

The background of the top section is a thermal image of a hand, with colors ranging from dark blue (cooler) to yellow and red (warmer). A semi-transparent circular overlay is centered on the palm area. The text "INFRARED SOLUTIONS - SYSTEMS & SERVICES" is written in a white, sans-serif font, curving around the circular overlay.

INFRARED SOLUTIONS - SYSTEMS & SERVICES



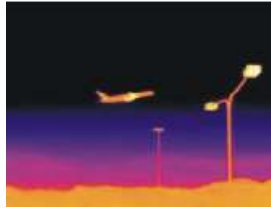
INFRARED-CAMERA-CONFIGURATOR  
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# TI35S /TI65S

## Online Monitoring Thermal Imaging Cores

### User Manual



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# To Users

**Dear Users,**

**Thanks for choosing the Online Monitoring Thermal Imaging Cores.**

**Please read this user manual carefully before first use. Also please keep it in a safe place for reference in the future.**

**Please operate it according to the recommended instructions in user manual.**

**We reserve the right to change this user manual without further notice.**



## **WARNING**

**KEEP THE CORE FROM DAMP OR RAIN!**

**DO NOT OPEN OR EXCHANGE PARTS!**

**REPAIR ONLY CAN BE CONDUCTED BY OUR STUFF!**

## **CAUTIONS**

- In order not to cause malfunctions or even damages for the device, please do not direct the lens towards strong high-temperature radiation source (i.e. the sun) regardless of the power is on or off!
- Avoid shock and impact during operation or transport.
- Device must be kept in the original case during transport and storage. Storage temperature is between -40°C and 70°C.
- Please keep it in a cool, dry, ventilated, and without strong electrical or magnetic field place.
- Keep the lens surface off grease or any chemical substances that would damage the lens. Close the lid after using.

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# 1. Introduction

It is the Thermal Imaging Core. It is equipped with Uncooled Focal Plane Array (FPA) Micro-bolometer which can produce intuitive thermal images for users by conveying the infrared ray of objects. And it applies IVE image enhancement algorithm to produce clear images. Besides, the Ethernet RJ45 interface is used for video transmitting or controlling, and the SMA analog video interface is used for displaying the analog image.

The Thermal Imaging Cores are packed with advanced features, such as low power consumption, low noise, small size, light weight and high resolution colored images. The cores can be applied in various products, such as vehicles, ships, planes, sights, telescopes, cameras and so on.

## Standard Item List:

Item	Quantity	Configuration	Notes
Thermal Imaging Core	1	√	Standard
Software CD	1	√	Standard
Video cable of SMA to BNC	1	√	Standard
2P Junctor	1	√	Standard

## 2. Power supply

- The recommended power supply is DC 12V/2A. And the range of power supply is between 10V to 14V.
- The cores are equipped with protection of over-voltage and over low voltage. And it has the protection of reverse connection.

## 3. The configuration & Accessories

### 3.1 The configuration



Figure 3-1

- **Core:** Thermal Imaging Core which is equipped with UFPA thermal detector. Users can control the core by Ethernet RJ45 interface.
- **Lens:** There are three kinds of fixed-focus lens optional, the 6.2mm lens, the 15mm lens and the 25mm lens.
- **Mounting Hole:** According to needs, users can connect the core to other device by the mounting hole.

### 3.2 The Accessories



Figure 3-2

- **SMA Video:** The interface of SMA Video. It can display the analog images. The Pins from the left to the right are Pin1 to Pin10.
- **RJ45 Internet:** The interface of Ethernet RJ45. It has many functions, such as video transmitting, core controlling and software updating.
- **Power Supply:** The interface of power supply. The recommended power supply is 12V DC.



- **Industrial Terminal:** There are many functions. For example, it is available for RS232 pin and Reserved I/O pin. And it has the alarm function. According to needs, users can connect the core to other device by the mounting hole.
- **Transfer SMA to BNC:** It is compatible with SMA Video.
- **Micro SD Card (built-in):** It can increase the memory of the cores to record more pictures and videos.

The definitions of all industrial terminals:

No.	Identifications	Pin Functions
PIN1	Power	Isolate power input
PIN2	GND	Isolate ground
PIN3	PC_TXD	RS232
PIN4	PC_RXD	
PIN5	GND	
PIN6	485_D-	RS485
PIN7	485_D+	
PIN8	GND	
PIN9	ALAM_IN	I/O
PIN10	ALAM_OUT	

**Notes:**

- (1) Power Input: 10V~14V.
- (2) AV Video Output Mode: PAL and NTSC are both available.
- (3) Polarity switching is also for the color bar switching.
- (4) Zoom ratio: 1X, 2X, 4X.
- (5) Trigger the Video PIN, start recording video.  
Trigger the Video Pin again, stop recording.
- (6) Trigger the Motorized focus PIN, start motorized focusing.  
Trigger the Motorized focus PIN again, stop motorized focusing.
- (7) The PWM square wave reference figure as below.



Period    20ms  
Voltage high levels are:  
1.0 ms    Mode 1  
1.5 ms    Mode default  
2.0 ms    Mode 2

### 3.3 The Installation

---

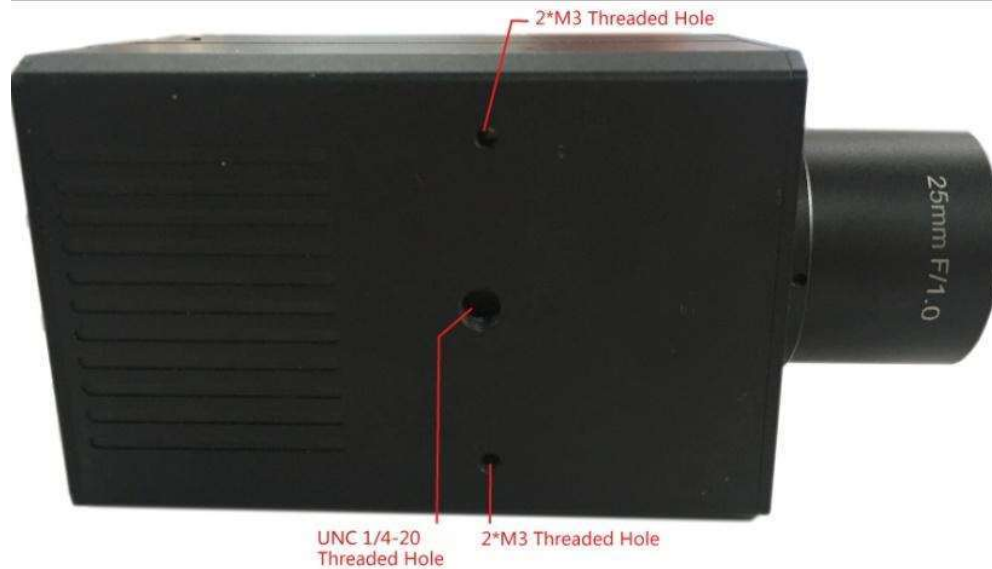


Figure 3-3

- **UNC 1/4-20 Threaded Hole:** It can be fixed in tripod or others bracket.
- **2\*M3 Threaded Hole:** It can be fixed in tripod or others bracket. There are 6 holes in total, 2 in bottom, 2 in left and 2 in right side.

### 3.4 Core Structure

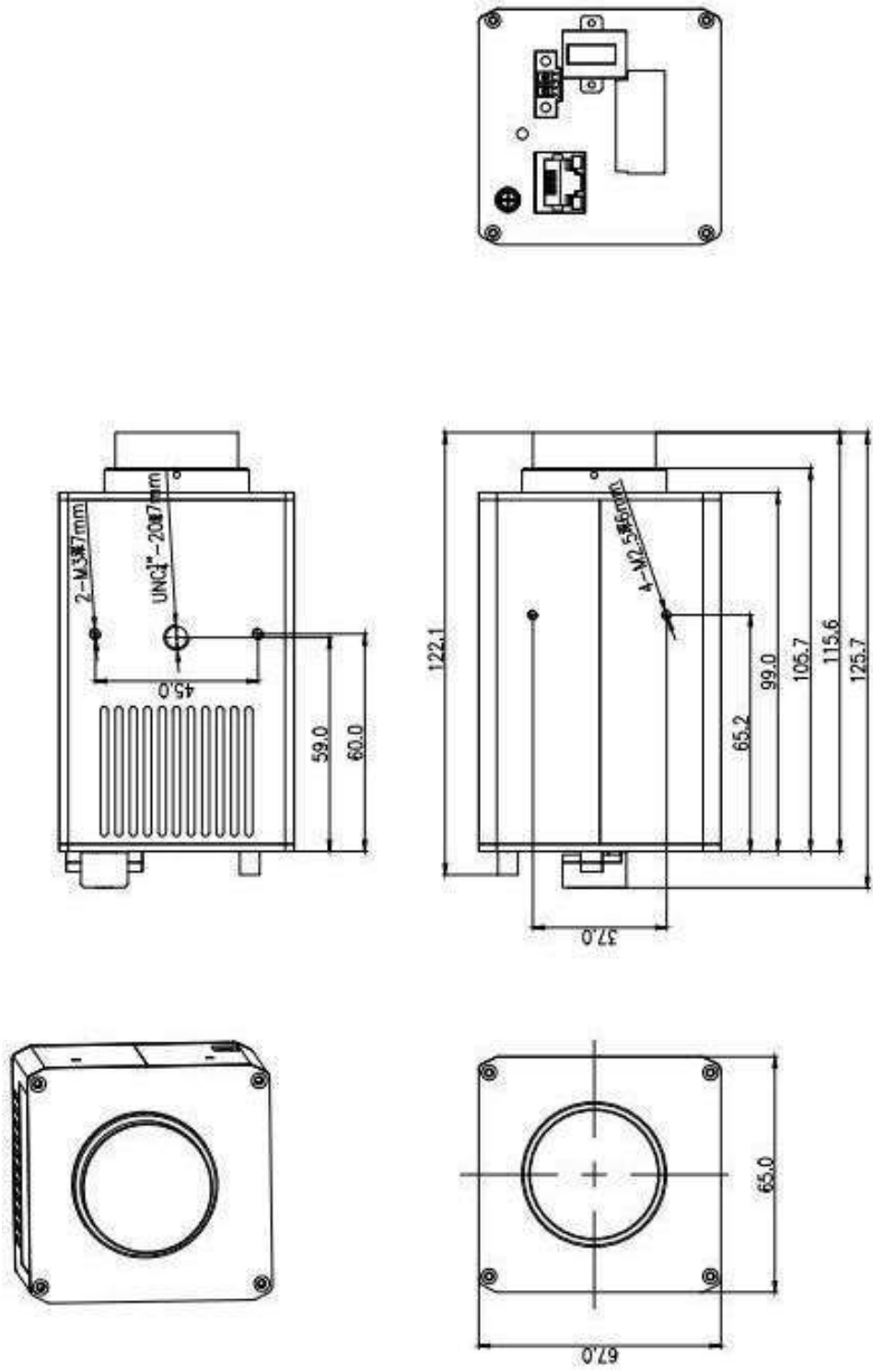


Figure 3-4 (384×288)

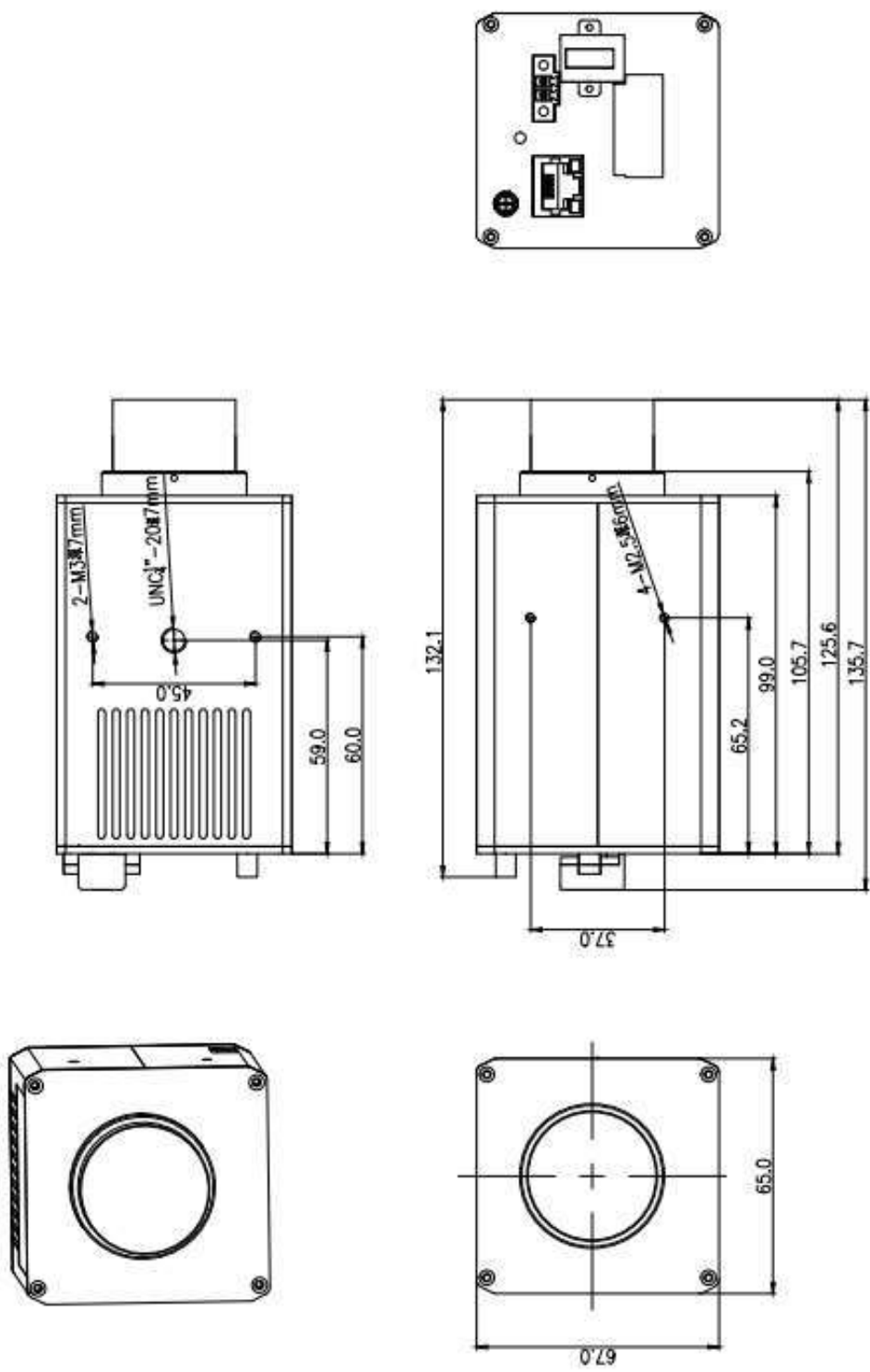


Figure 3-4 (640x480)

## 4. Technical Specifications

Detector Data	Type	Uncooled FPA detector	
	IR Resolution	384×288	640x480
	Pixel Pitch	17μm	
	Spectral Range	7.5~14μm	
	NETD	65mk	
Lens Data	Focus	Auto/Motor	
	FOV	24°×18°	
	IFOV	1.3mrad	0.68mrad
	Lens	three kinds of fixed-focus lens: 6.2mm lens/ 15mm lens/ 25mm lens	
Image	Image Enhancement	IVE image enhancement algorithm	
	Frequency	50Hz/60Hz	
	Electronic Zoom	2×, 4×	
	Palette	10 optional colors (white-hot, black-hot, rainbow and so on)	
	Temp Range	-20°C~150°C , 100°C~650°C	
	Temp Accuracy	±2°C or ±2%, taking the larger value	
	Temp Correction	Auto	
	Tracking of Highest Temp	Real-time displaying of location and temp of highest temperature	
	Emissivity Correction	0.01 to 1.0 adjustable, auto correcting according to the inputted emissivity and ambient temperature	
	Ambient Temp Correction	Auto correcting according to the inputted transmittance	
	Correction of Atmospheric Transmittance	Auto calculating atmospheric transmittance according to meteorologic parameters and correcting temperature	
	Function Setting	Date/Time, Temp unit°C/°F/K, Language	

## Continuous: Technical Specifications

Storage Data	Temp Data	MGT format, IRSEEX software to analyze	
	Temp Data Flow	MGS format, IRSEEX software to playback with timeline. It can adjust speed, frozen, loop playback and process playing image	
	Image	JPG format (Core), BMP and JPG format (PC)	
	Video	AVI format, H264 compression	
	Storage Control	Serial port command. Level trigger and key trigger are optional	
	Report Generation	Word format	
	SD Card	32G built-in IT card	
Interface	Network Interface	100M Ethernet, RJ45 interface, temp data transmission	
	Power Interface	DC 12V	
	Video Interface	SMA RFI	
	Controlling	RS232, RS485	
	Alarm In/Out	Support	
	API	Support SDK (Win7, LINUX)	
Power System	Working Power	DC 12V	
	Consumption	< 4.8W	< 7W
Environment Data	Operation temp	-20°C ~ +50°C	
	Storage temp	-40 ~ +70°C	
	Humidity	≤95% ( non-condensing )	
	Shock	25G , IEC68-2-29	
	Vibration	2G , IEC68-2-6	
	EMC	CE/FCC	
Physical Data	Size	118mm*67mm*65mm (without lens)	
	Weight	≤470g	
	Mounting	UNC 1/4"-20 threaded hole, M3 threaded hole	





### 5.3 Thermal Imaging Camera Setting

**1) Search:** Click the search button. After a few seconds, the software will automatically search to the thermal imaging camera, and show the IP address. As shown in the figure 5-2.

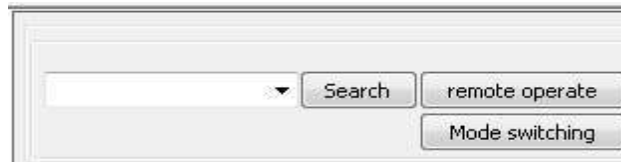


Figure 5-2

**2) Remote operate:** It can operate the thermal imaging camera multi-functionally, such as Remote setup, Modify IP, AVI preview, Gray preview, Capture image and Downloads file. As shown in the figure 5-3.

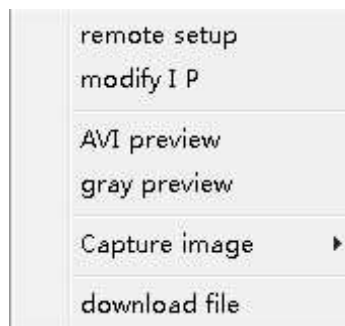


Figure 5-3

**Remote setup:** Adjust the options in Camera, System, Parameter, Temp and Image, as well as look up the basic information of device. As shown in the figure 5-4.

In menu of parameters, users can set up the temperature coefficients, such as distance, humidity, and radiance.

**Distance:** Set up the distance in order to get more accurate result. This value can be omitted if target subject is close to device (less than 3m).

Humidity: Set up the humidity in order to get more accurate result. It is recommended to keep the default humidity.

Radiance: Set up the radiance in order to get more accurate result, according to the real transmission coefficient of filter, such as germanium wafer.

In the menu of temp, users can add spots, line or areas, and select one of them as reference. Turn it on to show the relative temperature, and turn off to show the real temperature. It is only available in AVI preview, which is also named real-time observation.

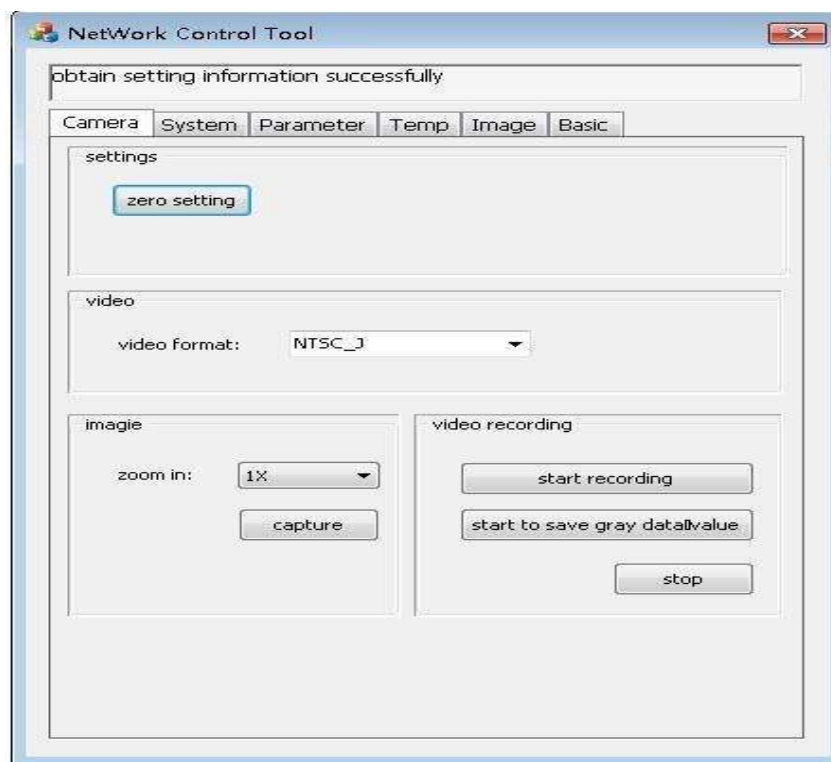


Figure 5-4

**Modify IP:** Modify the thermal imaging camera original IP, subnet mask and gateway. As shown in the figure 5-5.



Figure 5-5

**AVI preview:** It can capture the images of thermal imaging camera, record video, stop recording and set up the thermal image focal length. Click the Auto Focus button, then the device will adjust the focus automatically in order to get crisp thermal images. It can be adjusted by clicking the near& far button as well. Besides, users can click the Getwalk button to read the step number of motor, and click the Setwalk button to set the motor step number. As shown in the figure 5-6.

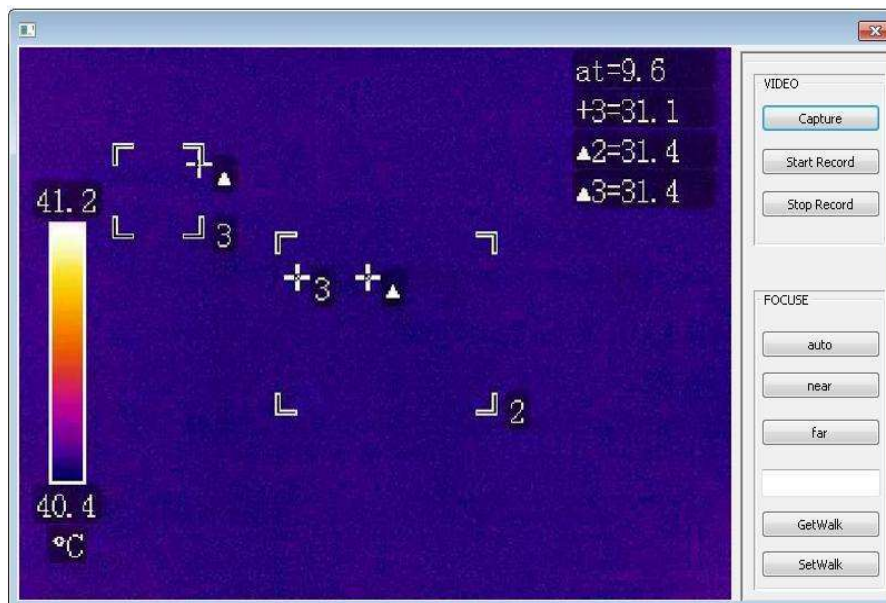


Figure 5-6

**Gray preview:** Preview and analysis the current target gray value of thermal images. As shown in the figure 5-7.

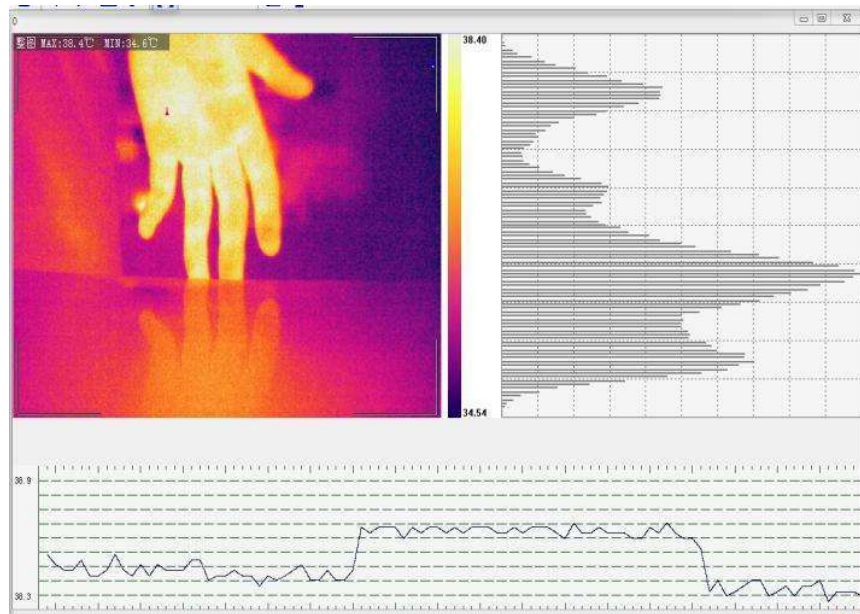


Figure 5-7

**Capture image:** Capture the gray images, JPG images and BPM images.

**Download file:** Download the images and videos which are saved in the device. Select the files you need, make sure of the save path, and then click “Download”. It can delete the files as well.

**3) Mode switching:** It can set up the series and baud rate. Click “Setup” to adjust the options in Camera, System, Parameter, Temp and Image, as well as look up the basic information of device.

## 5.4 Function Area Operation

Function area can analyze images and videos. It divides into 7 parts: Files, View, Analysis, Setup, Help, Report and PTZ control. As shown in the figure 5-8.

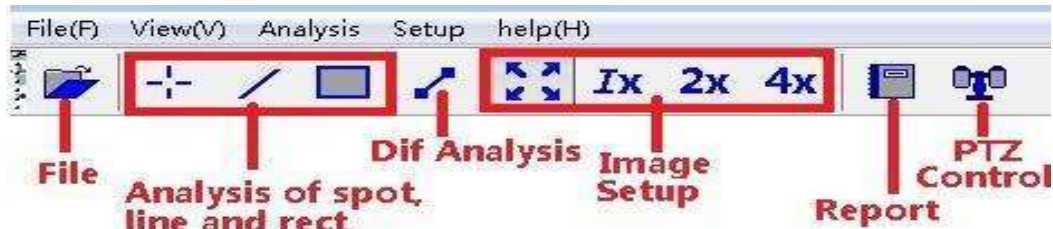


Figure 5-8

### 1 ) File

- Open files or quit the software. Only gray images in Utd form can be opened by the software.
- Analyze the added images or videos.
- Analyze the added dots, lines and rectangles. As shown in the figure 5-9.

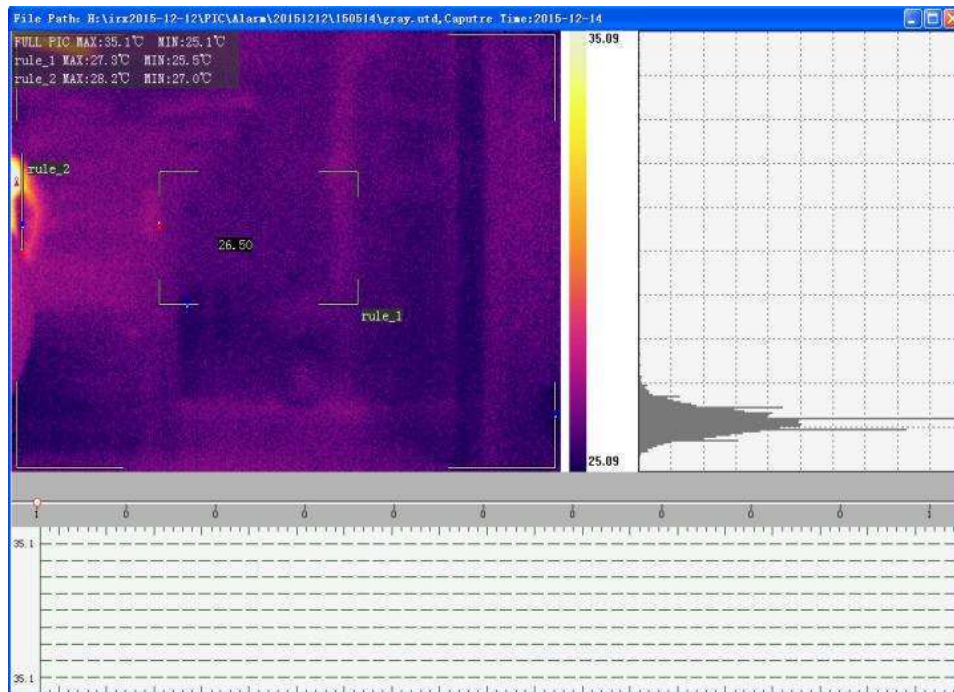


Figure 5-9

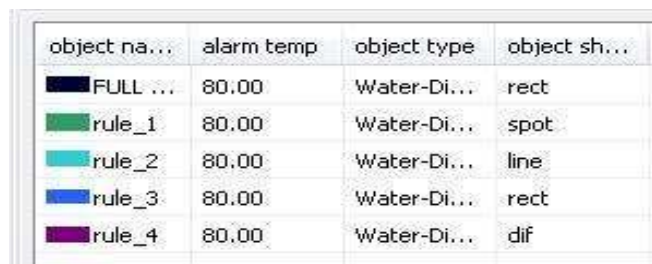
## 2 ) View

- Analyze the added dots, lines and rectangles, as well analyze temperature differences. As shown in the figure 5-10.



Figure 5-10

- Set up the measurement target, object name, alarm temperature, object type and object shape. As shown in the figure 5-11.



A screenshot of a table with four columns: 'object na...', 'alarm temp', 'object type', and 'object sh...'. The table contains five rows of data. The first row is for 'FULL ...' with a black square icon. The following four rows are for 'rule\_1' through 'rule\_4', each with a colored square icon (green, cyan, blue, and purple respectively). All 'alarm temp' values are '80.00' and all 'object type' values are 'Water-Di...'. The 'object sh...' values are 'rect', 'spot', 'line', 'rect', and 'dif' respectively.






object na...	alarm temp	object type	object sh...
 FULL ...	80.00	Water-Di...	rect
 rule_1	80.00	Water-Di...	spot
 rule_2	80.00	Water-Di...	line
 rule_3	80.00	Water-Di...	rect
 rule_4	80.00	Water-Di...	dif

Figure 5-11

- Select a measured target, and right-click to select options (target delete, delete all, and property set). As shown in the figure 5-12.



Figure 5-12

- Set up the properties, basic property and thermos. Basic property can adjust the object name, jump points and end

point. As shown in the figure 5-13.

object setup

Basic Property

Object Name : rule\_3

Jump Point (x,y) : 247 157

End Point (x,y) : 343 215

thermos

Object (Emiss) : Water-Distille 0.96

sampling time (frame) : 1

Alarm temp : 80.0

apply delete exit

Figure 5-13

### 3 ) Analysis

- Set up the view size: Full screen, Real size, 2X and 4X. As shown in the figure 5-14.

Analysis Setup help(H)

☒ Full Screen

☐ Real Size

☐ 2X

☐ 4X

Figure 5-14

### 4 ) Setup

#### Basic setup

- Set up the temperature of the unit.
- Set up the save path of images and AVI videos.
- Select the default object type.
- Select the default alarm temp and Dif temp.



More details please refer to the figure 5-15.

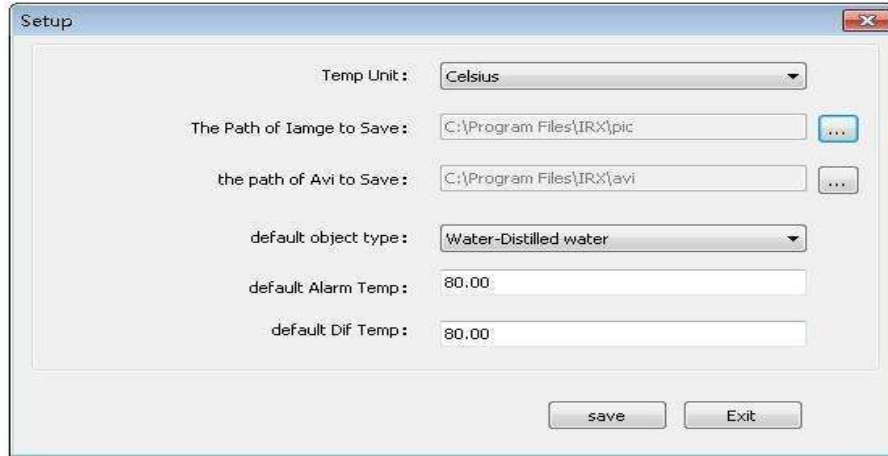


Figure 5-15

## Series setup

- Set up series (串口), baud rate (波特率), data bit (数据位), check bit (校验位), stop bit (停止位), buffer size (缓冲区大小) and waiting time (等待时间). As shown in figure 5-16.

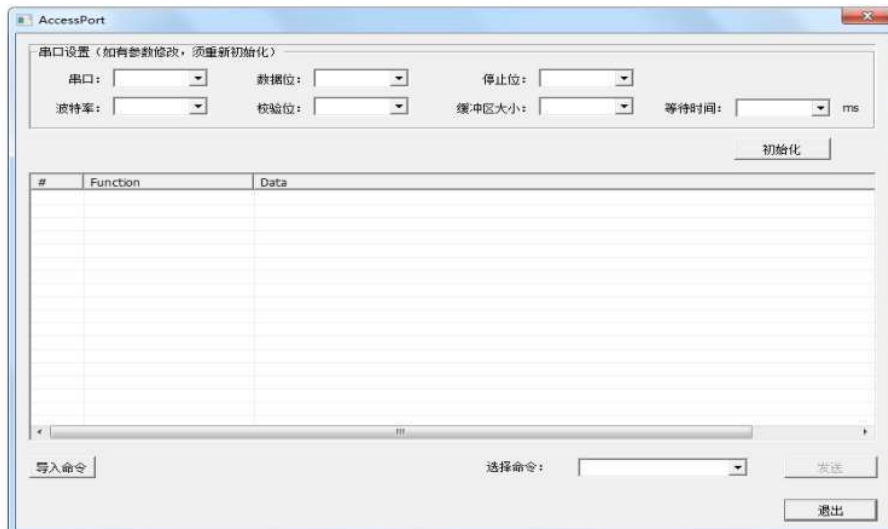


Figure 5-16

## 5 ) Help

- Click the “help” to open the user manual, and click “about IRX” to look up the software information. As shown in the



figure 5-17.

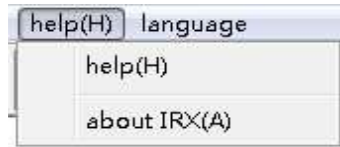


Figure 5-17

## 6 ) Report

- Select report template. Users can select the blank template or standard template to edit.
- Set up the appearance of the report, the title, the alignment, the border color and the background color.
- Set up the font of report, the font size, the bold, font color and so on.
- Export files in Microsoft Word or PDF

More details please refer to the figure 5-18.

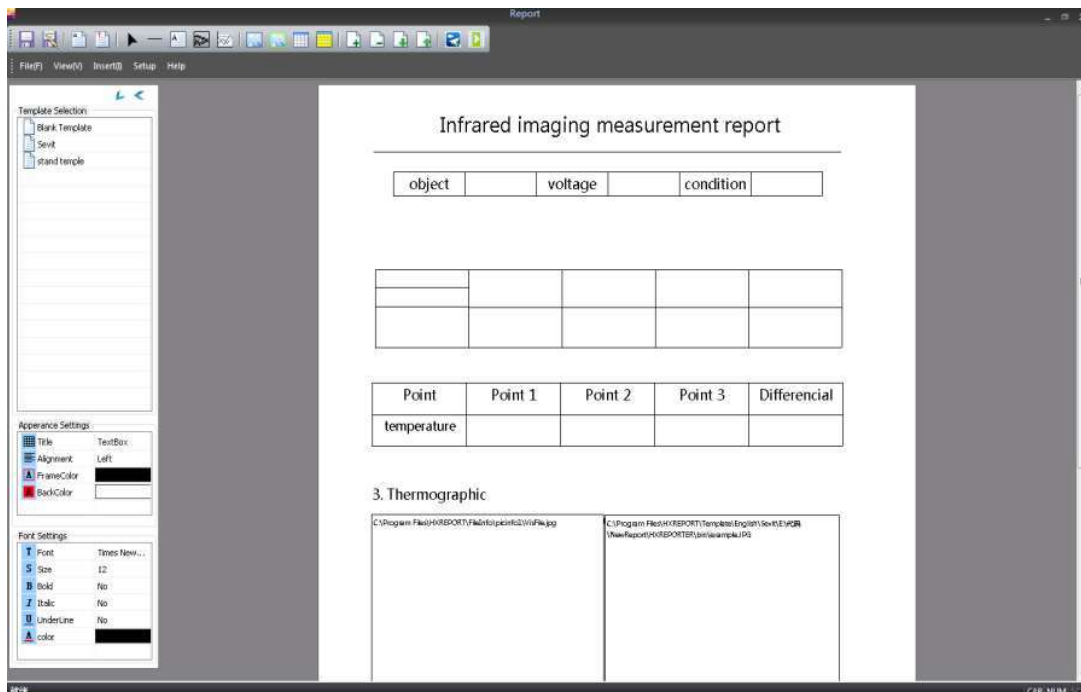
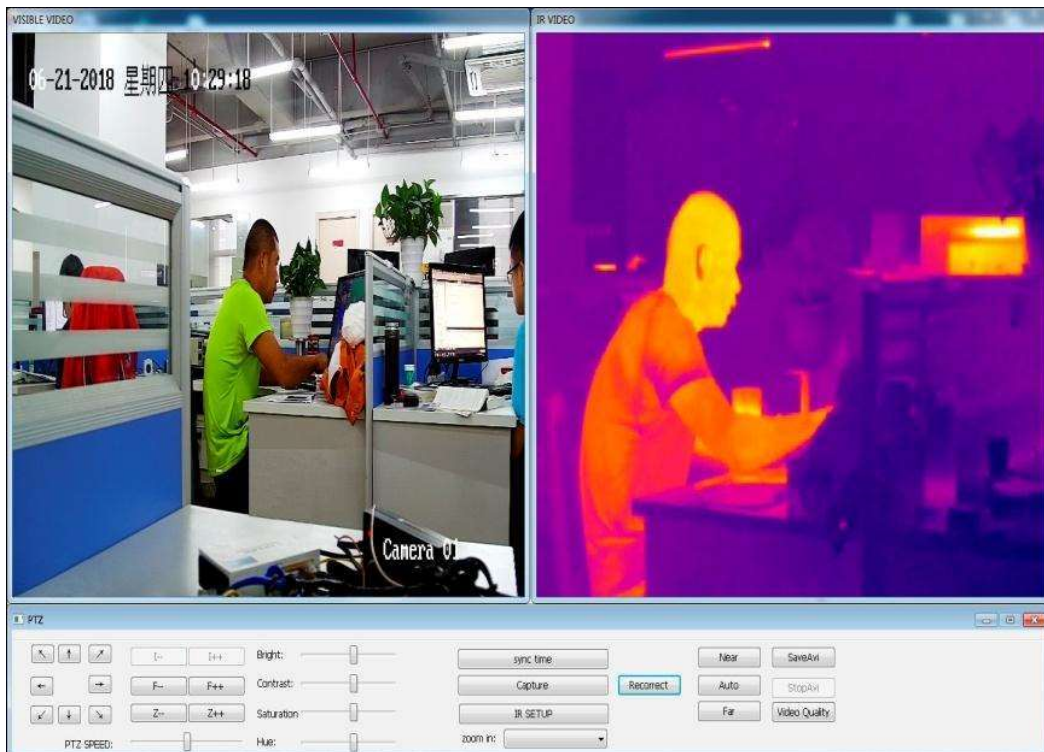


Figure 5-18

## 7 ) Pan &Tilt control

- Click the button “PTZ Control”. In the interface, users can look over the visible light images and thermal images. In outdoors, GPS will locate to the latitude and longitude, and then display them in the thermal images. As shown in the picture 5-19.



Picture 5-19

- Set up the rotation speed and rotation angle of PTZ. As shown in the picture 5-20.



Picture 5-20

- Click “Reconnect” to rectify the images automatically.

Besides, users can adjust the focus by 3 buttons, Near, Far and Auto. And users can save Avi, stop saving and adjust video quality. As shown in the picture 5-21.



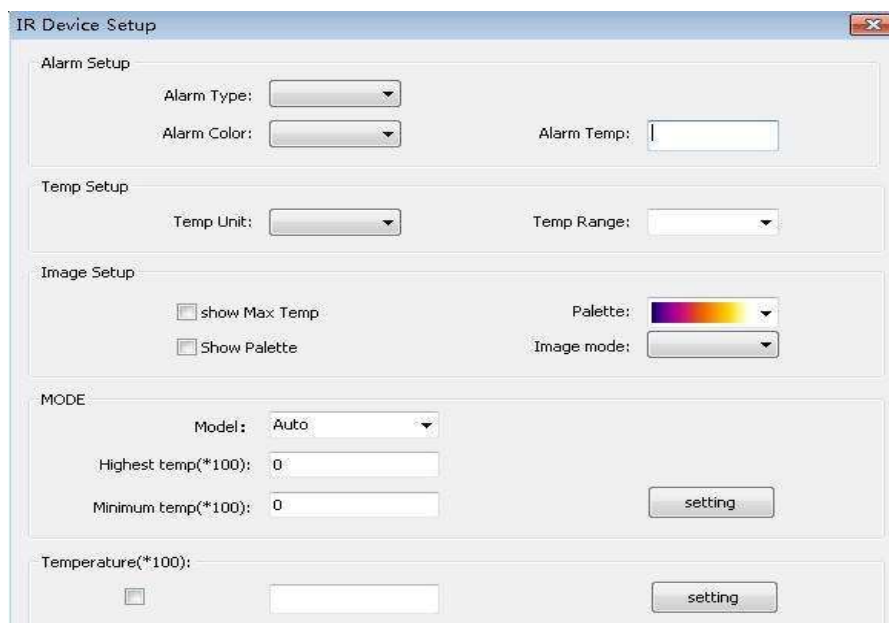
Picture 5-21

- Click the “sync time” to adjust the time, and click the “Capture” to capture images manually. As shown in the picture 5-22.



Picture 5-22

- Click the IR setup button to set up the parameters, such as thermal alarm type, alarm color, temperature unit, palette and so on. As shown in the picture 5-23.



Picture 5-23

## 5.5 The Highest Temperature Trend Chart

Analyze the trend range of highest temperature when users play the videos. And it will analyze all frames. As shown in the figure 5-24.

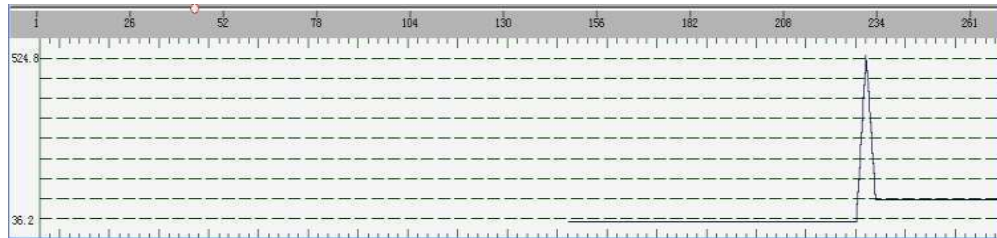


Figure 5-24

## 5.6 Histogram

In the right menu bar, there is an option “☒ Draw Temp. Histogram”. Please check it. Then it will analyze the temperature distribution of each frame when users play the videos. As shown in the figure 5-25

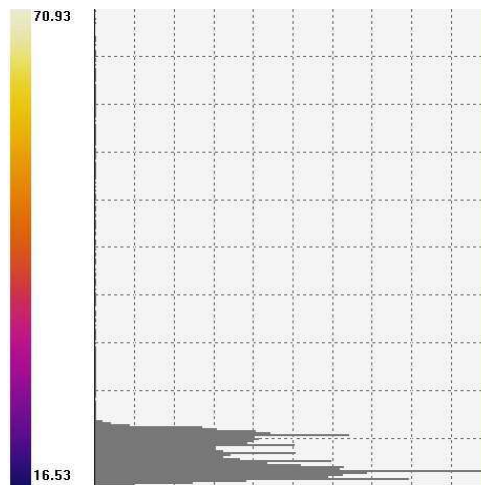


Figure 5-25

## 5.7 Iso show & Palette

- 1) **iso show:** Check “ ☒ iso show ”, and adjust the maximum or minimum temperature.
- 2) **Palette:** There are 12 kinds of palettes are available. As shown in the figure 5-26.

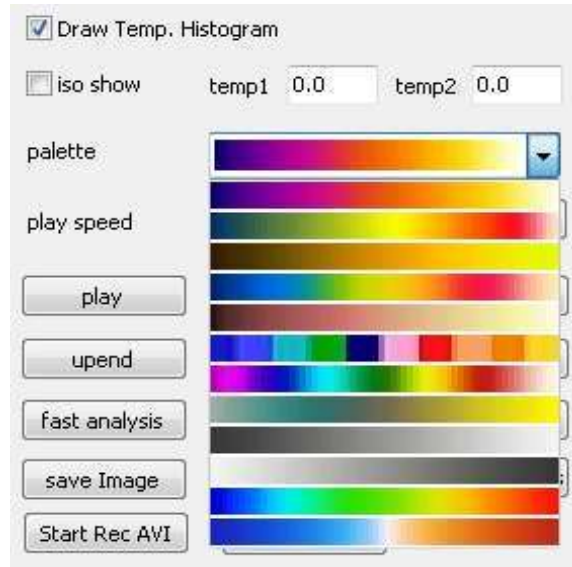


Figure 5-26

## 5.8 Video Setup

Related parameters can be set up related to video settings when users play videos. As shown in the figure 5-27.

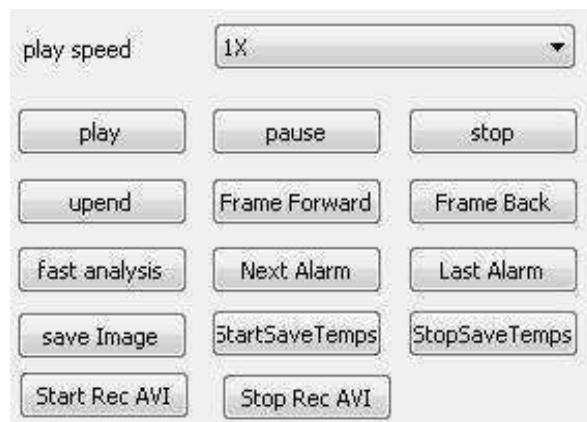


Figure 5-27

## 5.8 Language

Users can select languages according to needs. There are four languages in total.



Figure 5-28

## 6. Appendix: The Emissivity of Raw Materials

(For reference purpose only)

Material	Surface	Temp (°C)	Emissivity coefficient ( $\epsilon$ )
Aluminum	Polished	100	0.20
	Oxidized	100	0.55
Brass	Polished,brown	20	0.40
	Dull, tarnished	38	0.22
	Oxidized	100	0.61
Copper	Strongly Oxidized	20	0.78
Iron	Oxidized	100	0.74
	Rusted	25	0.65
Iron,cast	Oxidized	200	0.64
	Polished	100	0.21
wrought Iron	Rough	25	0.94
	Carefully polished	38	0.28
Nickel	Oxidized	200	0.37
Stainless Steel	Oxidized	60	0.85
steel	Oxidized at 800°C	200	0.79
Brick, common	---	20	0.93
Concrete	---	20	0.92
Glass	Smooth flat	20	0.94
Lacquer	White	100	0.92
	Natural Black	100	0.97
Carbon	Smoky black	25	0.95
	Candle smoke	20	0.95
	Black-lead rough	20	0.98
Paint oil based	Average of 16 colours	100	0.94
Paper	White	20	0.93
Sand	---	20	0.90
Wood	Polished	30	0.90
Water	---	30	0.96
Skin	Human	32	0.98
Porcelain	Fine	21	0.90
	Rough	21	0.93

## 7. Technical Support

For common mistakes and issues during operation, please refer the following form. If the issue cannot be resolved, please contact our technical support department.

Problems	Possible Causes	Reference Solutions
Imaging not clear, temp measurement abnormal	Not Adjust the lens focus	Adjust the lens focus
	Not in the valid temp range	Make sure the temp in the valid range
Power light indicator off	Power plug is not plugged in correctly	Check the power plug
	Power adapter damage	Exchange the power adapter
RJ45 yellow light off	The Ethernet cable is not plugged in correctly	Check the Ethernet cable
	Ethernet cable broken	Replace the Ethernet cable



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POLAND

Application Anwendungsbereich	Model Modell						
Building Investigation Gebäudethermografie		●	●	●	●		
Electrical Thermography Elektrothermografie		●	●	●	●		
Medical/Human Body Investigation Medizintechnische Anwendungen		●	●	●	●	○	
Predictive Maintenance Vorbeugende Instandhaltung		●	●	●	●		○
Research & Development Forschung & Entwicklung		○	○	●	●	●	○
Automation/Conditional Monitoring Automation/Qualitätssicherung				●	●	●	○
Industrial Process Control Industrielle Prozesskontrolle				●	●	●	○
Surveillance/Rescue Management Fernbeobachtung/Sicherheitstechnik						●	
Traffic Control Verkehrsüberwachung						●	
Furnace/Glass melting industry Brennraum/Glasschmelze							●
Flame- and plastic measurement Flamm- und Folienmessung							●

○ capable geeignet

● well suitable gut geeignet

● particularly suitable sehr gut geeignet