Infrared Thermal Imaging Camera

Instruction Manual V1.1.9

Thank you very much for choosing our products，It is recommended that you read the instructions carefully before using the infrared thermal camera.

Introduction

◆ Overview

The Manual introduces the software products and functional features, basic settings, daily operation, settings, system service maintenance and other related functional modules of the dual IP thermal imaging camera.

◆ History of revision

Revision number	Modifications	Issue date
V1.0.0	First issue	February 25, 2021
V1.1.8	Function optimization	September 23, 2021
V1.1.9	Content adjustment	October 11, 2021

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General Conventions

◆ Expressions

In order to simplify the expressions, the common functions and names in this document are specified as follows.

This document is used for multiple models of products. Different products may have different functions and interfaces. The function introduction and interface screenshots in this document are for reference only. Please refer to the actual functions and interfaces of the actual products.

In order to ensure security of the devices, the IP address, MAC address, serial number and other information in this document are assumed.

◆ Symbols

The following symbol IDs that may appear in the document have the following meanings:

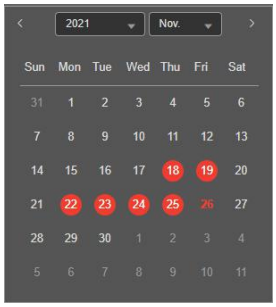
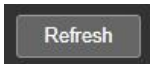
Identification	Description
Hazard	A high potential hazard which may result in serious injury if it cannot be avoided.
Warning	Moderate or low potential hazard which may cause minor or moderate injury if it cannot be avoided
Notice	A potential risk that could result in device damage, data loss, device performance degradation, or unforeseen results if the text is ignored.

◆ Format

Format	Description	Examples
>	Multilevel menu progression	Select "System Management> Temperature Measurement Settings> Cold/Hot Spot Tracking Settings "
“”	Interface control name, specific name, etc.	
【】	Device hardware, keyboard keys, etc.	[enter] key
Italic	Variable, which needs to be typed according to the actual situation.	Open the browser and enter "http:// Device IP address" in the address bar

◆ Interface icon/button

Icon/button	Description
	Text box. Characters such as numbers, letters, Chinese characters, symbols can be typed
	Drop-down box Click the icon to display the drop-down menu.

	Calendar box Click the icon to select the date in the calendar interface.
	Check box
	Radio box
	Paging
	Adjustment of slider value
	Refresh Click this button to restore the configuration item in the current interface to the latest saved information.
	Default Click this button to restore the configuration item in the current interface to the factory default value.
	Confirm Click the button to save the setting information.

1. Product description

1.1. INTRODUCTION

The dual IP thermal imaging camera software is a comprehensive application system used with network monitoring equipment. It is a supporting auxiliary tool for infrared temperature measurement hardware products. It can meet the needs of users in various aspects. It is mainly used in industrial temperature measurement, such as various hazardous product production enterprises, storage, gas stations, power distribution), and various communication data centers (server rooms). Its main functions are:

Real-time visible light and thermal imaging dual-channel real-time image preview.

Record video, capture pictures, and sound alarms for temperature alarms or alarm linkages generated by other early warning events.

Add analysis objects to the video screen, track cold and hot spots, and set the alarm linkage time and configuration properties.

Support alarm for events such as intelligent analysis.

Play back and view the video and screenshots of various alarm linkage, and mark the corresponding alarm sources.

Support real-time temperature curve analysis, image fusion viewing, report viewing and export.

1.2. Service environment

Item	Detailed requirements
Operating system	Windows XP, Windows7, Windows10 32-bit/64-bit and above versions
Operating environment	Google Browser, 360 Extreme/Secure Browser, Firefox Browser, IE8 or above
Other software	PDF viewing software

1.3. Overview

Module	Characteristic	Detailed description
Real-time preview	Dual-channel preview screen	Provide visible light and infrared thermal imaging channels to view real-time images.
	Image capture and video recording	Manual capture and view recording of monitored images
	Video recording delay and capture timing	Realize video recording delay and capture timing by setting the delay time of video recording and the rules of capture timing.
	Dual-channel video	Provide one-key video recording to realize simultaneous two-channel video recording.
	Code stream selection	Select the stream type and streaming protocol of video preview. Primary code stream: large code stream and high image definition, but occupies a large bandwidth, which is suitable for storage and monitoring. Auxiliary code stream: The code stream is smaller than the main code stream, the

		image is smooth, and the bandwidth occupied is small. It is suitable for monitoring the main code stream when the network bandwidth is insufficient.
	Electronic enlargement	Take the center of the picture as the origin, and enlarge the thermal imaging and visible light images according to the set multiplicity.
	Real-time temperature curve	The real-time temperature curve of each analysis object is viewed and exported according to cycle time.
	Full screen	Full screen display
	Window scale	Window adaptive: adaptive dual-channel images in windows of different resolutions Original: Display preview screen according to the original length-width ratio of the image
	Sound output	Turn on or off audio output
	Alarm output	Alarm output: Select this item and enable alarm output. When an alarm is triggered, the system interacts with the alarm output device to alarm.
Playback management	Playback video files	Play back video files according to the query criteria.
	Playback image files	Play back pictures according to conditions
	Periodic viewing of alarm progress bar	Video and diagrams can be viewed in the viewing of alarm type within a period.
Alarm	Temperature alarm	Analysis object temperature alarm settings
	Exception handling	Alarm for full memory: when memory is full, alarm linkage is triggered. Memory fault alarm: alarm linkage occurs when memory abnormality occurs in the video and diagram. Flow push failure: an alarm occurs when the flow push fails. Illegal access: an alarm occurs when illegal access occurs. Network fault: alarm occurs when network problems occur.
	Alarm	Alarm list: all alarm list types Alarm details: view various types of alarm videos and alarm images Alarm prompt: turn on the prompt, play the prompt tone, and select the latest alarm.
Statistical	Viewing line charts and exporting reports	Select the analysis object, view the temperature curve, and export the report

report		CSV or the current picture.
System settings	Global settings of temperature measurement	Settings of various ambient temperature parameters such as global temperature, emissivity, humidity, isotherm, color zone, etc.
	Analysis object rule settings	Add analysis object of points, lines, boxes, ellipses and polygons, set corresponding parameters and alarm linkage
	Shielding area settings	Screen area shielding to exclude settings of various alarm events
	Cold hotspot tracking settings	Set relevant information for cold hot spots. You can track the highest temperature and lowest temperature of the screen and set its alarm.
	Network settings	TCP/IP, port, MQTT, national standard protocol, SMTP mail, platform access and other network parameter settings
	Image settings (image settings, image fusion, stream settings)	Setting of visible light and thermal imaging of images achieves the highest imaging effect.
	Storage settings	Video and image resource storage settings of device
	Peripheral control	Luminance and other settings of peripheral white light
	System settings (system settings, system upgrade)	Timed capture and delayed video settings for temperature measurement, such as timing, number of captured images, delayed video time, delay time, file size, etc., and basic information settings of the system software itself. File system upgrade can provide import file upgrade and online file upgrade.

2. Operation guidance

2.1. Initializing configuration

If the equipment is used for the first time after leaving the factory or after the factory settings are restored, the configuration needs to be initialized. The WEB page can be logged in through the browser for device initialization.

! Notice:

- If the device is not initialized, the device cannot be used.
- To ensure device security, after initialization is completed, please keep the password of admin user and modify it regularly.
- Equipment can be initialized only when the device IP address (default is 192.168.1.168) is in the same network segment as that of the PC.

2.1.1. Device initialization

Operation steps

1. Open the browser, enter the default IP address of the device in the address bar, and press [enter]. The default factory IP address is 192.168.1.168.
2. Enter the login interface.

2.1.2. Login to the WEB interface.

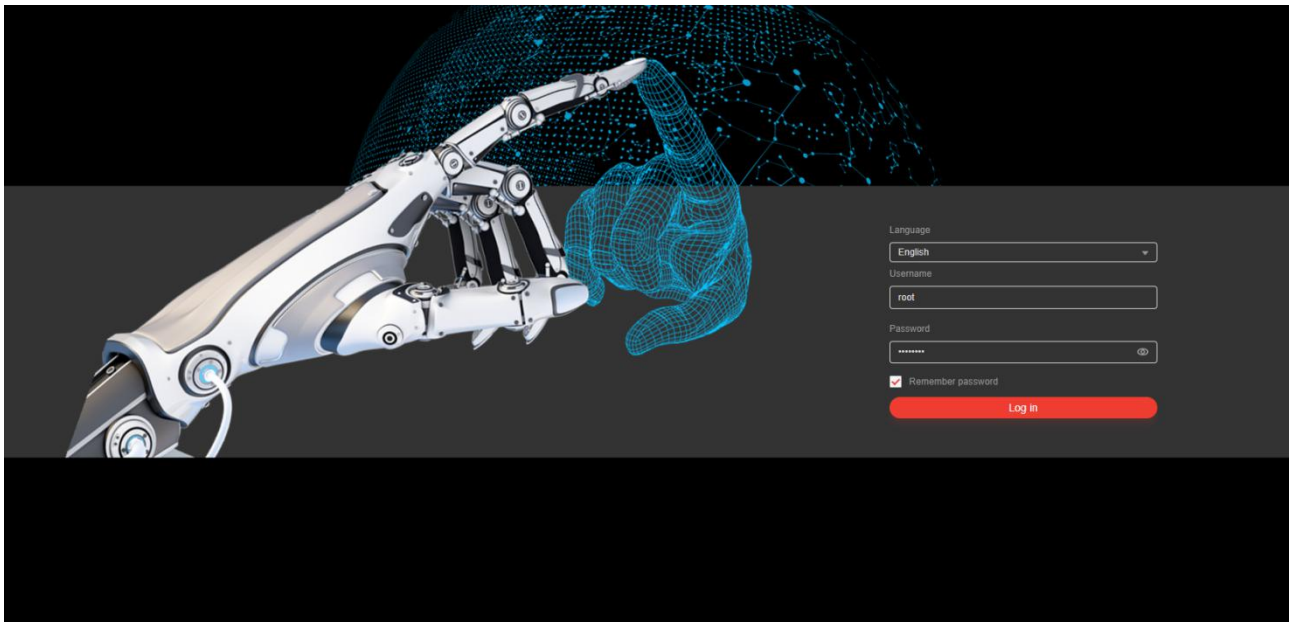


Figure 2-1 Login page

The language is available in Chinese and English. Enter the account and password, and click Login to enter the software main page. Enter System Management> Network Settings> TCP/IP Settings for device initialization.

2.1.3. IP modification

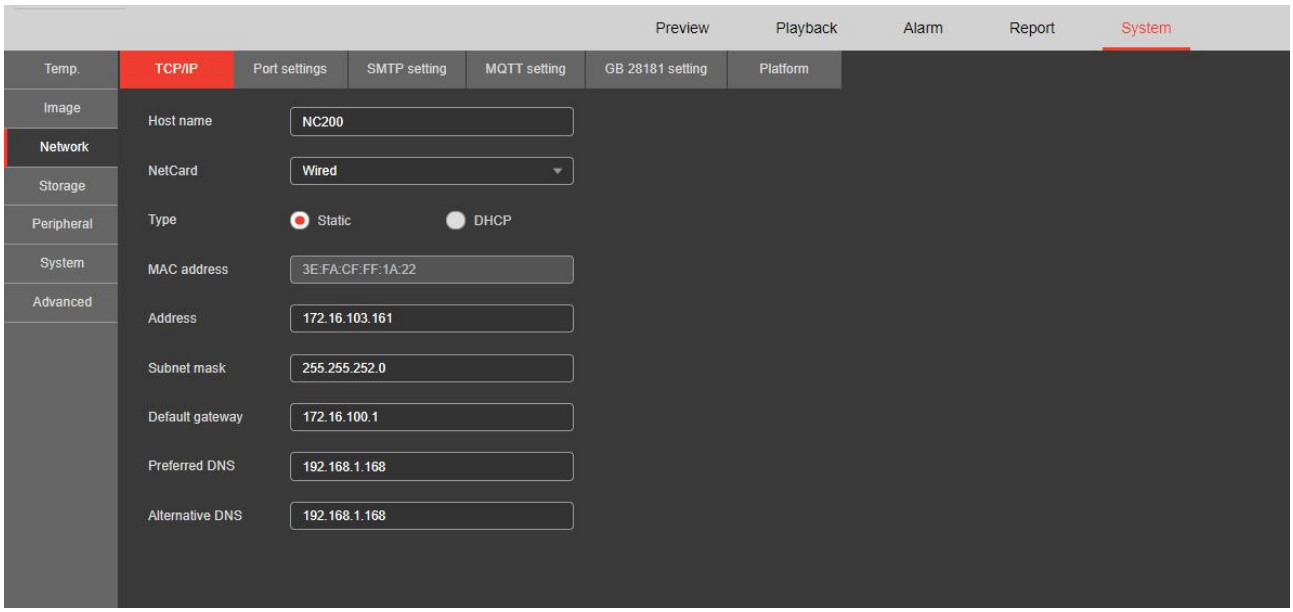


Figure 2-2 IP modification page

Enter System Management-Network Settings-TCP/IP, and select static IP or automatically acquire IP. Static IP identifies the accessible IP network segment by setting the address and subnet mask, and computers of the same network segment can access the software website. The default gateway uses the gateway of the local network.

2.1.4. Password modification

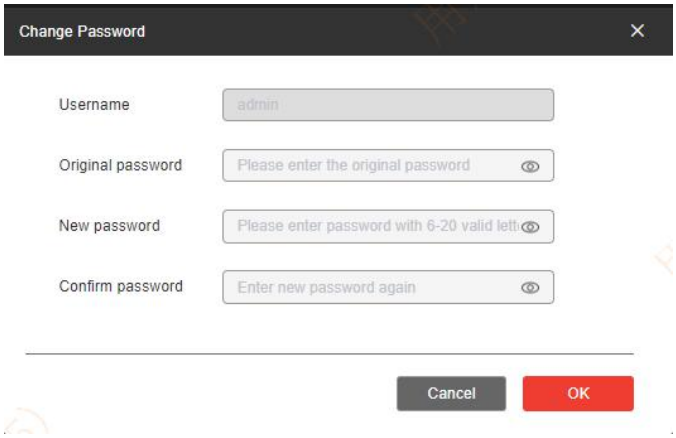


Figure 2-3 Password modification

By clicking Current User-Modify Password, the password modification interface pops out, enter the original password and the new password set by users, and confirm the password again, and click OK.

2.1.5. Exit

Click Current User-Security Exit, and exit the software page to return to the login page.

2.2. Real-time preview

Click the "Real-time Preview" button to display the real-time preview interface. The real-time monitoring screen can be previewed, captured, and recorded on the real-time preview interface. The real-time preview interface mainly includes three functional module areas, which are summarized as follows:

No.	Column	Description

①	Menu column	The top menu displays real-time preview, playback management, alarm management, statistical report and system management. The real-time preview menu is selected by default.
②	Real-time preview area	Two-channel display of visible light and thermal imaging. Visible light is selected by default.
③	Video window operation bar	Pause/play, capture, video, timing capture, dual-channel video, delayed video, save hot maps, suitable window adjustment, image mode selection, coding selection settings, real-time temperature curve, electronic amplification, sound and alarm output, full screen and other functions

See Figure 2-5 for real-time preview:

Figure 2-5 Real-time preview

2.2.1. Preview area

The real-time preview area mainly includes dual-channel video real-time display windows for visible light and infrared thermal imaging. For real-time preview of dual-channel window, see Figure 2-6,:

Figure 2-6 Real-time preview of dual-channel window

2.2.2. Pause/Play

Operation steps

1. Go to the real-time preview interface.
2. Select the video channel window in the preview area.
3. Click the Stop/Play button.
4. Play/pause the video preview.

No.	Function	Function Description and Operation
①	 Pause	In the video window operation bar, the preview button is the Pause button by default. Click the Pause button to pause the video in the currently selected channel window. At this time, the button status s changed to "Play".
②	 Play	When the Play button is clicked, the window video that is currently selected to suspend playback starts to play, and the button status is changed to "Pause".

2.2.3. Capture

Select the video channel window and click Capture  to capture the images of the window.

2.2.4. Video recording

Select the video channel window, click Video  , wait for a while, and then click Close  again to capture the images of the window during this period. The video can be played back/downloaded in the playback management.

2.2.5. One-key dual-channel video/stop

Click dual-channel video  , wait for a while, and then click Close  to capture visible light and thermal images during this period. The video can be played back/downloaded in the playback management.

2.2.6. Capture timing

Select the video channel window and click  to automatically capture the images according to the set parameters, including the capture interval and the number of captured images, which are set in the System Management-System select-System settings.

2.2.7. Video recording delay

Select the video channel window and click  to start the video recording after countdown. Manually click Close  or wait for automatic closing to capture the images of the window in this time period, and the video can be played back/downloaded in the playback management. Countdown and recording duration can be set in System Management-System Settings-System Settings.

2.2.8. Image mode selection

By clicking to select dual IP fusion, the infrared thermal imaging screen displays dual IP fusion images; by clicking to select single-channel infrared, the infrared thermal imaging screen displays only infrared image.

2.2.9. Primary stream/secondary stream

Select the video channel window and click the auxiliary code stream to switch the video to the auxiliary code stream for playback; Click the main code stream and switch the video to the main code stream for playback.

2.2.10. Real-time temperature curve

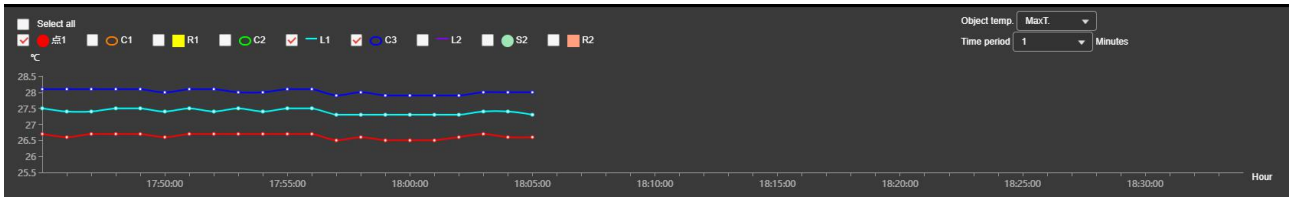


Figure 2-7 Real-time temperature curve

Click the real-time temperature curve to pop out interface shown in the figure above. select the object, and select the highest/lowest/average temperature, and 1/2/5/15min for the time period. The change curve of the specified temperature of the checked object can be displayed in real time. The curve is updated according to the set time period.

2.2.11. Electronic enlargement

Select the video channel window and click to select the scale to enlarge screen according to the set scale with the center as the origin. Visible light can be enlarged to 1X, 4X, 16X; thermal imaging can be enlarged by 1X, 2X, 3X.

2.2.12. Sound

When Mute is clicked , no sound will be heard during alarm; when Sound is clicked again, the sound will be heard when the alarm is given.

2.2.13. Alarm output

If an alarm event occurs, the alarm output is on and click to close it. The alarm event is prompted.

2.2.14. Full screen

Select the video channel window and click Full Screen to display it in full screen; Click it again to return to the original window.

2.3. Playback management

The playback management page can open and analyze the locally saved video and capture, select the file type to be opened, the corresponding time to filter the file, and then the corresponding file to open to analyze the file in the main operation area on the right.

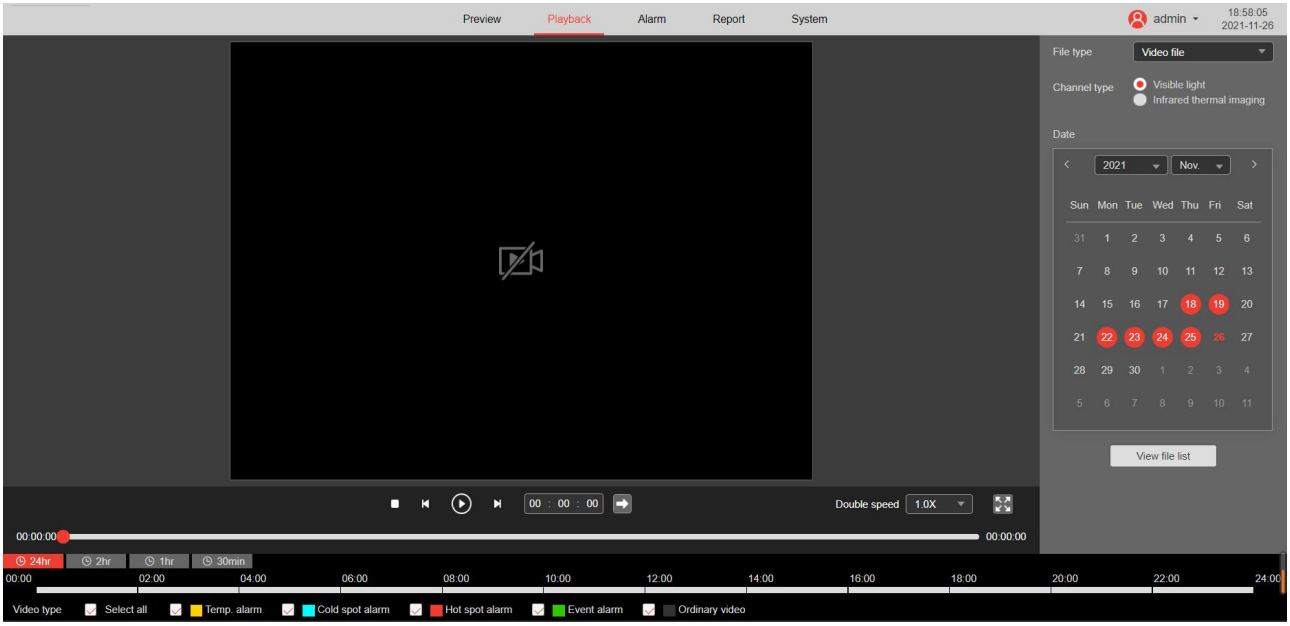


Figure 2-8 Playback management

No.	Column	Description
①	Menu column	Playback menu column, selected by default
②	Playback area	Video and pictures
③	Video operation area	It is divided into video operation area and file operation area.
④	Selection of video type and progress bar	The screened video types can be all, temperature alarm, hot spot alarm, cold spot alarm, ordinary video and event alarm. Display the video type and its time period. Click a point in the color area to start playback from that point in time. Different types of videos have different colors.
⑤	File type query	Query video files and image files

2.3.1. Playback window

Display the playback video/capture.

2.3.2. File query

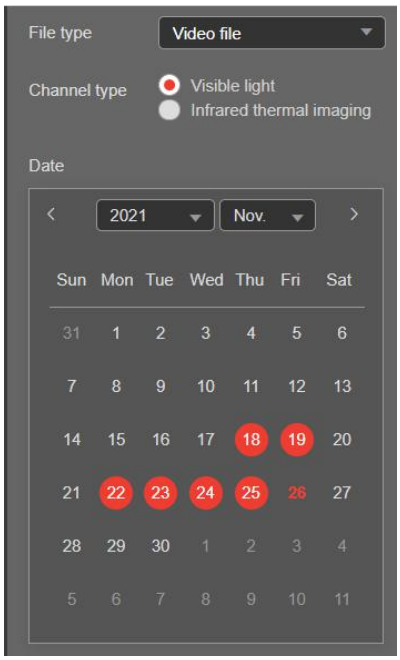


Figure 2-9 File query

Select video files/capture files, visible light/infrared thermal imaging, and time (the date in red means there are files on this day), and click and view file list to jump to the file list interface. The list displays the files filtered based on the above conditions.

2.3.3. File list

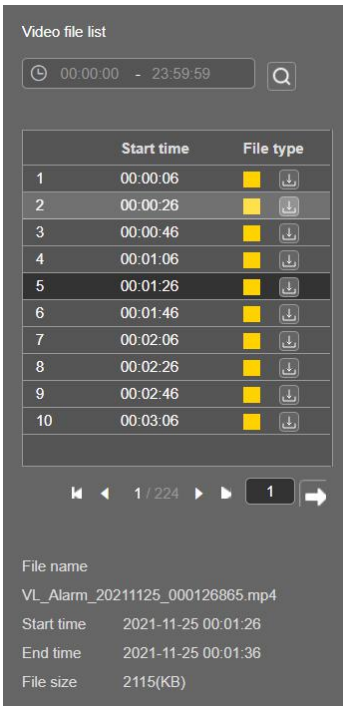


Figure 2-10 File list

Modify the time and click Search to further filter files. The list shows the file start time and file type. Click the Download icon to download the file of this row. When there are many files in the list, view all files through the first page/previous page/next page/last page/jump to the specified page. When a line is clicked in the list, the file name, start time, end time and file size of the file will be displayed below.

Double-click the file to play it back.

2.3.4. Play/pause/stop

During playback, click Pause  to pause the video, and click  again.

By clicking Stop  to stop the video, the play window will display the beginning of the video, and the linkage triggers the Pause button, and click  for playback.

2.3.5. Previous frame/next frame/jump to specified time/double speed playback

Previous frame: Click the previous frame to play the image of the previous frame.

Next frame: Click the previous frame to play the image of the next frame.

Jump to the specified time: Enter the time value within the video length and click Jump to the specified time.

Double speed playback: Click to select the play speed, and the video will be played quickly at the selected speed. It supports 1 x speed, 1.2 x speed, 1.5 x speed and 2 x speed.

2.3.6. Capture

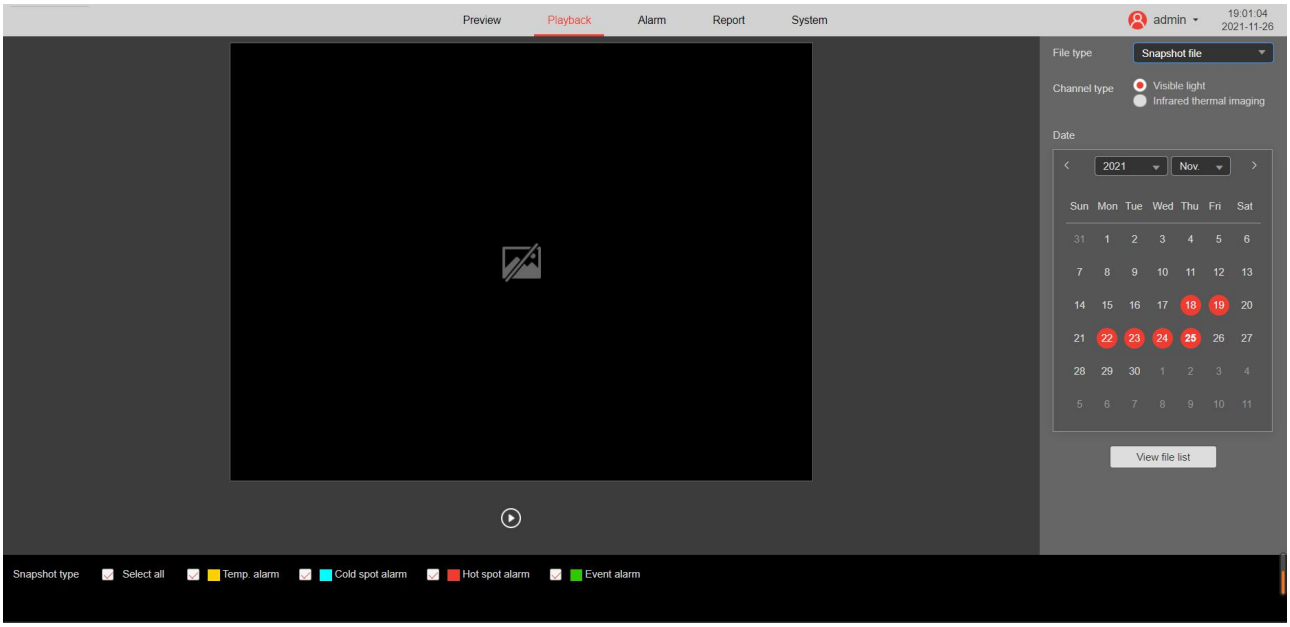


Figure 2-11 Query of picture file

Search for the capture file and click Play  . The capture file in the list will be played sequentially. Then, click Stop  . Double-click a file in the list to play the capture file.

2.3.7. Full screen

Click Full Screen  to play the video on full screen. Click  again to restore the video to the original window.

2.3.8. Video file/capture file alarm progress bar

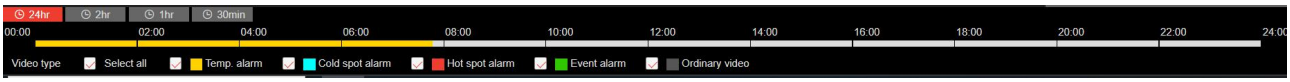


Figure 2-12 Playback time schedule

24hr: Click 24hr, and the progress bar displays the alarm status for 24 hours of the day.

2hr: by clicking the event clustering point of the progress bar and 2hr, the progress bar displays the alarm status for 1h before and after the click point.

1hr: by clicking the event clustering point of the progress bar and click 1hr, the progress bar displays the alarm status for 0.5h before and after the click point.

30min: by clicking the event clustering point of the progress bar and click 30min, the progress bar displays the alarm status for 15 minutes before and after the click point.

Progress bar: the mouse displays time when the progress bar moves, and click the time marked by color to play back the video of that time.

By clicking temperature alarm, cold spot alarm, hot spot alarm, event alarm and ordinary video (video manually clicked on the real-time preview page), display the alarm video interval in the progress bar.

2.4. Alarm management

Users can set and view alarm events in the alarm management menu bar. It is divided into alarm events, temperature alarms and exception handling.

2.4.1. Alarm event

Alarm events comprise alarm type, alarm settings, alarm list and alarm details page. All information in the alarm list can also be cleared.

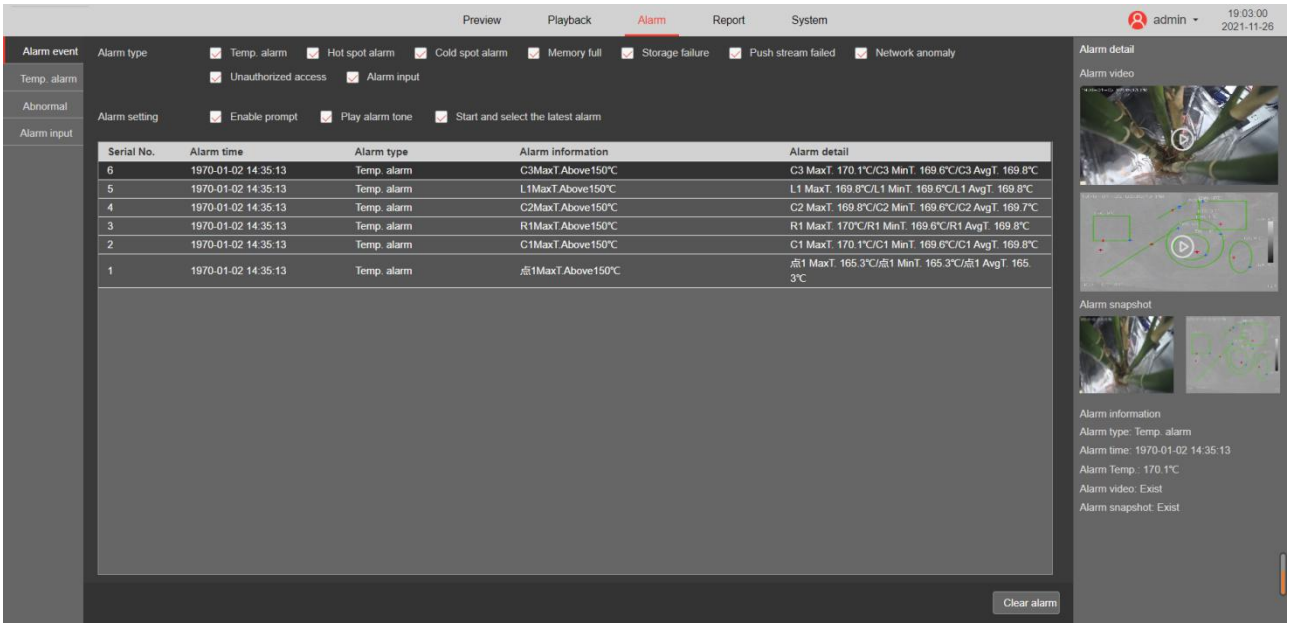
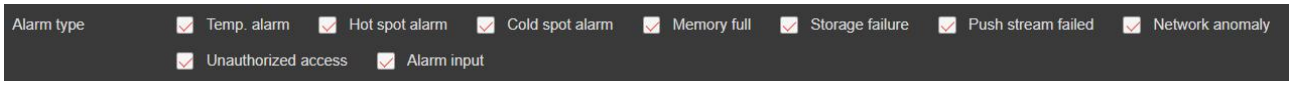


Figure 2-13 Alarm list

No.	Column	Description
①	Alarm column	If an alarm occurs and the user manipulates other pages, the icon  at the menu position is highlighted.
②	Alarm type screening	Temperature alarm, hot spot alarm, cold spot alarm, memory full, storage fault, push flow failure, network

		exception and illegal access can be screened.
③	Alarm setting	Enable prompt, play alarm prompt, automatically select the latest alarm
④	Alarm list	Display all alarm information lists (serial number, alarm time, alarm type, alarm information and alarm details), display in reverse order of time
⑤	Clear alarm	All alarm information can be cleared
⑥	Alarm details	Alarm video, alarm image and alarm details

2.4.1.1. Alarm type screening

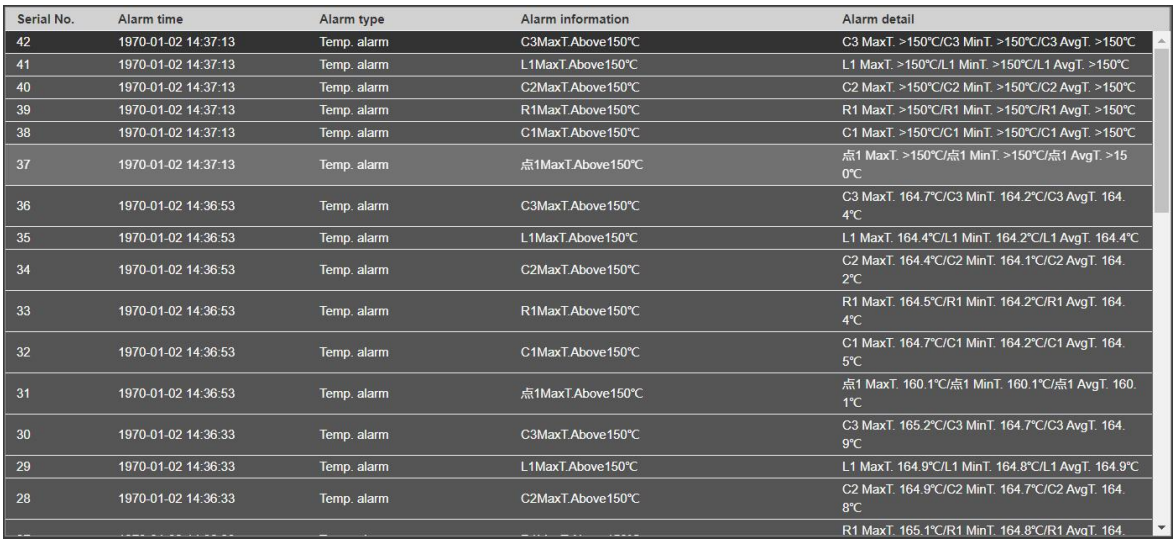


Alarm events such as temperature alarm, hot spot alarm, cold spot alarm, memory full, storage fault, push flow identification, network exception, illegal access, etc. When checked, the list will display alarm information; If not checked, the alarm will not be displayed.

2.4.1.2. Alarm settings

Enabling prompt	When an alarm event is checked, the alarm icon will be displayed next to the alarm management at the top of the menu column.
Play alarm prompt tone	When an alarm event is checked, an alarm prompt sound will be played.
Automatically select the latest alarm	When an alarm event is checked, the latest alarm information will be selected by default in the alarm list, and the alarm details will be displayed on the right side.

2.4.1.3. Alarm list display



Serial No.	Alarm time	Alarm type	Alarm information	Alarm detail
42	1970-01-02 14:37:13	Temp. alarm	C3MaxT.Above150℃	C3 MaxT. >150℃/C3 MinT. >150℃/C3 AvgT. >150℃
41	1970-01-02 14:37:13	Temp. alarm	L1MaxT.Above150℃	L1 MaxT. >150℃/L1 MinT. >150℃/L1 AvgT. >150℃
40	1970-01-02 14:37:13	Temp. alarm	C2MaxT.Above150℃	C2 MaxT. >150℃/C2 MinT. >150℃/C2 AvgT. >150℃
39	1970-01-02 14:37:13	Temp. alarm	R1MaxT.Above150℃	R1 MaxT. >150℃/R1 MinT. >150℃/R1 AvgT. >150℃
38	1970-01-02 14:37:13	Temp. alarm	C1MaxT.Above150℃	C1 MaxT. >150℃/C1 MinT. >150℃/C1 AvgT. >150℃
37	1970-01-02 14:37:13	Temp. alarm	点1MaxT.Above150℃	点1 MaxT. >150℃/点1 MinT. >150℃/点1 AvgT. >150℃
36	1970-01-02 14:36:53	Temp. alarm	C3MaxT.Above150℃	C3 MaxT. 164.7℃/C3 MinT. 164.2℃/C3 AvgT. 164.4℃
35	1970-01-02 14:36:53	Temp. alarm	L1MaxT.Above150℃	L1 MaxT. 164.4℃/L1 MinT. 164.2℃/L1 AvgT. 164.4℃
34	1970-01-02 14:36:53	Temp. alarm	C2MaxT.Above150℃	C2 MaxT. 164.4℃/C2 MinT. 164.1℃/C2 AvgT. 164.2℃
33	1970-01-02 14:36:53	Temp. alarm	R1MaxT.Above150℃	R1 MaxT. 164.5℃/R1 MinT. 164.2℃/R1 AvgT. 164.4℃
32	1970-01-02 14:36:53	Temp. alarm	C1MaxT.Above150℃	C1 MaxT. 164.7℃/C1 MinT. 164.2℃/C1 AvgT. 164.5℃
31	1970-01-02 14:36:53	Temp. alarm	点1MaxT.Above150℃	点1 MaxT. 160.1℃/点1 MinT. 160.1℃/点1 AvgT. 160.1℃
30	1970-01-02 14:36:33	Temp. alarm	C3MaxT.Above150℃	C3 MaxT. 165.2℃/C3 MinT. 164.7℃/C3 AvgT. 164.9℃
29	1970-01-02 14:36:33	Temp. alarm	L1MaxT.Above150℃	L1 MaxT. 164.9℃/L1 MinT. 164.8℃/L1 AvgT. 164.9℃
28	1970-01-02 14:36:33	Temp. alarm	C2MaxT.Above150℃	C2 MaxT. 164.9℃/C2 MinT. 164.7℃/C2 AvgT. 164.8℃
				R1 MaxT. 165.1℃/R1 MinT. 164.8℃/R1 AvgT. 164.

Figure 2-14 Alarm list display

No.	The events are sorted according to the time of occurrence and displayed in reverse order, with the latest events at the top.
Alarm time	Display the time when the alarm event occurs.
Alarm type	Display the types of alarm events, including temperature alarm, hot spot alarm, cold spot alarm, full memory, storage fault, push failure, network exception and illegal access.
Alarm information	Describe the cause of the alarm.
Alarm details	Describe details at the time of alarm.

2.4.1.4. Viewing alarm details

Alarm linkage capture and video recording information.

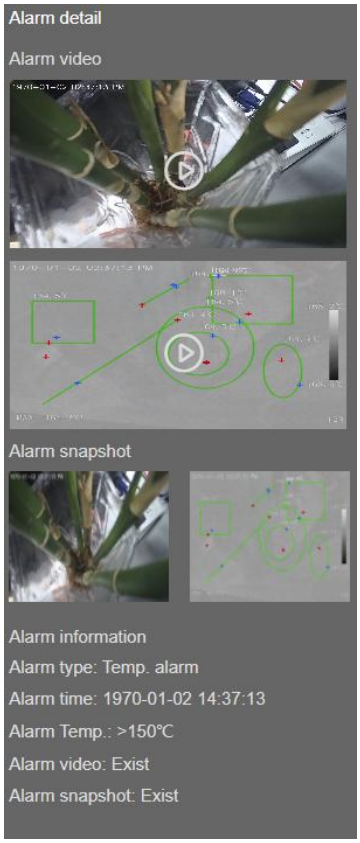


Figure 2-15 Alarm details

Click to select a row of alarm events in the alarm list. The event details will be displayed when viewed, including alarm video, alarm capture and alarm information.

Only when the alarm video capture is set for temperature alarm, cold point alarm and hot spot alarm, the video capture content will be displayed in the alarm details view. Double-click the video capture to view the full screen. The alarm information displays the alarm type, alarm time, temperature beyond the alarm conditions and whether there is video capture file.

For other types of alarms, there is no alarm video capture. The alarm information only displays the corresponding alarm type and alarm time, alarm temperature/, excluding video capture.

2.4.1.5. Alarm clearing

Click Clear Alarm to clear the data in the alarm list.

2.4.2. Temperature alarm settings

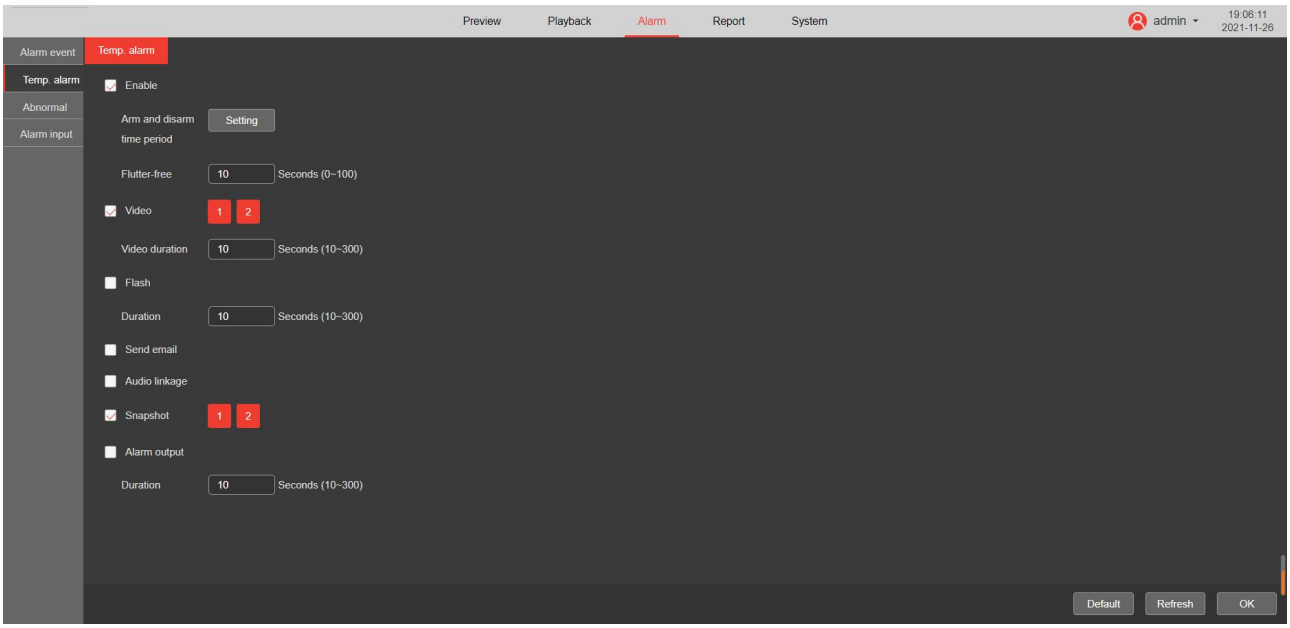


Figure 2-16 Temperature alarm settings

Enable	Enable alarm; no alarm will be given if it is not enabled.
Deployment and withdrawal time	For setting of alarm time period, see 2.4.2.1 Setting of the deployment time period.
Dejitter	After the alarm temperature condition is met, the alarm will not be triggered immediately; An alarm will be triggered only after the temperature alarm condition is met and the duration exceeds the set dejitter time.
Video recording	When it is checked, select channel 1 (visible light) and channel 2 (infrared thermal imaging) to capture images when an alarm is given; When it is not checked, the alarm will not be recorded.
Video duration	Set the alarm video duration.
Alarm output	When it is checked, in case of temperature alarm event, the fill light will flash; If not checked, it will not flash.
Alarm delay	Set the flash duration of the fill light.
Sending an Email	When it is checked, the alarm will push the mail to the specified mailbox. If the alarm is not checked, the mail will not be pushed. For the mail settings, see section 2.6.3.5 SMTP mail settings.
Audio linkage	After it is checked, an alarm sound will be given when the alarm is checked; No sound will be emitted if it is not checked
Capture	When it is checked, select channel 1 (visible light) and channel 2 (infrared thermal imaging) when giving an alarm; If it is not checked, the alarm will not capture the image.
Default	Click Default to return all settings parameters on this page to default values.
Refresh	Click Refresh to refresh the current settings, and set the data to the latest saved one.
Confirm	Click OK to save the current settings. The changes will not be saved until the point is confirmed.

2.4.2.1. Setting of deployment time period

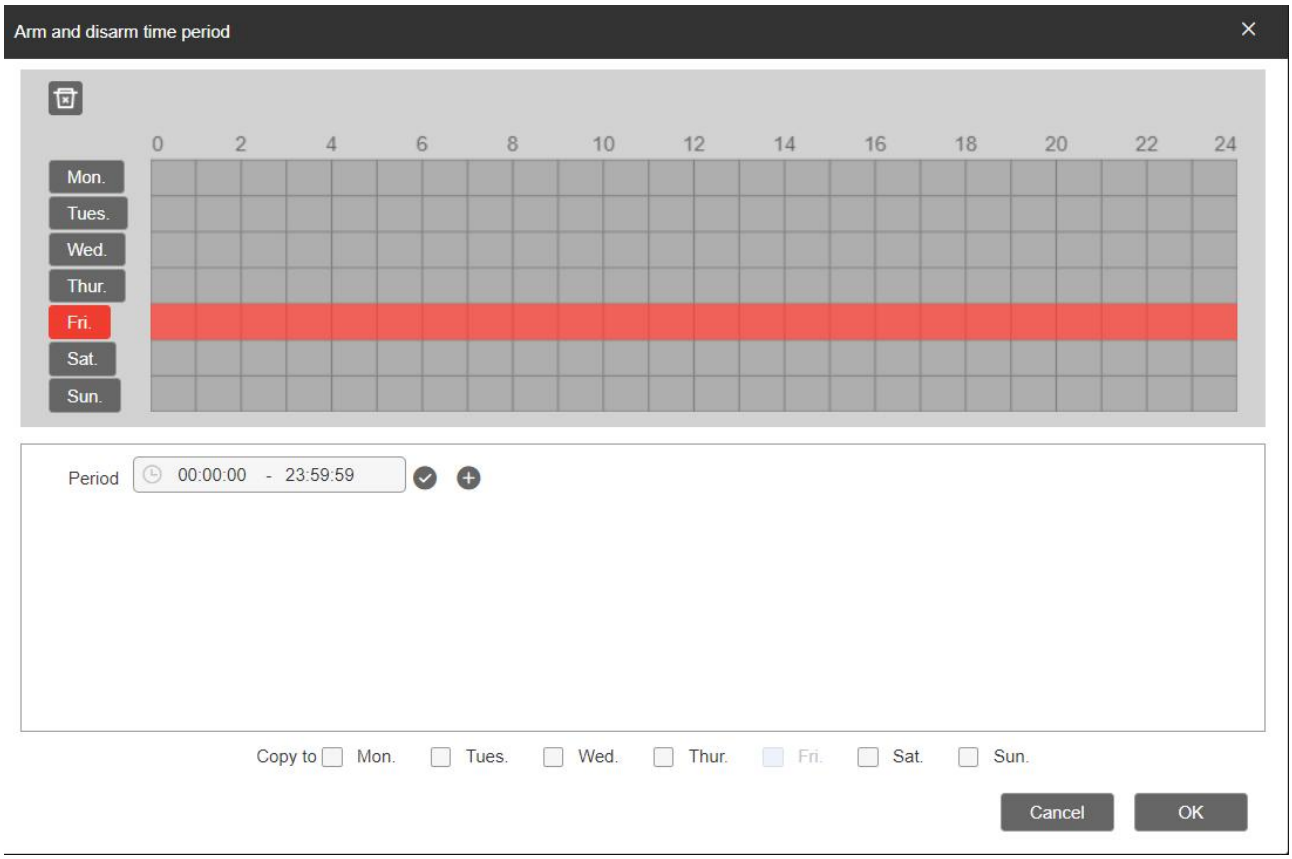


Figure 2-17 Setting of deployment time period

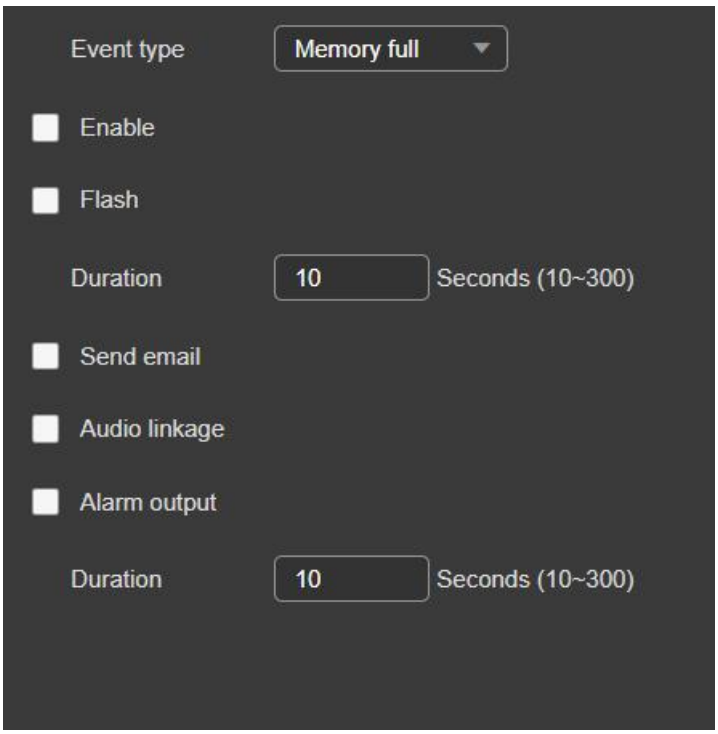
One of the temperature alarm conditions is that the alarm will only be given if other conditions meet the requirements within the deployment time, and the alarm is not given beyond the deployment time, and the temperature alarm can be monitored within a certain period of a certain day of the week. For example, 8-18 points from Monday to Friday are shown in the figure. The setting method is as follows:

1. Click to select the day of the week. The highlight red indicates that editable can be selected.
2. Hold down, drag, and release the left mouse button in the blank space of the line to set a time period. If a time period is given, click + below to create a new time period and set it. Do not set overlap multiple time periods. Click √ to verify it. If the time period needs to be deleted, right-click the time period in the table or click × next to the time period below.
3. Accurate time can be modified in the time period of layout below the table.
4. After setting the deployment time of one day, check another week to replicate data.
5. Click OK to exit the interface for setting the deployment and withdrawal time or click Cancel or X in the upper right corner to exit, but the previous settings cannot be saved.

2.4.3. Exception handling

2.4.3.1. Memory exception

Storage exceptions are divided into full memory, storage exception and flow push failure, and their setting methods are the same, and the full memory is taken as an example.



2-18 Linkage of storage alarm events

Enable	Enable alarm; no alarm will be given if it is not enabled.
Alarm output	When it is checked, if the memory is full and an alarm is given, the fill light will flash; if it is not checked, it will not flash.
Alarm delay	Set the flash duration of the fill light.
Sending an Email	When it is checked, the alarm will push the mail to the specified mailbox. If the alarm is not checked, the mail will not be pushed. For the mail settings, see section 2.6.3.5 SMTP mail settings.
Audio linkage	When the card machine alarm is checked, the alarm sound will be sounded; No alarm is sounded if the alarm is not checked.

The definitions of Default, Refresh, and Confirm in the lower right corner of the page are the same as 2.4.2.

2.4.3.2. Network anomaly

If the network is abnormal, alarm linkage event settings occur.

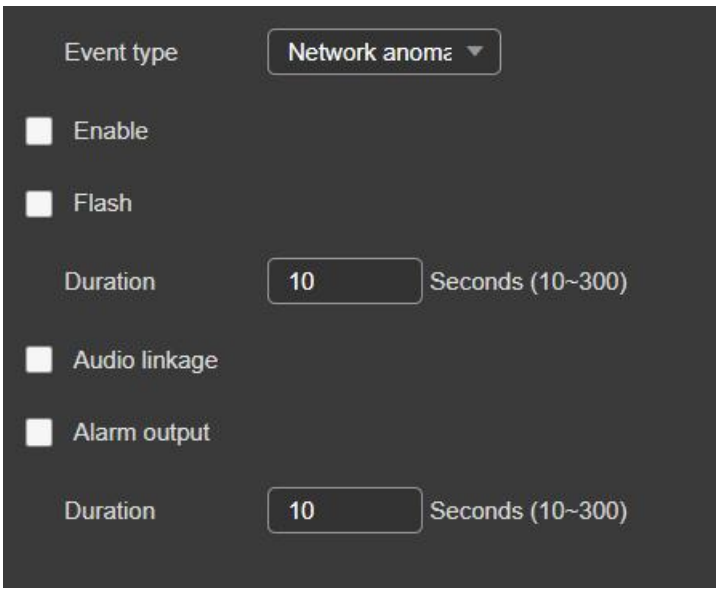


Figure 2-19 Network event alarm linkage

Enable	Enable alarm; No alarm will be given if it is not enabled.
Alarm output	When it is checked, the fill light blinks when there is a network exception alarm event; If not checked, it will not blink.
Alarm delay	Set the flash duration of the fill light.
Sending an Email	When it is checked, the alarm will push the mail to the specified mailbox. If the alarm is not checked, the mail will not be pushed. For the mail settings, see section 2.6.3.5 SMTP mail settings.
Audio linkage	When the card machine alarm is checked, the alarm will be sound; No alarm will be sounded if the alarm is not checked.

The definitions of Default, Refresh, and Confirm in the lower right corner of the page are the same as 2.4.2.

2.4.3.3. Illegal access

If illegal access occurs, alarm linkage can be set.

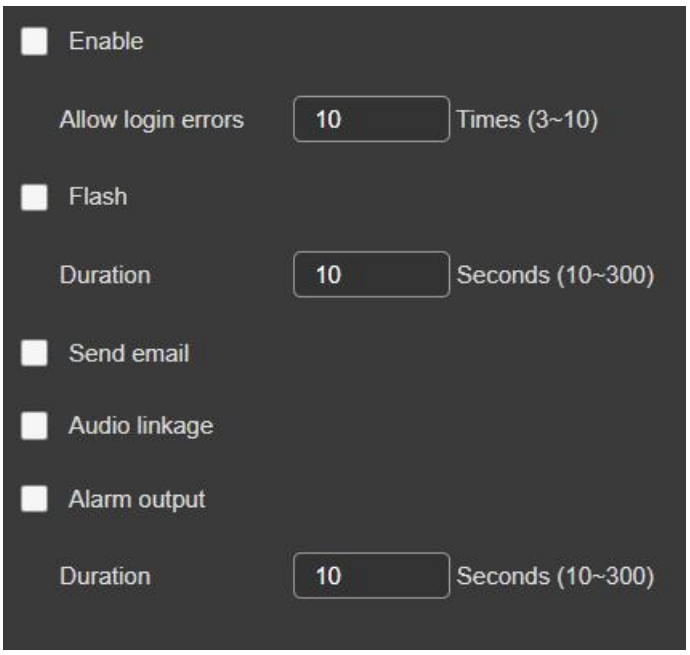


Figure 2-20 Alarm linkage of illegal alarm

Enable	Enable alarm; No alarm will be given if it is not enabled.
Allowed login errors number	Set the maximum number of login errors allowed. Login error The set number of times triggers illegal access alarm and accounts are locked.
Alarm output	If it is checked, the fill light will flash when it is illegal access alarm event; If it is not checked, it will not flash.
Alarm delay	Set the flash duration of the fill light.
Sending an Email	When it is checked, the alarm will push the mail to the specified mailbox. If the alarm is not checked, the mail will not be pushed. For the mail settings, see section 2.6.3.5 SMTP mail settings.
Audio linkage	When the card machine alarm is checked, the alarm will be sounded; No alarm will be sounded if the alarm is not checked.

The definitions of the Default, Refresh, and Confirm in the lower right corner of the page are the same as 2.4.2.

2.5. Statistical report

Figure 2-21 Statistical report

① Data search	Enter the start time and end time, select the object type and temperature type users want to view, and click Search. The temperature data of the selected temperature type of this object type will be imported into the report on the left. The optional time cycle is 5/10/15/30min, that is, temperature data is displayed every 5/10/15/30min. The temperature type includes the object's highest/lowest/average temperature.
② Report	The searched temperature data is displayed in the report. The X-axis is time, starting from the set start time and covers the end time; The Y axis is the temperature. Move the mouse in the report to view the temperature data of all objects at the nearest time point to the mouse.
③ Select object	Filter objects displayed in reports
④ Multi-page viewing	When the time is too long, multiple pages will be displayed. Click the previous page/the next page to view all data.
⑤ Screenshot	Click the current page of report screenshot.
⑥ Export report	Export all data in the report to the local computer, and the file type is CSV

2.6. System management

Users can operate temperature measurement, images, network and system in the system management.

Column	Description
Temperature measurement setting	Global setting, rule setting, shielding area setting, cold/hot spot setting
Image setting	Image setting, image fusion, video stream
Network setting	TCP/IP, port setting, MQTT setting, SMTP mail setting, national standard

	protocol setting, platform access
Storage control	Clear data and push flow setting
Peripheral control	White light mode setting
System setting	Temperature measurement and storage setting, system setting, file upgrades

2.6.1. Temperature measurement settings

2.6.1.1. Global settings

Setting of global temperature measurement parameters.

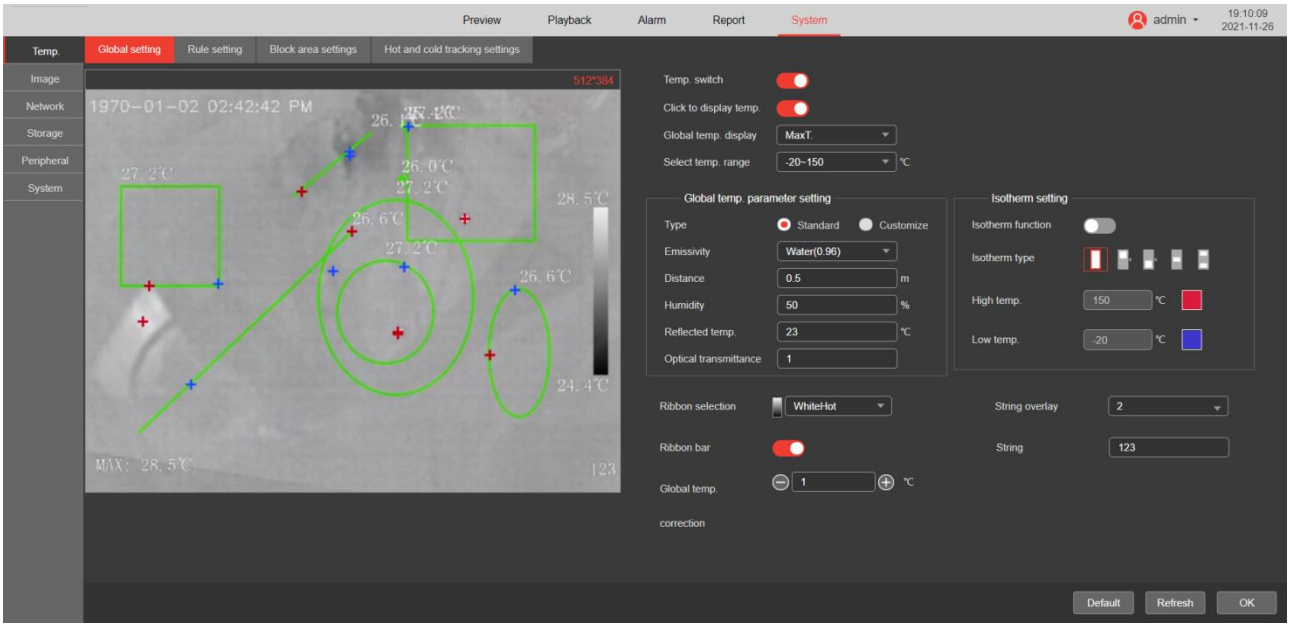


Figure 2-22 Settings of global temperature measurement

Temperature measurement switch	When the global temperature measurement switch is turned off, all temperature-related functions of the software are invalid and all temperature data are not displayed.
Click mouse button to display temperature	After opening, click the mouse button in the infrared thermal imaging on the live preview page to display the temperature at the click point.
Global temperature display	The lower left corner of infrared thermal imaging displays the selected temperature. Options include highest temperature, lowest temperature, average temperature, highest temperature + lowest temperature, highest temperature + average temperature, average temperature + lowest temperature, highest temperature + average temperature + lowest temperature, highest temperature + average temperature + lowest temperature, not displayed.
Selection of temperature measurement gear	Select temperature measurement gear, and there are two optional gears: -20~150℃ and 100-550℃.
Type	Define the global emissivity type. The emissivity of some common materials can be selected in the standard. The customized emissivity can be input to a value between 0.01 and 1.
Emissivity	The emissivity of some common materials can be selected for the standard. The customized emissivity can be input to a value between 0.01 and 1.
Distance	The distance between the monitoring targets can be set to 0.5-10m.

Humidity	Set the humidity of the current environment, humidity ≤ 95%
Reflected temperature	The temperature of the monitoring target can be set to -20 ℃ ~ 550 ℃.
Optical transmittance	It can only be displayed and cannot be edited. The temperature drift and gain around the detector are continuously automatically checked according to the built-in temperature sensor.
Isotherm function	Opening indicates turning on the isotherm function.
Furnace	Set the upper limit of the isotherm interval, and the corresponding color can be set on the right side.
Low temperature	Set the lower limit of the isotherm interval, and the corresponding color can be set on the right side.
Isotherm type	Set the isotherm type, including turning off the temperature range, turning on high isotherm, turning on low isotherm, isotherm within the opening range, and isotherm outside the opening range. Close the temperature range: close the isotherm Turn on high isotherm: High temperature color is highlighted where the global temperature is higher than the set high temperature value. Turn on low isotherm: The low temperature color is highlighted where the global temperature is lower than the set low temperature value. Interval isotherm: High temperature color is highlighted where the global temperature is between the set low temperature value and the high temperature value. Outside the interval isotherm: Low-temperature color is highlighted at places where the global temperature is lower than the set low-temperature value, and high-temperature color is highlighted at places higher than the set high-temperature value.
Select color zone	Select the effect displayed on the infrared thermal imaging screen, such as white heat. The screen shows high temperature in white and low temperature in black. There are the following types of color zone: white heat, black heat, iron red, lava, hot iron, medical, medical 0, medical 1, medical 2, Arctic, human screening, rainbow 1, rainbow 2, rainbow 3, red 1, red 2, red 3, ice fire, anti-ice fire, layered, dark brown, green heat, blue heat, winter, highlight, amber
Color zone bar	When turned on, the color zone bar and the global maximum temperature and minimum temperature are displayed on the infrared thermal imaging screen. Select color zone bar is consistent with the selected color zone.
Global temperature correction	The global temperature can be corrected, and the temperature displayed after correction is the actual temperature + correction value. Up to ± 1°C can be corrected
String superimposition	The display string is superimposed on the specified position of the infrared thermal image. Select the superposition position here, including closure, upper right and lower right.
String	The display string is superimposed on the specified position of the infrared thermal image. Set the content of the displayed string here.

The definitions of Default, Refresh, and Confirm in the lower right corner of the page are the same as 2.4.2.

2.6.1.2. Rule setting

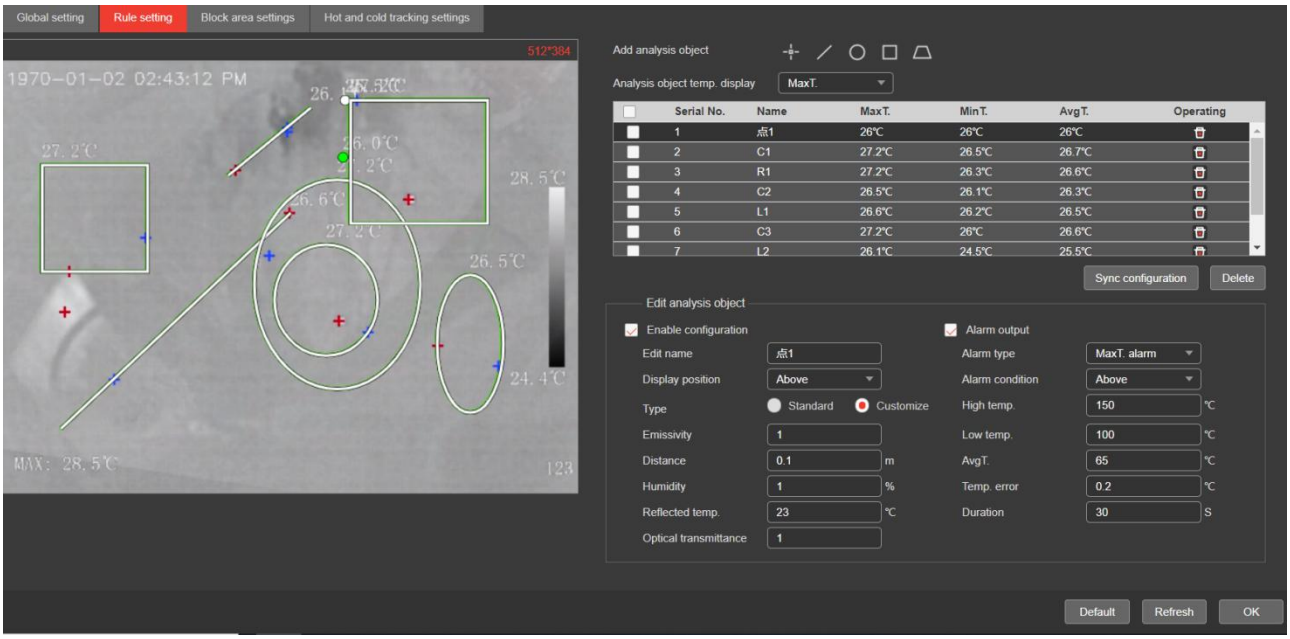


Figure 2-23 Setting of temperature measurement rules

① Add object	Click object type and drag and drop in the thermal imaging screen on the left to add objects. Select the temperature or name of the object displayed in the screen.
② Select temperature measurement gear	Select temperature measurement gears, and there are two optional gears: -20~150℃ and 100-550℃.
③ List of objects	Display the temperature information of an object. Click Select Object in the list. Drag and move the object on the left screen or edit the object below. Click Delete in the operation column to delete a single object. Multiple objects are checked for synchronous configuration or deletion.
④ Edit object parameters	Edit configuration objects, including modification name, temperature display orientation, emissivity, distance, humidity, reflected temperature, etc. For parameter settings, refer to 2.6.1.1 global settings.
⑤ Alarm output	Set object temperature alarm. Check the alarm output to enable alarm, and judge whether to give an alarm according to the combination of alarm type, alarm condition and temperature. For example, the highest temperature alarm + lower than + high temperature 10 ℃ means that the object's highest temperature is lower than 10 ℃ to trigger an alarm; Average temperature alarm + matching + average temperature 10°C indicates that the average temperature of the object is equal to 10°C to trigger an alarm.

2.6.1.3. Shielding area settings

Set the heat source shielding area to avoid false alarms caused by other heat sources.

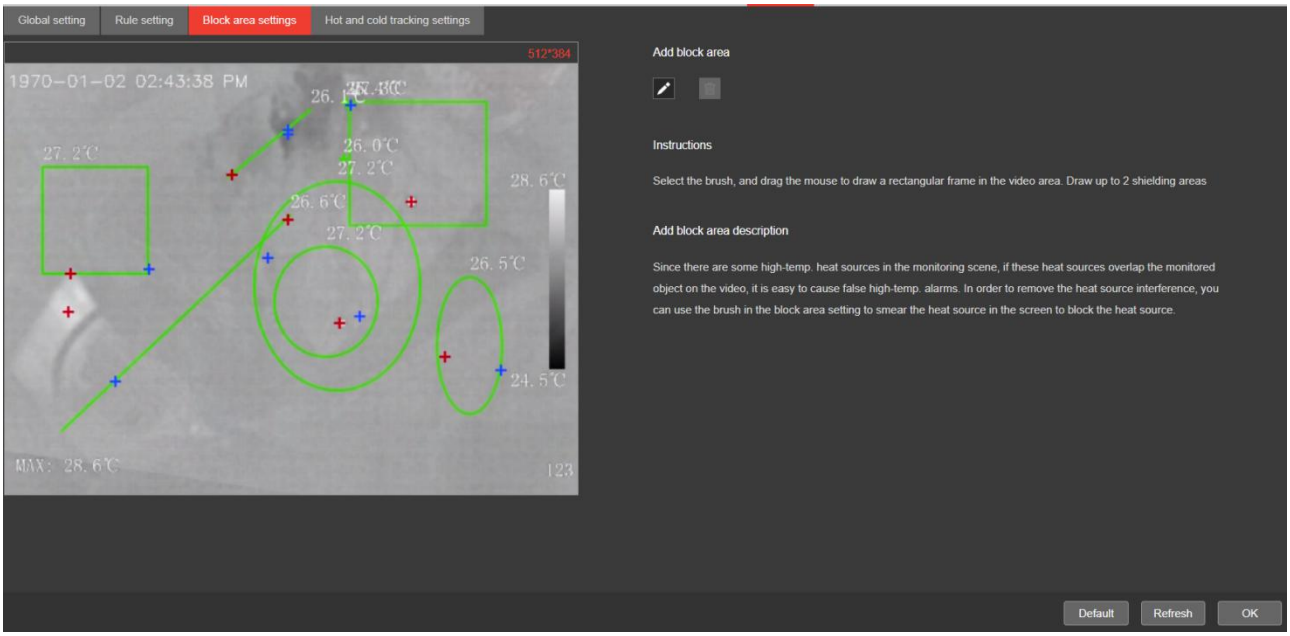


Figure 2-24 Shielding area settings

This function is used to shield the interference source. Click the brush to pull a rectangle on the left screen and circle the interference source. Click to select the shielding area and click Delete to delete the shielding area.

Temperature data in the shielding area should not be considered for other functions.

2.6.1.4. Cold/hot spot tracking

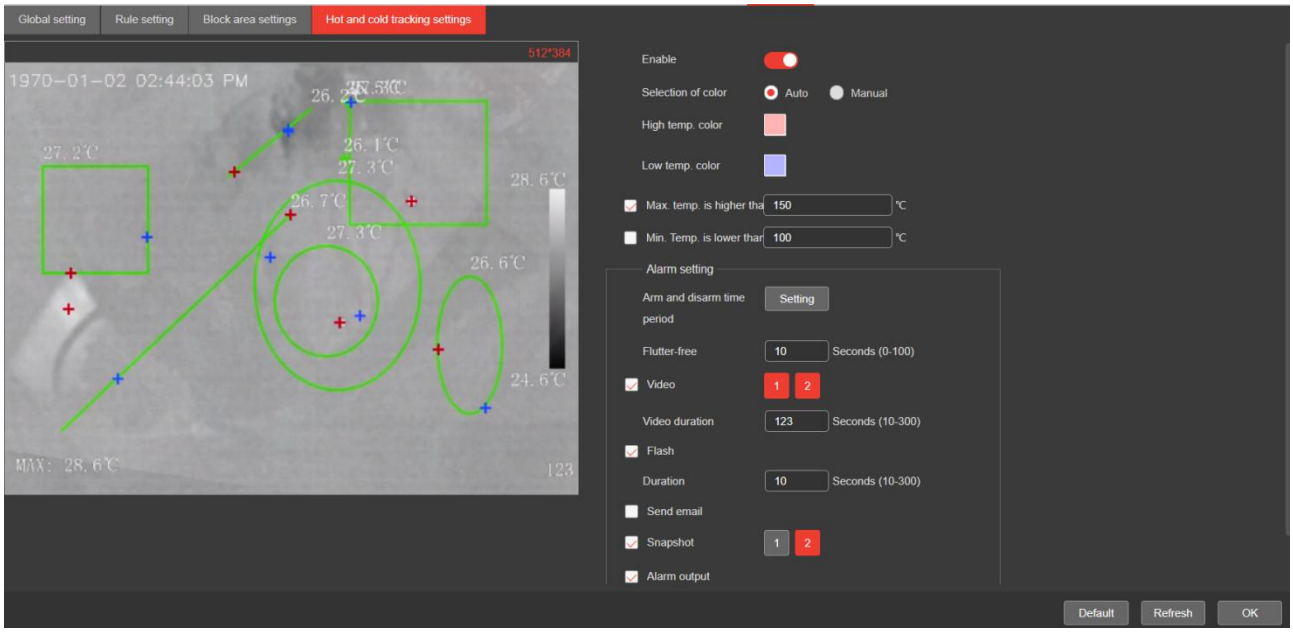


Figure 2-25 Setting of cold/hot spot tracking

Enable	When Enable is clicked, alarm will be issued if the alarm conditions are met. If it is not enabled, alarm will not be issued.
Color	The cursor colors for global highest and lowest temperature can be set automatically or manually.
Maximum temperature is higher than	It is a judgment condition for hot spot alarm; if it is higher than the set value, the alarm condition is met.

Minimum temperature is lower than	It is a judgment condition for cold spot alarm; if it is lower than the set value, the alarm condition is met.
Deployment and withdraw time	For setting the alarm time period, see 2.4.2.1 Setting of the protection time period.
Dejitter	After the alarm temperature condition is met, the alarm will not be triggered immediately; An alarm will be triggered only after the temperature alarm condition is met and the duration exceeds the dejitter setting time.
Video recording	When it is checked, select channel 1 (visible light) and channel 2 (infrared thermal imaging) to record video if an alarm is given; If it is not checked, video will not be recorded when an alarm is given.
Video duration	Set the alarm video duration.
Alarm output	When it is checked, if there is a temperature alarm event, the fill light will flash; If not checked, it will not flash.
Alarm delay	Set the flash duration of the fill light.
Sending an Email	When it is checked, the alarm will push the mail to the specified mailbox. If the alarm is not checked, the mail will not be pushed. For the mail settings, see 2.6.3.5 SMTP mail settings.
Capture	When it is checked, if an alarm is given, select channel 1 (visible light) and channel 2 (infrared thermal imaging); if it is not checked, if an alarm is given, the image is not captured .

2.6.2. Image settings

2.6.2.1. Image settings

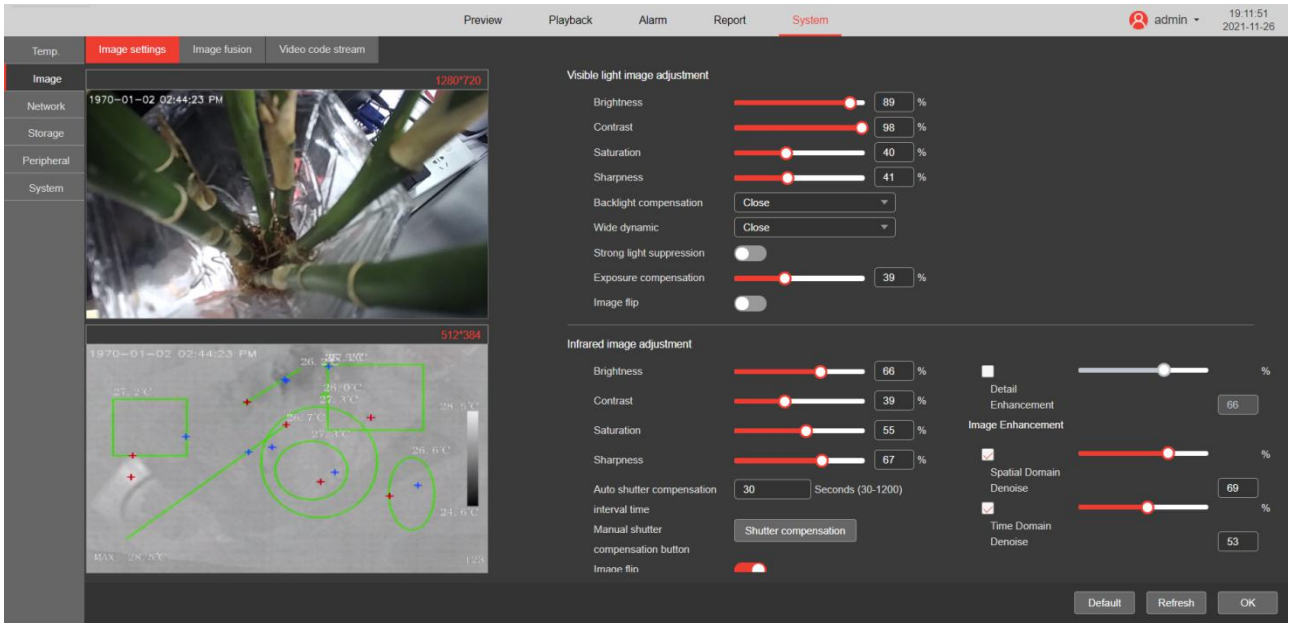


Figure 2-26 Image settings

Visible light image adjustment:	
Brightness	Move the Brightness slider to adjust the brightness. The larger the value, the greater the brightness of the image. The brightness can be adjusted by value input.

Contrast	Move the Contrast slider to adjust the contrast. The larger the value, the greater the bright contrast of the image. The contrast can be adjusted by value input.
Saturation	Move the Saturation slider to adjust the saturation. The larger the value, the thicker the image color. The saturation can be adjusted by value input.
Sharpness	Move the Sharpness slider to adjust the sharpness. The larger the value, the more obvious the edge of the image. The sharpness can be adjusted by value input.
Backlight compensation	When the image is backlit, backlight compensation can be set to turn on the backlight. Click the drop-down to select up, down, left, right, center, automatic, close.
Wide dynamic	Click the drop-down to select adjustment of width dynamic.
Strong light suppression	When it is turned on, the strong light in the visible light image is shielded.
Exposure compensation	When the light is dark, it can slide to adjust the exposure compensation to highlight the image.
Image flip	After clicking, the image is flipped 180°and then restored again. Positive image during machine inversion
Adjustment of infrared thermal imaging:	
Brightness	Move the Brightness slider to adjust the brightness. The larger the value, the greater the brightness of the image. The brightness can be adjusted by value input.
Contrast	Move the Contrast slider to adjust the contrast. The larger the value, the greater the bright contrast of the image. The contrast can be adjusted by value input.
Saturation	Move the Sharpness slider to adjust the sharpness. The larger the value, the thicker the image color. The saturation can be adjusted by value input.
Sharpness	Move the Sharpness slider to adjust the sharpness. The larger the value, the more obvious the edge of the image. The sharpness can be adjusted by value input.
Automatic shutter compensation interval	Set the automatic shutter time of the machine.
Manual shutter compensation button	Click the button and the machine will immediately open a shutter.
Image flip	After click, the image is flipped 180°and then restored again. Positive image during machine inversion
Detail enhancement	Highlight image details. The larger the value, the more obvious the image details will be.
Spatial noise reduction	Remove airspace (2D) noise from the image. The larger the value, the smaller the image noise, the more blurred the image details.
Time domain noise reduction	Remove time domain (3D) noise from the image. The larger the value is, the better the noise reduction effect will be, ensuring that the video output picture maintains a stability, and the more serious the drag of moving objects will be.

2.6.2.2. Image fusion

Visible light and infrared image can be fused for display.

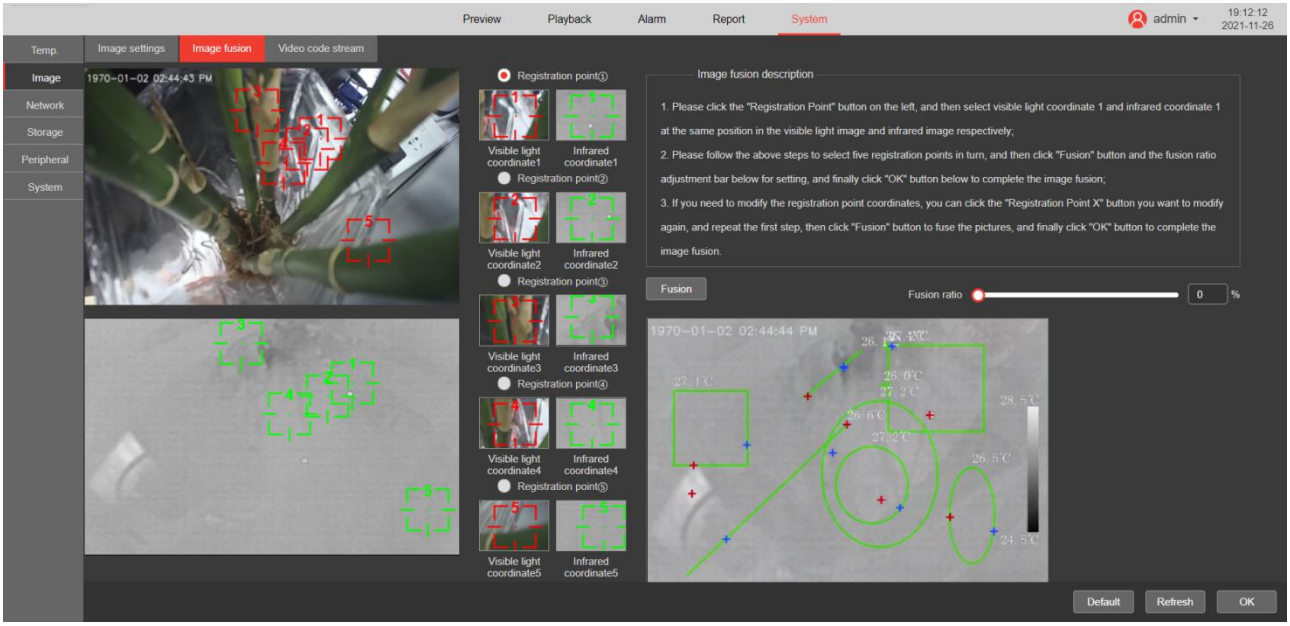


Figure 2-27 Image fusion

1. Click the "Alignment Point ①" button on the left, and then select visible coordinate 1 and infrared coordinate 1 at the same position in the visible light image and infrared image respectively;

2. According to the above steps, select five alignment points in turn, then click the "Fusion" button below and the fusion ratio adjustment column to set them, and finally click the "OK" button below to complete image fusion;

3. If coordinates of the alignment point needed to be modified, click the "Alignment Point X" button to be modified again, repeat the first step, then click the "Fusion" button to fuse the picture, and finally click the "OK" button to complete image fusion.

2.6.2.3. Code stream settings

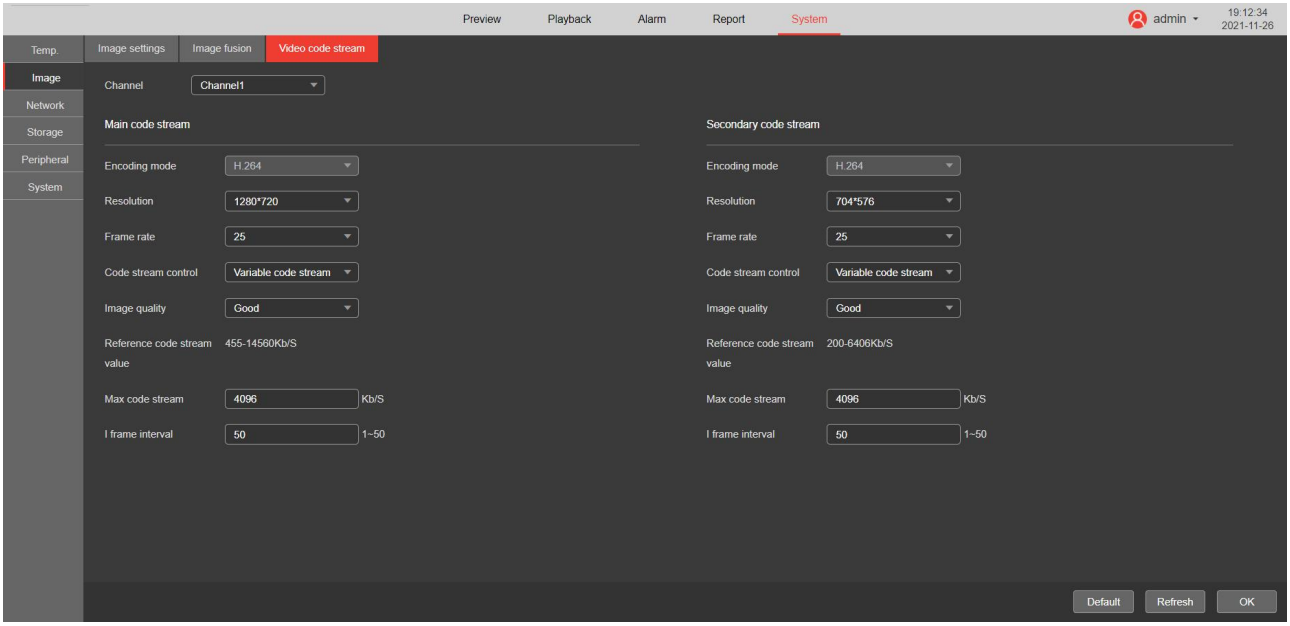


Figure 2-28 Video stream settings

<table>
<tr><td>Code Format</td><td>Video encoding mode, only H.264 encoding format</td></tr>
<tr><td>Resolution</td><td>Set the video resolution.</td></tr>
<tr><td>Frame rate</td><td>Number of frames per second the video contains. The higher the frame rate, the more realistic and smooth the image.</td></tr>
<tr><td>Code stream control</td><td>Variable stream and fixed stream can be set. If variable stream is set, video stream changes with scene scenarios; if the fixed code stream is set, the code stream changes little, and the code stream fluctuates around the set code stream value.
Reference code stream value: The best code stream value range is recommended to users according to the resolution and frame rate set by users.
Variable stream input parameters:
<table>
<tr><td>Image quality</td><td>Select picture quality; the natural code stream with high quality requirements will be larger, including 6 levels: best, better, good, poor, worse, and worst.</td></tr>
<tr><td>Code stream upper limit</td><td>Set the upper limit of variable stream. The code stream changes with monitoring scenarios, but the maximum code stream value changes near the set code stream upper limit. Select the upper limit of the code stream according to Reference Code Stream Value.</td></tr>
</table>
Fixed code stream input parameters:
<table>
<tr><td>Code stream</td><td>Set the video stream value and change around this value. Select the code stream value according to Reference Code Stream Value.</td></tr>
</table></td></tr>
<tr><td>I Frame interval</td><td>It is advised to set the I frame interval to twice the frame rate.</td></tr>
</table>

Set main code streams and auxiliary code streams of channel 1 (visible light) and channel 2 (infrared thermal imaging)in turn according to the above table. For switch primary/secondary code streams, see 2.2.9.

2.6.3. Network settings

2.6.3.1. TCP/IP

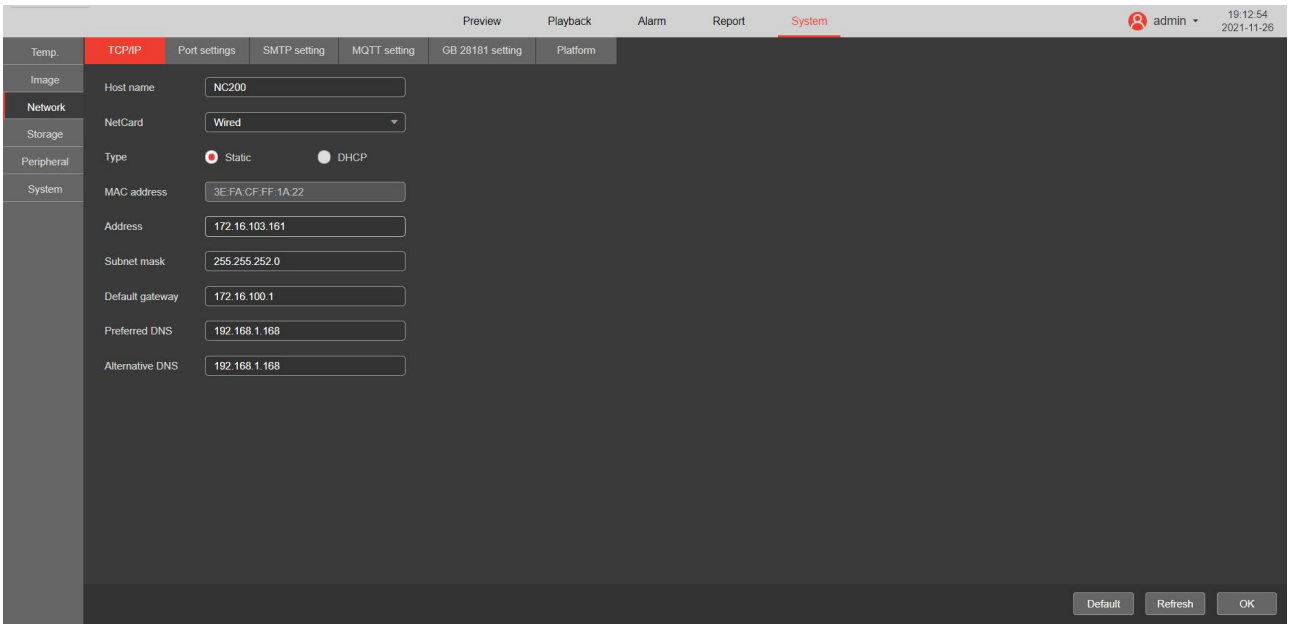


Figure 2-29 Network IP settings

Host name	Set the host name.
Network card	Currently, only wired is supported, that is, the installation requires a network cable to be directly connected to the computer or the network owned by the computer.
Type	Define IP address type. Select static IP and set IP address and other information below; Select DHCP to automatically get IP address and other information.
MAC address	Display the host MAC address which cannot be set.
Address	For static IP, the host IP address can be set, but DHCP cannot be set.
Subnet mask	Set the subnet mask of the host, which can be set only under static IP.
Default gateway	It can be set according to the actual situation, it should be in the same network segment as the IP address.
Preferred DNS	Set the preferred DNS.
Alternative DNS	Set alternative DNS.

2.6.3.2. Port settings

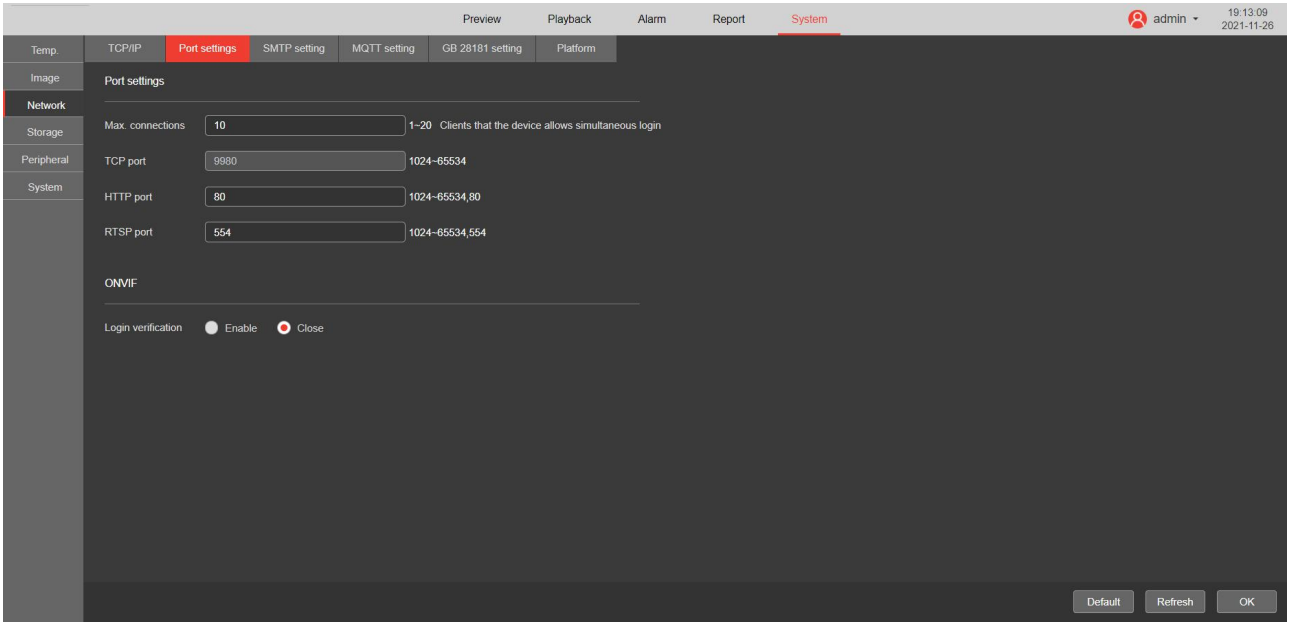


Figure 2-30 Port settings

Maximum number of connections	Set the maximum number of clients that the device is allowed to log in simultaneously.
TCP port	TCP communication port of device cannot be set.
HTTP port	Set the port of device webpage.
RTSP port	Set the RTSP port of the device.
ONVIF login verification	If it is enabled, the ONVIF needs to be verified when logging in. By default, the admin account is verified.

2.6.3.3. MQTT

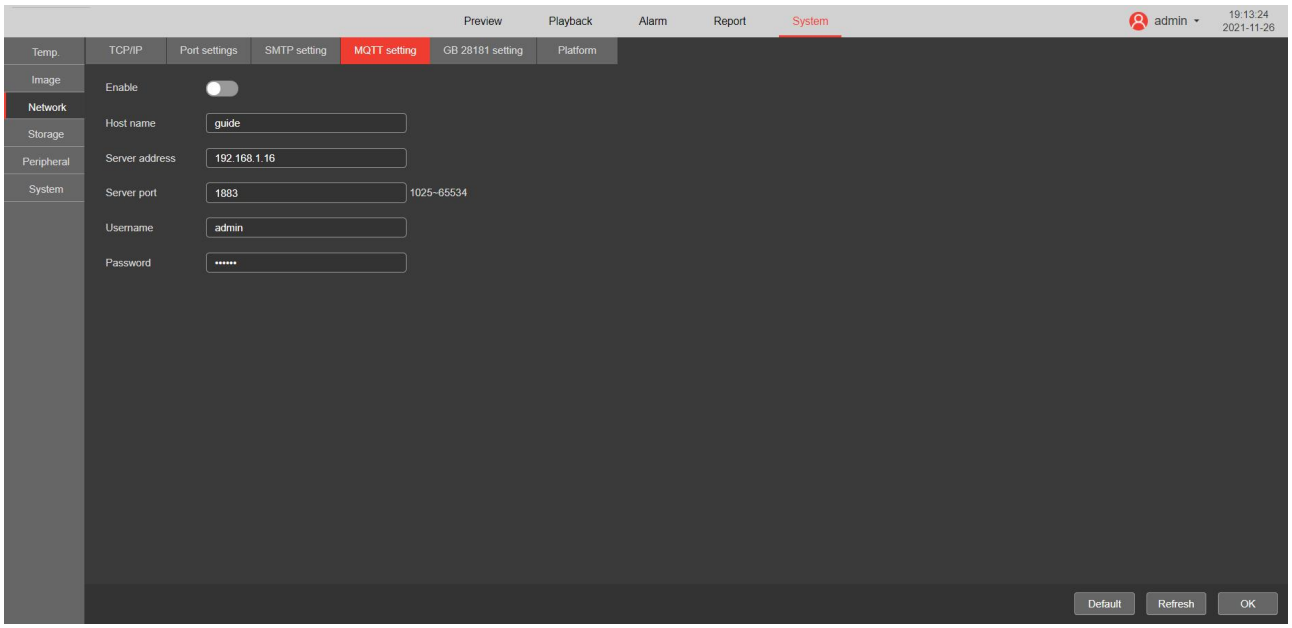


Figure 2-31MQTT settings

Set the device MQTT server interface.

Enable	Enable control switch set by MQTT to support MQTT
Host name	Set the device name.
Server address	Set the address to be accessed to the server.
Server port	Set the ports to be accessed to the server.
User name	Set the username for server login
Cryptographic	Set the password for server login

2.6.3.4. National standard protocol

The device supports access to other devices or servers conforming to the national standard GB/T28181 protocol, and realizes some related real-time monitoring, alarm control and other functions.

Generally, it is only required to set two parameters of the SIP server IP and device number, and other parameters are consistent with those of the device or servers to be accessed.

Parameters should be set based on the information provided on the platform. All parameters must be set correctly; otherwise, exceptions such as device registration failure and no response may occur.

Fill in the parameters provided by the server and click Enable, as shown in the following figure:

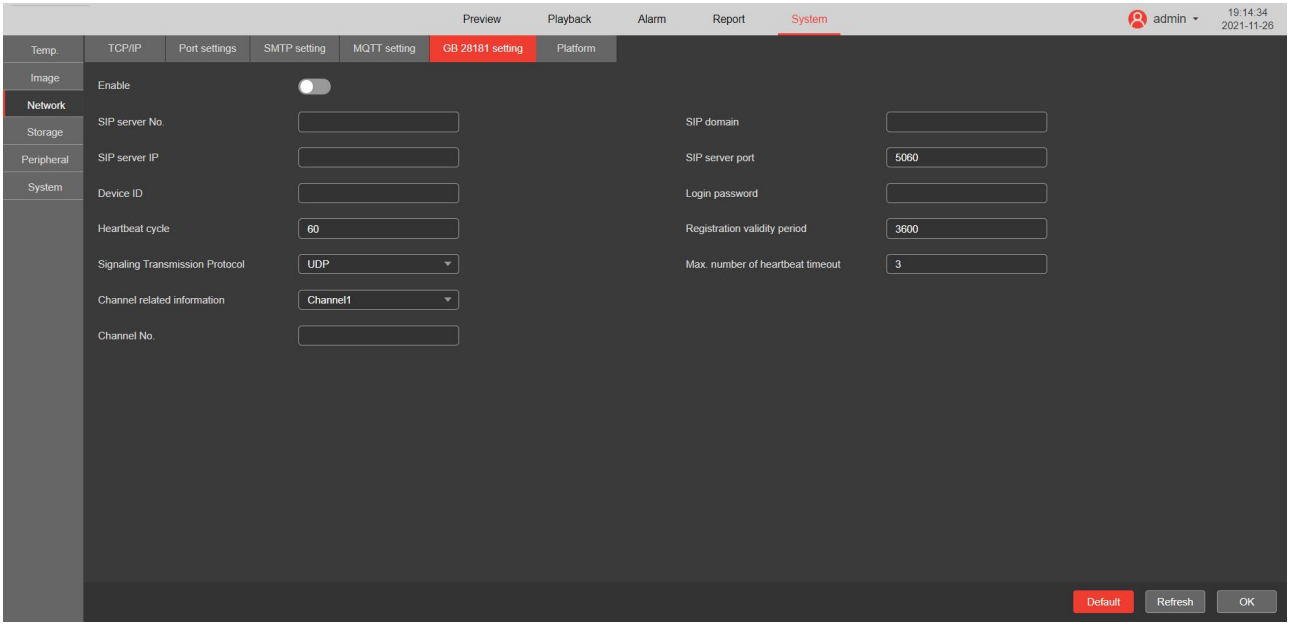


Figure 2-32 Settings of national standard 28181 protocol

Enable	Open Enable to start the GB28181 service of the device and support access to platform after startup.
SIP server number	28181 Server Platform Number
SIP domain	28181 server platform domain name number, generally the top ten server number
SIP server IP	Fill in the IP address of the server to be connected
SIP server port	SIP service Port, other SIP services send commands to this Port to communicate with it
Device number	Device registration number, default 5060
Register password	Device registration password, default 12345678
Heartbeat cycle	Set the heartbeat cycle to confirm whether the previous connection status between the server and the device is valid. The default is 60
Registration validity period	Valid time of device registration. The default is 3,600 in seconds.
Signaling transmission protocol	The device supports TCP and UDP transmission protocols.
Maximum number of heartbeat timeout times	Set the maximum number of heartbeat timeout times. If the continuous heartbeat timeout reaches this set number, it is considered that the server and the device are disconnected. The default is 3.
Channel related information	Channel 1 and channel 2 are optional. Channel 1 is an infrared video channel, and channel 2 is a visible light video channel.
Channel number	Set the number of channels 1 and 2.

2.6.3.5. SMTP mail settings

Set mailbox information. After the "Send an Email" function of alarm linkage is enabled, the system will send an alarm mail to the specified recipient when an alarm is triggered.

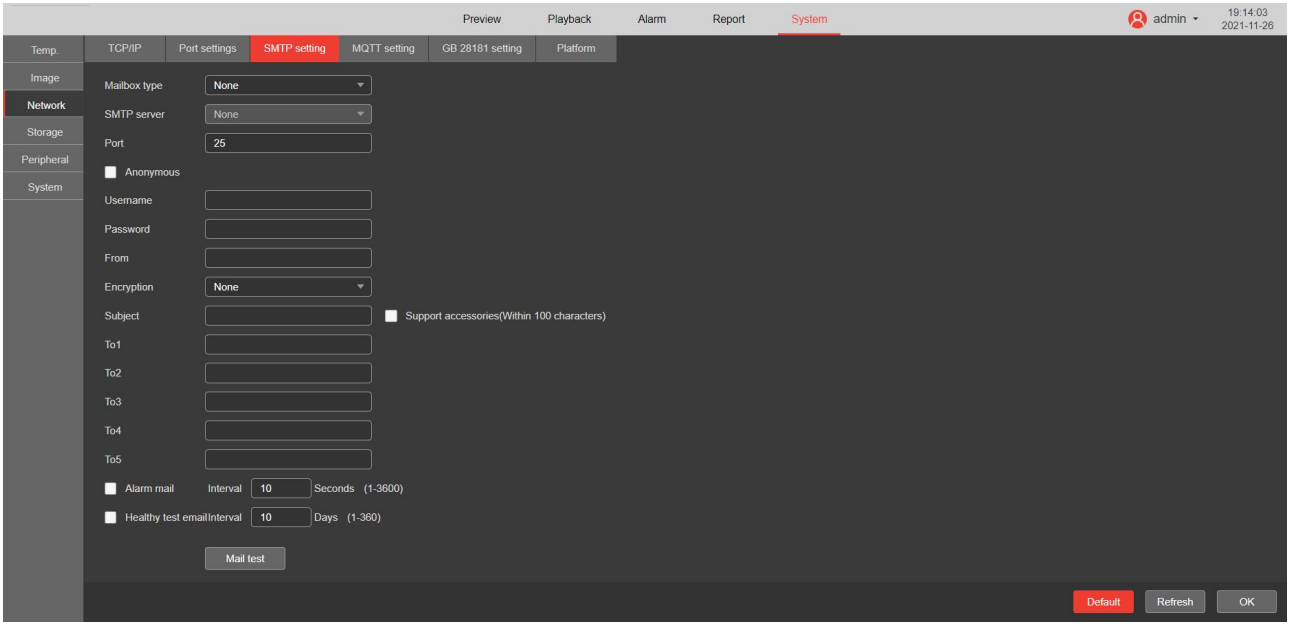
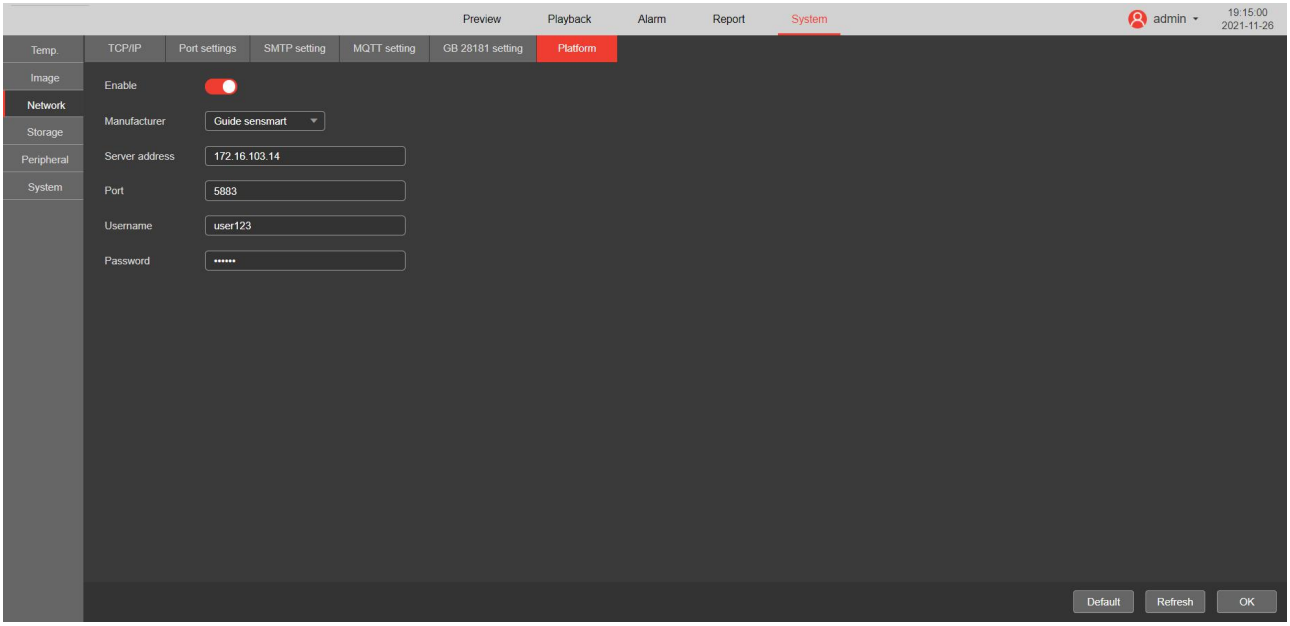


Figure 2-33 SMTP mail settings

Mailbox type	Set the mailbox type, select the commonly used qq/126/163/sina mailbox or customize it.
SMTP server	Commonly used qq/126/163/sina mailboxes automatically generate SMTP servers, and the corresponding SMTP server needs to be set for custom mailboxes.
Port	Set mailbox SMTP server port
Anonymous	Set whether the sender sends an email anonymously.
User name	Set SMTP username, generally mailbox account
Password	Set email SMTP authorization password
Sender	Set the mailbox for sending out mail.
Encryption method	Set the encryption method according to the selected server
Subject, attachments	Set the subject for sending alarm mail. If the attachment is checked, the alarm video and capture will be packaged to the mail as attachments.
Recipient	Set the recipient mailbox, up to 5 recipients.
Alarm mail	Subscribe to alarm mail and set the interval to prevent frequent mail from causing high pressure on the mail server.
Health test email	Set the interval time, the system will send email test information according to the interval time to confirm that the mailbox is not disconnected.
Mail test	After the above information is set, click the mail test to verify whether the mail sending and receiving functions are normal and whether the settings are correct.

2.6.3.6. Platform access

The device supports the access to other platforms. After the platform access parameter configuration is completed and enabled, the device can be searched and controlled on other platforms.



Enable	Enable the control switch of the this device to support access to other platforms, otherwise other platforms cannot search for this device
Manufacturer	For Guide Sensmart self-sensing platform, selects Guide Sensmart and for others, select other agreed manufacturer .
Server address	Address of the platform server.
Port	Platform server port
User name	User name of the connected platform
Password	Password corresponding to the username of the connected platform

2.6.4. Storage settings

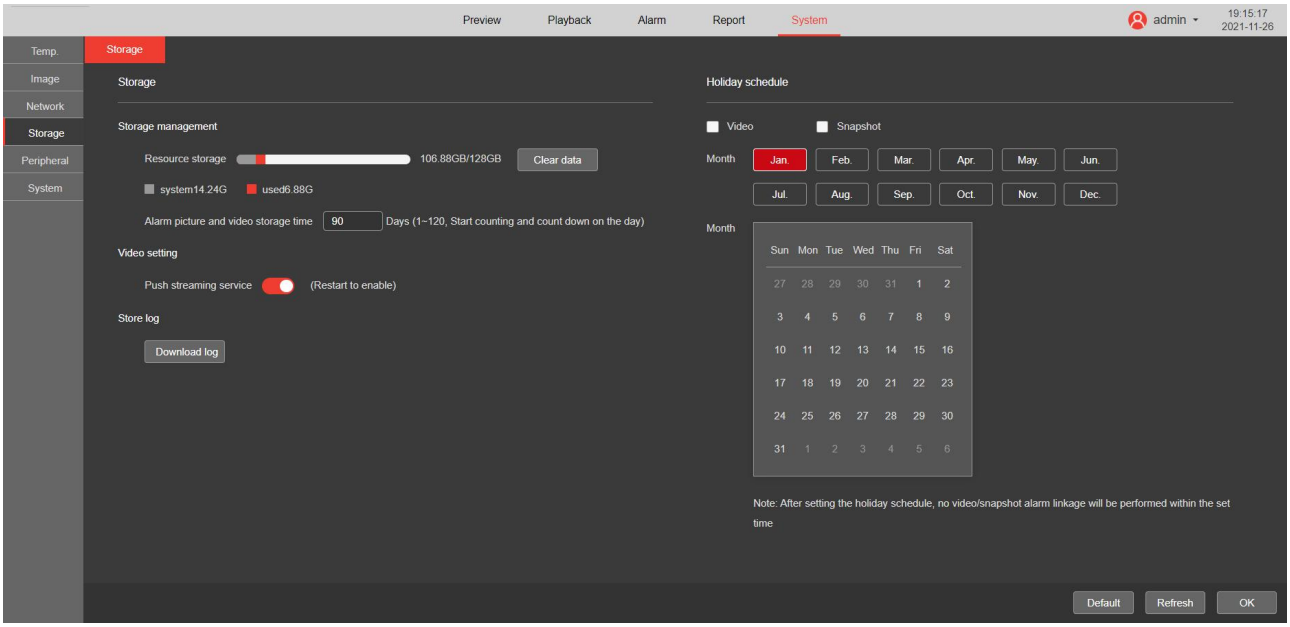


Figure 2-34 Storage settings

Resource storage	Display system storage progress, remaining capacity/total capacity

Clear data	If Click Clear data, all unnecessary files of the system will be deleted, and the storage capacity will be released.
Storage time	Set the alarm photo and video storage time which is counted from the day. If the file exceeds the storage time, it will automatically deleted by the system.
Push flow service	By default, video files captured and recorded can be pushed to the peripheral.
Download log	Click to download the system log to the local for viewing.
Holiday schedule	Set the holiday alarm and do not capture image or record video to reduce unnecessary memory usage. Click to select the month, then the date below, and then click to cancel setting. The red highlight displays that the day is set as a holiday. If the video is checked, it will not be recorded when there is an alarm on holidays. If it is not checked, it will be recorded normally. The setting is the same for image capture.

2.6.5. Peripheral settings

If the current ambient light is dark, the fill light can be controlled to fill the light.

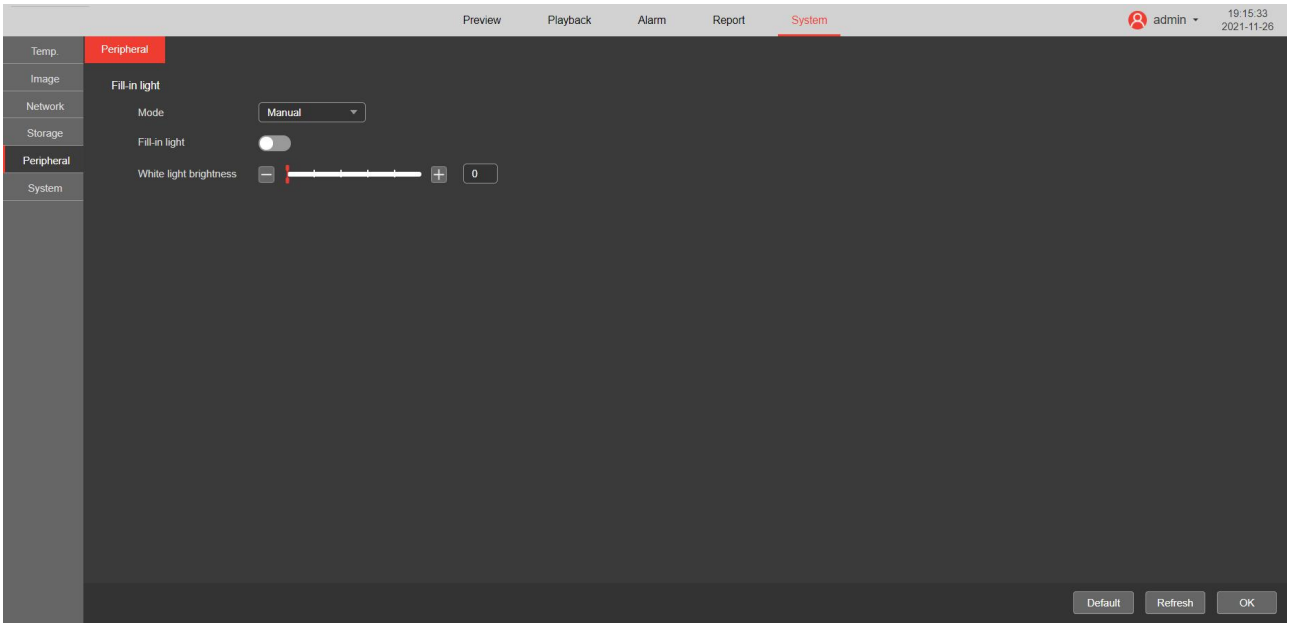


Figure 2-35 Settings of peripheral fill light

Mode	Manual/Automatic can be selected. Manually click the Fill Light button below to set the brightness and click OK to turn on the fill light; in automatic mode, the brightness fill light will be automatically turned on according to the environment.
Fill light	In manual mode, automatic mode is disabled
White light brightness	Adjust the brightness of the fill light.

2.6.6. System settings

2.6.6.1. System settings

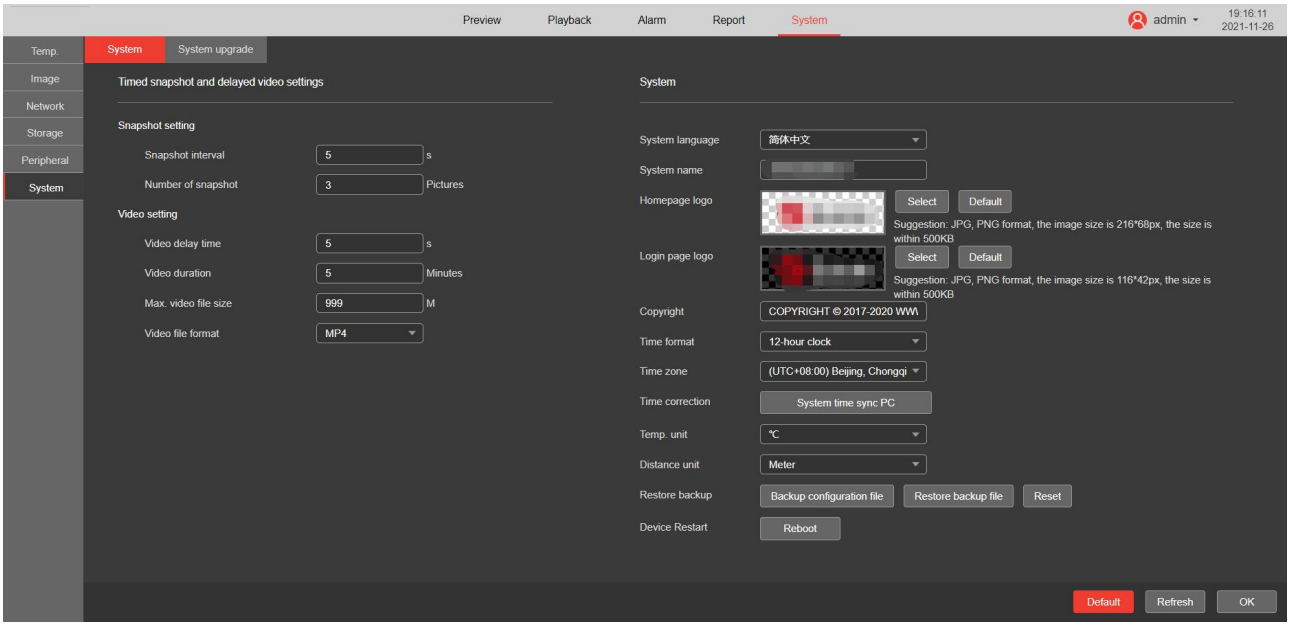


Figure 2-36 System settings

Capture setting	Set the capture interval time and number of captured images, and timing capture function on the real-time preview page can capture images at the set interval time and according to the number of images.
Video setting	Set the video delay time, video duration, file size and format. The video delay function of the real-time preview page starts to record video after the delay time, and is automatically closed after reaching the time limit or the maximum file limit. Currently, it only supports MP4.
System s Language	Switch the system language, and the options are Chinese and English.
System Name	Set the software system name.
Logo of main page	To set the logo on the upper left corner of the main page, click Select, import the images that meet the requirements, and confirm the settings; Click Default to restore the default value for the logo of main page.
Logo of Login page logo	To set the logo of the login page, click Select and import the images that meet the requirements, and confirm the settings; Click Default to restore the default value for the logo of login page.
Copyright ownership	Copyright ownership is displayed on the login page, which can be set here.
Time format	Click to set the system time format, and there are 12-hour time format and 24- hour time format .
Time zone setting	The default is Beijing time, click the drop-down to select the required time zone.
Time correction	Click to synchronize the system time with the local PC time.
Temperature unit	The default is Celsius; it can be switched to Fahrenheit by clicking Fahrenheit . After switching to Fahrenheit, all temperature units of the system is Fahrenheit.
Distance unit	The default unit is meter; click to select feet. After switching to feet, all distance settings of the system are expressed in feet.

Backup profile	Click to download the system profile to the local computer.
Restore profile	Click Import Profile to modify the system configuration.
Reset to factory settings	Click to restore all system configurations to the factory default state.

2.6.6.2. System upgrade

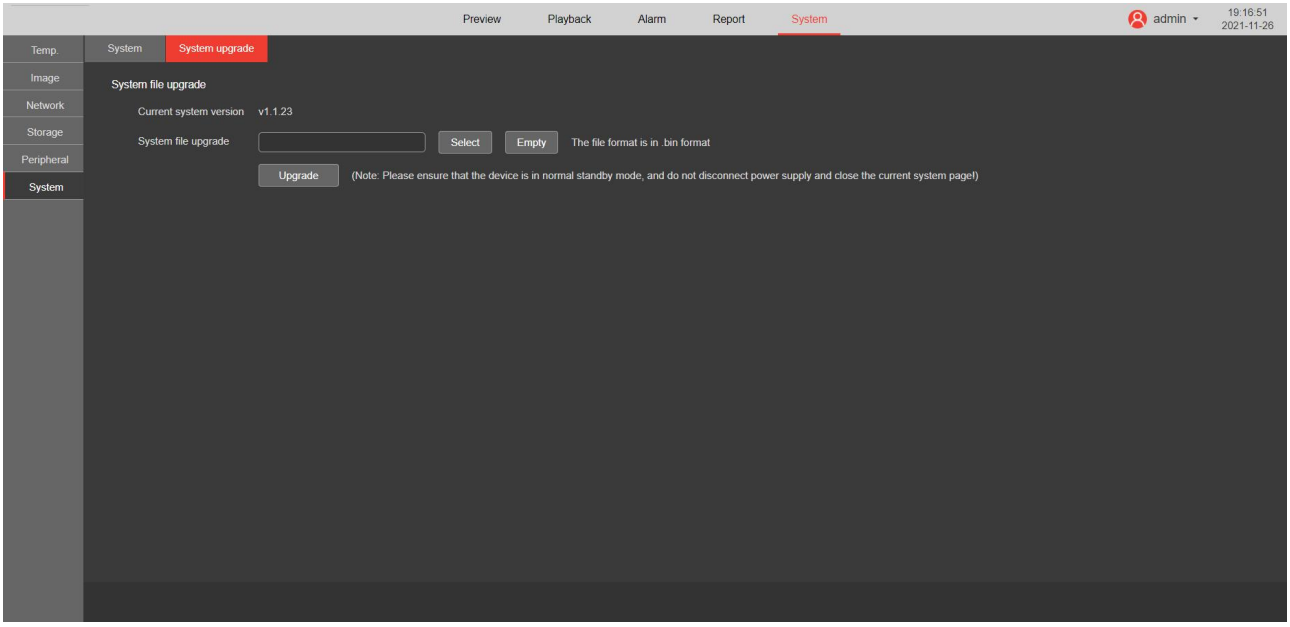


Figure 2-37 System updating

Display the current system version, click to Select to import upgrade file, click Upgrade to upgrade the system, and the upgrade file is. Bin file. Do not close the current page and turn off the power during the upgrade.

3. FAQ

Q1: Why cannot be the device connected after powered on?

Answer: The device is being started when it is powered on, and it will be reconnected after a while;

The computer IP address and the device IP address are not in the same network segment, and modify the computer IP;

The IP address of the device conflicts with that of another device on the network. It is advised to change the IP address directly before connecting the device to the public network or LAN.

Q2: Why is the infrared image not clear?

Answer: The lens is covered with water vapor or contaminated, and shall be cleaned with special equipment.

Q3: Why is the visible light image not clear?

Answer: There is water vapor or pollution at the front end of visible light. Use special device to clean the front end of visible light.

Q4: Where is there no video or/and captured image when an alarm is given?

Answer: The memory is full and cannot save files. It is advised to clear the system memory.

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5. Appendix 2 Network Security Suggestions

Necessary measures to ensure the basic network security of equipment:

Users must create a complex password and the password.

- must contain at least 8 characters in length
- must contain at least 2 types of character, including uppercase and lowercase letters, digits, and symbols
- must not contain the user's account name or account name
- must not contain consecutive sequential numbers/characters, such as 123, abc, etc.
- must not contain repetitions of numbers/characters, such as 111, aaa, etc.

Timely updating of system and device firmware information.

- According to the standard operating specifications of the science and technology industry, the firmware of the device needs to be updated to the latest version in time to ensure that the device has the latest functions and security. When the device is connected to the public network, it is advised to enable online updating to facilitate timely discovery of firmware update information.
- It is advised to update and use the latest system software.

Suggested measures to enhance device network security:

- **Physical protection**

It is advised to perform physical protection on equipment (especially storage equipment), such as placing equipment in special equipment rooms and cabinets, and do access control rights and key management to prevent unauthorized personnel from damaging hardware, external equipment and other physical contact behaviors.

- **Regular password modification**

It is advised to modify the password regularly to reduce the risk of being guessed or cracked.

- **Timely setting and updating of password reset information**

The device supports the password resetting function. In order to reduce the risk of this function being exploited by attackers, please set the information related to password reset in time. If there is any information change, please modify it in time.

- **Enabling account lock**

It is advised to enable illegal access settings to protect account security. After multiple password attempts failed, the corresponding account and source IP address of the attacker will be locked.

- **Changing default ports of HTTP and other services**

It is advised to change the default port of HTTP and other services to any port between 1024 and 65535 to reduce the risk of an attacker guessing the service port.

- **MAC address binding**

It is advised to bind the device IP of its gateway to the MAC address on the device side to reduce risk.

- **Reasonable assignment of authority**

Reasonably add new users based on service and management requirements and allocate minimum rights to them.

- **Closure of non-mandatory services to use secure mode**

If it is not necessary, it is advised to turn off functions such as SMTP to reduce the risk faced by the device.