



AT30 Online Dual-spectrum Thermal Camera User Manual V1.0.0



IRay Technology Co., Ltd.

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Introduction to IRay Technology

IRay Technology concentrates on developing infrared thermal imaging technologies and manufacturing relevant products, with completely independent intellectual property rights. IRay is committed to providing global customers with professional and competitive infrared thermal imaging products and solutions. The main products include IRFPA detectors, thermal imaging modules, and terminal thermal cameras and imagers.

With R&D personnel accounts for 48% of all employees, 787 intellectual property projects in terms of IRay have been authorized and accepted: 629 patented technologies authorized and accepted in China (including those for integrated circuit chips, MEMS sensors design and manufacture, Matrix III image algorithms and intelligent precise temperature measurement algorithms, etc.); 18 patented technologies authorized and accepted overseas; 101 software copyrights; and 39 integrated circuit layout designs.

(The statistic data is up to August, 2021)

IRay products have been applied in various fields, including epidemic prevention and control, industrial thermography, security and fire control, night vision observation, automatic driving, Internet of Things, AI, and machine vision.

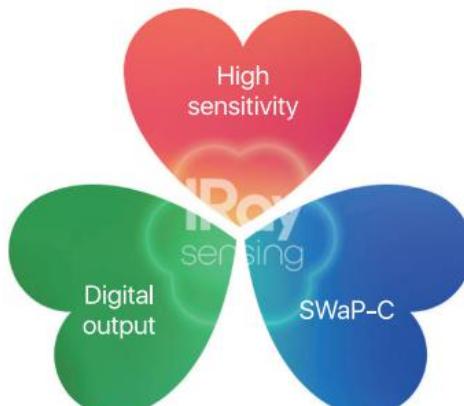


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1. Legal Disclaimer

1.1 Legal Disclaimer

The thermal cameras manufactured by IRAY TECHNOLOGY are warranted for a period of two-year and the accessories are warranted for a period of three-month from the delivery date of the original purchase, provided such products have been under normal storage, use and maintenance.

This warranty extends only to the original purchaser and is not transferable. It is not applicable to any product that has been subjected to misuse, neglect, accident or abnormal conditions of operation.

In the case of a defect in a product covered by this warranty, the product must not be further used or maintained in order to prevent additional damage. The purchaser shall promptly report any defect to IRAY TECHNOLOGY or this warranty will not apply.

IRAY TECHNOLOGY will, at its option, repair or replace any such defective product free of charge if, upon inspection, the product or accessories prove to be defective, the user can contact with after-sales service department of IRAY TECHNOLOGY within the said warranty period.

1.2 Copyright

©IRay Technology Co., Ltd. 2022. All right reserved worldwide. All contents in this manual, including words, pictures, images, etc., belong to IRAY TECHNOLOGY CO., LTD. (Hereinafter referred to as "THE COMPANY" or "IRAY TECHNOLOGY"). No part of the manual, in whole or in parts, may be copied, photocopied, translated, or transmitted without the prior written permission of IRAY TECHNOLOGY.

This manual is used as a guide. The photos, graphics, diagrams and illustrations provided in the manual are only used to explain, which may be different from the specific product. Please refer to the real object. We try our best to make sure the contents in this manual are accurate. We do not provide any representations or warranties in this manual.

IRAY TECHNOLOGY reserve the right to update the manual. If you need the latest version of this manual, please contact us. It is recommended that you use this manual with the guidance of professionals.

1.3 Quality Assurance

The Quality Management System under which these products are developed and manufactured has been certified in accordance with the ISO 9001 standard.

We reserve the right to make changes and improvements on any of the products without prior notice.

2. Safety Information



WARNING

1. Before using the cleanser, make sure you read all applicable material safety data sheets (MSDS) and warning labels on cleanser containers.
2. Do not use too long screws when installing the front/rear mounting bracket, which may damage the thermal camera.
3. It is prohibited to place the product in a high temperature above 70°C or in a low temperature below -45 °C.
4. It is forbidden to disassemble or refit the thermal camera at will.



CAUTION

1. No matter there is a lens cover or not, do not point the thermal camera towards strong light or equipment with laser radiation. This will affect the accuracy of the thermal camera and even damage the detector in the thermal camera.
2. Do not use the product under conditions that doesn't match the environmental requirements. For specific use environment requirements, see the product parameter table.
3. Do not apply solvents or equivalent liquids to the camera, the cables, or other items.
4. Be careful when you clean the infrared lenses. The lens has an anti-reflective coating which is easily damaged. Damage to the infrared lens can occur with too much force or cleaning with rough objects such as tissues.

3. Notice to user

3.1 Calibration

Annual calibration to the thermal camera is recommended to ensure the accuracy of temperature measurement, either through IRAY TECHNOLOGY or third-party organizations.

3.2 Accuracy

For accurate measurement, it's recommended that you use the thermal camera after it is stable for 30 minutes.

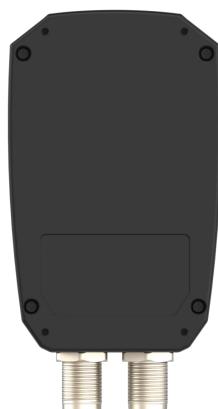
3.3 Video Teaching

You can search for mount and use videos from our website.

3.4 Documentation Update

Our manuals are updated several times per year, and we also issue product-critical notifications of changes on a regular basis. Please visit our website to access the latest manuals and notifications.

4. Product Introduction



Main Features	Accurate temperature measurement
	Support PoE
	Bi-spectral display
	Support multi-protocol access to industrial or IoT systems
	Multi-functional web client
	Wi-Fi hotspot
	Compact size

Typical Applications	Monitoring power distribution cabinet
	Monitoring warehouse
	Monitoring production line

5.Quick Start Guide

Please follow the steps:

1. After installing the thermal camera in the desired position, use the cable to connect the thermal camera and the computer correctly. There are two power supply methods for AT30. Connect the device to the PoE port of the power supply through the M12 8-pin adapter cable or connect to the DC power supply through the M12 12-pin adapter cable. Connect AT30 to the network, and wait for 2 minutes after powering on. The power indicator light is steady blue and the network indicator light flashes green, indicating that the network connection is normal.
2. Modify the computer network segment to be the same with that of thermal camera. The specific path is "Control Panel"- "Network and Internet"- "Network and Sharing Center"- "Change Adapter Options"- "Ethernet"- "Properties"- "Internet Protocol Version 4 (TCP/IPv4)" - "Use the following IP address"- set the IP address to 192.168.1.xxx.

6.Product and Accessories List

Product and Accessories
AT30 online dual-spectrum thermal camera
M12 8-pin adapter cable
Fixing accessories (screws, mounting stickers)

Optional Accessories
M12 12-pin adapter cable &alarm input/output cable
front/rear mounting bracket

Table 6.1 Product and Accessories List

7. Mechanical Installation

The front and back of the thermal camera are equipped with mounting interfaces, which can be installed with screws after the holes are punched with the auxiliary stickers in the package. In addition, we also provide two optional forms of front and back installation.

**WARNING**

Do not use too long screws in case of damaging the thermal camera.

The maximum hole depth of the front shell is 10mm, and the maximum hole depth of the rear shell is 4mm.

It's normal that the thermal camera will generate heat during operation. In order to sufficiently dissipate the heat, it is suggested that the back shell of the thermal camera should be fixed on a metal object to minimize the temperature drift of the infrared detector in thermal camera.

7.1 Installing Shells with Screws

As shown in Figure 7.1, please paste the sticker to the position to be installed, and then punch 4 $\Phi 2.5$ mounting holes according to the label on the sticker, and use 4 M2 screws to install the front shell.

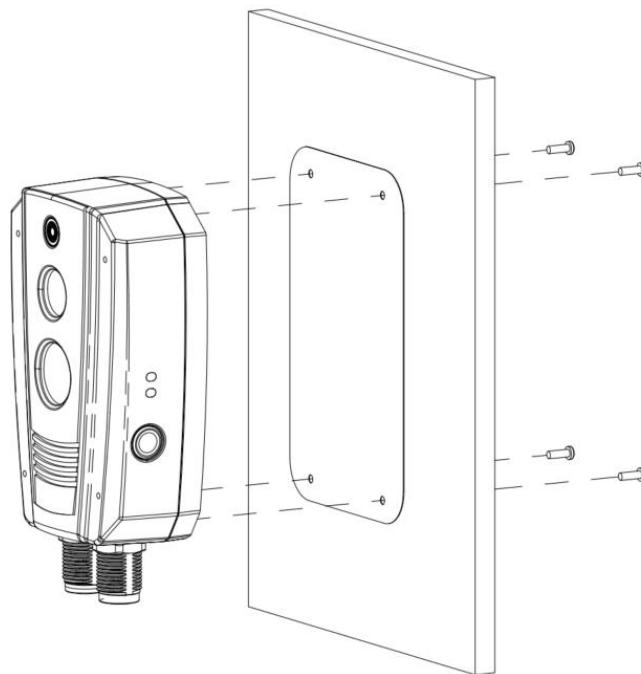


Figure 7.1 Front Shell Installation

7.2 Front Mounting

There are four M4 threaded holes on the front mounting bracket for fixing.

Step 1 Install the front mounting bracket

As shown in Figure 7.2, connect the front mounting bracket and the thermal camera with ST2.2*8 self-tapping screws. The installation effect is shown in Figure 7.3.

Step 2 Punch holes

As shown in Figure 7.4, please paste the sticker to the position to be installed, and then punch four $\Phi 4.5$ mounting holes according to the label on the sticker.

Step 3 Install the thermal camera

As shown in Figure 7.4, use M4 screws to install the thermal camera to the designated location.

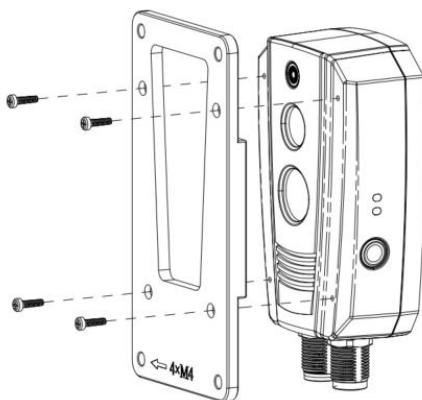


Figure 7.2

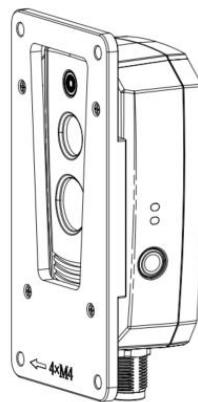


Figure 7.3

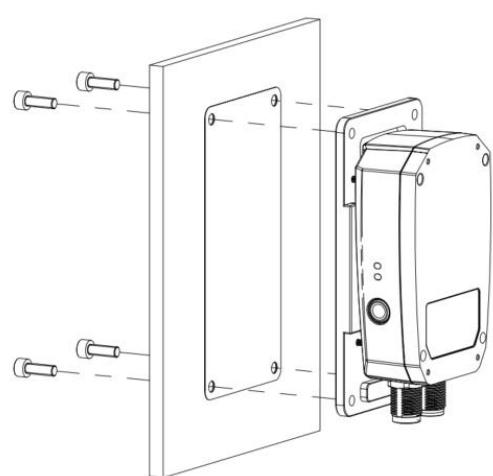


Figure 7.4

7.3 Rear Mounting

There are four M4 threaded holes on the rear mounting bracket for fixing.

Step 1 Install the rear mounting bracket

As shown in Figure 7.5, connect the rear mounting bracket and the thermal camera with M2*6 screws. The effect installation is shown in Figure 7.6

Step 2 Punch holes

As shown in Figure 7.7, please paste the sticker to the position to be installed, and then punch four $\Phi 4.5$ mounting holes according to the label on the sticker.

Step 3 Install the thermal camera

As shown in Figure 7.7, use M4 screws to install the thermal camera to the designated location.

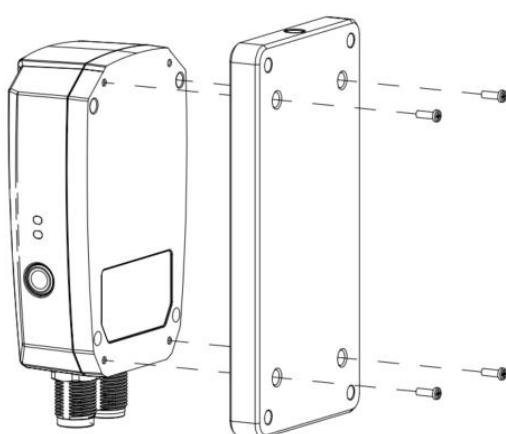


Figure 7.5

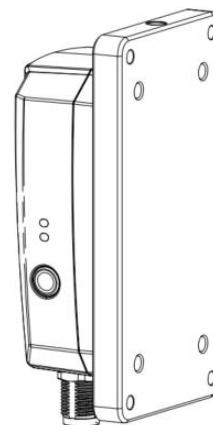


Figure 7.6

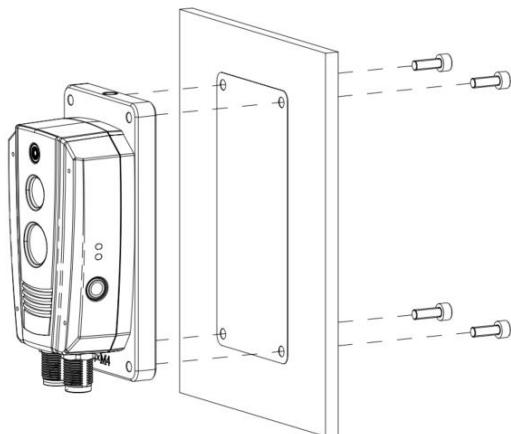


Figure 7.7

8. Alarm Input and Output

8.1 Alarm Input

Support 1-ch active alarm input (switch value, photoelectric isolation).

8.2 Alarm Output

Support 2-ch alarm outputs (switch value, photoelectric isolation), 3~25VDC, maximum 85mA.

9. Technical Data

Imaging and Optical Data		
Infrared	Resolution	384×288
	NETD	40mK
	Frequency	25Hz
	Lens	3.8mm
	FOV	68.0°×51.8°
	Focus	Focus free
Visible Light	Visible Light Pixels	2 MP
	FOV	81°×61°
	Supplement Light	LED

Detector Data	
Detector Type	VOx, Uncooled FPA detector
Spectral Range	8~14μm
Pixel	12μm

Temperature Measurement	
Object Temperature Range	-20 ~ 650°C
Accuracy	±2°C or ±2%, the larger value shall prevail
Spot/Line/Area	maximum 8 spots/8 lines/8 areas
Palette	20

Environment Variable Correction	distance, atmospheric temperature, emissivity, reflection temperature, atmospheric transmittance
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Alarm	
Alarm Function	The highest temperature, lowest temperature and average temperature in all temperature measurement points, temperature measurement areas and lines can be configured with separate alarm outputs.
Alarm Input/Output	1-ch alarm input; 2-ch alarm out Other alarms: save image/video, sending file (FTP), email (SMTP), and flash alarm.

Ethernet	
Ethernet Functions	control, imaging and power supply
Ethernet Connector Type	RJ45/ Wi-Fi/ Hotspot
Ethernet Power Supply	Support PoE
Network Protocol	TCP,UDP,RTSP,HTTP,SMTP
Interface Protocol	ONVIF,GB28181,Modbus TCP,MQTT

Image transmission		
Image Stream	Image Stream Format	H.264/H.265
	Resolution	visible light 1600×1200; infrared 384×288, support super resolution up to Max. 1024×768
	Image Mode	thermal image, visual image, fusion, DDE, and parallel display of visual images are supported.
	Frame Rate Adjustment	supported
Data Stream	Data Stream Transmission	Visible and thermal images, temperature stream, adjustable frame rate
Image Storage	Storage Medium	built-in 32GB storage
	Storage Mode	store thermal images and visible images simultaneously.
	File Format	JPG, MP4
	Storage Form	local storage, connected to monitoring systems, such as NVR.

Typical Power Supply

External Power	12~30V DC
PoE	IEEE 802.3af
Power Consumption	≤2W

Environmental Data

Encapsulation	IP67
Operating Temperature Range	-10~50°C
Storage Temperature Range	-40~70°C
Humidity	≤95% (no condensation)
EMC	IEC 61000-4-2(anti-interference) IEC 61000-4-3(anti-radiation)
Shock	25G, IEC68-2-29
Vibration	2G, IEC68-2-6

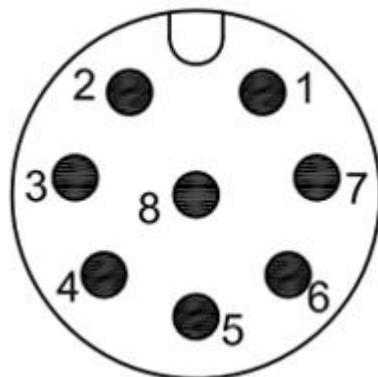
Physical Data	
Dimension	109×58×31mm
Weight	191g
Housing Material	Front shell is plastic and rear shell is aluminum alloy.

Others	
Certification	CE/FCC/RoHS
SDK	Cross-platform SDK for secondary development.
External Interface	M12, Type A ,8-pin, including 10M / 100M adaptive Ethernet port and PoE power supply; M12, Type A, 12-pin, including DC power supply, alarm input and output;

Table 9.1 AT30 Performance Parameters

10.Pin Configuration for Interfaces

10.1 Ethernet Pin Configuration (8pin)



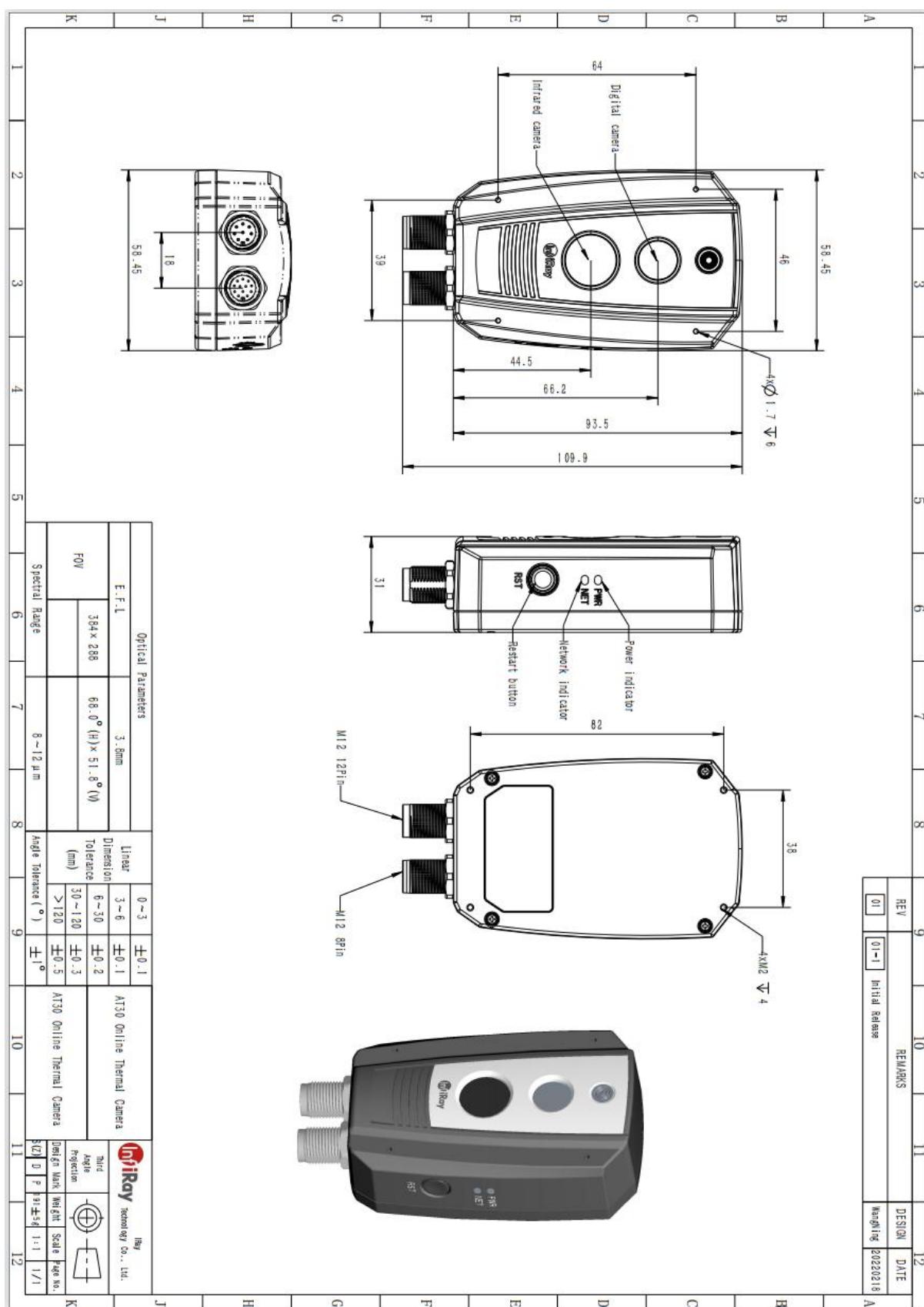
Pin	Configuration	Pin	Configuration
1	TX+	5	PD+
2	TX-	6	PD+
3	RX+	7	PD-
4	RX-	8	PD-

10.2 Power Pin Configuration (12pin)



Pin	Configuration	Pin	Configuration
1	Power +	7	ALARM POWER2
2	Power +	8	ALARM OUT2
3	Power Ground	9	ALARM IN+
4	Power Ground	10	ALARM IN-
5	ALARM_POWER1	11	GND
6	ALARM_OUT1	12	Video

11. Mechanical Drawings



12. Common Troubleshooting

Troubles	Possible Cause	Solutions
Camera cannot be started.	The supply voltage exceeds the normal working supply voltage range.	Check whether the power supply voltage is between 12 and 30V
	The power connector is loose.	Check whether the power cable is connected
Web cannot be logged in.	IP setting is wrong.	Manually configure the computer address to the 192.168.1.XX
Image is stuck.	Network cable connection is loose.	After checking the network cable connection, restart the web.

13.Cleaning Thermal Camera

13.1 Cleaning Camera Housing, Cables and Other Items

Camera Housing, Cables and Other Items	
Liquids	<p>One of the following liquids can be used.</p> <ol style="list-style-type: none">1. Warm water2. Neutral detergent solution
Cleaning Tools	A soft cloth
Cleaning Procedures	<p>Please follow this procedure:</p> <ol style="list-style-type: none">1. Soak a soft cloth in the liquid.2. Twist the cloth to remove excess liquid.3. Clean the camera parts with the cloth.

13.2 Cleaning Infrared Lens

Cleaning Infrared Lens	
Liquids	<p>One of the following liquids can be used.</p> <p>1. Commercial lens cleaning liquid with more than 30% isopropyl alcohol.</p> <p>2. 96% ethyl alcohol(C_2H_5OH).</p>
Cleaning Tools	Dustless cloth, cotton wool
Cleaning Procedure	<p>Please follow this procedure (Take dustless cloth as an example).</p> <p>1. Soak the dustless cloth in the liquid.</p> <p>2. Gently wipe the lens with the dustless cloth</p>



CAUTION

The dustless cloth or cotton wool should be used one time only.

Appendix A Emissivity of Common Materials

Material	Temperature (°C)	Emissivity
Water	0~100	0.95~0.98
Soil(dry)	20	0.92
Soil(wet)	20	0.95
Woods	17	0.962
Sand	20	0.9
Sandstone	19	0.909~0.935
PVC plastic	70	0.93
Asphalt	20	0.967
Paint	70	0.92~0.94
Wallpaper	20	0.85~0.90
Cloth	20	0.98
Concrete	20	0.92
Pavement surface	5	0.974
Smooth porcelain	20	0.92
Ceramic tile	17	0.94
Gypsum	17	0.86
Bricks	35	0.94
Hard rubber	0~100	0.89
Charcoal	20~400	0.95~0.97
Granite(rough)	20	0.879
Cold rolled steel	70	0.09
Oxidized steel	50	0.88
Copper	20	0.07
Oxidized copper	50	0.6~0.7

FCC Statement:

MODIFICATION: Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the device.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The device should be installed and operated with minimum distance 7.9 inches (20 cm) between the radiator & your body.

Worth comes from Service

Technical Support

Hotline:

400-883-0800

24h Hotline:

400-998-3088

Customized Services