Thermal Imaging Integrated Network Camera

User Manual

Issue	**V1.1**
Date	**2022-04-12**

Precautions

Precautions

Fully understand this document before using this device, and strictly observe rules in this document when using this device. If you install this device in public places, provide the tip "You have entered the area of electronic surveillance" in an eye-catching place. Failure to correctly use electrical products may cause fire and severe injuries. To prevent accidents, carefully read the following context:

Symbols

This document may contain the following symbols whose meanings are described accordingly.

Symbol	Description
DANGER	It alerts you to fatal dangers which, if not avoided, may cause deaths or severe injuries.
WARNING	It alerts you to moderate dangers which, if not avoided, may cause minor or moderate injuries.
CAUTION	It alerts you to risks. Neglect of these risks may cause device damage, data loss, device performance deterioration, or unpredictable results.
TIP	It provides a tip that may help you resolve problems or save time.
NOTE	It provides additional information.

DANGER

To prevent electric shocks or other dangers, keep power plugs dry and clean.

WARNING

- Strictly observe installation requirements when installing the device. The manufacturer shall not be held responsible for device damage caused by users' non-conformance to these requirements.

- Strictly conform to local electrical safety standards and use power adapters that are marked with the LPS standard when installing and using this device. Otherwise, this device may be damaged.
- Use accessories delivered with this device. The voltage must meet input voltage requirements for this device.
- If this device is installed in places with unsteady voltage, ground this device to discharge high energy such as electrical surges in order to prevent the power supply from burning out.
- When this device is in use, ensure that no water or any liquid flows into the device. If water or liquid unexpectedly flows into the device, immediately power off the device and disconnect all cables (such as power cables and network cables) from this device.
- Do not place the thermal imaging camera and unpackaged products at a radiation source with a high intensity regardless of whether the device is in the normal power-on state, for example, the sun, laser, and electric arc welder, and place the thermal imaging camera and unpackaged products against objects with a high heat source, for example, the sun. Otherwise, the accuracy of the thermal imaging camera will be affected. In addition, the detector in the thermal imaging camera may be permanently damaged.
- If this device is installed in places where thunder and lightning frequently occur, ground the device nearby to discharge high energy such as thunder strikes in order to prevent device damage.

CAUTION

- Unless otherwise specified in the user manual, do not use the thermal imaging camera in an environment with the temperature lower than -30°C (-22 °F) or higher than 60°C (+140°F). Otherwise, the images displayed by the thermal imaging camera are abnormal and the device may be damaged if working beyond the temperature range for a long period.
- During the outdoor installation, prevent the morning or evening sunlight incidence to the lens of the thermal imaging camera. The sun shade must be installed and adjusted according to the angle of the sunlight illumination.
- Avoid heavy loads, intensive shakes, and soaking to prevent damages during transportation and storage. The warranty does not cover any device damage that is caused during secondary packaging and transportation after the original packaging is taken apart.
- This device is a static sensitivity device. Improper static may damage the thermal imaging camera. ESD protection measures and reliable grounding must be well prepared for device installation and uninstallation.
- Protect this device from fall-down and intensive strikes, keep the device away from magnetic field interference, and do not install the device in places with shaking surfaces or under shocks.

- Use a soft and dry cloth to clean the device body. In case that the dirt is hard to remove, use a dry cloth dipped in a small amount of mild detergent and gently wipe the device, and then dry it again. Pay special attention to the front window of the thermal imaging camera because this is precision optics. If the front window has water spots, use a clean and soft cloth to moisten with water and wipe it. If the front window needs further cleaning, use a soft cloth dampened with isopropyl alcohol or detergent. Improper cleaning can cause damage to the device.
- The lens window of the thermal imaging camera is designed to be applicable to an outdoor environment. The window is coated with durable coating material, but may require frequent cleaning. When you found lens image degradation or excessive accumulation of pollutants, you should clear up the window in a timely manner. Exercise caution when you use this device in severe sandstorm (such as deserts) or corrosive environments (such as offshore). Improper use may cause surface coating off.
- Do not jam the ventilation opening. Follow the installation instructions provided in this document when installing the device.
- Keep the device away from heat sources such as radiators, electric heaters, or other heat equipment.
- Keep the device away from moist, dusty, extremely hot or cold places, or places with strong electric radiation.
- If the device is installed outdoors, take insect- and moisture-proof measures to avoid circuit board corrosion that can affect monitoring.
- Remove the power plug if the device is idle for a long time.
- Before unpacking, check whether the fragile sticker is damaged. If the fragile sticker is damaged, contact customer services or sales personnel. The manufacturer shall not be held responsible for any artificial damage of the fragile sticker.

Special Announcement

All complete products sold by the manufacturer are delivered along with nameplates, operation instructions, and accessories after strict inspection. The manufacturer shall not be held responsible for counterfeit products.

This manual may contain misprints, technology information that is not accurate enough, or product function and operation description that is slightly inconsistent with the actual product. The manufacturer will update this manual according to product function enhancement or changes and regularly update the software and hardware described in this manual. Update information will be added to new versions of this manual without prior notice.

This manual is only for reference and does not ensure that the information is totally consistent with the actual product. For consistency, see the actual product.

Contents

1 Product Overview 1
1.1 Thermal Imaging Principles and Advantages 1
1.2 Device Structure 1
1.3 Functions and Features 5
2 Quick Configuration 6
2.1 Login and Logout 6
2.2 Main Page layout 7
2.3 Change the Password 9
2.4 Browse Video 10
2.4.1 Install Plugins 12
2.5 Setting Local Network Parameters 12
3 Thermal Setting 16
3.1 Temperature Parameters 16
3.2 Ambient Temperature 22
3.3 Temperature Area 23
3.4 Shield Area 28
3.5 Schedule Linkage 29
3.6 Bad Point Check 31
3.7 Version Information 33
4 Parameter Setting 34
4.1 Sensor Setting Interface 34
4.2 Mode Setting 36
4.3 Image Setting 36
4.4 Scene 37
4.5 Set Pseud ocolor 38
4.6 FFC Control 39
4.7 Noise Reduction 41
4.8 Enhance Image 42
4.9 Lens Control (Supplied for some models) 42
A Troubleshooting 44

B Common Emission Rate 46

1 Product Overview

1.1 Thermal Imaging Principles and Advantages

For any object, as long as its temperature is above the absolute zero (-273.15° C), although the object does not give out light, it can radiate infrared. The infrared is also known as thermal radiation. A temperature change occurs when the infrared radiated by objects at different temperatures is absorbed by the infrared thermal detector, and thereby generating an electrical effect. An electrical signal is amplified and processed to obtain a thermal image corresponding to the distribution of heat on the surface of the object, that is, infrared thermal imaging.

- Applicable to any light environment

  Traditional cameras rely on the natural or ambient light for imaging. However, the infrared thermal imaging camera can clearly image the object with the infrared heat radiation of the object without relying on any light. The infrared thermal camera is applicable to any light environment and is free from glare impact. It can clearly detect and find the target as well as identify the camouflaged and hidden target in both day and night. Therefore, it achieves real 24-hour surveillance.

- Monitoring the temperature field of the target heat distribution

  The infrared thermal camera can display the temperature field of the object and change the surface temperature distribution of the object that cannot be directly seen by human eyes to the thermal image representing the surface temperature distribution of the object. By monitoring the temperature field, you can immediately identify the temperature abnormality, thereby preventing potential risks caused by the temperature, such as fire.

- Providing the cloud penetration capability

  Atmosphere, dust, and clouds can absorb visible light and near infrared, but are clear to the thermal infrared for 3 to 5 microns (medium wave infrared region) and 8 to 14 micron (long wave infrared). Therefore, it is difficult for the conventional cameras to capture clear images under dense clouds, while the thermal imaging camera is able to effectively penetrate the atmosphere and clouds to capture clear images.

1.2 Device Structure

Figure 1-1 shows the rear panel of the thermal imaging box network camera. For details about the interfaces, see Table 1-1.

Figure 1-1 Appearance and interfaces of device

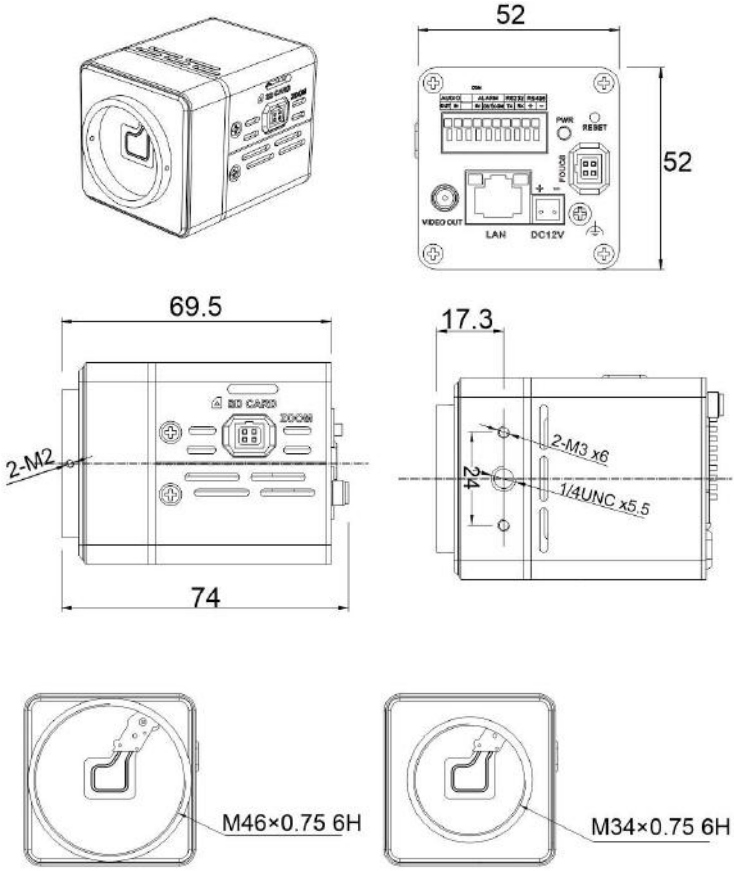
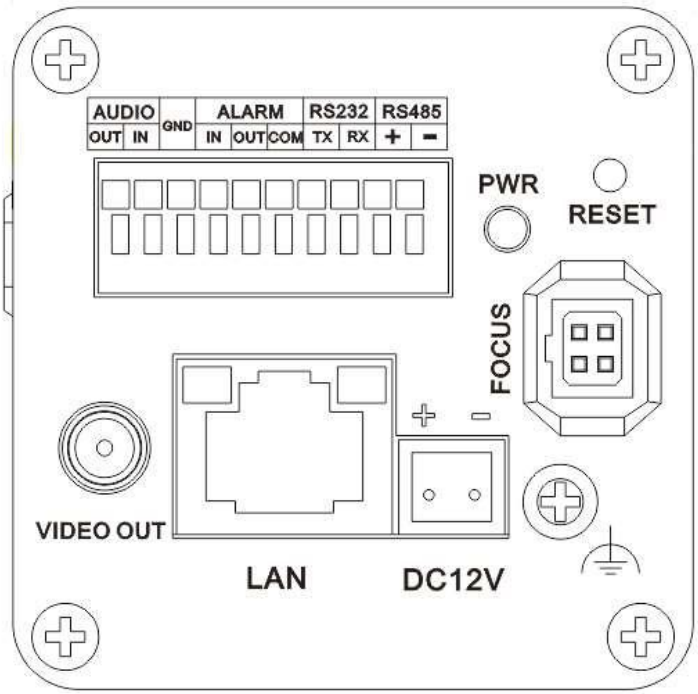


Figure 1-2 Port of device



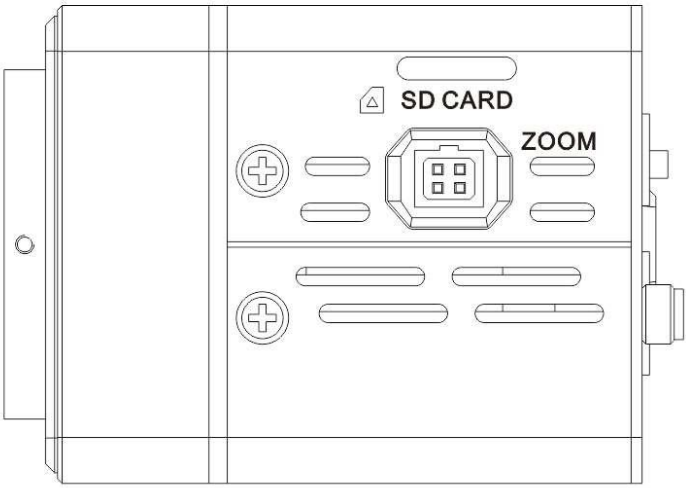


Table 1-1 Interfaces

Char	Physical Interface	Connection
Audio	Audio input/audio output	Inputs the audio signal and receives the analog audio signals from the sound pick-up device. Connects to the external alarm out device, such as alarm light.
GND	Ground of system	Connect to system ground
Alarm	Alarm in/ out	Connect to alarm out and alarm in devices.
RS232	RS 232 port	Connect to RS 232 peripheral.
RS485	RS 485 port	Connect to the external pan & tilt
PWR	Power indicator light	When the power is normal, the red light is on.
RESET	Reset button (RESET)	The configuration resumes to the factory settings after you press the reset button for 3s. The default value of IP is 192.168.0.121.
FOCUS	Focus port	Connect to fucus control cable of motorized lens.
VIDEO OUT	Analog video interface	Sends analog video signals. User can connect the camera to a TV monitor through this port to view analog videos.

Char	Physical Interface	Connection
LAN	Network interface	Connects to the standard Ethernet cable.
DC 12V	Power interface	Connects to the 12 V DC power supply.
	Ground	GND
SD CARD	SD card slot	Plug the SD card to save the video recording.
Zoom	Zoom port	Connect to zoom control cable of motorized lens.

1.3 Functions and Features

- Using the uncooled infrared focal plane sensor.
- Detecting the infrared wavelength ranging from 8 um to 14 ums.
- 400*300 pixels.
- High thermal sensitivity, reaching 40 Mk.
- Supporting dedicated lens for 8/15/25/35/50 mm focal distance (optional), and motor lens for 8/25/50/75 / 100 mm (optional).
- Support 17 pseudo color modes such as black hot, white hot, rainbow, iron bow and so on.
- Support the DVE image enhancement.
- Support noise reduction and mirroring.
- Support three coding algorithms, these are H. 265, H. 264 and MJPEG, high compatibility.
- In the heat setting temperature measuring points in the image or temperature area, temperature detection and display: point temperature measurement, regional temperature measuring, full screen (the highest temperature, the lowest temperature and the average temperature) temperature measurement. User can set over temperature warning and over temperature alarm.
- Output two code streams in real time, and satisfying local storage and network transmission of the video.
- 1-channel audio input and 1-channel audio output, supporting bidirectional voice talkback.
- Support the local storage, Micro SD card (the maximum capacity is 128 GB) and effectively resolving the video loss problem caused by network failure.
- Provide software and hardware watchdogs and automatic fault recovery.
- Linked heat dissipation structure of the metal enclosure.
- DC 12 V.

2 Quick Configuration

2.1 Login and Logout

CAUTION

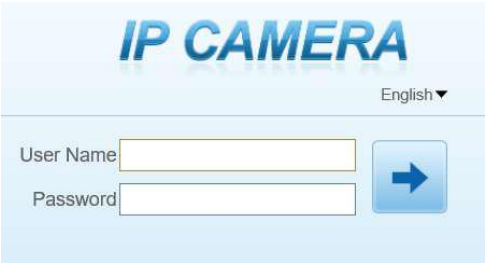
You must use Internet Explorer 8 or a later version to access the web management system; otherwise, some functions may be unavailable.

Login system

Step 1 Open the Internet Explorer, enter the IP address of IP camera (default value: 192.168.0.121) in the address box, and press Enter.

The login page is displayed, as shown in Figure 2-1.

Figure 2-1 Login page



Step 2 Input the User and password.

NOTE

- The default name and password are both **admin.** Modify the password when you login the system for first time to ensure system security. After modifying password, you need to wait at least three minutes then power off to make sure modifying successfully . Or login the Web again to test the new password.
- You can change the system display language on the login page.

Step 3 Click Login arrow. The main page is displayed.

----End

logout

To logout of system, click in the upper right corner of the main page, the login page is display after you log out of the system.

2.2 Main Page layout

On the main page, you can view real-time video, set parameter, Video parameter, Video control, and logout of the system. Figure 2-2 is shown the main page layout. Table 2-1 lists the elements on the main page layout.

Figure 2-2 Main page layout

Table 2-1 Elements on the main page

No.	Element	Description
1	Real-time video area	Real-time videos are played in this area. You can also set sensor parameters.
2	Playback	You can retrieve the playback videos in this area. NOTE Only when the SD card has videos that user can retrieve the playback videos.
3	Device configuration	You can choose a menu to set device parameters, including the device information, audio and video streams, alarm setting, and privacy mask function.
4	Change password	You can click to change the password.
5	Sign Out	You can click to return to the login page.

No.	Element	Description
6	Stream	Three are three streams. Choose one type from drop-down list.
7	Pause/Start	Close live video or play live video.
8	Live/Smooth	Switch image quality.
9	Audio	Open or close audio.
10	Interphone	Open or close interphone.
11	Sensor setting	Click the icon, it will access to sensor setting.
12	Snapshot	Click the icon, it will snapshot.
13	Local record	Click the icon, it will record video and save.
14	Intelligent analysis	Choose the stream to stream 2, click to open the intelligent analysis, it will show target information and video stream draw line after you have turned on the function in IAS settings.

NOTE

1. When the device generates an alarm, the alarm icon is displayed. You can click to view the alarm information. When the device accepts an alarm signal, the alarm icon will display within 10s in the web management system.

2. When the device encounters an exception, the fault icon is displayed. You can click to view the fault information.

----End

2.3 Change the Password

Description

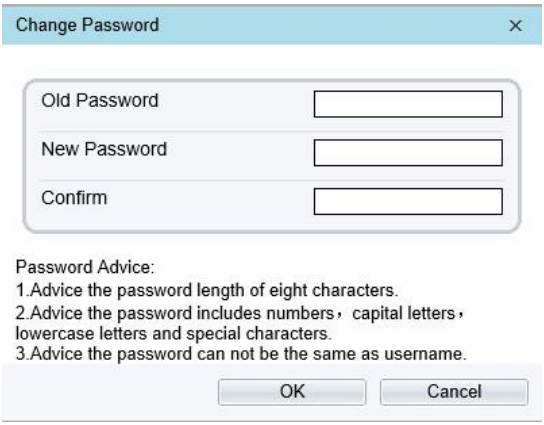
You can click to change the password for logging to the system.

Procedure

Step 1 Click in the upper right corner of the main page.

The **Change Password** dialog box is displayed, as shown in Figure 2-3.

Figure 2-3 Modify Password dialog box



NOTE

The change password page will be displayed if you don't change the default password when you log into the system for the first time. User need to wait at least three minutes after changing password, and then restart the device. The password incorrect more than 3 times, please login again after 5 minutes

Step 2 Input the old password, new password, and confirmation password.

Step 3 Click **OK**.

If the message "Change own password success" is displayed, the password is successfully changed. If the password fails to be changed, the cause is displayed. (For example, the new password length couldn't be less than eight.)

Step 4 Click **OK**. The login page is displayed.

----End

2.4 Browse Video

User can browse the real-time video in the web management system.

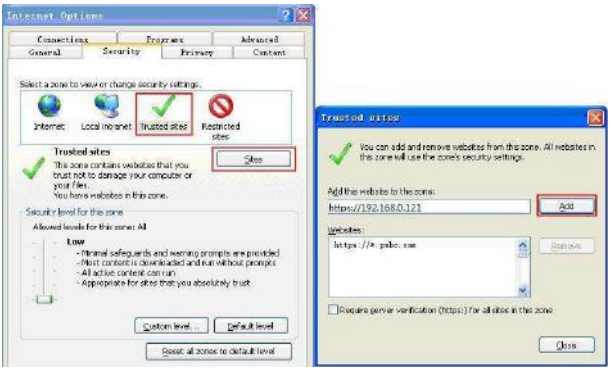
Preparation

To ensure the real-time video can be play properly, you must perform the following operation when you log into the web for the first time:

Step 1 Open the Internet Explorer. **Choose Tools > Internet options > Security > Trusted sites > Sites.**

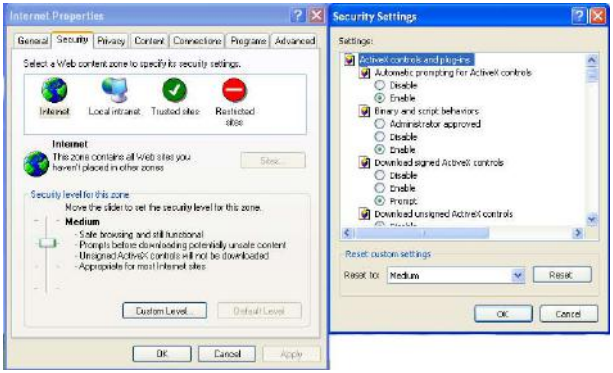
In the display dialog box, click **Add**, as shown in Figure 2-4.

Figure 2-4 Add a trusted site



Step 2 In the Internet Explorer, choose **Tool > Internet Options > Security > Customer level**, and set Download unsigned ActiveX control and initialize and script ActiveX controls not marked as safe for scripting under ActiveX controls and plug-ins to Enable, as shown in Figure 2-5.

Figure 2-5 Configuring ActiveX control and plug-ins



Step 3 Download and install the player control as prompted.

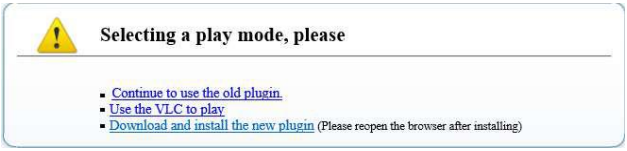
NOTE

The login page is display when the control is loaded.

2.4.1 Install Plugins

You will be prompted with a message “Download and install the new plugin” will show as in Figure 2-6, when you log into the web management system for the first time.

Figure 2-6 Install plugin



Procedure

Step 1 Click the message, download and install the plugin follow the prompts.

Step 2 During installing, user should close the browser.

Step 3 Reopen the browser after installation.

----End

2.5 Setting Local Network Parameters

Description

Local network parameters include:

- IP protocol
- IP address
- Subnet mask
- Default gateway
- Dynamic Host Configuration Protocol (DHCP)
- Preferred Domain Name System (DNS) server
- Alternate DNS server
- MTU

Procedure

Step 1 Choose **Configuration** > **Device** >**Local Network**.

The **Local Network** page is displayed, as shown in Figure 2-7.

Figure 2-7 Local Network page

Step 2 Set the parameters according to Table 2-2.

Table 2-2 Local network parameters

Parameter	Description	Setting
IP Protocol	IPv 4 is the IP protocol that uses an address length of 32 bits. IPv 6 is the IP protocol that uses an address length of 128 bits.	[Setting method] Select a value from the drop-down list box. [Default value] IPv4
DHCP	The device automatically obtains the IP address from the DHCP server.	[Setting method] Click the option button. NOTE To query the current IP address of the device, you must query it on the platform based on the device name.
DHCP IP	IP address that the DHCP server assigned to the device.	DHCP function is enabled.

Parameter	Description	Setting
IP Address	Device IP address that can be set as required.	[Setting method] Enter a value manually. [Default value] 192.168.0.121
Subnet Mask	Subnet mask of the network adapter.	[Setting method] Enter a value manually. [Default value] 255.255.255.0
Default Gateway	This parameter must be set if the client accesses the device through a gateway.	[Setting method] Enter a value manually. [Default value] 192.168.0.1
Preferred DNS Server	IP address of a DNS server.	[Setting method] Enter a value manually. [Default value] 192.168.0.1
Alternate DNS Server	IP address of a domain server. If the preferred DNS server is faulty, the device uses the alternate DNS server to resolve domain names.	[Setting method] Enter a value manually. [Default value] 192.168.0.2
MTU	Set the maximum value of network transmission data packets.	[Setting method] Enter a value manually. NOTE The MTU value is range from 1280 to 1500, the default value is 1500, Please do not change it arbitrarily.

Step 3 Click **OK**.

- If the message "Apply success" is displayed, click **OK**. The system saves the settings. The message "Set network pram's success, Please login system again" is displayed. Use the new IP address to log in to the web management system.
- If the message "Invalid IP Address", "Invalid Subnet Mask", "Invalid default gateway", "Invalid primary DNS", or "Invalid space DNS" is displayed, set the parameters correctly.

NOTE

- If you set only the **Subnet Mask**, **Default Gateway**, **Preferred DNS Server**, and **Alternate DNS Server** parameters, you do not need to login to the system again.
- You can click **Reset** to set the parameters again if required.

----End

3 Thermal Setting

3.1 Temperature Parameters

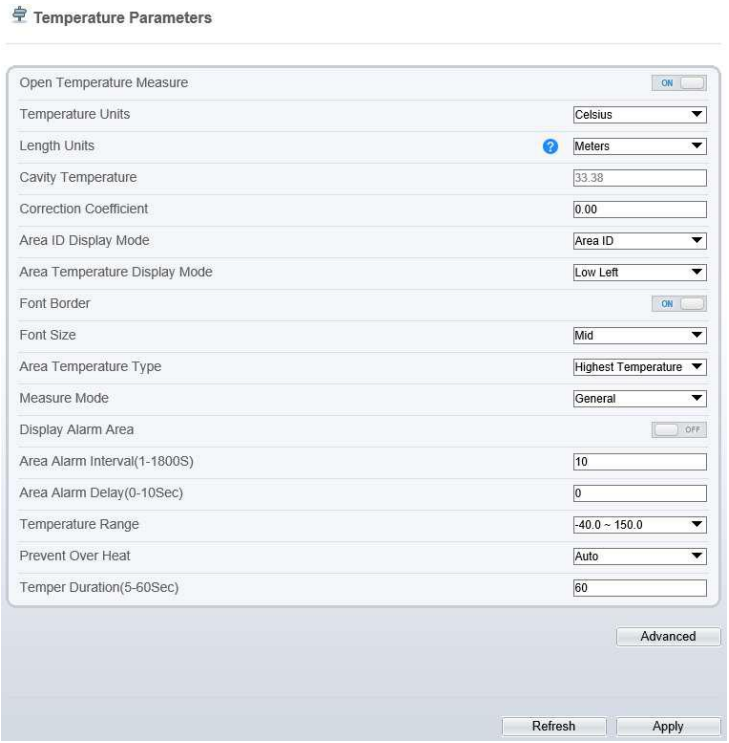
Temperature parameters include temperature unit, ambient type, ambient temperature, cavity temperature, correctional coefficient, area temperature display mode, area temperature type, measure mode, and area alarm interval.

Operation Procedure

Step 1 Choose **Configuration** >**Thermal** >**Temperature Parameters.**

The **Temperature Parameters** page is displayed, as shown in Figure 3-1.

Figure 3-1 Temperature Parameters interface



Step 2 Set the parameters according to Table 3-1.

Table 3-1 Temperature parameters

Parameter	Description	Setting
Open Temperature Measure	Enable to open temperature measuring.	[Default value] Enable

Parameter	Description	Setting
Temperature Unit	Celsius and Fahrenheit temperature units are available.	[Setting method] Select a value from the drop-down list box. [Default value] Celsius
Length Units	Meters and feet length units are available.	[Setting method] Select a value from the drop-down list box. [Default value] Meters
Cavity Temperature	The cavity temperature of camera.	N/A
Correction Coefficient	Correction coefficient is refer to the deviation of measured object temperature and actual temperature, is offset value. For example: 1. The measured object temperature is 36.0, and actual temperature is 36.5, so the correction coefficient should be **0.5.** 2. The measured object temperature is 37.3, and actual temperature is 36.5, so the correction coefficient should be -0.8**.** NOTE User should contact the technical support staff of our company at this condition to make sure to apply	[Setting method] Enter a value manually. [Default value] **0.00**
Area ID Display Mode	Area ID or Area name can be chosen.	[Setting method] Select a value from the drop-down list box. [Default value] **Area ID**

Parameter	Description	Setting
Area Temperature Display Mode	The display position of temperature information on the live-video image.	[Setting method] Select a value from the drop-down list box. [Default value] **Low left**
Font Border	Enable to bold the font	[Setting method] Enable or disable [Default value] **ON**
Font Size	Enable to choose the size of font.	[Setting method] Enable or disable [Default value] **Mid**
Area Temperature Type	There are three types of area temperature.	[Setting method] Select a value from the drop-down list box. [Default value] **Highest Temperature**
Measure Mode	There are two types of measure modes.	[Setting method] Select a value from the drop-down list box. [Default value] **General**
Display Alarm Area	N/A	[Setting method] Enable or disable [Default value] **Disable**
Area Alarm Interval (1-1800S)	N/A	[Setting method] Enter a value manually ranges from 1 to 1800. [Default value] **10**
Area Alarm Delay (1-10 Sec)	The delay of alarm send out.	[Setting method] Enter a value manually ranges from 0 to 10. [Default value] **0**

Parameter	Description	Setting
Temperature range	It depends on the device. Different devices have different modes, there are two ranges, such as -20 ℃ -150℃，-40 ℃-150℃, the thermal imaging box network camera is -40 ℃-150℃.	[Setting method] Select a value from the drop-down list box.
Prevent Over Heat	Open, if temperature of the testing area is too high, you can enable prevent over heat function, there are two types, manual and auto.	[Setting method] Select a value from the drop-down list box.
Temper Duration(5-60 S)	Prevent over heat' mode is auto, the control cover will block for duration time automatically if over heat.	[Setting method] Enter a value manually ranges from 5 to 60.
Control Cover	When prevent over heat mode is manual, the user should choose the action manually, such as pick up, lay down.	[Setting method] Select a value from the drop-down list box.

Figure 3-2 Advanced interface

Table 3-2 Advance parameters

Parameter	Description	Setting
Dimming Mode	There are auto and manual modes. It will show on temperature item.	[Setting method] Select a value from the drop-down list box. [Default value] **Auto**
Greater Prominent	Enable that, the image will show the setting color if the temperature is higher than set value.	[Setting method] Enter a value manually. Choose one color to show.
Section Prominent	Enable that, the image will show the setting color if the temperature is between minimum and maximum temperature.	[Setting method] Enter a value manually. Choose one color to show.
Less Prominent	Enable that, the image will show the setting color if the temperature is lower than set value.	[Setting method] Enter a value manually. Choose one color to show.

Parameter	Description	Setting
Raw Data Upload Interval(F/S)	Interval of Uploading the raw data.	[Setting method] Select a value from the drop-down list box. [Default value] **1**
Mix Stream Mode	This function is used for thermal and visible image to mix. There are close, mode 1 and mode 2. If the device only has the thermal channel, the function will be closed.	[Default value] **Close**

----End

3.2 Ambient Temperature

Table 3-3 parameter of ambient temperature

Parameter	Description	Setting
Ambient Temperature	Environment temperature of camera.	[Setting method] Enter the temperature of ambient. [Default value] **25**
Adaptation environment temperature	Set the ambient temperature, click “Apply”, click “Refresh” ,the camera will get the value automatically.	---

----End

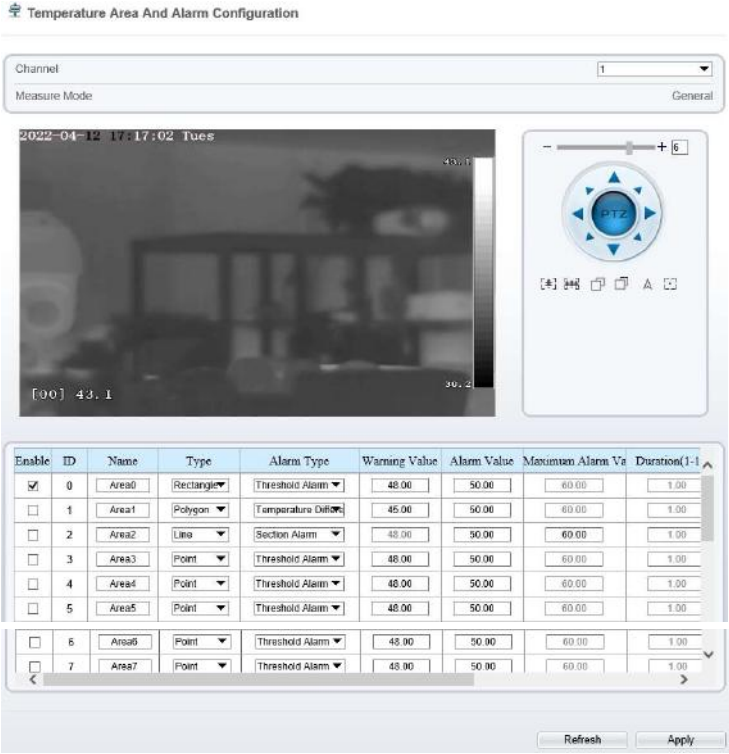
3.3 Temperature Area

Operation Procedure

Step 1 Choose **Configuration** >**Thermal** >**Temperature Area.**

The **Temperature Area** page is displayed, as shown in Figure 3-3.

Figure 3-3 Temperature area and alarm configuration



Step 2 Set the parameters according to Table 3-4.

Table 3-4 Temperature area and alarm configuration

Parameter	Description	Setting
Channel	N/A	[Setting method] Select a value from the drop-down list box. [Default value] 1
Measure Mode	Set at temperature parameter interface.	N/A
Enable	Tick to enable the temperature alarm	N/A
ID	The areas ID, there are 20 IDs	N/A
Name	Name of temperature area, you can edit it yourself.	[Setting method] Enter a value manually.
Type	Type of temperature area. ID 0 is default rectangle area, which is full screen.	[Setting method] Select a value from the drop-down list box. [Default value] **Rectangle/Point**
Alarm Type	Threshold alarm, temperature difference alarm, section alarm, temperature rise alarm are available for alarm type. Section Alarm: if the temperature value is among the set temperature range, it will generate the alarm. Temperature rise alarm means it the rising temperature value is more than the set value, it will generate the alarm.	[Setting method] Select a value from the drop-down list box. [Default value] **Threshold alarm**
Warning Value	Camera will trigger warning alarm when the object temperature reaches the warning value.	[Setting method] Enter a value manually. [Default value] **48**
Alarm Value	Camera will alarm when the object temperature reaches the alarm value.	[Setting method] Enter a value manually. [Default value] **50**

Parameter	Description	Setting
Maximum Alarm Value	At section alarm type, the device would not alarm when the temperature is higher than maximum alarm value.	[Setting method] Enter a value manually. [Default value] **60.00**
Emission Rate	The emission rate is the capability of an object to emit or absorb energy. The emission rate should be set only when the target is special material. The emission rate list refers to B Common Emission Rate	[Setting method] Enter a value manually. [Default value] **0.95**
Distance(M)	The distance between camera and target.	[Setting method] Enter a value manually. [Default value] **15** NOTE Enter actual distance when the distance between camera and target is less than 15m.Enter 15 when the distance between camera and target is great than or equal to 15m.
Alarm	Enable or disable the alarm output and linkage of area.	[Setting method] Tick the alarm output channel .

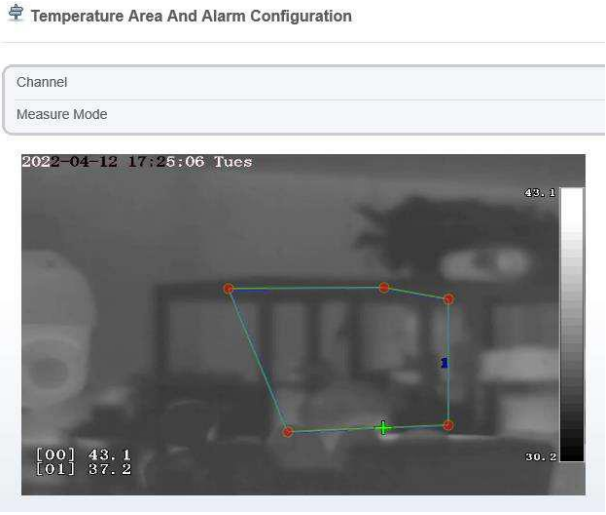
Parameter	Description	Setting
Group ID	The ID can be chosen into one of six groups, or no group. The group will be alarm following as the next rules: A=The highest temperature of groups (the highest temperature of N regions is the largest) B=Average temperature of groups (average temperature of N regions) WA=Warning value AA=Alarm value a. If A-B >= WA, a temperature difference warning signal is generated ---> (the one with the largest difference between the N areas and the average temperature is the alarm area flashing) b. If A-B >= AA, a temperature difference alarm signal is generated ---> (the one with the largest difference between the N areas and the average temperature is the alarm area flashing) c. If the warning and alarm conditions are met at the same time, the alarm signal will be generated first.	[Setting method] Select a value from the drop-down list box.

Step 3 **Set temperature area.**

Step 1. Tick an area ID.

Step 2. Press and hold the left mouse button, and drag in the video area to draw a temperature area, as shown in Figure 3-4. Right-click to finish the area selected.

Figure 3-4 Temperature Area Setting Interface



Step 3. Click **Apply**, the message “Apply success” is displayed, the temperature area is set successfully.

NOTE

ID 0 is the full screen; The area cannot be changed.

: The lowest temperature of the full screen.

: The highest temperature of the full screen.

: The lowest temperature of the area.

: The highest temperature of the area.

Delete a temperature area:

Step 1. Select an area ID.

Step 2. Click the temperature area and right-click.

Step 3. Remove the tick of area ID.

Step 4. Click **Apply**, the message “Apply success” is displayed, the temperature area is deleted successfully.

Step 4 Click **Apply**.

The message "Apply success" is displayed, the system saves the settings.

----End

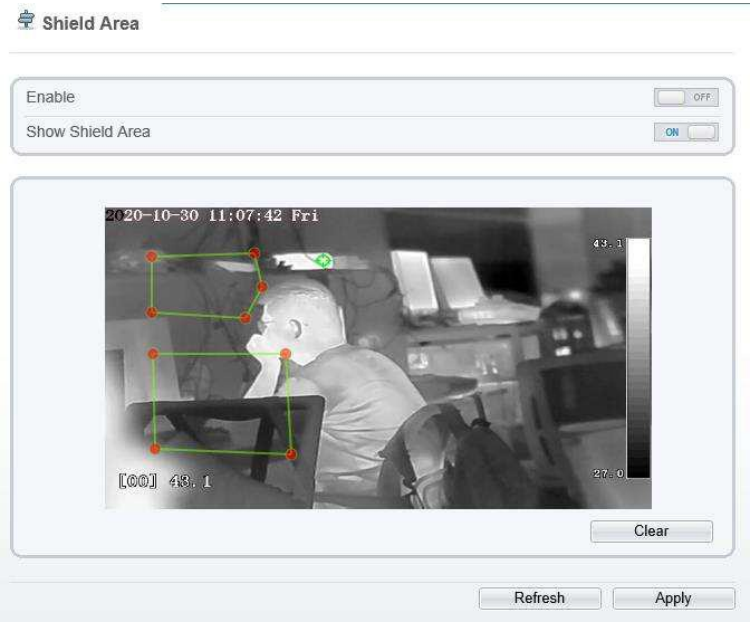
3.4 Shield Area

Shield area is meaning that the camera will do not detect the temperature of that area. The shield areas can be set up to four areas.

Operation Procedure

Step 1 Choose **Configuration** >**Thermal** > **Shield Area.**

Figure 3-5 Shield Area



Step 2 Enable the shield area.

Step 3 Enable **Show Shield Area,** then the setting shield will show on live video.

Step 4 Click left mouse button to set area; click right mouse button to end the setting.

Step 5 Click **Clear** to clear the shield area.

----End

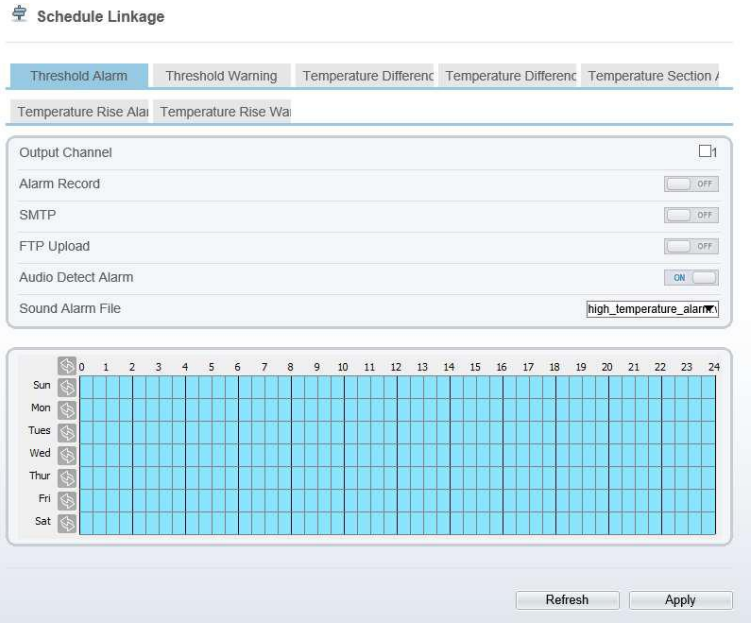
3.5 Schedule Linkage

Operation Procedure

Step 1 Choose **Configuration** >**Thermal** > **Schedule Linkage.**

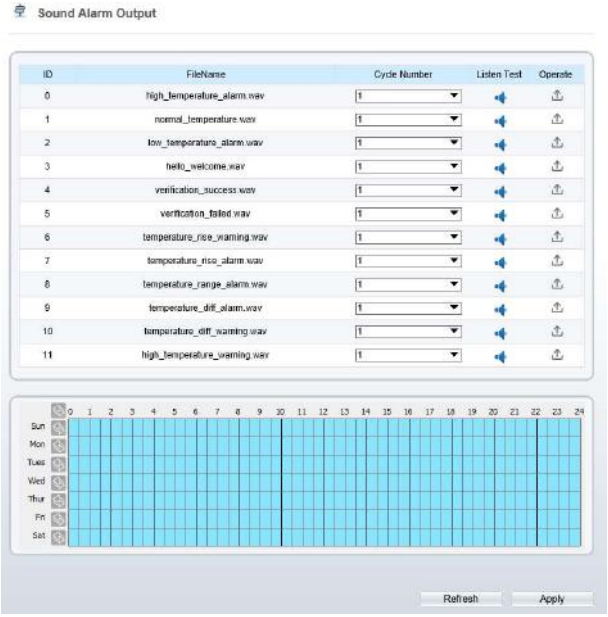
The **Schedule Linkage** page is displayed, as shown in Figure 3-6. Tick the output channel if user connects the external alarm device. It can also enable alarm record, SMTP, FTP upload and audio alarm.

Figure 3-6 Schedule Linkage



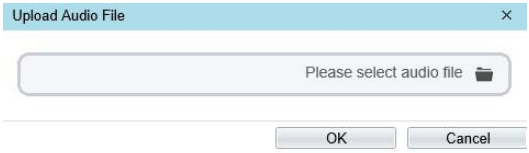
Step 2 Tick the output channel. Enable alarm record，SMTP, FTP upload, and audio alarm. The audio alarm file will be set at **Alarm > Sound Alarm Output** interface, as shown in Figure 3-7.

Figure 3-7 Sound alarm output



User can set the audio file manually. Click  to upload the audio file(the type should be WAV), as shown in Figure 3-8.

Figure 3-8 Upload audio file



Step 3 Set schedule linkage.

Method 1： Click left mouse button to select any time point within 0:00-24:00 from Monday to Sunday as shown in Figure 3-6.

Method 2： Hold down the left mouse button, drag and release mouse to select the alarm time within 0:00-24:00 from Monday to Sunday.

NOTE

When you select time by dragging the cursor, the cursor cannot be moved out of the time area. Otherwise, no time can be selected.

Method 3： Click in the alarm time page to select the whole day or whole week.

Deleting alarm time: Click again or inverse selection to delete the selected alarm time.

Step 4 Click **Apply**.

The message "Apply success" is displayed, the system saves the settings.

Step 5 There are four types schedule linkage to set, like threshold alarm, threshold warning, temperature difference alarm and temperature difference warming.

----End

3.6 Bad Point Check

Operation Procedure

Step 1 Choose **Configuration** >**Thermal** > **Bad Point Check.**

The **Bad Point Check** page is displayed, as shown in Figure 3-9.

If the image has a white dot as shown in figure, user can test the function to recover the bad point. User should connect the technical support at this condition to make sure to apply.

Figure 3-9 Bad Point Check

Step 2 Click the white point at image, click **Test** to recover the bad point, as shown in Figure 3-10

Figure 3-10 Recover bad point

Step 3 Click **Apply.** The message "Apply success" is displayed, the system saves the settings.

----End

3.7 Version Information

Choose **Configuration >Thermal > Version Information.** User can view the version information as shown in Figure 3-11.

Figure 3-11 Version Information

----End

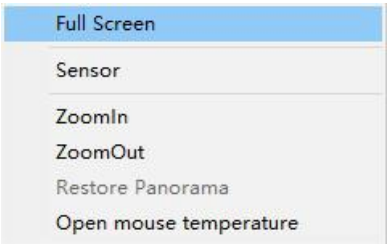
4 Parameter Setting

4.1 Sensor Setting Interface

Operation Procedure

Step 1 On the Internet Explorer interface or the client software interface, select and right-click the surveillance image to the set, as shown in Figure 4-1. At **Configuration > Sensor Setting** page you can also set the sensor parameter.

Figure 4-1 Sensor Setting



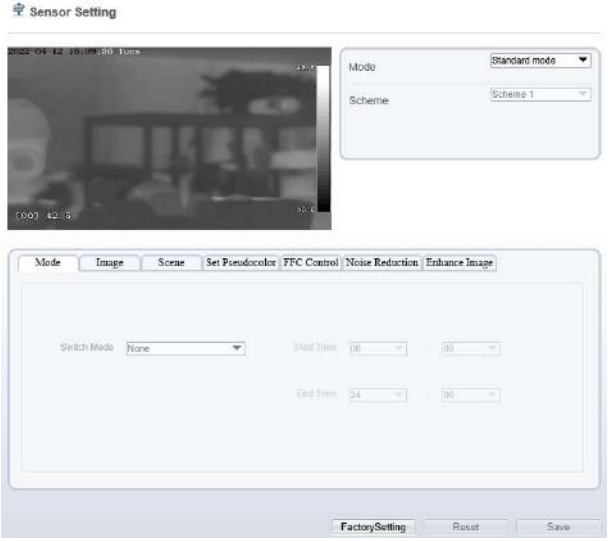


Table 4-1 Right-click setting parameters

Parameter	Description	Setting
Full screen	Click it, the live video will be displayed in full screen	[Setting method] Click
Sensor	Set parameters of sensor, more details please refer next chapters.	[Setting method] Click
Zoom In/ Zoom Out	N/A	[Setting method] Click
Open mouse temperature	Click this, and mouse cursor display temperature of point that cursor's position.	[Setting method] Click

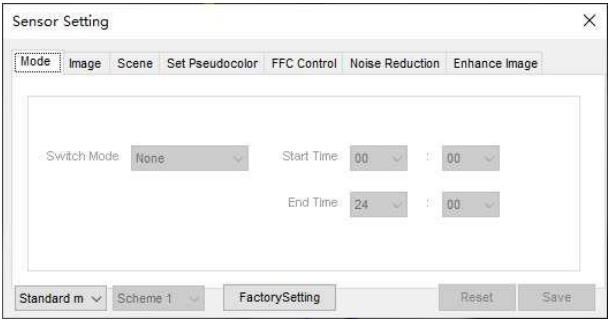
Step 2 Choose **Sensor**. The **Sensor Configuration** dialog box is displayed, as shown in Figure 4-2.

----End

4.2 Mode Setting

Figure 4-2 shows the time segment interface.

Figure 4-2 Time segment interface



Operation Procedure

Step 1 Click  in the lower left corner of Sensor Setting, and choose **Debug Mode**.

Step 2 Tick **Enable**. Choose the T**ime Mode**, set the **Start Time** and **End Time.**

Step 3 Click **Save**, the message "Save success" is displayed, the system saves the settings.

----End

4.3 Image Setting

Figure 4-3 shows the image setting interface.

Figure 4-3 Image interface

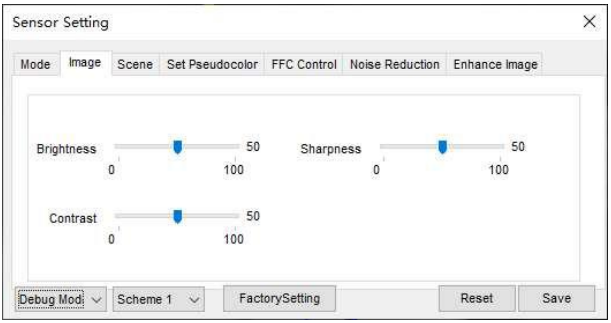


Table 4-2 lists the image setting parameters.

Table 4-2 Image setting parameters

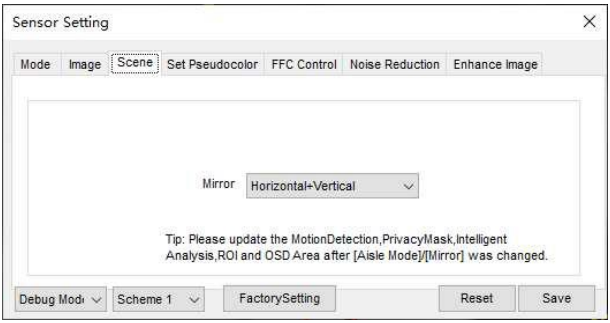
Parameter	Description	Setting
Brightness	It indicates the total brightness of an image. As the value increases, the image becomes brighter.	[Setting method] Drag the slider. [Default value] **50**
Contrast	It indicates the contrast between the bright part and the dark part of an image. As the value increases, the contrast increases.	[Setting method] Drag the slider. [Default value] **50**
Sharpness	It indicates the sharpness of the image plane and the sharpness of the image edge. The more shape of the image, the better image detail contrast.	[Setting method] Drag the slider. [Default value] **50**

----End

4.4 Scene

Figure 4-4 shows the scene interface.

Figure 4-4 Scene interface



Provide the selection of image pixel locations.

Normal: the image is not flipped.

Horizontal: the image is flipped left and right.

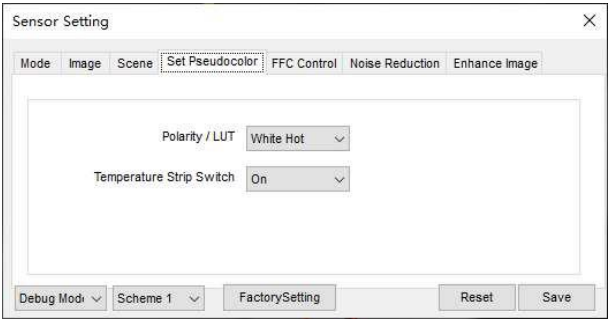
Vertical: the image is flipped up and down.

Horizontal + Vertical: the image upside-down and reversal.

4.5 Set Pseud ocolor

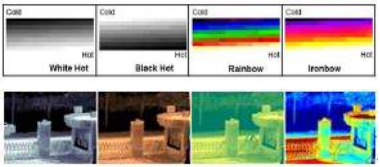
Figure 4-5 shows the set pseudo color interface.

Figure 4-5 Set pseudocolor interface



Polarity/LUT: the temperatures of the temperature fields detected by the thermal imaging camera are separately mapped to values ranging from 0 to 255 by the algorithm. In the black/white display mode, this range is converted to the grayscale tones. For example, 0 indicates completely black, and 255 indicates completely white. The temperature field of the scene is converted to images by using the grayscale

ranging from 0 to 255. Different polarity modes can be converted to different display images. The most common setting is white hot (a hotter object is displayed brighter than a colder object) or black hot (a hotter object is displayed darker than a colder object). The difference between two modes lies in that the temperatures corresponding to the darker one and the lighter one is reversed. Other modes include rainbow, ironbow, HSV, autumn, bone and so on.



Temperature strip switch is on, the live video will show it, otherwise is no strip.

4.6 FFC Control

Figure 4-6 shows the FFC control interface.

Figure 4-6 FFC control interface

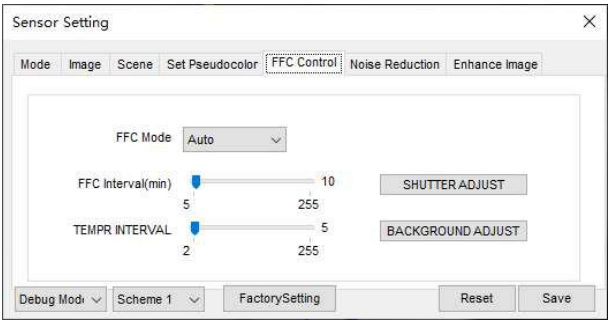


Table 4-3 lists the parameters on the FFC control interface.

Table 4-3 Parameters on the FFC control interface

Parameter	Description	Setting
FFC Mode	The internal of the thermal imaging camera may comprise the mechanical action correction mechanism that can periodically improve the image quality. This component is called flat field correction (FFC). When controlling the FFC, the FFC shields the sensor array, so that each portion	[How to set] Select from the drop-down list box. [Default value] Auto

Parameter	Description	Setting
	of the sensor can collect uniform temperature fields (flat field). By means of FFC, the camera can update the correction coefficients to output more uniform images. Throughout the FFC process, the video image is frozen for two seconds and a static-frame image is displayed. After the FFC is complete, the image is automatically recovered. Repeated FFC operations can prevent the grainy and image degradation problems. The FFC is especially important when the temperature of the camera changes. For example, after the camera is powered on or the ambient temperature is changed, you should immediately perform the FFC. **Auto**: In the Automatic FFC mode, the camera performs FFC whenever its temperature changes by a specified amount or at the end of a specified period of time (whichever comes first). When this mode is selected, the FFC interval (minutes) ranges from 5 to 30 minutes. The temperature change of the camera is based on the temperatures collected by the internal temperature probe. The temperature of the camera sharply changes when the camera is powered on. The FFC is relatively frequent, which is normal. **Manual**: In the manual FFC mode, the camera does not automatically perform the FFC based on the temperature change or the specified period. You can press the Do FFC button to select the manual FFC mode. When you feel that the image is obviously degraded but the automatic FFC is not performed, you can use the manual FFC function to check whether the image quality can be improved.	
FFC Interval (min)	In the automatic FFC mode, the FFC interval ranges from 5 to 255 minutes.	[How to set] Drag the slider. [Default value] 5
Temper Interval	In the automatic FFC mode, the FFC interval ranges from 5 to 25.5 centigrade.	[How to set] Drag the slider. [Default value] 5
Shutter	Click the icon to adjust exposure immediately.	N/A

Parameter	Description	Setting
Adjust		
Background Adjust	Click the icon and adjust the image by covering the camera's lens, finish the image adjustment by removing the shelter.	N/A

----End

4.7 Noise Reduction

Figure 4-7 shows the Noise Reduction interface.

Figure 4-7 Noise reduction interface

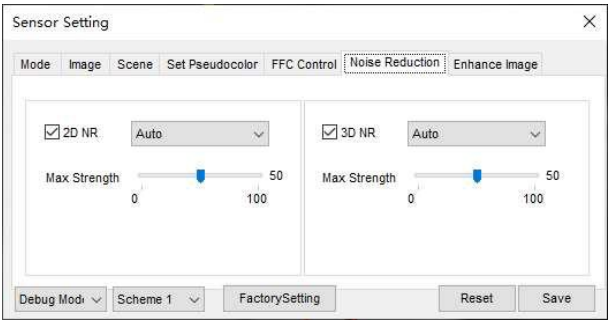


Table 4-4 lists the Noise reduction parameters.

Table 4-4 Parameters on the Noise reduction interface

Parameter	Description	Setting
2 DNR	Decrease the image noise.	[How to set] Select from the drop-down list box. Drag the slider to adjust max strength. [Default value] Auto
3 DNR	Decrease the image noise.	[How to set] Select from the drop-down list box. Drag the slider to adjust max strength. [Default value]

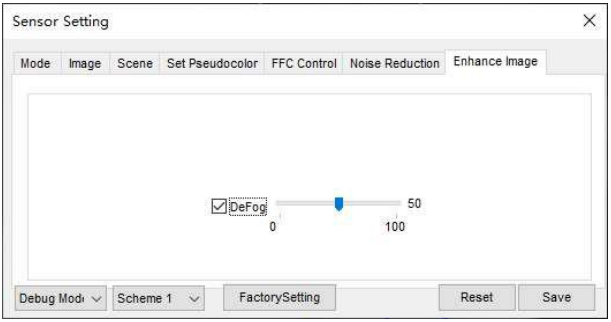
Parameter	Description	Setting
		Auto

----End

4.8 Enhance Image

Figure 4-8 shows the Enhance Image interface.

Figure 4-8 Enhance image interface



Tick defog, and drag the slider to adjust. The default value is 50.

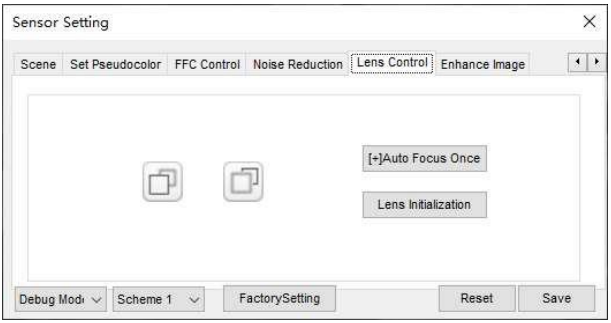
----End

4.9 Lens Control (Supplied for some models)

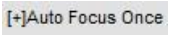
The lens control is useful for motorized lens, please refer to actual products.

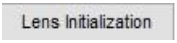
Figure 4-9 shows the Lens Control interface.

Figure 4-9 Lens control interface



Click the   to do near focus/ far focus.

Click  to do auto focus, the focusing charter will show on live video.

Click  to initialize the lens.

----End

A Troubleshooting

Common Trouble	Possible Cause	Solution
Unable to access the web	Network is not connected.	• Connect the network cable of the camera to the PC to check whether the network cable is in good contact. • Run the ping command to check the network connection and whether the device works normally.
	IP address is occupied.	Directly connect the camera to the PC, and reset the IP address of the camera.
	The IP addresses of the PC and the device are in different networks.	Check the IP address, subnet mask and gateway setting of the camera.
PTZ camera is out of control.	The protocol, bit-rate, or address setting of the PTZ is incorrect.	Modify the address of the PTZ on the web.
	The signal cable is unconnected or not connected correctly.	Check the signal strength, and reconnect the signal cable.
The measured temperature is not accurate.	The device is just powered on, and the temperature of the cavity is unstable.	The temperature of the cavity is stable within 15 to 30 min after the device is powered on.
	The FFC mode is incorrect.	The FFC mode is auto by default. If the mode is set to manual, it will be no block calibration, which may lead to fuzzy pictures and inaccurate temperature.
	The target configuration is incorrect.	Check whether the emission rate and distance of the target are configured correctly.

Common Trouble	Possible Cause	Solution
An error occurs in accessing the web of the device after the upgrade.	The data in the cache of browser is not updated in time.	Delete the cache of the Internet Explorer. The steps are as follows (taking IE9 as an example): 1. Open the Internet Explorer. 2. Select **Tools** > **Internet Options**. 3. On the **General** tab, select **Delete** under **Browsing history**. The **Delete Browsing History** dialog box appears. 4. Select all check boxes. 5. Click **Delete**. Login again the web page of the camera.
Upgrade failed.	• No network cable is connected. • The network setting is incorrect.	• Ensure the upgrade network is connected. • Check whether the network setting is correct.
	The upgrade package is incorrect.	Perform the correct upgrade package again.

B Common Emission Rate

Emission Rate

The emission rate is the capability of an object to emit or absorb energy. An ideal transmitter provides an emission rate of emitting 100% of intake energy. An object with an emission rate of 0.8 can absorb 80% of intake energy, and reflect the remaining 20%. The emission rate is the ratio of the energy emitted by an object at a specific temperature to that emitted by an ideal radiator at the same temperature. The range of emission rate value is 0.0 to 1.0 generally.

Materials	Temperature (℃/℉)	Emissivity
Gold (High-purity)	227/440	0.02
Aluminum foil	27/81	0.04
Aluminum sheet	27/81	0.18
Aluminum used for families (flat)	23/73	0.01
Aluminum plate (98.3% purity)	227/440	0.04
	577 10	0.06
Aluminum plate (rough)	26/78	0.06
Aluminum (oxidized @ 599℃)	199/390	0.11
	599/1110	0.19
Polished aluminum	38/100	0.22
Tin (light tinned Iron sheet)	25/77	0.04

Nickel wire	187/368	0.1
Lead (99.9% purity, No oxidized)	127/260	0.06
Copper	99 90	0.18
Cobalt	599/111	0.19
Steel	199/390	0.52
	599/1110	0.57
Tinned iron sheet (Light)	28/82	0.23
Brass (High-polish)	247/476	0.03
Brass (Tough rolled, polished metal wire)	21/70	0.04
Tinned Iron (Light)	-	0.13
Iron plate (Rust eaten)	20/68	0.69
Rolled steel sheet	21/71	0.66
Ferric oxide	100/212	0.74
Wrought-iron	21/70	0.94
Fused iron	1299-1399/3270-2550	0.29
Copper (Polished)	21-117/70-242	0.02
Copper (Polished, not reflected)	22/72	0.07
Copper (Heavy oxide Board)	25/77	0.78
Enamel (Fuse on iron)	19/66	0.9
Formica Plate	27/81	0.94

Frozen soil	-	0.93
Brick (Red, rough)	21/70	0.93
Brick (Unglazed, rough)	1000/1832	0.8
Carbon (T - carbon 0.9% ash)	127/260	0.81
Concrete	-	0.94
Glass (Glossy)	22/72	0.94
Granite (Surfaced)	21/70	0.85
Ice	0/32	0.97
Marble (I Polished, grey)	22/72	0.93
Asbestos board	23/74	0.96
Asbestos paper	38/100	0.93
	371/700	0.95
Asphalt (Paving the road)	4/39	0.97
Paper (Black tar)	-	0.93
Paper (White)	-	0.95
Plastic (White)	-	0.91
plywood	19/66	0.96
Water	-	0.95
Wood (Fresh scent)	-	0.9

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