



2. Select a day, and the alarm type next to a period, and then set the period.

- Select **All** or checkboxes of some days to set the time period of multiple days at one time.
- You can set 6 time periods per day.

Step 4 Click **Save**.

6.3.1.2 Configuring Snapshot Plan

According to the configured snapshot plan, the system enables or disables snapshot at corresponding time.

Step 1 Select **Setting** > **Storage** > **Schedule** > **Snapshot**.

Step 2 Select the channel

- Select **1** in **Channel** to configure the parameters for the visible channel.
- Select **2** in **Channel** to configure the parameters for the thermal channel.

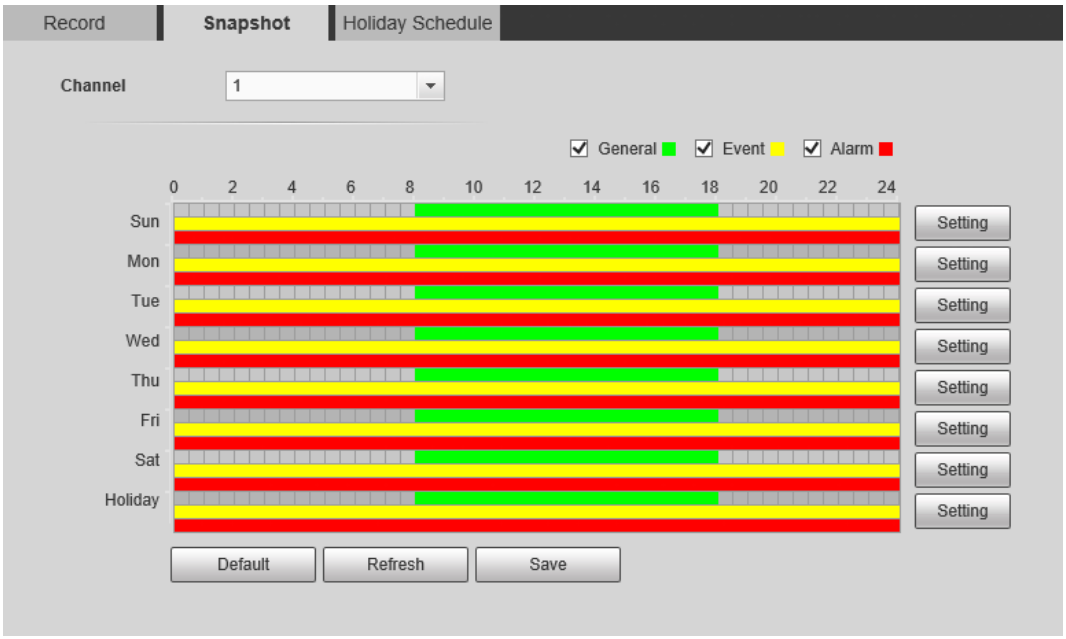
The monocular camera does not support channel selection.

Step 3 Select snapshot type and set time period.

Green represents normal snapshot plan (such as timing snapshot); yellow represents motion snapshot plan (such as snapshot triggered by intelligent events); red represents alarm snapshot plan (such as snapshot triggered by alarm-in).

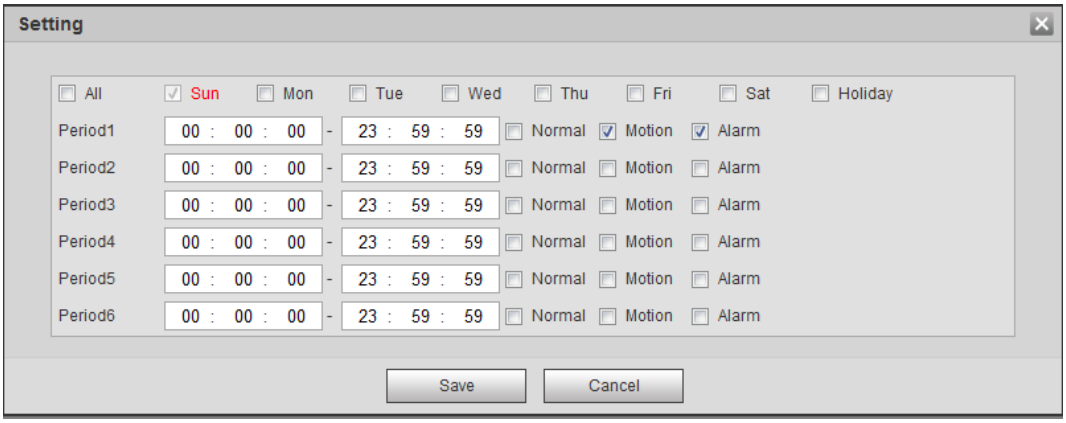
- Method one: Select snapshot type, such as **General**, and directly press and drag the left mouse button to set time period for normal snapshot on the timeline.

Figure 6-46 Snapshot



- Method two: Enter an actual time period.
  1. Click **Setting** next to a day.

Figure 6-47 Setting (snapshot time period)



  2. Select a day, and the alarm type next to a period. Then set the period.

     ◇ Select **All** or checkboxes of some days to set the time period of multiple days at one time.

     ◇ You can set 6 time periods per day.

  3. You can set 6 time periods per day.

Step 4 Click **Save**.

6.3.1.3 Configuring Holiday Schedule

Select a day as the holiday and video recording and snapshots will be enabled on the holiday.

- To use holiday recording function, you need to configure holiday recording schedule. For details, see "6.3.1.1 Configuring Record Plan".
- To use holiday snapshot function, you need to configure holiday record and snapshot schedule.

For details, see "6.3.1.2 Configuring Snapshot Plan".

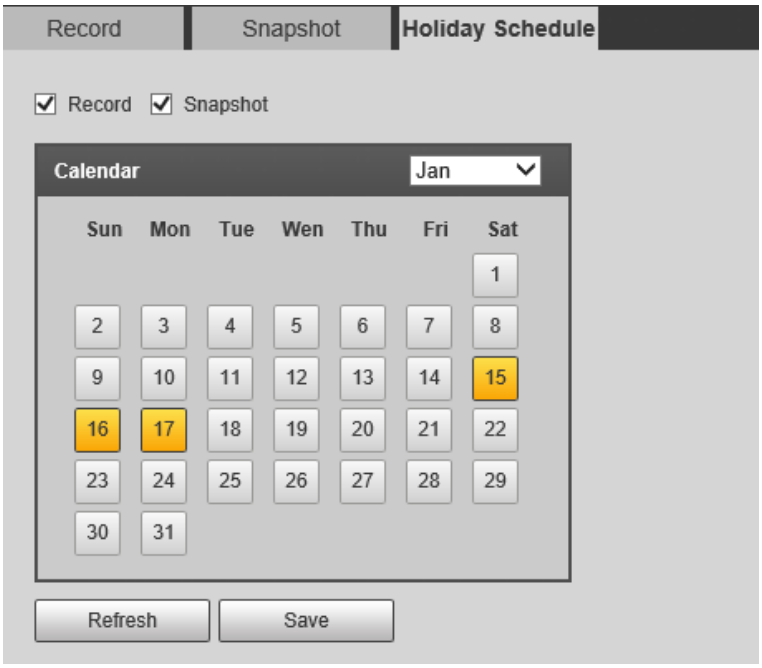
Step 1 Select **Setting** > **Storage** > **Schedule** > **Holiday Schedule**.

Step 2 Select from record and snapshot.

Step 3 Select days that you need, and then set them as the holiday.

Those days with yellow color indicates that they were set as holidays.

Figure 6-48 Holiday schedule



Step 4 Click **Save**.

6.3.2 Configuring Storage Method

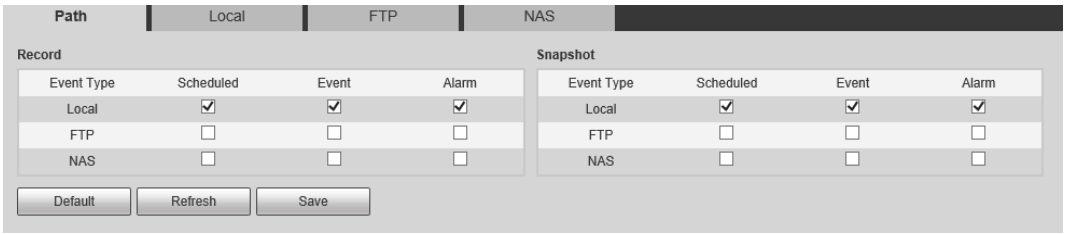
6.3.2.1 Configuring Storage Path

You can set the storage methods of video recording and snapshot according to event types. You can save them in SD card, FTP or NAS.

Local storage is available only on models that support SD card.

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

Figure 6-49 Path



Step 2 Select different storage paths for the recorded videos and snapshots which belong to different event types.

Table 6-24 Path parameters

Parameter	Description
Event type	Select from **Scheduled**, **Event** and **Alarm**.
Local	Save in the internal SD card.
FTP	Save in the FTP server.
NAS	Save in the NAS (network attached storage).

Step 3 Click **Save**.

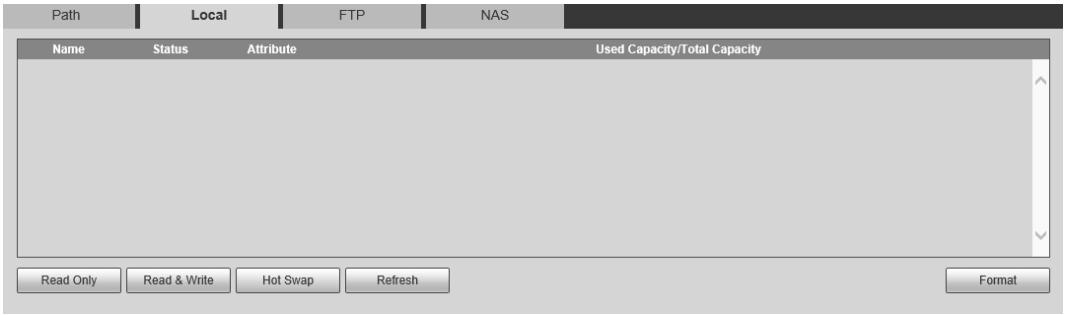
6.3.2.2 Configuring Local Storage

Displays the information of the local SD card. You can set it as read only or read & write; you can also hot swap and format SD card.

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

- Click **Read Only**, and then the SD card is set to read only.
- Click **Read & Write**, and then the SD card is set to read & write.
- Click **Hot Swap**, and then you can pull out the SD card.
- Click **Refresh**, and then you can format the SD card.
- Click **Format**, and you can format the SD card.

Figure 6-50 Local storage



6.3.2.3 Configuring FTP Server

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

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

Step 2 Select the **Enable** checkbox, and then select the service type.

Select **FTP** or **SFPT** from the drop-down list. **SFTP** is recommended to enhance network security.

Step 3 Configure FTP parameters.

Figure 6-51 FTP settings

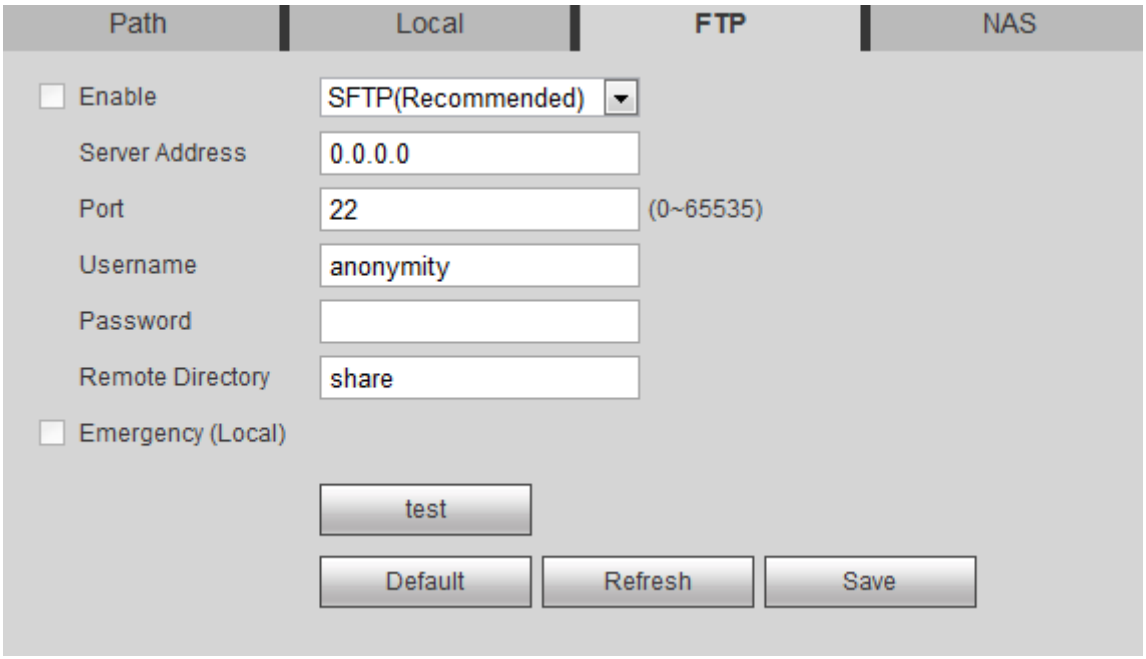


Table 6-25 FTP parameter description

Parameter	Description
Server Address	The IP address of the SFTP or FTP server.
Port	The port of the SFTP or FTP server.
User name	The username to log in to the server.
Password	The password to log in to the server.
Remote Directory	The destination path in to the server.
Emergency (Local)	Select the **Emergency (Local)** checkbox, and when the FTP server does not work, all the files are saved to the internal SD card.

Step 4 Click **Save**.

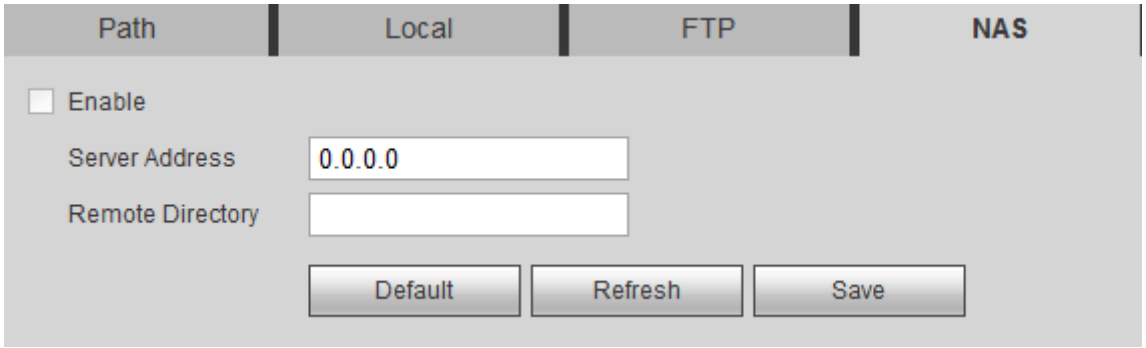
Click **Test** to check whether the server has been properly connected.

6.3.2.4 Configuring NAS Server

This function can be enabled only when NAS has been selected as destination path. Click the **NAS** tab and you can save files in NAS server.

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

Figure 6-52 NAS settings



Step 2 Select the **Enable** checkbox.

Step 3 Configure NAS parameters.

Table 6-26 NAS parameters

Parameter	Description
Server Address	The IP address of the NAS server.
Remote Directory	The destination path in the NAS server.

Step 4 Click **Save**.

6.3.3 Setting Record Control

Set parameters such as pack duration, pre-event record, disk full, record mode, and record stream.

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

Step 2 Set parameters.

Figure 6-53 Record control

Table 6-27 Description of record control parameters

Parameter	Description
Pack Duration	The time for packing each video file.
Pre-event Record	The time to record the video in advance of a triggered alarm event. For example, if the pre-event record is set to be 5 s, the system saves the recorded video of 5 s before the alarm is triggered. When an alarm or motion detection links recording, and the recording is not enabled, the system saves the video data within the pre-event record time to the video file.
Disk Full	Recording strategy when the disk is full. • **Stop**: Stop recording when the disk is full. • **Overwrite**: Cyclically overwrite the earliest video when the disk is full.
Record Mode	When you select **Manual**, the system starts recording; when you select **Auto**, the system starts recording in the configured time period of record plan.
Record Stream	Select record stream, including **Main Stream** and **Sub Stream**.

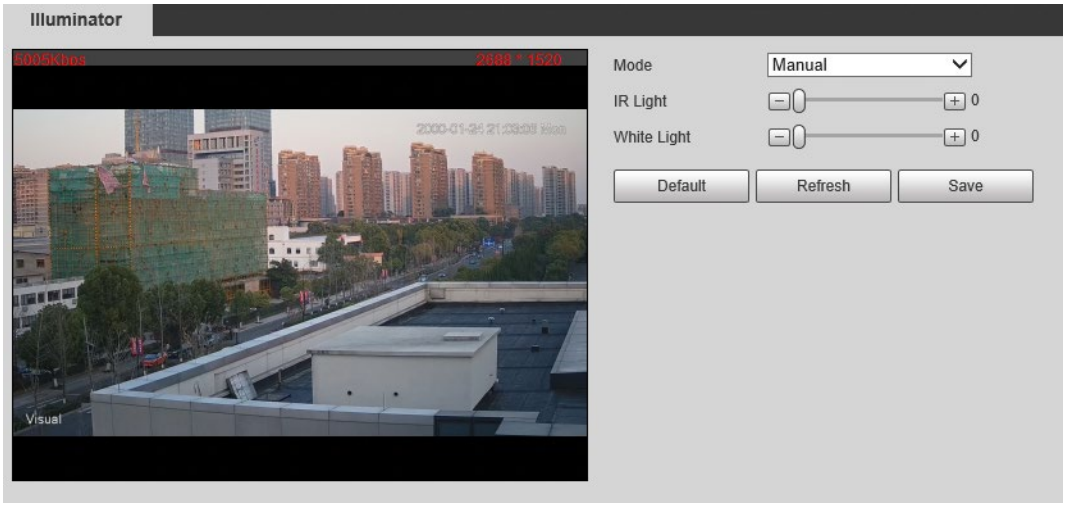
Step 3 Click **Save**.

6.4 Peripheral

6.4.1 Configuring Illuminator

Step 1 Select **Setting** > **Peripheral** > **Illuminator**.

Figure 6-54 Illuminator



Step 2 Configure the running mode of the illuminator.

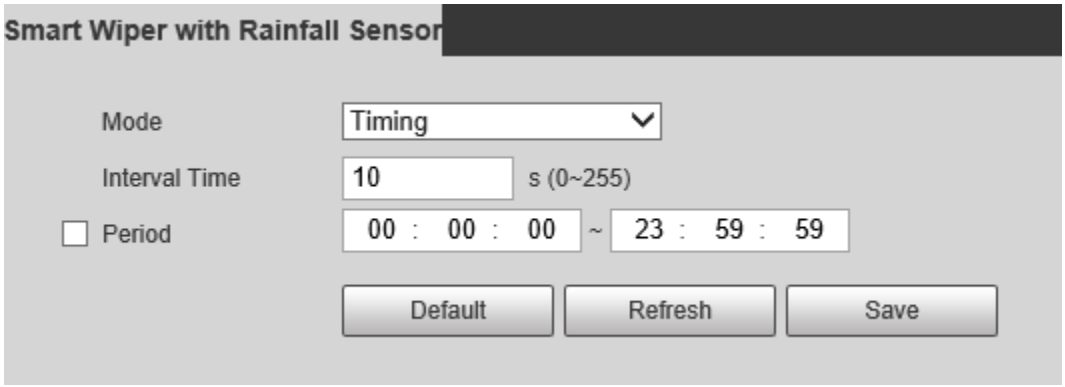
- **Auto**: Turn on or off the illuminator automatically according to the actual situation.
- **Manual**: Manually adjust the brightness of the illuminator to realize the best image display effect under night vision condition.

Step 3 Click **Save**.

6.4.2 Configuring Wiper

Step 1 Select **Setting** > **Peripheral** > **Wiper**.

Figure 6-55 Wiper



Step 2 Configure the running mode.

- **Timing**: You can configure the **Interval Time** and **Period**.
  1. **Interval Time**: Interval from the point when the wiper starts to the point when the wiper stops.
  2. **Period**: The working time of the wiper.
  3. Click **Save**.

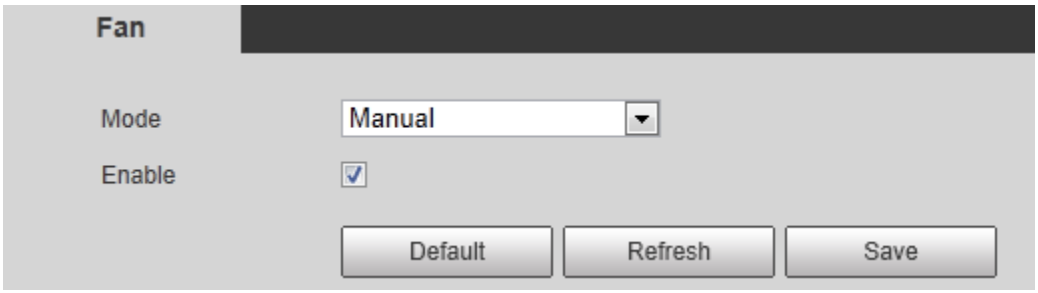
- **Manual**: Turn on and off the wiper manually.
  1. **Interval Time**: Interval from the point when the wiper starts to the point when the wiper stops.
  2. Click **Start** to get the wiper work in the interval time that you have just configured, and click **Stop** to stop it; click **Once** to get the wiper work for one round.
- **Auto**: Adjust the sensitivity according to the actual situation.

Step 3 Click **Save**.

6.4.3 Configuring Fan

Step 1 Select **Setting** > **Peripheral** > **Fan**.

Figure 6-56 Fan



Step 2 Select the **Enable** checkbox.

Step 3 Configure the running mode.

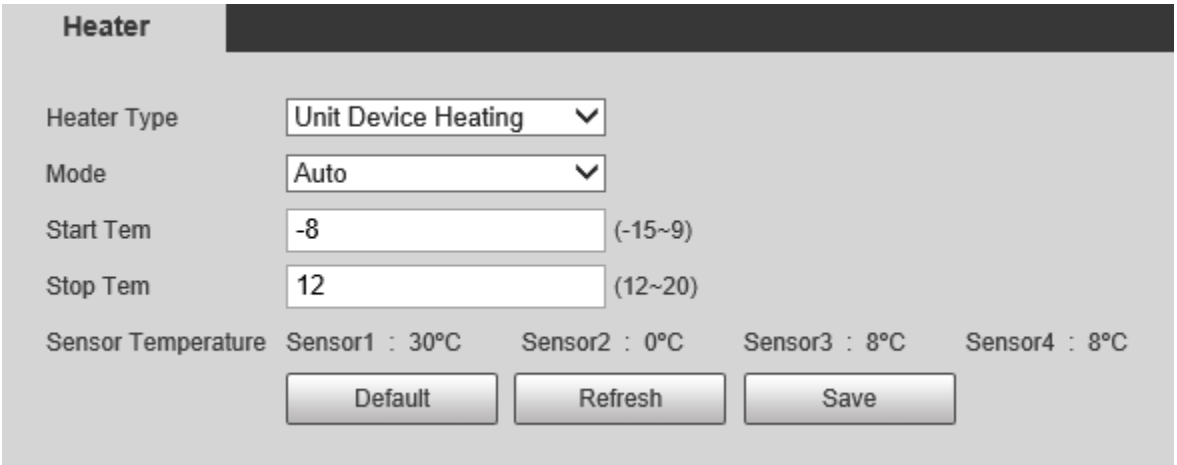
- **Auto**: Click **Save**, and the fan works automatically.
- **Manual**: Select the **Enable** checkbox to manually start the fan.

Step 4 Click **Save**.

6.4.4 Configuring Heater

Step 1 Select **Setting** > **Peripheral** > **Heater**.

Figure 6-57 Heater



Step 2 Select the heat type as needed.

Step 3 Configure the heater parameter.

- **Auto**: Select **Start Tem** and **Stop Tem** as the temperature range for heater to start, and click **Save**. When the sensor temperature is in the range, heater works automatically.

- **Manual**: When you think it is cold enough and you want to let the Camera work in a warm condition, you can select **Manual** as the **Mode**. Select the **On** checkbox, and then click **Save**.

Step 4 Click **Save**.

6.5 System Management

6.5.1 General Settings

6.5.1.1 Configuring General Information

Configure the camera name, language and video standard.

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

Step 2 Configure general parameters.

Figure 6-58 General

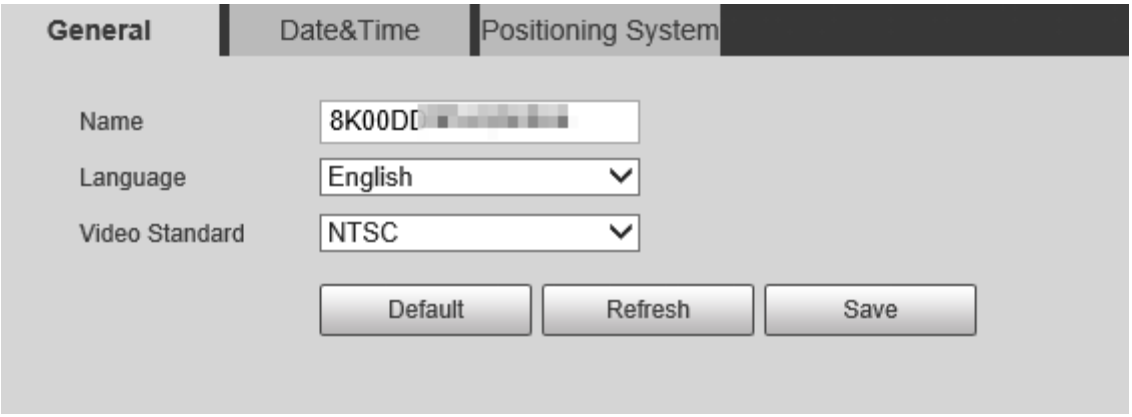


Table 6-28 General parameter description

Parameter	Description
Name	The name of the Camera. Each Camera has a unique name.
Language	Select the system language.
Video Standard	Select video standard from PAL and NTSC.

Step 3 Click **Save**.

6.5.1.2 Configuring Date and Time

You can set Date and Time format, Time zone, Current Time, DST (Daylight Saving Time) or NTP server.

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

Step 2 Configure Date & Time parameters.

Figure 6-59 Date & Time

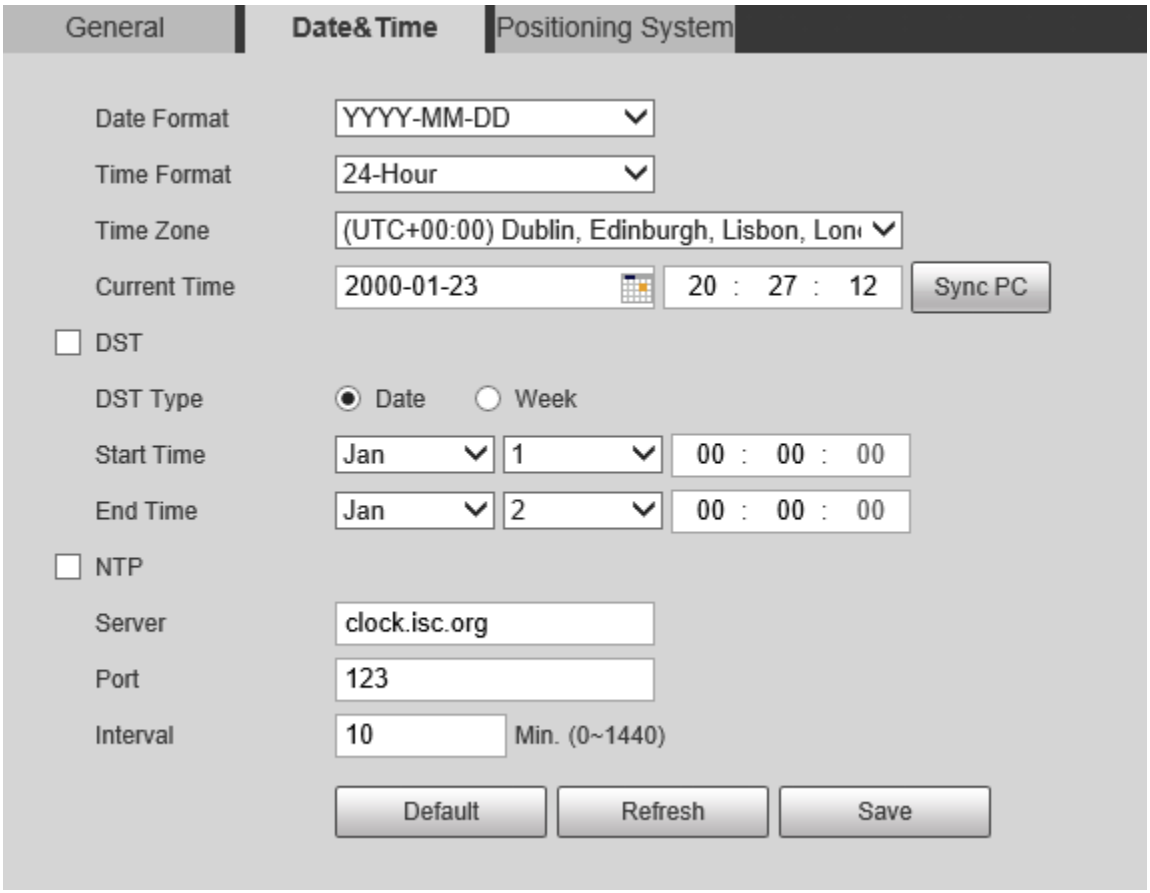


Table 6-29 Date & Time parameters

Parameter	Description
Date Format	Date format.
Time Format	Configure the time format. You can select from 24-Hour or 12-Hour.
Time zone	Configure the time zone that the Camera is at.
Current Time	Configure system time. Click **Sync PC**, and the system time changes to the time on PC.
DST	Enable DST as needed. Select the checkbox to enable daylight saving time. Select **DST**, and then configure the start time and end time of DST with dates or days of the week.
NTP	When you need the Camera to transmit its time to NTP server, you can select the **NTP** checkbox to enable it.
Server	IP address or domain name of the NTP server.
Port	Port number of the FTP server.
Interval	Time gap of Camera's transmission of its current time to NTP server.

Step 3 Click **Save**.

6.5.1.3 Configuring Position System

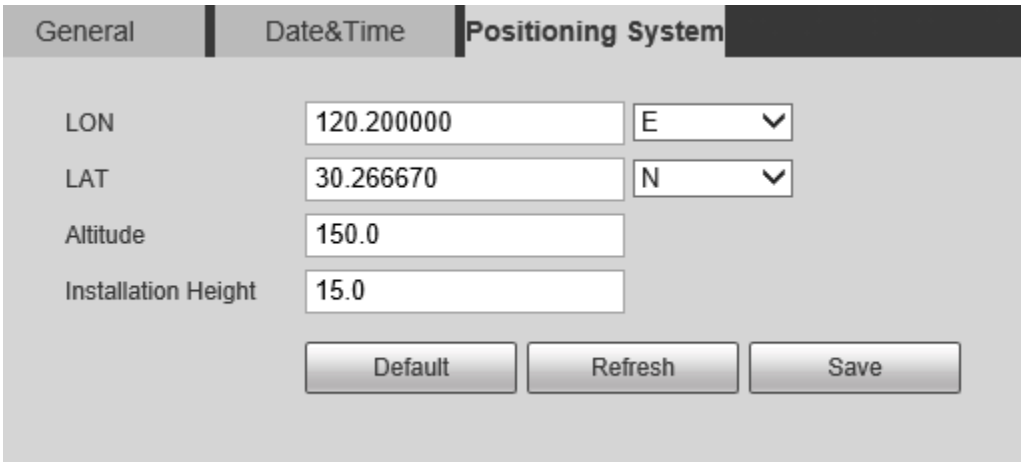
Enter the position system information of the Camera in the web to remind you where the Camera locates.

When the Camera with a platform, it will automatically send the position system information to the management platform, and the position system information can be viewed on the platform to help the platform operator track the Camera.

This function is supported on select models.

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

Figure 6-60 Position system



Step 2 Enter the longitude, latitude altitude, and installation height of the Camera.

Step 3 Click **Save**.

6.5.2 User Management

Managing users and groups are only available for administrator users.

- The max length of the user or group name is 15 characters which can only be consisted of letters, numbers and underlines.
- The password is made up of characters for 8–32 digits and the password must contain two of the three forms (number, letter, and the common characters. **'**, **"**, **;**, **:**, **&** are not included.) Administrator users can modify all the uses' password.
- You can have 19 users and 8 groups at most.
- You can manage users through single user or group, duplicate user names or group names are not allowed. A user can be in one group at a time and the group users can own authorities within group authority range.
- Online users cannot modify their own authority.
- There is one admin by default which has highest authority.
- Select **Anonymous login**, and then log in with only IP address instead of user name and password. Anonymous users only have preview authorities. During Anonymous login, click **Logout**, and then you can log in with other username.

6.5.2.1 Adding a User

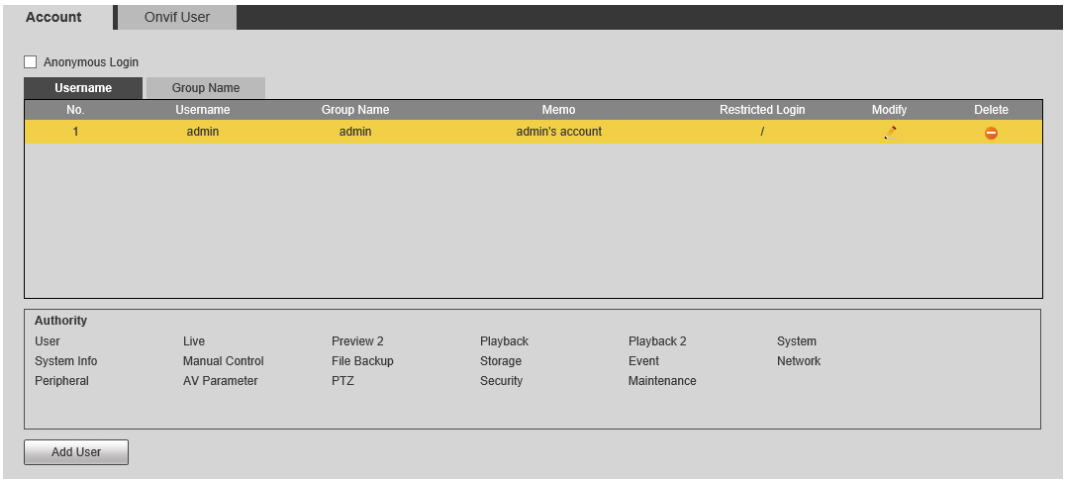
You are admin user by default, and you can add user, delete added users or modify their password.

Procedure

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

Step 2 Click **Add User**.

Figure 6-61 User settings



Step 3 Configure parameters.

Figure 6-62 Add user (operation permission)

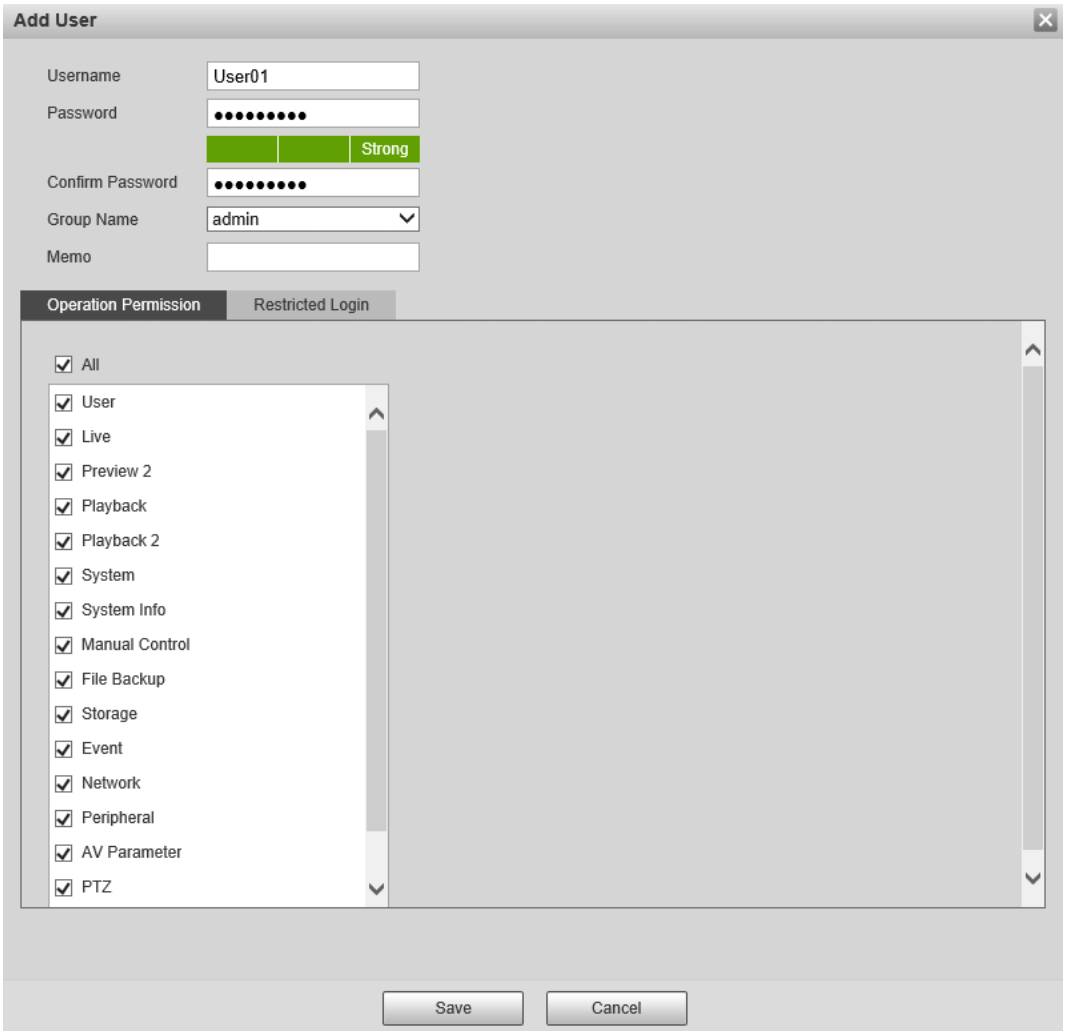


Figure 6-63 Add user (restricted login)

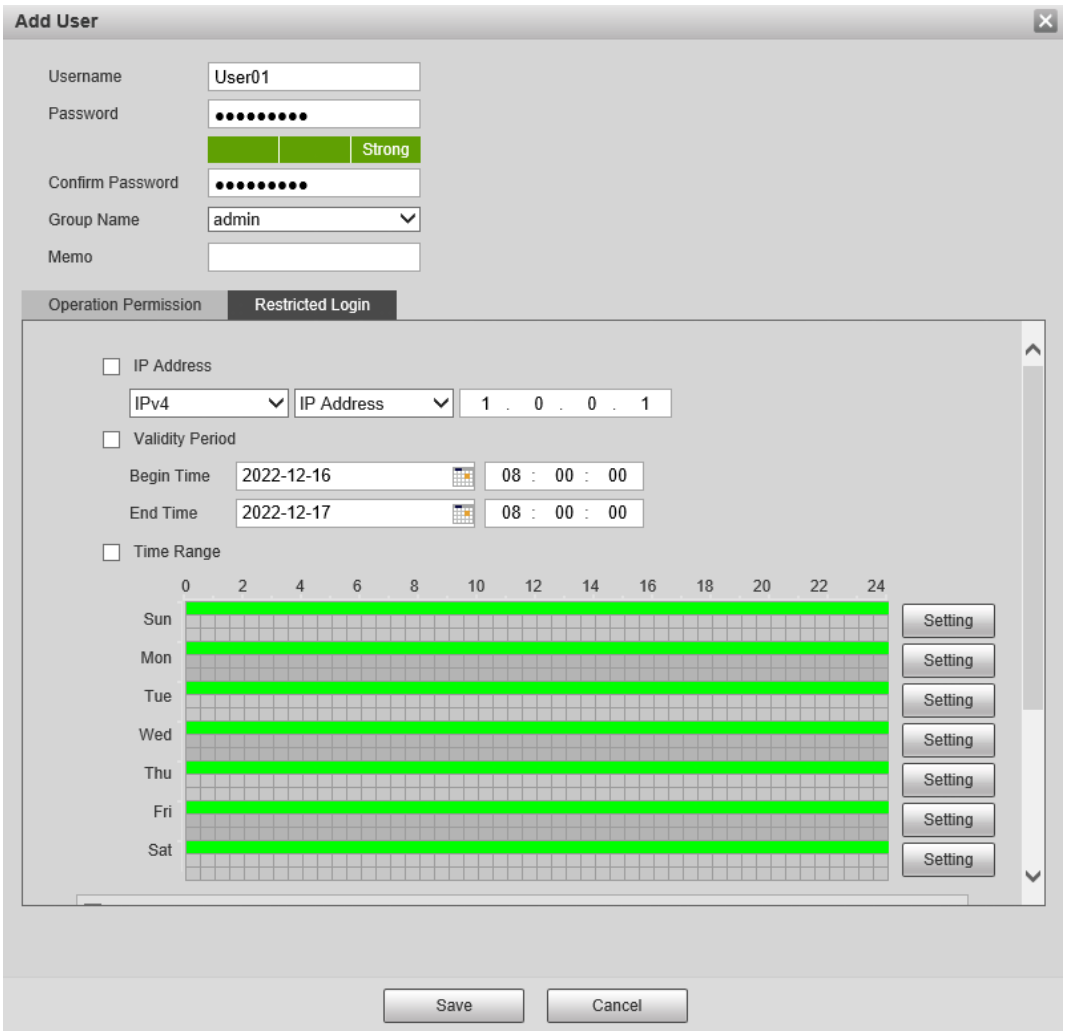


Table 6-30 User parameter description

Parameter	Description
Username	User's unique identification You cannot use existing user name.
Password	Enter password and confirm it. The two items must be the same.
Confirm Password	
Group name	The group that users belong to. Each group has different authorities.
Memo	Describes the user.

Parameter	Description
Restricted Login	Set the PC address that allows the defined user to log in to the Camera and the validity period and time range. You can log in to the web with the defined IP in the defined time range of validity period. ● IP address: You can log in to the web through the PC with the configured IP. ● Validity period: You can log in to the web in the configured validity period. ● Time range: You can log in to the web in the configured time range. Configured as following: 1. Enable **IP Address**, and then select IP type and set the IP address. ● IP address: Enter the IP address of the host to be added. ● IP segment: Enter the start address and end address of the host to be added. 2. Enable **Validity Period**, and then set the start time and end time. 3. Enable **Period**, and then click **Time** to set the period that allows login.

Step 4 Click **Save**.

The newly added users are displayed in the user list.

Related Operations

- Click to modify password, group, memo or authorities.
- Click to delete the added user, admin user cannot be deleted.
- Click in the admin row to change user name and email address.

6.5.2.2 Adding a Group

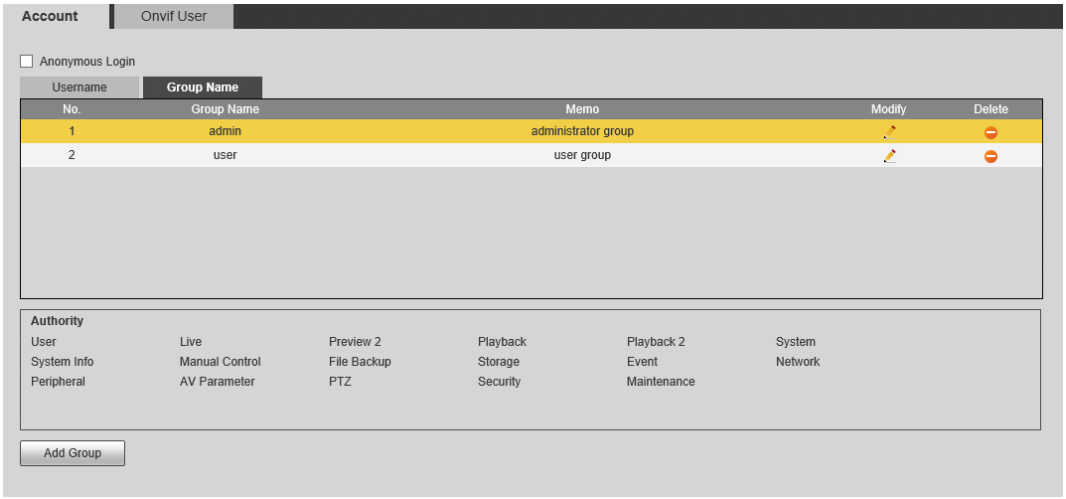
You have two groups named admin and user by default, and you can add new group, delete added group or modify group authority and memo.

Procedure

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

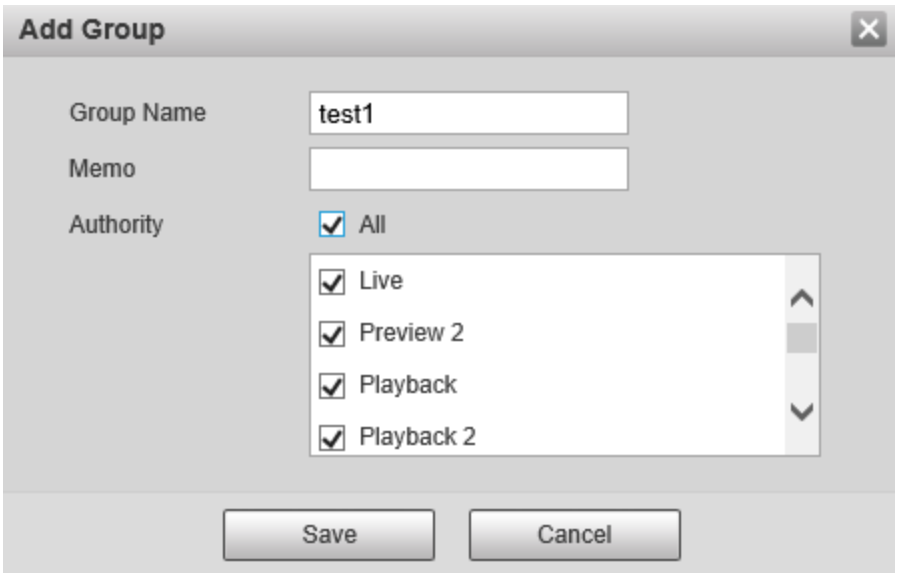
Step 2 Click **Add Group**.

Figure 6-64 User group



Step 3 Enter group name and memo, and then select the group authorities.

Figure 6-65 Add group



Step 4 Click **Save**.

The newly added group are displayed in the group name list.

Related Operations

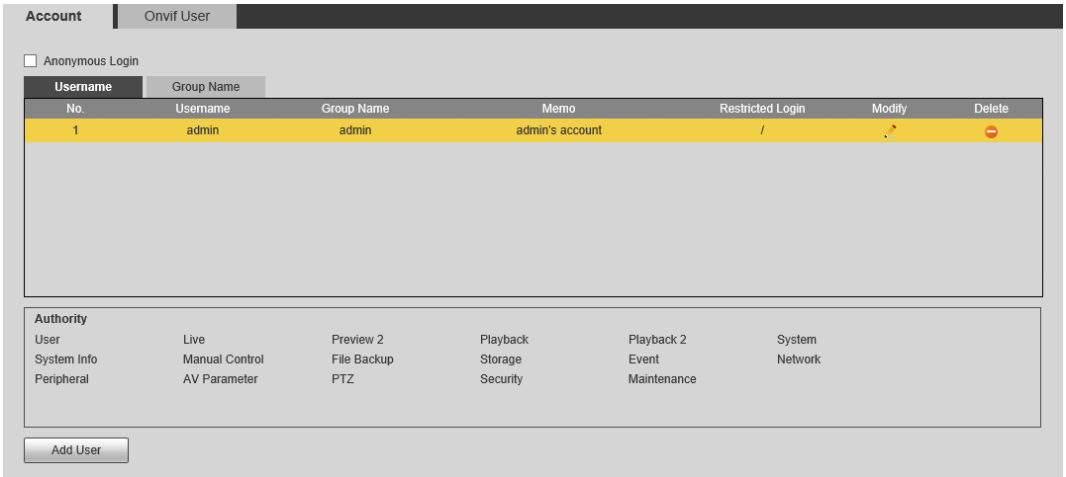
- Click to modify group memo or authorities.
- Click to delete the added group, admin group and user group cannot be deleted.
- Click in the row of admin group or user group to modify group memo.

6.5.2.3 Modifying User Password

For data security, we strongly recommend you change the default password of the Camera and modify it regularly, and adopt a complicated and strong password.

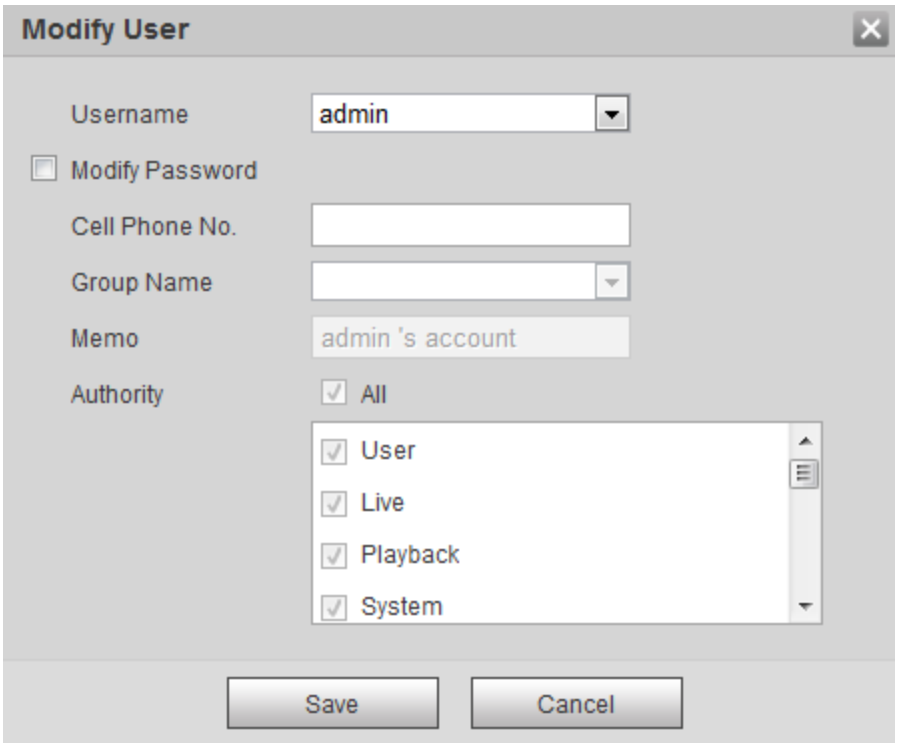
Step 1 Select **Setting** > **System** > **Account** > **Account** > **Username**.

Figure 6-66 Username



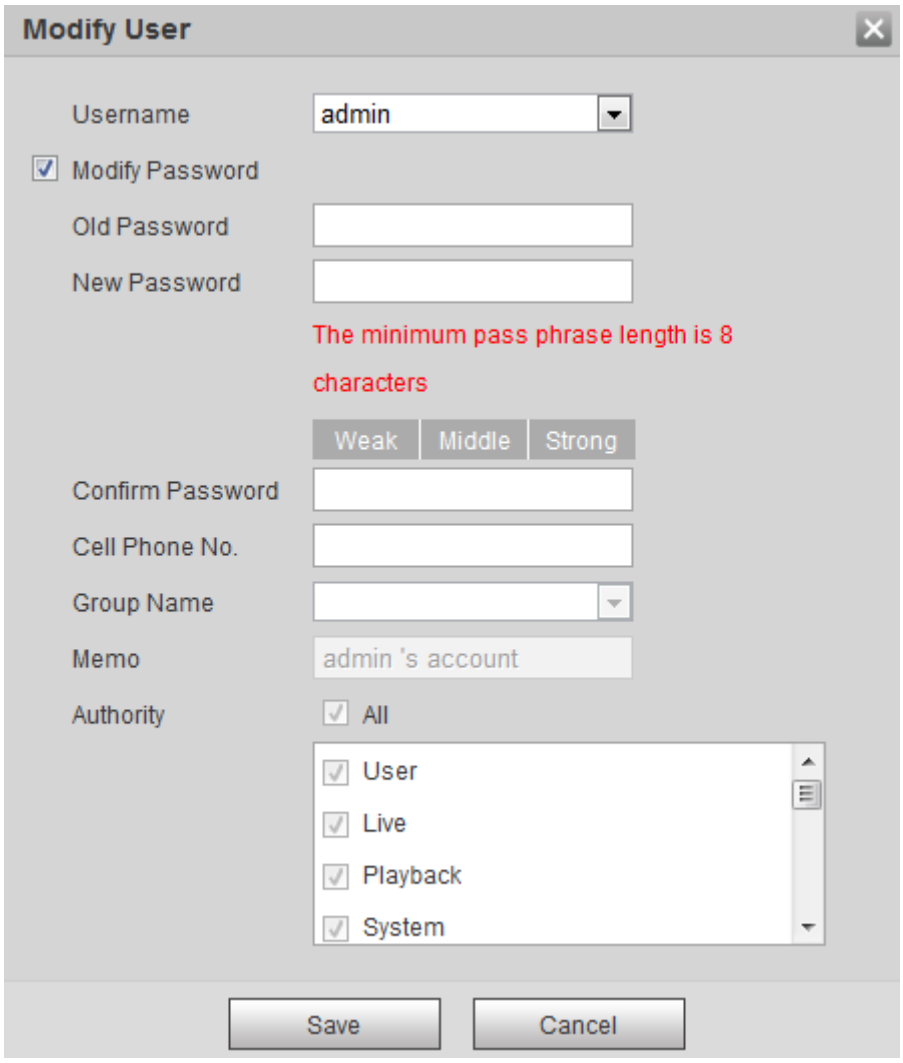
Step 2 Click .

Figure 6-67 Modify user (1)



Step 3 Select the **Modify Password** checkbox.

Figure 6-68 Modify user (2)



Step 4 Enter the old password, new password and confirm it.

The password is made up of characters for 8–32 digits and the password must contain two of the three forms (number, letter, and the common characters. '、"、;、:、& are not included).

Step 5 Click **Save**.

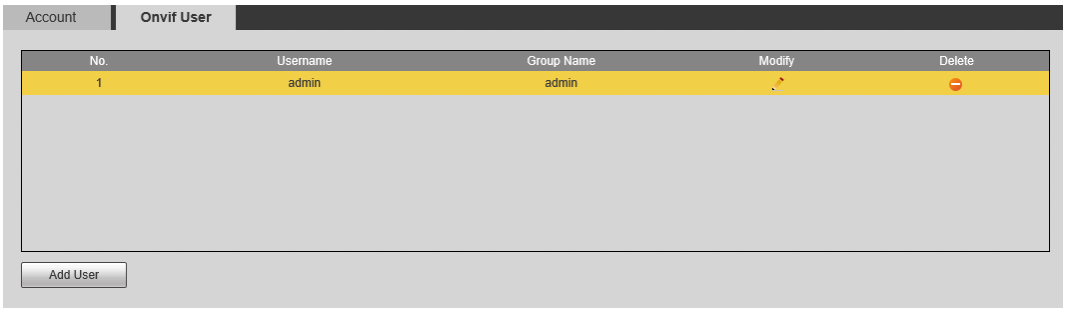
6.5.3 Adding ONVIF User

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

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

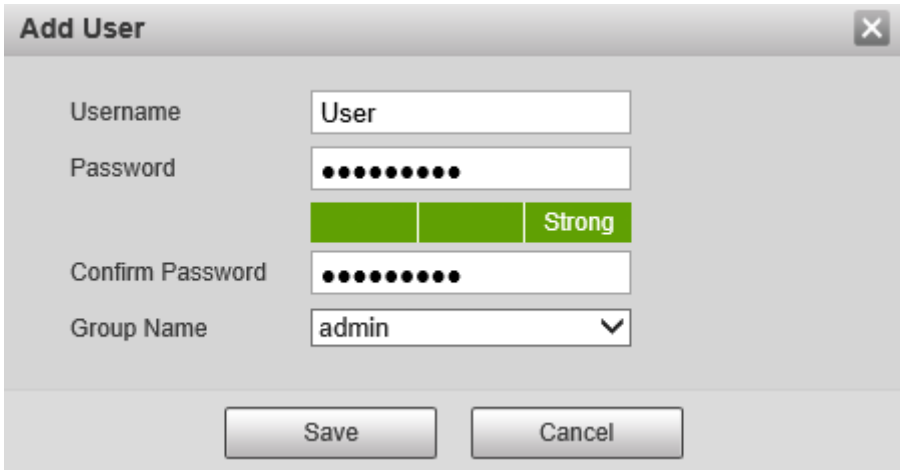
Step 2 Click **Add User**.

Figure 6-69 ONVIF user



Step 3 Enter the username, password, confirm the password, and then select group name.

Figure 6-70 Add user



Step 4 Click **Save**.

6.5.4 Safety Management

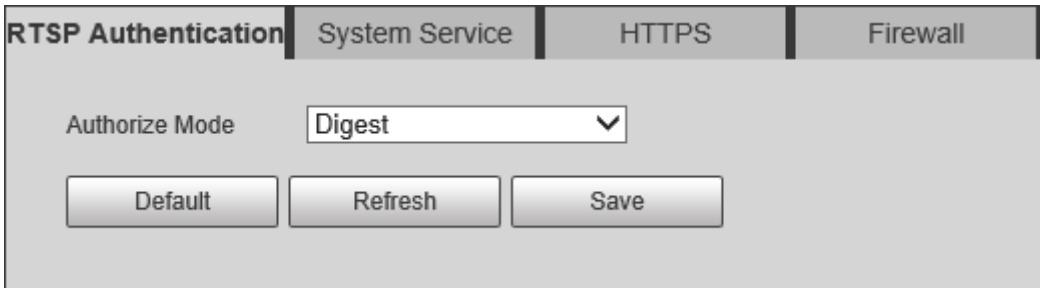
Set RTSP authentication, IP filter, system service and HTTPS to secure data transmission and prevent data leakage.

6.5.4.1 Configuring RTSP Authentication

RTSP (Real Time Streaming Protocol) is to secure transmission of streaming media.

Step 1 Select **Setting** > **System** > **Security** > **RTSP Authentication**.

Figure 6-71 RTSP authentication



Step 2 Select an authentication mode.

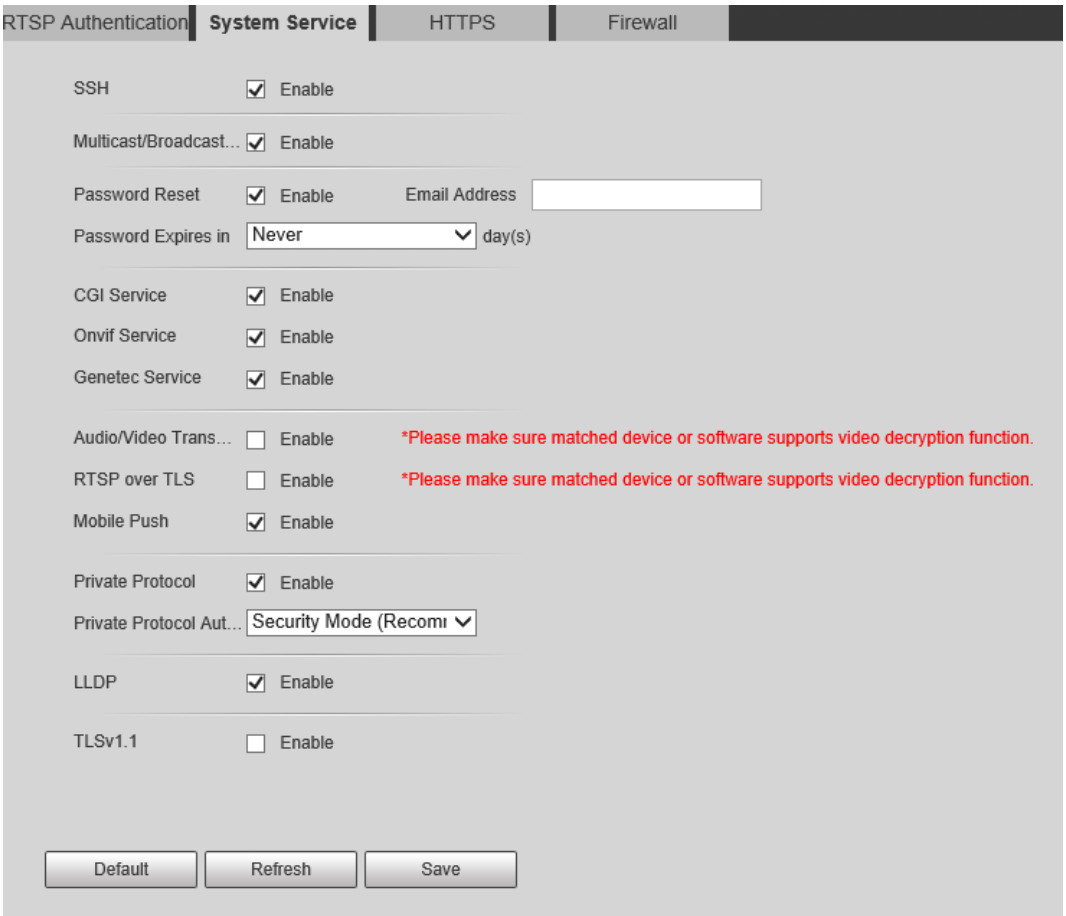
Step 3 Click **Save**.

6.5.4.2 Configuring System Service

You can set functions such as SSH, password reset, CGI service, Onvif service, genetec service, audio and video transmission encryption and mobile push.

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

Figure 6-72 System service



Step 2 Enable functions on the **System Service** page.

Table 6-31 System service parameters description

Parameter	Description
SSH	It is disabled by default. SSH (Secure Shell) can encode your data for its transmission. By this way, data leakage can be prevented when you manage your Camera remotely.
Multicast/Broadcast Search	Enable this function, and then when multiple users are previewing the device video image simultaneously through network, they can find your device with multicast/broadcast protocol.
Password Reset	It is enabled by default. If you disable this function, you can only restore hardware to reset password.
CGI Service	Enable CGI (Common Gateway page) and then you can use your browser to get data from the server.
Onvif Service	Enable Onvif service to connect your Camera to network video products by other manufacturers.
Genetec Service	It is enabled by default.
Audio and Video Transmission Encryption	It is disabled by default. • If you enable this function, ensure that the matching Cameras or software can decode audio and video that you have encoded. • Transmission of audio and video between your Camera and the third-party platform cannot be encoded. So for data security, we recommend you disable CGI service and Onvif service.
Mobile Push	It is enabled by default. Snapshots under alarm condition can be delivered to your phone.
Private Protocol	It is disabled by default.
Private Protocol Authentication Mode	Select the authentication mode from **Security Mode** and **Compatible Mode**.
LLDP	Link Layer Discovery Protocol. After enabling this function, in the cloud operation and maintenance system, the device can actively send IP addresses to the App for operation and maintenance management and fault diagnosis. We recommend you disable this function. Otherwise there might be security risks to the device.
TLSv1.1	After enabling this function, communication with devices is allowed through TLSv1.1 version.

Step 3 Click **Save**.

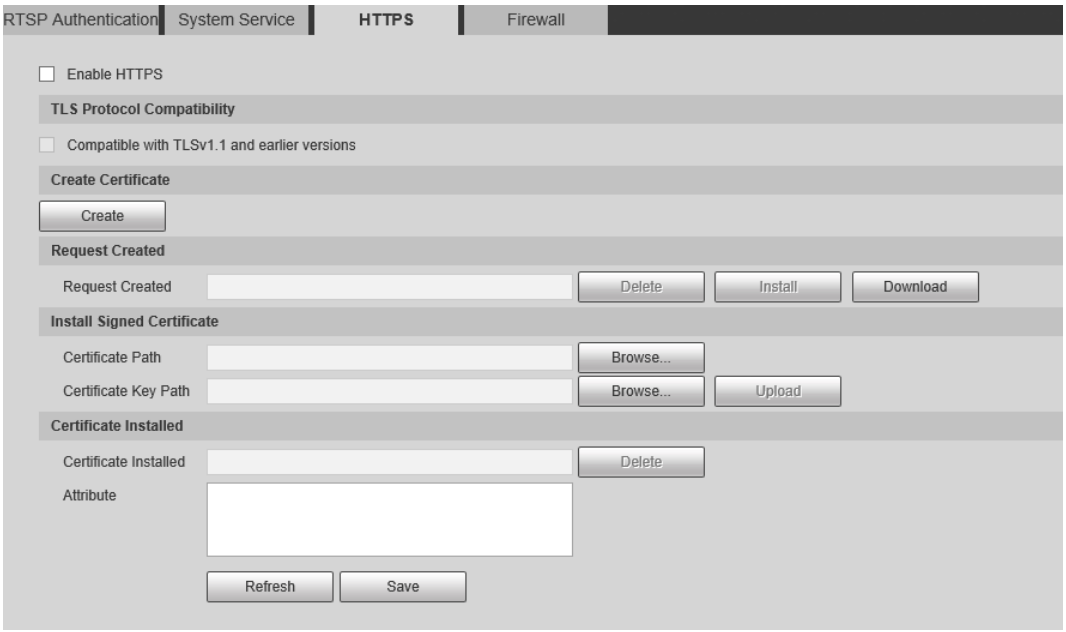
6.5.4.3 HTTPS

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

keep user communications, identity, and web browsing private.

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

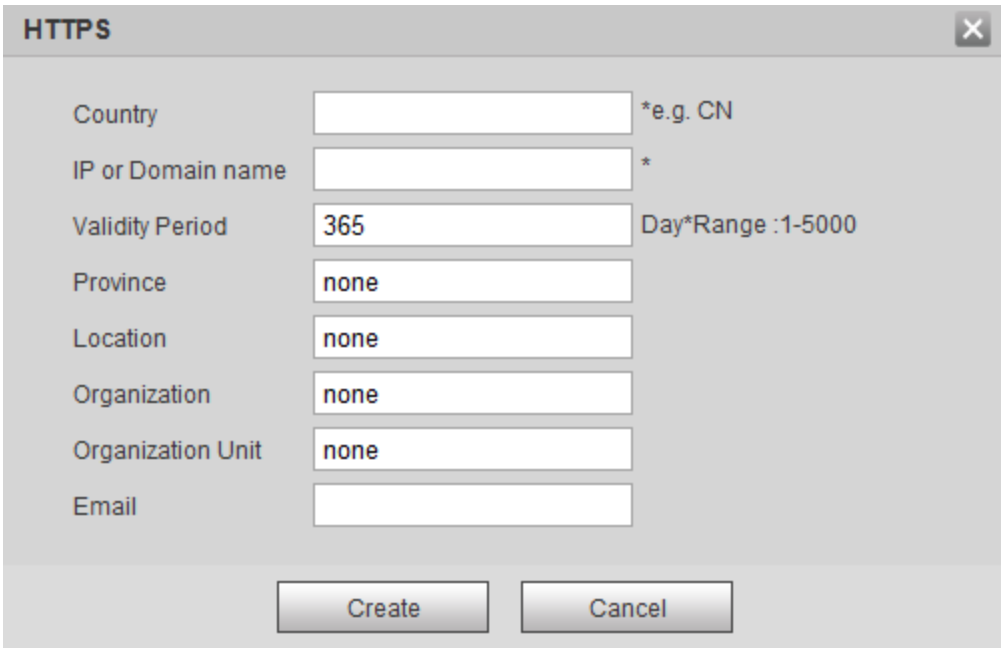
Figure 6-73 HTTPS



Step 2 Create a certificate or upload an authenticated certificate.

- For creating a certificate, click **Create**.

Figure 6-74 Certificate creating



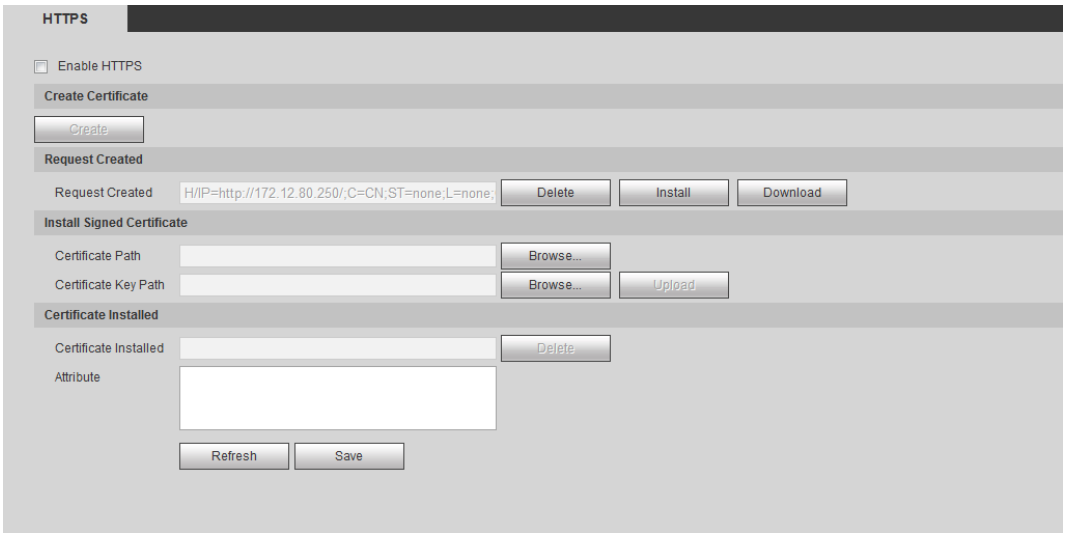
- For uploading the authenticated certificate, click **Browse** to select the certificate and certificate key, click **Upload** to upload them, and then skip to Step5.

Step 3 Enter the required information and then click **Create**.

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

Step 4 Click **Install**.

Figure 6-75 Install a certificate



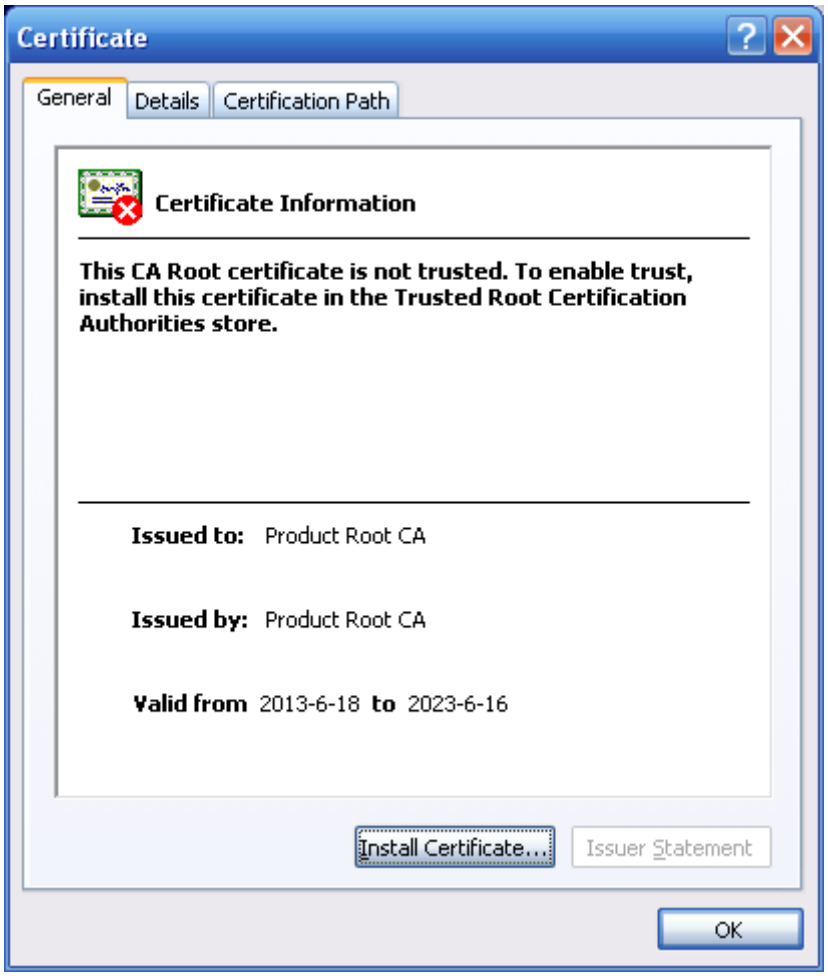
Step 5 Click **Download** to download root certificate.

Step 6 Click **Download Root Certificate**.

Figure 6-76 File download

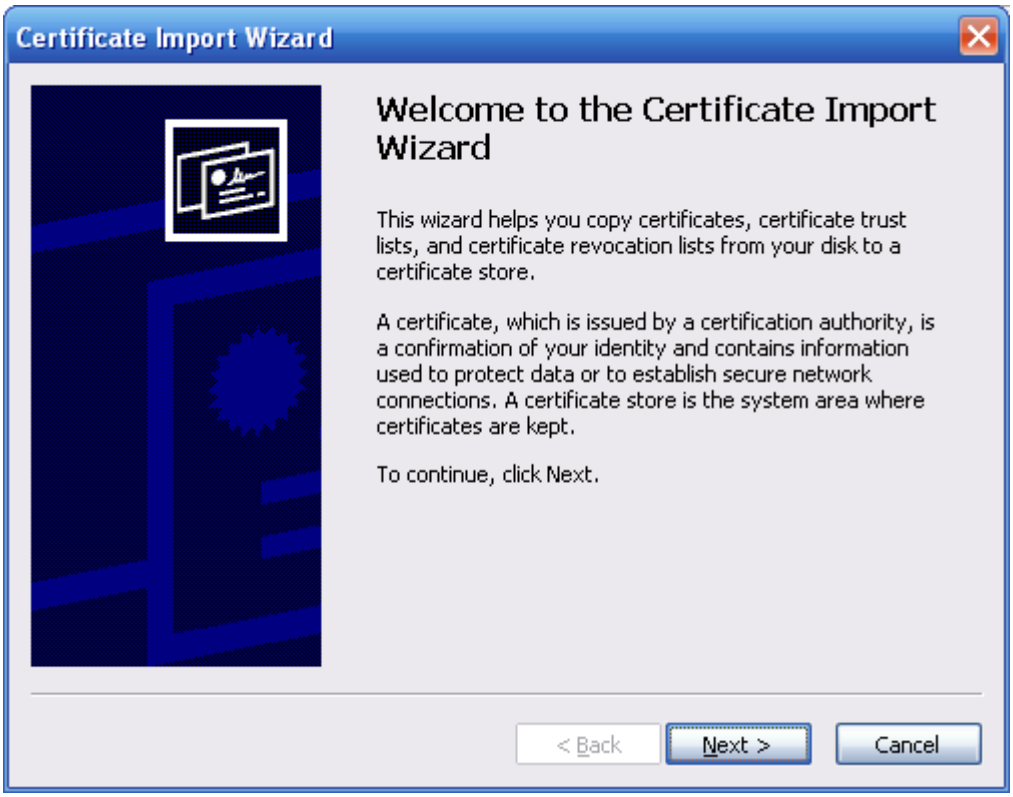
Step 7 Click **Open**.

Figure 6-77 Certificate information (1)



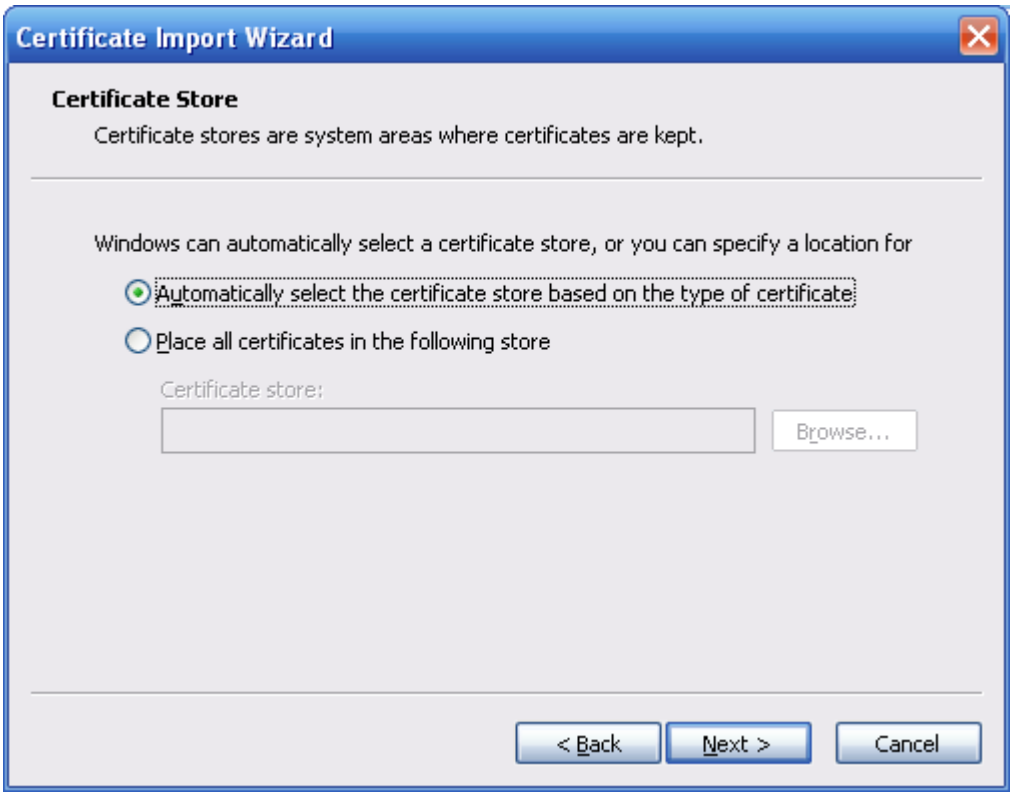
Step 8 Click **Install Certificate**.

Figure 6-78 Certificate information (2)



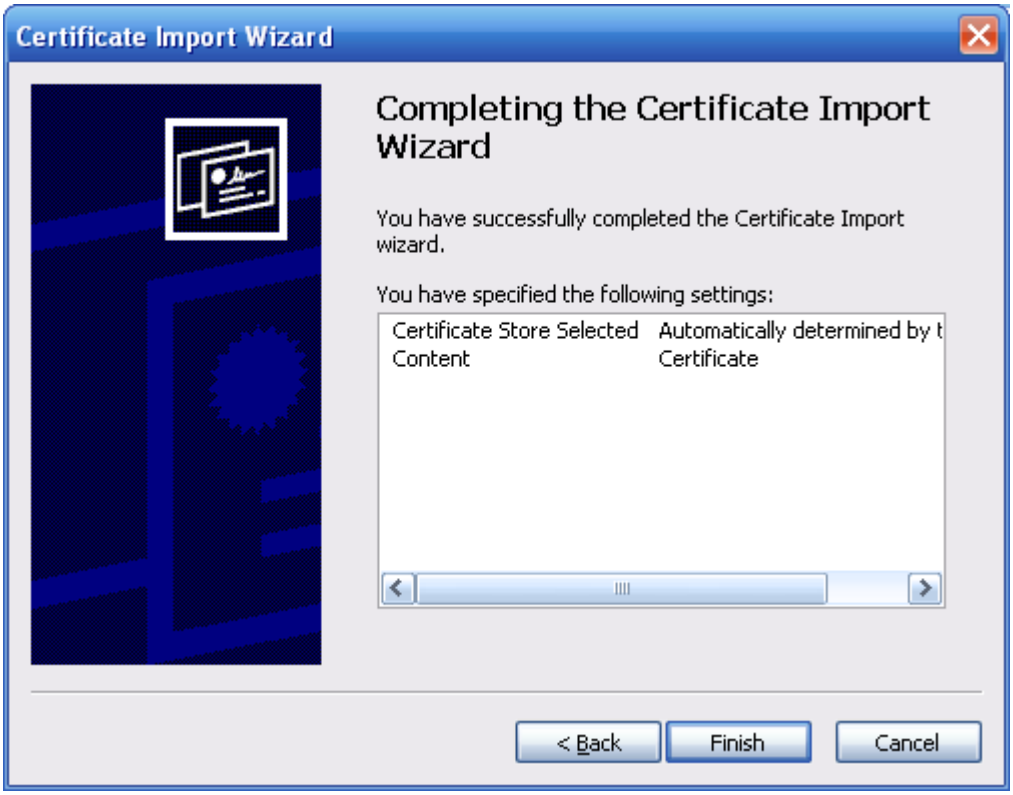
Step 9 Click **Next**.

Figure 6-79 Certificate import wizard (1)



Step 10 Select the storage location and click **Next**.

Figure 6-80 Certificate import wizard (2)



Step 11 Click **Finish** and a dialog box showing **The import was successful.** pops up.

Figure 6-81 Certificate import wizard (2)

Step 12 Enable HTTPS and a prompt that the Camera needs to be restarted is displayed.
After the Camera restarts, enter the IP address of the Camera in your browser and access the Camera through HTTPS protocol.

6.5.4.4 Firewall

Configure firewall to limit access to the camera. You can configure **Network Access**, **PING prohibited** and **Prevent Semijoin** to enhance network and data security.

- **Network Access**: Set the allowlist and blocklist to limit access.
  - **Allowlist**: Only when the IP/MAC of your computer in the allowlist, can you access the Camera. Ports are the same.
  - **Blocklist**: When the IP/MAC of your computer is in the blocklist, you cannot access the Camera. Ports are the same.
- **PING prohibited**: Enable the **PING prohibited** function, and the Camera will not respond to the ping request.
- **Prevent Semijoin**: Enable the **Prevent Semijoin** function, and the Camera can provide service normally under Semijoin attack.

- You cannot set allowlist or blocklist for Camera IP or MAC addresses.
- You cannot set allowlist or blocklist for port MAC addresses.
- When the IP addresses of the camera and your computer are in the same LAN, MAC verification takes effect.
- When you access the Camera through internet, the Camera verifies the MAC address according to the router MAC.

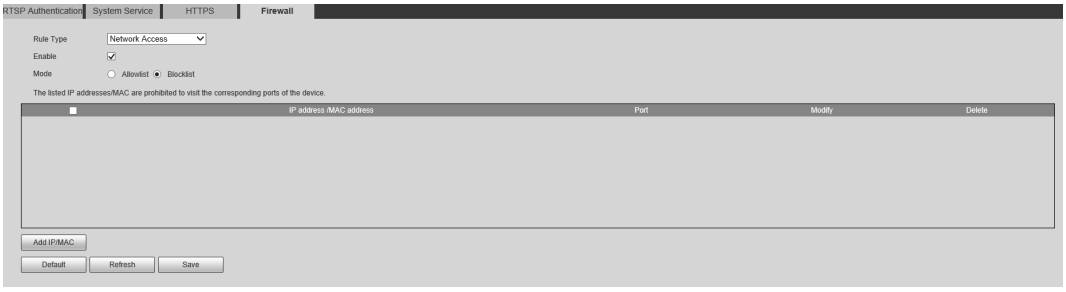
This section takes **Network Access** as an example.

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

Step 2 Select **Network Access** from the **Rule Type** list, and then select the **Enable** checkbox.

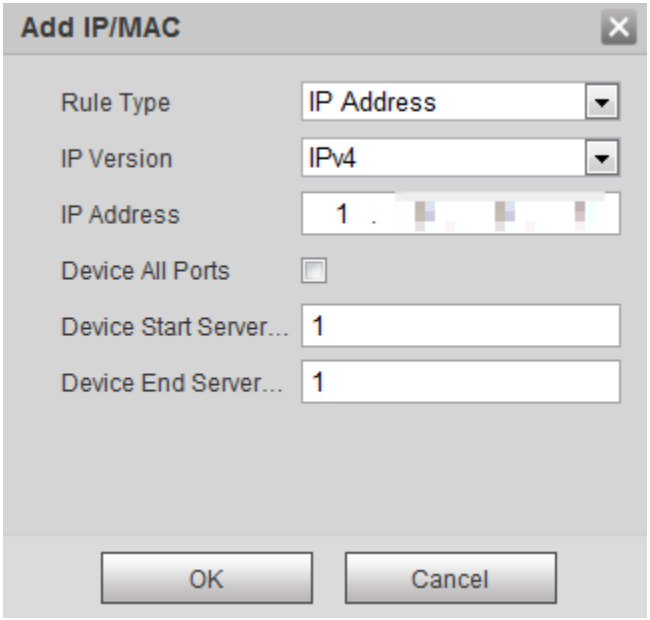
- Enable **PING prohibited** and **Prevent Semijoin**, and click **Save**. You do not need to configure parameters.
- Enable **Network Access**, and configure allowlist and blocklist.

Figure 6-82 Network access



1. Select the mode: **Allowlist** and **Blocklist**.
2. Click **Add IP/MAC**.

Figure 6-83 Network access



3. Configure the parameters.

Table 6-32 Description of adding IP/MAC parameters

Parameter	Description
Rule Type	Select IP address, IP segment, MAC address or all IP addresses. ● P address: Select IP version and enter the IP address of the host to be added. ● IP segment: Select IP version and enter the start address and end address of the segment to be added. ● MAC address: Enter MAC address of the host to be added. ● All IP addresses: Set all IP addresses in allowlist or restricted list.
Device All Ports	Set access ports. You can select all ports or the ports in defined areas. ● Device all ports: Set all IP port in allowlist or Blocklist. When selecting **BlockIList** in **Mode**, and **All IP Address** in **Rule Type**, you cannot select the **Device All Ports** checkbox. ● Device start server port and Device end server port: Set Device start server port and device end server port, and the range is 1–65535.
Device Start Server Port	
Device End Server Port	

4. Click **OK**, and the **Firewall** page is displayed.

Step 3 Click **Save**.

7 System Maintenance

7.1 Maintenance Requirements

To make sure that the system runs normally, maintain it as the following requirements:

- Check surveillance images regularly.
- Clear regularly user and user group information that are not frequently used.
- Change your password every 3 months.
- View system logs and analyze them, and process the abnormity in time.
- Back up the system configuration regularly.
- Restart the device and delete the old files regularly.
- Upgrade firmware in time.

7.2 Maintenance Management

7.2.1 Auto Maintenance

You can restart the system manually, and set the time of auto reboot and auto deleting old files. This function is disabled by default.

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

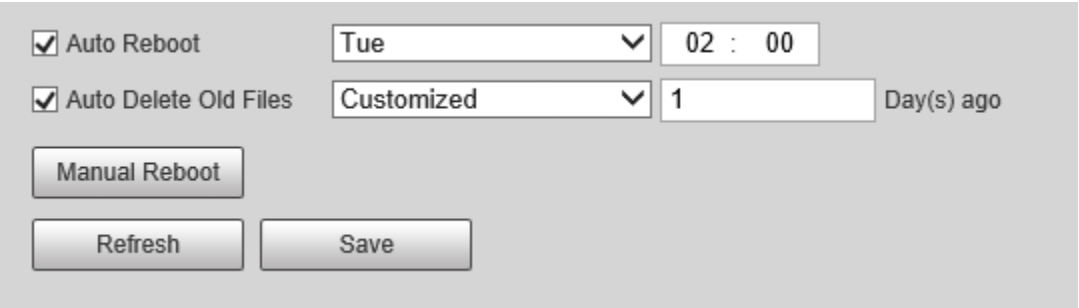
Step 2 Configure auto maintain parameters.

- Select the **Auto Reboot** checkbox, and set the reboot time, the system automatically restarts as the set time every week.
- Select the **Auto Delete Old Files** checkbox, and set the time, the system automatically deletes old files as the set time. The time range is 1 to 31 days.

  ⚠

  When you enable and confirm the **Auto Delete Old Files** function, The **The deleted files cannot be restored, are you sure?** notice is displayed. Operate it carefully.
- Click **Manual Reboot**, and then click **OK** on the displayed page, the Camera will restart.

Figure 7-1 Auto maintenance



Step 3 Click **OK**.

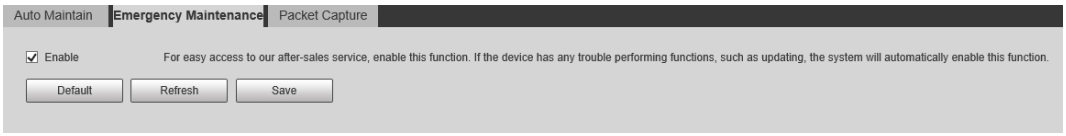
7.2.2 Emergency Maintenance

To provide better after-sales operation and maintenance services, we recommend you manually enable this function. If the function is disabled, the camera will automatically enable it when the critical business of the camera (such as upgrading) is abnormal.

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

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

Figure 7-2 Emergency maintenance



7.2.3 Packet Capture

View the data interaction status between the camera and third-party platforms, and other devices.

Step 1 Select **Setting** > **System** > **Manager** > **Packet Capture**.

Step 2 Enter the designated addresses.

Step 3 Click to start capturing packet.

To define the address and port, you can enter the specific address and port in **Designated Address1** and **Designated Address2**.

Figure 7-3 Start capturing packet

Step 4 Click to stop capturing packet.

After stopping capturing packet, the Camera will automatically download the pacp file.

Figure 7-4 Stop capturing packet

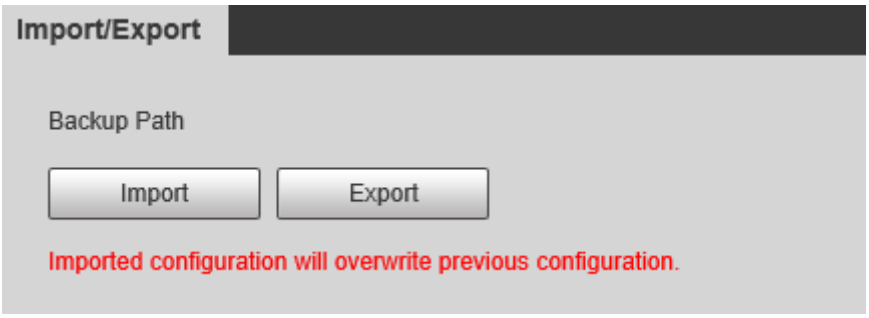
7.3 Backing Up and Restoring

7.3.1 Importing and Exporting

- 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**.

Figure 7-5 Import/Export



Step 2 Import/Export files.

- Click **Export** and paths of backing up files are displayed.
- Click **Import** to import files that you have exported and backed up.

7.3.2 Default Settings

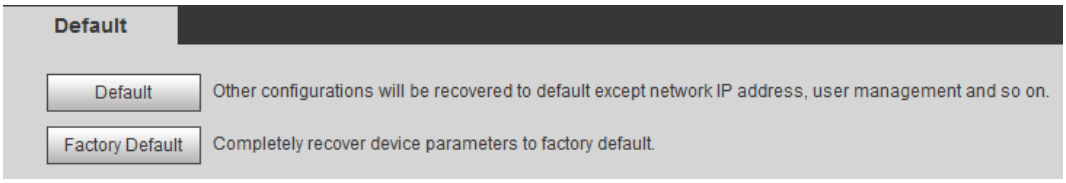
Restore the device to default configuration or factory settings.

⚠

This function will restore the device to default configuration or factory setting.

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

Figure 7-6 Default setting



Step 2 Restore the Camera to default setting.

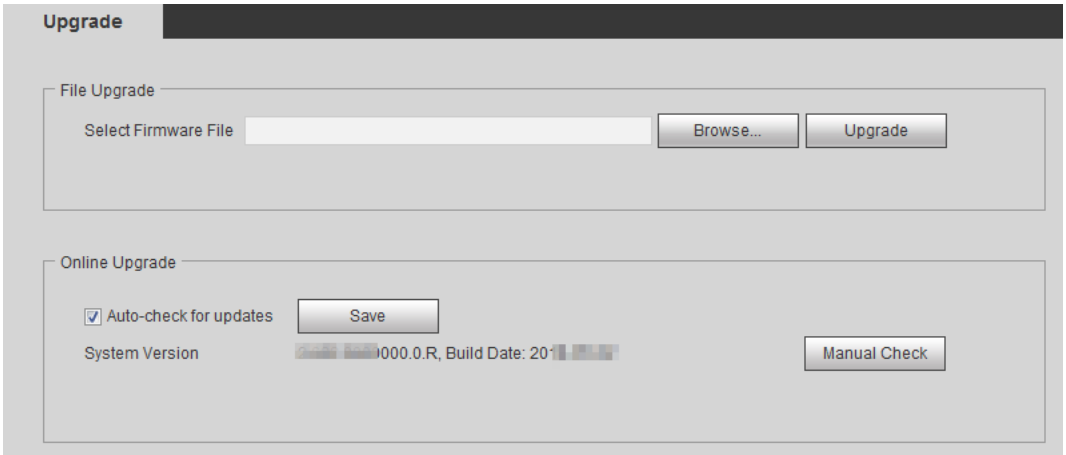
- Click **Default**, and all the configurations except IP Address and Account are reset.
- Click **Factory Default**, and all the configurations are reset.

7.4 Upgrading Firmware

Upgrading to the latest system can optimize the camera functions and improve stability.

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

Figure 7-7 Upgrade



Step 2 Select upgrading method as needs.

- File Upgrade
  1. Click **Browse** to upload upgrade file.
     The upgrade file should be a .bin file.
  2. Click **Upgrade** to start the process.
- Online Upgrade
  1. Select the **Auto-check for updates** checkbox.
     The system checks for upgrade once a day automatically, and there will be system notice if any upgrade is available.

     We need to collect the data such as device name, firmware version, and device serial number to proceed auto-check. The collected information is only used for verifying the legality of cameras and upgrade notice.
  2. If there is any upgrade available, click **Upgrade**, and then the system starts upgrading.

     Click **Manual Check** to check for upgrade manually.

7.5 Information

You can view the information, including version, log and online user, and back up or clear log.

7.5.1 Version

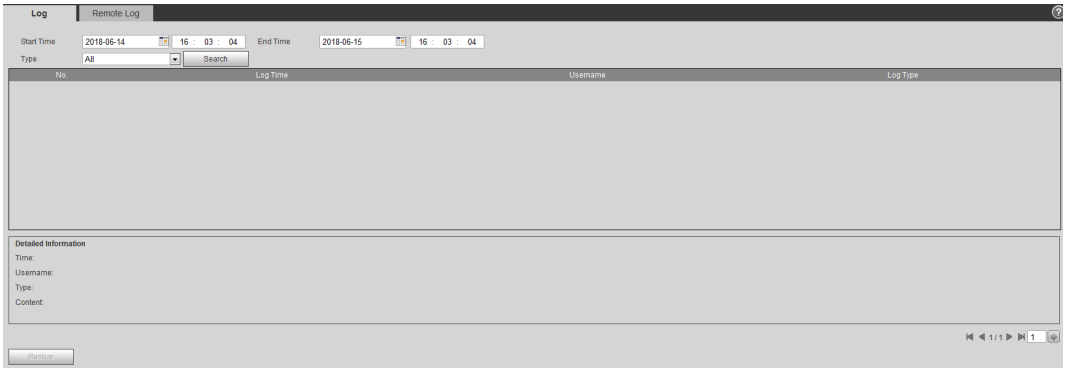
You can view device information such as hardware, system version, and web version.
Select **Setting** > **Information** > **Version** to view the version information.

7.5.2 Log

You can view and back up logs.

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

Figure 7-8 Log



Step 2 Configure the start time and end time, and then select the log type.

- **System**: Includes program start, abnormal close, close, program reboot, device

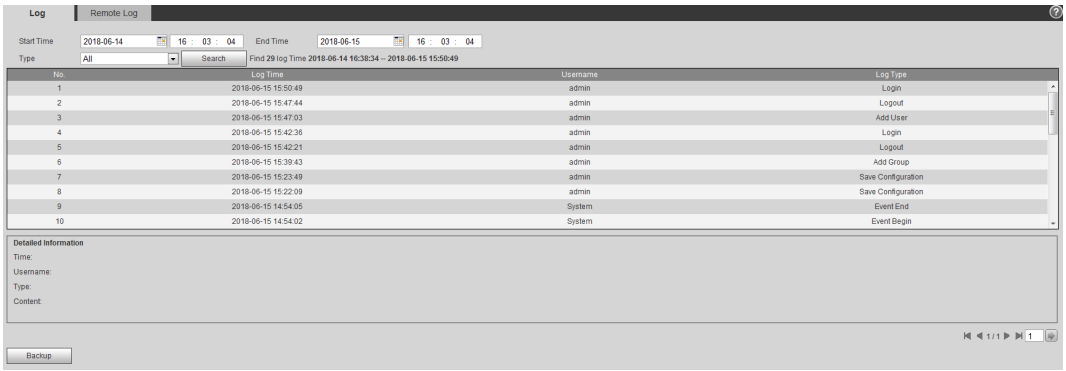
closedown, device reboot, system reboot, and system upgrade.

- **Setting**: Includes saving configuration and deleting configuration file.
- **Data**: Includes configuring disk type, clearing data, hot swap, FTP state, and record mode.
- **Event** (records events such as video detection, smart plan, alarm and abnormality): includes event start and event end.
- **Record**: Includes file access, file access error, and file search.
- **Account**: Includes login, logout, adding user, deleting user, modifying user, adding group, deleting group, and modifying group.
- **Safety**: Includes password resetting and IP filter.

Step 3 Click **Search**.

- Click a certain log, and then you can view the detailed information in **Detailed Information** area.
- Click **Backup**, and then you can back up all the found logs to your PC.

Figure 7-9 Log

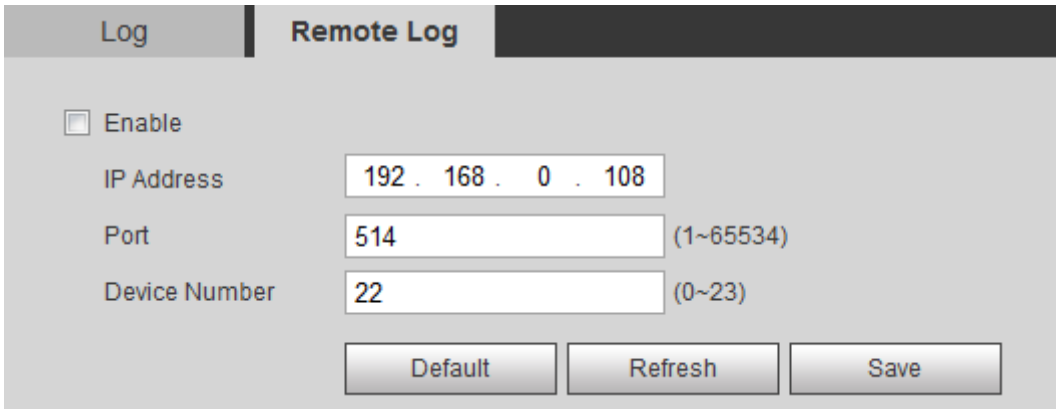


7.5.3 Remote Log

Configure remote log, and you can get the related log by accessing the set address.

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

Figure 7-10 Remote Log



Step 2 Select the **Enable** checkbox.

Step 3 Set address, port and device number.

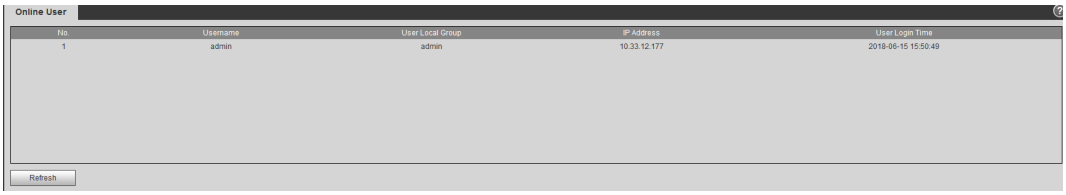
Step 4 Click **Save**.

7.5.4 Online User

View all the current users logging in to web.

Select **Setting** > **Information** > **Online User**.

Figure 7-11 Online user



7.5.5 Legal Information

Select **Setting** > **Information** > **legal Info** to view Software License Agreement, Privacy Policy and Open Source Software Notice.

Appendix 1 Cybersecurity Recommendations

1. Account Management

1.1 Use complex passwords

Please refer to the following suggestions to set passwords:

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

1.2 Change passwords periodically

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

1.3 Allocate accounts and permissions appropriately

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

1.4 Enable account lockout function

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

1.5 Set and update password reset information in a timely manner

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

2. Service Configuration

2.1. Enable HTTPS

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

2.2 Encrypted transmission of audio and video

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

2.3 Turn off non-essential services and use safe mode

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

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

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

2.4 Change HTTP and other default service ports

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

3. Network Configuration

3.1 Enable Allow list

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

3.2 MAC address binding

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

3.3. Build a secure network environment

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

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

4. Security Auditing

4.1 Check online users

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

4.2 Check device log

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

4.3 Configure network log

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

5. Software Security

5.1 Update firmware in time

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

5.2 Update client software in time

It is recommended to download and use the latest client software.

6. Physical Protection

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