



# **Thermographic Cube Camera**

**User Manual**

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## Symbol Conventions

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

| Symbol                                                                                           | Description                                                                                                                                                     |
|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <b>Danger</b>  | Indicates a hazardous situation which, if not avoided, will or could result in death or serious injury.                                                         |
|  <b>Caution</b> | Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results. |
|  <b>Note</b>    | Provides additional information to emphasize or supplement important points of the main text.                                                                   |

## Safety Instruction

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

### Laws and Regulations

- In the use of the product, you must be in strict compliance with the electrical safety regulations of the nation and region.

### Transportation

- Keep the device in original or similar packaging while transporting it.
- Keep all wrappers after unpacking them for future use. In case of any failure occurred, you need to return the device to the factory with the original wrapper. Transportation without the original wrapper may result in damage on the device and the company shall not take any responsibilities.
- DO NOT drop the product or subject it to physical shock. Keep the device away from magnetic interference.

### Power Supply

- Please purchase the charger by yourself. Input voltage should meet the Limited Power Source (12 VDC) according to the IEC62368 standard. Please refer to technical specifications for detailed information.
- Make sure the plug is properly connected to the power socket.
- The socket-outlet shall be installed near the equipment and shall be easily accessible.
- DO NOT connect multiple devices to one power adapter, to avoid over-heating or fire hazards caused by overload.
- DO NOT touch the bare metal contacts of the inlets after the circuit breaker is turned off. Electricity still exists.
- + identifies the positive terminal(s) of equipment which is used with, or generates direct current.  
- identifies the negative terminal(s) of equipment which is used with, or generates direct current.

### Battery

- Risk of explosion if the battery is replaced by an incorrect type. Dispose of used batteries according to the instructions. Il y a risque d'explosion si la batterie est remplacée par une batterie de type incorrect. Mettre au rebut les batteries usagées conformément aux instructions.
- 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.
- This equipment is not suitable for use in locations where children are likely to be present.
- Improper replacement of the battery with an incorrect type may defeat a safeguard (for example, in the case of some lithium battery types).

- DO NOT dispose of the battery into fire or a hot oven, or mechanically crush or cut the battery, which may result in an explosion.
- DO NOT leave the battery in an extremely high temperature surrounding environment, which may result in an explosion or the leakage of flammable liquid or gas.
- DO NOT subject the battery to extremely low air pressure, which may result in an explosion or the leakage of flammable liquid or gas.

## Installation

- Never place the equipment in an unstable location. The equipment may fall, causing serious personal injury or death.
- This equipment is for use only with corresponding brackets. Use with other (carts, stands, or carriers) may result in instability causing injury.

## System Security

- You acknowledge that the nature of Internet provides for inherent security risks, and our company shall not take any responsibilities for abnormal operation, privacy leakage or other damages resulting from cyber attack, hacker attack, however, our company will provide timely technical support if required.
- Please enforce the protection for the personal information and the data security as the device may be confronted with the network security problems when it is connected to the Internet. Please contact us when the device might exist network security risks.
- Please understand that you have the responsibility to configure all the passwords and other security settings about the device, and keep your user name and password.

## 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.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the device may be impaired.
- To reduce the risk of fire, replace only with the same type and rating of fuse.
- The serial port of the equipment is used for debugging only.

## 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.

- The equipment shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the equipment.
- No naked flame sources, such as lighted candles, should be placed on the equipment.
- Provide a surge suppressor at the inlet opening of the equipment under special conditions such as the mountain top, iron tower, and forest.
- Burned fingers when handling the parts with symbol  . Wait one-half hour after switching off before handling the parts.

### **Emergency**

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

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## Chapter 1 Overview

### 1.1 Brief Description

The Thermographic Cube Camera is a temperature measurement device which is equipped with a thermal lens.

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.

#### Temperature Exception Alarm

Device outputs 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.

#### 433 Wireless Network Transmission

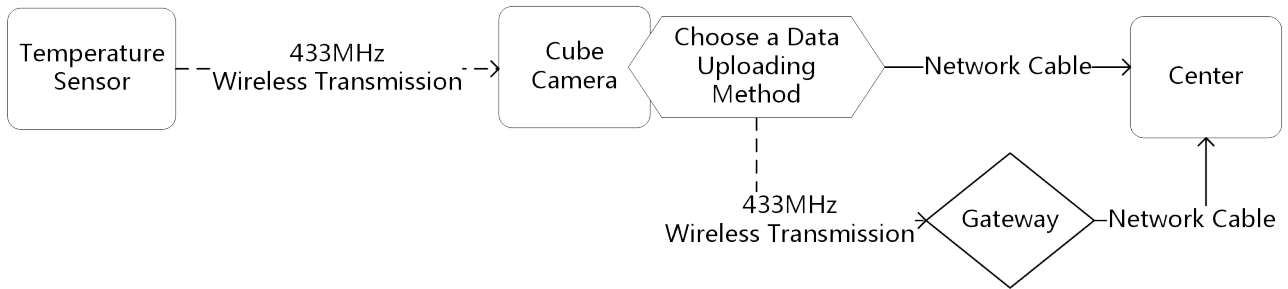
Device can receive the thermometry information of the sensors through the 433 module, and upload the information to the wireless gateway.

### 1.3 Typical Application

Thermographic Cube Camera supports 433MHz wireless transmission, which makes it more friendly to use in the application scenarios where cable routing is inconvenient.

The device receives temperature data and alarm from external temperature detectors with 433MHz wireless transmission and uploads the data to the center.

When sending data to the center client (iVMS-4200), the device supports a wireless way (with the help of a gateway that supports 433MHz transmission) and a wired way.



**Figure 1-1 Temperature Data Transmission among sensors, Cube Camera, and Center**

**Table 1-1 Settings for Temperature Data Transmission**

| Data Transmission                                              | Main Settings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| From External Temperature Sensors to Thermographic Cube Camera | <ol style="list-style-type: none"> <li>1. Install sensors and the device. Refer to the installation guide of the sensors and the device.</li> </ol> <p> <b>Note</b></p> <p>The distance between a sensor and a device should be within the 433MHz transmission distance limitation.</p> <ol style="list-style-type: none"> <li>2. Activate and log in to the device. See <a href="#"><b><i>Device Activation and Accessing</i></b></a> for instructions.</li> <li>3. Enable 433MHz data transmission on device. See <a href="#"><b><i>Set 433 MHz Transmission</i></b></a> for instructions.</li> <li>4. Connect temperature sensor to device. See <a href="#"><b><i>Connect Temperature Sensors to Device</i></b></a> for instructions.</li> <li>5. Set alarm rules for each temperature detector. See <a href="#"><b><i>Set External Temperature Sensor</i></b></a> for instructions.</li> </ol> |
| From Thermographic Cube Camera to Center (Wireless Way)        | <ol style="list-style-type: none"> <li>1. Enable 433MHz data transmission on device. See <a href="#"><b><i>Set 433 MHz Transmission</i></b></a> for instructions.</li> <li>2. Set up the gateway to connect the device to a network. See the manual of your gateway for instructions.</li> </ol> <p> <b>Note</b></p> <p>The gateway should support 433MHz transmission.</p> <ol style="list-style-type: none"> <li>3. Set the temperature alarm <b>Transmission Mode</b> to <b>433 Wireless Network Transmission</b> at <b>Configuration → Temperature Measurement → Alarm Settings</b> . See <a href="#"><b><i>Upload Temperature Alarm to Center</i></b></a> for instructions.</li> <li>4. Add the device to the center client (iVMS-4200). See the user manual of the client software for instructions.</li> </ol>                                                                            |

| Data Transmission                                    | Main Settings                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                      | Access <a href="https://www.hikmicrotech.com/en/download/5">https://www.hikmicrotech.com/en/download/5</a> to get iVMS-4200 software.                                                                                                                                                                                                                               |
| From Thermographic Cube Camera to Center (Wired Way) | <ol style="list-style-type: none"><li>1. Connect the device to network with network cable.</li><li>2. Add the device to the center client (iVMS-4200). See the user manual of the client software for instructions.</li></ol> Access <a href="https://www.hikmicrotech.com/en/download/5">https://www.hikmicrotech.com/en/download/5</a> to get iVMS-4200 software. |

## 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 <https://www.hikmicrotech.com/en/download/5> 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 Plug-in Installation

Certain operation systems and web browser may restrict the display and operation of the device function. You should install plug-in or complete certain settings to ensure normal display and operation. For detailed restricted function, refer to the actual device.

| Operating System | Web Browser                              | Operation                                                                                                                                                                                                                                                                                                                     |
|------------------|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Windows          | Internet Explorer 10+                    | Follow pop-up prompts to complete plug-in installation.                                                                                                                                                                                                                                                                       |
|                  | Google Chrome 57+<br>Mozilla Firefox 52+ | Click  <b>Download Plug-in</b> to download and install plug-in.<br>Go to <b>Configuration → Network → Advanced Settings → Network Service</b> to enable WebSocket or WebSockets for normal view if plug-in installation is not required. |



| Operating System | Web Browser    | Operation                                                                                                                                                                                                                                                                                                                                                |
|------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  |                | Display and operation of certain functions are restricted. For example, Playback and Picture are not available. For detailed restricted function, refer to the actual device.                                                                                                                                                                            |
| Mac OS 10.13+    | Mac Safari 12+ | Plug-in installation is not required.<br><br>Go to <b>Configuration → Network → Advanced Settings → Network Service</b> to enable WebSocket or WebSockets for normal view. Display and operation of certain functions are restricted. For example, Playback and Picture are not available. For detailed restricted function, refer to the actual device. |



### Note

The device only supports Windows and Mac OS system and does not support Linux system.

---

### 2.3.2 Illegal Login Lock

It helps to improve the security when accessing the device via Internet.

Go to **Configuration → System → Security → Security Service**, and enable **Enable Illegal Login Lock**. **Illegal Login Attempts** and **Locking Duration** are configurable.

#### Illegal Login Attempts

When your login attempts with the wrong password reach the set times, the device is locked.

#### Locking Duration

The device releases the lock after the setting duration.

## 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.

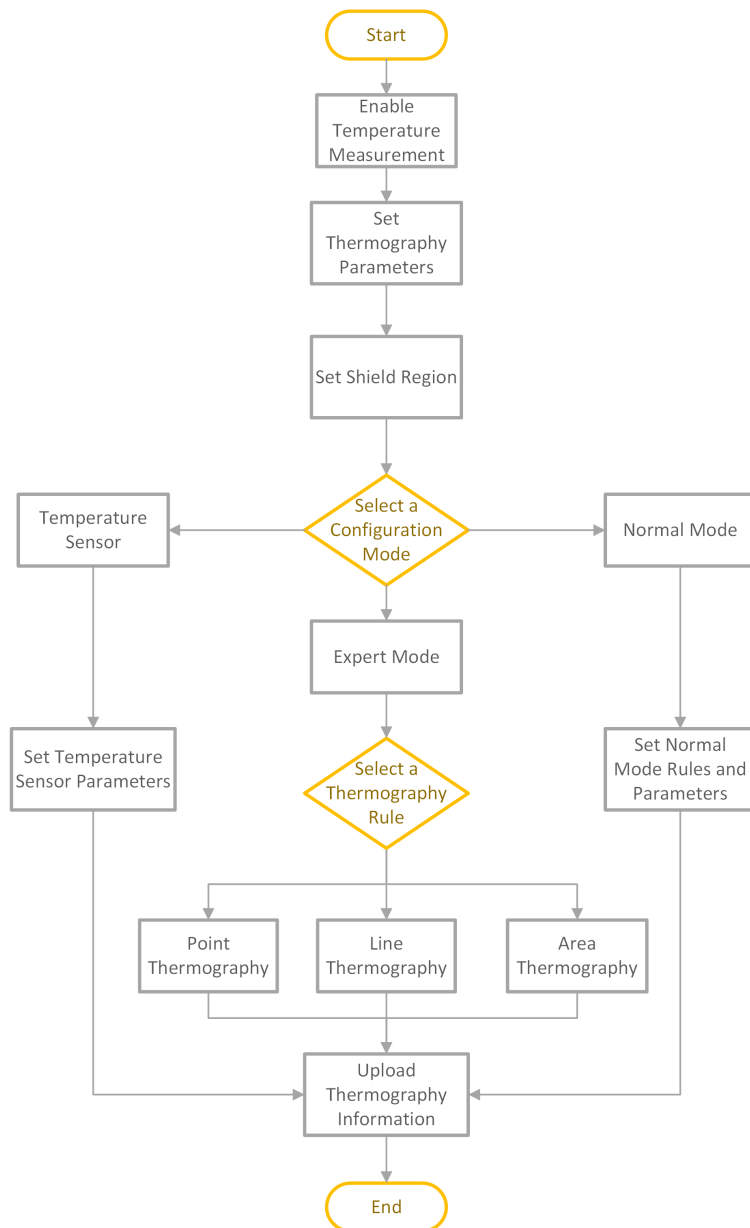
### 3.1 Notice

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  $5 \times 5$ .
- Please select line thermography or area thermography for a certain area temperature measurement. The point thermography is not recommended in case of deviation occurred during device movement to affect the accuracy of temperature measurement.

### 3.2 Thermometry Flow Chart

This part introduces the process of configuring temperature measurement.



**Figure 3-1 Thermometry Flow Chart**

## 3.3 Automatic Thermography

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 Thermometry Parameters

Configure the parameters of temperature measurement.

#### Steps

1. Go to **Configuration → Local** , enable **Display Temperature Info.** .

#### Display Temperature Info.

Select **Yes** to display temperature information on live view.

Enable **Rules** to display the rules information on live view.

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 Max./Min./Average Temperature

Check to display maximum/minimum/average temperature information on live view 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.

### Calibration File Version

View the version of calibration file.

### Alarm Interval

Set the time interval of alarms.

### Display Rule Info. on Alarm Picture

Select the rule information to be added on the alarm capture.

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 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.

### Temperature Sudden Change Alarm

When the temperature change exceeds the set sudden change alarm value within the set cycle, the camera triggers an alarm.



### Note

Temperature sudden change alarm is only supported by certain device models.

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.



### Note

Go to **Image → VCA Rules Display** to adjust the fonts size and the temperature colour of normal, alarm and pre-alarm.

---

### 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 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 Thermography 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 thermography rules will be displayed on the live view.



### Note

Go to **Image → VCA Rules Display** to adjust the fonts size and the temperature colour of normal, alarm and pre-alarm.

---

8. **Optional:** Call the preset and check if the rules are efficient.
9. Enable the scan function of device, such as linear scan to monitor the scene.

### 3.3.4 Set Thermography 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 Thermography\*\*](#) for detailed configuration.

**Line** Please refer to [\*\*Line Thermography\*\*](#) for detailed configuration.

**Area** Please refer to [\*\*Area Thermography\*\*](#) 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.

### **Area's Temperature Comparison**

Select two areas and set the comparison rule, and set the temperature difference threshold. The device alarms when the temperature difference meets the setting value.

### **Temperature Sudden Change Alarm**

**Temperature Sudden Increase** and **OFF** are selectable. When the temperature change value in the drawn area exceeds the set alarm threshold, the device triggers an alarm.

### Cycle

Set the recording period of the temperature change.

### Sudden Change Alarm Value

Set the temperature change alarm threshold for the rule. When the difference between the max. temperature and the min. temperature in the recording cycle exceeds the set alarm value, the device triggers an alarm.

5. You can shield certain area from being detected. Refer to **Set Shielded Region** for detailed settings.

6. Click **Save**.

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

## Point Thermography

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.

## Line Thermography

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.

## Area Thermography

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.

### 3.3.5 Set Shielded Region

You can configure areas from being detected.

#### Steps

1. Check **Enable Shield Area**.
2. Click .
3. Drag the mouse in the live view to draw the area. You can drag the corners of the red rectangle area to change its shape and size.
4. Right click the mouse to stop drawing.
5. **Optional:** Select one area and click  to delete it.
6. Click **Save**.

## 3.4 External Temperature Sensor

The device can receive the temperature and alarm information detected by the external temperature sensors.

To receive data from temperature sensors, you should set:

- **Set 433 MHz Transmission**
- **Connect Temperature Sensors to Device**
- **Set External Temperature Sensor**

### 3.4.1 Set 433 MHz Transmission

You can enable the 433 wireless network transmission function to receive and send the thermometry information through the 433 module.

#### Steps

1. Go to **Configuration → 433 Module Configuration → Basic Settings**.
2. Check **Enable 433 Wireless Network Transmission**.
3. Confirm the baud rate. The fixed baud rate is 10 k.
4. Click **Save**.

### 3.4.2 Connect Temperature Sensors to Device

Before starting 433 wireless network transmission, you should configure temperature sensors, and connect the sensors to the device.

## Before You Start

Go to **Configuration → 433 Module Configuration → Basic Settings** to enable 433 wireless network transmission.

## Steps

1. Go to **Configuration → 433 Module Configuration → Sensor**.
2. Select the **Type** of the sensor.
3. Enter the **Identification Code**.
4. Enter the **Name** for the sensor.
5. Click **Save**.



## Note

Please use the sensor models recommended by the manufacturer.

---

## Result

The configured sensors will be listed in **Temperature Measurement → Temperature Sensor → Sensor**.

## 3.4.3 Set External Temperature Sensor

Set alarm rules for the configured sensors. The sensors can measure the temperature in the set area and trigger an alarm if there is any exception.

## Before You Start

- Enable 433 module configuration. See [Set 433 MHz Transmission](#) for reference.
- Complete the sensor configuration. See [Connect Temperature Sensors to Device](#) for reference.

## Steps

1. Go to **Temperature Measurement → Temperature Sensor → Sensor**.
2. Check to select the sensor to be configured.
3. Click  and set the **Alarm Rule**.

### Alarm Temperature and Pre-Alarm Temperature

Set the alarm temperature and pre-alarm temperature for the sensor. E.g., if you set the **Pre-Alarm Temperature** to **50 °C**, and set the **Alarm Temperature** to **55 °C**, the device triggers pre-alarm actions when its temperature is higher than 50 °C, triggers alarms actions when the temperature is higher than 55 °C.

### Temperature Sudden Change Alarm

**Temperature Sudden Increase** and **OFF** are selectable. When the temperature change value in the detected area exceeds the set alarm threshold, the device triggers an alarm.

### Cycle

Set the recording period of the temperature change.

### Sudden Change Alarm Value

Set the temperature change alarm threshold for the rule. When the difference between the max. temperature and the min. temperature in the recording cycle exceeds the set alarm value, the device triggers an alarm.

4. Click **OK**.
5. Click  , and check the sensor ID as needed to copy the rule to it.
6. Go to **Linkage Method → Arming Schedule** to set the arming schedule for the alarm. See **Set Arming Schedule** for reference.
7. Set the linkage method for the alarm. See **Linkage Method Settings** for reference.

### 3.5 Upload Temperature Alarm to Center

The device can upload thermography information to the surveillance center through 433 wireless module.

#### Before You Start

- Enable the temperature measurement function in **Configuration → Temperature Measurement → Basic Settings** .
- Complete the 433 module configuration. See **Set 433 MHz Transmission** for reference.

#### Steps

1. Go to **Configuration → Temperature Measurement → Alarm Setting** .
2. Confirm that the transmission mode is **433 Wireless Network Transmission**.
3. Configure the parameters for the alarm setting.

#### Normal Interval

The interval of information upload.

#### Display Rule Info. on Alarm

If you select **All Rules**, the uploaded pictures contain all rule information configured in expert mode. If you select **No**, the uploaded pictures do not contain any rule information.

#### Upload Picture

If you select **Upload All**, the device uploads the thermography information and captured thermal pictures at the same time. If you select **No**, the device does not upload any pictures.

4. Click **Save**.

## Chapter 4 Event and Alarm

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

### 4.1 Set Exception Alarm

Exception such as HDD full can trigger the device to take corresponding action.

#### Steps

1. Go to **Configuration → Event → Basic Event → Exception** .

2. Select **Exception Type**.

|                                   |                                                                             |
|-----------------------------------|-----------------------------------------------------------------------------|
| <b>HDD Full</b>                   | The HDD storage is full.                                                    |
| <b>HDD Error</b>                  | Error occurs in HDD.                                                        |
| <b>Illegal Login</b>              | Incorrect user name or password is entered.                                 |
| <b>Calibration File Exception</b> | The calibration file is modified. The temperature accuracy may be affected. |

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 Notify Surveillance Center

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

## Chapter 6 Live View

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

### 6.1 Live View Parameters

The supported functions vary depending on the model.

#### 6.1.1 Window Proportion

-  refers to the window size is 16 : 9.
-  refers to the window size is 4 : 3.
-  refers to original window size.
-  refers to self-adaptive window size.

#### 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 the channel.

- Click  to start the live view.
- Click  to stop the live view.

#### 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.

## 6.2 Quick Set Live View

It offers a quick setup of display settings, OSD, video/audio and VCA resource settings on live view page.

### Steps

1. Click  to show quick setup page.
2. Set display settings, OSD, video/audio and VCA resource parameters.
  - For display settings, see [Display Settings](#) .
  - For OSD settings, see [OSD](#) .
  - For audio and video settings, see [Video and Audio](#) .
  - For VCA settings, see [Temperature Measurement](#) .



### Note

The function is only supported by certain models.

---

## 6.3 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.

**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** .

#### 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 mean 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.

#### 7.1.2 Video Type

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

##### Video

Only video content is contained in the 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.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.

### 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 to 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.

## 7.2 Display Settings

It offers the parameter settings to adjust image features.

Go to **Configuration → Image → Display Settings** .

Click **Default** to restore settings.

### 7.2.1 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 **DPC (Defective Pixel Correction)**, the device will take the uniform object as the standard and optimize the image once.

#### Manual Correction

Click **DPC (Defective Pixel Correction)** 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**.

---

#### Thermal AGC Mode

**Linear** mode is for scene with low temperature difference and the target is not obvious. It can improve image contrast and enhance image. E.g. the bird in forest.

### 7.2.2 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 a palette mode in **Image Enhancement** according to your need.

#### Result

The live view displays the image with palette.

### 7.2.3 DDE

Digital Detail Enhancement is used to adjust the details of the image. **OFF** and **Normal** modes are selectable.

#### **OFF**

Disable this function.

#### **Normal**

Set the DDE level to control the details of the image. The higher the level is, the more details shows, but the higher the noise is.

## 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.

### **Character Set**

Select character set for displayed information. If Korean is required to displayed on screen, select **EUC-KR**. Otherwise, select **GBK**.

### **Displayed Information**

Set camera name, date, week, and their related display format.

### **Text Overlay**

Set customized overlay text on image.

## 7.4 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 manual mode.
3. Click the defective pixel on the image, then a cursor shows on the live view.
4. Click **Up, Down, Left, Right** to adjust the cursor position to the defective pixel position.
5. Click  , then click  to correct defective pixel.



### 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.

---

6. **Optional:** Click  to cancel defective pixel correction.

## 7.5 Metadata

Metadata is the raw data that the device collects before algorithm processing. It is often used for the third party integration.

Go to **Configuration → Video/Audio → Metadata Settings** to enable metadata uploading of the desired function for the camera channels.

## 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 Video Recording

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

#### 8.1.1 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  in the live view interface to start recording. Click  to stop recording.

### 8.2 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.

#### 8.2.1 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.

## 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 inaccessible.

---

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

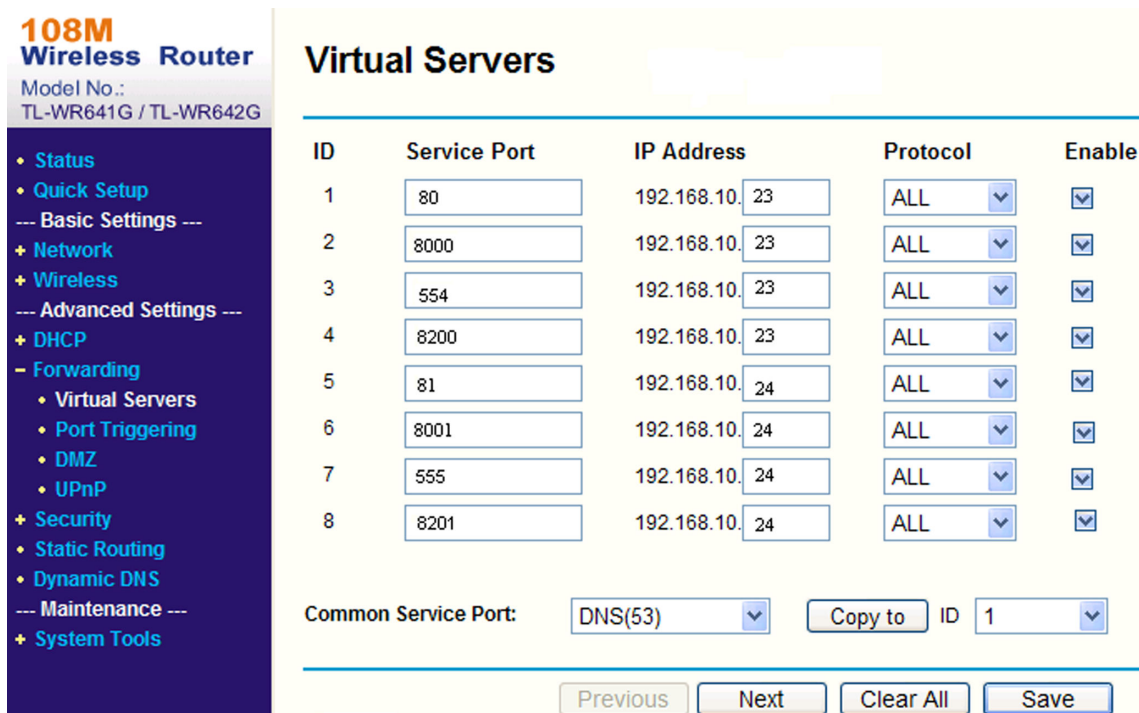
The following settings are for a certain router. The settings vary depending on different models of routers.

### 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.



**108M Wireless Router**  
Model No.: TL-WR641G / TL-WR642G

- Status
- Quick Setup
- Basic Settings ---
- Network
- Wireless
- Advanced Settings ---
- DHCP
- Forwarding
  - Virtual Servers
  - Port Triggering
  - DMZ
  - UPnP
- Security
  - Static Routing
  - Dynamic DNS
- Maintenance ---
- System Tools

### Virtual Servers

| ID | Service Port | IP Address    | Protocol | Enable                              |
|----|--------------|---------------|----------|-------------------------------------|
| 1  | 80           | 192.168.10.23 | ALL      | <input checked="" type="checkbox"/> |
| 2  | 8000         | 192.168.10.23 | ALL      | <input checked="" type="checkbox"/> |
| 3  | 554          | 192.168.10.23 | ALL      | <input checked="" type="checkbox"/> |
| 4  | 8200         | 192.168.10.23 | ALL      | <input checked="" type="checkbox"/> |
| 5  | 81           | 192.168.10.24 | ALL      | <input checked="" type="checkbox"/> |
| 6  | 8001         | 192.168.10.24 | ALL      | <input checked="" type="checkbox"/> |
| 7  | 555          | 192.168.10.24 | ALL      | <input checked="" type="checkbox"/> |
| 8  | 8201         | 192.168.10.24 | ALL      | <input checked="" type="checkbox"/> |

Common Service Port: DNS(53) Copy to ID 1

Previous Next Clear All Save

Figure 9-1 Port Mapping on Router

### 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 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.

## 9.5 Set HTTP Listening

The device can send alarms to destination IP or host name through HTTP or HTTPS protocol. The destination IP or host name should support the HTTP data transmission.

### Steps

1. Go to **Configuration → Network → Advanced Settings → HTTP Listening**.
2. Input **Destination IP** or **Host Name**, **URL**, and **Port**.
3. Select **Protocol**.



#### Note

HTTP and HTTPS are selectable. It is recommended to use HTTPS, as it encrypts the data transmission during communication.

---

4. Click **Test**.
5. Click **Save**.

## 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.

- |                |                                                                                                           |
|----------------|-----------------------------------------------------------------------------------------------------------|
| <b>Restore</b> | Reset device parameters, except user information, IP parameters and video format to the default settings. |
| <b>Default</b> | Reset all the parameters to the factory default.                                                          |



### 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.

- |                 |                                            |
|-----------------|--------------------------------------------|
| <b>Firmware</b> | 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** , 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.



#### Note

You should keep the parameters of the device and the computer or terminal all the same.

3. Click **Save**.



## 10.12 Set Same Unit

Set the same temperature unit and distance unit. When you enable this function, the unit cannot be configured separately in other setting pages

### Steps

1. Go to **Configuration → System → System Settings → Unit Settings** .
2. Check **Use Same Unit**.
3. Set the temperature unit and distance unit.
4. Click **Save**.

## 10.13 Security

You can improve system security by setting security parameters.

### 10.13.1 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.

---

### 10.13.2 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**.

### 10.13.3 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 Authorized 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/Region, Hostname/IP, Validity** and other parameters.

4. Click **OK**.

#### Result

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

### Install Authorized 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/Region, Hostname/IP, Validity** and other parameters.

4. Click **Download** to download the certificate request and submit it to the trusted 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**.

### 10.13.4 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**.

## 10.14 User and Account

### 10.14.1 Set User Account and Permission

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



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.

**Modify** 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

| Material              | Emissivity |
|-----------------------|------------|
| Human Skin            | 0.98       |
| Printed Curcuit Board | 0.91       |
| Concrete              | 0.95       |
| Ceramic               | 0.92       |
| Rubber                | 0.95       |
| Paint                 | 0.93       |
| Wood                  | 0.85       |
| Pitch                 | 0.96       |
| Brick                 | 0.95       |
| Sand                  | 0.90       |
| Soil                  | 0.92       |
| Cloth                 | 0.98       |
| Hard Paperboard       | 0.90       |
| White Paper           | 0.90       |
| Water                 | 0.96       |

### 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 HikMicro 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 HikMicro thermal cameras.





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