Thermal Imaging Integrated Network Camera
User Manual

Issue	**V1.0**
Date	**2018-10-31**

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 which 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 the 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 -10°C (+14F) or higher than 50°C (+122F). 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 moistened 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 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 integrated network camera. For details about the interfaces, see Table 1-1.

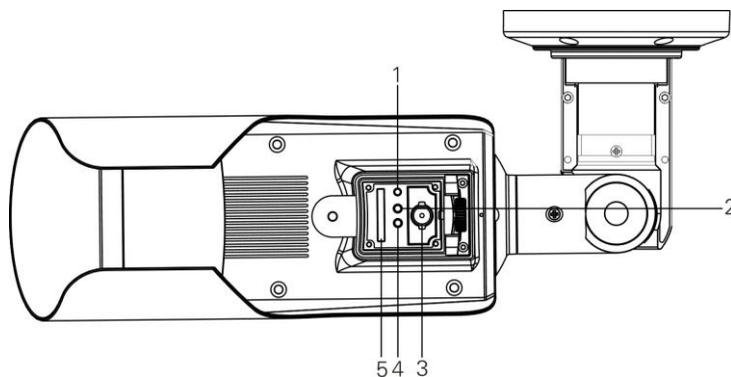Figure 1-1 Appearance and interfaces of the thermal imaging integrated network camera

Table 1-1 Interfaces

No.	Physical Interface	Connection
1	Reset button (RESET)	The configuration resumes to the factory settings after you press the reset button for 3s. The default value is 192.168.0.121.
2	Network indicator	Network connection indicator
3	Video output (VOUT)	It outputs the analog video signals and can be connected to the TV monitor to view analog videos.
4	SD card indicator	The SD indicator has the following states: • OFF: The SD card is not inserted. • ON: The SD card is inserted.
5	SD card slot	It places the SD card. Note: • When you install the SD card, ensure that the SD card is not in the write-protection state and then insert the SD card in the SD card slot. • When you remove the SD card, ensure that the SD card is not in the write-protection state. Otherwise, the data may be lost or the SD card may be damaged. When hot plugging the SD card, stop recording and then perform the corresponding operation.

1.3 Cable Connection

Figure 1-2 the multi-connector combination cable of the thermal imaging integrated network camera. For details about the multi-connector combination cable, see Table 1-2.

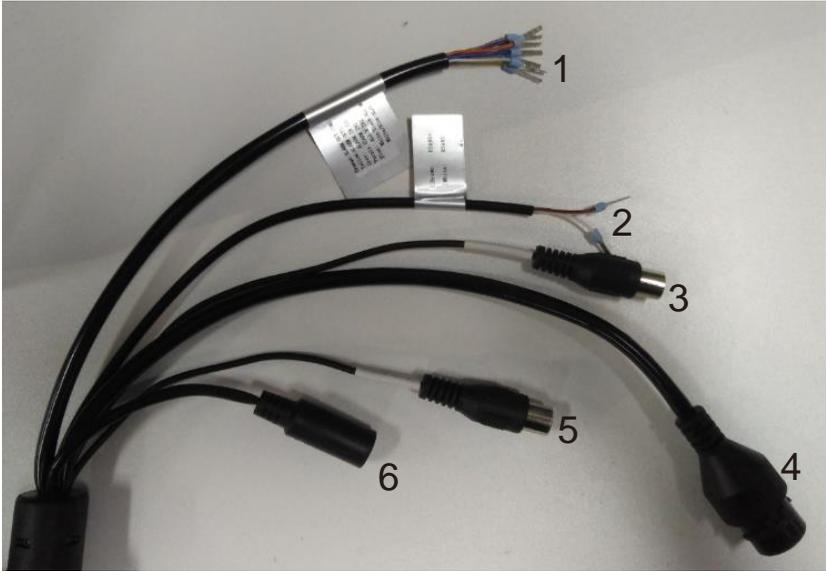Figure 1-2 Multi-connector combination cable

Table 1-2 Multi-connector combination cable

ID	Core of Cable	Functions	Connection
1	Orange	Alarm output 1 negative	Connects to the alarm output device.
	White injected with black	Alarm output 2 negative	
	Yellow	Alarm output 1	
	White injected with blue	Alarm output 2	
	gray	Alarm input negative	Connects to the alarm input device.
	Purple	Alarm input 1	
	Blue	Alarm input 2	
2	Brown	RS485RS+	RS485 interface connects to the external pan & tilt.
	White	RS485RS-	

| ID	Core of Cable	Functions	Connection
3		Audio input port (cable input)	Inputs the audio signal and receives the analog audio signals from the sound pick-up device.
4	-	Network interface	Connects to the standard Ethernet cable.
5	-	Audio output	Connects to the external audio device such as the voice box.
6	-	DC12V (2A)	Power interface, connects to the 12 V DC power supply.

1.4 Functions and Features

- Using the uncooled infrared focal plane sensor

- Detecting the infrared wavelength ranging from 8 um to 14 um

- 400*300 pixels

- High thermal sensitivity, reaching 50mK

- Supporting dedicated lens for 8/15/25/35/50 mm focal distance (optional)

- Supporting 17 pseudo color modes such as black hot, white hot, rainbow, iron bow and so on

- Supporting the DVE image enhancement

- Supporting noise reduction and mirroring

- Supporting three coding algorithms, that is H.265,H.264 and MJPEG, it is 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, temperature measurement.

- Over temperature warning and over temperature alarm

- Outputting three 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

- Supporting the local storage of the Micro SD card (the maximum capacity is 128 GB) and effectively resolving the video loss problem caused by network failure

- Supporting NAS storage

- Providing software and hardware watchdogs and automatic fault recovery

- Linked heat dissipation structure of the metal enclosure

- 3-axis rotational adjustment structure facilitating installation and adjustment
- DC 12 V/2A

2 Device Dimensions

Figure 2-1 shows the dimensions of device.

Figure 2-1 Dimensions (unit: mm)
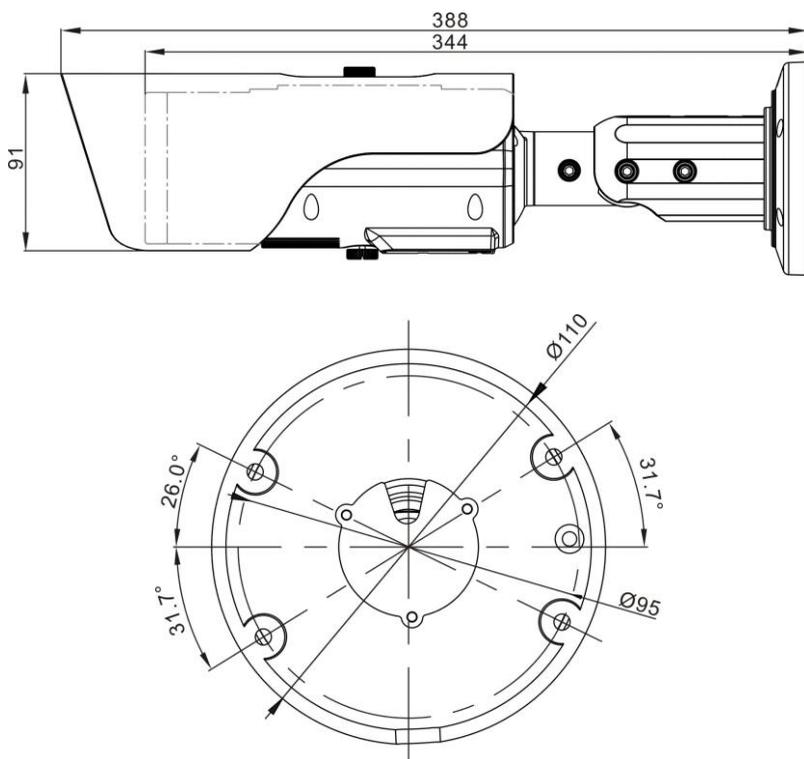
3 Installation

3.1 Preparations

You may need the tools and accessories shown in Table 3-1 during the installation (you need to prepare the tools by yourself, and the accessories are in the package of the camera).

Table 3-1 Installation tools

Tools	Appearance
Phillips screwdriver (prepare by yourself)	
Claw hammer (prepare by yourself)	
Hammer drill (prepare by yourself)	
Spirit level (prepare by yourself)	
T15 ring spanner (delivered with the camera)	
Stainless hexagon socket head cap screw (delivered with the camera)	
Self-tapping screw (delivered with the camera)	
Inflatable colloidal particle (delivered with the camera)	

3.2 Installation Mode

The thermal imaging integrated camera can be installed on the ceiling or the wall. You can select the appropriate installation according to your requirements. If the camera needs to be installed on the cement wall, you need to install the expansion screws (the mounting holes of the screws must be consistent with that of the support), and then install the support.

📖 NOTE

The wall where the support is mounted must be able to withstand at least three times of the total weight of the support and the camera.
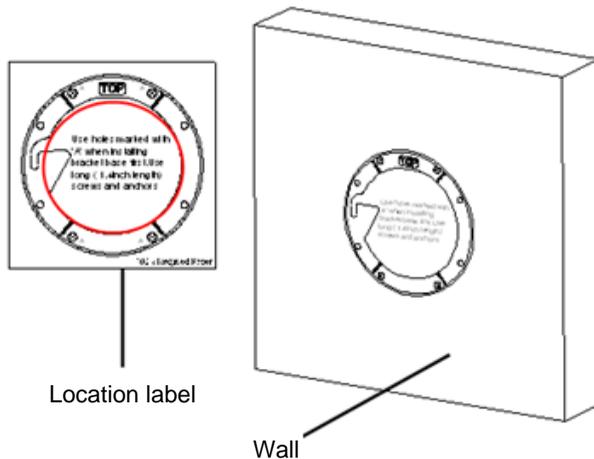
3.3 Installation Procedure

Step 1   Remove the installation location labels delivered with the camera. Stick the installation location labels on the ceiling or the wall, as shown in Figure 3-1.

📖 NOTE

- If the installation uses the back leading mode, pouch a leading-out hole on the ceiling or the wall, as shown in the area highlighted in red in Figure 3-1. (This manual uses the back leading mode as an example.)

- If the installation uses the side leading mode, lead the multi-connector combination cable from the side notch on the bottom of the camera.

Figure 3-1 Installation location label

Location label

Wall

Step 2   According to the location hole positions shown in the installation location label, punch four location holes with diameter 5 mm on the ceiling or the wall.
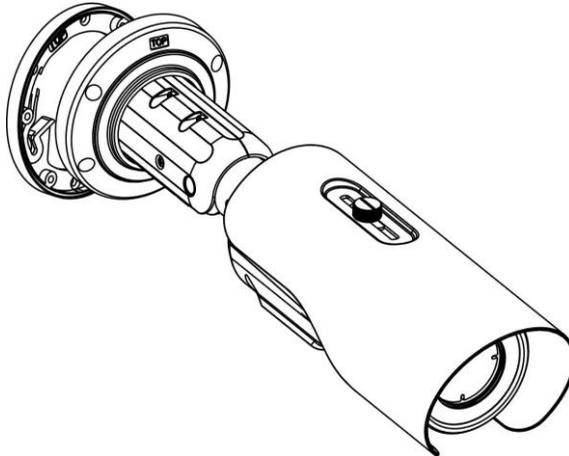
Step 3   Fix the installation base on the wall, as shown in Figure 3-2.

Figure 3-2 Fixing base

Step 4   Hang the integrated camera into the base along the guide slots and rotate it to a certain angle to facilitate cable connection, as shown in Figure 3-3.

Figure 3-3 Hang the integrated camera into the base

Step 5   Connect and conceal the cables for the integrated camera. After the cable connection is complete, rotate the integrated camera to align at the installation base, as shown in Figure 3-4.

Figure 3-4 Align at the base
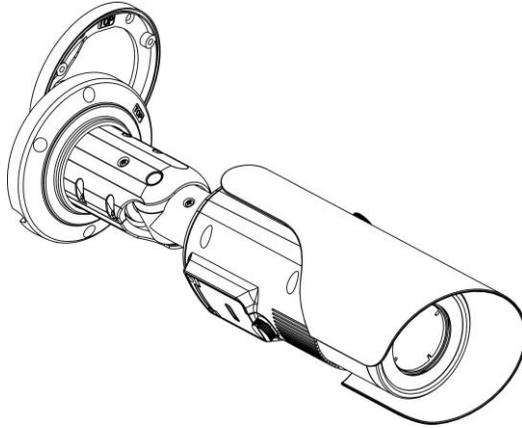
Step 6   Fix the integrated camera to the installation base, as shown in Figure 3-5.

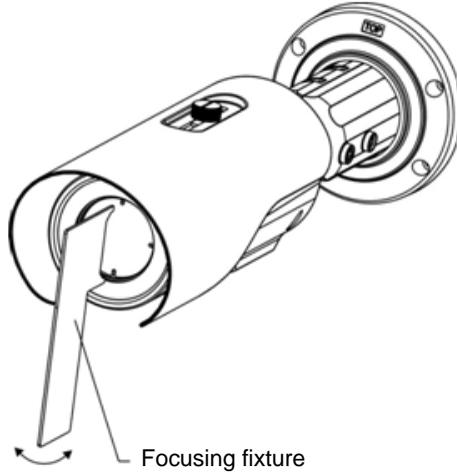Figure 3-5 Fix the integrated camera to the installation base
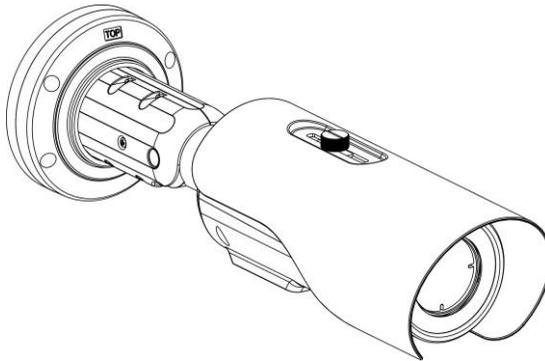
Step 7   Focus

(1)   Focus with focusing fixture

Align the focusing fixture at the lens grooves, clamp a proper position, grasp the handle
portion of the fixture, and focus along the direction of arrows, as shown in Figure 3-6.
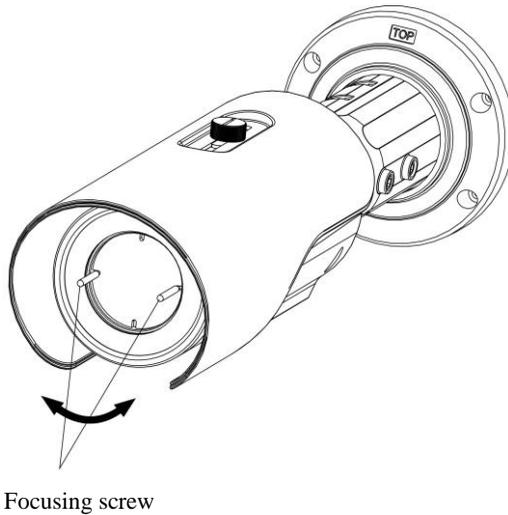
Figure 3-6 Focus with focusing fixture
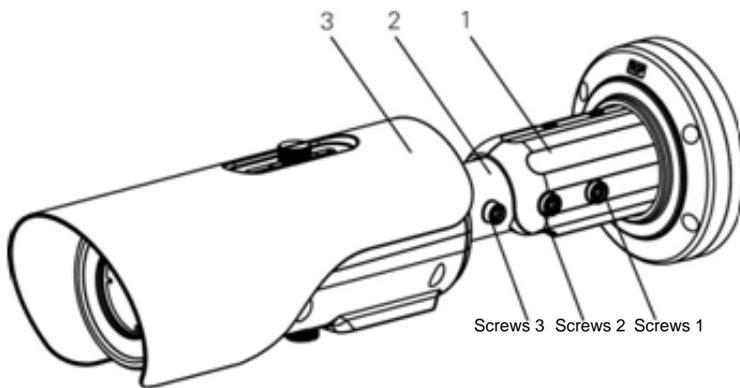

Focusing fixture

(2)   Focus with focusing screw

Insert the focusing screw into the screw hole and focus along the direction of arrows as shown in Figure 3-7.

Figure 3-7 Focus with focusing screw

Focusing screw

Step 8   Adjust the surveillance angle, as shown in Figure 3-8, and then fix the screws.

Figure 3-8 Adjust the surveillance angle

1. Loosen the screws 1, and adjust the part 1 along the arrow direction. The adjustment angle is 360 degrees.

1. Loosen the screws 2, and adjust the part 2 along the arrow direction. The adjustment angle is 90 degrees.

1. Loosen the screws 3, and adjust the part 3 along the arrow direction. The adjustment angle is 360 degrees.

----End

4 Quick Configuration

4.1 Login and Logout

> ⚠ **CAUTION**
>
> You must use Internet Explorer 7 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 4-1.

Figure 4-1 Login page

Step 2   Input the user name and password.

📖 **NOTE**

- The default name is **admin.** The default password is **admin**. Change the password when you log in the system for first time to ensure system security.

- You can change the system display language on the login page.

Step 3   Click Login.

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 displayed after you logout of the system.

4.2 Main Page Layout

On the main page, you can view real-time video, playback and configuration. You can set parameter, Video parameter, Video control, PTZ control, PTZ Configure and logout of the system. Figure 4-2 is shown the main page layout. Table 4-1 lists the elements on the main page layout.

Figure 4-2 Main page layout

Table 4-1 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 query the playback videos in this area. NOTE Only when the SD card or NAS have videos that you can query 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.

NO.	Element	Description
4	Alarm icon	When the device generates an alarm, the alarm icon ![alarm icon] is displayed. You can click ![alarm icon] to view the alarm information. NOTE When the device accepts an alarm signal, the alarm icon will display within 10s in the web management system.
5	Change password	You can click ![icon] to change the password.
6	Sign Out	You can click ![icon] to return to the login page.

----End

4.3 Changing the Password

Description

You can click ![icon] to change the password for logging in to the system.

Procedure

Step 1   Click ![icon] in the upper right corner of the main page.

The **Change Password** dialog box is displayed, as shown in Figure 4-3.

Figure 4-3 Modify Password dialog box

> **NOTE**
>
>   The change password page will be displayed if you don't change the default password when
>   you login the system for the first time.

Step 2   Enter the old password, new password, and confirm 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

4.4 Browsing Video

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

Preparation

    To ensure the real-time video can be played properly, you must perform the following
    operation when you log in to 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 4-4.

Figure 4-4 Adding the a trusted site
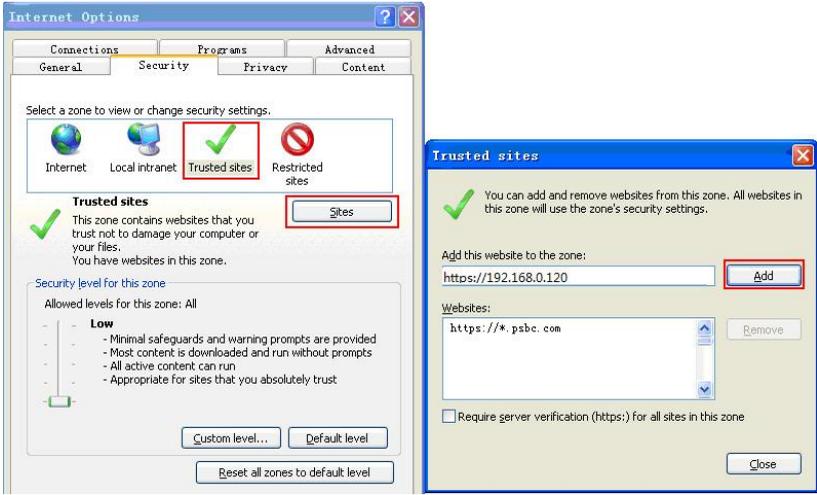
Step 2   In the Internet Explorer, choose Tool > Internet Options > Security > Customer level, and set Download unsigned ActiveX control and initialize and script ActiveX controls not marked as safe for scripting under ActiveX controls and plug-ins to Enable, as shown in Figure 4-5.

Figure 4-5 Configuring ActiveX control and plug-ins
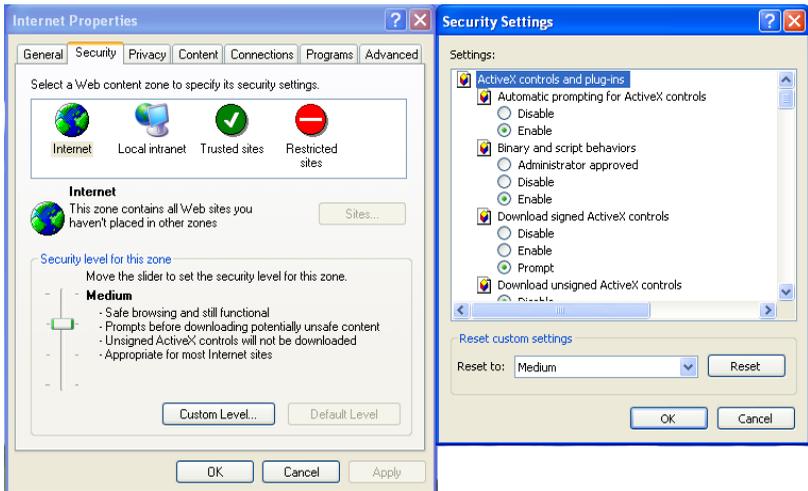
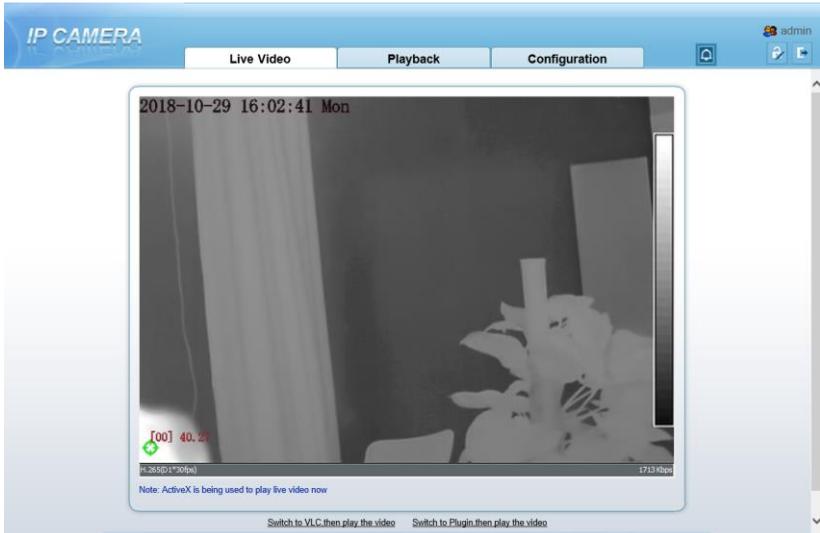Step 3   Download and install the player control as prompted.

 NOTE

The login page is displayed when the control is loaded.

4.4.1 Install Plugins

You will be prompted with a message "click here to use short delay Plugin for Live Video" as shown in Figure 4-6 when you log in to the web management system for the first time.

Figure 4-6 Download the plugin page

Procedure

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

Step 2   Reopen the browser after installation.

----End

4.5 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 错误!未找到引用源。.

Figure 4-7 Device information

🖥 **Local Network**

IP Protocol	IPv4 ▼

DHCP	⬜ OFF
IP Address	192.168.0.121
Subnet Mask	255.255.255.0
Default Gateway	192.168.0.1

Preferred DNS Server	192.168.0.1
Alternate DNS Server	192.168.0.2
MTU(800-1500)	1500

Refresh   Apply

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

Table 4-2 Local network parameters

Parameter	Description	Setting
IP Protocol	IPv4 is the IP protocol that uses an address length of 32 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.

Parameter	Description	Setting
DHCP IP	IP address that the DHCP server assigned to the device.	N/A
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 800 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 log in to the system again.

- You can click **Reset** to set the parameters again if required.

----End

5 Thermal Setting

5.1 Temperature Parameters

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

Operation Procedure

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

The **Temperature Parameters** page is displayed, as shown in Figure 5-1.

Figure 5-1 Temperature Parameters interface

Step 2 Set the parameters according to Table 5-1.

Table 5-1 Temperature parameters

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

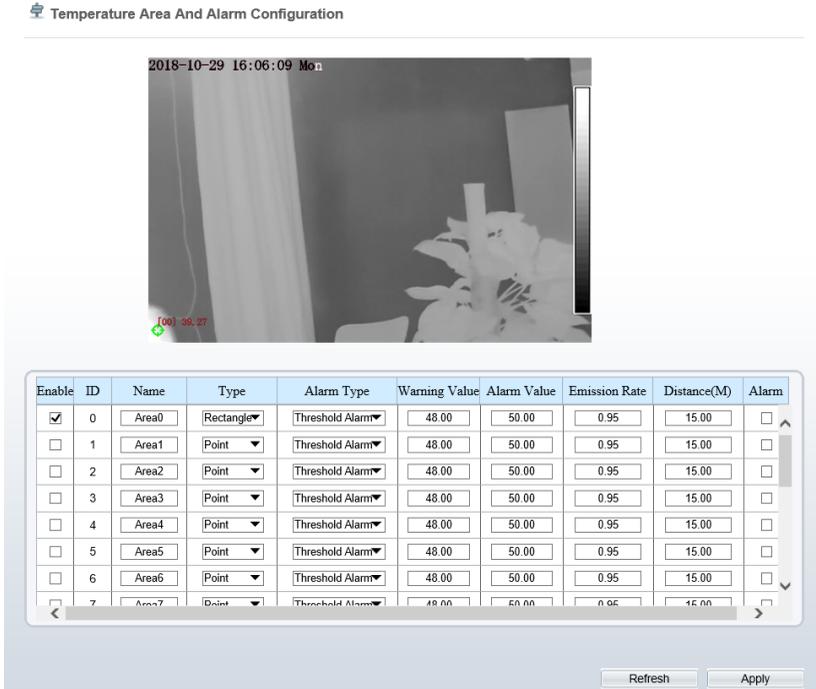| Parameter	Description	Setting
Ambient Type	The ambient of camera. Outside and Inside are available. **Inside** suggest to be selected when the ambient temperature change frequently.	[Setting method] Select a value from the drop-down list box. [Default value] Outside
Ambient Temperature	The ambient temperature of camera. It is set when ambient is outside.	[Setting method] Enter a value manually.
Cavity Temperature	The cavity temperature of camera.	N/A
Correction Coefficient	Correction coefficient refers to the deviation of measured object temperature and actual temperature. For example: 1.The measured object temperature is 30, and actual temperature is 37, so the correction coefficient should be **7.** 2. The measured object temperature is 37, and actual temperature is 30, so the correction coefficient should be -**7.**	[Setting method] Enter a value manually. [Default value] 0.00
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
Measure Mode	Choose the measure mode from general to preset.	[Setting method] Select a value from the drop-down list box. [Default value] General
Display alarm area	Enable or disable the display alarm area	
Area alarm interval	Set the area alarm interval from 1 to1800s	[Setting method] Enter a value manually.

----End

5.2 Temperature Area

Operation Procedure

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

The **Temperature Area** page is displayed, as shown in Figure 5-2

Figure 5-2 Temperature area and alarm configuration

Step 2   Set the parameters according to Table 5-2

Table 5-2 Temperature area and alarm configuration

Parameter	Description	Setting
Enable	Enable the temperature area.	[Setting method] Tick the enable button.
ID	Area ID of temperature area.	N/A
Name	Area name of temperature area.	[Setting method] Enter a value manually.

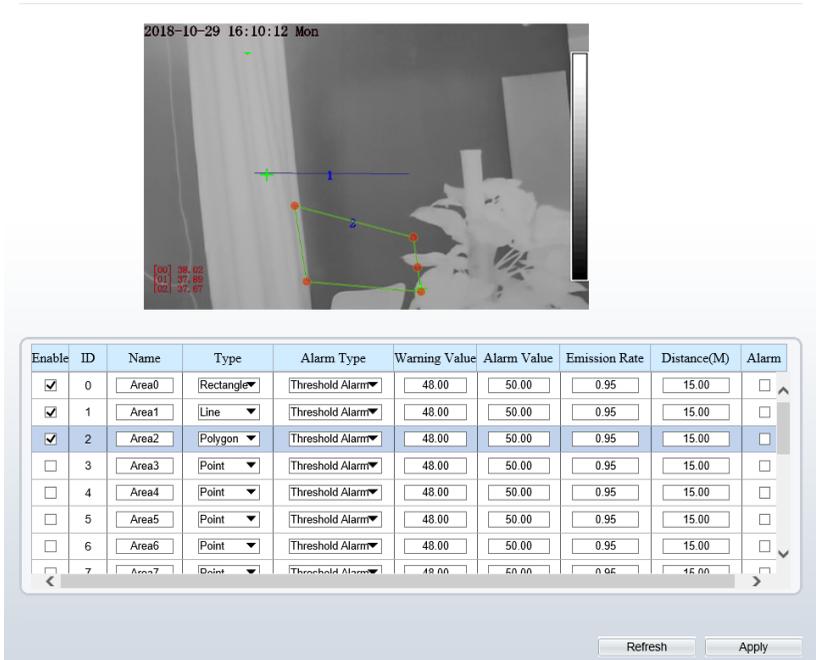| Parameter	Description	Setting
Type	Type of temperature area.	[Setting method] Select a value from the drop-down list box. [Default value] Rectangle
Alarm Type	Threshold alarm and Temperature difference alarm are available for alarm type.	[Setting method] Select a value from the drop-down list box. [Default value] Threshold alarm
Warning Value	Camera will warn when the surveillance object temperature reaches the warning value.	[Setting method] Enter a value manually. [Default value] 48
Alarm Value	Camera will alarm when the surveillance object temperature reaches the alarm value.	[Setting method] Enter a value manually. [Default value] 50
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	Channel of alarm output.	[Setting method] Tick the alarm output channel .

Step 3   Set temperature area.

> Step 1. Select an area ID
>
> Step 2. Select type from drop-list.
>
> Step 3. Press and hold the left mouse button, and drag in the video area to draw a temperature area, as shown in Figure 5-3.

Figure 5-3 Alarm Time Setting Interface

> Step 4. Click **Apply**, the message "Apply success" is displayed, the temperature area is set successfully.

📖 NOTE

> Delete a temperature area:
>
> Step 1. Select an area ID
>
> Step 2. Click the temperature area and right-click.
>
> Step 3. 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

5.3 Schedule Linkage

Operation Procedure

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

The **Schedule Linkage** page is displayed, as shown in Figure 5-4

Figure 5-4 Schedule Linkage

Step 2   Choose threshold alarm, threshold temperature difference alarm, threshold warming
and temperature difference warming to set. All of these four settings are the same ways
to set.

Step 3   Check the output channel.

Step 4   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 5-4.

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 5   Click **Apply**.

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

----End

6 Parameter Setting

6.1 Sensor Configuration 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 6-1.

Figure 6-1 Sensor configuration

Full Screen
Sensor
ZoomIn
ZoomOut
Restore Panorama
Turn on the mouse to measure the temperature
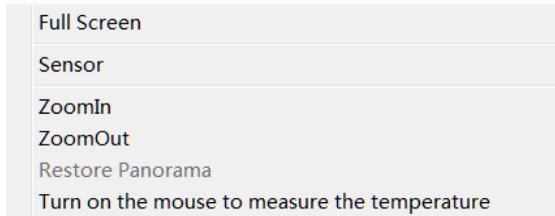
Step 2   Choose **Sensor**. The **Sensor Configuration** dialog box is displayed, as shown in Figure 6-2.

----End

6.2 Time Segment

Figure 6-2 shows the time segment interface.

Figure 6-2 Time segment interface
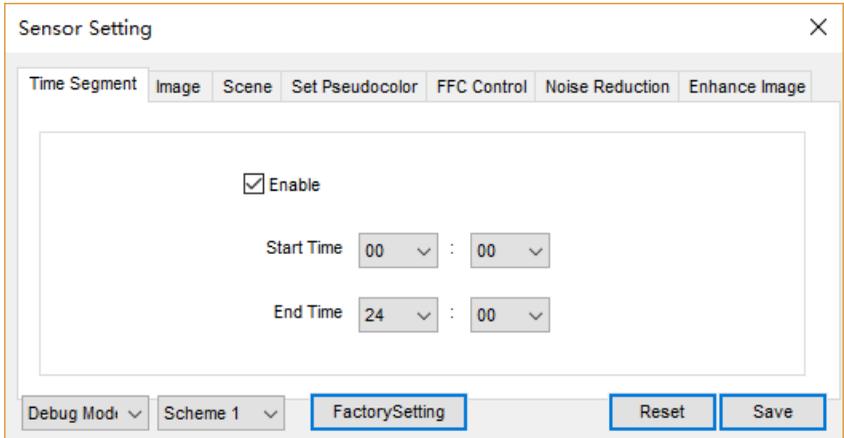
Operation Procedure

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

Step 2   Tick **Enable**.

Step 3   Set the **Start Time**

Step 4   Set the **End Time**

Step 5   Click **Save**, the message "Save success" is displayed, the system saves the settings.

----End

6.3 Images

Figure 6-3 shows the image setting interface.

Figure 6-3 Image setting interface
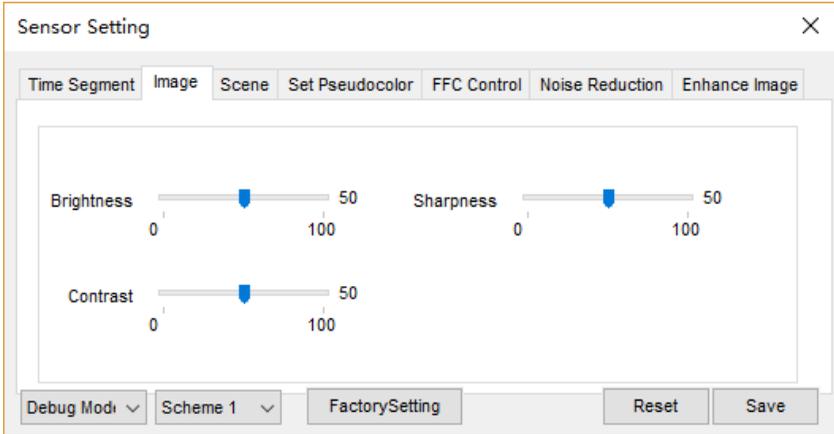
Step 1   Click **Standard ▼** in the lower left corner of Sensor Setting, and choose **Debug Mode**.

Step 2   Drag the slider to adjust parameter of image.

Brightness：It indicates the total brightness of an image. As the value increases, the image becomes brighter. It ranges from 0 to100.

Contrast：It indicates the contrast between the bright part and the dark part of an image. As the value increases, the contrast increases. It ranges from 0 to 100.

Sharpness: it indicates the contrast between definition and edge sharpness. The higher value, the higher definition and greater distortion. It ranges from 0 to 100

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

----End

6.4 Scene

Figure 6-4 shows the scene setting interface

Figure 6-4 Scene setting interface
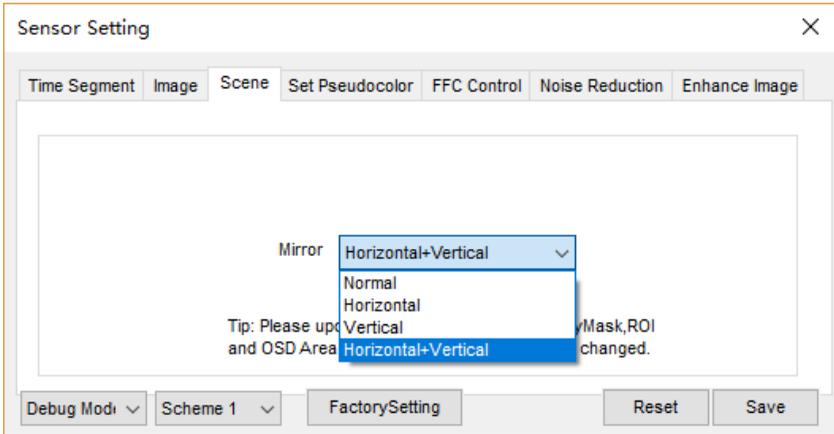
Step 1   Click Standard ▼ in the lower left corner of Sensor Setting, and choose **scene**

Step 2   Choose mirror mode from drop-list.

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

📖 **NOTE**

Mirror providing 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.

Picture Flip: the image is rotated at 180 degree.

----End

6.5 Set Pseudocolor

Figure 6-5 shows the scene setting interface

Figure 6-5 Set pseudocolor setting interface
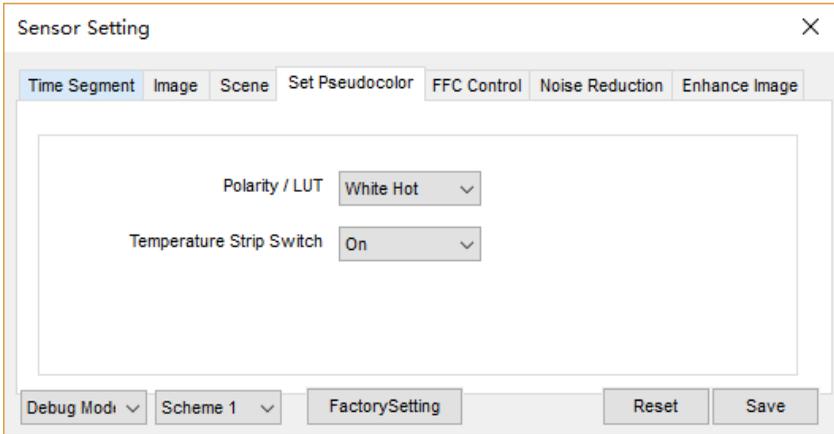
Step 2   Click [Standard ▼] in the lower left corner of Sensor Setting, and choose **set pseudo color**

Step 3   Choose polarity/LUT mode from drop-list.

Step 4   Enable or disable the temperature strip switch

Step 5   Click **Save**, the message "Save success" is displayed, the system saves the settings.

📖 **NOTE**

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 gray scale 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 are reversed. Other modes include rainbow, ironbow, HSV, autumn, bone and so on.
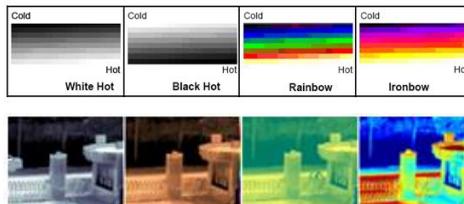
6.6 FFC Control

Figure 6-6 shows the FFC control interface.

Figure 6-6 FFC control interface
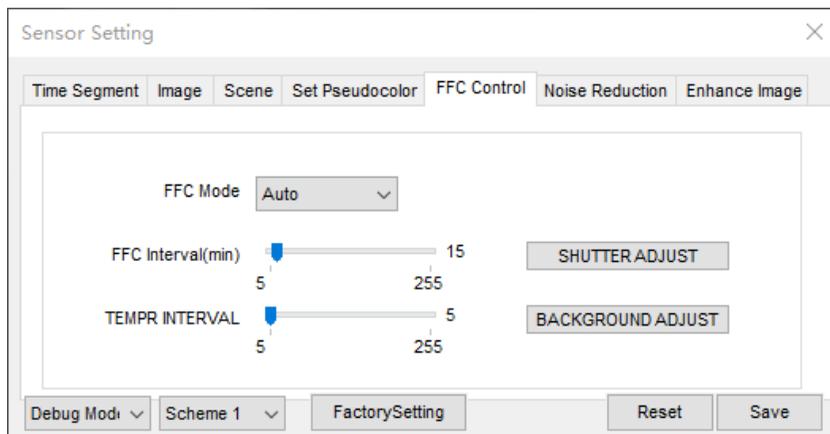
Table 6-1 lists the parameters on the FFC control interface.

Table 6-1 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 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	[How to set] Select from the drop-down list box. [Default value] Auto

Parameter	Description	Setting
	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. When the time reach to setting value, the camera do shutter adjust operation automatically.	[How to set] Select by dragging the slider. [Default value] 5
Tempr interval	In the automatic FFC mode, the tempr interval value ranges from 5 to 255 degree centigrade. When the time reach to setting value, the camera do background adjust operation automatically.	[How to set] Select by dragging the slider. [Default value] 5
Shutter adjust	Click the icon and camera perform the action.	Manually
Background adjust	Click the icon and camera perform the action.	Manually

----End

6.7 Noise Reduction

Figure 6-7 shows the Noise reduction interface.

Figure 6-7 Noise reduction interface
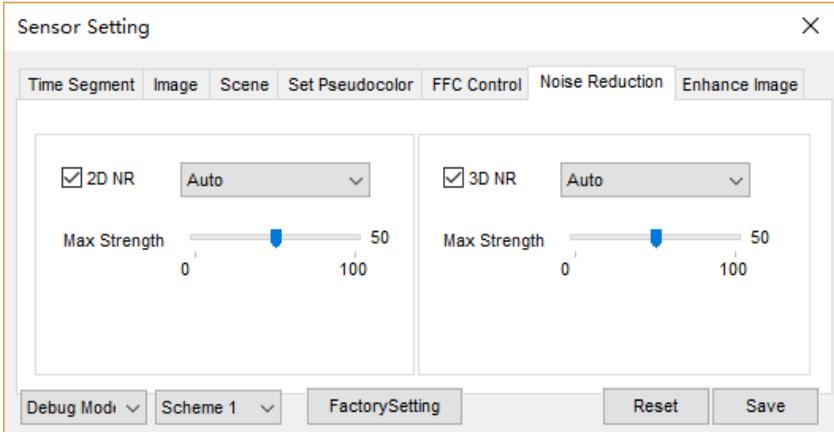
Table 6-2 lists the Noise reduction parameters.

Table 6-2 Parameters on the Noise reduction interface

Parameter	Description	Setting
2DNR	Decrease the image noise.	[How to set] Select from the drop-down list box. [Default value] Close
3DNR	Decrease the image noise.	[How to set] Select from the drop-down list box. [Default value] Close

----End

6.8 Enhance Image

Figure 6-8 shows the **Enhance image** interface.

Figure 6-8 Enhance image interface
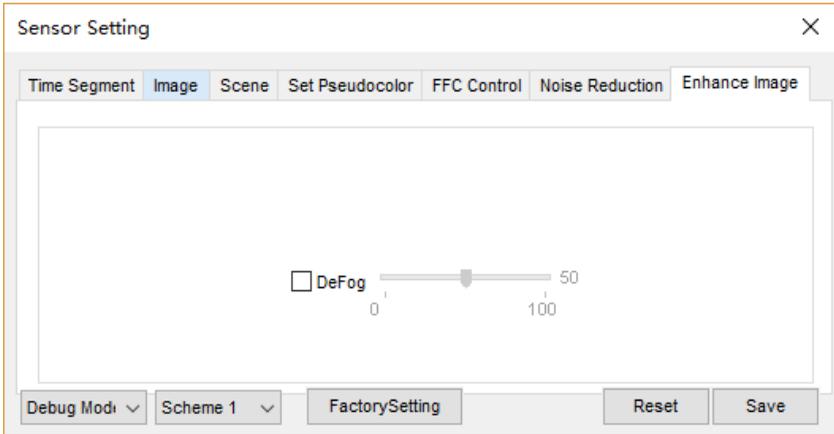
Step 2   Click [Standard ▼] in the lower left corner of Sensor Setting, and choose **enhance image**

Step 3   Check **defog,** then drag the slider to set**.** It ranges from 0-100, the default value is 50.

Step 4   Click **Save**, the message "Save success" is displayed, the system saves the settings.

----End

7 Technical Specifications

Table 7-1 lists the specifications of the thermal imaging integrated camera.

Table 7-1 Technical specifications

Type	Parameter	Description
Detector performance	Detector type	Uncooled infrared focal plane sensor
	Sensing mode	Micro bolometer
	Material type	Vanadium oxide
	Pixel	400x300
	Pixel spacing	17 um
	Response waveband	8-14 um
	Thermal sensitivity NETD	40Mk/F1.0
	Frame frequency	50/60 Hz
Lens features	Prime lens	8/15/25/35/50mm (optional)
	Focusing mode	Manual
	Field angle	46 °×35 °/25 °×19 °/15 °×11 °/11 °×8 °/ 7 °×5 °
	F value	1.0
	Recognition distance (Human body)	764/120/199/279/399 meters
	Recognition distance (Vehicle)	159/298/497/696/994 meters
Imaging feature	Polarity LUT	Black hot / white hot / rainbow / iron bow (up to 17define optional)
	DVE Image Enhancement	Continuous adjustable
	FFC	Auto/manual/external
	DNR	2D/3D

Type	Parameter	Description
	Contrast	Support
	Mirror	Support
	OSD display	Support
Video features	Output resolution	D1/CIF
	Frame rate	25/30fps
	Video encode format	H.265/H.264./MPGE
	Video resolution and frame rate	Stream 1:D1 25/30fps；stream 2：CIF 25/30fps
	Multiple code streams	3 streams
	Bit rate control	CBR/VBR
	SNR	55 dB
	DNR	Automatically /manually, Support 3D noise reduction
Audio features	Audio encode format	G.711:8kbps；RAW_PCM:16kbps
Thermal performance	Temperature Measurement Function	Point temperature measurement, Regional temperature measuring, Full screen temperature measurement
	Alarm Temperature Detection	Over temperature warn, Over temperature alarm.
	measuring-temperature accuracy	$\pm2℃$ or more$\pm2℃$（it depends emissivity, distance, temperature, etc.）
	Multiple temperature area	Support
	Temperature response time	Less than 30 millisecond
	Effective range of working temperature	-10℃～+55℃
	Theoretical temperature range	-30℃～+200℃
	Display thermometry mode	If the object's temperature is more than 5℃，it will be shown absolute temperature

Type	Parameter	Description
		If the object's temperature is less than or equal to 5℃, it will be shown relative temperature(DEV=maximum-average)
Network features	Network protocol	IPv4/IPv6, RTSP/RTP/RTCP, TCP/UDP, HTTP, DHCP, DNS, FTP, DDNS, PPPOE, SMTP, and SIP
	Storage communication protocol	CIFS and NFS
	WEB management	Embedded WEB service, remote browsing and configuration over IE browser
	Remote upgrade and maintenance	Support
	Integration	Supporting the international standard Onvif and the third-party protocol
	Maximum user access amount	Simultaneous access of 10 users to the maximum
Interface features	Network interface	RJ-45 and 10/100Base-T
	Audio interface	1-channel audio input and 1-channel audio output, supporting bidirectional voice talkback
	Alarm interface	2-channel alarm input and 2-channel alarm output
	Analog video output interface	BNC,75Ohm
	Pan & tilt control interface	RS485
	SD card connector	Micro SD card/HCSD card, 128 GB to the maximum
System function features	Intelligent alarm	Motion detection alarm, I/O alarm, and disk alarm
	Intelligent analysis	Area invaded/single virtual fence/double virtual fences/object left/object removed

Type	Parameter	Description
	ROI	Support
	Time-phased configuration	Support
	Storage	Local storage, NAS storage, and SD card storage
	Privacy mask	5 areas with configurable size
	Support SDK development	Linux C /windows C&C++ SDK
	Character display	Time, date, channel No., channel name and user-defined characters
	Security	Password protection, multi-level user group management, user-define permissions, and one-key reset
Physical features	Power supply	DC 12 V/POE
	Power consumption	5 W
	Operating temperature	-10°C to +50°C(thermometry type) -30°C～+55°C(imaging type)
	Operating humidity	RH90% MAX (no condensation)
	Protection class	IP66
	Installation mode	Wall and ceiling
	Dimensions	φ110×388 mm
	Weight	About 1900g (25mm lens)

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 or high speed dome 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 minutes after the device is powered on.
	The FFC mode is incorrect.	The FFC default mode is automatic. 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**. Relogin 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
	577/107	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	199/90	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