![InfiRay logo]

AT300/600/600Pro Online Temperature Measurement Thermal Camera

User Manual V1.0.1

IRay Technology Co., Ltd.

www.iraytek.com

Explore And
Perceive The Future

Introduction to IRay Technology

IRay Technology Co., Ltd. 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 imaging products.

With R&D personnel accounts for 48% of all employees, 662 intellectual property projects in terms of IRay have been authorized and accepted: 522 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.); 16 patented technologies authorized and accepted overseas; 86 software copyrights; and 38 integrated circuit layout designs.

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.
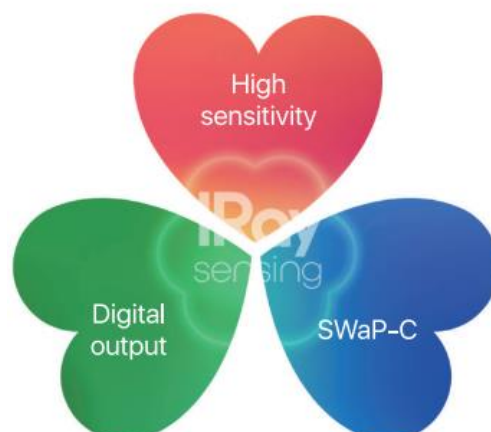
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1.Legal Disclaimer

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 form 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 which has be 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. 2020. All rights 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 part, 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. The real product shall prevail. 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 ISO9001 standard.

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

2.Safety Information

⚠ WARNING
Make sure you read all applicable Material Safety Data Sheets (SDS) and warning labels on containers before you use a liquid. The liquids can be dangerous. Injury to persons can occur.
Do not use too long screws when installing the front/rear mounting bracket, which may damage the thermal camera.
It is forbidden to disassemble or refit the thermal camera at will.
It is prohibited to use the product in a high temperature above 85°C or in a low temperature below -45 °C.

⚠ CAUTION
No matter there is a lens cover or not, do not point the infrared 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.
Do not use the product under conditions that doesn't match the environmental requirements. For specific use environment requirements, see the product parameter table.
Do not apply solvents or equivalent liquids to the camera, the cables, or other items.
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

IRAY TECHNOLOGY recommends that you verify your calibration yearly in order to ensure accuracy. You can verify the calibration through IRAY TECHNOLOGY or third-party organizations.

3.2 Accuracy

For very accurate results, we recommended that you wait 30 minutes after you have started the camera before measuring a temperature.

3.3 Video Teaching

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

3.4 Documentation Updates

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.Customer Help

4.1 FAQ

You can find answers to FAQ about this model on the service support page of our official website.

4.2 Download

You can download the following contents from our website : www.iraytek.com

Product Documentation
Client Software
Video Teaching Courses

5.Product Introduction

Main Features	Accurate temperature measurement
	Quick Installation
	Compact size
	Support PoE
	Several optional lenses
	The second generation auto-focus algorithm
	Simultaneous output of temperature data and image data

Typical Applications	Medical temperature measurement
	Livestock breeding
	Machine vision
	Elevated skin temperature screening
	High-precision power detection
	High-precision industrial testing

6.Product Figure and Explanation
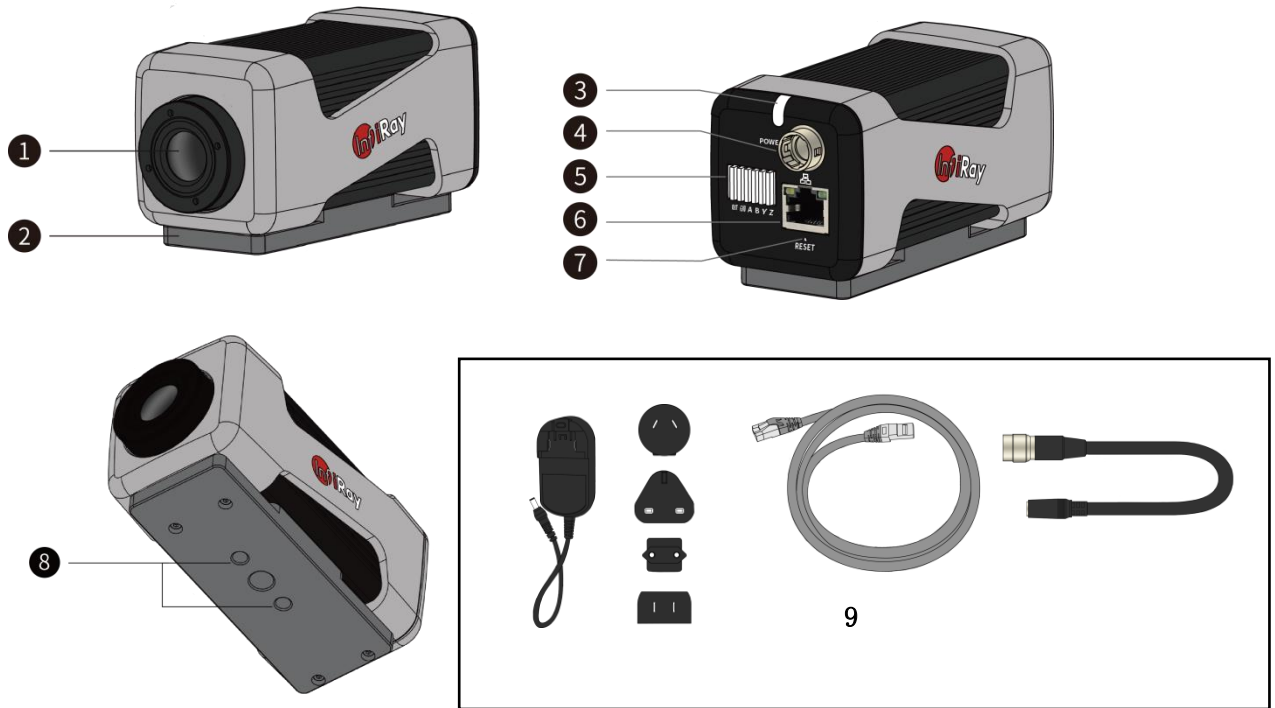
No.	Explanation
1	Infrared lens
2	Adapter bracket
3	LED light
4	Power interface
5	Data interfaces
6	Ethernet/Network cable interface
7	Reset button
8	Installation holes for tripod and other accessories
9	Accessories from left to right: Power adapter, gigabit network cable, power cable

Table 6.1 Explanation of Product Appearance

7.Product Models Reference

AT300	3	X
Model	Lens	Reserved
AT300	3: 7.8mm 4: 13mm 5: 15mm 7: 19mm 8：25mm	X
AT600	3: 7.8mm 4: 13mm 5: 15mm 6: 10.6mm 7: 19mm 8: 25mm	X
AT600P	4: 13mm 5: 15mm 7: 19mm 9: 17mm	X

Table 7.1 Product Models List

E.G.：AT3003X(AT300-3-X) stands for AT300 with 7.8mm lens.

Note：

1. During the product upgrade process, some of AT600 series products may be out of stock. You can choose the high-performance AT600P series.

2. You choose the following products. For specific information, please contact our sales staff:

(1) The neutral version.

(2) Different image compression algorithms. (Style 1: support H.264, H.265, MJPEG. Style 2: support GigE Vision)

8.Lens Parameters

Resolution	Focal Length	FOV（H×V）	IFOV
384×288	7.8mm	47°×35.6°	2.17mrad
384×288	13mm	29.6°×22°	1.3mrad
384×288	15mm	25°×18.7°	1.1mrad
384×288	19mm	19.6°×14.7°	0.89mrad
384×288	25mm	14.8°×11.1°	0.68mrad

Table 8.1 AT300 Lens Parameters

Resolution	Focal Length	FOV（H×V）	IFOV
640×512	7.8mm	62.4°×50.9°	1.79mrad
640×512	10.6mm	49.3°×39.2°	1.32mrad
640×512	13mm	39.6°×31.6°	1.07mrad
640×512	15mm	34.2°×27.4°	0.93mrad
640×512	19mm	26.5°×21.3°	0.73mrad
640×512	25mm	20.3°×16.3°	0.56mrad

Table 8.2 AT600 Lens Parameters

Resolution	Focal Length	FOV（H×V）	IFOV
640×512	13mm	33.7°×27°	0.92mrad
640×512	15mm	29.4°×23.5°	0.80mrad
640×512	17mm	25.2°×20.3°	0.706mrad
640×512	19mm	22.8°×18.4°	0.63mrad

Table 8.3 AT600P Lens Parameters

9.Quick Start Guide

Please follow the steps:
1.   Install IRT_TAS_AT or IRS_HTS, the software may be updated, the actual version shall prevail. The computer configuration for installing the software is recommended to meet the following conditions: i5-9500T and above CPU, 8G and above memory, 64-bit win10 system, support Gigabit network.
2.   Follow the installation instructions in Chapter 11.1.2 to connect the thermal camera, power supply, and a computer. You can also connect to the Ethernet cable through the PoE power supply module.
3.   Follow the instructions in *IRT_TAS_AT_User Manual* or *IRS_HTS User Manual* to set the computer IP.
4.   Run IRS_TAS_AT or IRS_HTS as an administrator, enter the correct user name and password, and click Login.
5.   Continue to follow the procedures in the software instructions. If the camera is successfully connected and the image is normal, then the software can be used for thermal imaging control and temperature analysis.

10.Product and Accessories List

Product and Accessories
AT online temperature measuring thermal camera(with adapter bracket)
Network cable
Power cable
Power adapter

Optional Parts
Tripod
Extended axis
Blackbody

Table 10.1 Product and Accessories List

11.Mechanical Installation

The thermal camera can be mounted via a transfer bracket with four metric M2 mounting holes at the bottom of the mounting interface.
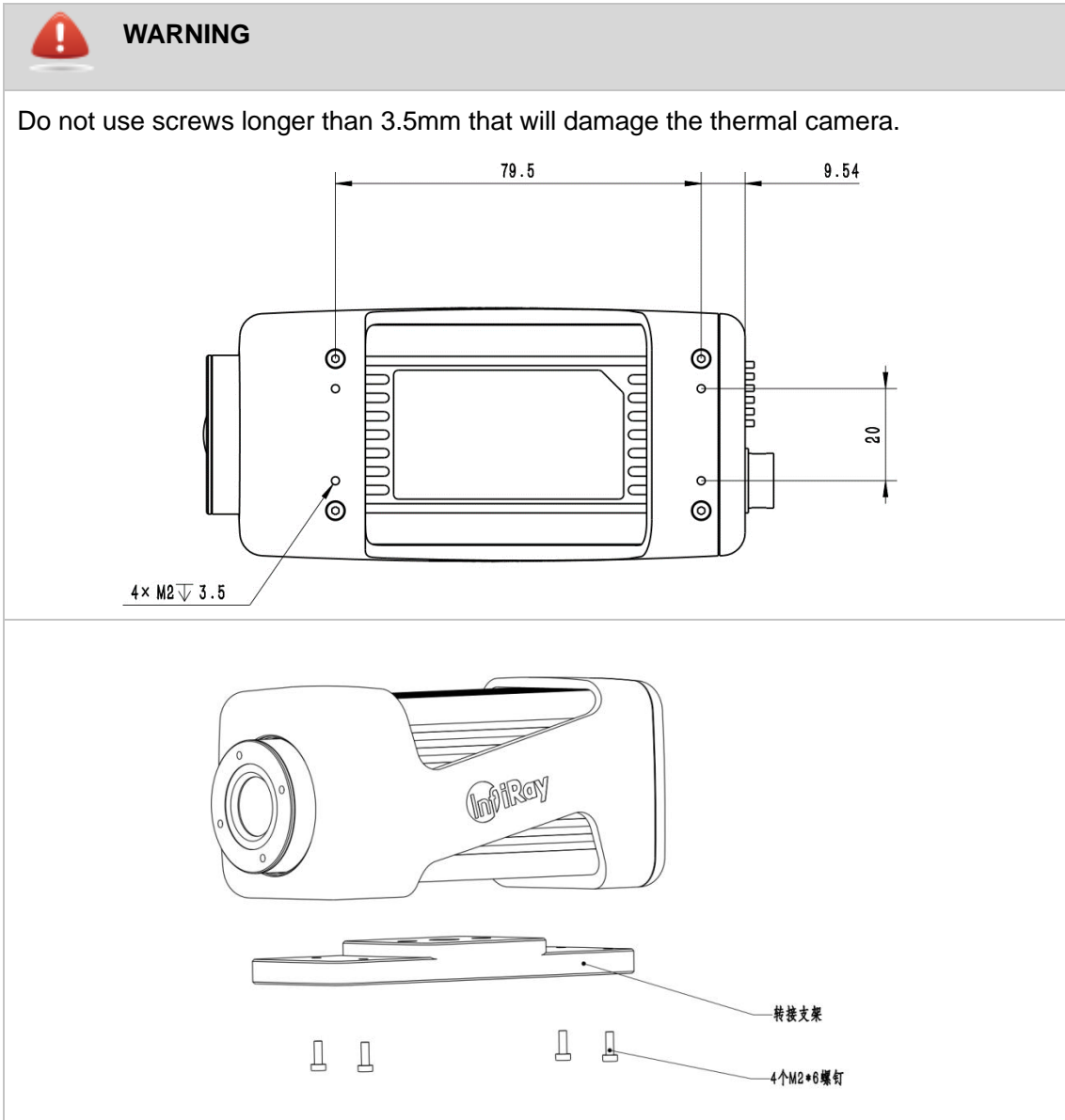
The temperature rise will occur during normal operation. If the thermal camera is used under poor heat dissipation conditions, the temperature rise may be too high, which will affect the temperature measurement performance. In order to ensure the normal use of the thermal camera, it is recommended to be used under good heat dissipation conditions.11.1 Camera Mounting

11.1.1 Illustrations

Interface 1

Interface
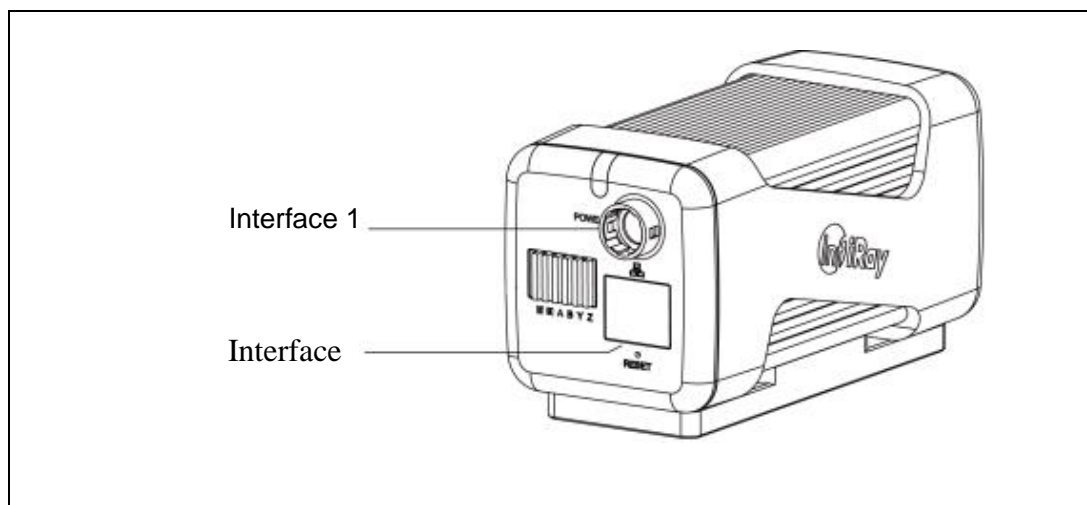
11.1.2 Explanations

1. Fix the thermal camera at the desired location according to the specific use method. The recommended location is in a sheltered area with a relatively stable thermal state.

2. Connect the power cable to the power adapter and interface 1 respectively, power on the thermal camera, and connect the two ends of the network cable to interface 2 and the PC Gigabit Ethernet port respectively.

3. Wait 30 minutes after you have stated the camera, then the temperature can be measured and analyzed by the client software of the computer.

12.Technical Data

12.1 AT300

Imaging and Optical Data	
Resolution	384×288
Thermal Sensitivity/NETD	＜50mK(40mK is optional) @25℃, F#1.0
Image Frequency	50Hz
Focus	Support Auto-focus/Manual focusing

Detector Data	
Detector Type	VOx, Uncooled FPA detector
Spectral Range	8～14μm
Pixel	17μm

Temperature Measurement	
Object Temperature Range	0℃～50℃
Accuracy	±2℃@object temperature 0℃～20℃ ±0.6℃@ object temperature 20℃～33℃ ±0.3℃@ object temperature 33℃～42℃ ±0.6℃@ object temperature 42℃～50℃
Measurement Tools	Any fixed point Full screen max./min. temperature capture Center spot Line/Area analysis tool Manually choose temperature width

Ethernet	
Ethernet	Control and imaging
Ethernet Type	Gigabit
Ethernet Standard	IEEE 802.3
Ethernet Connector Type	RJ45
Ethernet Image Stream	RTSP,ONVIF
Ethernet Power Supply	PoE power supply supported
Ethernet Protocol	TCP,UDP,ICMP,DHCP

Image Adjustment	
Brightness and Contrast Adjustment	Manual/Auto 0(defaulted)/Auto 1
Polarity	Black hot/white hot
Palette	18 palettes are available
Image Flip	Left and right/up and down/diagonal
ROI	Support

Power System	
Typical power consumption@25℃	≤3W
Connector type for external power supply	DC
Voltage	10-36VDC

Environmental Data	
Operating Temperature Range	10℃～40℃（16℃～32℃ accurate measurement）
Storage Temperature Range	-45℃～85℃
Humidity (operating & storage)	5%～95%RH(no condensation)
EMC	With EMC design
Shock	30g,11ms, all axial
Vibration	4.3g, random vibration, all axial

Physical Data	
Weight	430g±5g(without adapter bracket）)
Thermal Camera（L×W×H）	55mm×55mm×110mm
Base Installation	Fix the adapter bracket on the thermal camera with 4 M2*6 screws
Housing Material	Aluminum

Shipping Information	
Packing Type	Carton
Weight with Package	1.1kgs
Packaging Size	224.4mm×126.4mm×144.4mm
List of Contents	Thermal camera
	Adapter bracket
	Power adapter
	Power cable
	Gigabit cable
Country of Origin	China

Table 12.1.1 AT300 Performance Parameters

12.2 AT600

Imaging and Optical Data	
Resolution	640×512
Thermal Sensitivity/NETD	＜50mK(40mK is optional) @25℃, F#1.0
Image Frequency	25Hz
Focus	Support Auto-focus

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

Temperature Measurement	
Object Temperature Range	0℃～50℃
Accuracy	±2℃@object temperature 0℃～20℃ ±0.6℃@ object temperature 20℃～33℃ ±0.3℃@ object temperature 33℃～42℃ ±0.6℃@ object temperature 42℃～50℃
Measurement Tools	Any fixed point Full screen max./min. temperature capture Center point Line/Area analysis tool Manually choose temperature width

Ethernet	
Ethernet	Control and imaging
Ethernet Type	Gigabit
Ethernet Standard	IEEE 802.3
Ethernet Connector Type	RJ45
Ethernet Image Stream	RTSP,ONVIF
Ethernet Power Supply	PoE power supply supported
Ethernet Protocol	TCP,UDP,ICMP,DHCP

Image Adjustment	
Brightness and Contrast Adjustment	Manual/Auto 0(defaulted)/Auto 1
Polarity	Black hot/white hot
Palette	18 palettes are available
Image Flip	Left and right/up and down/diagonal
ROI	Support

Power System	
Typical power consumption@25℃	≤3.3W
Connector type for external power supply	DC
Voltage	10-36VDC

Environmental Data	
Operating Temperature Range	10℃ ～ 40℃ （ 16℃ ～ 32℃ accurate measurement）
Storage Temperature Range	-45℃～85℃
Humidity (operating & storage)	5%～95%RH(no condensation)
EMC	With EMC design
Shock	30g,11ms, all axial
Vibration	4.3g, random vibration, all axial

Physical Data	
Weight	430g±5g(without adapter bracket））
Thermal Camera（L×W×H）	55mm×55mm×110mm
Base Installation	Fix the adapter bracket on the thermal camera with 4 M2*6 screws
Housing Material	Aluminum

Shipping Information	
Packing Type	Carton
Weight with Package	1.1kgs
Packaging Size	224.4mm×126.4mm×144.4mm
List of Contents	Thermal camera Adapter bracket Power adapter Power cable Gigabit cable
Country of Origin	China

Table 12.2.1 AT600 Performance Parameters

12.3 AT600P

Imaging and Optical Data	
Resolution	640×512
Thermal Sensitivity/NETD	＜50mK(40mK is optional) @25℃, F#1.0
Image Frequency	25Hz
Focus	Support Auto-focus/Manual focusing

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

Temperature Measurement	
Object Temperature Range	0℃～50℃
Accuracy	±2℃@object temperature 0℃～20℃ ±0.6℃@ object temperature 20℃～33℃ ±0.3℃@ object temperature 33℃～42℃ ±0.6℃@ object temperature 42℃～50℃
Measurement Tools	Any fixed point Full screen max./min. temperature capture Center point Line/Area analysis tool Manually choose temperature width

Ethernet	
Ethernet	Control and imaging
Ethernet Type	Gigabit
Ethernet Standard	IEEE 802.3
Ethernet Connector Type	RJ45
Ethernet Image Stream	RTSP,ONVIF
Ethernet Power Supply	PoE power supply supported
Ethernet Protocol	TCP,UDP,ICMP,DHCP

Image Adjustment	
Brightness and Contrast Adjustment	Manual/Auto 0(defaulted)/Auto 1
Polarity	Black hot/white hot
Palette	18 palettes are available
Image Flip	Left and right/up and down/diagonal
ROI	Support

Power System	
Typical power consumption@25℃	≤3.3W
Connector type for external power supply	DC
Voltage	10-36VDC

Environmental Data	
Operating Temperature Range	10℃ ～ 40℃ （ 16℃ ～ 32℃ accurate measurement）
Storage Temperature Range	-45℃～85℃
Humidity (operating & storage)	5%～95%RH(no condensation)
EMC	With EMC design
Shock	30g,11ms, all axial
Vibration	4.3g, random vibration, all axial

Physical Data	
Weight	430g±5g(without adapter bracket)）
Thermal Camera（L×W×H）	55mm×55mm×110mm
Base Installation	Fix the adapter bracket on the thermal camera with 4 M2*6 screws
Housing Material	Aluminum

Shipping Information	
Packing Type	Carton
List of Contents	Thermal camera Adapter bracket Power adapter Power cable Gigabit cable
Weight with Package	1.1kgs
Packaging Size	224.4mm×126.4mm×144.4mm
Country of Origin	China

Table 12.3.1 AT600P Performance Parameters

13.Mechanical Drawing
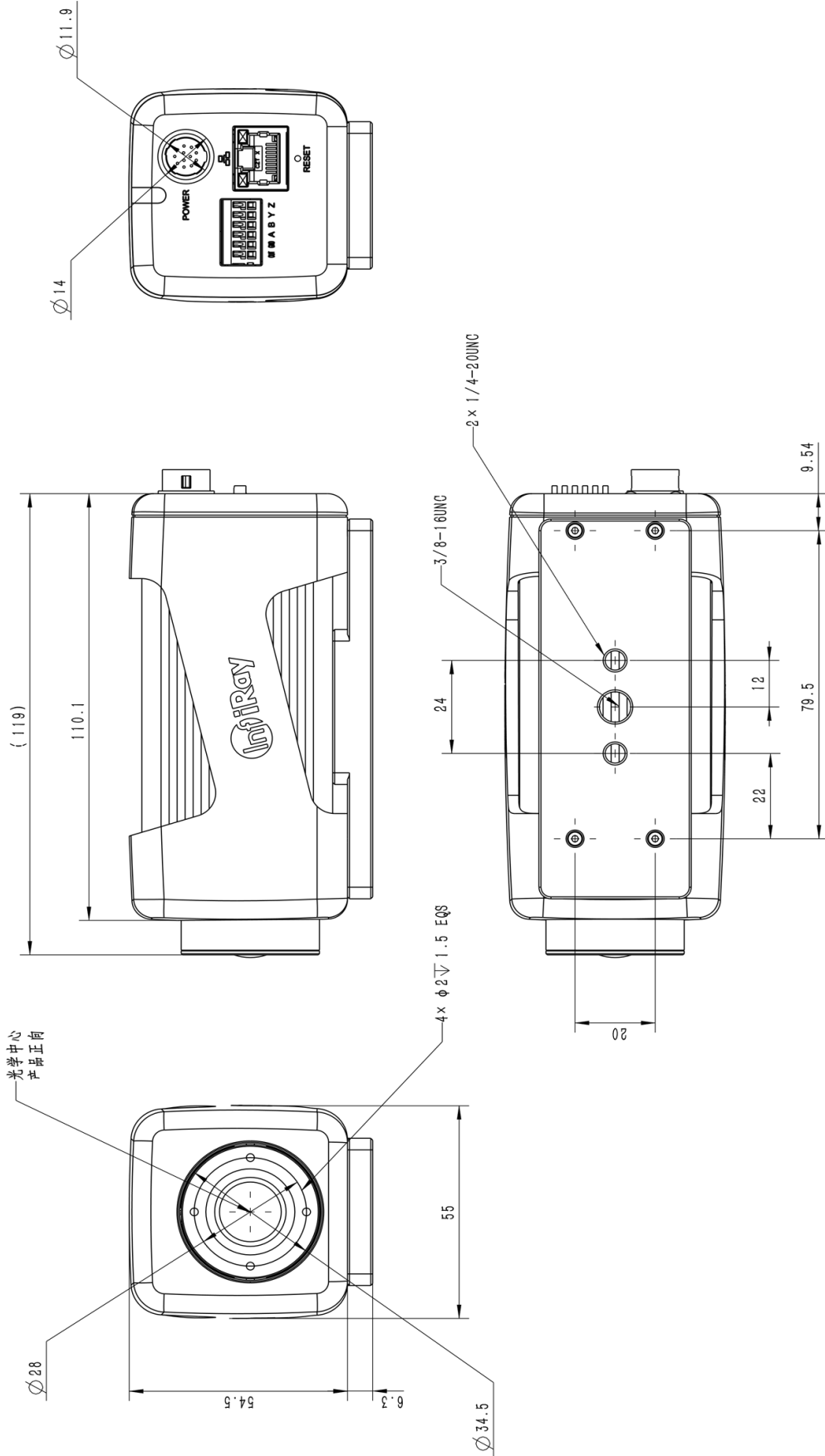
14.Declaration of Conformity

Report No. SET2020-02469

EMC TEST REPORT

Report No.: SET2020-02469

Product: AT Precise Body Temperature Measurement Thermal Camera

Trade name InfiRay

Model No.: AT3003X

Applicant: IRay Technology Co., Ltd.

Issued by: CCIC Southern Testing Co., Ltd.

Lab Location: Electronic Testing Building, No. 43 Shahe Road, Xili Jiedao, Nan shan District, 518055 Shenzhen, Guangdong, China

Tel: 86 755 26627338   **Fax:** 86 755 26627238

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Query No. :X4UK2R4P

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15.Common Troubleshooting

Troubles	Possible Cause	Solutions
Images are blurred	Objective lens focal length does not match	Click auto focus in the software after aiming the thermal camera at the target
	No image calibration for a long time	Click the shutter correction button in the software
Camera can't be started	The supply voltage exceeds the normal working supply voltage range	Check whether the power supply voltage is between 10 and 36V
	The power connector is loose	Check whether the power cable is connected
Inaccurate temperature measurement	The stabilization time for thermal camera is too short.	Keep the thermal camera stable for more than 10 minutes.
	Focus is not good.	Align the target for automatic focus calibration.
The client cannot open, the error shows no mfc300.dll	VC environment is not installed	Install Microsoft Visual Studio
Network parameters can be recognized, but can't be connected.	Network IP address setting is not correct.	Manually configure the computer address to the 192.168.1.XX network segment.
Image is stuck.	Power cable or network cable connection is loose.	After checking the power supply and network cable connection, restart the software.
Image temperature cannot be seen clearly	Default font is smaller.	Adjust font size by Aa icon
Video is not continuous.	Computer configuration is not matched.	The network card is not a gigabit network port.

Table 15.1 Product Common Troubleshooting

16.Cleaning Thermal Camera

16.1 Cleaning Camera Housing, Cables and Other Items

Camera Housing, Cables and Other Items	
Liquids	One of the following liquids can be used. 1.Warm water 2.A Weak detergent solution
Cleaning Tools	A soft cloth
Cleaning Procedure	Please follow this procedure: 1.Soak a soft cloth in the liquid. 2.Twist the cloth to remove excess liquid. 3.Clean the camera parts with the cloth.

16.2 Cleaning Infrared Lens

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

⚠ **CAUTION**

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

17.Terms and Definitions

Terms	Definition
FPA (Focal Plane Array)	A type of infrared detector
IFOV (Instantaneous Field of View)	A resolution measure method of infrared thermal camera (that is, the field of view of a pixel)
FOV (Field of View)	The angle of view that the infrared camera can see HFOV is the horizontal angle of FOV，VFOV is the vertical angle of FOV.
NETD (Noise Equivalent Temperature Difference)	A measure of image anti-interference level of infrared thermal camera.

Appendix A Emissivity of Common Materials

Material	Temperature（℃）	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

Worth comes from Service

Technical Support

Hotline：

400-883-0800

24h Hotline:

400-998-3088

Customized Services