Dual-spectrum Fixed Network Camera

User Manual V2.0.0

Statement

The copyright of this manual belongs to the equipment manufacturer. Without the written permission of the manufacturer, no one shall copy, photocopy, translate or disseminate all or part of this manual.

This document is only used as a guide for the related products. It may differ from the actual product. The actual device may prevail.The contents of this manual will be changed from time to time due to product version upgrades or other reasons, and subject to change without notice. We try our best to ensure that the content in this manual is accurate and reliable. This manual is only used as a guide. All statements, information and suggestions in this manual do not constitute any express or implied guarantee.

It is recommended that you use this manual under the guidance of a professional.

Special Statement

Please strictly abide by the applicable laws and regulations for the use and maintenance of the monitoring interface. Using equipment for illegal purposes or snooping on the privacy of others are all illegal surveillance.

Symbol Description

For the symbols that appear in the document, the description is as follows.

 Cautions: general warning signs, reminding things that should be paid attention to during operation.

 Instructions: instructions are an emphasis and supplement to the main text.

Default Information:

The default super administrator account of the device: admin.

The default super administrator password of the device: admin.

The default IPv4 address of the device: 192.168.1.123.

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1. Camera Login

After the camera is connected to the network, the user can enter the camera's IP address in the browser address bar to access the camera.

Make sure the camera is on the same LAN as the PC.

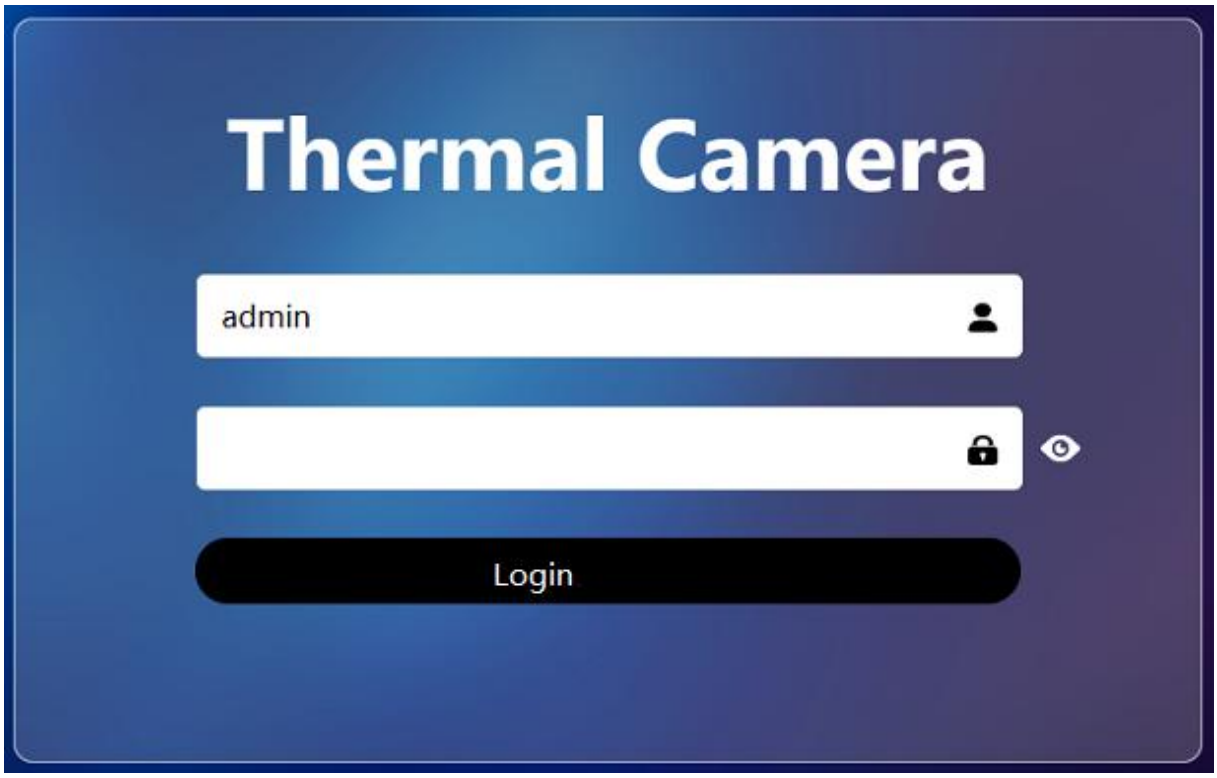


Figure 1.1 Camera Login Interface

The specific login steps are as follows:

1. Enable the browser. (Note: only Google, Edge and Firefox are supported.)

2. Enter the IP address of the camera in the browser address bar: http://xx.xx.xx.xx. For example, enter http://192.168.1.123. Enter the "Login" interface, as shown in Figure 1.1.

3. Enter the correct user name and password (the default user name and password of the camera is admin/admin).

4. The password is forced to be changed during the first login and factory default restoring.

5. Enter the new password, Click the [Login] button to access the camera, otherwise a related login error will be prompted.

Simplified Chinese and English are available, you can choose language on the login interface.



Figure 1.2 Select Language

2. Preview

The preview screen has two channels for simultaneous monitoring, one for visible light and the other for thermal imaging.

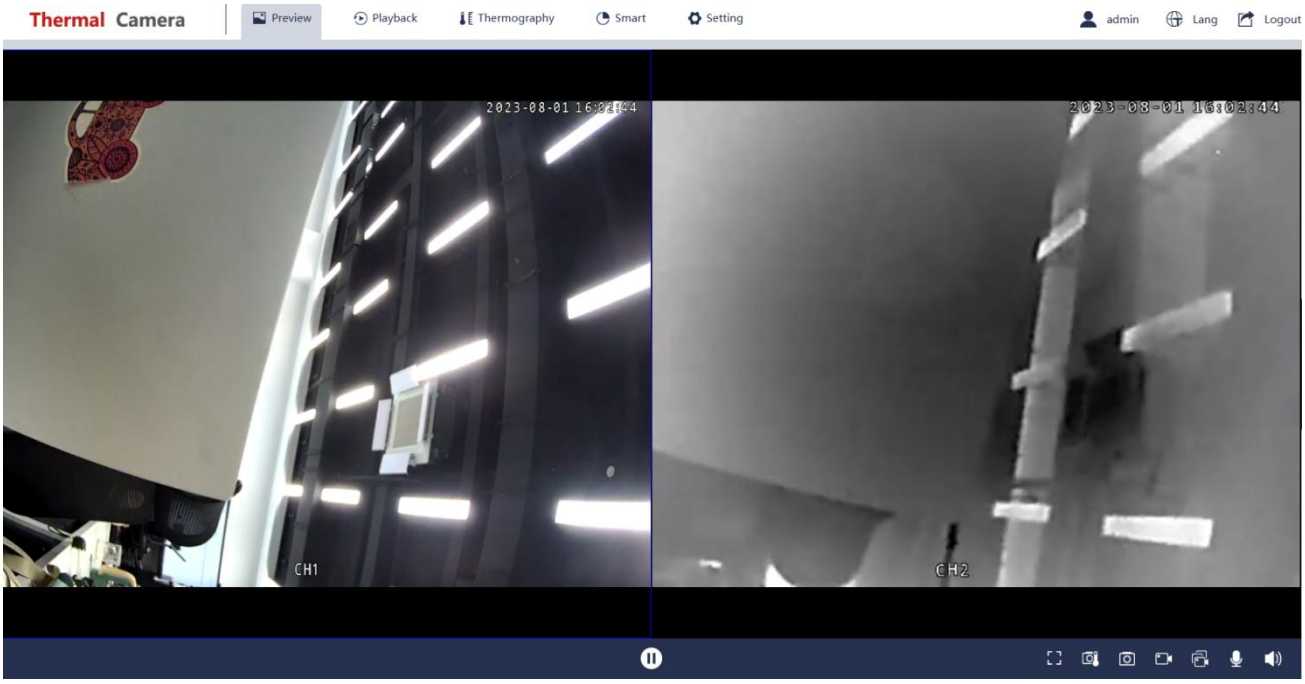


Figure 2.1 Preview Interface

Full Screen: 

Click the full video icon in the lower right corner, the preview image will be displayed on full screen. Quit the full screen mode by pressing ESC.

Temperature Mapping: 

When post-overlay is selected(Refer to chapter 3.1 *Basic Parameters-Temperature Display* for detailed introduction), the temperature mapping icon will be presented in the lower right corner, click the  icon , the drawn temperature measurement rules and temperature info can be overlaid on the visible channel, click the icon again to cancel.

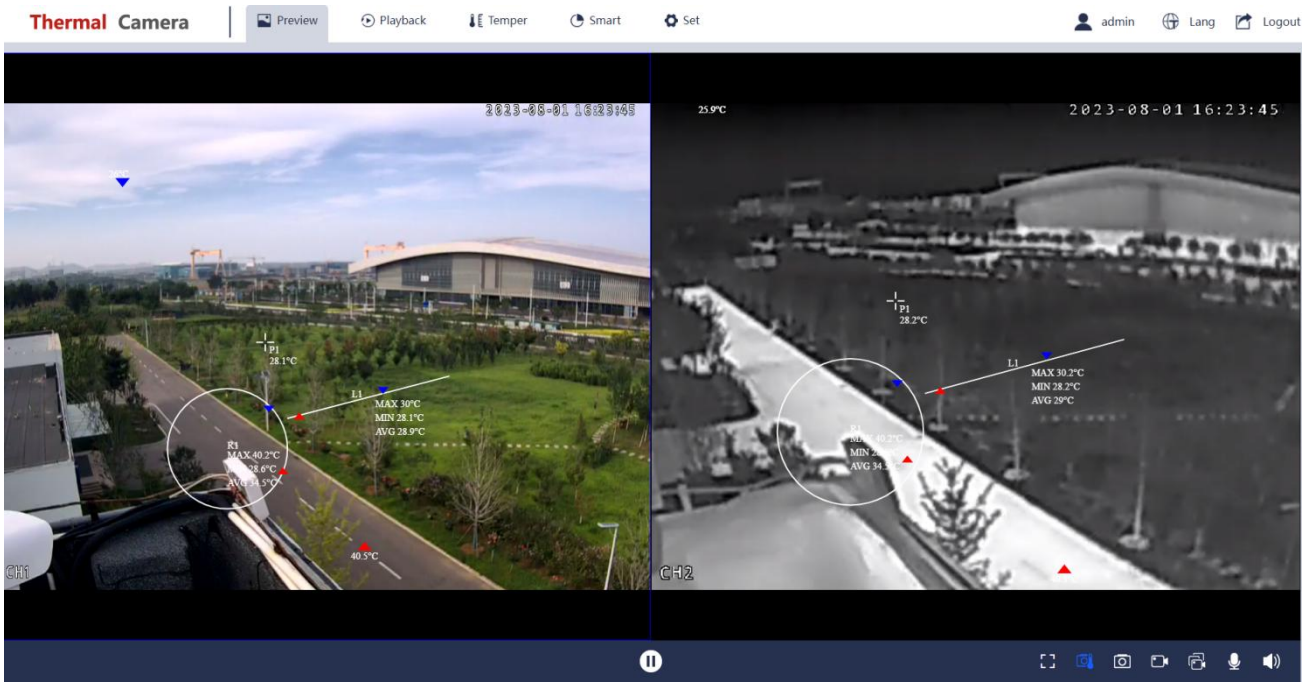


Figure 2.2 Image After Temperature Mapping Activated

Snap:

After selecting the visible channel or thermal channel with the mouse, click the snap icon in the lower right corner. The current screen of the selected channel is captured, and the pictures can be viewed through the downloaded folder of the browser by default.

Video:

After selecting the visible channel or thermal imaging channel with the mouse, click the video icon in the lower right corner , select the channel to start recording videos, the icon will turn to , and click the icon again to end the recording. The videos can be viewed through the downloaded folder of the browser by default, they can also viewed via replay, refer to Chapter 6 *Replay* for detailed introduction.

Full Video:

Click the full video icon in the lower right corner , the video will be recorded in the two channels, the recording icon becomes ,click the icon again to end recording, the videos can be viewed through the downloaded folder of the browser by default, they can also viewed via replay, refer to Chapter 6 *Replay* for detailed introduction.

Talk:

The external interface of the camera "line out" is connected to the speaker, "line in" is connected to the audio source (pickup or phone player) and the talk function is turned on by clicking the icon in the lower right corner of the web preview interface. Use the headset to speak on the computer, and the sound can be heard from the speaker. The sound of the audio source through "line in" can be heard in the headset.

You need to set in “Settings-Camera Settings-Enable” before use the talk and voice function.

Note: before the talk function is enabled, enable the option Insecure origins treated as secure first, click the Relaunch button, the microphone can be used in the webpage by typing in http://xx.xx.xx.xx in the address bar after rebooting the browser.

The option can be enabled by typing in the following address in the browser.

Chrome：“chrome://flags/#unsafely-treat-insecure-origin-as-secure”.

Edge：“edge://flags/#unsafely-treat-insecure-origin-as-secure”.

Voice:

Enable this function,the external interface of the camera "line in" is connected to the audio source (pickup or phone player), turn on the voice switch in the lower right corner of the preview interface, and the sound can be heard on the computer web server.

Play/Pause： /

Click the play/pause button at the bottom of the video, and the two channels of visible light and thermal imaging will be frozen at the same time. Click the play/pause button again and the two channels will return to normal.

: the images in the two channels will be automatically displayed by default after the camera is turned on.

3. Temperature Measurement

3.1 Basic Parameters

Temperature measurement function is only available for thermal channel.

Thermometry： enable the thermometry or not. The point, line and area can be drawn only after the thermometry function is enabled.

Thermographic Frame Rate： setting range is 1-12.

Temperature Unit： Celsius, Fahrenheit, and Kelvin are interchangeable.

Thermographic Mode： high gain and low gain, high gain by default.

Thermographic Overlay: front-end overlay, back-end overlay or no overlay can be set.

■Front-end overlay: Temperature data is added to the stream and can be displayed during playback.

■Back-end overlay: temperature data is not added to the stream. In order to see the temperature data, the intelligent information overlay should be enabled when the video is played back.Refer to Chapter 6 *Replay* for detailed introduction.

■No overlay: the thermographic rules and the related data are not shown.

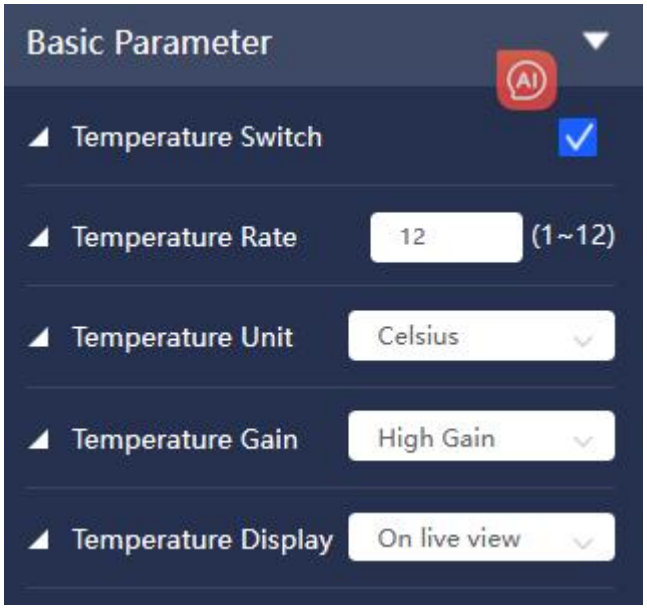


Figure 3.1 Temperature Measurement- Interface of Basic Parameter Settings

Environmental Parameters:

Set the environmental variables of the thermal imaging channel, including emissivity/reflected temperature/atmospheric temperature/atmospheric transmissivity/distance as shown in the below figure.

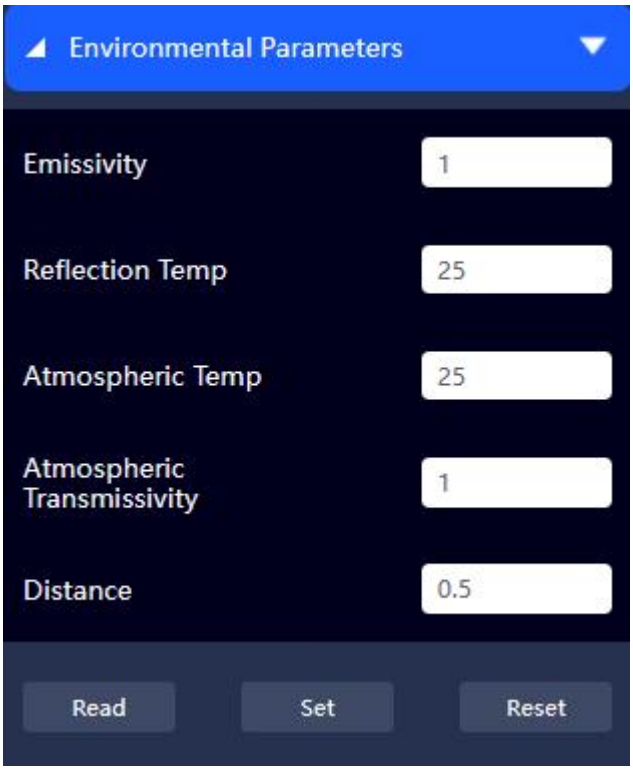


Figure 3.2 Temperature-Environmental Parameters Interface

If the temperature measurement information is not configured separately, the environmental parameters here will be used by default, the info can also be set separately in *alarm rules*.

3.2 Cold/Hot Spot Tracing

After the above/below alarm is enabled, the highest/lowest of the whole frame reaches the set alarm threshold, the system will make alarm calls and alarm linkage actions.

Procedures: refer to Table 3-1 for detailed parameters.

1) Enable on the hot/cold spot trace interface.
2) Enable above/below alarm; Set the alarm temperature threshold.
3) Set the filtration time;
4) Set the temperature allowance;

5) Set the alarm linkage parameters: the corresponding event is linked when the alarm is triggered, for example, video recording (enable visible/thermal channel), image capture, Email linkage, flash alarm, voice alarm and alarm output, etc.

6) Click “save” to finish. See the following figure:

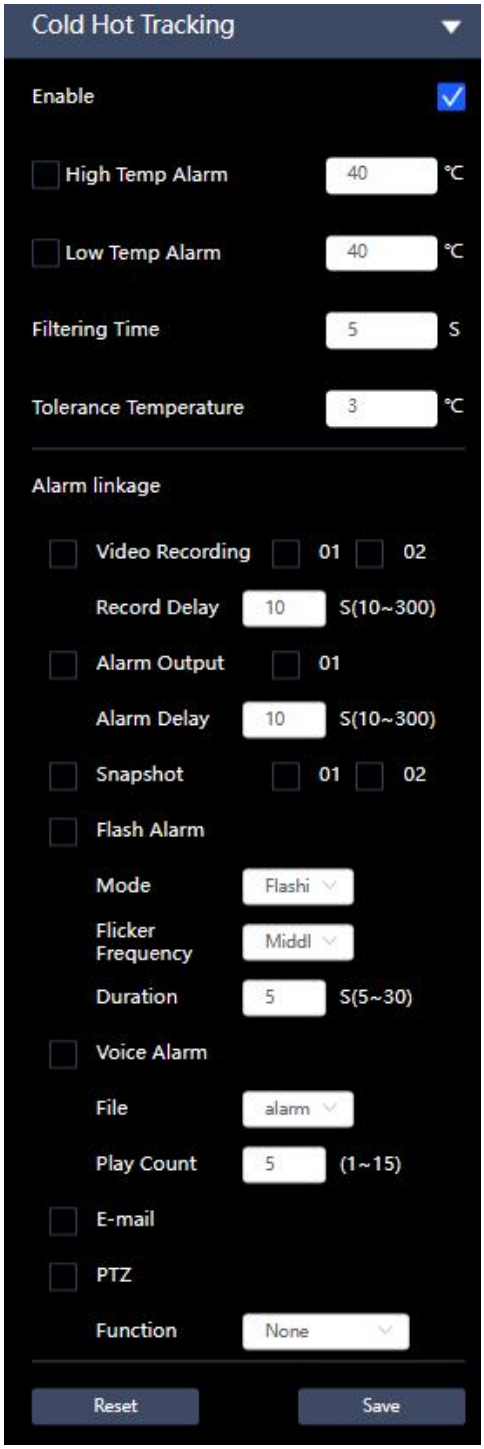


Figure 3.3 Temperature-Cold/hot Spot Tracing Interface

Parameter	Descriptions
1 Enable	To make the alarm linkage rules take effect
2 High Temp Alarm	Above alarm threshold
3 Low Temp Alarm	Below alarm threshold
4 Filtering Time	Alarm conditions: reach the temperature threshold and meet the time period requirement e.g. the filtering time is set as 3s, then while reaching the temperature threshold reaches and lasts for 3s, the alarm will be triggered.
5 Tolerance of Temperature	A tolerant alarm temperature range needs to be set in case of drifting temperature. e.g. the tolerance of temperature is set as 3℃, the alarm temperature is set as 45℃, then the alarm will be triggered when the detected temperature reaches 45℃, and the alarm will stop until the temperature is below 42℃.
6 Video	Video：select this option and set the video channel No.,the alarm will be automatically triggered in the selected channel.01 stands for the visible channel, 02 stands for the thermal channel. Video Delay：type in the delay time. After the alarm is finished, the alarm video would stop after a while.
7 Alarm Output	Alarm Output：the alarm output will be enabled after this option is selected. When the alarm is triggered, the system will link the alarm output and make alarms. Alarm Delay：type in delay time. After the alarm is finished, the alarm video would stop after a while. Before the function is enabled, please make sure that the alarm device is connected debugged and can operate normally.(e.g. alarm light and alarm

	whistle)
8 Take Pictures	Select this option and set the channel No., the image will automatically captured in the selected channel when the alarm is triggered. 01 stands for visible channel,02 stands for thermal channel.
9 Flash Alarm	The camera illuminator will flicker or stay on when the alarm is triggered after this option is selected. Mode: select the light flashing type during alarm. There are two options: Flashing and glowing continuously. Frequency: configure flicking frequency. Residence Time: set the flashing time, 5s by default.
10 Voice Alarm	The system will link to broadcast audio files when the alarm is triggered after this option is selected. File： select the built-in audio alarm files. The audio files can be uploaded by the user, refer to chapter 5.1.3 for detailed operation. Times of Play： set the times of broadcasting.
11 E-mail	Select this option, the system will send Email to inform the user when the alarm is triggered. The camera needs to be connected to the network and the Email parameters should be set before this function is enabled, refer to chapter 5.2.3 SMTP for detailed operation.

3.3 Measurement Analysis

3.3.1 Measurement List

The measurement data list can be displayed after *Thermometry* is enabled in *Basic Parameter Settings*. See the following picture:

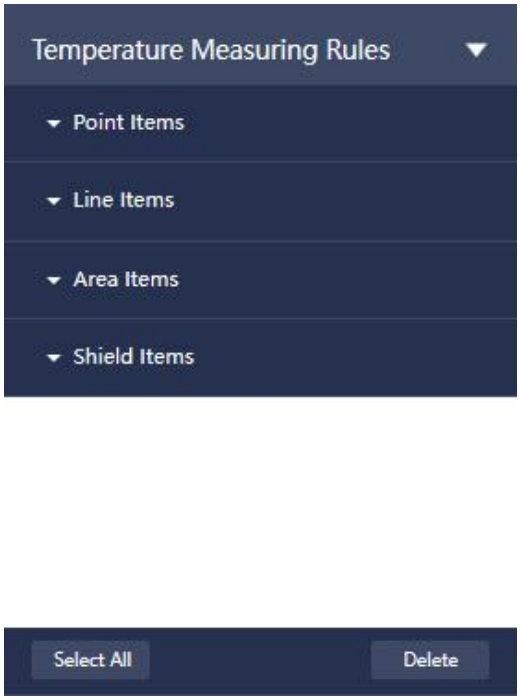


Figure 3.4 Measurement Analysis-Data List Interface

The measurement data is displayed in group: temp points list （0-P1~0-P12）, temp lines list （0-L1~0-L12）, temp areas list(0-R1~0-R12) and shielded areas list （0-SR1~0-SR12）, maximum 12 articles of records for each group.

Alarm Rules Settings

Select an article of data among temperature measurement list and click the *Set* button. See the following figure:

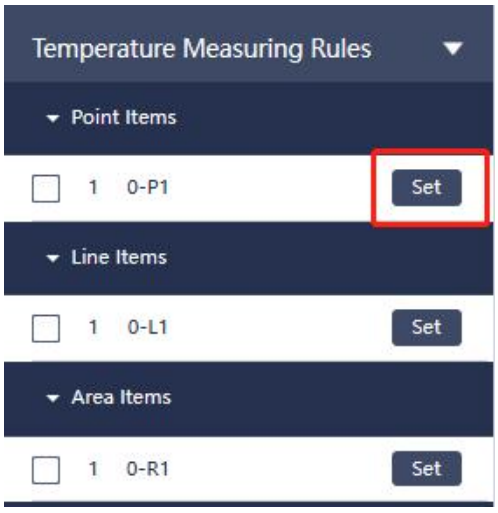


Figure 3.5 Measurement Analysis-Alarm Rules Setting Interface

The environmental parameters and alarm rules can be set separately. See the following figure for environmental parameter settings.

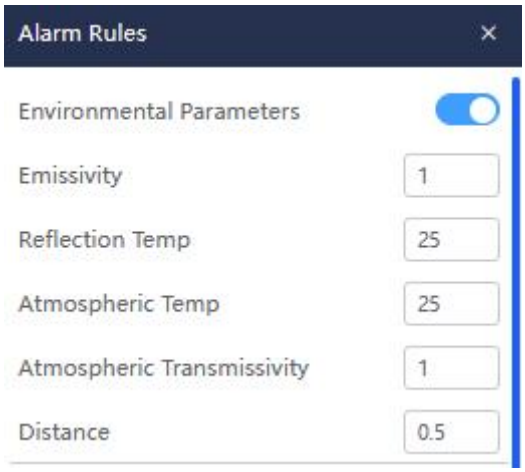


Figure3.6 Thermography Analysis-Environmental Parameters Settings Interface

The environmental parameters can be set only after environmental parameters is enabled . If the environmental parameters function is enabled and set here, then the environmental parameters should be followed, or else the parameters in *Basic Parameter* should be followed.

Refer to the environmental parameters in chapter 3.1 for basic parameters settings.

Refer to chapter *3.2 Cold Hot Tracking* for settings of alarm rules and linkage way.

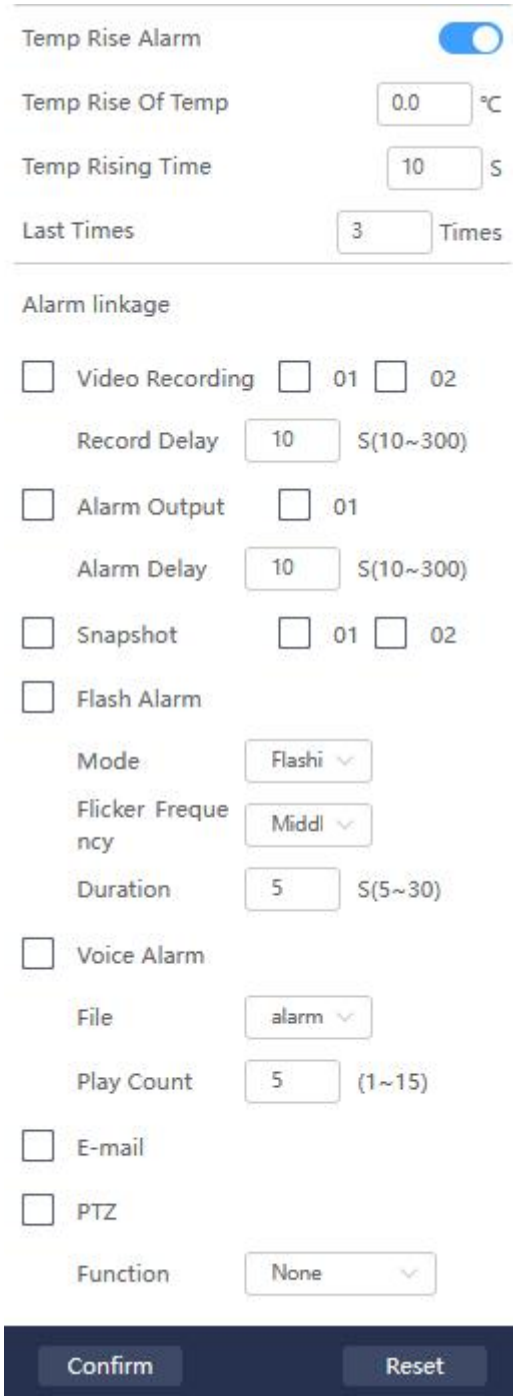


Figure 3.7 Thermography Analysis-Alarm Rules Interface

Confirm to delete ConfirmDelete

The info of drawn points, lines, area and shielding areas are displayed in the measurement lists, which can be ticked and deleted.

Check all Select All

The drawn measurement info can be checked all or not checked.

3.3.2 Temperature Measurement Drawing

Point/line/region Drawing: 

Click the icon point/line/region(circle,polygon,rectangle) to draw the corresponding temperature measurement graph in the video screen (drawing up to 12 points/line/region respectively, 36 in all, the point temperature will be displayed in real time, and the line/box will display 3 temperatures in real time (the highest /lowest temperature/average temperature).

Shielding Area: 

Click the shielding area icon to draw the shielded area on the video screen (up to12 shielded areas), and the temperature data will not be displayed in the shielded area.

Display Temperature Bar: 

Click the icon to activate/inactivate temperature bar, when turned on, the temperature bar including the highest and lowest temperature value will be displayed on the right side of the temperature measurement interface. When turned off, the bar will be hidden.The color of the temperature bar is consistent with current color palette.

The cold/hot spot tracing needs to be enabled before real-time temperature display.

Color Palette: 

20 palettes are supported as below.



Figure 3.8 Temperature-Palette

Temperature difference:

Compare several measurement regions (circle, rectangle or polygon), the comparison rules can be added, which can be regarded as the alarm trigger. Four articles of rules can be output at most.



Figure 3.9 Temperature measurement-temperature difference settings interface

Delete:

Click the delete icon in the lower right corner of the temperature measurement interface, the icon will become, and click the point/line/region/ shielding area in the screen to delete (the corresponding data in the temperature measurement list will also disappear after deletion).

1.The functions of deleting point/line/region/shielding area are mutually exclusive, and any two of them cannot be enabled at the same time.

2. If alarm is triggered in current measurement rule, it can be deleted, added again and new rules can be configured.

3.3.3 Scheduled Plan

Set the trigger time period of the full frame high/low temperature alarm event (full time by default), you can set 6 time periods every day in a week to activate the scheduled plan time period, accurate to seconds, and it can also realize the replication of the same time period. If an alarm occurs in the configured time period, the related alarm action will be linked, the full time period will be enabled by default.

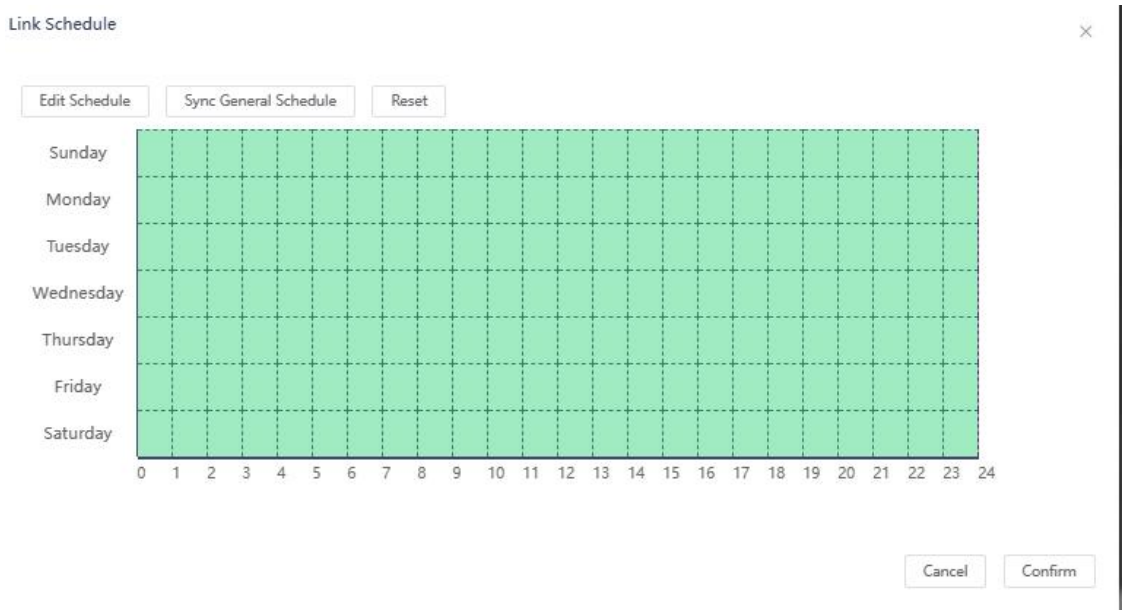


Figure 3.10 Temperature measurement-Scheduled Plan Settings

4. Smart Analysis

4.1 General Behavior Analysis

4.1.1 Trip Wire Intrusion

When the target moves across the cordon in the set direction, the system will generate an alarm and linkage setting action.

This function is supported both in visible channel and thermal channel.

Setting Steps:

1. Select channel: Smart-Trip Wire Invassion-Channel1/channel 2.
2. Select full frame for scenario by default;
3. Enable: enable/disable this function.
4. Click "+" in the upper right corner to add a new rule (up to 8 articles of rules can be added, and the parameter settings between different rules are completely independent), and set the rule name;
5. Click "Drawing Rules" to draw the rule on the monitoring screen, click "Clear" the current rule line is deleted, and click "Drawing Rules" again to draw the rule line again;
6. Direction: configure the tripwire direction: A->B, B->A or A<->B.
7. Set alarm linkage parameters: when an alarm is triggered, the corresponding actions will be linked;
8. Scheduled plan: set the time period for triggering the tripwire intrusion event;
9. Click "Confirm" to complete the setting. See below:

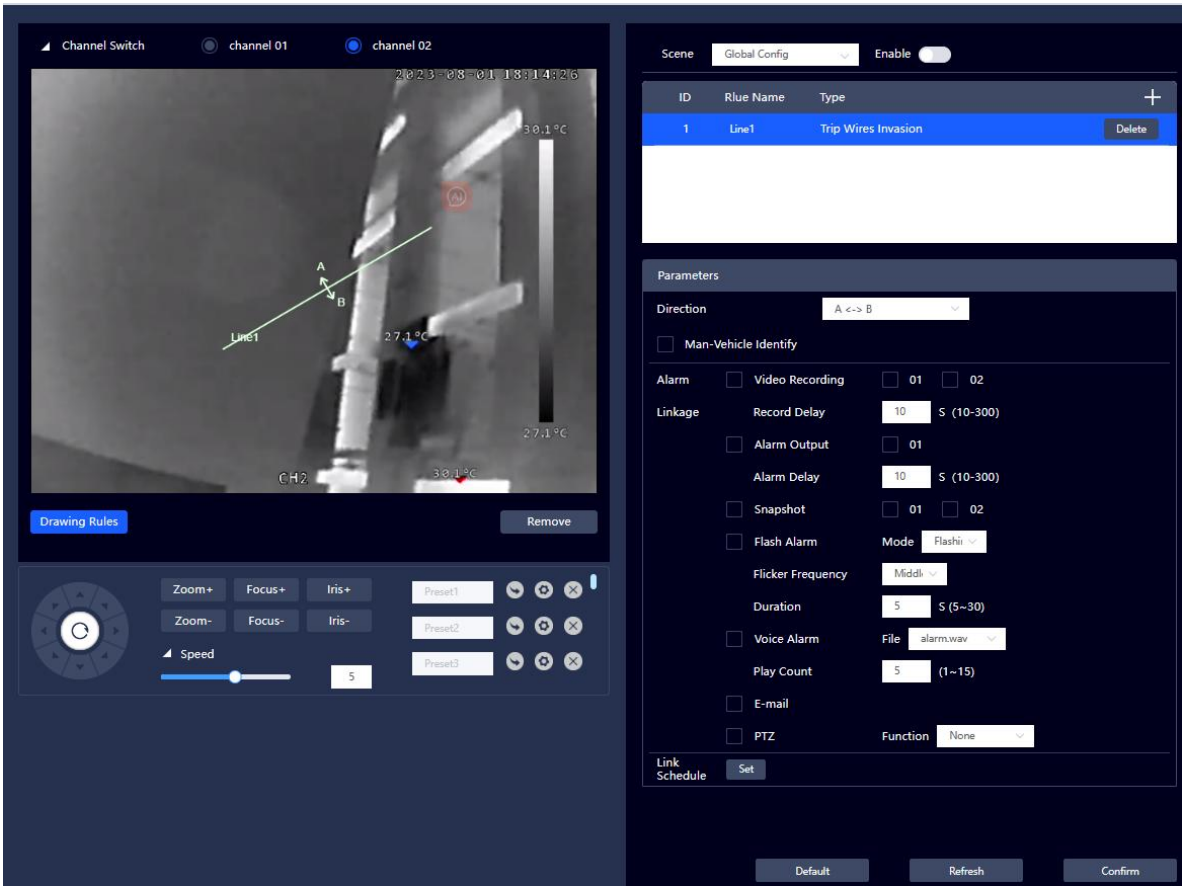


Figure 4.1 Trip Wire Intrusion Setting Interface

4.1.2 Regional Intrusion

When the target crosses the region (Enter/Leave/Pass in and out), the system generates an alarm and linkage setting action.

This function is available in both visible channel and thermal channel.

Setting Steps:

1.Select channel: Smart-Regional Invasion-channel 1/channel 2;

2.Enable: enable/disable the function;

3. Click "+" in the upper right corner to add a new rule (up to 8 rules can be added, and the parameter settings between different rules are completely independent), and set the rule name;

4. Click "Drawing Rules" to draw the rule on the monitoring screen, click "Clear" the current rule line is deleted, and click "Drawing Rules" again to draw the rule line again;

5. Direction: set the direction of regional intrusion, optional enter/leave/pass in and out;

■When "Enter" is selected, an alarm will be triggered when the target enters the area;

■When "Leave" is selected, an alarm will be triggered when the target leaves the area;

■When selecting "Pass in and out", an alarm will be triggered when the target enters or leaves the area;

6.Vehicle /person identification: after this function is selected, the filter identification of people and vehicle will be activated, select the type of alarm target(human/vehicle/all).This function is supported only by thermal imaging channels;

7. Set alarm linkage parameters: when an alarm is triggered, the corresponding actions will be linked;

8. Arming time: set the time period for triggering the tripwire intrusion event (default setting is full time);

9. Click "Confirm" to complete the setting. See below:

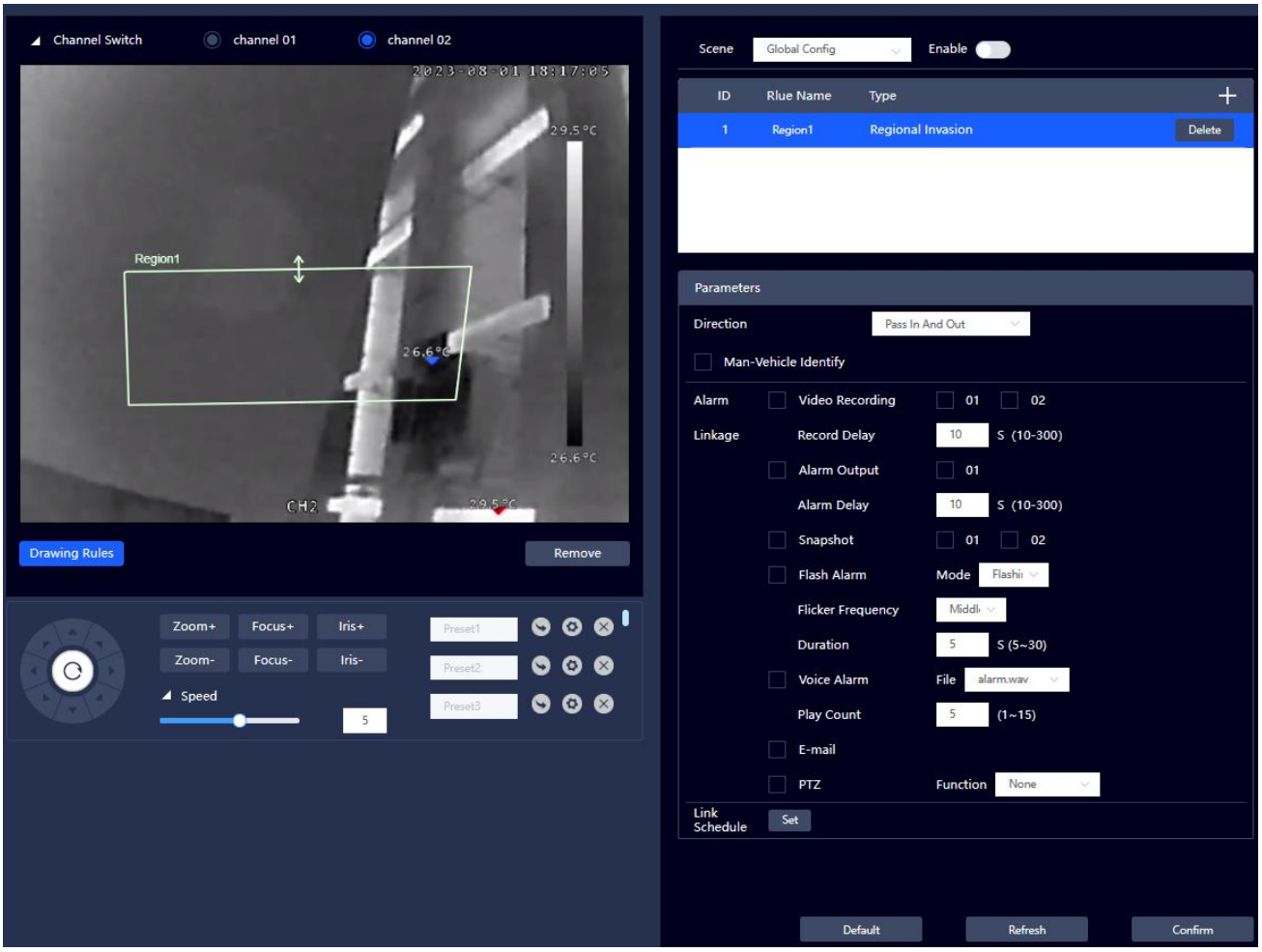


Figure 4.2 Regional Intrusion Setting Interface

Environment setup recommendations:

1.The distance requirement between the target and the camera:

The observing distance varies for cameras with different focal length and observing angle, the recommended distance is more than 2～3m.

2.Target Size Requirement:

Max.: the width should be shorter than 1/2 of the image width, the height should be shorter than the height of the image.

Min.: the width or height should be longer than the 1/16 of the image width or height.

4.1.3 Dynamic Detection

The system will make alarm and link the corresponding events when the moving target reaches the preset sensitivity.

This function is available in both visible channel and thermal channel.

Operation procedures:

1) Select the channel: Smart-Dynamic Testing-Channel 1/Channel 2.
2) Enable: enable/disable the function.
3) Set the sensitivity (height by default, the higher sensitivity will trigger the alarm more easily).
4) Area: at most four detecting areas can be set at the same time. The area color, area name, threshold and alarm rules can be set separately for each area.
5) Draw Area: click the icon of draw area, then you can draw the detecting areas. Different color indicates different detection area.
6) Remove: click remove button, the drawn area will be removed, click Draw Area again to draw other detection areas.
7) Threshold: detecting area value of dynamic valid area, the smaller the value is, the more easily the alarm will be triggered.
8) Set the alarm linkage parameters, the corresponding events will be linked when the alarm is triggered.
9) Set deploying time: the alarm events will be triggered only within the time range.
10) Click “OK” to finish the settings.

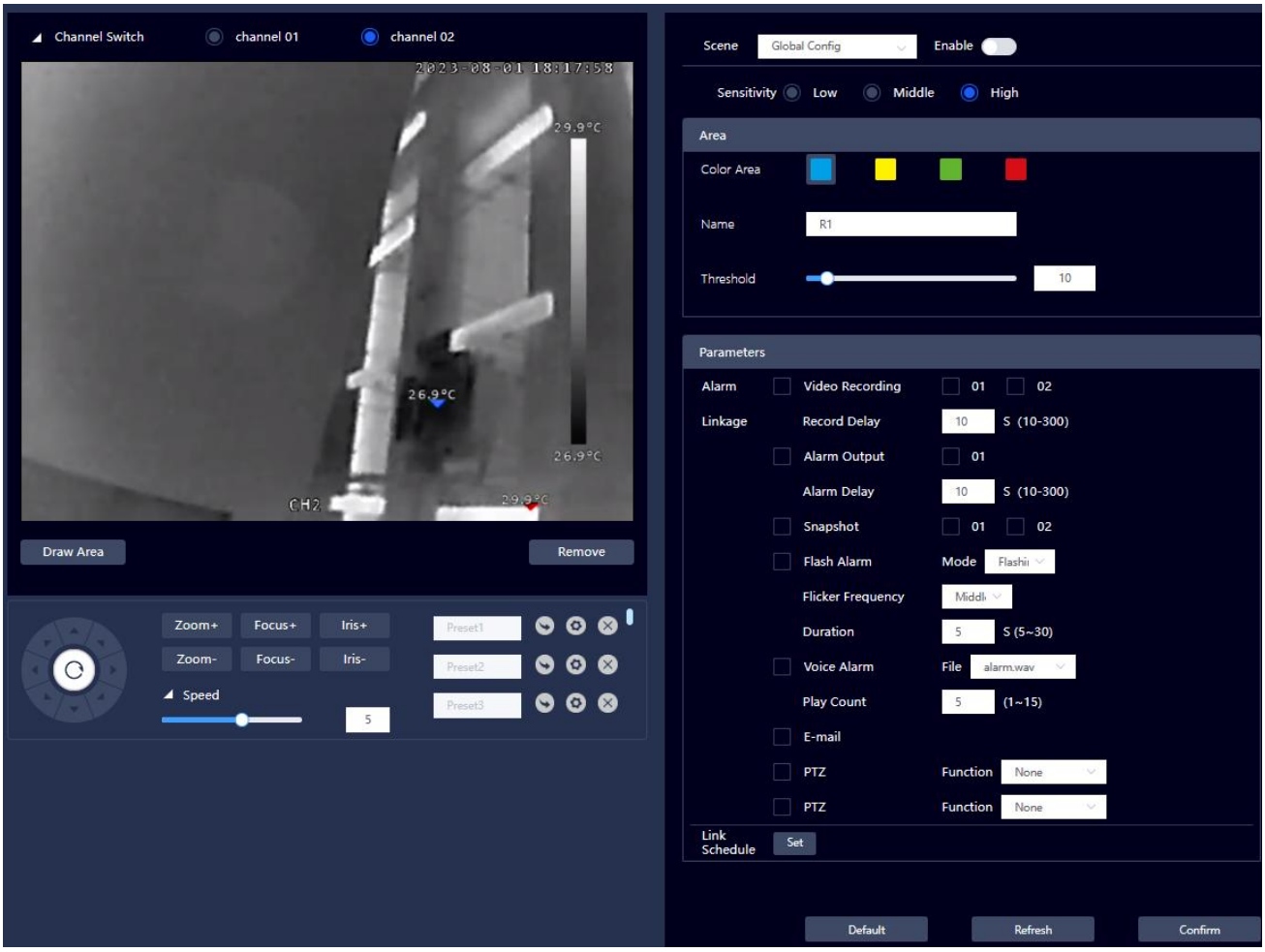


Figure 4.3 Set Dynamic Detection Interface

4.1.4 Global Config

Set the maximum and minimum value of the target filtering size, the alarm will be triggered only when the target size is between the two filtering boxes.

The maximum size by default is 8191*8191, the minimum size is 500*500, the size value uses the 8192 unified coordinate system within the internal program. For example, the resolution is **1920*1080,** then the actual size of 500*500 is 【500*(**1920**/8192)】 * 【500*(**1080**/8192)】）

Operation procedures:

1) Select channel: Smart-Global config-channel 1;

2) Select the maximum and minimum size, click Draw the Target, you can draw a filtering box in the video image by dragging the mouse. (The alarm will be triggered only when the target size is between the two filtering boxes).

3) Select the maximum and minimum size, click remove to delete the corresponding filtering box（The default filtering box will be displayed after deletion）;

4) Click Draw the Target again to draw another filtering box;

5) Click Confirm, as shown in the following figure:

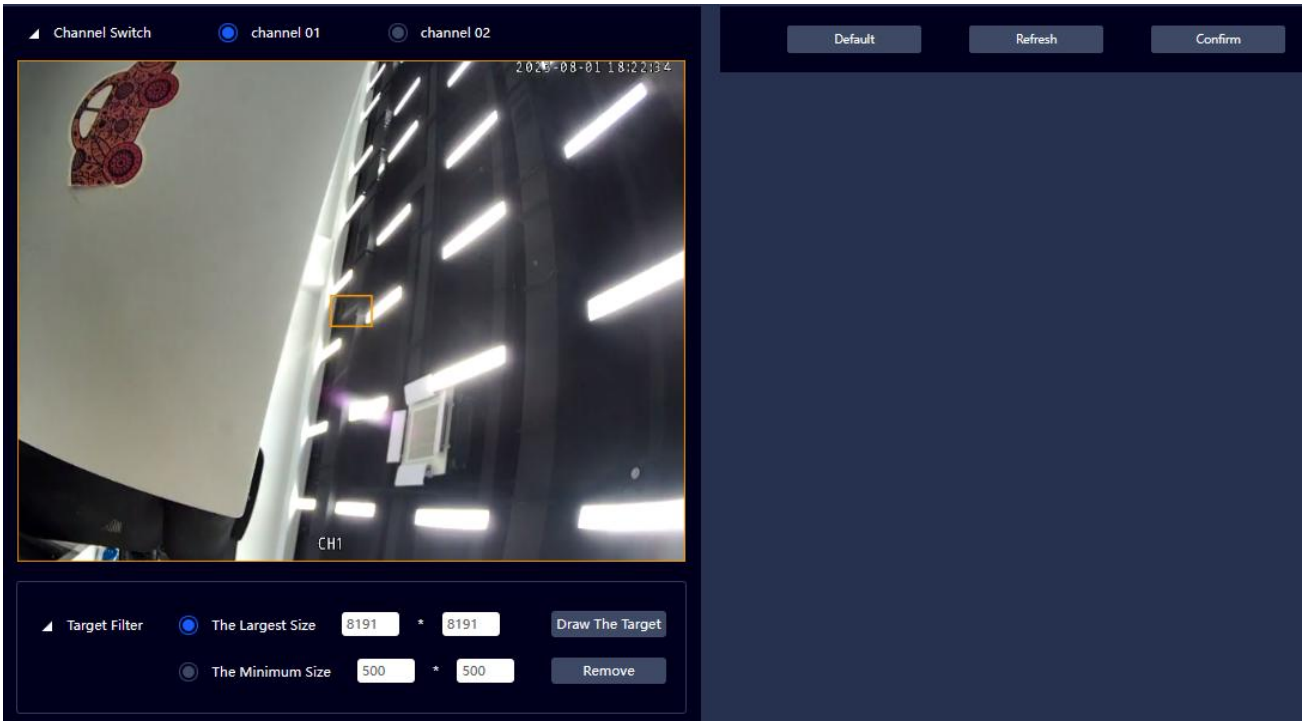


Figure 4.4 Global Config Setting Interface

The event analysis setting for Channel 2(thermal) is mostly the same as Channel 1(visible), the settings in the two channels are independent, they can be configured simultaneously.

4.2 Fire Warning

Set fire alarm rules. When it is judged as a fire by the system, an alarm and linkage setting action will be generated.

This function is only available in thermal channel.

Setting Steps:

1. Enable: enable or disable fire alarm;

2. Select the fire alarm mode according to actual needs: anti-interference or high response modes. Anti-interference mode by default.

3. Sensitivity: the greater the value, the more easily to detect the fire, 50 by default.

4. Draw Area: click the icon of draw area, then you can draw the fire detecting areas. Different color indicates different detection area.

5. Privacy mask: click the + button to add privacy mask names, 4 privacy masks at most;

6. Set the alarm linkage parameters and the corresponding actions will be linked when the alarm is triggered.

7. Set scheduled plan: the alarm events will be triggered only within the configured time range.

8. Click "Confirm" to complete the setting.

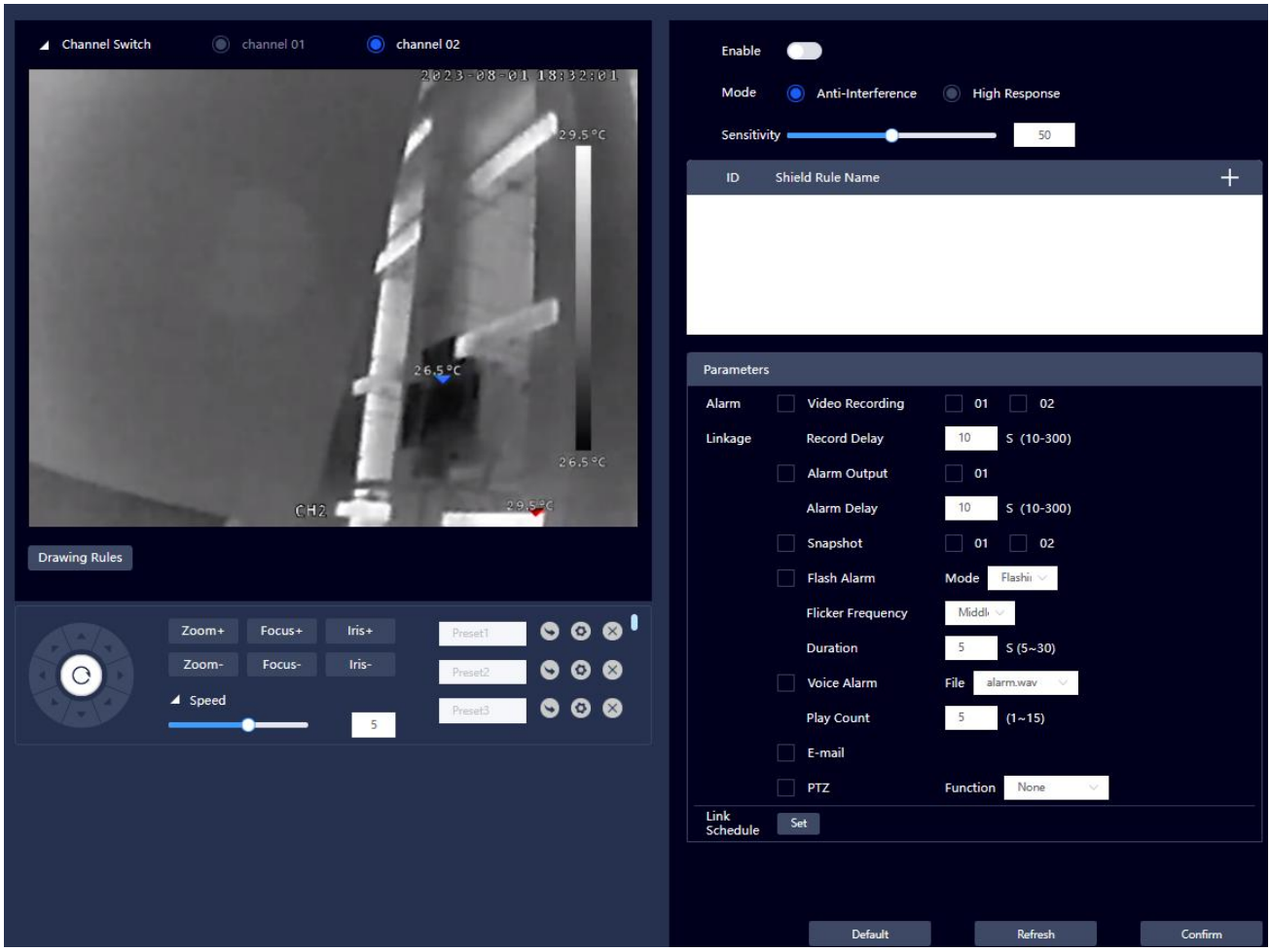


Figure 4.5 Fire Alarm Setting

4.3 Alarm Input

When an external alarm input generates an alarm, the system will generate an alarm and linkage setting action.

Precondition: The camera alarm input is connected to external alarm devices. For the wiring method, refer to the Quick Start Guide.

Setting Steps:

1. Enable: Enable or disable the alarm input;

2. Alarm input: the device supports 2-channel alarm inputs.

3. Image Stabilization: setting range is 0-100s, and only one alarm event is recorded in the image stabilization time period.

4. Sensor type: select "normally open" or "normally closed" according to the type of external alarm device sensor.

5. Alarm Linkage: set alarm linkage parameters and the corresponding actions will be linked when the alarm is triggered, refer to Chapter3.2 *Cold/Hot Spot Tracing* for parameter settings;

6. Scheduled Plan: the alarm events will be triggered only within the configured time range.

7. Click "Confirm" to complete the setting.

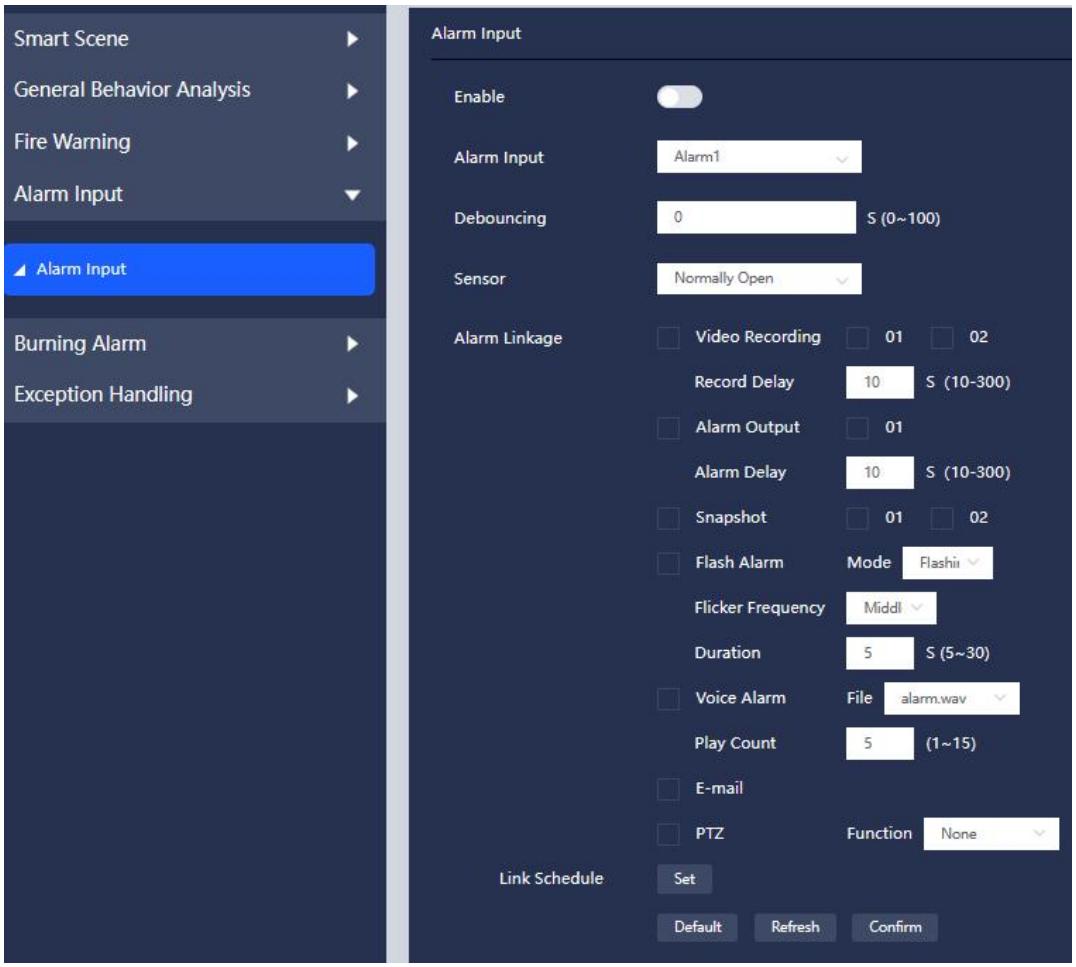


Figure 4.6 Alarm Input Setting

4.4 Burning Alarm

The strong light protection function will be enabled when the sun directly shines on the camera and the energy value reaches the threshold, the infrared lens shutter will be shut automatically and the linkage alarm will be triggered.

When the alarm is triggered, the video stream on the thermal channel is frozen, the switch can be disabled manually to cancel the solar protection, then the video stream will return to normal.

Operation procedures:

1) Enable the function.

2) Energy value: 0-100, the smaller energy value will trigger the alarm more easily.

3) Sensitivity: 0-100, the higher sensitivity will trigger the alarm more easily.

4) Alarm linkage: set the alarm linkage parameters, then the corresponding events will be linked when the alarm is triggered.

5) Deploying time: the alarm events will be triggered only within the time range.

6) Set “OK” to finish.

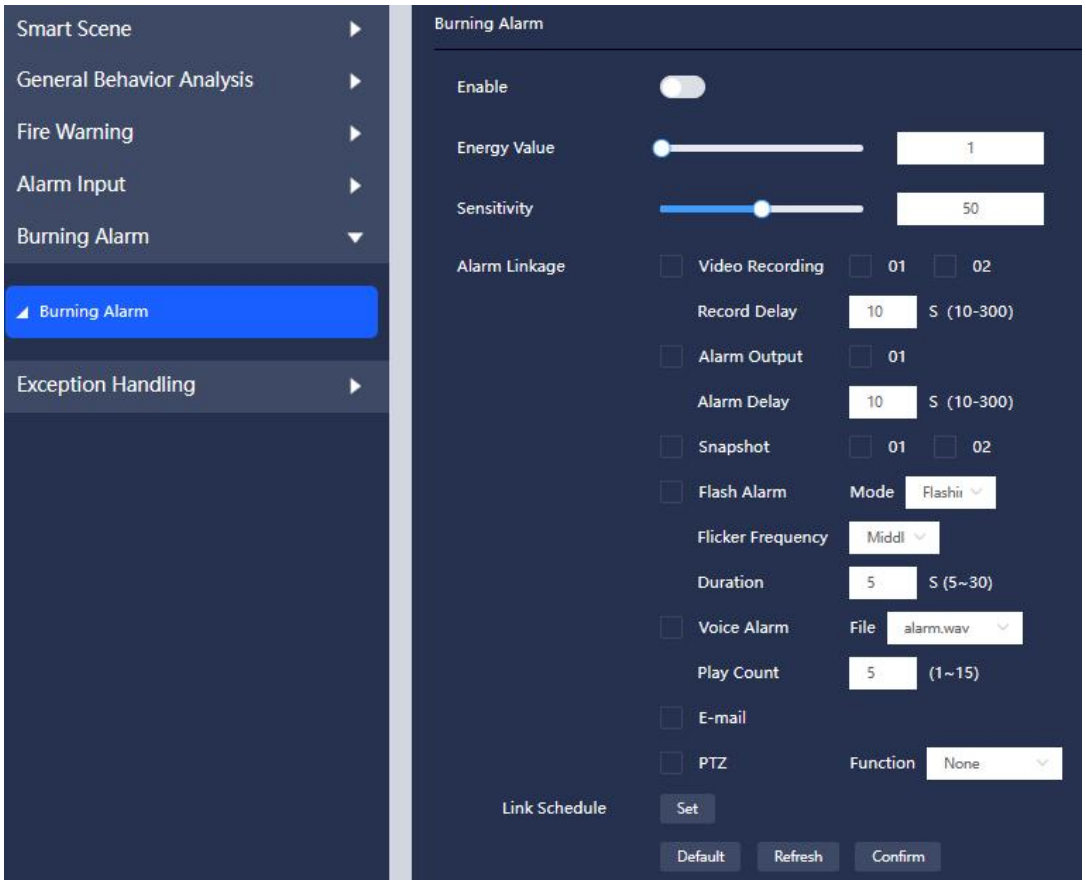


Figure4.7 Burning Alarm Setting Interface

4.5 Exception Handling

4.5.1 SD Card Exception

When there is some exception in SD card, the system will generate an alarm and linkage setting action or send Email to the specified mailbox.

SD card abnormalities include not existing or SD card error.

4.5.2 Network Anomaly

When the network is abnormal, the system will generate alarm output/video recording. The network abnormalities include network disconnection and IP conflicts.

4.5.3 Illegal Access

When the number of login password errors exceeds 5 times or access from an IP address not in the whitelist, the system will generate an alarm or send Email to the specified mailbox.

5. Settings

5.1 Camera Setting

5.1.1 Camera Parameters

Camera parameters can be set for both visible light and thermal imaging.

Channel 1--Visible Light

■Image Parameters Setting

Brightness: adjust the overall brightness of the image by linear adjustment, keep the default value, the larger the value, the brighter the image, and vice versa.

Contrast: The larger the value, the greater the brightness and contrast of the image, and vice versa; when the value is set too large, the dark areas of the image are too dark, and the bright areas are easy to overexpose. If the setting is too small, the image will be blurred.

Saturation: the larger the value, the brighter the image color; the smaller the value, the lighter the image color.

Acuity: adjust the sharpness of the image edge; the larger the value, the more obvious the image edge; when the value is larger, the image is prone to noise.

3DNR:remove the temporal noise(3D) , generally keep the default value. The larger the value, the better the noise reduction effect to ensure the output image stability, but the more serious the motion blur is.

Style: "Standard, Soft, Gorgeous" can be selected.

■Standard: the overall color of the image is neutral, not dark or light.

■Soft: the overall color of the image is soft and light.

■Gorgeous: the overall color of the image is brighter and darker.

Flip: there are four modes to be selected;

Up-down flip: both visual image and thermal image will flip 180º up down.

Horizontal flip: both the visual image and the thermal image will flip 180º from left to right.

180º flip: the visual image and thermal image flip 180º both up down and left to right.

Normal: the image returns to normal state.

De-fog: the visual image quality will degrade in environment with fog and haze, then the de-fog function can be enabled to improve the image sharpness.



Figure 5.1 Camera Parameters Setting

■ Exposure Parameters Setting

FLK: outdoor/50Hz/60Hz can be selected.

50Hz: auto/manual adjust exposure, and make sure there is no cross stripe on the image;

60Hz: auto/manual adjust exposure, and make sure there is no cross stripe on the image;

Outdoor: manual switch exposure mode to achieve the corresponding effect.

Mode: manual/automatic can be selected; Exposure time and gain can be set in manual mode to achieve image display brightness.

Exposure Strategy: None/Strong Inhibition/Backlight Compensation can be selected.

None: the backlight mode is disabled;

Strong Inhibition: weaken the strong light part and brighten the dark area to achieve the light balance of the whole picture.

Backlight Compensation: solve the problem of darkening of foreground objects due to underexposure.

See the following picture:



Figure 5.2 Exposure Setting

■ **Day and Night Conversion**

Day Night Mode: Automatic/Colour/Black and White/Time Period can be selected.

Automatic: switch the day/night mode automatically;

Color: the system will be forced to switch to day mode;

Black and White: the system will be forced to switch to night mode;

Time Period: you can customize the time period during day or night, and the camera will auto switch between day and night mode based on the current time and configured time period.

Delay: delay setting is supported in automatic mode. The delay time will be set within the range 2-10s.

To improve user experience, it is recommended to enable the NTP function to ensure that the current camera time is consistent with the actual time.

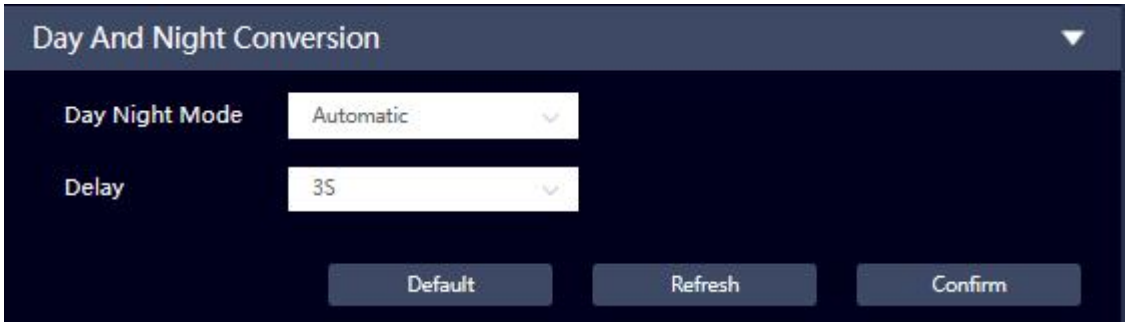


Figure 5.3 Day and Night Conversion

Thermal Imaging Channel

■ Image Adjust

Brightness and contrast: refer to the descriptions of visible channel for detailed information.

Background correction: the image is optimized according to the current scene background;

Shutter correction: the image is optimized through shutter adjustment;

Image Enhancement

2D NR: remove the spatial noise of the image. The larger the value is, the less the image noise is, but the more blurred the image details are;

3D NR: remove the 3D noise of the image, keep the default value. The larger the value is, the better the noise reduction effect, to ensure stable image output, but the image tail of the moving objects more serious.

DDE: enhance the image detail manually, the higher the level, the better the detail, but the bigger the noise;

Regional video enhancement: select the ROI or important parts of the image, set the video quality enhancement area, the image of the selected area is more bright and clearer. You can choose 25% center point, 50% center point, 75% center point, full screen, bottom, middle, top and custom, corresponding to different positions and ranges in the screen.

Select "Custom", click "Draw", and then hold the left button on the screen and drag to add the video quality enhancement box. After selecting the corresponding region option, an orange box marks the selected region in the left preview screen.

Color palettes: there are 20 types: white hot, black hot, rainbow, HC rainbow, Iron, Lava, Sky, MidGrey, RdGy, PuOr, Special, Red, IceFire, GreenRed, Special 2, RedHot, Greenhot, Bluehot, Green, Blue.

Image flip: available in original image mode, unavailable in image fusion mode .

Fusion: overlay the visible channel data with the thermal channel data, retain the gray information of visible image and mark different temperatures with different color palettes to make the video image of thermal channel clearer.

Refer to the following figure for the image fusion parameters.

Image Fusion Ratio: 0 stands for visual image, 100 stands for thermal image, 50 stands for the default dual-spectrum overlay effect;

Edge Fusion Ratio: 0 stands for no edge fusion, 100 stands for highlighted edge fusion, 50 stands for the default dual-spectrum edge fusion;

Horizontal compensation: change the horizontal parameters, align the visual image with the thermal image in horizontal;

Vertical compensation: change the vertical parameters, align the visual image with the thermal image in vertical.

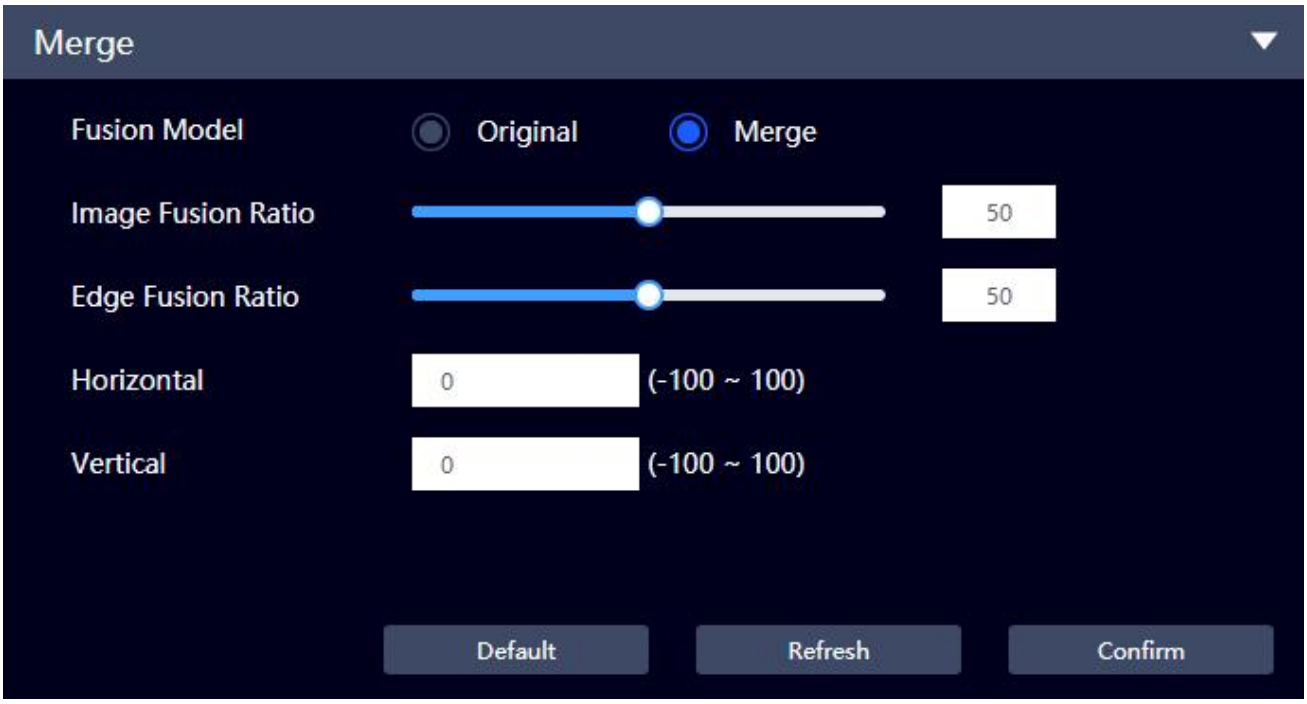


Figure 5.4 Merge Settings Interface of Thermal Channel

5.1.2 Video

5.1.2.1 Video Stream

Visible Light

Main Stream

Main stream: the resolution, code rate and image quality is relatively high, can be used for HD preview, video and so on.

The preview image is two-channel sub stream by default. You can double-click any channel to switch from sub stream to main stream (single channel), and you can restore two-channel sub stream by right-clicking.

■Encoding Scheme:

H.264: main Profile encoding.

H.265: High Efficiency Video Coding. Higher-quality network videos can be transmitted under limited bandwidth, and videos of the same quality can be played with only half of the original bandwidth.

■Resolution: the actual resolution shall prevail.

■Video Frame Rate: the number of frames a video contains per second; the higher the frame rate, the more realistic and smooth the image.

PAL supports up to 25 frames, NTSC supports up to 30 frames.

■Stream Control: CBR is a fixed stream, and VBR is a variable stream. The image quality can only be set in the variable stream mode, not in the fixed stream mode.

■Picture Quality: the picture quality can be set only in VBR mode, and six levels of 1-6 can be set, the higher the level, the better the picture effect, the larger the code stream, but it will not exceed the stream limit.

■Stream Limit: in variable stream mode, this value is the upper limit of code stream; while in fixed stream mode, this is a fixed value.

■Frame Spacing: the number of P frames between two I frames ranges from the size of the set frame rate to the maximum value of 150. It is recommended to set it to 2 times the frame rate.

Sub Stream

■Encoding Scheme:

H.264: Main Profile encoding scheme.

H.265: High Efficiency Video Coding. Higher-quality network videos can be transmitted under limited bandwidth, and videos of the same quality can be played with only half of the original bandwidth.

■Resolution: the actual resolution shall prevail.

■Video Frame Rate: the number of frames a video contains per second; the higher the frame rate, the more realistic and smooth the image.

Note: P system supports up to 25 frames, N system supports up to 30 frames.

■Stream Control: CBR is a fixed stream, and VBR is a variable stream. The image quality can only be set in the variable stream mode, not in the fixed stream mode.

■Picture Quality: the picture quality can be set only in VBR mode, and six levels of 1-6 can be set , the higher the level, the better the picture effect, the larger the code stream, but it will not exceed the stream limit.

■Stream Limit: in variable stream mode, this value is the upper limit of code stream. While in fixed stream mode, this value is a fixed value.

■Frame Spacing: the number of P frames between two I frames, ranges from the size of the set frame rate to the maximum value of 150. It is recommended to set it to 2 times the frame rate.

 The parameter settings of main stream in thermal channel(Channel 02) is basically the same as visible channel, except for the supported resolution and reference stream value.

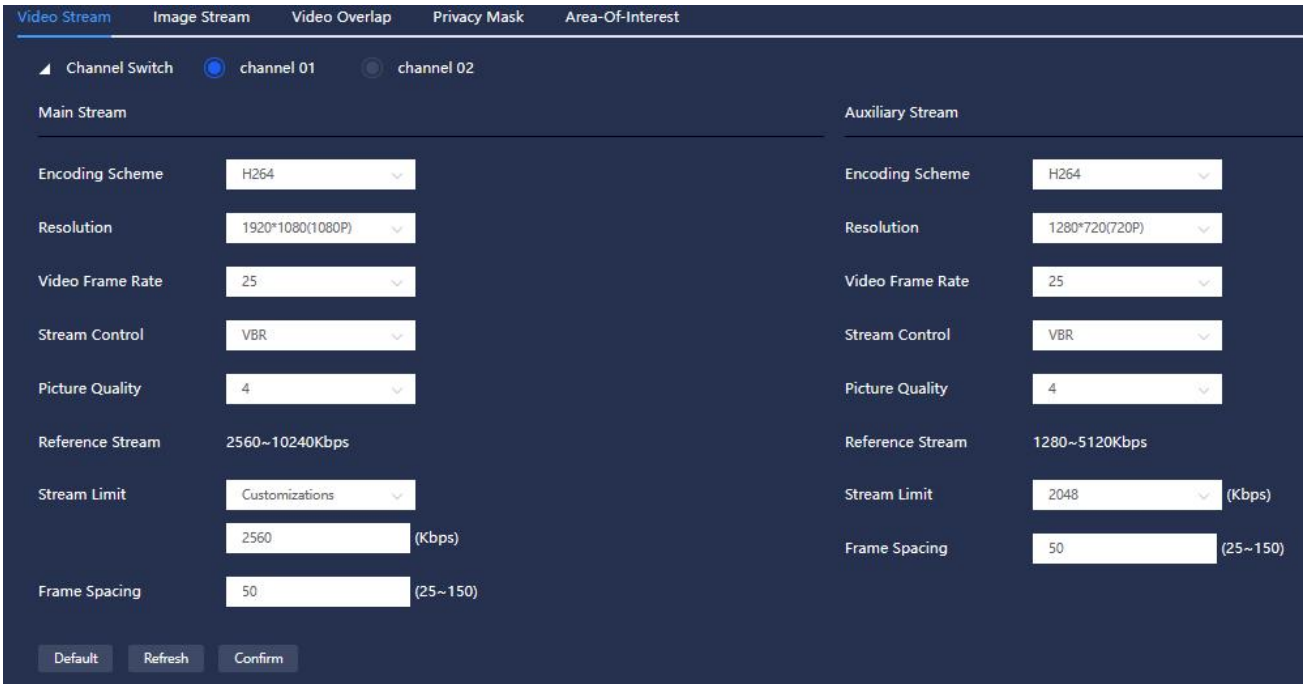


Figure 5.5 Video Stream Settings of Visible Channel

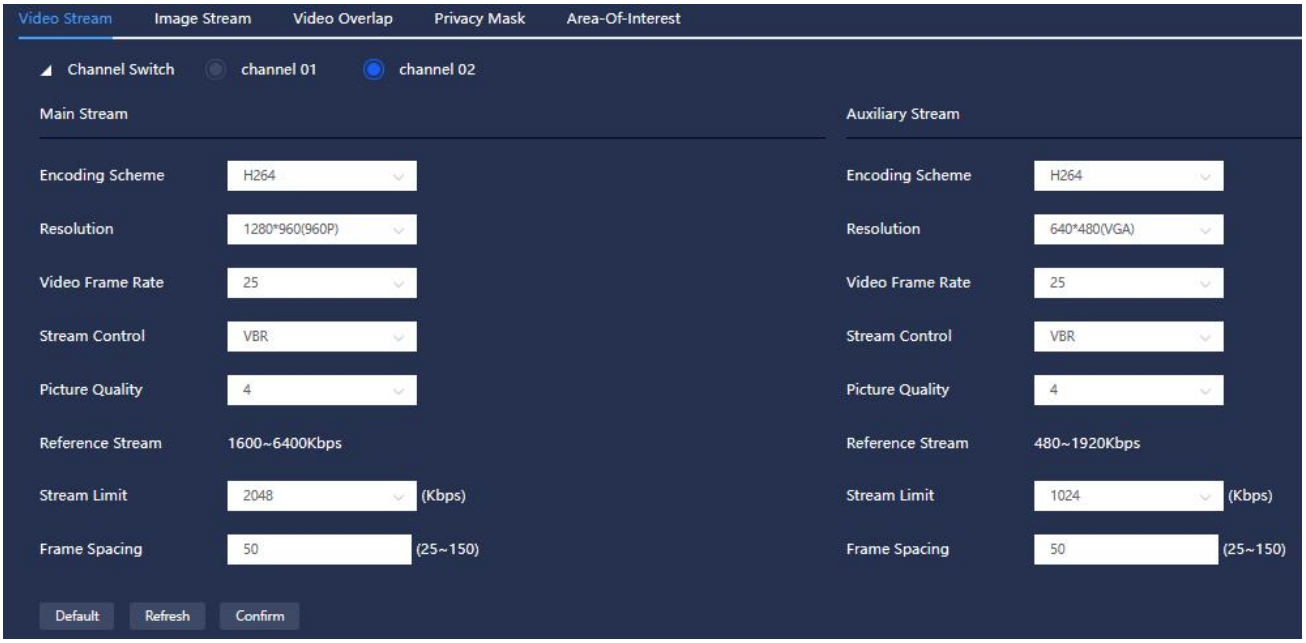


Figure 5.6 Video Stream Settings of Thermal Channel

5.1.2.2 Image Stream

Visible Channel

■**Image Size:** The size of the captured image is consistent with the set resolution.

■**Image Quality:** You can choose the 6 levels of image quality as best (6), better (5), good (4), poor (3), worse (2), and worst (1).

■ **Capture Interval:** the rate of capture.

The image stream setting of thermal imaging channel(channel 02) is similar to that of the visible channel.

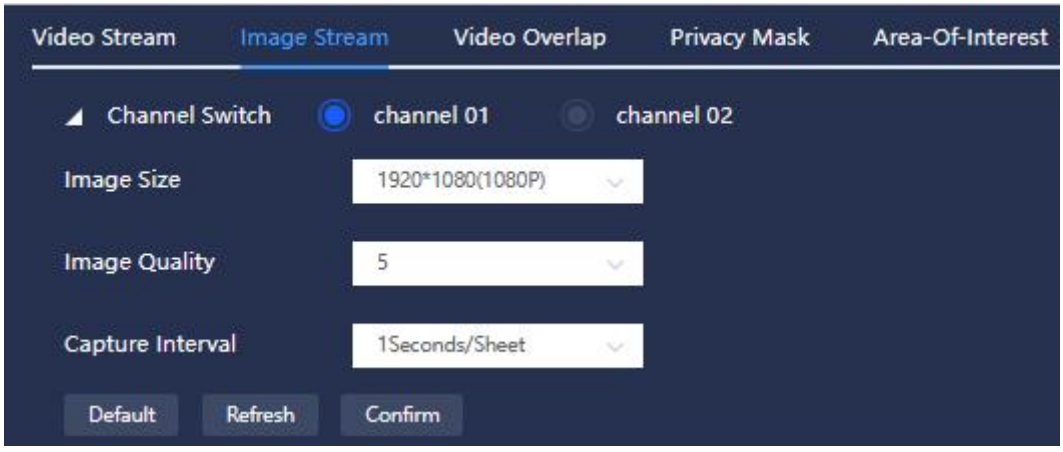


Figure 5.7 Image Stream Settings of Visible Channel

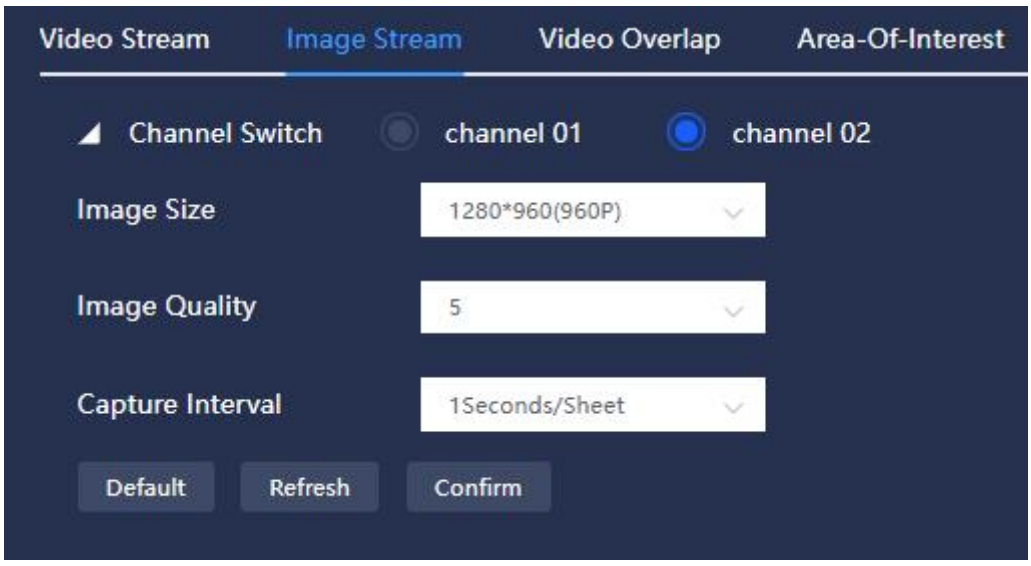


Figure 5.8 Image Stream Settings of Thermal Channel

5.1.2.3 Video Overlay

Visible Channel

Channel title: you can configure the channel title when it needs to be displayed in the image.

Operation procedures:

1. Enable: Enable/disable the function;

2. Enter the channel title in the input box;

3. Drag the channel title box with the mouse in the image to adjust the position of the channel title;

4. Set the font color;

5. Click *Confirm* to complete.

The channel title settings in thermal channel are similar to those in visible channel.



Figure 5.9 Video Overlay -Channel Title Settings

■ **Custom Title:** you can set the custom title when you need to display multiple lines of custom titles in the video screen.

Steps:

1. Enable: enable or disable the custom title;

2. Enter the content of multiple lines of custom title in the custom title input box (up to 4 lines of input are supported);

3. Drag the custom title area frame with the mouse to adjust the position of the custom title in the video screen;

4. Set the fond color.

5. Click "Confirm" to complete the setting.

The custom title setting of the thermal imaging channel is similar to that of the visible light channel.



Figure 5.10 Video Overlay—Custom Title Settings

■ **Time Title:** you can set the time title when you need to display time title in the video screen.

Steps:

1. Enable: enable or disable the time title;

2. Drag the time title box with the mouse to adjust the position of the time title in the image;

3. Display week, enable/disable this function;

4. Set the font color.

5. Click *Confirm* to complete the setting.

The time title setting of the thermal imaging channel is similar to that of the visible light channel.

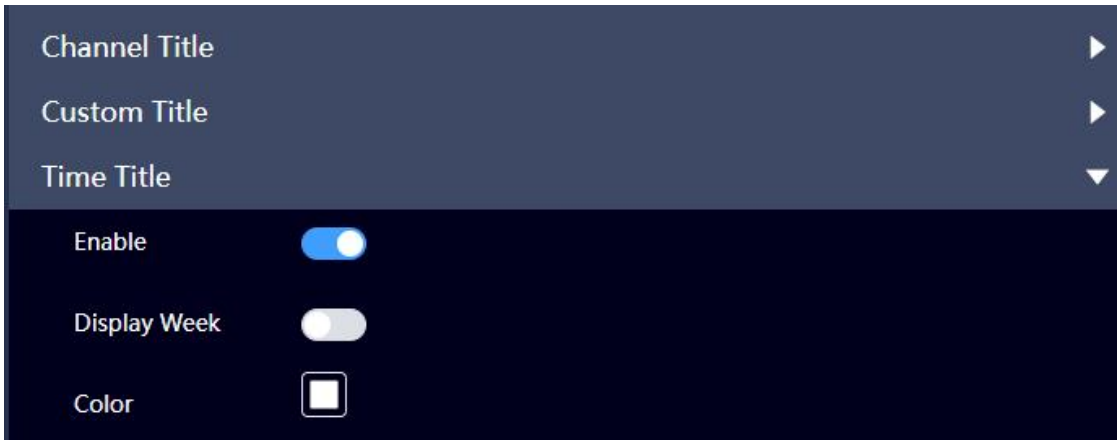


Figure 5.11 Video Overlay—Time Title Settings

5.1.2.4 Privacy Mask

Draw a privacy mask in the image, and the area will be displayed according to the configured number of privacy mask.

Operation steps:

1. Enable: Enable/disable the function;

2. Click *Draw Area*, hold the left button to draw the privacy mask area on the image (only one privacy mask can be drawn at the same time, at most four privacy masks are supported), click *Delete*, select the area to delete; Click *Draw Area* to redraw the privacy area.

3. Click *Confirm* to complete.

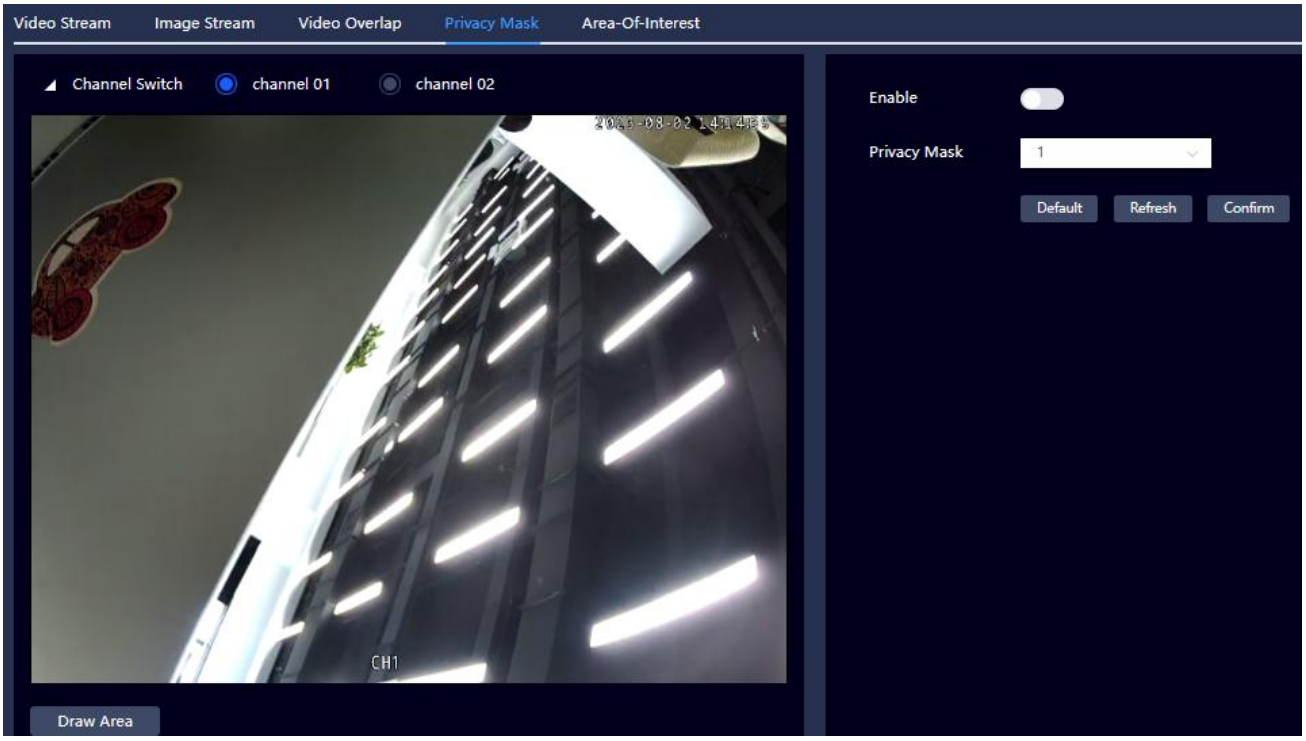


Figure 5.12 Privacy Mask Settings

5.1.2.5 Region of Interest

Set the region of interest in the screen, and the area of interest will be displayed according to the set image quality.

Steps:

1. Enable: enable or disable the area of interest;

2. Click "Draw Area" to draw the area of interest on the video screen (up to 8 areas can be set), and set the image quality of the corresponding area of interest; Click "Delete" to delete the selected area frame; Click "Draw Area" to draw the area of interest again.

3. Click "Confirm" to complete the setting.

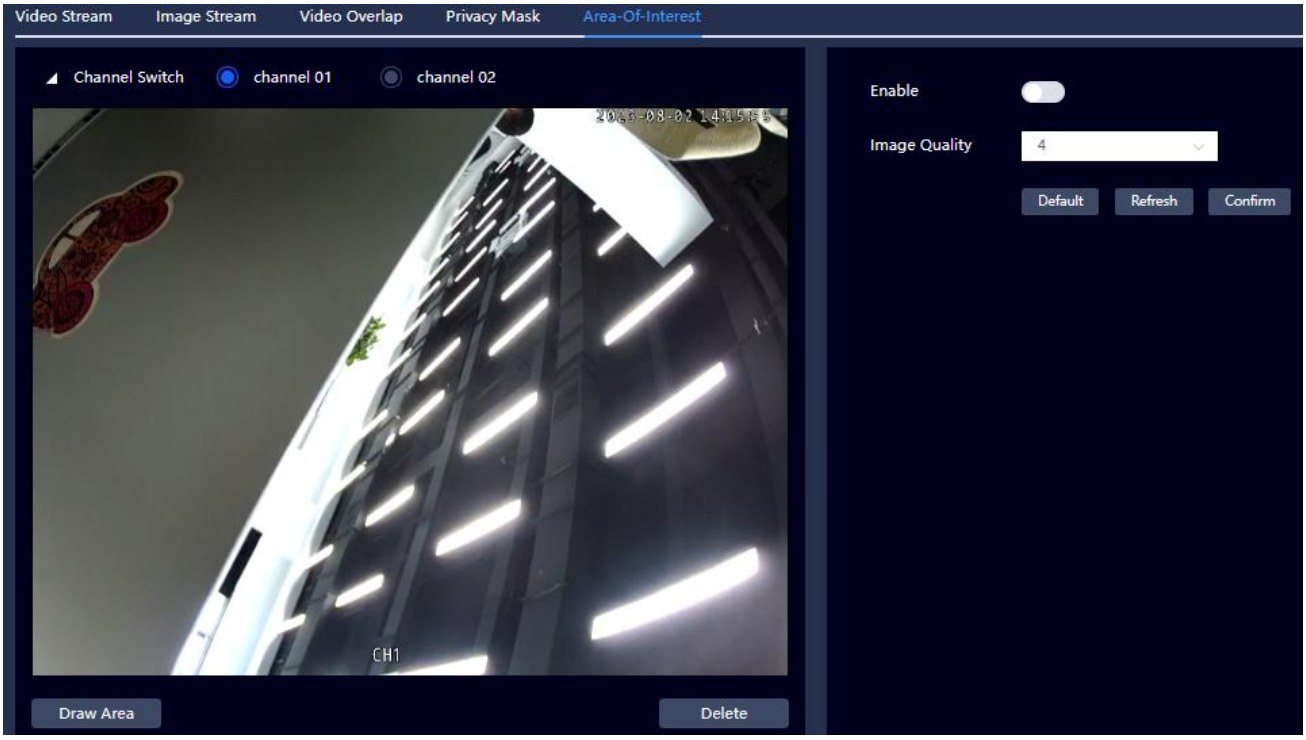


Figure 5.13 Region of Interest Setting

5.1.3 Audio

5.1.3.1 Audio Settings

Coding

Enable: enable or disable this function, the audio can be enabled only when the video is enabled;

Encoding Scheme: the encoding scheme of the audio, which contains PCM, G.711A, G.711U and AAC, the set audio encoding scheme will make audio and voice intercom take effect at the same time.

Sampling Rate: the audio sampling frequency, 16K;

Attribute

Audio Input Type: support LineIn

Mic Volume: adjust the mic volume.

Speaker Volume: adjust the speaker volume.

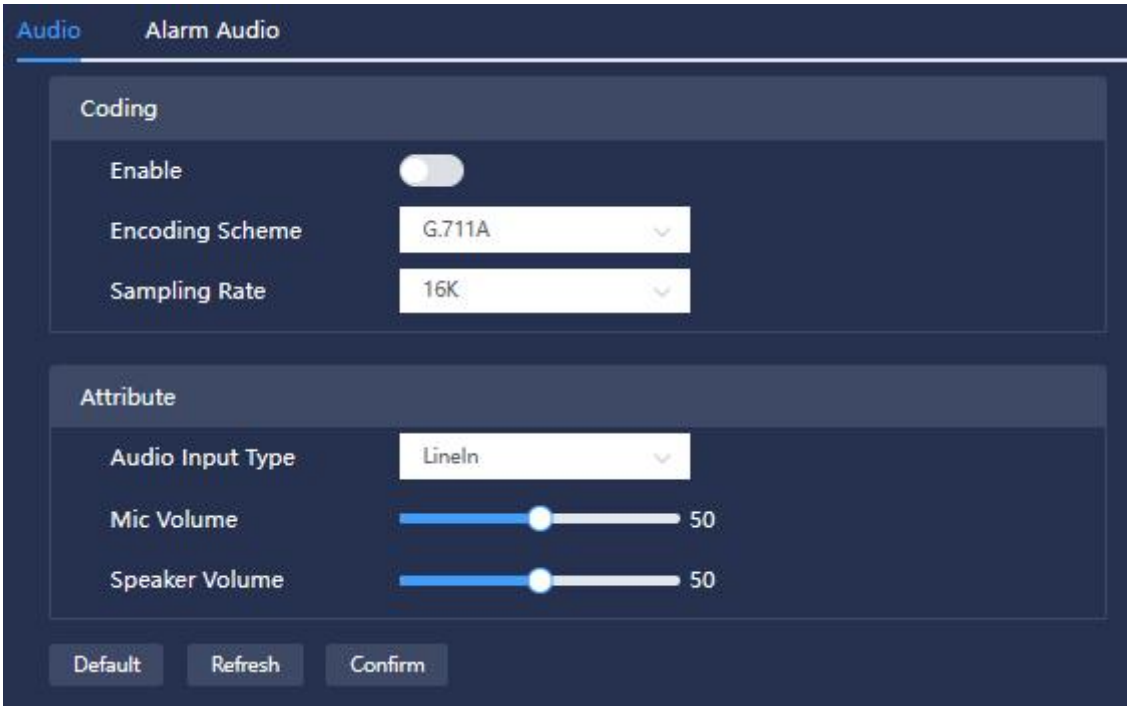


Figure 5.14 Audio Settings Interface

5.1.3.2 Alarm Audio

There is a default alarm audio(alarm.wav), and the user can upload the alarm audio, which needs to meet the audio file requirements: sampling rate 16k, sampling accuracy 16bit, encoding type （PCM/G711A/G711U）, the files can be downloaded, deleted and the file name can be revised.

See the following figure:

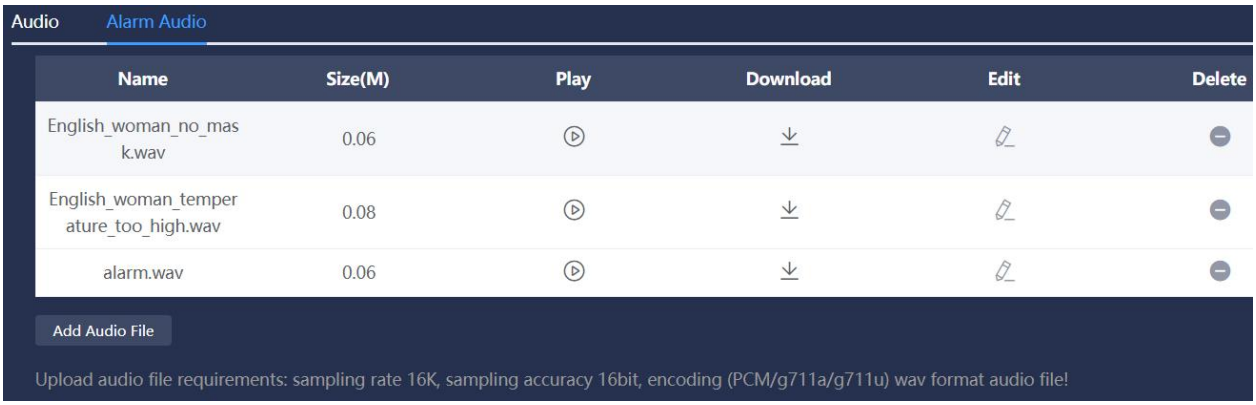


Figure 5.15 Alarm Audio Setting Interface

5.2 Network Settings

5.2.1 TCP/IP

Set the IP address and DNS server of the camera to ensure that it can communicate with other devices in the network. See below:

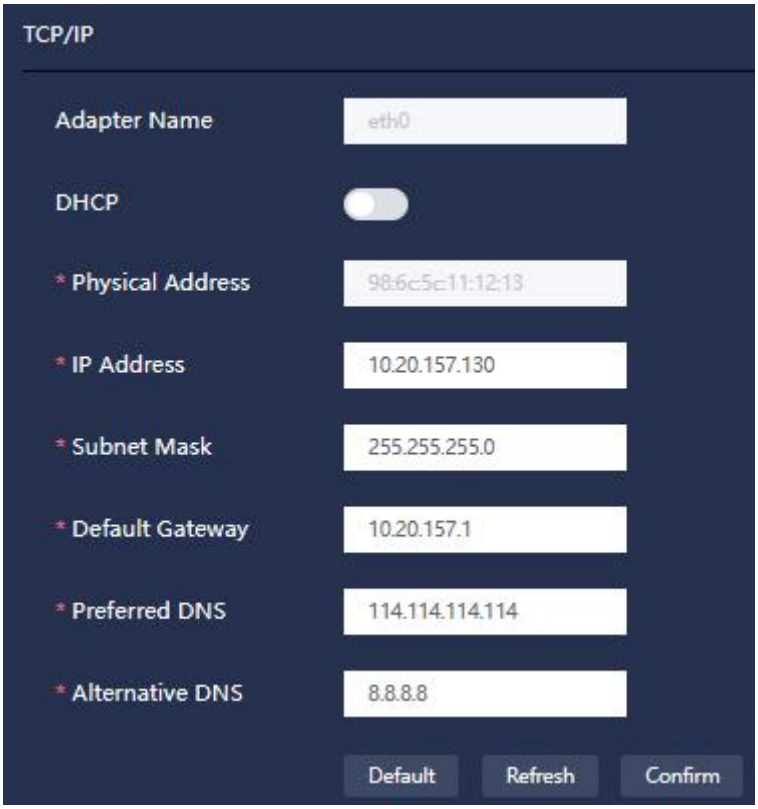


Figure 5.16 Network Settings—TCP/IP Setting

Other parameters:

■DHCP:

1. It is in static mode when disabled. You can manually set the IP address, subnet mask, and gateway.

2. The camera will automatically obtain an IP address when this function is enabled(there is a router with DHCP enabled in the network connected to the camera); Now the *IP address*, *subnet mask* and *default gateway* cannot be configured.

■MAC address: display the MAC address of the host, which cannot be changed.

■IP address/subnet mask/default gateway: input the correct "IP address", "subnet mask" and "default gateway" according to the actual situation; the IP address and default gateway must be in the same network segment and matched with the subnet code.

■Preferred DNS server: DNS server IP address.

■Alternative DNS server: IP address of alternative DNS servers.

5.2.2 DDNS

By setting the DDNS parameters, the system can dynamically update the relationship between the domain name and IP address on the DNS server when the device's IP address frequently changes, and you can directly use the domain name to remotely access the device without recording the constantly changing IP address.

Server Type: supports 4 types (oray DDNS, NO-IP DDNS, Dynans DDNS, pubyun DDNS).

Server Address: each server type has a corresponding address.

Domain: the domain name registered by the user on the website of the DDNS server provider.

Port: the port can be customized.

Username/Password: enter the username and password obtained from the DDNS service provider; users need to register an account (including username and password) on the DDNS server provider website.

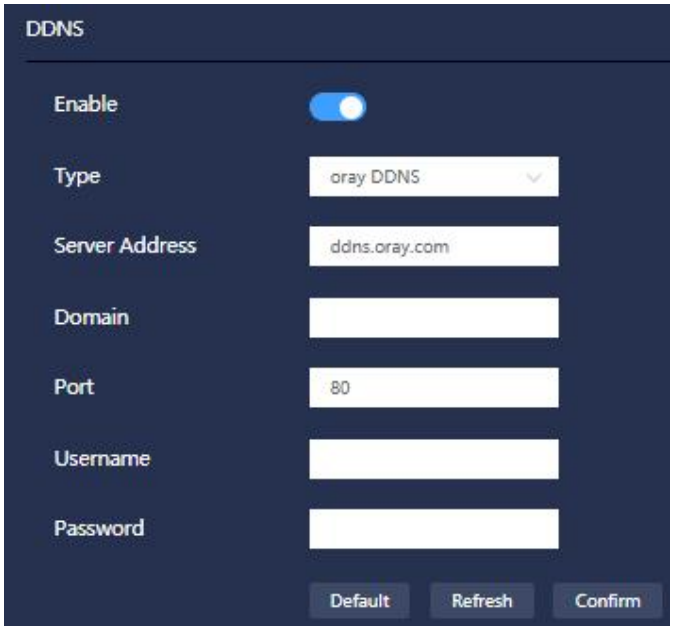


Figure 5.17 Network Settings-DDNS Setting

5.2.3 SMTP

Set the mailbox information. After enabling the "mail" function of the alarm linkage, the system will send an alarm email to the designated recipient when an alarm is triggered.

SMTP Server: different mailbox types have different server addresses; for example: (163 mailbox server address: smtp.163.com/Sina mailbox server address: smtp.sina.com, etc.).

Port: the port is related to the encryption method (the port for SSL encryption is generally 465, and the port for TLS or non-encryption is generally 25).

Username/Password/Sender: fill in the sender's mailbox information according to the actual situation.

Encryption: three options of None/SSL/TLS are optional.

Theme: email subject information.

Recipient: recipient's email address.

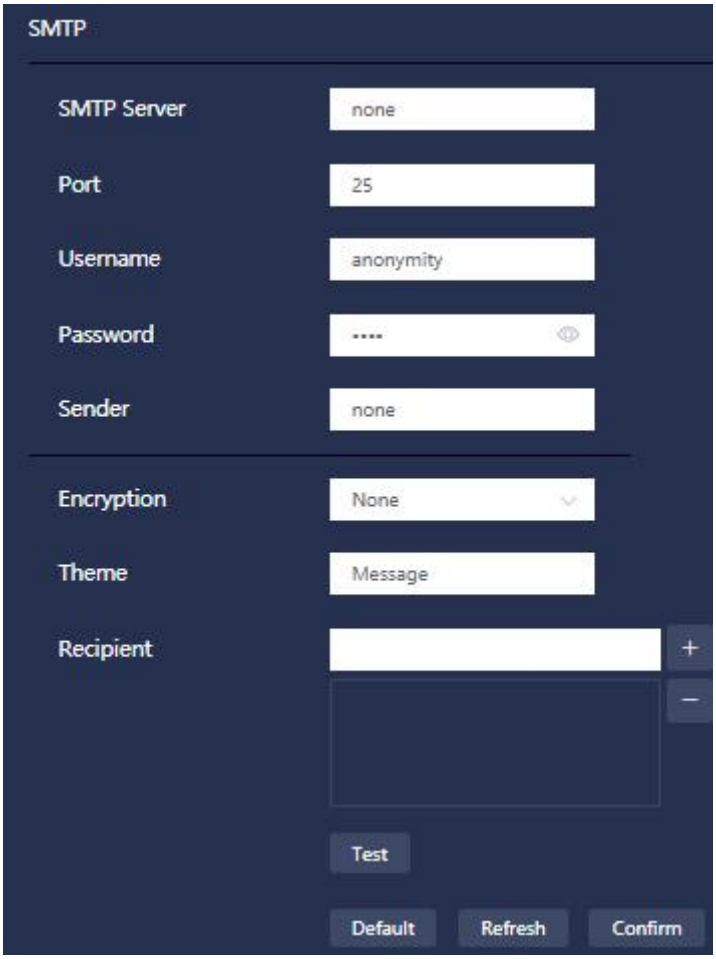


Figure 5.18 Network Settings-SMTP Setting

5.2.4 UPnP

Establish a mapping relationship between the private network and the external network through the UPnP protocol, and users of the external network can access the internal network device by accessing the external network IP address.

Prerequisites:

1. Make sure that the PC has installed the UPnP network service;
2. Log in to the router and set the router's WAN port IP address to access the external network;
3. The router enables the UPnP function;
4. Connect the device to the router's LAN port and access the private network;
5. Set the "IP address" of the device to the private network IP of the router, or select "DHCP" to obtain an IP address automatically.

Steps:

1. Enable the UPnP interface;
2. Select the port mapping method and the corresponding service name.
3. UPnP is divided into two mapping modes: custom and default.
   - "Custom" mode: users can modify the external port.
   - "Default" mode: users do not need to change the mapping and port.
4. Click "Confirm" to complete the setting.

Note: Enter "http://external network IP: external port number" in the browser to access the private network device with the corresponding port number in the router.

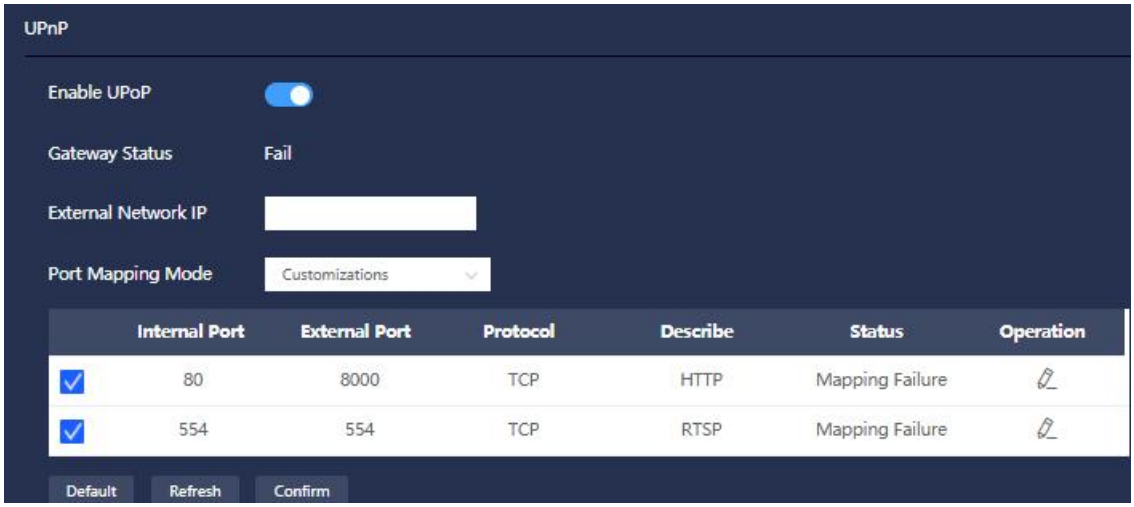


Figure 5.19 Network Settings-UpnP Setting

5.2.5 FTP



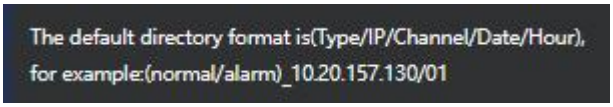
Figure 5.20 Network Settings-FTP Setting

1. FTP is enabled;

2. Set the FTP address (e.g. 10.10.18.160), port number (e.g. 21), user name, password, etc., and perform network tests on the FTP;

3. Storage Directory: the location of the server where the snapshots are stored.

Default directory: the default directory when configuring the server, as shown in the following figure:



Custom directory: set a custom remote server storage directory.

4. Click "Confirm" to complete the setting.

5. This setting can be used to save the captured pictures in the corresponding FTP designated directory in the "Capture Plan".

Go to "Settings"→"Storage Management"→"Capture Plan"→"Storage"→Select "Upload FTP" and click "Confirm", as shown in the figure below:

The schedule is used to one-shot synchronize the time period configured in the general schedule when setting the scheduled plan and video/capture plan. The general schedule can be edited (drag and click) or one-click reset.

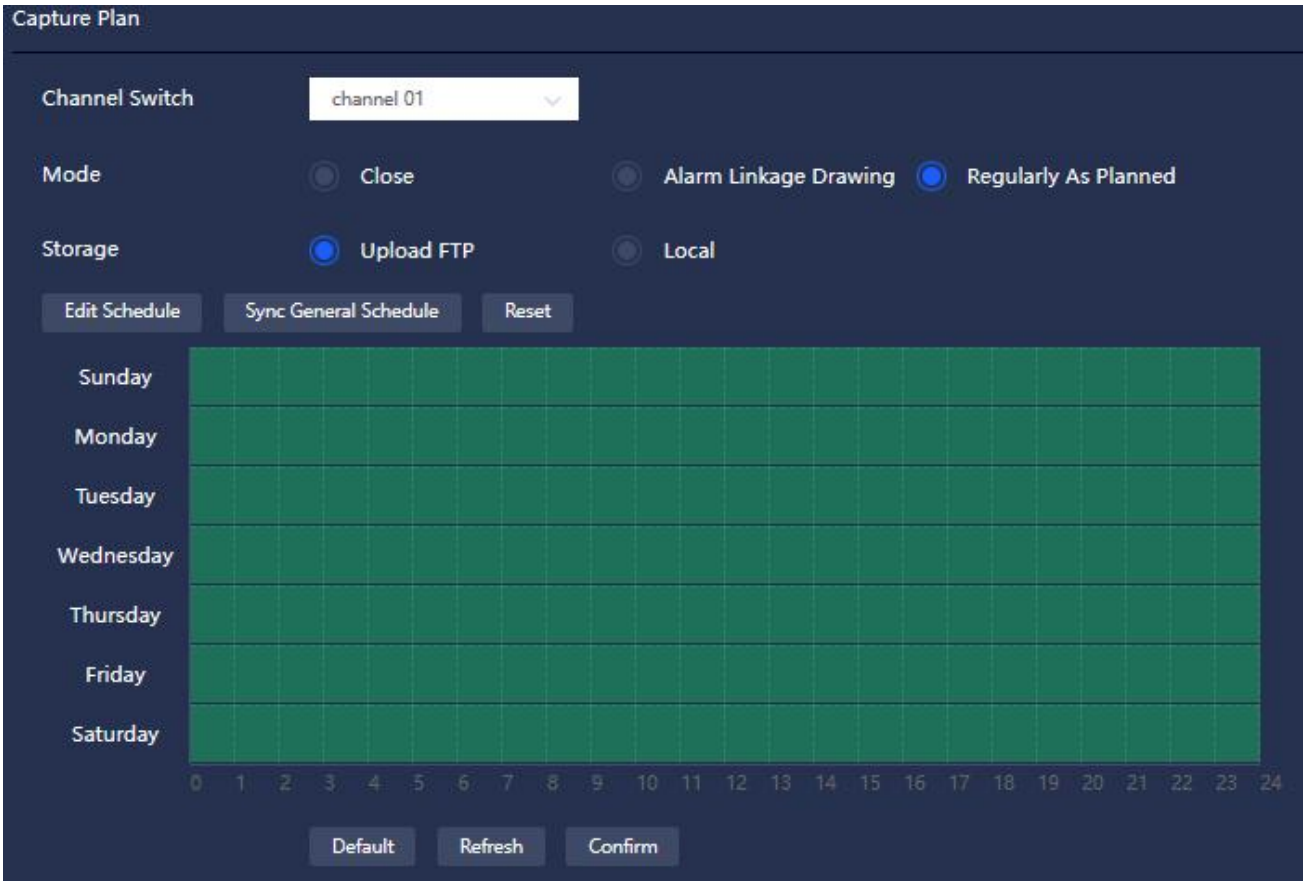


Figure 5.21 Capture Plan-Upload FTP Setting

5.2.6 Platform Access

5.2.6.1 GB28181

The camera supports access to other devices or servers that comply with the GB28181 protocol, and realizes some related real-time monitoring, alarm control and other functions.

Steps:

1. Enable the platform access;

2. Set GB28181 parameters; Generally only the two parameters of SIP server IP and device number need to be set, and the other parameters are consistent with the docking device or server.

Note: Please set the parameters in accordance with the information provided by the platform during actual use. All parameters must be set correctly, otherwise there may be exceptions such as device registration failure and no response of functions.

3. Click "Confirm" to complete the setting.

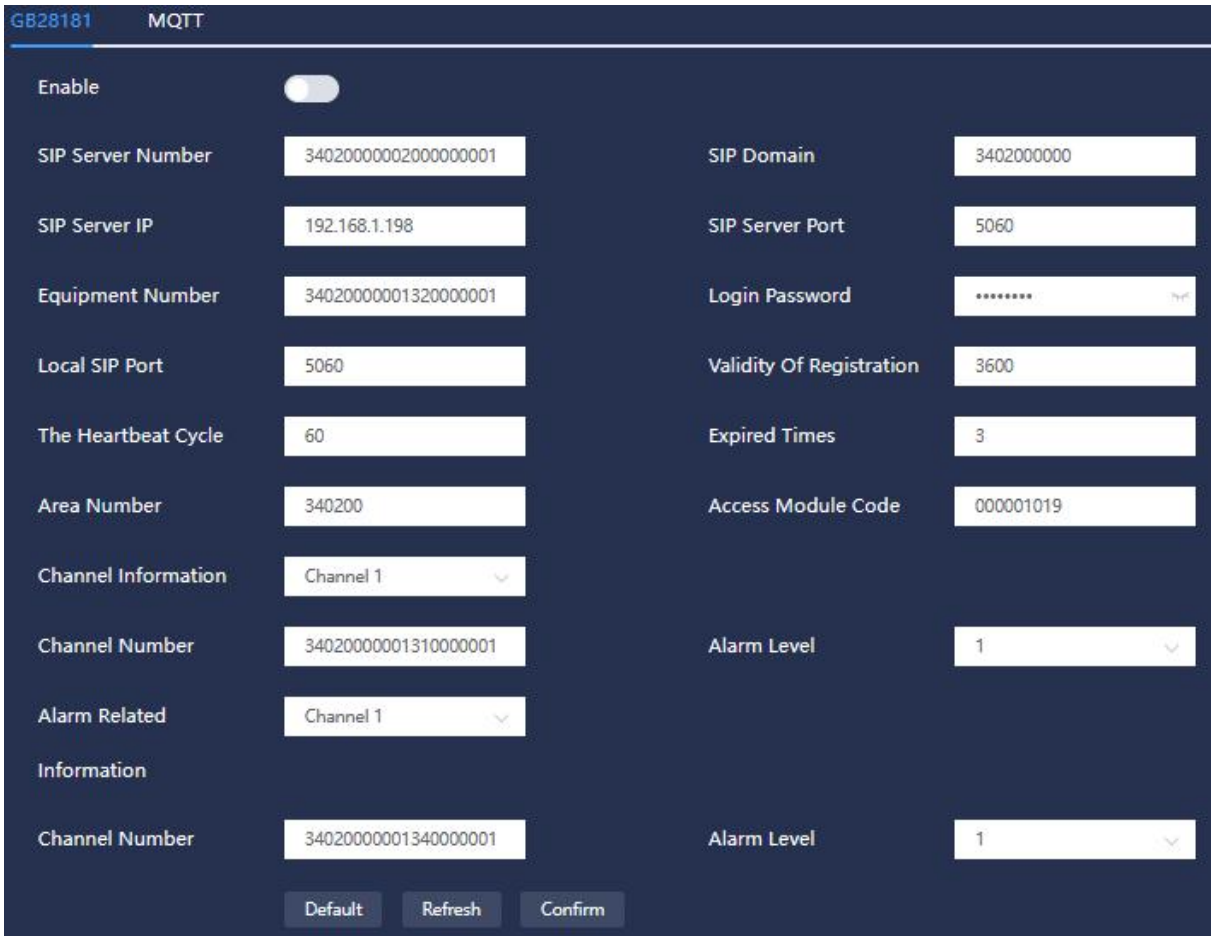


Figure 5.22 Network Settings-Platform Access -GB28181 Setting

5.2.6.2 MQTT

MQTT operation procedures:

1. Enable this function;

2. The camera is configured with connecting parameters, see Table 5-1 for detailed information:

Parameters	Descriptions
1 Device Name	Mandatory, name of the device connecting to the server
2 Server Address	Mandatory, IP address of the MQTT server used to connect the device
3 Time Interval	Mandatory, set the interval for sending data
4 User Name	Mandatory, server user name
5 Password	Mandatory, server password

Table 5-1 MQTT Parameter Setting Table

3. Service Status

If the device parameters match the server, the service status is displayed in blue after the MQTT server is successfully connected. Otherwise, no color is displayed, the connection fails (as shown in the following figure).

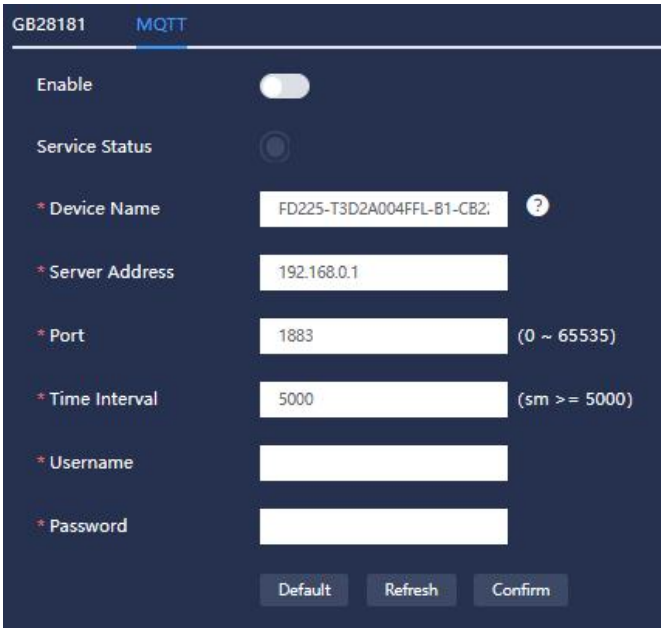


Figure 5.23 Network Settings-Platform Access-MQTT Settings

5.3 Peripherals Settings

5.3.1 Illuminator

The fill light has two modes: automatic and manual.

Automatic Mode: adjust the illuminance of filling lamp according to the visual scenes.

When the illuminance of visible light channel is lower than a certain value, the screen will automatically switch to black and white. The infrared light is on, the darker the picture, the brighter the infrared light;

When the illuminance of visible light channel is higher than a certain value, the screen will automatically switch to color and the infrared light will go out.

Manual Mode: The illuminator brightness can be manually adjusted, ranging from 0-100.

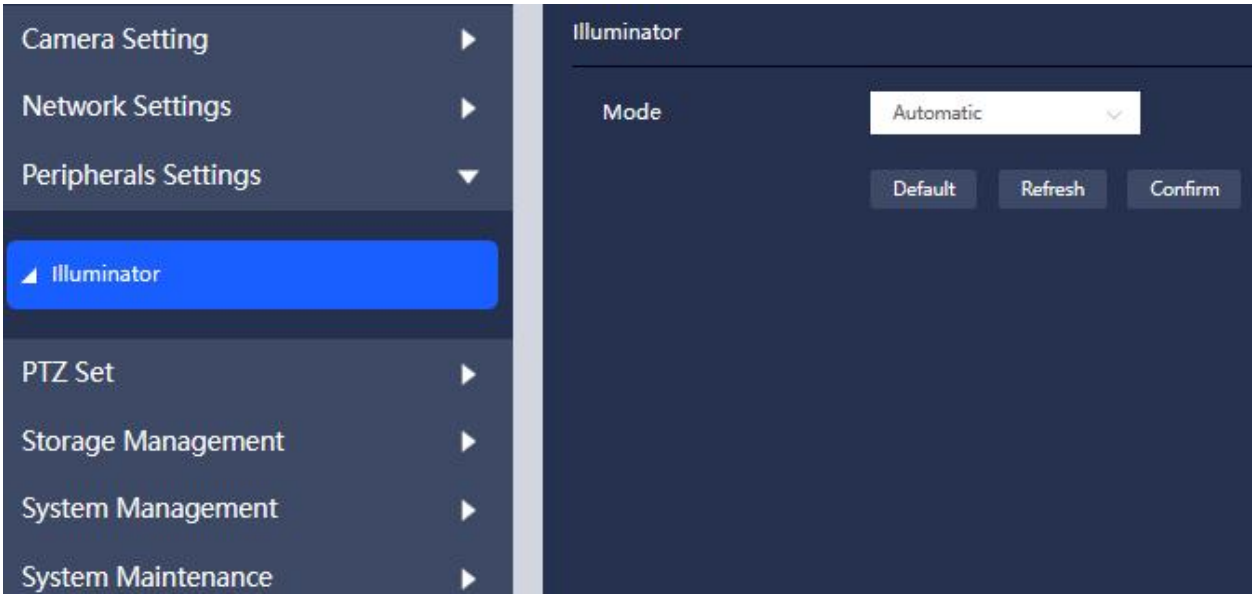


Figure 5.24 Peripherals Settings-Fill Light Setting

5.4 Storage Management

5.4.1 Storage Device

Display the relevant information of the local SD card, for example, device name, status and used space etc. The SD card can also be formatted.

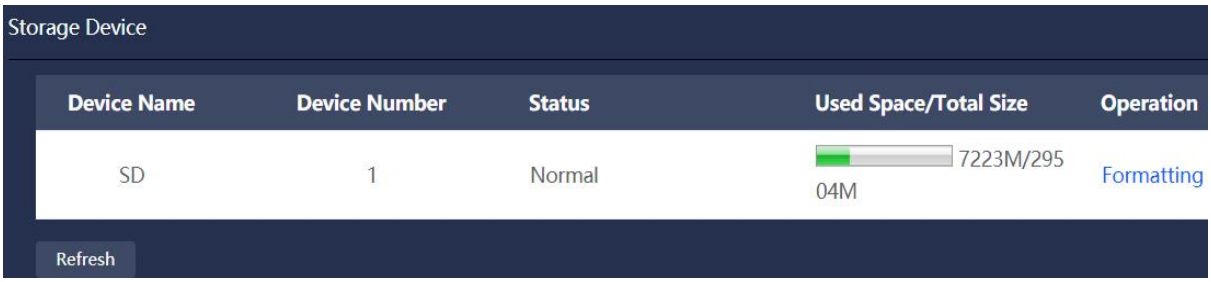


Figure 5.25 Storage Management-Storage Device

5.4.2 Video Control

Video Duration: the duration of each video file.

Pre-recording Time: when an alarm is triggered, the time of recording is advanced. For example, when 5 is input, the system saves the recording 5 seconds before the alarm occurs to the recording file.

Video Stream: including the main stream and the sub stream.

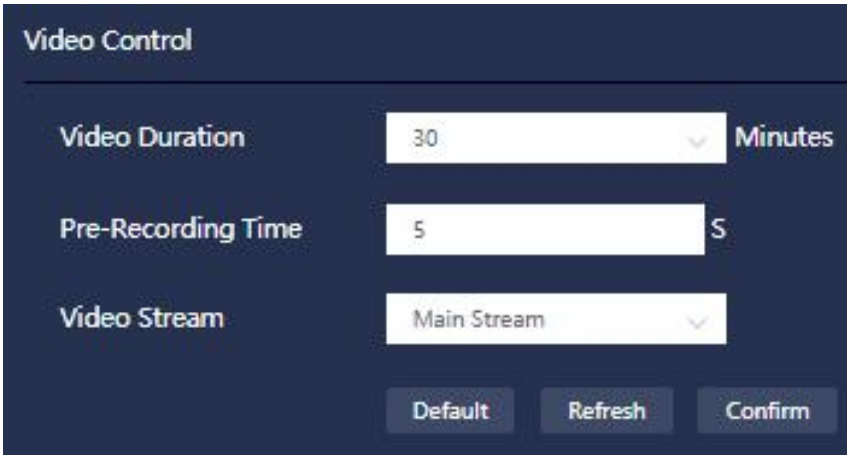


Figure 5.26 Storage Management-Video Control

5.4.3 Video Plan

Channel Selection: configure video recording plan for 2 channels of visible light and thermal imaging, and the 2 channel configuration are independent of each other.

Mode: supports three modes, selecting from close the video, alarm recording (default), and scheduled recording.

■Close the Video: select to close the recording, the channel recording will no longer be recorded in the SD card;

■Alarm Recording: select alarm recording, check linkage recording in the alarm setting interface, and there will be alarm recording of this channel in the SD card.

■Scheduled Recording: choose to record by time period according to plan, and ordinary video will be recorded according to the set time period.

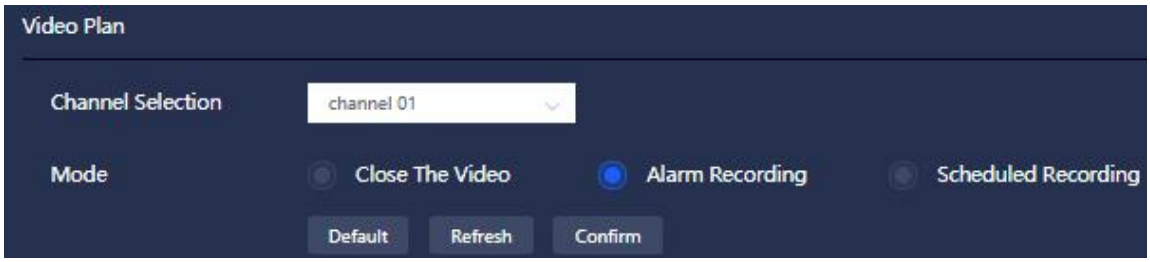


Figure 5.27 Storage Management-Video Plan

5.4.4 Capture Plan

Channel Selection: configure capture plan for 2 channels of visible light and thermal imaging, and the 2 channel configuration items are independent of each other.

Mode: supports three modes: close, alarm linkage capture, and scheduled capture.

Storage Method: upload FTP and local storage device (SD card storage) are optional. You can choose one at will or two at the same time.

■Close: choose to close the capture, and all the capture functions stored in the SD card or FTP will be closed;

■Alarm linkage capture: select the alarm linkage capture, check the linkage to take pictures in the alarm setting interface, and there will be alarm pictures of this channel in the SD card or FTP storage directory.

■Scheduled capture: capture ordinary pictures according to the set time period to SD card or FTP storage directory.

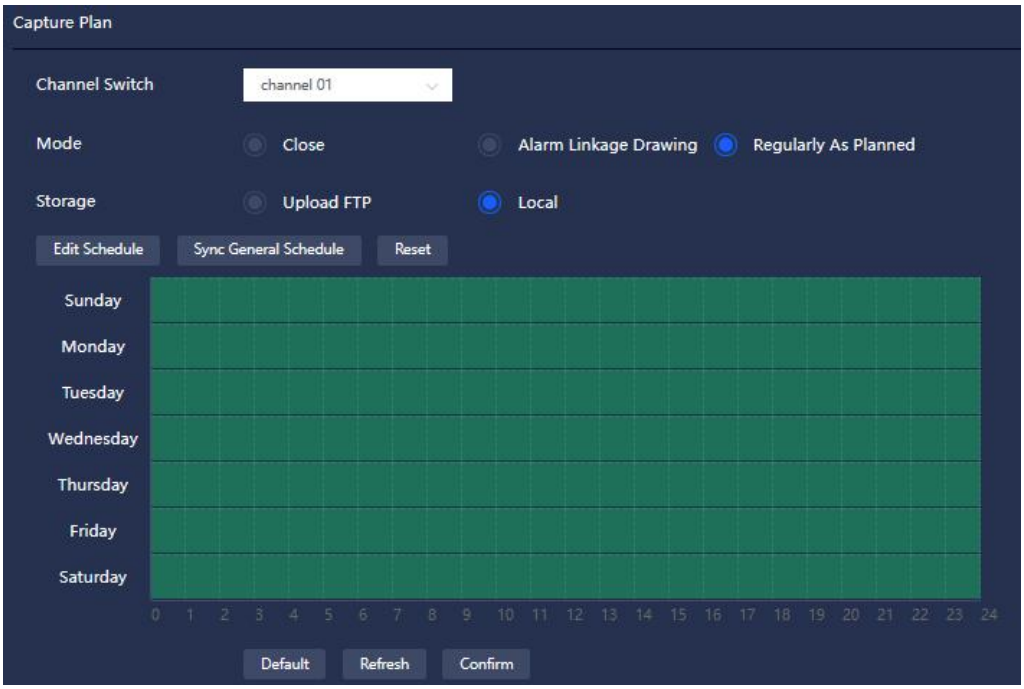


Figure 5.28 Storage Management-Capture Plan

5.5 System Management

5.5.1 Local Setting

It includes local setting and setting for date and time and general schedule.

5.5.1.1 Local Setting

The local setting interface sets device name, system language and video format, as shown in the figure below:



Figure 5.28 System Management-Local Setting

Parameters	Descriptions
1 Device Name	the device name can be set
2 Language	the system language, including Chinese and English
3 Video Formats	display the video formats, including 50Hz and 60Hz

Table 5-1 The parameter description of local setting

5.5.1.2 Date and Time

The date and time setting interface sets date&time format, time zone, system time and NTP, as shown in the figure below:

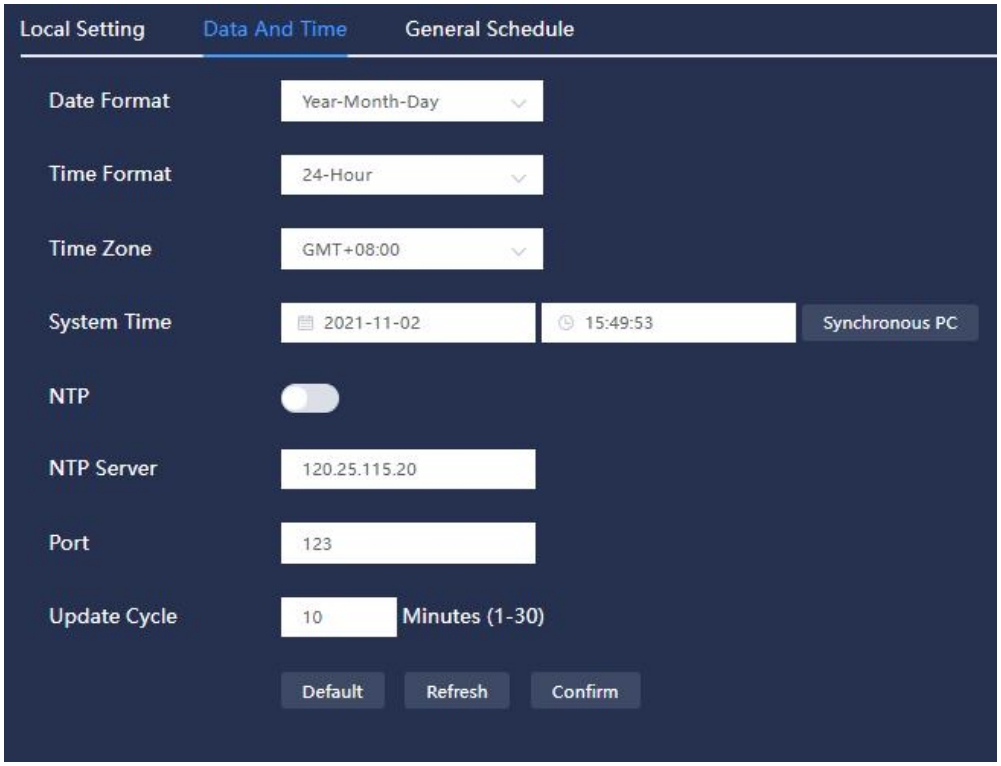


Figure 5.30 System Management-Date and Time Setting

Parameters	Descriptions
1 Date Format	date format in system display
2 Time Format	time format in system display，including 24-hour format and 12-hour format
3 Time Zone	The time zone where the device is located
4 System Time	The present system time Click Synchronous PC, then the time is adjusted based on the PC time.
5 NTP	To synchronize time with the NTP server, enable the NTP function. Choose this option to enable NTP function.
6 NTP Server	The IP address of NTP server
7 Port	Port of NTP server
8 Update Cycle	Interval at which the device synchronizes time with the NTP server

Table 5-2 The parameter description of date & time

5.5.2 User Management

5.5.2.1 User Management

User management can only be performed when the user has user management authority.

User:

1. The system has a default user admin, admin belongs to the highest authority user by default (admin users cannot be deleted); the admin can add ordinary user or operator, but can not add administrator.

2. The admin user change his/her own password and delete or modify non-admin users; the operator can change his/her own password or change/delete the ordinary users; the ordinary user does not have user management rights, the ordinary user can only change his/her own password.

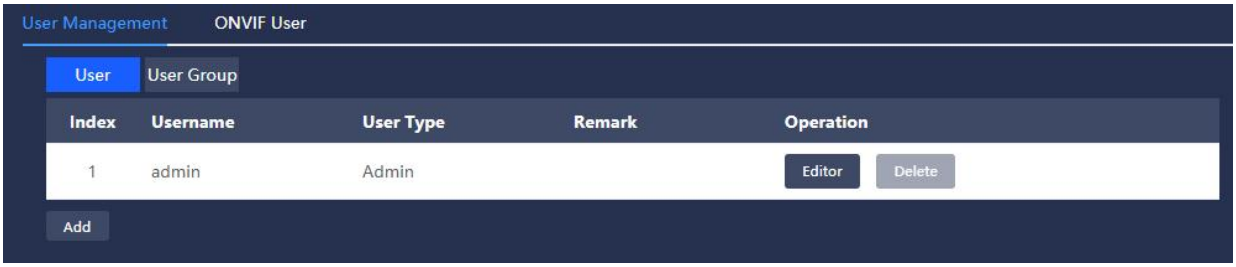


Figure 5.31 User Management-User Interface

User group:

1. There are three levels of user group: administrator, operator or ordinary user. Adding, changing or deleting new user group is not supported.

2. Only the admin can view or change the authority of user group, different user groups have different operation authorities. The authority of admin can not be changed, but can reassign the authorities to users of other levels.

As shown in the figure below.

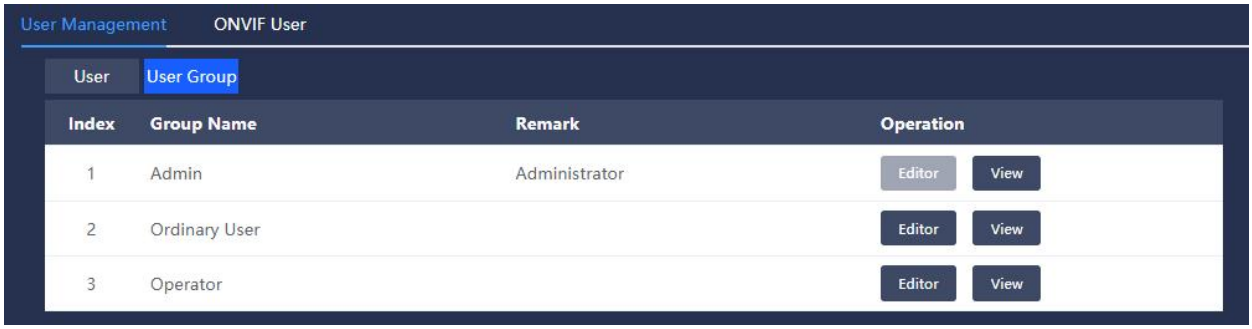


Figure 5.32 User Management-User Group Interface (Admin)

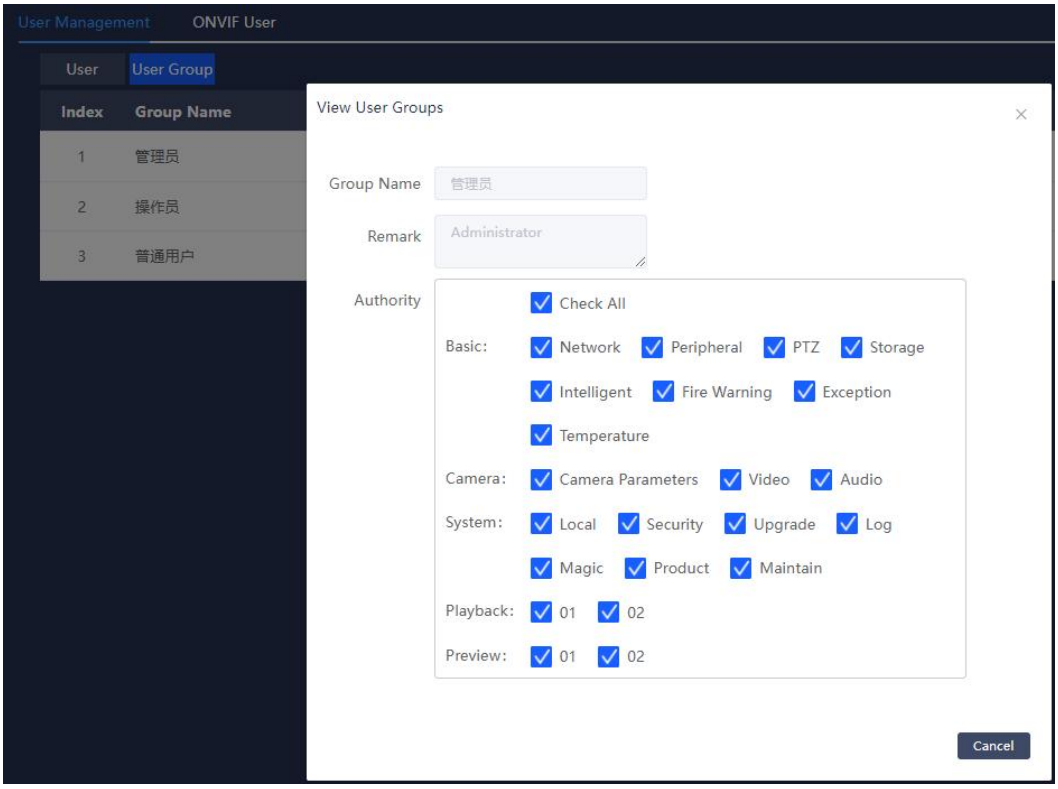


Figure 5.34 User Management-Authority Assignment (Admin)

User management adopts two levels of user group and user. User names cannot be repeated. A user can only belong to one group, and the user's authority is consistent with that of the user group it belongs to.

ONVIF User:

1) The default ONVIF user is admin, who can change admin's password, (password is admin by default), but can not delete admin users.
2) The admin can add other ONVIF users.
3) Turn off ONVIF authentication, when the camera is connected with NVR via ONVIF, user name and password check is not needed; Turn on ONVIF authentication, the user name and password is needed when connected.

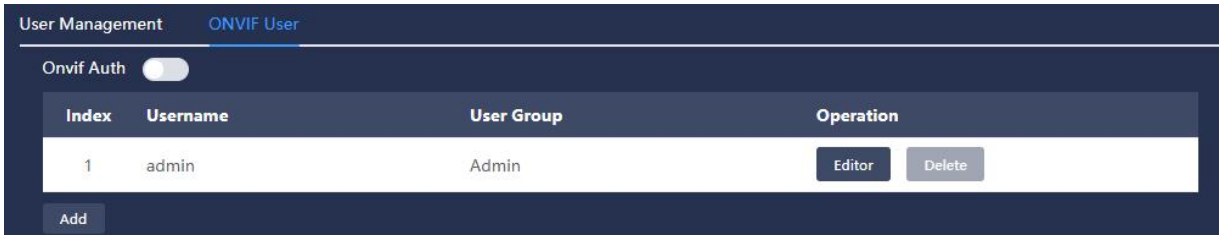


Figure 5.34 User Management-ONVIF User Interface

5.5.3 Safety Management

5.5.3.1 IP Permissions

In order to strengthen the network security of the device and protect the device data, the user who is allowed to access the device through the IP authority can be set.

Whitelist: the device can only be accessed using the IP host in the whitelist, otherwise it can not be accessed. (Edit and delete the added IP address)



Figure 5.35 Safety Management-IP Permission Interface

5.5.3.2 HTTPS

The signed certificate can be uploaded and installed through HTTPS, so that the PC can log in to the device normally through HTTPS to ensure the security of communication data.

Steps:

1. Enable HTTPS;

2. Import the certificate and certificate key;

3. Click "Confirm", and the device settings will take effect after restarting.

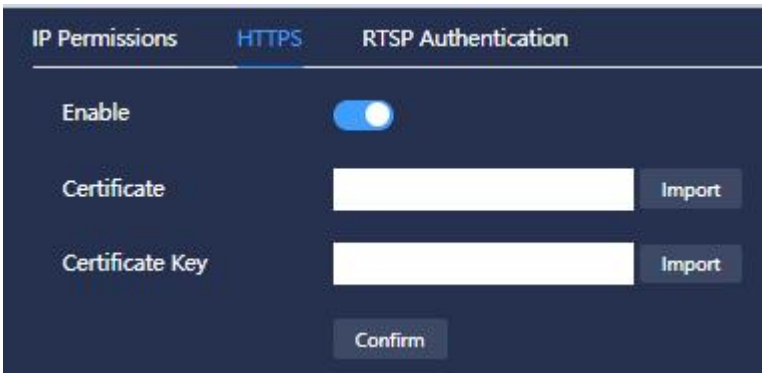


Figure 5.36 Safety Management-HTTPS Interface

5.5.3.3 RTSP Authentication

The authentication method for the media stream can be set to ensure the security of the data in the process of streaming media transmission.

None: no authentication; Digest: digest authentication; Basic: basic authentication.



Figure 5.37 Safety Management-RTSP Authentication

5.6 System Maintenance

5.6.1 Auto Maintenance

■Automatic maintenance can set the automatic restart time, the system will restart according to the set time period.

1. Turn on the enable;
2. Select the day of the week and the time;

3. Click OK to save the settings.

Manual Reboot:

■Click "Restart" to manually restart the device.

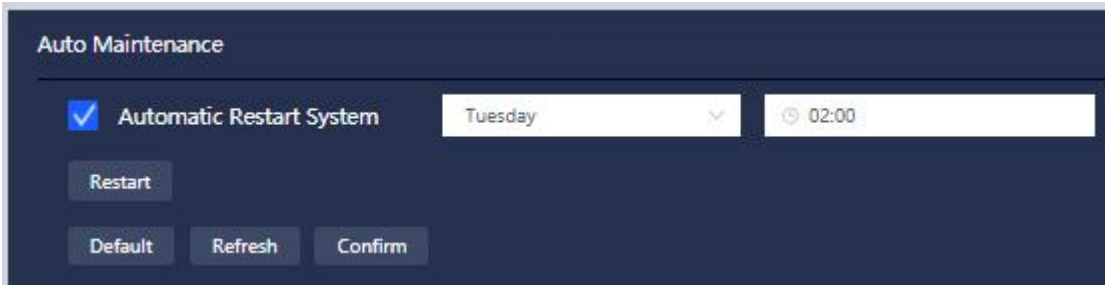


Figure 5.38 System Maintenance-Auto Maintenance

5.6.2 Backup and Restore

The "Restore Default Configuration" and "Factory Data Reset" operations involve restoring the configuration to the default and factory settings. Please operate with caution.

■ Clicking "Restore Default Configuration", all other configurations will be restored to their default values except for the network IP address and user management information.

■ Click "Factory Data Reset" to completely restore the device parameters to the factory state.

Default IP:192.168.1.123.

Import and Export:

■Import: click “selecting files” to select a config file, click “import” and the function will take effect after camera restart.

■Export: click “export” to export the current configuration to the specified path.

■Default Export Config: click “default export config” to export to the specified default path.

The default download path is the browser download folder.

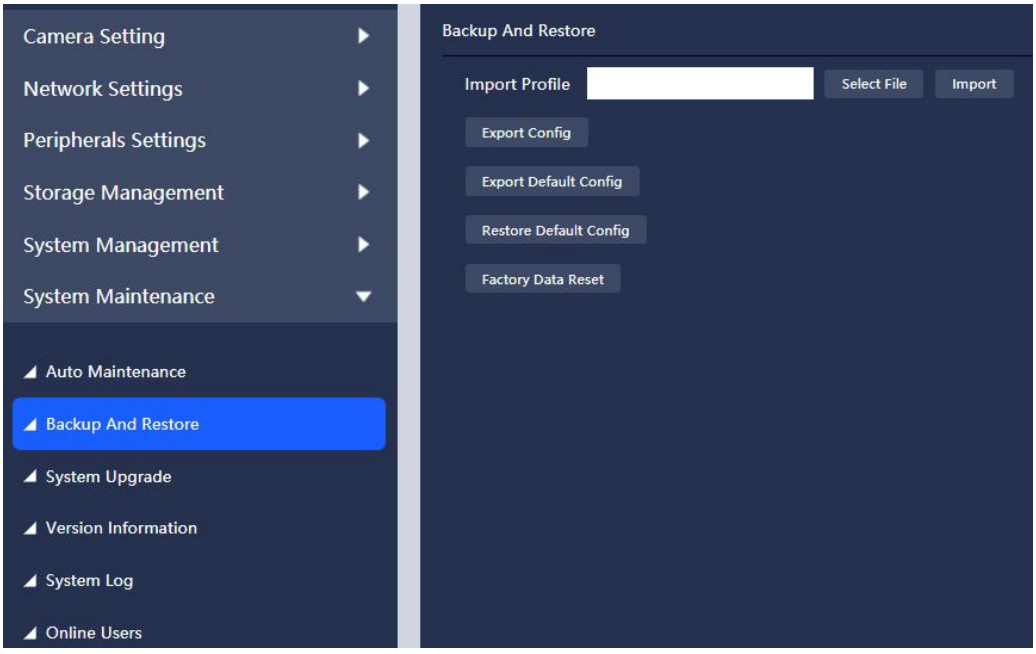


Figure 5.39 System Maintenance-Backup and Restore

5.6.3 System Upgrade

System upgrade steps:

1. Click *Import*, select the upgrade file of *.zip type, confirm whether to restore to factory default settings and click *Upgrade*.

2. Please **do not power off, disconnect the network, restart or turn off web** during the upgrade process.

3. Auto go to login page after update is completed.

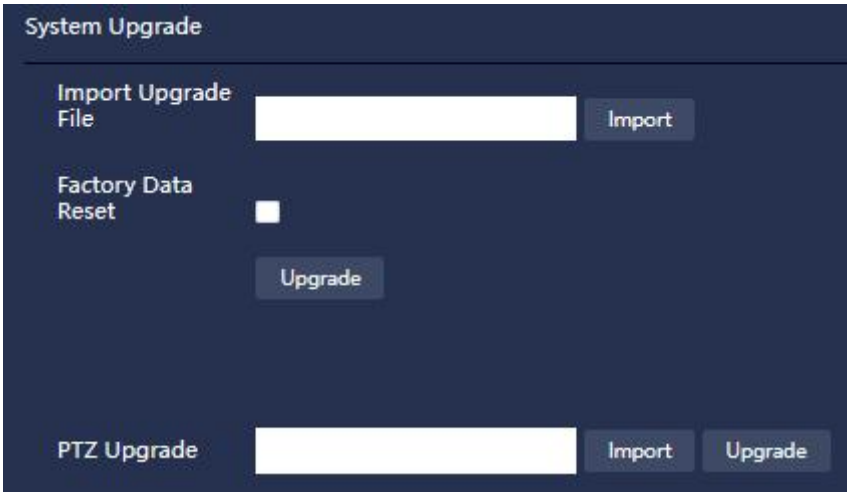


Figure 5.40 System Maintenance-System Upgrade

5.6.4 Version Information

Display device model, SN, PN, software version and release date. Please refer to the actual product.



Figure 5.41 System Maintenance-Version Information

5.6.5 System Log

View system operation, configuration operation, alarm event, temperature alarm, video operation, user management, network event, clearing log, storage management and other log information; See the following figure:

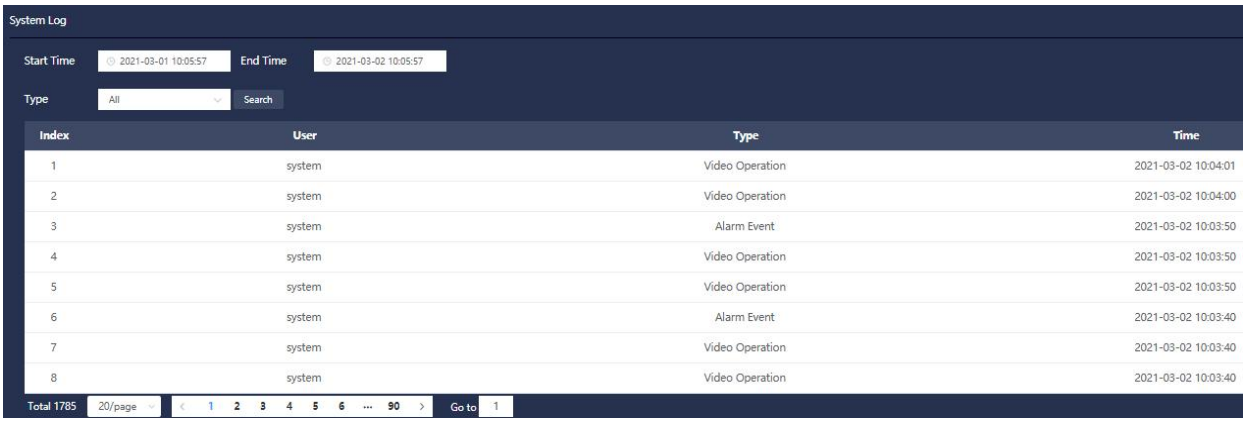


Figure 5.42 System Maintenance-System Log Interface

5.6.6 Online Users

View the user information of web login, as shown in the figure below.

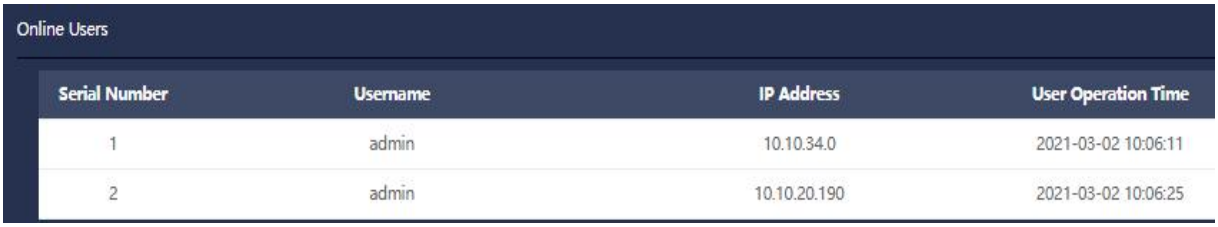


Figure 5.43 System Maintenance-Online User

6. Playback

6.1 Play SD Card Videos/Images

Channel Switch: select channel 01 (visible light) or channel 02 (thermal imaging) video/picture for playback.

6.1.1 SD card video playback:

Steps:

1.Select SD card as video source, video as file type, the date with recording as the date (the current day is displayed by default), and click Retrieve. All the video of this day will be displayed in the retrieved file list, as shown in the figure below:

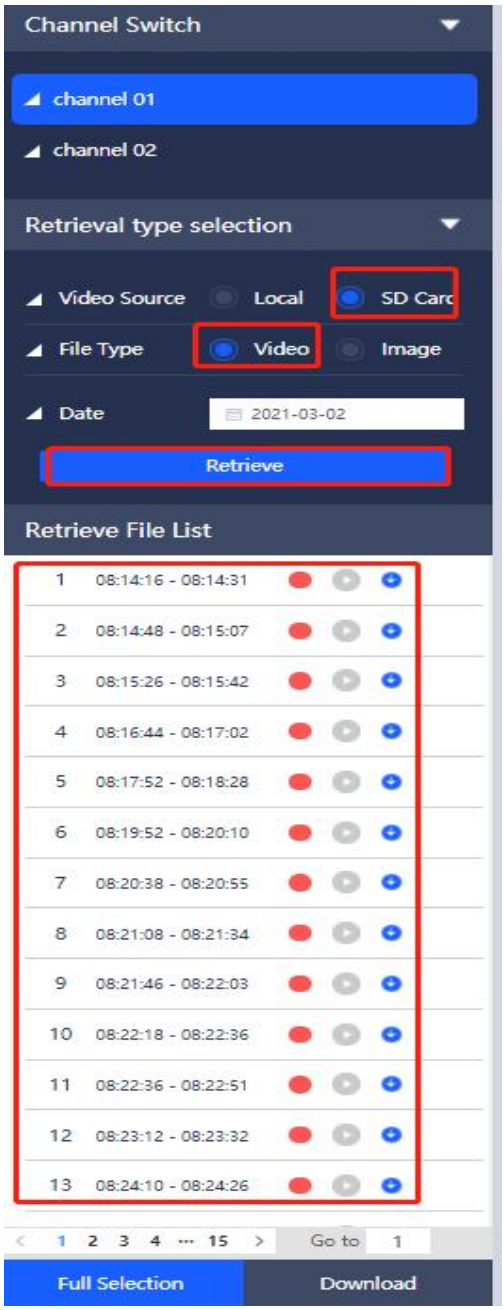


Figure 6.1 Playback-Play SD Card Videos

2.Select a video and click the play icon (there are two play icons here, one is behind the video file list  and the other is below the video timeline ). The video starts to play; click to select a video file and play on the video broadcasting area.

: Play the next video.

: Play the last video.



：Click a certain time point on the video time axis, and the video will jump to the corresponding time point for playback.

Recording type: there are two types of recordings: general and alarm. The recording file search will display these two types of recordings by default, and you can check one of the recording types separately for search. (The green circle displayed after the video file indicates general video, and the red circle indicates alarm video)

Video Download: video files like PAV and mp4 is supported. Click the download icon 

behind the video list to download the current video files. The download video files will be stored in the browser's default download files, you can select the corresponding player to play. Single or multiple video download is supported. (Tick several video files or select "all", click "download" to select the format).

Display IVS: after enabling, the smart information overlay will be displayed in the playback video.

Playback video sound switch : after enabled, the sound can be heard when the video is played.

6.1.2 SD card image playback:

Steps:

1. Select SD card as video source, image as file type, date with image (the day is displayed by default), and click "retrieve". All image files for this day will be displayed in the search file list, as shown in the figure below:

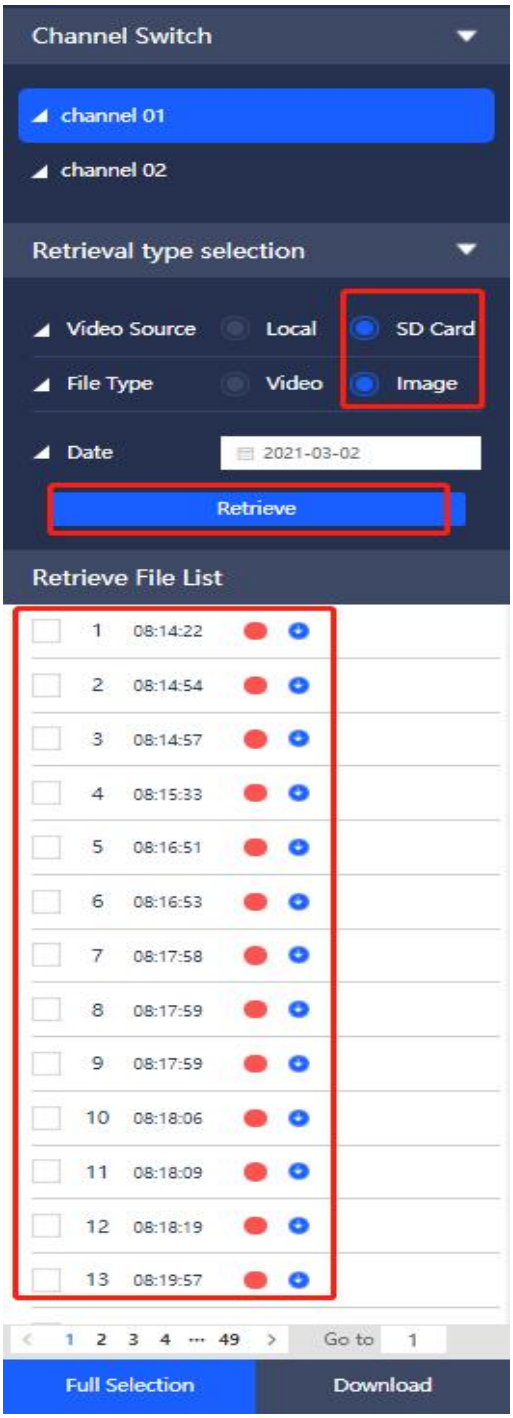


Figure 6.2 Playback-Play SD Card Images

2. Click an image in the file list to play the image. Click the icon at the bottom right to play images one by one in order from the current position.

: Play the next image.

: Play the last image.

Capture Type: it includes two types of images: general and alarm. The image file search displays these two types of images by default. You can check one of the image types separately for retrieval. (The green circle displayed after the picture file indicates the general capture, and the red circle indicates the alarm capture).

Picture Download: you can select one or several images to download. Select all to download all images of a certain column; the downloaded images will be stored in the browser's default download files, and you can view them with image viewer supporting .jpg format.

6.2 Play Local Videos/Images

Steps:

Select local as video source, video/image for file type, and click "Select Local Files" button. Select a video/image file on the computer, and click the play icon, as shown in the figure below:



Figure 6.3 Playback-Play Local Videos

The image files can be displayed after being selected, see the following figure:

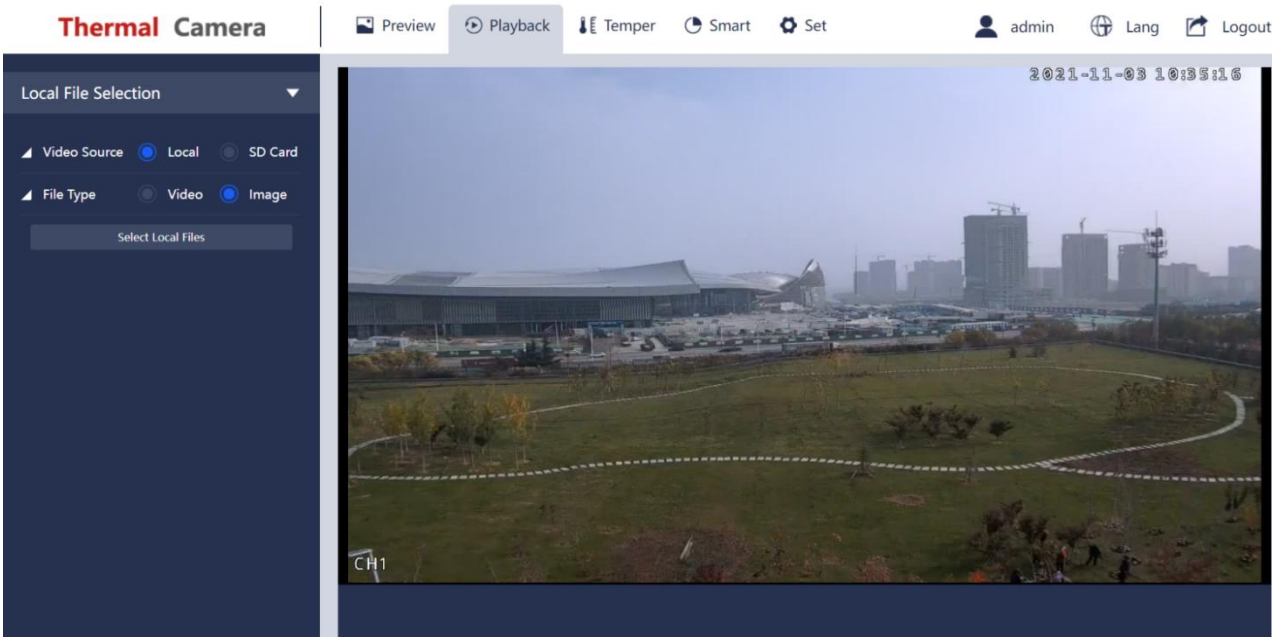


Figure 6.4 Playback-Play Local Image