

# **Thermal Imaging Body Temperature Measurement System (KIT-BODYTEMP-BLACKBODY)**

## **User Manual**

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## 1 Notice

- Try to keep Blackbody and Thermal Camera at the same height, make sure the Blackbody won't be sheltered by people or other objects; Try to position the Blackbody on a corner of the thermal image;
- To decrease sunshine's affection on temperature measurement, avoid installation outside or in sunshine;
- To guarantee measuring accuracy, the distance between Thermal Camera and the Object should be 2m~6m;
- If installation point got surface shaking, please consult us for solution;
- To take better performance of the face recognition, we suggest to apply PC (laptop or desktop) with following system requirement:

Operating System: Microsoft Windows 7 and above version

CPU: 3.4 GHz or higher

RAM: 4G or higher

Display: 1024×768 resolution or higher

## 2 Features

1. Multi-objects detection, Face recognition with smart tracing, which can help to decrease the false warning;
2. Automatically select and detect fever people by virtual passageway setting;
3. 3 levels alarm setting for Healthy, Re-inspection and Fever People;
4. External blackbody empowered system's temperature measuring accuracy at  $\leq \pm 0.3^{\circ}\text{C}$ ;
5. Smart combination with Thermal imaging camera and Visible camera, synchronized alarm makes selection and detection real time with more intuitive, effective and accurate;

## 3 Product Specification

Picture	
<b>Thermal Camera</b>	
Resolution	384*288
Pixel Pitch	17μm
Focus Length	9.6mm (Optional: 6.6mm,10mm, 19mm, 25mm)
FOV	25°×19°
<b>Visible Camera</b>	
Resolution	1920×1080
<b>Blackbody</b>	

Temp.Calibration	$\leq\pm 0.2^{\circ}\text{C}$
<b>Temperature Measurement</b>	
Object Temp. Range	20°C~50°C
Accuracy	$<\pm 0.3^{\circ}\text{C}$
Temp.Calibration	Build-in/Outlaid blackbody, automatically calibration
<b>Housing</b>	
IP grade	IP66
Interface	1x RJ45 for Ethernet, 1x 12V power supply
<b>Software</b>	
Temp.Measurement	Smart detection, face capture, tracking and body temp. correction;
Alarm/Capture	3 grades' alarm setting, voice alarm with capture;
Other Parameters	Video setting, alarm value setting, display mode setting, display zone setting, blackbody calibration temp. setting
History Data Query	Query and process history alarm information
<b>Work Environment</b>	
Working Temp.	0~30°C (more higher accuracy in environment temp.16~30°C)
Storage Temp.	-20~60°C
Humidity	<90% (no condensation)

Table 1 Datasheet

## 4 Installation

### 4.1 Cables and Interfaces

1 pcs. Network cable, 1 pcs. Power cable (please refer to actual packaging)

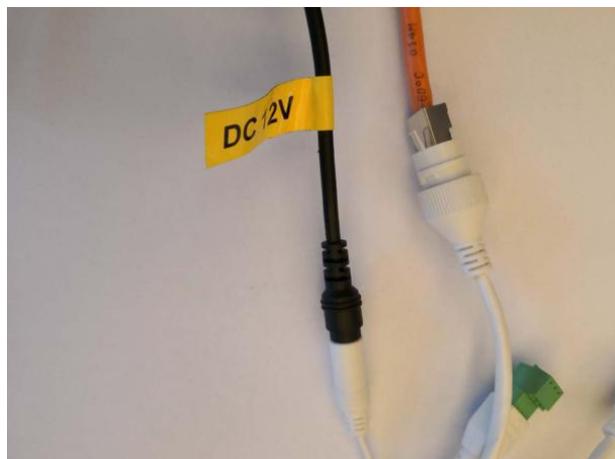


Figure 1 Cables and interfaces

## 4.2 System Installation

### 4.2.1 Camera Installation

1. Fix camera's holder by crew, install the camera (on wall or other support) in a proper height (recommend height at approx.2m);
2. Power supply with adapter (manufacturer supplied): AC 220V;

### 4.2.2 Blackbody Installation

1. Tripod Setting
  - Take off the adapter block from tripod;
  - Fix the adapter block on blackbody, then put it on the tripod;
  - Set the blackbody on the entrance of passenger way, height at approx. 2m;
  - Blackbody is powered by AC 220v.
2. You also can choose other installation ways according to actual situation;

### 4.2.3 Miscellaneous

1. Suggest distance between Thermal Imaging Camera and blackbody is 3~5m.
2. Suggest to set blackbody and Objects on one parallel side, to get the most accurate measuring result the space between should be set to 1m~2m.

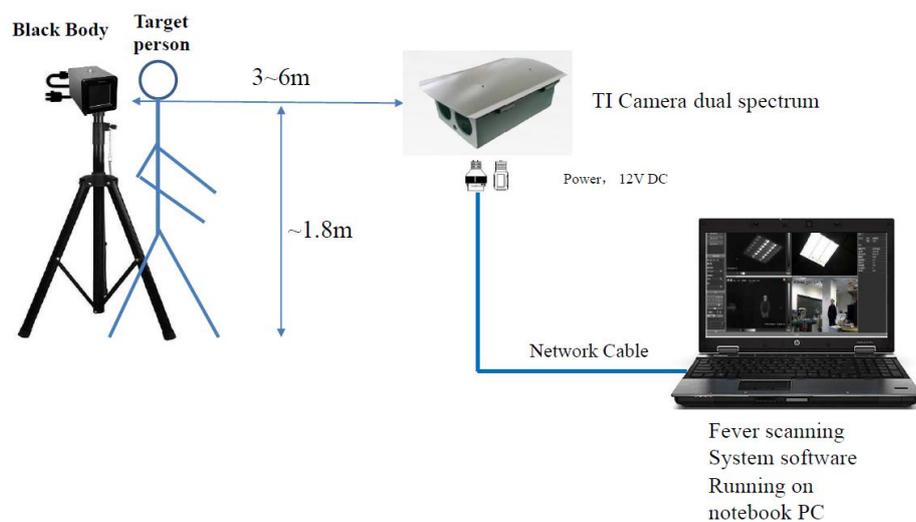


Figure 2 The system installation architecture example

## 5 System configuration

### 5.1 Device Management

Add Thermal Imaging Camera on System Tools via Device Management Interface:

**STEP 1:** Add the thermal camera

- Please refer to the figure picture, choose the protocol “mac-p” to search thermal camera on Device Management Interface;

**Remark:**

1. Disable PC’s Automatic acquisition of IP addresses, set PC’s Lan local network IP address as the same segment as thermal camera’s;
2. Default IP address of the thermal camera is 192.168.1.63;

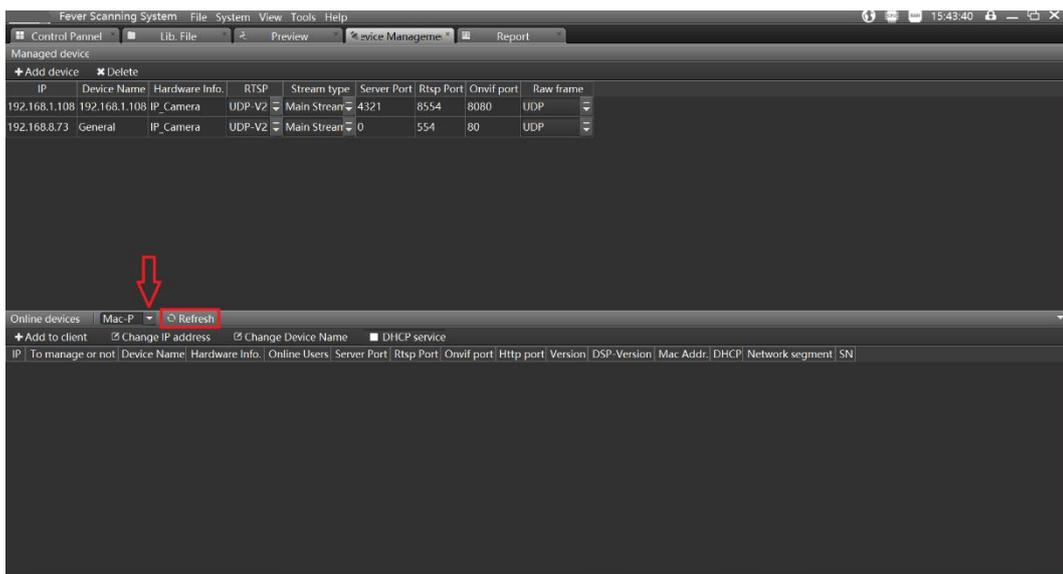


Figure 3 Search and add the TI cameras to be managed

3. Double click the shown-up device on the list, and input user name and password;
  - The Default user name is “admin”, password is “admin123”;
  - If password forgotten after added the thermal camera on the tools, please reset thermal camera by press “RST” button for few seconds, then the added thermal camera will be shown on the list.

**STEP 2:** Add visible camera

- 1) Search visible camera via “Onvif” protocol

**Remark:**

- ✧ make sure PC's Lan local network IP address as the same network segment as in the thermal imaging camera's;
- ✧ The Default IP for thermal camera is 192.168.1.64;

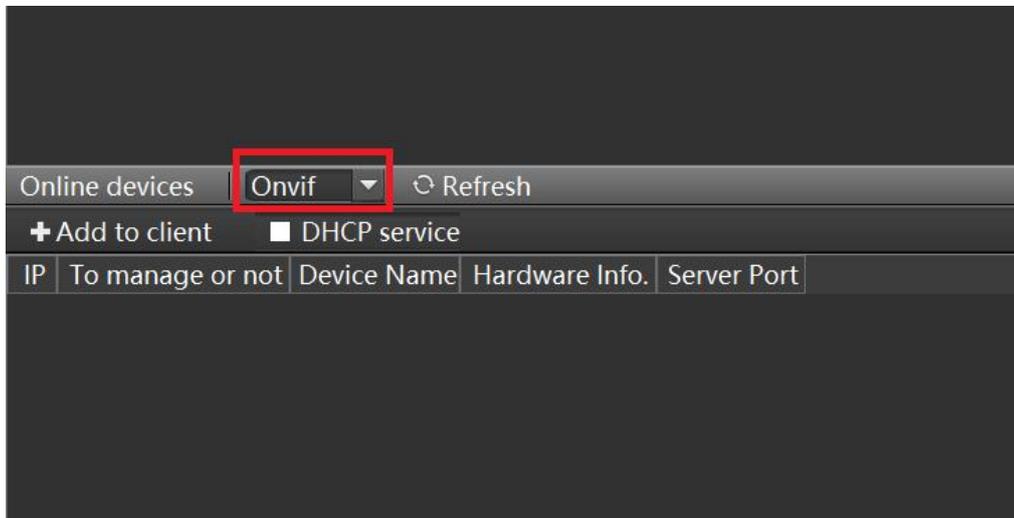


Figure 4 Search and add the visible light camera to be managed

- 2) Double click the shown-up device on the list, and input user name and password; The default user name is “admin”, password is “admin123”;

**STEP 3: Online Preview**

- 1) Added cameras could be seen on “Online Preview” interface, those cameras’ connection with system could be ON/OFF by click ;

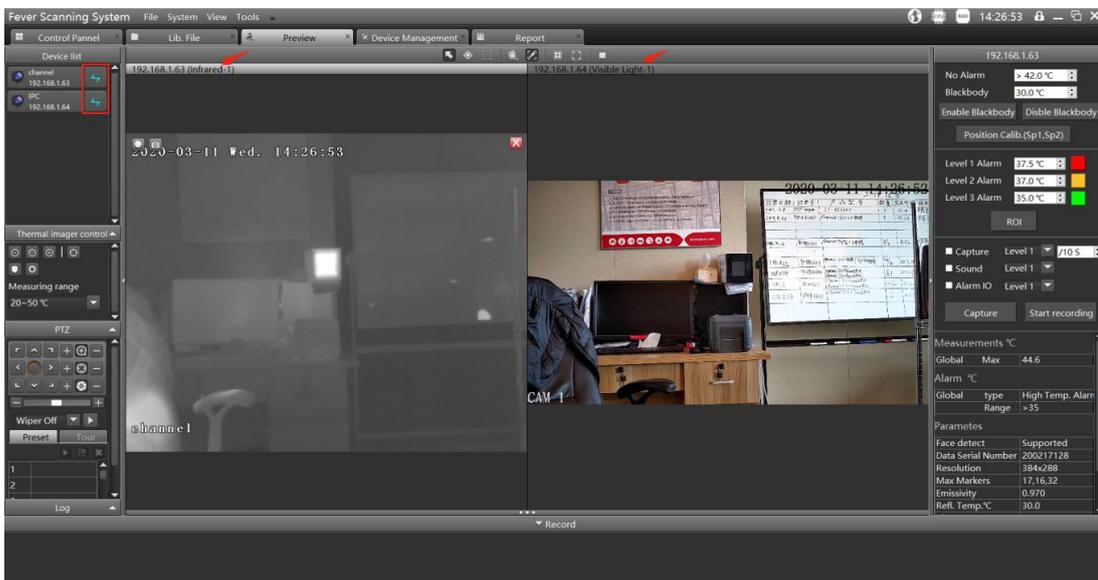


Figure 5 Online preview of the dual spectrum camera

- 2) Choose the display window first by single click the window, then choose the camera which will be displayed on this window.

## 5.2 Referential point setting

Click enable reference point, and a reference point will appear in the screen (yes, my name is a reference point). Move the reference point to the center of the Blackbody, and fill in the actual temperature value of the Blackbody in the column of reference Blackbody temperature (generally 35 °C).

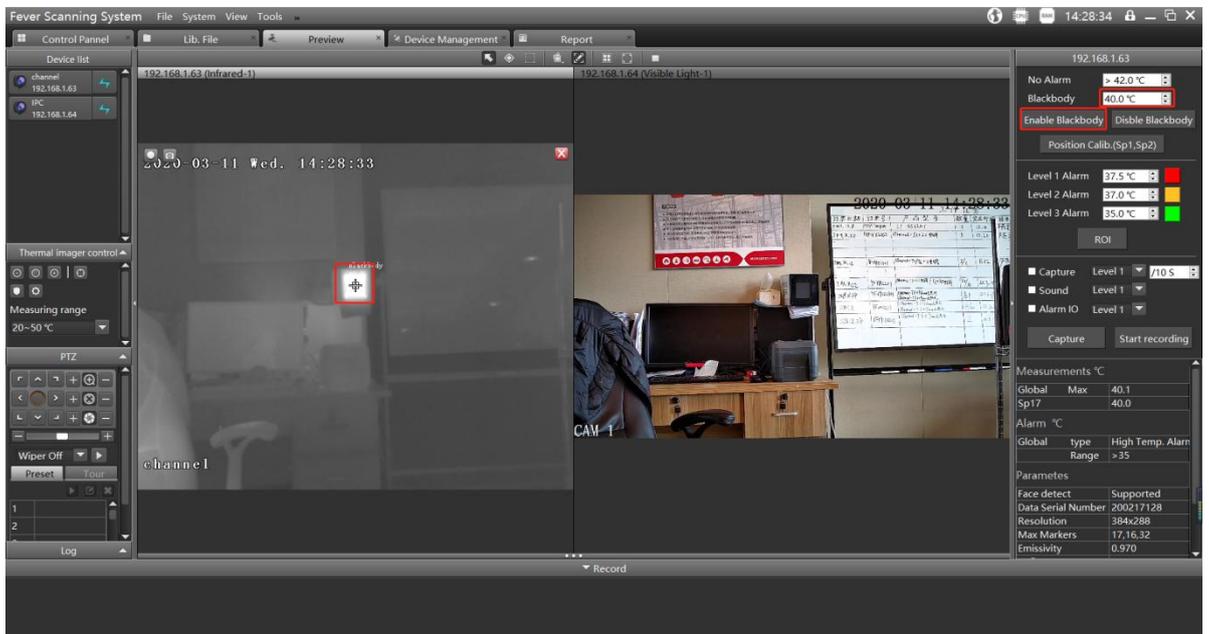


Figure 6 Set the referential point (blackbody)

## 5.3 Thermal/Visible camera view field matching

The purpose of this step is to establish the matching between the thermal imaging and visible light camera video preview, such that when setting the measuring marks on the thermal imaging previewing, they will be synchronized to the same place on the visible light peering places. The steps are described as following:

- 1) Find the feature points Sp1 and Sp2 in the infrared and visible images. The distance between Sp1 and SP2 should be as far as possible, and it is suggested to set them on the diagonal direction of the picture.
- 2) Let the visible camera and the thermal camera draw the point mark on the same object, for

example, Sp1 is the upper left corner of the Blackbody, Sp2 is a point on the bracket (refer to the picture below), and click position correction (Sp1, Sp2).

- 3) Test: Please let somebody walks around in front of the image to see whether the position of the picture alarm frame is consistent. If not, readjust the position of Sp1 and Sp2. Then click position correction Sp1, Sp2.
- 4) After the temperature alarm overlaps in the same position of the visible image, click the real-time mark mode to hide the mark points Sp1, Sp2 and reference points.

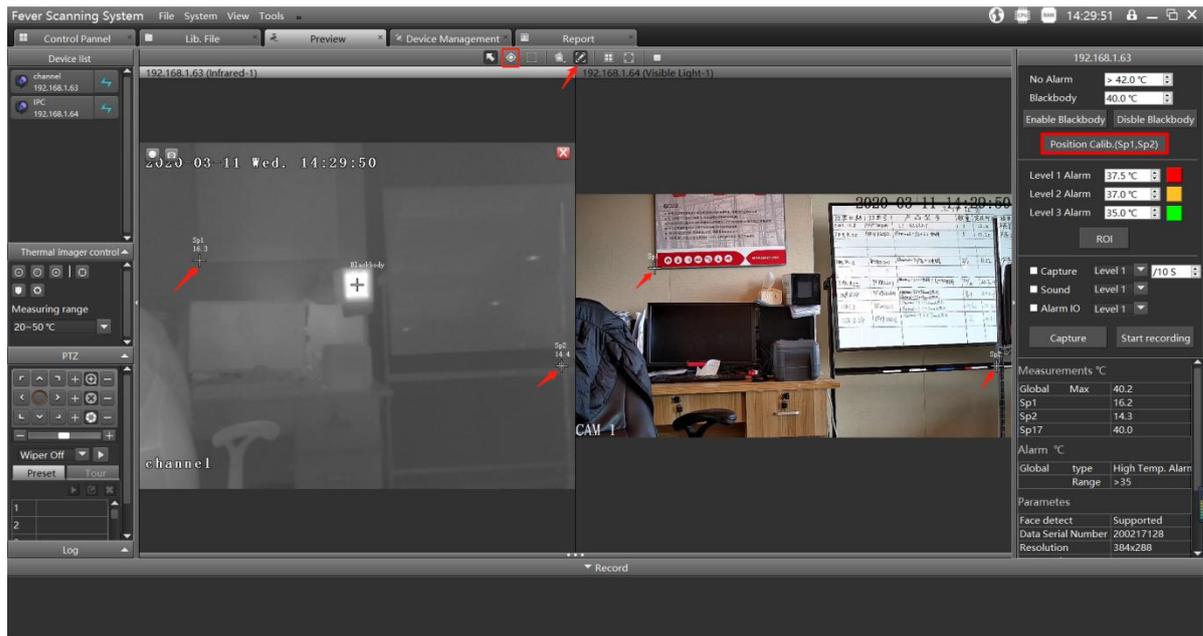


Figure 7 Set the points to match the TI and visible camera preview view field

#### 5.4 Smart (Face detection) Temperature Measurement Setting

Activate Smart Temperature Measurement Setting by opening “Tools”, then select “AI Detect”.



Figure 8 AI Detect

## 5.5 Alarm setting

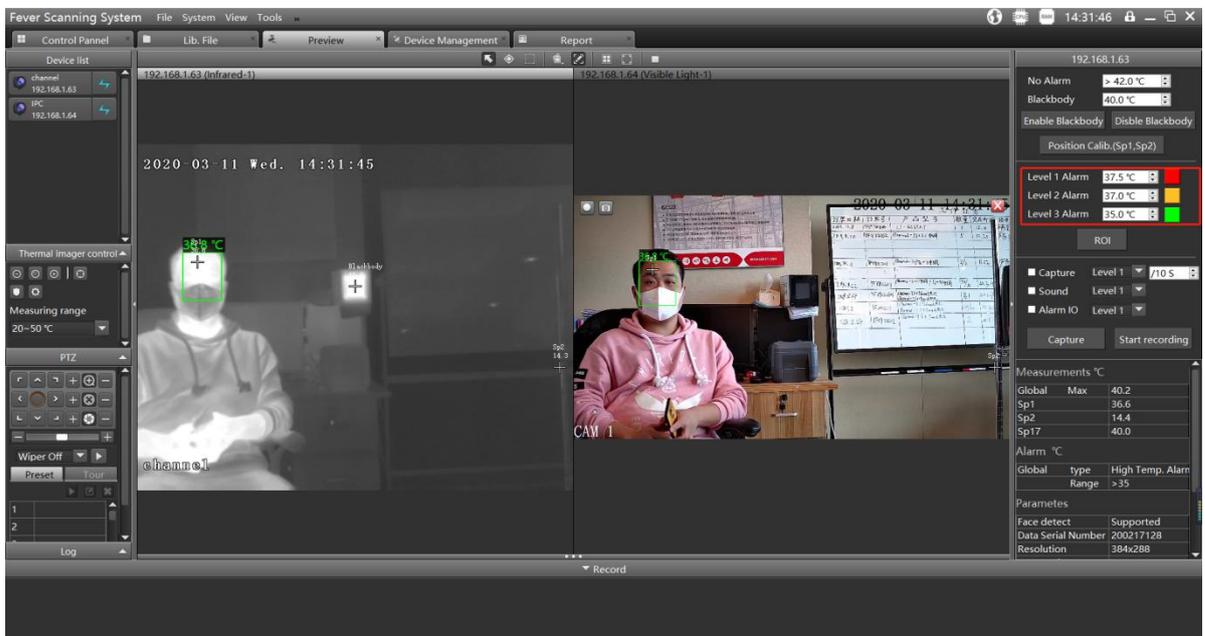


Figure 9 Set the multi-levels over temperature alarming threshold

1. The information bar on the right side of the system interface sets the third-level alarm temperature as 33°C. When an object is higher than the temperature, a green box will be

- drawn for alarm (the temperature can be set according to the actual situation).
- The information bar on the right side of the system interface sets the second-level alarm temperature as 36°C. When an object is higher than the temperature, a yellow box will be drawn for alarm (the temperature can be set according to the actual situation).
  - The information bar on the right side of the system interface sets the first-level alarm temperature as 37.5°C. When an object is higher than the temperature, a red box will be drawn for alarm (the temperature can be set according to the actual situation).

**Note: It is required to select the thermal image first, then the information bar on the right will be displayed.**

- Click the “capture” checkbox and select the alarm level to automatically capture the image. The snapshot information is at the bottom of the system. Double click to enlarge. Check the heat source (Note: "interval" refers to the snapshot triggered after the interval of 10s).
- Click the “Sound” checkbox, when somebody’s voice exceeds the selected alarm level within the real-time detection range, the sound alarm can be triggered for the staff to view and confirm.



Figure 10 Alarm event (image capture and sound alarm)

- Click on “Save Params After Power Off” save all the settings above. Then click “Tools” and select “Client Config” to create configuration; Choose “YES” when a notification saying “if save this current configuration as default?” Close the Client Tools and re-start it to check if above setting were saved and still working;

## 5.6 Device upgrade

The "Remote upgrade" function is to upgrade the firmware version of the camera modules and boards.

1. Enter "Remote configuration" ---- click on "Remote upgrade".
2. Please refer to the following figures steps.



Figure 11 To enter the remote upgrade interface

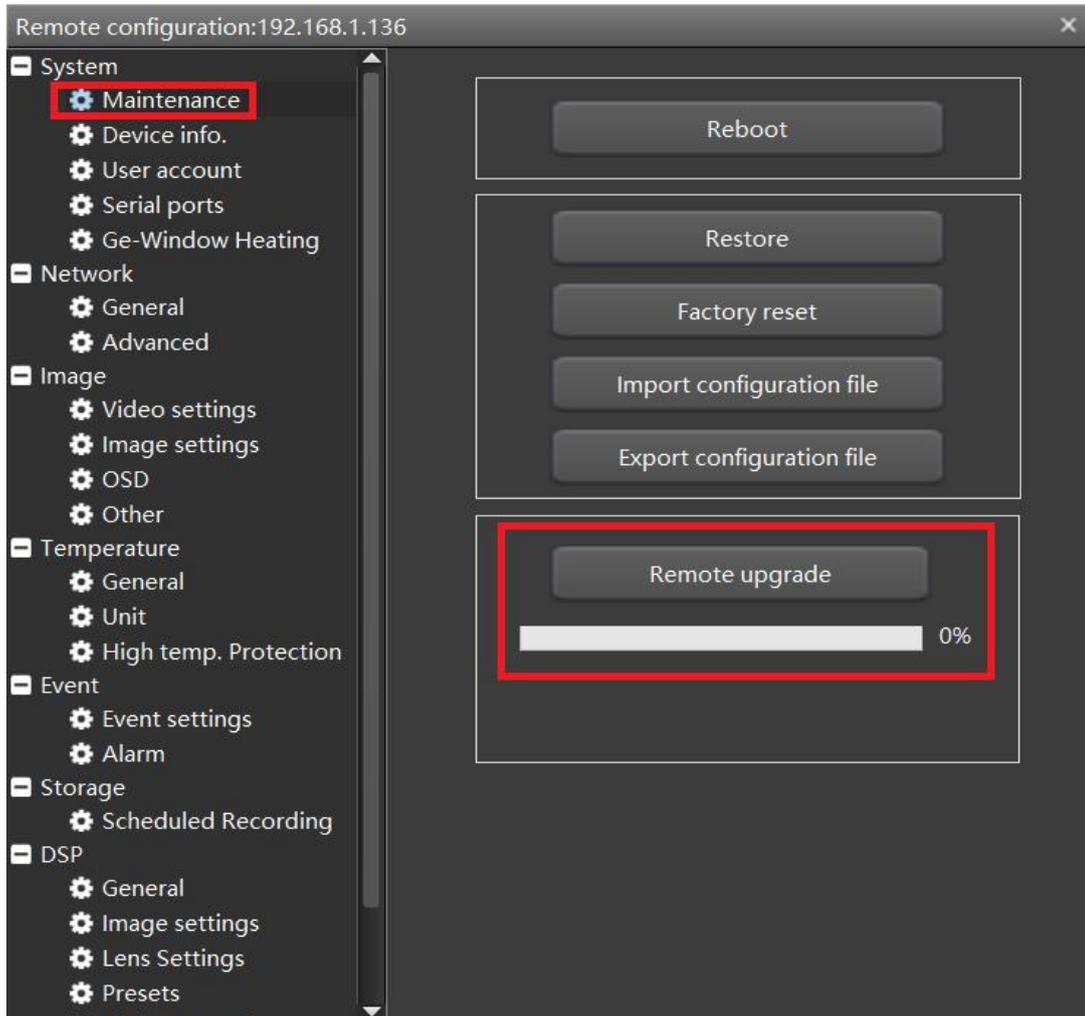


Figure 12 Click maintenance and then “Remote upgrade”

### 5.6.1 DSP Firmware upgrade

Choose the corresponding file, click “open” to upgrade.

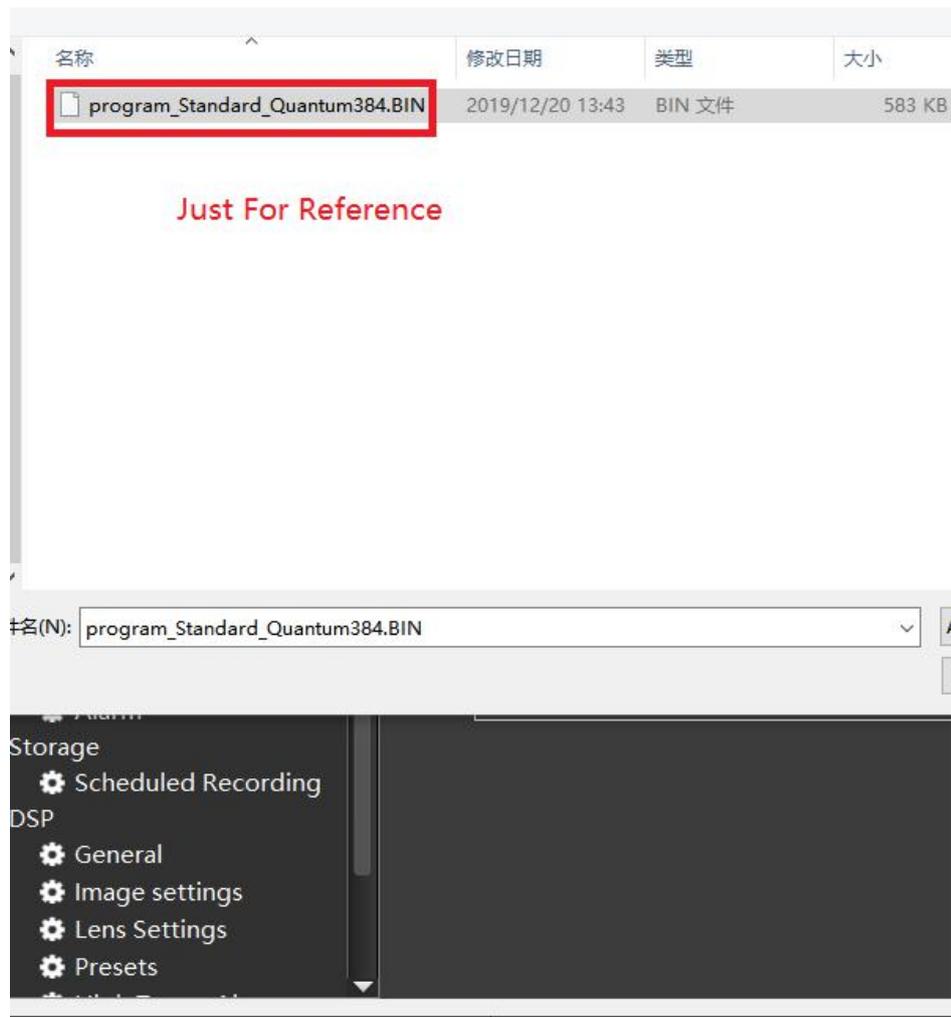


Figure 13 Upgrade the DSP firmware

After the progress bar shows 100%, it returns to zero (red box 1). When the red box 2 appears on the screen, restart the device (red box 3).

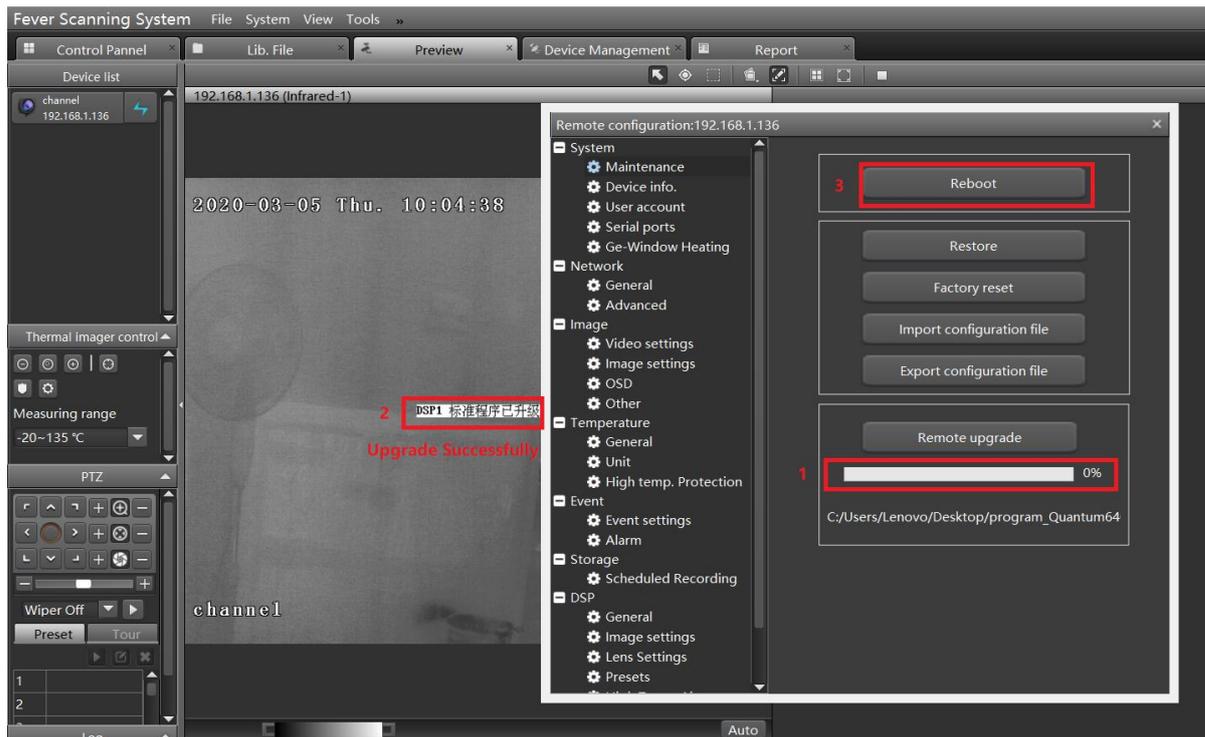


Figure 14 Upgrade the DSP firmware

## 5.6.2 Hisilicon firmware upgrade

Please follow the steps instruction below



1. Upgrade the “.pkg” file ;
2. Do not reboot when the progress bar shows 100%.
3. Reboot it according to the instructions of the image (When shows “Upgrade completed, please restart”, then reboot).

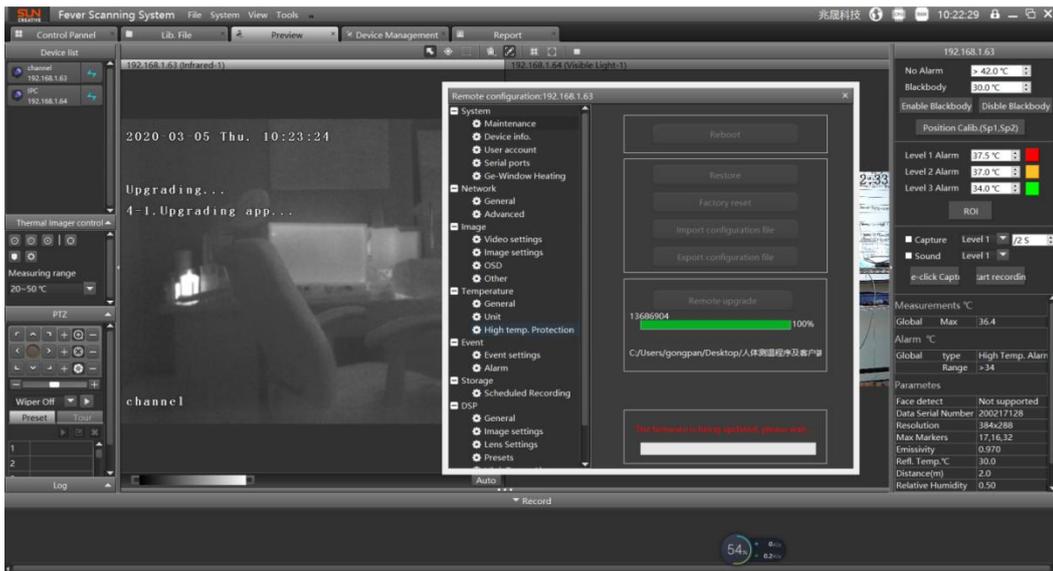


Figure 15 Upgrade the Hisilicon firmware (To begin)

After each program file is successfully upgraded, then reboot the device.

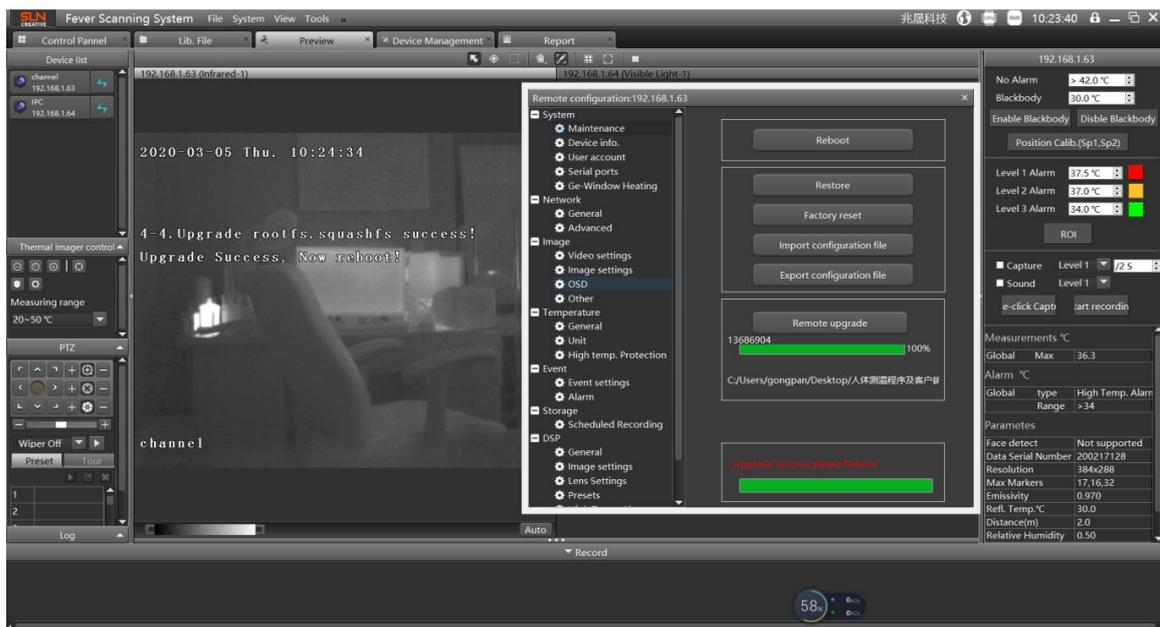


Figure 16 Upgrade the Hisilicon firmware (successfully completed)

After upgrading, delete the original device in “Device Management”; Refresh and add the device.

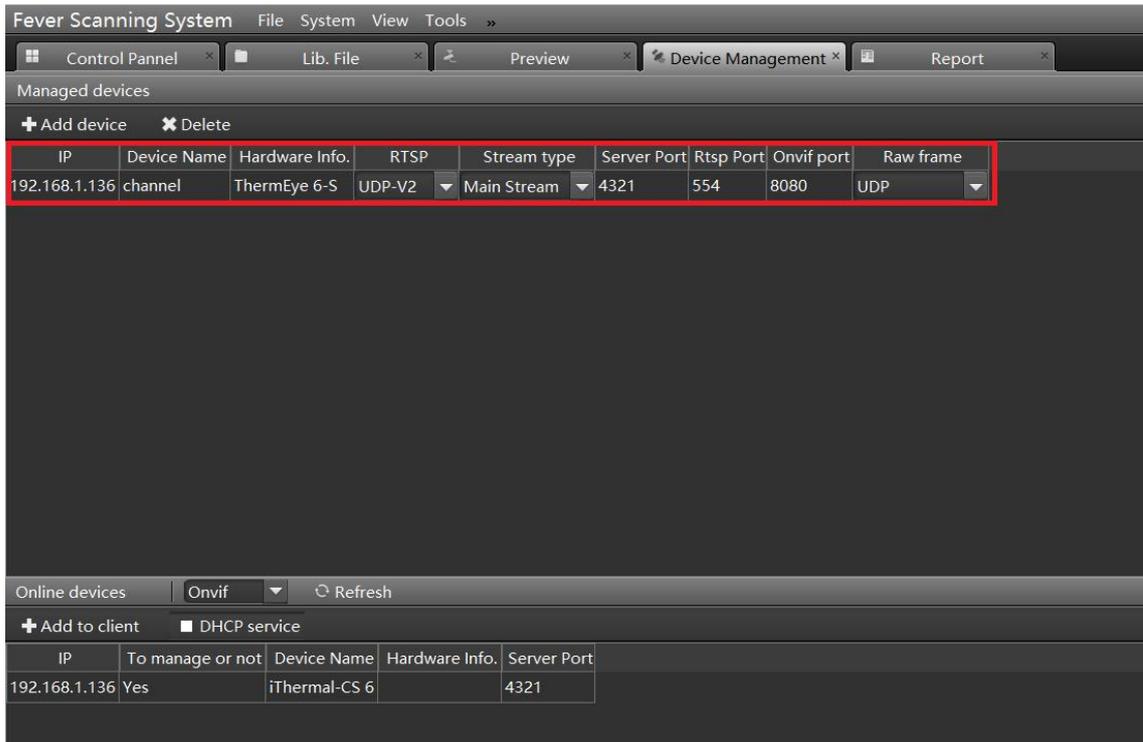


Figure 17 Add the device after upgrading firmware

## 5.7 OSD setting

Support the display of some information such as time, channel, and temperature marker overlay.

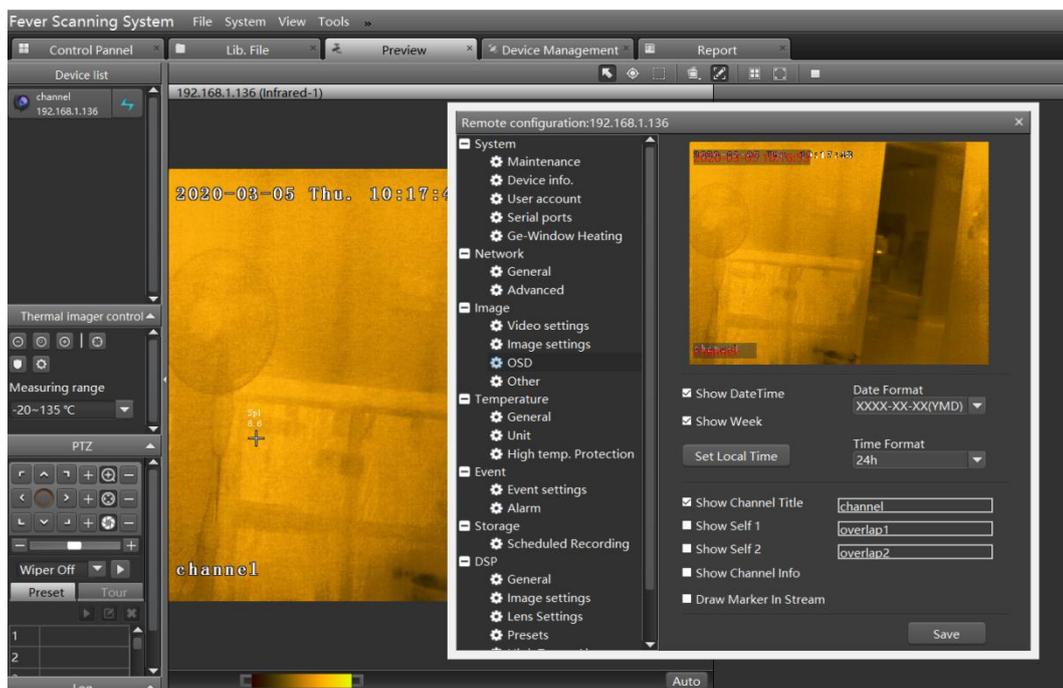


Figure 18 OSD settings

## 5.8 Image setting

Support setting of some parameters for images and the image mirror to change the image display.

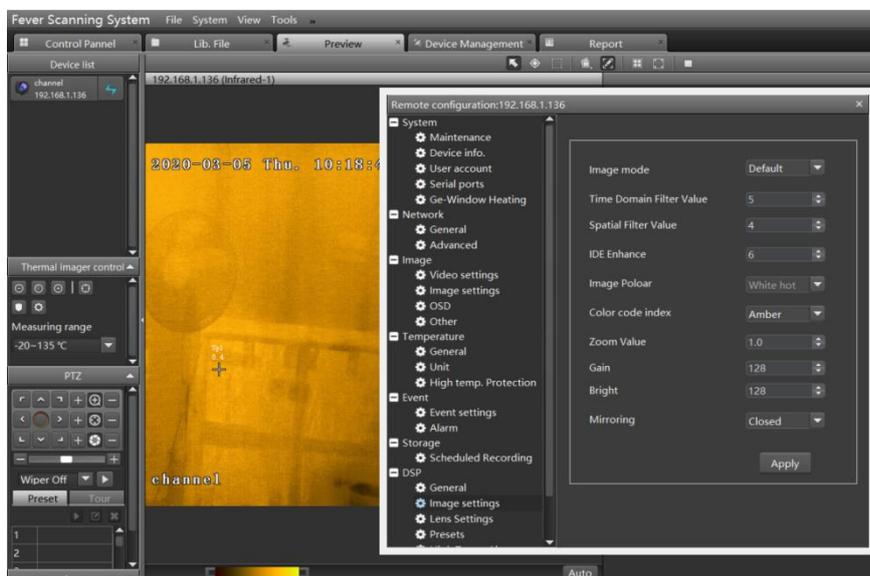


Figure 19 Image settings

## 6 Marking the measuring area

Set up a human body temperature measurement area upon situation on site. Landmark lines or temporary fences are normally used to set up human body temperature measurement areas. The shortest distance from this area to the device should not be less than 2 meters, and the longest distance should not be greater than 8 meters, otherwise the temperature measurement accuracy will be affected.



Figure 20 Marking the measuring area