

Dual-light Body Temperature Measurement Instrument



ZX-C-IV-F190-AC

User Manual

I. Introduction

The dual-light Body Temperature Measurement Instrument adopts “facial recognition + IR/EO dual-sensor” for non-contact temperature measurement with features of high temperature alarm and face detection while avoiding cross infection.

The instrument recognizes facial areas via visible light camera and measures temperature of those areas by infrared camera on a real-time basis, therefore, avoids influences by other objects of high temperature in the field of view comparing to traditional temperature measurement devices. In the meantime, it helps to detect and remind if someone in the FOV did not wear face mask.

The instrument is designed for mass temperature measurement (mas 600 people/min) at assembly occupancies such as airports, hospitals, train stations, metros, schools etc. and improving the work efficiency of screening people that possibly have fever out of moving crowd.



II. Features

- ◆ IR+EO dual-light sensors
- ◆ Facial detection
- ◆ Non-contact temperature measurement
- ◆ Face masks detection
- ◆ Mass temperature measurement (>10 people at the same time)
- ◆ External black body calibration (optional)

III. Parameters

IR sensor	Working system	Un-cooled long wave (8μm ~ 14μm)
	Pixels of detector	640×480
	Frequency	60Hz
	NETD	≤50mK (@25°C)
	MRTD	≤400mK (@characteristic)
	Angle of FOV	32°×24°
	Auto non-uniform correction function	Yes (NUC)
EO sensor	Resolution	1920×1080
	Frequency	60Hz
	Angle of FOV	54°×32°
Imaging	Image enhancement	Auto adjust brightness and contrast
	Color palette	Black/white/pseudo color
	Display device	Support PC (RTSP)/ NVR
	Brightness & contrast	Auto/manual
Temperature Measurement†	Measuring range	20°C~50°C
	Measuring accuracy	≤±0.5°C (@target temperature 33°C~37°C); ≤±0.6°C (@target temperature < 33.0°C or > 37°C)
	Measuring Mode	Temperature bar (pseudo color) highest, lowest and center of FOV temperature
	Auto temperature tracking	Highest & lowest temperatures
	Temperature alarm	Image (in red)
Functions	Screening	Abnormal temperature display in red
	Temperature alarming value	Configurable
	Temperature compensation	Configurable
Interfaces	Control	Ethernet
	Video output	Ethernet
	Power input	12V DC
	Power consumption	≤4.6W@25°C

IV. Theory

Anything in nature whose temperature is above absolute zero (-273.15°C) radiates infrared emanation which is corresponding to its temperature. The operating wavelength of ZX-C-IV-F190-AC is $8\mu\text{m}\sim 14\mu\text{m}$.

V. System Component

(1) Dual-light Body Temperature Measurement Instrument



ZX-C-IV-F190-AC has two sets of external interfaces, one of which is for power, the other one is for Ethernet as shown above. Product introduction please refer to <https://youtu.be/mG7SU1au4TU>

(2) Display Device

User could either use normal television (HDMI interface) or desk top display monitor (VGA interface) for display by connecting those display devices to laptop, please refer to Appendix I.

VI. Package List

1. Dual-light Body Temperature Measurement Instrument: 1 set;

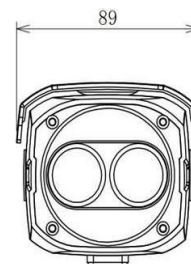
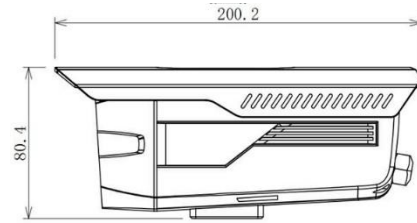
(size: $\Phi 89\text{mm} \times 80\text{mm} \times 200.2\text{mm}$)

2. Tripod: 1 set;

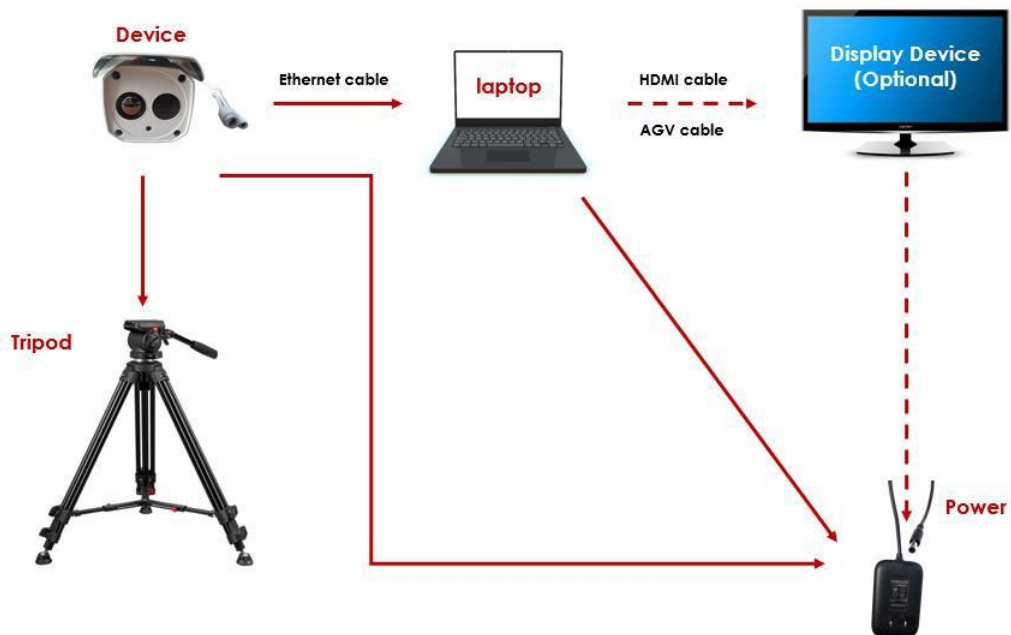
3. Power adapter for the device: 1 set;

4. Ethernet cable: 1 unit;

5. HDMI cable: 1 unit.



VII. Installation



VIII. Notification

- ◆ Please do not change the location of a proper-setting device so as to minimize the measuring error caused by the optical property of it;
- ◆ It is suggested to have a 5 minutes warming up of the device for the first time use so that let it reach thermal balance with the operating environment;
- ◆ Please do NOT put the camera directly to sun or any other object at high temperature to avoid damage of IR detector inside;
- ◆ Proper operating temperature of the device is indoor between 10°C~40°C;
- ◆ User has to keep the lens clean with anhydrous alcohol to prevent measuring error;
- ◆ In order to keep the device off electromagnetic interference, please keep the device away from resources of high magnetic field such as welding machine, motor, drive etc.;
- ◆ Please do NOT put air conditioner or other facilities with high temperature in the monitoring area to avoid influence of the measurement;
- ◆ Please do NOT open the machine as nothing inside could be repaired by user. Please contact us for troubleshooting when system ran into malfunction;
- ◆ Please keep the device in drying gloomy and cold place for storage.

IX. Service

For any concern about the temperature configuration and maintenance, please contact the technical support.

X. Warranty

Every device has been through strict quality inspection before leaving the factory, therefore, if user has any concern, please contact the technical support.

The warranty period of the device is 12 months from the date of delivery. After the expiration of the warranty period, we would provide extra 6 months of maintenance and replacement of components if any. It is not covered by warranty if the instrument is disassembled without permission or damaged due to improper use.

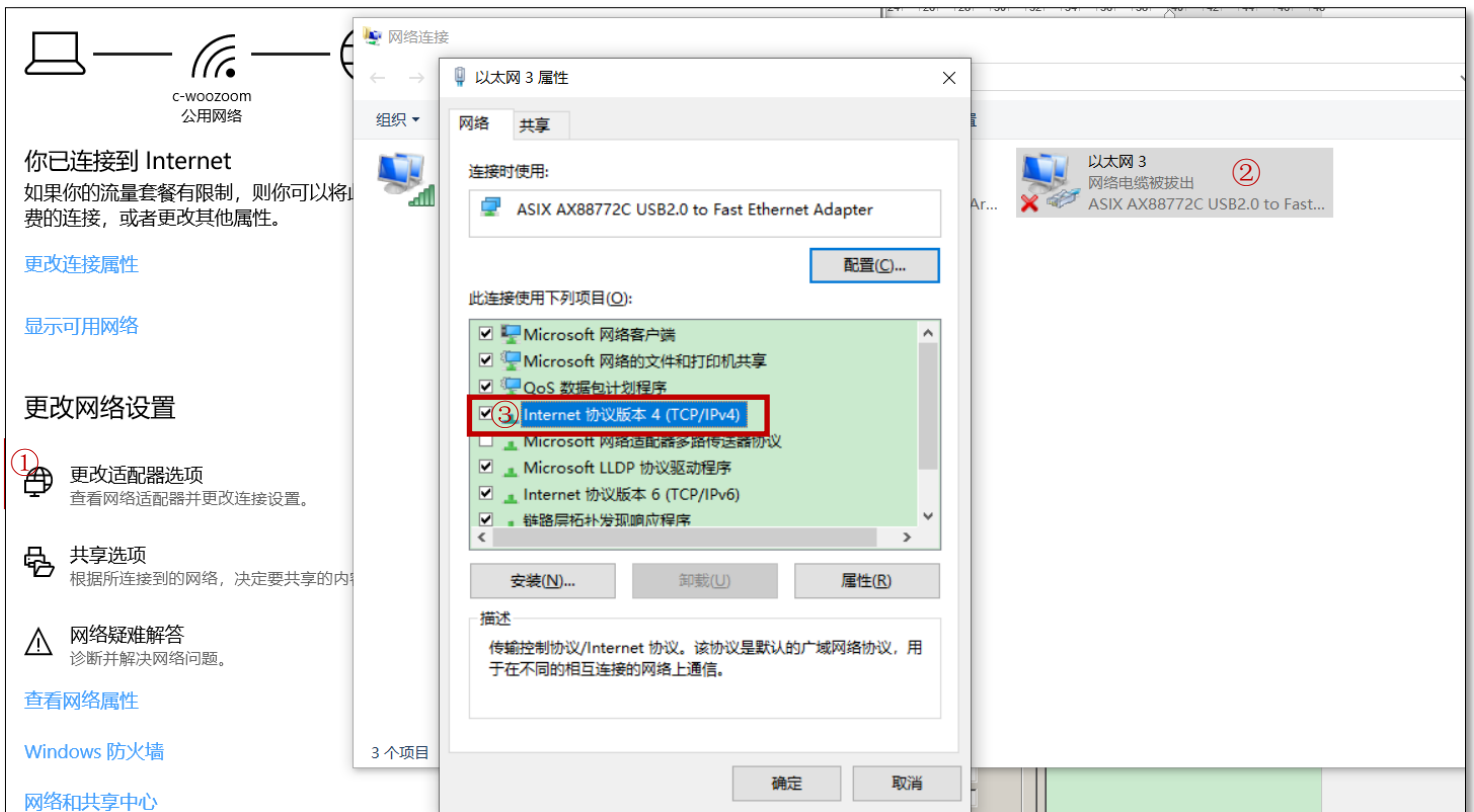
If there is any problem with the instrument during the warranty period, it can be replaced, calibrated or repaired free of charge. The freight incurred during the warranty period is borne by shipper.

The manufacturer has the right to choose to repair the instrument or replace the components. If the failure of the instrument is caused by the improper use by user, the user must bear the maintenance cost. In such case, the user can inquire about the maintenance cost in advance.

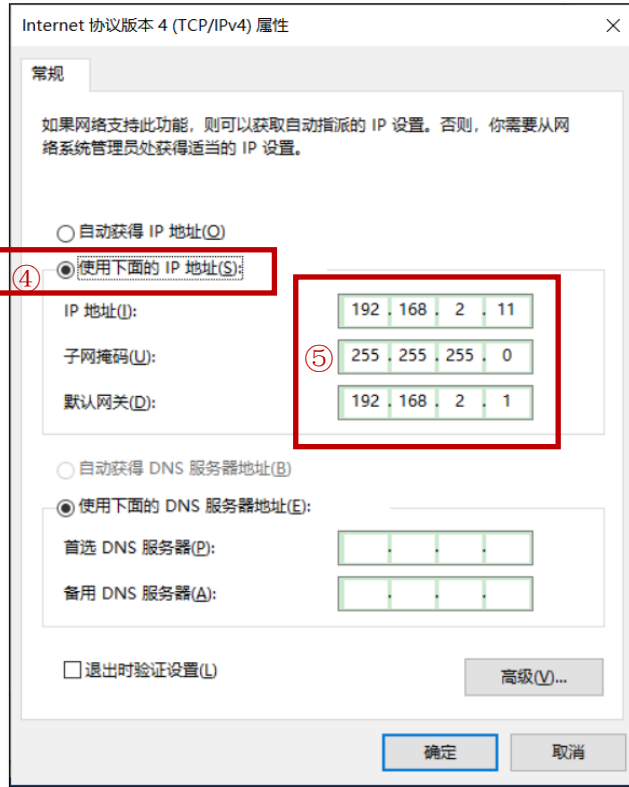
Appendix I

Video Display Guidance

1. Download the software operating environment here https://1drv.ms/u/s!As_Tz_khtnnrHMrc3YDnLmbNu92?e=GvsweT and please refer to the “read me” file for installation.
2. Connection settings
 - 1) Open “Control panel” → “Network and sharing center”, click “Local connectivity” icon, find “property” and double click “Internet protocol version (TCP/IPv4)” as shown in Pic 1, and please set the IP address and gateway at the same segment as the device but different values as Pic 2 (Note: no setting for DNS server), click confirm to complete setting.

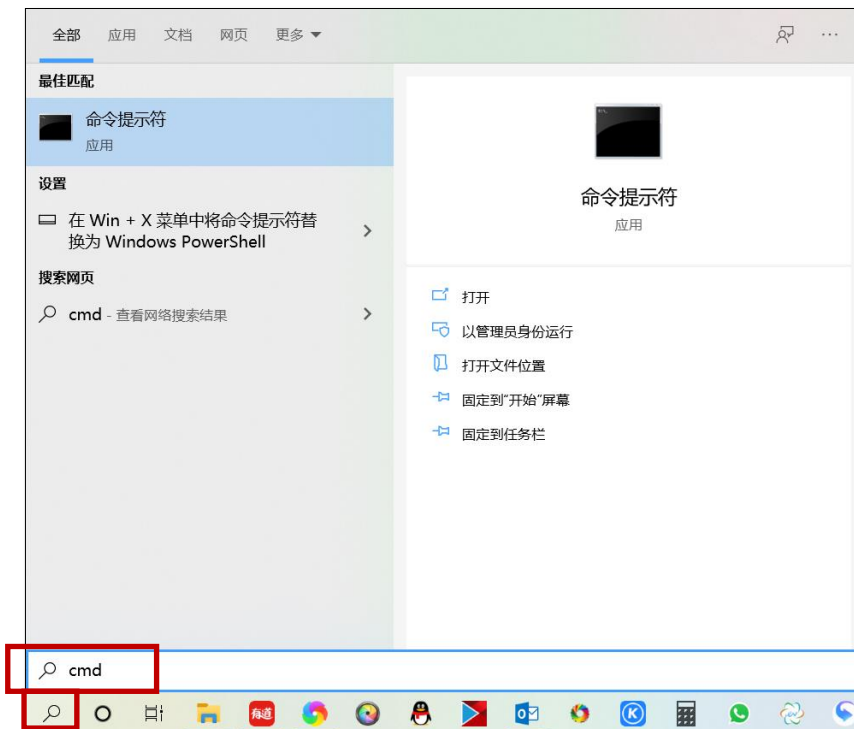


Pic 1



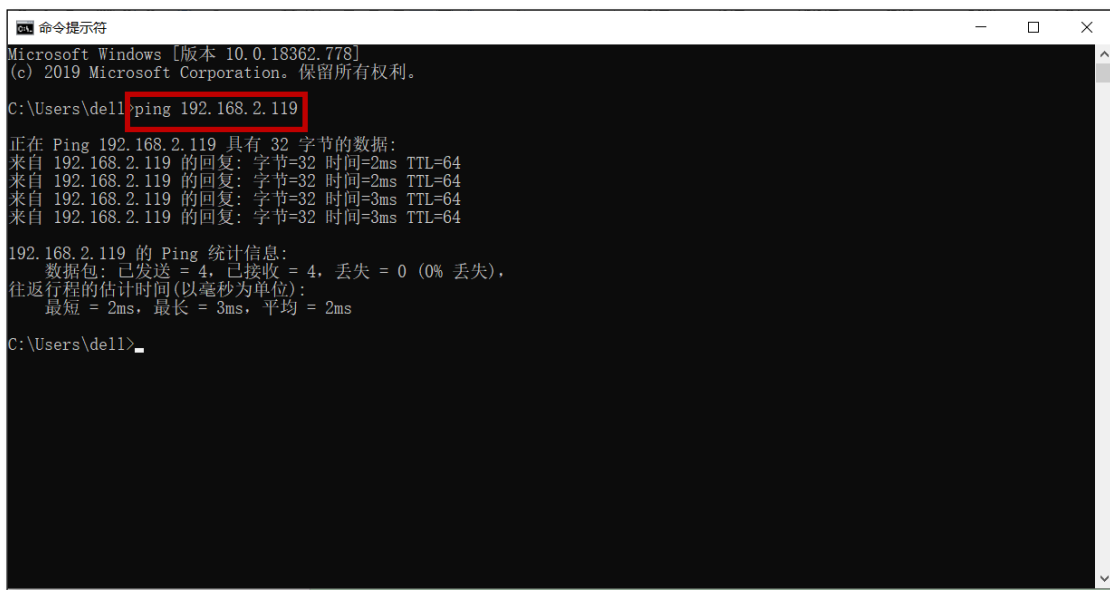
Pic 2

- 2) Connect the device to the PC with Ethernet cable and make sure all the connections are properly done, then power on the device.
- 3) Input "cmd" to the search column and click "Enter" to go into cmd commands



Input “ping 192.168.2.119”, then click “Enter” to double check the Ethernet connection, and if the connections are ok then the PC will receive bits data package from the device as shown in Pic 4. If not, please check Ethernet connection or replace for another Ethernet cable.

Note: there's a space between “ping” and “192.168.2.119”

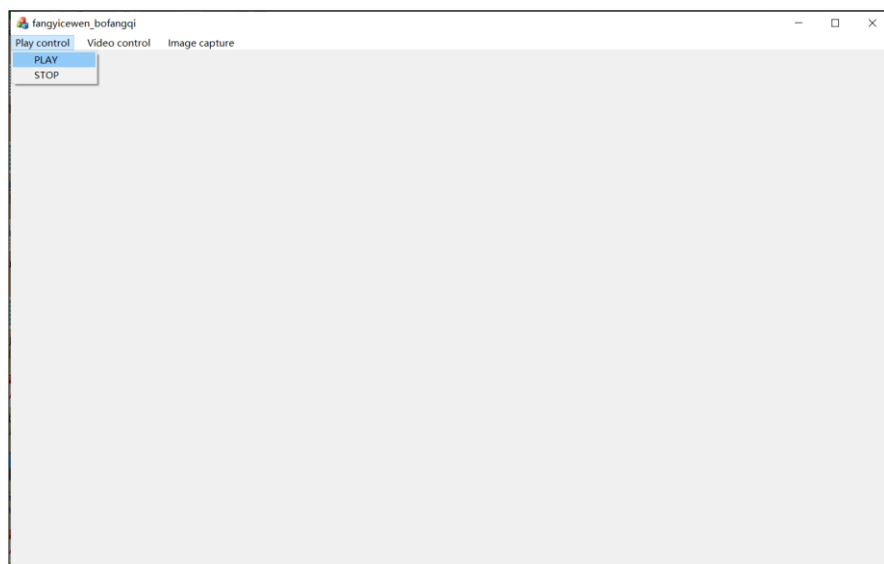


Pic 4

3. Please download the PC Video Player from the link below

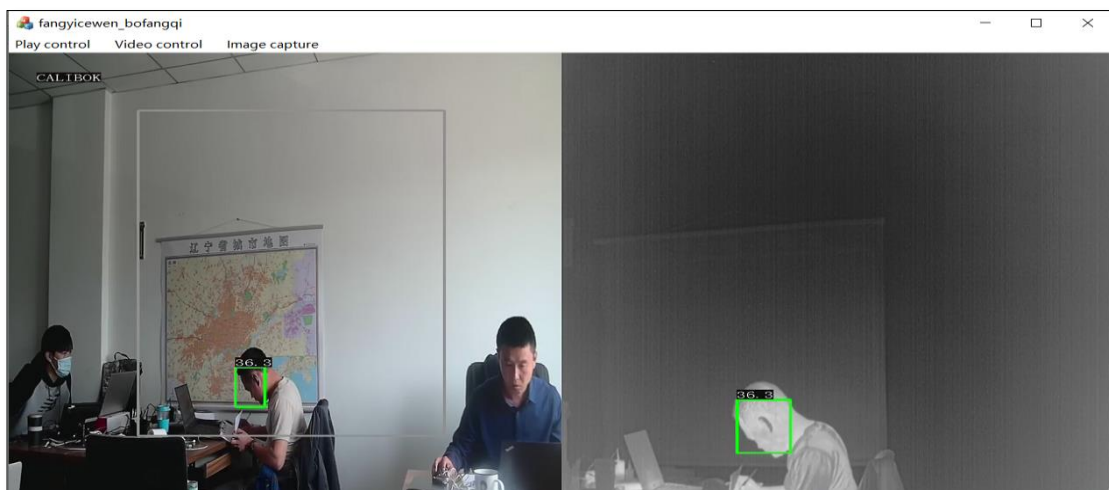
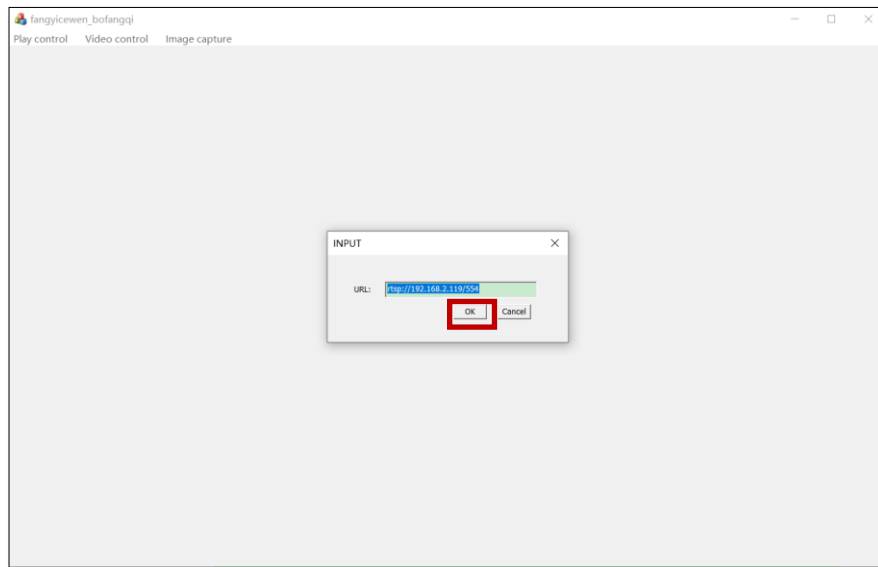
https://1drv.ms/u/s!As_Ttz_khtnnrHWC18iUgiDcZbaR?e=qz0D4o

1) Find “Alarm Video Player” and open up the software, then click “Play Control” to choose “PLAY”



Pic 5

2) Click “OK” to display the video stream

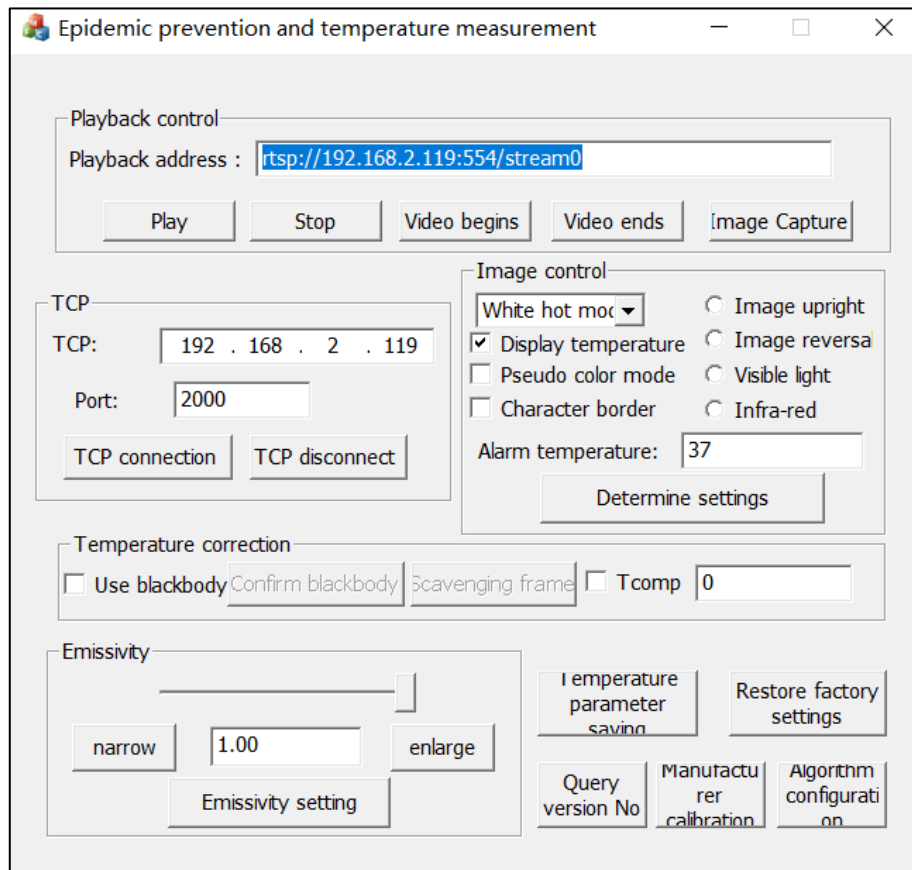


4. User could do video recording and snapshot by clicking “Video Control” and “Image capture” and all files would be saved under the same catalog of the software. Pictures of people who triggered the temperature alarm will automatically be saved in the “Pic” file.

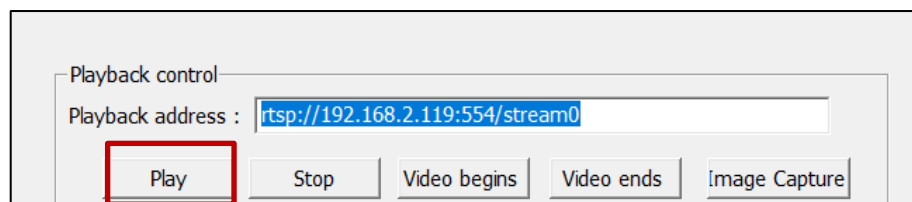
Appendix II

PC configuration

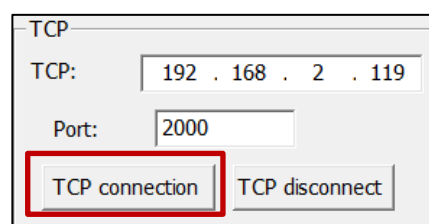
1. Double click the “Epidemic prevention and temperature measurement” software.



2. Click “Play” to show up the display window. User could also adjust the size of the video box with mouse.

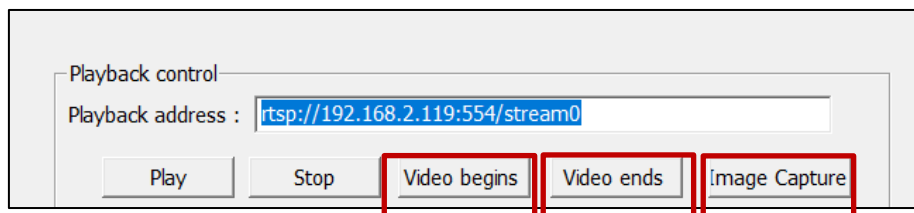


3. Click “TCP connection”



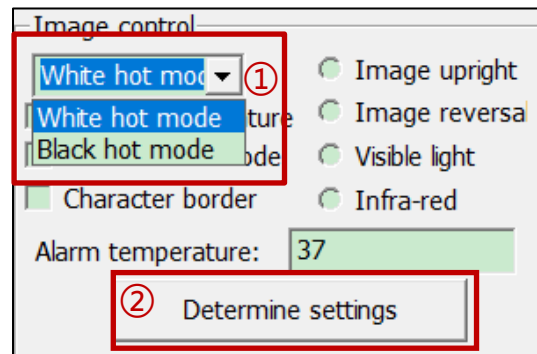
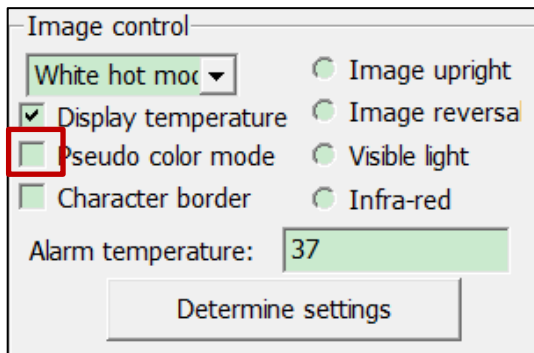
4. Video recording

Click “Video begins” to start record the video and when red frames show up, user could click “Image capture” to take and record photos, which will be stored in jpg. Click “Video ends” to stop recording, all the videos and pictures are kept in the same file where the software is placed. If user closes the video box but would like to view the live video stream again, please click “Stop” and then “Play” again.

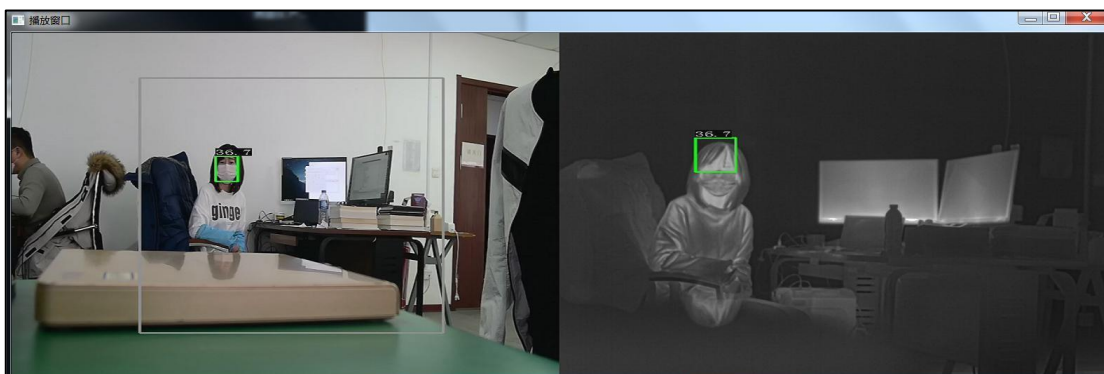


5. Display modes

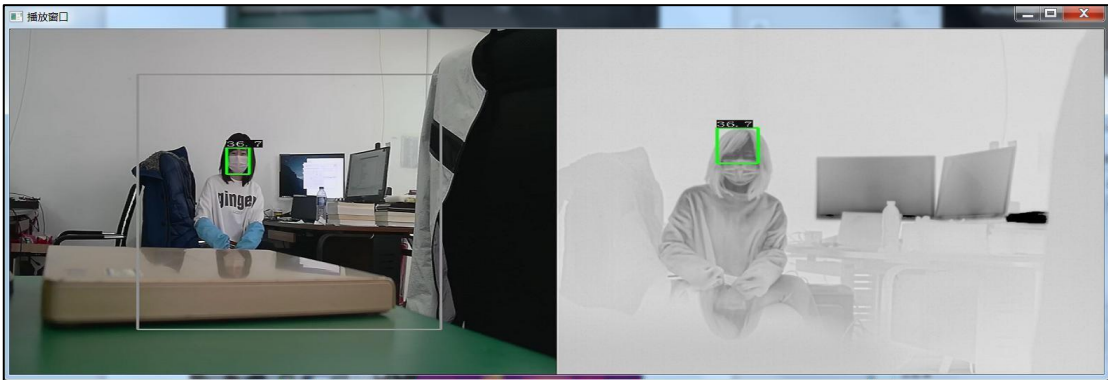
User could select display mode from the drop-down list as shown and click “Determine settings” to save the changes. If user want to see video display in pseudo color please click the tick of it. Click the tick of “Visible light” resumes dual-light image display (even when it's been ticked already).



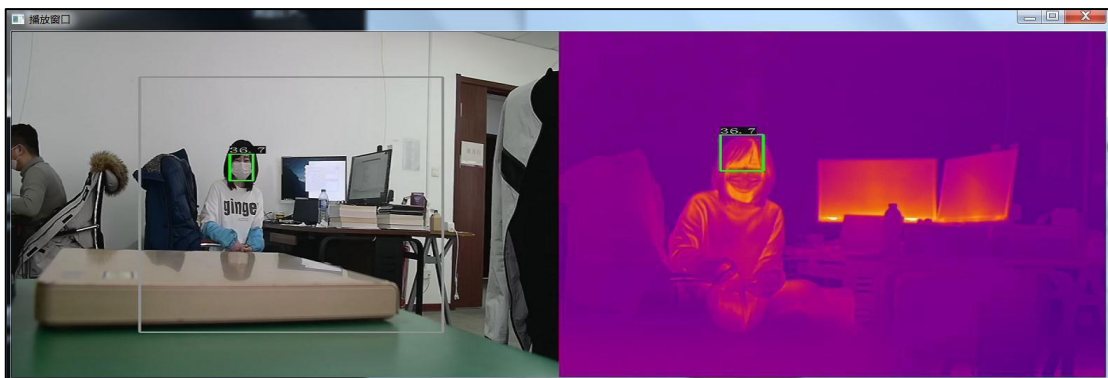
White hot mode



Black hot mode

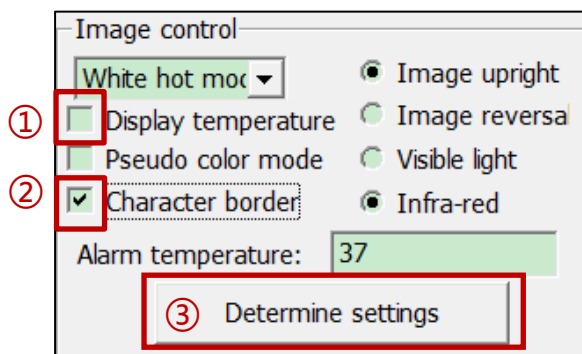


Pseudo color mode



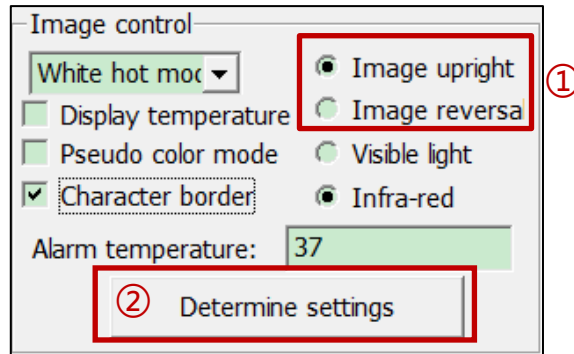
6. Temperature display settings

Click “Display temperature”, the highest temperature spot (+H) will show up in green characters, click “Character border” to add black border to the font it and click “Determine settings” to let the user better read the spot data of the highest temperature. This would be a single IR display (hereinafter referred to as **SIR display**), click “Visible light” to resume dual-light image display mode with the highest temperature spot being hidden and frames show up again.



7. Image display settings

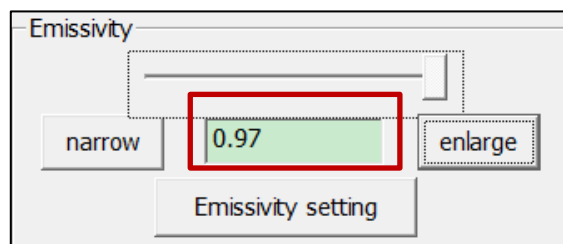
Click “Image upright” or “Image reversa” and click “Determine settings” to change the direction of the image (which might apply to users who’d like to fix the device on a high holder).



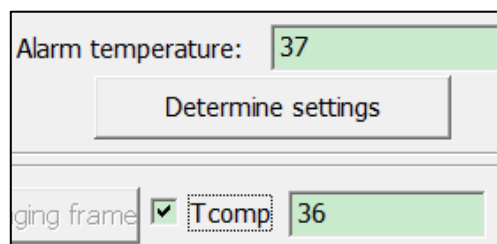
8. Compensation temperature and alarm temperature settings

(This setting only applies to **SIR display**)

IR sensor receives thermal radiation of body surface to measure shell temperature. Normally a person’s forehead temperature is about 2 °C lower than his/her armpit temperature. And shell temperature is largely subjected to environment temperature. Normal people’s emissivity is 0.97, which we could input the value as shown below for better accuracy.



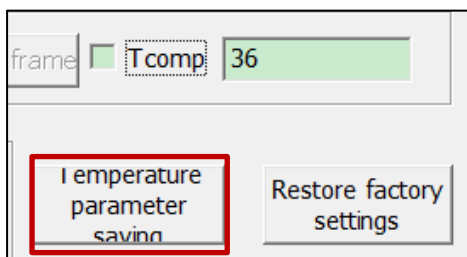
We use compensation temperature value for calibration, we suggest to select white hot mode for display.



Step I: Keep a person stand 3~4 meters right in front of the device, and make sure the temperature value is displayed on the person's face. Click the tick of "Tcomp" and user could use contact thermometer to measure the person's temperature at first and input the value in "Tcomp" as compensation temperature value, simply input 36°C, and input 37°C as the alarm temperature, then press "Determine setting" to complete the operation. (In order to avoid the influence caused by surrounding environment, please make sure there's nothing in the field of view whose temperature is higher than the person during the operation).

Step II: After temperature settings, we suggest user to double check if the facial temperature of a healthy person is between 35~36.8 to confirm the configuration.

Step III: Remove the tick of "Tcomp" and click "Temperature parameter saving" to save the settings, when the operation completes, a "Save OK" sign would show up on lower right corner of the display.



Note: if user would like to see dual-light display please do not set the temperature as discussed above. User could just let a person with normal temperature stand in front of the device 3~4 meters and wait 1~2 mins till the device completes auto-learning and sets the person's temperature as default value 36°C (default alarm temperature value is 37°C). If user would like to set the temperature manually, then he/she has to go with **SIR display** mode.