Thermographic Cube Camera

User Manual
Legal Information

User Manual
©2019 Hangzhou Hikvision Digital Technology Co., Ltd. All rights reserved.

About this Manual
The Manual includes instructions for using and managing the Product. Pictures, charts, images and all other information hereinafter are for description and explanation only. The information contained in the Manual is subject to change, without notice, due to firmware updates or other reasons. Please find the latest version of this Manual at the Hikvision website (https://www.hikvision.com/en/). Please use this Manual with the guidance and assistance of professionals trained in supporting the Product.

Trademarks
Hikvision and other Hikvision's trademarks and logos are the properties of Hikvision in various jurisdictions. Other trademarks and logos mentioned are the properties of their respective owners.

Disclaimer
TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, THIS MANUAL AND THE PRODUCT DESCRIBED, WITH ITS HARDWARE, SOFTWARE AND Firmware, ARE PROVIDED "AS IS" AND "WITH ALL FAULTS AND ERRORS". HIKVISION MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY, SATISFACTORY QUALITY, OR FITNESS FOR A PARTICULAR PURPOSE. THE USE OF THE PRODUCT BY YOU IS AT YOUR OWN RISK. IN NO EVENT WILL HIKVISION BE LIABLE TO YOU FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, OR INDIRECT DAMAGES, INCLUDING, AMONG OTHERS, DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, OR LOSS OF DATA, CORRUPTION OF SYSTEMS, OR LOSS OF DOCUMENTATION, WHETHER BASED ON BREACH OF CONTRACT, TORT (INCLUDING NEGLIGENCE), PRODUCT LIABILITY, OR OTHERWISE, IN CONNECTION WITH THE USE OF THE PRODUCT, EVEN IF HIKVISION HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES OR LOSS.
YOU ACKNOWLEDGE THAT THE NATURE OF INTERNET PROVIDES FOR INHERENT SECURITY RISKS, AND HIKVISION SHALL NOT TAKE ANY RESPONSIBILITIES FOR ABNORMAL OPERATION, PRIVACY LEAKAGE OR OTHER DAMAGES RESULTING FROM CYBER-ATTACK, HACKER Attack, VIRUS INSPECTION, OR OTHER INTERNET SECURITY RISKS; HOWEVER, HIKVISION WILL PROVIDE TIMELY TECHNICAL SUPPORT IF REQUIRED.
YOU AGREE TO USE THIS PRODUCT IN COMPLIANCE WITH ALL APPLICABLE LAWS, AND YOU ARE SOLELY RESPONSIBLE FOR ENSURING THAT YOUR USE CONFORMS TO THE APPLICABLE LAW. ESPECIALLY, YOU ARE RESPONSIBLE, FOR USING THIS PRODUCT IN A MANNER THAT DOES NOT INFRINGE ON THE RIGHTS OF THIRD PARTIES, INCLUDING WITHOUT LIMITATION, RIGHTS OF PUBLICITY, INTELLECTUAL PROPERTY RIGHTS, OR DATA PROTECTION AND OTHER PRIVACY RIGHTS.
YOU SHALL NOT USE THIS PRODUCT FOR ANY PROHIBITED END-USES, INCLUDING THE DEVELOPMENT OR PRODUCTION OF WEAPONS OF MASS DESTRUCTION, THE DEVELOPMENT OR PRODUCTION OF CHEMICAL OR BIOLOGICAL WEAPONS, ANY ACTIVITIES IN THE CONTEXT RELATED TO ANY NUCLEAR EXPLOSIVE OR UNSAFE NUCLEAR FUEL-CYCLE, OR IN SUPPORT OF HUMAN RIGHTS ABUSES.

IN THE EVENT OF ANY CONFLICTS BETWEEN THIS MANUAL AND THE APPLICABLE LAW, THE LATER PREVAILS.
Symbol Conventions

The symbols that may be found in this document are defined as follows.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>🚨 Danger</td>
<td>Indicates a hazardous situation which, if not avoided, will or could result in death or serious injury.</td>
</tr>
<tr>
<td>🚨 Caution</td>
<td>Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results.</td>
</tr>
<tr>
<td>🔄 Note</td>
<td>Provides additional information to emphasize or supplement important points of the main text.</td>
</tr>
</tbody>
</table>
Safety Instruction

These instructions are intended to ensure that user can use the product correctly to avoid danger or property loss.

Laws and Regulations
• The device should be used in compliance with local laws, electrical safety regulations, and fire prevention regulations.

Transportation
• Keep the device in original or similar packaging while transporting it.

Power Supply
• Please purchase the charger by yourself. Input voltage should meet the Limited Power Source (12 VDC) according to the IEC61010-1 standard. Please refer to technical specifications for detailed information.
• Make sure the plug is properly connected to the power socket.
• DO NOT connect multiple devices to one power adapter, to avoid over-heating or fire hazards caused by overload.

Battery
• Improper use or replacement of the battery may result in explosion hazard.
• The built-in battery cannot be dismantled. Please contact the manufacture for repair if necessary.
• For long-term storage of the battery, make sure it is fully charged every half year to ensure the battery quality. Otherwise, damage may occur.

Maintenance
• If the product does not work properly, please contact your dealer or the nearest service center. We shall not assume any responsibility for problems caused by unauthorized repair or maintenance.
• A few device components (e.g., electrolytic capacitor) require regular replacement. The average lifespan varies, so periodic checking is recommended. Contact your dealer for details.
• Wipe the device gently with a clean cloth and a small quantity of ethanol, if necessary.

Using Environment
• Make sure the running environment meets the requirement of the device. The operating temperature shall be -20°C to 50°C (-4°F to 122°F), and the operating humidity shall be 95% or less.
• Do not expose the device to high electromagnetic radiation or dusty environments.
• Do not aim the lens at the sun or any other bright light.
Emergency

- If smoke, odor, or noise arises from the device, immediately turn off the power, unplug the power cable, and contact the service center.
Contents

Chapter 1 Overview ........................................................................................................................................... 1
  1.1 Brief Description ................................................................................................................................. 1
  1.2 Function ............................................................................................................................................. 1

Chapter 2 Device Activation and Accessing ........................................................................................... 2
  2.1 Activate the Device via SADP ........................................................................................................... 2
  2.2 Activate the Device via Browser ....................................................................................................... 2
  2.3 Login .................................................................................................................................................. 3
    2.3.1 Install Plug-in ............................................................................................................................ 3
    2.3.2 Illegal Login Lock ...................................................................................................................... 3

Chapter 3 Temperature Measurement ....................................................................................................... 5
  3.1 Notice ................................................................................................................................................ 5
  3.2 Thermometry Configuration Flow Chart .......................................................................................... 5
  3.3 Automatic Thermometry ................................................................................................................... 6
    3.3.1 Set Automatic Thermometry Parameters ................................................................................. 7
    3.3.2 Set Normal Mode ....................................................................................................................... 8
    3.3.3 Set Expert Mode ......................................................................................................................... 9
    3.3.4 Set Thermometry Rule .............................................................................................................. 9
    3.3.5 Point Thermometry .................................................................................................................. 10
    3.3.6 Line Thermometry .................................................................................................................... 11
    3.3.7 Area Thermometry ................................................................................................................... 11
  3.4 Manual Thermometry .......................................................................................................................... 11

Chapter 4 Event and Alarm ......................................................................................................................... 12
  4.1 Set Video Tampering Alarm ............................................................................................................ 12
  4.2 Set Video Loss ................................................................................................................................. 13
  4.3 Set Alarm Input ............................................................................................................................... 13
  4.4 Set Exception Alarm ......................................................................................................................... 13
Chapter 5 Arming Schedule and Alarm Linkage ............................................................. 15
  5.1 Set Arming Schedule .............................................................................................. 15
  5.2 Linkage Method Settings ....................................................................................... 15
    5.2.1 Trigger Alarm Output ....................................................................................... 15
    5.2.2 FTP/NAS/Memory Card Uploading ................................................................. 16
    5.2.3 Send Email ....................................................................................................... 17
    5.2.4 Notify Surveillance Center ................................................................................ 18
    5.2.5 Trigger Recording ............................................................................................ 18
    5.2.6 Set Audible Alarm Output ................................................................................ 18

Chapter 6 Live View ....................................................................................................... 19
  6.1 Live View Parameters ............................................................................................ 19
    6.1.1 Window Division ............................................................................................... 19
    6.1.2 Live View Stream Type .................................................................................... 19
    6.1.3 Enable and Disable Live View ......................................................................... 19
    6.1.4 Start Digital Zoom ......................................................................................... 19
    6.1.5 View Previous/Next Page ............................................................................... 20
    6.1.6 Full Screen ...................................................................................................... 20
    6.1.7 Light ................................................................................................................. 20
    6.1.8 Wiper ............................................................................................................... 20
    6.1.9 Lens Initialization ............................................................................................ 20
    6.1.10 Auxiliary Focus ............................................................................................. 20
  6.2 Set Transmission Parameters ................................................................................ 20

Chapter 7 Video and Audio ............................................................................................ 22
  7.1 Video Settings ....................................................................................................... 22
    7.1.1 Stream Type .................................................................................................... 22
    7.1.2 Video Type ...................................................................................................... 22
    7.1.3 Resolution ....................................................................................................... 23
    7.1.4 Bitrate Type and Max. Bitrate ........................................................................ 23
7.1.5 Video Quality ................................................................. 23
7.1.6 Frame Rate .................................................................................. 23
7.1.7 Video Encoding ............................................................................... 23
7.1.8 Smoothing ..................................................................................... 25
7.1.9 Display VCA Info ............................................................................. 25
7.1.10 Set ROI ......................................................................................... 26

7.2 Display Settings .............................................................................. 26
7.2.1 Image Adjustment ........................................................................... 26
7.2.2 Image Adjustment (Thermal Channel) ............................................ 27
7.2.3 Exposure Settings ............................................................................ 27
7.2.4 White Balance ............................................................................... 27
7.2.5 DNR ............................................................................................... 27
7.2.6 Set Palette ...................................................................................... 28
7.2.7 Set Target Color ............................................................................ 28
7.2.8 Mirror ........................................................................................... 30
7.2.9 Video Standard ............................................................................... 30
7.2.10 Digital Zoom ................................................................................ 30
7.2.11 Local Video Output ....................................................................... 30

7.3 OSD .............................................................................................. 30
7.4 Set Picture in Picture ....................................................................... 31
7.5 Set Privacy Mask ............................................................................... 31
7.6 Overlay Picture ................................................................................ 32
7.7 Set Manual DPC (Defective Pixel Correction) ................................. 32

Chapter 8 Video Recording and Picture Capture ................................... 33
8.1 Storage Settings ............................................................................... 33
  8.1.1 Set Memory Card ........................................................................ 33
  8.1.2 Set NAS ....................................................................................... 33
  8.1.3 Set FTP ....................................................................................... 34
8.2 Video Recording ................................................................................................................... 34
  8.2.1 Record Automatically .................................................................................................. 34
  8.2.2 Record Manually ........................................................................................................ 36
  8.2.3 Playback and Download Video .................................................................................... 36
8.3 Capture Configuration ......................................................................................................... 36
  8.3.1 Capture Automatically ................................................................................................ 37
  8.3.2 Capture Manually ........................................................................................................ 37
  8.3.3 View and Download Picture ........................................................................................ 37

Chapter 9 Network Settings .................................................................................................. 39
  9.1 TCP/IP ................................................................................................................................... 39
    9.1.1 Multicast Discovery ..................................................................................................... 40
  9.2 Port ...................................................................................................................................... 40
  9.3 Port Mapping ....................................................................................................................... 41
    9.3.1 Set Auto Port Mapping ................................................................................................ 41
    9.3.2 Set Manual Port Mapping ........................................................................................... 41
    9.3.3 Set Port Mapping on Router ....................................................................................... 42
  9.4 SNMP ................................................................................................................................... 42
  9.5 Access to Device via Domain Name ..................................................................................... 43
  9.6 Access to Device via PPPoE Dial Up Connection .................................................................. 44
  9.7 Set ONVIF User ..................................................................................................................... 44

Chapter 10 System and Security ............................................................................................ 46
  10.1 View Device Information .................................................................................................. 46
  10.2 Search and Manage Log .................................................................................................... 46
  10.3 Import and Export Configuration File ................................................................................. 46
  10.4 Export Diagnose Information ............................................................................................ 47
  10.5 Reboot ................................................................................................................................ 47
  10.6 Restore and Default ........................................................................................................... 47
  10.7 Upgrade ............................................................................................................................. 47
10.8 View Open Source Software License ........................................................................... 48
10.9 Time and Date .................................................................................................................. 48
  10.9.1 Synchronize Time Manually .................................................................................. 48
  10.9.2 Set NTP Server ........................................................................................................ 48
  10.9.3 Set DST ................................................................................................................... 49
10.10 Set RS-232 .................................................................................................................. 49
10.11 Set RS-485 .................................................................................................................. 49
10.12 Security ....................................................................................................................... 50
  10.12.1 Authentication ....................................................................................................... 50
  10.12.2 Set IP Address Filter ........................................................................................... 50
  10.12.3 Set HTTPS ............................................................................................................ 50
  10.12.4 Set QoS ................................................................................................................ 51
  10.12.5 Set IEEE 802.1X ................................................................................................. 52
10.13 User and Account ....................................................................................................... 52
  10.13.1 Set User Account and Permission ....................................................................... 52

Chapter 11 Appendix .......................................................................................................... 54
  11.1 Common Material Emissivity Reference ................................................................. 54
  11.2 Device Command ....................................................................................................... 54
  11.3 Device Communication Matrix .................................................................................. 55
Chapter 1 Overview

1.1 Brief Description

The Thermographic Cube Camera is a temperature measurement device which combines the optical lens and thermal lens together.

It is equipped with high-sensitivity IR detector and high-performance sensor. The device is able to measure object’s temperature at a high accuracy in real time. It is applied to electric system, and industrial automation, etc, for fire prevention. The pre-alarm system helps you discover unexpected events immediately and protects your property.

1.2 Function

This section introduces main functions of the device.

**Temperature Measurement**
Device detects the real-time temperature all the day, and display it on liveview.

**Fusion**
Device can display fusion of thermal view and optical view.

**Audiable Alarm**
Device outputs audiable alarm when the temperature is higher than the setting alarm threshold value.

**Image Adjustment**
Device can correct the nonuniformity of the image and improve the image quality.
Chapter 2 Device Activation and Accessing

To protect the security and privacy of the user account and data, you should set a login password to activate the device when access the device via network.

**Note**
Refer to the user manual of the software client for the detailed information about the client software activation.

### 2.1 Activate the Device via SADP

Search and activate the online devices via SADP software.

**Before You Start**
Access www.hikvision.com to get SADP software to install.

**Steps**
1. Connect the device to network using the network cable.
2. Run SADP software to search the online devices.
3. Check **Device Status** from the device list, and select **Inactive** device.
4. Create and input the new password in the password field, and confirm the password.

**Caution**
We highly recommend you create a strong password of your own choosing (using a minimum of 8 characters, including upper case letters, lower case letters, numbers, and special characters) in order to increase the security of your product. And we recommend you reset your password regularly, especially in the high security system, resetting the password monthly or weekly can better protect your product.

5. Click **OK**.
   
   **Device Status** changes into **Active**.

6. **Optional:** Change the network parameters of the device in **Modify Network Parameters**.

### 2.2 Activate the Device via Browser

You can access and activate the device via the browser.

**Steps**
1. Connect the device to the PC using the network cables.
2. Change the IP address of the PC and device to the same segment.
Note
The default IP address of the device is 192.168.1.64. You can set the IP address of the PC from 192.168.1.2 to 192.168.1.253 (except 192.168.1.64). For example, you can set the IP address of the PC to 192.168.1.100.

3. Input **192.168.1.64** in the browser.
4. Set device activation password.

Caution
We highly recommend you create a strong password of your own choosing (using a minimum of 8 characters, including at least three of the following categories: upper case letters, lower case letters, numbers, and special characters) in order to increase the security of your product. And we recommend you reset your password regularly, especially in the high security system, resetting the password monthly or weekly can better protect your product.

5. Click OK.
6. Input the activation password to log in to the device.
7. Optional: Go to **Configuration → Network → Basic → TCP/IP** to change the IP address of the device to the same segment of your network.

2.3 Login
Log in to the device via Web browser.

2.3.1 Install Plug-in
You can access the device by installing plug-in.

Steps
1. Input IP address of the device in web browser and the login window will pop up.
2. Install the plug-in according to the prompt.
3. Open the web browser again and input IP address of the device.
4. Input user name and password, and click **Login**.

<table>
<thead>
<tr>
<th>Help</th>
<th>Get online help document of the device.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logout</td>
<td>You can exit safely.</td>
</tr>
</tbody>
</table>

2.3.2 Illegal Login Lock
It helps to improve the security when accessing the device via Internet.

The admin user can set the login attempts with the wrong password. When your login attempts with the wrong password reach the set times, the device is locked.
Go to Configuration → System → Security → Security Service, and enable Enable Illegal Login Lock, and set the illegal login attempts.
Chapter 3 Temperature Measurement

When you enable this function, the device measures the actual temperature of the scene. It alarms when temperature exceeds the temperature threshold value.

3.1 Notice

This part introduces the notices of configuring temperature measurement function.

• The target surface should be as vertical to the optical axis as possible. It is recommended that the angle of oblique image plane should be less than 45°.
• The target image pixels should be more than 5 × 5.
• If multiple presets will be taken for temperature measurement, it is recommended to set the patrol time above 20 s.
• Please select line thermometry or area thermometry for a certain area temperature measurement. The point thermometry is not recommended in case of deviation occurred during device movement to affect the accuracy of temperature measurement.

3.2 Thermometry Configuration Flow Chart

This part introduces the process of configuring temperature measurement.
3.3 Automatic Thermometry

Configure the temperature measurement parameters and temperature measurement rules. The device can measure the actual temperature and output alarms when temperature exceeds the alarm threshold value.
3.3.1 Set Automatic Thermometry Parameters

Configure the parameters of automatic temperature measurement.

Steps
1. Go to Configuration → Local, enable Display Temperature Info. and Display Temperature Info. on Capture.
   - **Display Temperature Info.**
     - Select Yes to display temperature information on liveview and playback interface.
   - **Display Temperature Info. on Capture**
     - Select Yes to display temperature information on the capture.
   Enable Rules to display the rules information on the liveview.
2. Click Save.
3. Go to Configuration → Temperature Measurement → Basic Settings to configure parameters.
   - **Enable Temperature Measurement**
     - Check to enable temperature measurement function.
   - **Enable Color-Temperature**
     - Check to display Temperature-Color Ruler in live view.
   - **Display Temperature Info. on Stream**
     - Check to display temperature information on the stream.
   - **Display Temperature in Optical Channel**
     - Check to display the thermal channel detected temperature information on the optical channel accordingly.
   - **Display Max./Min./Average Temperature**
     - Check to display maximum/minimum/average temperature information in thermal channel when the temperature measurement rule is line or area.
   - **Position of Thermometry Info**
     - Select the position of temperature information showed on the live view.
       - Near Target: display the information beside the temperature measurement rule.
       - Top Left: display the information on the top left of screen.
   - **Unit**
     - Display temperature with Degree Celsius (°C)/Degree Fahrenheit (°F)/Degree Kelvin (K).
   - **Temperature Range**
     - Select the temperature measurement range.
   - **Optical Transmissivity**
     - Set the optical transmissivity of external optical material (e.g.: germanium window) to improve the temperature measuring accuracy.
Calibration Coefficient
Check to enable it and set the value of calibration coefficient to get the temperature of the external window or optical material automatically. The setting range is 0 to 30.

**Note**
You can get the setting value from SDK software.

External Optics/Window Correction
Set the temperature of the external window or optical material (e.g.: germanium window) to correct the measured temperature.

Version
View the version of current algorithm.

4. Click Save.

### 3.3.2 Set Normal Mode

This function is used to measure the temperature of the whole scene and alarm.

**Steps**
1. Go to Configuration → Temperature Measurement → Basic Settings, and check Enable Temperature Measurement.
2. Refer to Set Automatic Thermometry Parameters to set the parameters.
3. Go to Configuration → Temperature Measurement → Advanced Settings, and select Normal.
4. Configure the parameters of normal mode.

**Emissivity**
Set the emissivity of your target. The emissivity of each object is different.

**Distance**
The distance between the target and the device.

**Pre-Alarm Threshold**
When the temperature of target exceeds the pre-alarm threshold, and this status keeps more than Filtering Time, it triggers pre-alarm.

**Alarm Threshold**
When the temperature of target exceeds the alarm threshold, and this status keeps more than Filtering Time, it triggers alarm.

**Pre-Alarm Output and Alarm Output**
Check Pre-Alarm Output and Alarm Output to link the pre-alarm or alarm with the connected alarm device.

5. Refer to Set Arming Schedule for setting scheduled time. Refer to Linkage Method Settings for setting linkage method.
6. Click Save.
The maximum and minimum temperature will be displayed on the live view.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Go to Image → VCA Rules Display to adjust the fonts size and the temperature colour of normal, alarm and pre-alarm.</td>
</tr>
</tbody>
</table>

### 3.3.3 Set Expert Mode

Select the temperature measurement rules from **Point**, **Line**, or **Area** and configure parameters, the device alarms if the alarm rules are met.

**Steps**

1. Go to **Configuration → Temperature Measurement → Basic Settings**, check **Enable Temperature Measurement**.
2. Refer to **Set Automatic Thermometry Parameters** to set the parameters.
3. Go to **Configuration → Temperature Measurement → Advanced Settings**, select **Expert**.
4. Select and enable the temperature measurement rules. Please refer to **Set Thermometry Rule** for setting the rule.
5. **Optional**: Click **Area's Temperature Comparison** to set the alarm rules and the temperature.
6. Refer to **Set Arming Schedule** for setting scheduled time. Refer to **Linkage Method Settings** for setting linkage method.
7. Click **Save**.

The maximum temperature and thermometry rules will be displayed on the liveview.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Go to Image → VCA Rules Display to adjust the fonts size and the temperature colour of normal, alarm and pre-alarm.</td>
</tr>
</tbody>
</table>

### 3.3.4 Set Thermometry Rule

**Steps**

1. Customize the rule name.
2. Select the rule type to Point, Line, or Area. Then draw a point, line, or area on the interface where the position to be measured.
   - **Point**: Please refer to **Point Thermometry** for detailed configuration.
   - **Line**: Please refer to **Line Thermometry** for detailed configuration.
   - **Area**: Please refer to **Area Thermometry** for detailed configuration.
3. Configure the temperature measurement parameters.

| Emissivity |
Set the emissivity of the target. The emissivity of the surface of a material is its effectiveness in emitting energy as thermal radiation. Different objects have different emissivity. Refer to *Common Material Emissivity Reference* to search for the target emissivity.

**Distance**

The distance between the target and the device.

**Reflective Temperature**

If there is any object with high emissivity in the scene, check and set the reflective temperature to correct the temperature. The reflective temperature should be set the same as the temperature of the high emissivity object.

4. Click + and set the **Alarm Rule**.

**Alarm Temperature and Pre-Alarm Temperature**

Set the alarm temperature and pre-alarm temperature. E.g., select Alarm Rule as Above (Average Temperature), set the Pre-Alarm Temperature to 50 °C, and set the Alarm Temperature to 55 °C. The device pre-alarms when its average temperature is higher than 50 °C and alarms when its average temperature is higher than 55 °C.

**Filtering Time**

It refers to the duration time after the target temperature reaches or exceeds the pre-alarm temperature/alarm temperature.

**Tolerance Temperature**

Set the tolerance temperature to prevent the constant temperature change to affect the alarm. E.g., set tolerance temperature as 3°C, set alarm temperature as 55°C, and set pre-alarm temperature as 50°C. The device sends pre-alarm when its temperature reaches 50°C and it alarms when its temperature reaches 55°C and only when the device temperature is lower than 52°C will the alarm be cancelled.

**Pre-Alarm Output and Alarm Output**

When the temperature of target exceeds the pre-alarm or alarm threshold, it triggers the pre-alarm or alarm output of the connected device.

5. Click **Save**.

Click **Liveview**, and select thermal channel to view the temperature and rules information on live view.

### 3.3.5 Point Thermometry

Configure the temperature measurement rule and click any point in live view to monitor the temperature.

**Steps**

1. Click in the live view and a cross cursor showed on the interface.
2. Drag the cross cursor to desired position.
Go to **Live View** interface to view the temperature and rule of the point in thermal channel.

### 3.3.6 Line Thermometry

Configure the temperature measurement rule and monitor the maximum temperature of the line.

**Steps**
1. Click and drag the mouse to draw a line in the live view interface.
2. Click and move the line to adjust the position.
3. Click and drag the ends of the line to adjust the length.
   - Go to **Live View** interface to view the maximum temperature and rule of the line in thermal channel.

### 3.3.7 Area Thermometry

Configure the temperature measurement rule and monitor the maximum temperature of the area.

**Steps**
1. Click and drag the mouse in the liveview to draw the area and right click to finish drawing.
2. Click and move the area to adjust the position.
3. Drag the corners of the area to adjust the size and shape.
   - Go to **Live View** interface to view the maximum temperature and rule of the area in thermal channel.

### 3.4 Manual Thermometry

After enable the manual thermometry function of the device, you can click any position on the live view to show the real temperature.

**Steps**
1. Go to **Configuration → Local** and select **Display Temperature Info.** as **Yes.**
2. Go to **Configuration → Temperature Measurement → Basic Settings.**
3. Check **Enable Temperature Measurement.**
4. Click **Save.**
5. Go to live view interface and select thermal channel, click ![]. Click any position on the interface to show the real temperature.
Chapter 4 Event and Alarm

This part introduces the configuration of events. The device takes certain response to triggered alarm.

4.1 Set Video Tampering Alarm

When the configured area is covered and cannot be monitored normally, the alarm is triggered and the device takes certain alarm response actions.

Steps
1. Go to Configuration → Event → Basic Event → Video Tampering.
2. Select the channel number.
3. Check Enable.
4. Set the Sensitivity. The higher the value is, the easier to detect the area covering.
5. Click Draw Area and drag the mouse in the live view to draw the area.

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stop Drawing</td>
<td>Finish drawing.</td>
</tr>
<tr>
<td>Clear All</td>
<td>Delete all the drawn areas.</td>
</tr>
</tbody>
</table>

Figure 4-1 Set Video Tampering Area
6. Refer to *Set Arming Schedule* for setting scheduled time. Refer to *Linkage Method Settings* for setting linkage method.
7. Click *Save*.

### 4.2 Set Video Loss

This function can detect the video signal loss in time and trigger the linkage action.

**Steps**
1. Go to *Configuration → Event → Basic Event → Video Loss*.
2. Select the channel number.
3. Check *Enable*.
4. Refer to *Set Arming Schedule* for setting scheduled time. Refer to *Linkage Method Settings* for setting linkage method.
5. Click *Save*.

### 4.3 Set Alarm Input

Alarm signal from the external device triggers the corresponding actions of the current device.

**Before You Start**
Make sure the external alarm device is connected. See *Quick Start Guide* for cables connection.

**Steps**
1. Go to *Configuration → Event → Basic Event → Alarm Input*.
2. Check *Enable Alarm Input Handling*.
3. Select *Alarm Input NO.* and *Alarm Type* from the dropdown list. Edit the *Alarm Name*.
4. Refer to *Set Arming Schedule* for setting scheduled time. Refer to *Linkage Method Settings* for setting linkage method.
5. Click *Copy to...* to copy the settings to other alarm input channels.
6. Click *Save*.

### 4.4 Set Exception Alarm

Exception such as network disconnection can trigger the device to take corresponding action.

**Steps**
1. Go to *Configuration → Event → Basic Event → Exception*.
2. Select *Exception Type*.
   - **HDD Full**: The HDD storage is full.
   - **HDD Error**: Error occurs in HDD.
   - **Network Disconnected**: The device is offline.
**IP Address Conflicted**  The IP address of current device is same as that of other device in the network.

**Illegal Login**  Incorrect user name or password is entered.

3. Refer to *Linkage Method Settings* for setting linkage method.
4. Click *Save*.
Chapter 5 Arming Schedule and Alarm Linkage

Arming schedule is a customized time period in which the device performs certain tasks. Alarm linkage is the response to the detected certain incident or target during the scheduled time.

5.1 Set Arming Schedule

Set the valid time of the device tasks.

Steps
1. Click Arming Schedule.
2. Drag the time bar to draw desired valid time.

Note
Up to 8 periods can be configured for one day.

3. Adjust the time period.
   - Click on the selected time period, and enter the desired value. Click Save.
   - Click on the selected time period. Drag the both ends to adjust the time period.
   - Click on the selected time period, and drag it on the time bar.
4. Optional: Click Copy to... to copy the same settings to other days.
5. Click Save.

5.2 Linkage Method Settings

You can enable the linkage functions when an event or alarm occurs.

5.2.1 Trigger Alarm Output

If the device has been connected to an alarm output device, and the alarm output No. has been configured, the device sends alarm information to the connected alarm output device when an alarm is triggered.

Steps
1. Go to Configuration → Event → Basic Event → Alarm Output.
2. Set alarm output parameters.
   - Automatic Alarm For the information about the configuration, see Automatic Alarm.
   - Manual Alarm For the information about the configuration, see Manual Alarm.
3. Click Save.
**Manual Alarm**

You can trigger an alarm output manually.

**Steps**

1. Set the manual alarm parameters.
   - **Alarm Output No.**
     - Select the alarm output No. according to the alarm interface connected to the external alarm device.
   - **Alarm Name**
     - Custom a name for the alarm output.
   - **Delay**
     - Select Manual.

2. Click **Manual Alarm** to enable manual alarm output.

3. **Optional:** Click **Clear Alarm** to disable manual alarm output.

**Automatic Alarm**

Set the automatic alarm parameters, then the device triggers an alarm output automatically in the set arming schedule.

**Steps**

1. Set automatic alarm parameters.
   - **Alarm Output No.**
     - Select the alarm output No. according to the alarm interface connected to the external alarm device.
   - **Alarm Name**
     - Custom a name for the alarm output.
   - **Delay**
     - It refers to the time duration that the alarm output remains after an alarm occurs.

2. Set the alarming schedule. For the information about the settings, see **Set Arming Schedule**.

3. Click **Copy to...** to copy the parameters to other alarm output channels.

4. Click **Save**.

**5.2.2 FTP/NAS/Memory Card Uploading**

If you have enabled and configured the FTP/NAS/memory card uploading, the device sends the alarm information to the FTP server, network attached storage and memory card when an alarm is triggered.
Refer to **Set FTP** to set the FTP server.
Refer to **Set NAS** for NAS configuration.
Refer to **Set Memory Card** for memory card storage configuration.

### 5.2.3 Send Email

Check **Send Email**, and the device sends an email to the designated addresses with alarm information when an alarm event is detected.
For email settings, refer to **Set Email**.

**Set Email**

When the email is configured and **Send Email** is enabled as a linkage method, the device sends an email notification to all designated receivers if an alarm event is detected.

**Before You Start**
Set the DNS server before using the Email function. Go to **Configuration → Network → Basic Settings → TCP/IP** for DNS settings.

**Steps**

1. Go to email settings page: **Configuration → Network → Advanced Settings → Email**.
2. Set email parameters.
   1) Input the sender’s email information, including the **Sender’s Address**, **SMTP Server**, and **SMTP Port**.
   2) **Optional**: If your email server requires authentication, check **Authentication** and input your user name and password to log in to the server.
   3) Set the **E-mail Encryption**.
      - When you select **SSL** or **TLS**, and disable STARTTLS, emails are sent after encrypted by SSL or TLS. The SMTP port should be set as 465.
      - When you select **SSL** or **TLS** and **Enable STARTTLS**, emails are sent after encrypted by STARTTLS, and the SMTP port should be set as 25.

   ![Note](image)

   If you want to use STARTTLS, make sure that the protocol is supported by your email server. If you check the **Enable STARTTLS** while the protocol is not supported by your email sever, your email is sent with no encryption.

4) **Optional**: If you want to receive notification with alarm pictures, check **Attached Image**. The notification email has 3 attached alarm pictures about the event with configurable image capturing interval.
5) Input the receiver’s information, including the receiver’s name and address.
6) Click **Test** to see if the function is well configured.

3. Click **Save**.
5.2.4 Notify Surveillance Center

Check Notify Surveillance Center, the alarm information is uploaded to the surveillance center when an alarm event is detected.

5.2.5 Trigger Recording

Check Trigger Recording, and the device records the video about the detected alarm event. For device with more than one camera channels, you can set one or more channels to take recordings if needed.

For recording settings, refer to Video Recording and Picture Capture

5.2.6 Set Audible Alarm Output

For device that supports audible warning as a linkage method, options are open to configure audible alarm parameters.

Steps

1. Go to the setting page: Configuration → Event → Basic Event → Audible Alarm Output.
2. Select desired alarm sound type and alarm times.
3. Set arming schedule for audible alarm. Refer to Set Arming Schedule.
4. Click Save.

Note

The function is only supported by certain camera models.
Chapter 6 Live View

It introduces the live view parameters, function icons and transmission parameters settings.

6.1 Live View Parameters

**Note**

For multichannel devices, select the desired channel first before live view settings.

6.1.1 Window Division

- □ refers to 1 × 1 window division.
- □□ refers to 2 × 2 window division.
- □□□ refers to 3 × 3 window division.
- □□□□ refers to 4 × 4 window division.

6.1.2 Live View Stream Type

Select the live view stream type according to your needs. For the detailed information about the stream type selection, refer to *Stream Type*.

6.1.3 Enable and Disable Live View

This function is used to quickly enable or disable live view of all channels.

- Click 📜 to start live view of all channels.
- Click 📜 to stop live view of all channels.

6.1.4 Start Digital Zoom

It helps to see a detailed information of any region in the image.

**Steps**

1. Click 📜 to enable the digital zoom.
2. In live view image, drag the mouse to select the desired region.
3. Click in the live view image to back to the original image.
6.1.5 View Previous/Next Page

When the number of channels surpasses that of live view window division, this function can switch live view among multiple channels.
Click ← → to switch live view among multiple channels.

6.1.6 Full Screen

This function is used to view the image in full screen mode.
Click ‣ to start full screen mode and press ESC button to exit.

6.1.7 Light

Click ‣ to turn on or turn off the illuminator.

6.1.8 Wiper

For the device that has a wiper, you can control the wiper via web browser.
Click ‣ on live view page. The wiper wipes the window one time.

6.1.9 Lens Initialization

Lens initialization is used on the device equipped with motorized lens. The function can reset lens when long time zoom or focus results in blurred image. This function varies according to different models.
Click ‣ to operate lens initialization.

6.1.10 Auxiliary Focus

Click ‣ to realize automatic focus. This function is subject to the actual device model.

6.2 Set Transmission Parameters

The live view image may be displayed abnormally according to the network conditions. In different network environments, you can adjust the transmission parameters to solve the problem.

Steps
1. Go to Configuration → Local.
2. Set the transmission parameters as required.
Protocol

TCP
TCP ensures complete delivery of streaming data and better video quality, yet the real-time transmission will be affected. It is suitable for the stable network environment.

UDP
UDP is suitable for the unstable network environment that does not demand high video fluency.

MULTICAST
MULTICAST is suitable for the situation that there are multiple clients. You should set the multicast address for them before selection.

HTTP
HTTP is suitable for the situation that the third-party needs to get the stream from the device.

Play Performance

Shortest Delay
The device takes the real-time video image as the priority over the video fluency.

Balanced
The device ensures both the real-time video image and the fluency.

Fluent
The device takes the video fluency as the priority over real-time. In poor network environment, the device cannot ensure video fluency even the fluency is enabled.

Auto Start Live View

• Yes means the live view is started automatically. It requires a high performance monitoring device and a stable network environment.
• No means the live view should be started manually.

3. Click OK.
Chapter 7 Video and Audio

This part introduces the configuration of video and audio related parameters.

7.1 Video Settings

This part introduces the settings of video parameters, such as, stream type, video encoding, and resolution.

Go to setting page: Configuration → Video/Audio → Video.

Note
For device with multiple camera channels, select a channel before other settings.

7.1.1 Stream Type

For device supports more than one stream, you can specify parameters for each stream type.

Main Stream
The stream stands for the best stream performance the device supports. It usually offers the best resolution and frame rate the device can do. But high resolution and frame rate usually means larger storage space and higher bandwidth requirements in transmission.

Sub Stream
The stream usually offers comparatively low resolution options, which consumes less bandwidth and storage space.

Other Streams
Steams other than the main stream and sub stream may also be offered for customized usage.

7.1.2 Video Type

Select the content (video and audio) that should be contained in the stream.

Video
Only video content is contained in the stream.

Video & Audio
Video content and audio content are contained in the composite stream.
7.1.3 Resolution
Select video resolution according to actual needs. Higher resolution requires higher bandwidth and storage.

7.1.4 Bitrate Type and Max. Bitrate
Constant Bitrate
It means that the stream is compressed and transmitted at a comparatively fixed bitrate. The compression speed is fast, but mosaic may occur on the image.

Variable Bitrate
It means that the device automatically adjust the bitrate under the set Max. Bitrate. The compression speed is slower than that of the constant bitrate. But it guarantees the image quality of complex scenes.

7.1.5 Video Quality
When Bitrate Type is set as Variable, video quality is configurable. Select a video quality according to actual needs. Note that higher video quality requires higher bandwidth.

7.1.6 Frame Rate
The frame rate is to describe the frequency at which the video stream is updated and it is measured by frames per second (fps).
A higher frame rate is advantageous when there is movement in the video stream, as it maintains image quality throughout. Note that higher frame rate requires higher bandwidth and larger storage space.

7.1.7 Video Encoding
It stands for the compression standard the device adopts for video encoding.

Note
Available compression standards vary according to device models.
**H.264**

H.264, also known as MPEG-4 Part 10, Advanced Video Coding, is a compression standard. Without compressing image quality, it increases compression ratio and reduces the size of video file than MJPEG or MPEG-4 Part 2.

**H.264+**

H.264+ is an improved compression coding technology based on H.264. By enabling H.264+, you can estimate the HDD consumption by its maximum average bitrate. Compared to H.264, H.264+ reduces storage by up to 50% with the same maximum bitrate in most scenes.

When H.264+ is enabled, **Max. Average Bitrate** is configurable. The device gives a recommended max. average bitrate by default. You can adjust the parameter to a higher value if the video quality is less satisfactory. Max. average bitrate should not be higher than max. bitrate.

---

**Note**

When H.264+ is enabled, **Video Quality, I Frame Interval, Profile** and **SVC** are not configurable.

---

**H.265**

H.265, also known as High Efficiency Video Coding (HEVC) and MPEG-H Part 2, is a compression standard. In comparison to H.264, it offers better video compression at the same resolution, frame rate and image quality.

**H.265+**

H.265+ is an improved compression coding technology based on H.265. By enabling H.265+, you can estimate the HDD consumption by its maximum average bitrate. Compared to H.265, H.265+ reduces storage by up to 50% with the same maximum bitrate in most scenes.

When H.265+ is enabled, **Max. Average Bitrate** is configurable. The device gives a recommended max. average bitrate by default. You can adjust the parameter to a higher value if the video quality is less satisfactory. Max. average bitrate should not be higher than max. bitrate.

---

**Note**

When H.265+ is enabled, **Video Quality, I Frame Interval, Profile** and **SVC** are not configurable.

---

**Profile**

This function means that under the same bitrate, the more complex the profile is, the higher the quality of the image is, and the requirement for network bandwidth is also higher.
I-Frame Interval

I-frame interval defines the number of frames between 2 I-frames.

In H.264 and H.265, an I-frame, or intra frame, is a self-contained frame that can be independently decoded without any reference to other images. An I-frame consumes more bits than other frames. Thus, video with more I-frames, in other words, smaller I-frame interval, generates more steady and reliable data bits while requiring more storage space.

SVC

Scalable Video Coding (SVC) is the name for the Annex G extension of the H.264 or H.265 video compression standard.

The objective of the SVC standardization has been to enable the encoding of a high-quality video bitstream that contains one or more subset bitstreams that can themselves be decoded with a complexity and reconstruction quality similar to that achieved using the existing H.264 or H.265 design with the same quantity of data as in the subset bitstream. The subset bitstream is derived by dropping packets from the larger bitstream.

SVC enables forward compatibility for older hardware: the same bitstream can be consumed by basic hardware which can only decode a low-resolution subset, while more advanced hardware will be able decode high quality video stream.

7.1.8 Smoothing

It refers to the smoothness of the stream. The higher value of the smoothing is, the better fluency of the stream will be, though, the video quality may not be so satisfactory. The lower value of the smoothing is, the higher quality of the stream will be, though it may appear not fluent.

7.1.9 Display VCA Info

VCA information can be displayed by Player and Video.

Player

Player means the VCA info can be displayed by the dedicated player provided by the manufacturer.

Video

Video means the VCA info can be displayed by any general video player.
7.1.10 Set ROI

ROI (Region of Interest) encoding helps to assign more encoding resource to the region of interest, thus to increase the quality of the ROI whereas the background information is less focused.

**Before You Start**
Please check the video coding type. ROI is supported when the video coding type is H.264 or H.265.

**Steps**
1. Go to **Configuration → Video/Audio → ROI**.
2. Check **Enable**.
3. Select the channel No. according to your need.
4. Select **Stream Type**.
5. Select **Region No.** in **Fixed Region** to draw ROI region.
   1) Click **Drawing**.
   2) Click and drag the mouse on the view screen to draw the fixed region.
   3) Click **Stop Drawing**.

**Note**
Select the fixed region that needs to be adjusted and drag the mouse to adjust its position.

6. Input the **Region Name** and **ROI Level**.
7. Click **Save**.

**Note**
The higher the ROI level is, the clearer the image of the detected region is.

8. **Optional**: Select other region No. and repeat the above steps if you need to draw multiple fixed regions.

7.2 Display Settings

It offers the parameter settings to adjust image features.

Go to **Configuration → Image → Display Settings**.
For device that supports multiple channels, display settings of each channel is required.
Click **Default** to restore settings.

7.2.1 Image Adjustment

By adjusting the **Brightness**, **Saturation**, **Contrast** and **Sharpness**, the image can be best displayed.
7.2.2 Image Adjustment (Thermal Channel)

You can optimize the image display effect of thermal channel by setting background correction and manual correction.

**Background Correction**

Fully cover the lens with an object of uniform temperature in front of the lens, such as foam board or paperboard. When you click **Correct**, the device will take the uniform object as the standard and optimize the image once.

**Manual Correction**

Click **Correct** to optimize the image once.

---

**Note**

It is a normal phenomenon that short video freezing might occur during the process of **Background Correction** and **Manual Correction**.

---

7.2.3 Exposure Settings

Exposure is controlled by the combination of iris, shutter, and photo sensibility. You can adjust image effect by setting exposure parameters.

In manual mode, you need to set **Exposure Time**, **Gain** and **Slow Shutter**.

---

7.2.4 White Balance

White balance is the white rendition function of the camera. It is used to adjust the color temperature according to the environment.

---

7.2.5 DNR

Digital Noise Reduction is used to reduce the image noise and improve the image quality. **Normal** and **Expert** modes are selectable.

**Normal**

Set the DNR level to control the noise reduction degree. The higher level means stronger reduction degree.

**Expert**

Set the DNR level for both space DNR and time DNR to control the noise reduction degree. The higher level means stronger reduction degree.
7.2.6 Set Palette

You can select the palette mode to display the thermal grayscale image to colored image.

Steps
1. Go to **Configuration → Image → Display Settings**.
2. Select the thermal channel.
3. Select a palette mode in **Image Enhancement** according to your need.

Result
The live view displays the image with palette.

7.2.7 Set Target Color

You can set the color of the targets in different temperature ranges to identify the target quickly.

Before You Start
You need to set the palette as white hot mode.

Steps
1. Go to **Configuration → Image → Display Settings**.
2. Select the thermal channel.
3. Click **Image Enhancement**, select **Palette** as **White Hot**.
4. Set the temperature value and color of **High Temperature, Interval Temperature**, or **Low Temperature** targets.
Above (be colored)
When the target of high temperature needs to be colored, you can set the high temperature color. Target above the setting temperature will be displayed in setting color.

Between (be colored)
When the target of an interval temperature needs to be colored, you can set the interval temperature color. Target between the minimum and the maximum temperatures will be displayed in setting color.

Below (be colored)
When the target of low temperature needs to be colored, you can set the low temperature color. Target below the setting temperature will be displayed in setting color.

5. Click **Save**.

### 7.2.8 Mirror

When the live view image is the reverse of the actual scene, this function helps to display the image normally.

Select the mirror mode as needed.

---

**Note**

The video recording will be shortly interrupted when the function is enabled.

### 7.2.9 Video Standard

Select video signal standard according to the video system in your country.

### 7.2.10 Digital Zoom

You can zoom in the image

The larger the zoom size is, the more blurred the image is.

### 7.2.11 Local Video Output

If the device is equipped with video output interfaces, such as BNC, CVBS, HDMI, and SDI, you can preview the live image directly by connecting the device to a monitor screen.

Select the output mode as ON/OFF to control the output.

### 7.3 OSD

You can customize OSD (On-screen Display) information such as device name, time/date, font, color, and text overlay displayed on video stream.

Go to OSD setting page: **Configuration → Image → OSD Settings**. Set the corresponding parameters, and click **Save** to take effect.

**Displayed Information**

Set camera name, date, week, and their related display format.
Text Overlay
Set customized overlay text on image.

OSD Parameters
Set OSD parameters, such as Display Mode, OSD Size, Font Color, and Alignment.

7.4 Set Picture in Picture
You can overlay the images of two channels and view the image of two channels at the same time.

Steps
1. Select a channel number.
2. Select the picture in picture mode.
   - **Normal Mode**: Disable picture in picture mode.
   - **Overlay Mode**: Enable picture in picture mode. You can overlay the image of another channel in the current channel.
3. Adjust **Image Fusion Ratio**. It refers to the image fusion effect of thermal channel and optical channel.
4. Adjust **Border Fusion Ratio**. The higher the value is, the borders of objects are clearer.
5. Set the fusion distance of the target.
6. Click **Save**.

7.5 Set Privacy Mask
The function blocks certain areas in the live view to protect privacy. No matter how the device moves, the blocked scene will never be seen.

Steps
1. Go to privacy mask setting page: Configuration → Image → Privacy Mask.
2. Select the channel No.
3. Check **Enable Privacy Mask**.
4. Click **Draw Area**. Drag the mouse in the live view to draw a closed area.
   - **Drag the corners of the area**: Adjust the size of the area.
   - **Drag the area**: Adjust the position of the area.
   - **Click Clear All**: Clear all the areas you set.
5. Click **Stop Drawing**.
6. Click **Save**.

**Note**
Up to 4 areas are supported for setting.
7.6 Overlay Picture

Overlay a customized picture on live view.

**Before You Start**
The picture to overlay has to be in BMP format with 24-bit, and the maximum picture size is 128 × 128 pixel.

**Steps**
1. Go to picture overlay setting page: Configuration → Image → Picture Overlay.
2. Select a channel to overlay picture.
3. Click Browse to select a picture, and click Upload.
   The picture with a red rectangle will appear in live view after successfully uploading.
4. Check Enable Picture Overlay.
5. Drag the picture to adjust its position.
6. Click Save.

7.7 Set Manual DPC (Defective Pixel Correction)

If the amount of defective pixels in the image is comparatively small and accurate correction is needed, you can correct these pixels manually.

**Steps**
1. Go to Configuration → Image → DPC.
2. Select the thermal channel.
3. Select manual mode.
4. Click the defective pixel on the image, then a cursor shows on the live view.
5. Click Up, Down, Left, Right to adjust the cursor position to the defective pixel position.
6. Click to correct defective pixel.
   - Click  
     Save the position of defective pixel.
   - Click  
     Cancel defective pixel correction.

**Note**
If multiple defective pixels need to be corrected, click  after locating a defective pixel. Then after locating other pixels, click  to correct them simultaneously.
Chapter 8 Video Recording and Picture Capture

This part introduces the operations of capturing video clips and snapshots, playback, and downloading captured files.

8.1 Storage Settings

This part introduces the configuration of several common storage paths.

8.1.1 Set Memory Card

If you choose to store the files to memory card, make sure you insert and format the memory card in advance.

Before You Start

Insert the memory card to the camera. For detailed installation, refer to Quick Start Guide of the camera.

Steps

1. Go to storage management setting page: Configuration → Storage → Storage Management → HDD Management.
2. Select the memory card, and click Format to start initializing the memory card.
   The Status of memory card turns to Normal from Uninitialized, which means the memory card can be used normally.
3. Optional: Define the Quota of the memory card. Input the quota percentage for different contents according to your need.
4. Click Save.

8.1.2 Set NAS

Take network server as network disk to store the record files, captured images, etc.

Before You Start

Get the IP address of the network disk first.

Steps

1. Go to NAS setting page: Configuration → Storage → Storage Management → Net HDD.
2. Click HDD No. Select Mounting Type and set parameters for the disk.
   Server Address
   The IP address of the network disk.
   File Path
The saving path of network disk files.

**User Name and Password**
The user name and password of the net HDD.

3. Click **Test** to check whether the network disk is available.
4. Click **Save**.

### 8.1.3 Set FTP

You can configure the FTP server to save images which are captured by events or a timed snapshot task.

**Before You Start**
Get the FTP server address first.

**Steps**
1. Go to **Configuration** → **Network** → **Advanced Settings** → **FTP**.
2. Configure FTP settings.
   
   **Server Address and Port**
   The FTP server address and corresponding port.

   **User Name and Password**
   The FTP user should have the permission to upload pictures.
   If the FTP server supports picture uploading by anonymous users, you can check **Anonymous** to hide your device information during uploading.

   **Directory Structure**
   The saving path of snapshots in the FTP server.

3. Click **Upload Picture** to enable uploading snapshots to the FTP server.
4. Click **Test** to verify the FTP server.
5. Click **Save**.

### 8.2 Video Recording

This part introduces the operations of manual and scheduled recording, playback, and downloading recorded files.

#### 8.2.1 Record Automatically

This function can record video automatically during configured time periods.

**Before You Start**
Select **Trigger Recording** in event settings for each record type except **Continuous**. See *Event and Alarm* for details.
**Steps**

1. Go to **Configuration → Storage → Schedule Settings → Record Schedule**.
2. Select channel No.
3. Check **Enable**.
4. Select a record type.

**Note**

The record type is vary according to different models.

- **Continuous**
  - The video will be recorded continuously according to the schedule.

- **Motion**
  - When motion detection is enabled and trigger recording is selected as linkage method, object movement is recorded.

- **Alarm**
  - When alarm input is enabled and trigger recording is selected as linkage method, the video is recorded after receiving alarm signal from external alarm input device.

- **Motion | Alarm**
  - Video is recorded when motion is detected or alarm signal is received from the external alarm input device.

- **Motion & Alarm**
  - Video is recorded only when motion is detected and alarm signal is received from the external alarm input device.

- **Event**
  - The video is recorded when configured event is detected.

5. Set schedule for the selected record type. Refer to **Set Arming Schedule** for the setting operation.

6. Click **Advanced** to set the advanced settings.

- **Overwrite**
  - Enable **Overwrite** to overwrite the video records when the storage space is full. Otherwise the camera cannot record new videos.

- **Pre-record**
  - The time period you set to record before the scheduled time.

- **Post-record**
  - The time period you set to stop recording after the scheduled time.

- **Stream Type**
  - Select the stream type for recording.
7. Click Save.

8.2.2 Record Manually

Steps
1. Go to Configuration → Local.
2. Set the Record File Size and saving path to for recorded files.
3. Click Save.
4. Click 🎥 to start recording. Click 🎥 to stop recording.

8.2.3 Playback and Download Video

You can search, playback and download the videos stored in the local storage or network storage.

Steps
1. Click Playback.
2. Select channel No.
3. Set search condition and click Search.
   The matched video files showed on the timing bar.
4. Click 📼 to play the video files.
   - Click ⌬ to clip video files.
   - Click 😲 to play video files in full screen. Press ESC to exit full screen.

Note
Go to Configuration → Local, click Save clips to to change the saving path of clipped video files.

5. Click ⬇️ on the playback interface to download files.
   1) Set search condition and click Search.
   2) Select the video files and then click Download.

Note
Go to Configuration → Local, click Save downloaded files to to change the saving path of downloaded video files.

8.3 Capture Configuration

The device can capture the pictures manually or automatically and save them in configured saving path. You can view and download the snapshots.
8.3.1 Capture Automatically

This function can capture pictures automatically during configured time periods.

Before You Start
If event-triggered capture is required, you should configure related linkage methods in event settings. Refer to Event and Alarm for event settings.

Steps
1. Go to Configuration → Storage → Schedule Settings → Capture → Capture Parameters .
2. Set the capture type.
   Timing
   Capture a picture at the configured time interval.
   Event-Triggered
   Capture a picture when an event is triggered.
3. Set the Format, Resolution, Quality, Interval, and Capture Number.
4. Refer to Set Arming Schedule for configuring schedule time.
5. Click Save.

8.3.2 Capture Manually

Steps
1. Go to Configuration → Local .
2. Set the Image Format and saving path to for snapshots.
   JPEG
   The picture size of this format is comparatively small, which is better for network transmission.
   BMP
   The picture is compressed with good quality.
3. Click Save.
4. Click near the live view or play back window to capture a picture manually.

8.3.3 View and Download Picture

You can search, view and download the pictures stored in the local storage or network storage.

Steps
1. Click Picture.
2. Select channel No.
3. Set search condition and click Search.
   The matched pictures showed in the file list.
4. Select the pictures then click **Download** to download them.

**Note**
Go to **Configuration → Local**, click **Save snapshots when playback** to change the saving path of pictures.
Chapter 9 Network Settings

9.1 TCP/IP

TCP/IP settings must be properly configured before you operate the device over network. IPv4 and IPv6 are both supported. Both versions can be configured simultaneously without conflicting to each other.

Go to **Configuration → Basic Configuration → Network → TCP/IP** for parameter settings.

**NIC Type**

Select a NIC (Network Interface Card) type according to your network condition.

**IPv4**

Two IPv4 modes are available.

**DHCP**

The device automatically gets the IPv4 parameters from the network if you check **DHCP**. The device IP address is changed after enabling the function. You can use SADP to get the device IP address.

**Note**

The network that the device is connected to should support DHCP (Dynamic Host Configuration Protocol).

**Manual**

You can set the device IPv4 parameters manually. Input **IPv4 Address**, **IPv4 Subnet Mask**, and **IPv4 Default Gateway**, and click **Test** to see if the IP address is available.

**IPv6**

Three IPv6 modes are available.

**Route Advertisement**

The IPv6 address is generated by combining the route advertisement and the device Mac address.

**Note**

Route advertisement mode requires the support from the router that the device is connected to.

**DHCP**

The IPv6 address is assigned by the server, router or gateway.

**Manual**
Input **IPv6 Address**, **IPv6 Subnet**, **IPv6 Default Gateway**. Consult the network administrator for required information.

**MTU**

It stands for maximum transmission unit. It is the size of the largest protocol data unit that can be communicated in a single network layer transaction.

The valid value range of MTU is 1280 to 1500.

**DNS**

It stands for domain name server. It is required if you need to visit the device with domain name. And it is also required for some applications (e.g., sending email). Set **Preferred DNS Server** and **Alternate DNS server** properly if needed.

**9.1.1 Multicast Discovery**

Check the **Enable Multicast Discovery**, and then the online network camera can be automatically detected by client software via private multicast protocol in the LAN.

**9.2 Port**

The device port can be modified when the device cannot access the network due to port conflicts.

⚠️ **Caution**

Do not modify the default port parameters at will, otherwise the device may be unaccessible.

Go to **Configuration → Network → Basic Settings → Port** for port settings.

**HTTP Port**

It refers to the port that access the device through the browser. You should enter the port No. after the IP address. For example, when the **HTTP port** is modified to 81, you need to enter **http://192.168.1.64:81** in the browser for browser login.

**HTTPS Port**

It refers to the port of browser certificate access. Certificate verification is required when accessing the device through the browser, and the security level is high.

**RTSP Port**

It refers to the port of real time streaming protocol.

**Server Port**

It refers to the port on which the client adds the device.
9.3 Port Mapping

By setting port mapping, you can access devices through the specified port.

**Before You Start**
When the ports in the device are the same as those of other devices in the network, refer to Port to modify the device ports.

**Steps**
1. Go to Configuration → Network → Basic Settings → NAT.
2. Select the port mapping mode.
   - **Auto Port Mapping** Refer to *Set Auto Port Mapping* for detailed information.
   - **Manual Port Mapping** Refer to *Set Manual Port Mapping* for detailed information.
3. Click **Save**.

9.3.1 Set Auto Port Mapping

**Steps**
1. Check **Enable UPnP™**, and choose a friendly name for the camera, or you can use the default name.
2. Select the port mapping mode to **Auto**.
3. Click **Save**.

---

**Note**

UPnP™ function on the router should be enabled at the same time.

9.3.2 Set Manual Port Mapping

**Steps**
1. Check **Enable UPnP™**, and choose a friendly name for the device, or you can use the default name.
2. Select the port mapping mode to **Manual**, and set the external port to be the same as the internal port.
3. Click **Save**.

**What to do next**
Go to the router port mapping settings interface and set the port number and IP address to be the same as those on the device. For more information, refer to the router user manual.
9.3.3 Set Port Mapping on Router

The following settings are for a certain router. The settings vary depending on different models of routers.

**Steps**
1. Select the **WAN Connection Type**.
2. Set the **IP Address**, **Subnet Mask** and other network parameters of the router.
3. Go to **Forwarding → Virtual Servers**, and input the **Port Number** and **IP Address**.
4. Click **Save**.

**Example**
When the cameras are connected to the same router, you can configure the ports of a camera as 80, 8000, and 554 with IP address 192.168.1.23, and the ports of another camera as 81, 8001, 555, 8201 with IP 192.168.1.24.

![Figure 9-1 Port Mapping on Router](image)

**Note**
The port of the network camera cannot conflict with other ports. For example, some web management port of the router is 80. Change the camera port if it is the same as the management port.

9.4 SNMP

You can set the SNMP network management protocol to get the alarm event and exception messages in network transmission.
Before You Start
Before setting the SNMP, you should download the SNMP software and manage to receive the device information via SNMP port.

Steps
1. Go to the settings page: Configuration → Network → Advanced Settings → SNMP.
2. Check Enable SNMPv1, Enable SNMP v2c or Enable SNMPv3.

Note
The SNMP version you select should be the same as that of the SNMP software. And you also need to use the different version according to the security level required. SNMP v1 is not secure and SNMP v2 requires password for access. And SNMP v3 provides encryption and if you use the third version, HTTPS protocol must be enabled.

3. Configure the SNMP settings.
4. Click Save.

9.5 Access to Device via Domain Name

You can use the Dynamic DNS (DDNS) for network access. The dynamic IP address of the device can be mapped to a domain name resolution server to realize the network access via domain name.

Before You Start
Registration on the DDNS server is required before configuring the DDNS settings of the device.

Steps
1. Refer to TCP/IP to set DNS parameters.
2. Go to the DDNS settings page: Configuration → Network → Basic Settings → DDNS.
3. Check Enable DDNS and select DDNS type.
   - DynDNS
     Dynamic DNS server is used for domain name resolution.
   - NO-IP
     NO-IP server is used for domain name resolution.
4. Input the domain name information, and click Save.
5. Check the device ports and complete port mapping. Refer to Port to check the device port, and refer to Port Mapping for port mapping settings.
6. Access the device.
   - By Browsers
     Enter the domain name in the browser address bar to access the device.
   - By Client Software
     Add domain name to the client software. Refer to the client manual for specific adding methods.
9.6 Access to Device via PPPoE Dial Up Connection

This device supports the PPPoE auto dial-up function. The device gets a public IP address by ADSL dial-up after the device is connected to a modem. You need to configure the PPPoE parameters of the device.

Steps
1. Go to Configuration → Network → Basic Settings → PPPoE.
2. Check Enable PPPoE.
3. Set the PPPoE parameters.
   - **Dynamic IP**
     After successful dial-up, the dynamic IP address of the WAN is displayed.
   - **User Name**
     User name for dial-up network access.
   - **Password**
     Password for dial-up network access.
   - **Confirm**
     Input your dial-up password again.
4. Click Save.
5. Access the device.
   - **By Browsers**
     Enter the WAN dynamic IP address in the browser address bar to access the device.
   - **By Client Software**
     Add the WAN dynamic IP address to the client software. Refer to the client manual for details.

**Note**

The obtained IP address is dynamically assigned via PPPoE, so the IP address always changes after rebooting the camera. To solve the inconvenience of the dynamic IP, you need to get a domain name from the DDNS provider (e.g. DynDns.com). Refer to Access to Device via Domain Name for details.

9.7 Set ONVIF User

If you need to access to the device through ONVIF protocol, you can configure the ONVIF user to enhance the network security.

Steps
2. Check Enable ONVIF.
3. Click **Add** to configure the ONVIF user.
   - **Delete**  Delete the selected ONVIF user.
   - **Modify**  Modify the selected ONVIF user.
4. Click **Save**.
5. **Optional:** Repeat the steps above to add more ONVIF users.
Chapter 10 System and Security

It introduces system maintenance, system settings and security management, and explains how to configure relevant parameters.

10.1 View Device Information

You can view device information, such as Device No., Model, Serial No. and Firmware Version.

Enter Configuration → System → System Settings → Basic Information to view the device information.

10.2 Search and Manage Log

Log helps locate and troubleshoot problems.

Steps
1. Go to Configuration → System → Maintenance → Log.
2. Set search conditions Major Type, Minor Type, Start Time, and End Time.
3. Click Search.
   The matched log files will be displayed on the log list.
4. Optional: Click Export to save the log files in your computer.

10.3 Import and Export Configuration File

It helps speed up batch configuration on other devices with the same parameters.

Steps
1. Export configuration file.
   1) Go to Configuration → System → Maintenance → Upgrade & Maintenance.
   2) Click Device Parameters and input the encryption password to export the current configuration file.
   3) Set the saving path to save the configuration file in local computer.
2. Import configuration file.
   1) Access the device that needs to be configured via web browser.
   2) Click Browse to select the saved configuration file.
   3) Input the encryption password you have set when exporting the configuration file.
   4) Click Import.
10.4 Export Diagnose Information

Diagnose information includes running log, system information, hardware information.

Go to Configuration → System → Maintenance → Upgrade & Maintenance, and click Diagnose Information to export diagnose information of the device.

10.5 Reboot

You can reboot the device via browser.

Go to Configuration → System → Maintenance → Upgrade & Maintenance, and click Reboot.

10.6 Restore and Default

Restore and Default helps restore the device parameters to the default settings.

Steps
1. Go to Configuration → System → Maintenance → Upgrade & Maintenance.
2. Click Restore or Default according to your needs.

<table>
<thead>
<tr>
<th>Restore</th>
<th>Reset device parameters, except user information, IP parameters and video format to the default settings.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>Reset all the parameters to the factory default.</td>
</tr>
</tbody>
</table>

**Note**

Be careful when using this function. After resetting to the factory default, all the parameters are reset to the default settings.

10.7 Upgrade

Before You Start
You need to obtain the correct upgrade package.

⚠️ Caution

DO NOT disconnect power during the process, and the device reboots automatically after upgrade.

Steps
1. Go to Configuration → System → Maintenance → Upgrade & Maintenance.
2. Choose one method to upgrade.

| Firmware | Locate the exact path of the upgrade file. |
**Firmware Directory** Locate the directory which the upgrade file belongs to.

3. Click **Browse** to select the upgrade file.
4. Click **Upgrade**.

### 10.8 View Open Source Software License

Go to **Configuration → System → System Settings → About Device**, and click **View Licenses**.

### 10.9 Time and Date

You can configure time and date of the device by configuring time zone, time synchronization and Daylight Saving Time (DST).

#### 10.9.1 Synchronize Time Manually

**Steps**

1. Go to **Configuration → System → System Settings → Time Settings**.
2. Select **Time Zone**.
3. Click **Manual Time Sync.**
4. Choose one time synchronization method.
   - Select **Set Time**, and manually input or select date and time from the pop-up calendar.
   - Check **Sync. with computer time** to synchronize the time of the device with that of the local PC.
5. Click **Save**.

#### 10.9.2 Set NTP Server

You can use NTP server when accurate and reliable time source is required.

**Before You Start**
Set up a NTP server or obtain NTP server information.

**Steps**

1. Go to **Configuration → System → System Settings → Time Settings**.
2. Select **Time Zone**.
3. Click **NTP**.
4. Set **Server Address**, **NTP Port** and **Interval**.

**Note**
Server Address is NTP server IP address.

5. Click **Test** to test server connection.
6. Click Save.

10.9.3 Set DST

If the region where the device is located adopts Daylight Saving Time (DST), you can set this function.

Steps
1. Go to **Configuration → System → System Settings → DST**.
2. Check **Enable DST**.
3. Select **Start Time**, **End Time** and **DST Bias**.
4. Click **Save**.

10.10 Set RS-232

RS-232 can be used to debug device or access peripheral device. RS-232 can realize communication between the device and computer or terminal when the communication distance is short.

**Before You Start**
Connect the device to computer or terminal with RS-232 cable.

Steps
1. Go to **Configuration → System → System Settings → RS-232**.
2. Set RS-232 parameters to match the device with computer or terminal.
3. Click **Save**.

10.11 Set RS-485

RS-485 is used to connect the device to external device. You can use RS-485 to transmit the data between the device and the computer or terminal when the communication distance is too long.

**Before You Start**
Connect the device and computer or terminal with RS-485 cable.

Steps
1. Go to **Configuration → System → System Settings → RS-485**.
2. Set the RS-485 parameters.
3. Click **Save**.

---

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>You should keep the parameters of the device and the computer or terminal all the same.</td>
</tr>
</tbody>
</table>
10.12 Security
You can improve system security by setting security parameters.

10.12.1 Authentication
You can improve network access security by setting RTSP and WEB authentication.
Go to Configuration → System → Security → Authentication to choose authentication protocol and method according to your needs.

Note
Refer to the specific content of protocol to view authentication requirements.

10.12.2 Set IP Address Filter
IP address filter is a tool for access control. You can enable the IP address filter to allow or forbid the visits from the certain IP addresses.
IP address refers to IPv4.

Steps
1. Go to Configuration → System → Security → IP Address Filter.
2. Check Enable IP Address Filter.
3. Select the type of IP address filter.
   - **Forbidden**: IP addresses in the list cannot access the device.
   - **Allowed**: Only IP addresses in the list can access the device.
4. Edit the IP address filter list.
   - **Add**: Add a new IP address to the list.
   - **Modify**: Modify the selected IP address in the list.
   - **Delete**: Delete the selected IP address in the list.
5. Click Save.

10.12.3 Set HTTPS
HTTPS is a network protocol that enables encrypted transmission and identity authentication, which improves the security of remote access.

Steps
1. Go to Configuration → Network → Advanced Settings → HTTPS.
2. Check Enable.
3. Click **Delete** to recreate and install certificate.

   - Create and install self-signed certificate  
     Refer to *Create and Install Self-signed Certificate*
   - Create certificate request and install certificate  
     Refer to *Install CA Certificate*

4. Click **Save**.

---

**Create and Install Self-signed Certificate**

**Steps**

1. Check **Create Self-signed Certificate**.
2. Click **Create**.
3. Follow the prompt to enter **Country, Hostname/IP, Validity** and other parameters.
4. Click **OK**.

**Result**

The device will install the self-signed certificate by default.

---

**Install CA Certificate**

If the demand for external access security is high, you can create and install authorized certificate via HTTPS protocol to ensure the data transmission security.

**Steps**

1. Select **Create certificate request first and continue the installation**.
2. Click **Create**.
3. Follow the prompt to input **Country, Hostname/IP, Validity** and other parameters.
4. Click **Download** to download the certificate request and submit it to the trusted certificate authority for signature.
5. Import certificate to the device.
   - Select **Signed certificate is available, start the installation directly**. Click **Browse** and **Install** to import the certificate to the device.
   - Select **Create the certificate request first and continue the installation**. Click **Browse** and **Install** to import the certificate to the device.
6. Click **Save**.

---

**10.12.4 Set QoS**

QoS (Quality of Service) can help improve the network delay and network congestion by setting the priority of data sending.
QoS needs support from network device such as router and switch.

Steps
1. Go to Configuration → Network → Advanced Configuration → QoS.
2. Set Video/Audio DSCP, Alarm DSCP and Management DSCP.

Network can identify the priority of data transmission. The bigger the DSCP value is, the higher the priority is. You need to set the same value in router while configuration.

3. Click Save.

10.12.5 Set IEEE 802.1X

You can authenticate user permission of the connected device by setting IEEE 802.1X.

Go to Configuration → Network → Advanced Settings → 802.1X, and enable the function.
Select protocol and version according to router information. User name and password of server are required.

10.13 User and Account

10.13.1 Set User Account and Permission

The administrator can add, modify, or delete other accounts, and grant different permission to different user levels.

Caution
To increase security of using the device on the network, please change the password of your account regularly. Changing the password every 3 months is recommended. If the device is used in high-risk environment, it is recommended that the password should be changed every month or week.

Steps
1. Go to Configuration → System → User Management → User Management.
2. Click Add. Enter User Name, select Level, and enter Password. Assign remote permission to users based on needs.

Administrator
The administrator has the authority to all operations and can add users and operators and assign permission.
User
Users can be assigned permission of viewing live video, setting PTZ parameters, and changing their own passwords, but no permission for other operations.

Operator
Operators can be assigned all permission except for operations on the administrator and creating accounts.

Modifies Select a user and click **Modify** to change the password and permission.
Delete Select a user and click **Delete**.

**Note**
The administrator can add up to 31 user accounts.

3. Click **OK**.
Chapter 11 Appendix

11.1 Common Material Emissivity Reference

<table>
<thead>
<tr>
<th>Material</th>
<th>Emissivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Skin</td>
<td>0.98</td>
</tr>
<tr>
<td>Printed Curcuit Board</td>
<td>0.91</td>
</tr>
<tr>
<td>Concrete</td>
<td>0.95</td>
</tr>
<tr>
<td>Ceramic</td>
<td>0.92</td>
</tr>
<tr>
<td>Rubber</td>
<td>0.95</td>
</tr>
<tr>
<td>Paint</td>
<td>0.93</td>
</tr>
<tr>
<td>Wood</td>
<td>0.85</td>
</tr>
<tr>
<td>Pitch</td>
<td>0.96</td>
</tr>
<tr>
<td>Brick</td>
<td>0.95</td>
</tr>
<tr>
<td>Sand</td>
<td>0.90</td>
</tr>
<tr>
<td>Soil</td>
<td>0.92</td>
</tr>
<tr>
<td>Cloth</td>
<td>0.98</td>
</tr>
<tr>
<td>Hard Paperboard</td>
<td>0.90</td>
</tr>
<tr>
<td>White Paper</td>
<td>0.90</td>
</tr>
<tr>
<td>Water</td>
<td>0.96</td>
</tr>
</tbody>
</table>

11.2 Device Command

Scan the following QR code to get device common serial port commands.

Note that the command list contains the commonly used serial port commands for Hikvision thermal cameras.
11.3 Device Communication Matrix

Scan the following QR code to get device communication matrix.
Note that the matrix contains all communication ports of Hikvision thermal cameras.
See Far, Go Further