



ITSII 300

AI Thermal Imaging Temperature Screening System

Quick User Guide V1.0.1

Yantai IRay Technology Co., Ltd.

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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.

If you need the latest version of this manual, please contact us. IRay Photoelectric recommends that you use this manual under the guidance of professionals.

Version History

Version	Time	Description
V1.0.0	2020-04-17	Initial version
V1.0.1	2020-07-01	Modify the layout solution at site (on Page 8)

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1. Overview

ITSII300 AI Thermal Imaging Temperature Screening System is a non-contact, highly sensitive and flexible deployable AI Thermal Imaging Temperature Screening System developed for the epidemic situation. The system combines high-precision thermal temperature measurement and accurate face recognition technology, which can quickly detect pedestrians of abnormal body temperature and alarms in large crowds area (such as stations, airports, subways, supermarkets, schools, etc.). Provide accurate data and strong support for the rapid development and implementation of epidemic prevention work.



Figure1 Product appearance

2. Product Specification

Table 1 Product specification

Model	ITS300
Thermal Imaging	
Detector type	VOx Uncooled Thermal FPA
Resolution	384×288
Responsive spectrum	8~14μm
Lens	
Focal length	7.8mm
Focus	Auto/manual focus
FOV	47°×35.6°
IFOV	2.1mrad
Visual Imaging	
Resolution	1920×1080
Focal length	4.7~141mm
HFOV	60.5°~2.3°
Temperature Measurement	
Measurement range	0~60°C
Accuracy ⁽¹⁾	±0.3°C@target temperature of 33°C~42°C, @ ambient temperature of 16°C~32°C (with blackbody)
Measurement distance	2~10m
Connector	
Power supply	12VDC
Network port	2 100/1000Base-TX RJ-45 ports
USB	2 USB 2.0 ports
Com port	1 RS232, 1 RS485
Alarm output	GPIO: 5 channels switching signal, 4 channels relay signal NC/NO
Audio input	1 LINE-IN 3.5mm port
Audio output	1 LINE-OUT 3.5mm port
Video output	HDMI

Software functions	
Face recognition	Intelligent human recognition, max 50 people per frame
Measurement solution	Multiple spots, human face auto-tracking measurement
High temperature alarm	High temperature exceeding alarm, support alarm window output, auditable alarm, GPIO alarm
Preview mode	Visual / thermal
Data analysis	1TB historical data storage, retrieve in face mask, alarm, time
Body temperature correction	Intelligent human body temperature correction
Flux	200 People/minute
Remote access	Support web remote access, achieving preview in real-time, alarm in real-time
Network connection	Support 4 channel cameras access in
ID identification (optional)	Support local face library comparison
Environment adaption	
Working temperature	-10°C~50°C
Storage temperature	-20°C~+65°C
Humidity	5~95%, non-condensing

Note:

- (1) Precise measuring with blackbody @ambient temperature of 16°C~32°C (indoor, windless, without ambient temperature jump)

3 Installation Guide

3.1 Product and Accessory List

Before installation, please make sure that the equipment in the package is intact and all parts are available.

Standard packing list		
<p>Camera</p> 	<p>Network cable</p> 	<p>DC12V power adaptor</p> 
<p>Server AI60</p> 	<p>Tripod ×2+ Extension shaft ×4</p> 	<p>HTB-70 Blackbody</p> 

Optional package (Prepared by users):

- Displayer: resolution 1920×1080, HDMI cable;
- Tools: screw drivers.

3.2 Mounting and Connecting Camera

As shown in the figure below, one 1/4-20UNC mounting hole are reserved at the bottom and top of the product for fixing the camera to the adapter or bracket.

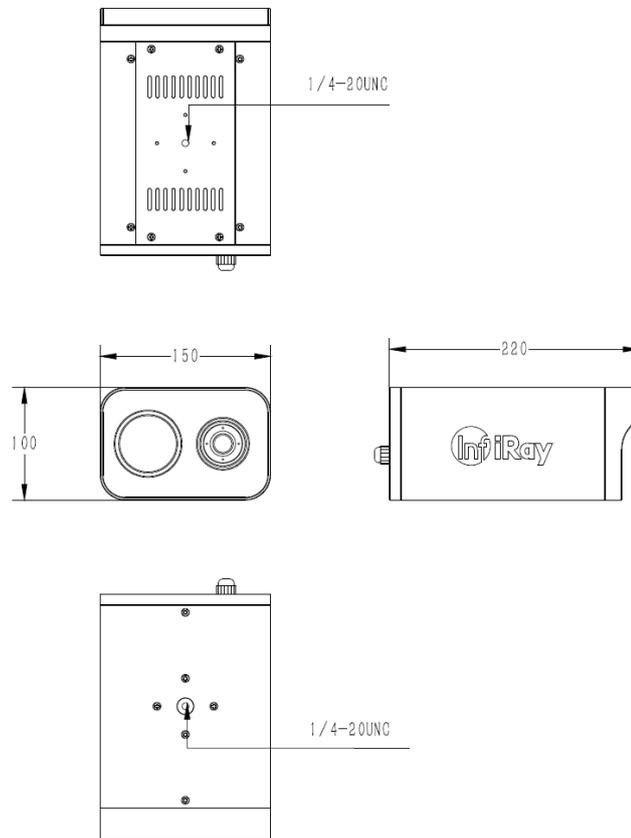


Figure 3.1 Structure of Camera

Take the thermal camera mounted on a tripod as an example, as follows:

- Remove the tripod head counterclockwise, exposing 3/8 screws, and mount it with the threaded hole of the extension shaft. Install 1 ~ 2 extension shafts according to the actual needs, and then install the tripod head back to top of the extension shaft on;



Figure3.2 Tripod and Extension Shaft Installation

- Remove the quick-release plate from tripod head and connect it to the 1 / 4-20UNC threaded hole at the bottom of the camera, and then install the quick-release plate back to the tripod head. Adjust the camera height according to the deployment scenario (1.7m ~ 2m is appropriate).



Figure3.3 Camera Installation

- Connect the DC 12V power cable and network cable to the DC-in port and RJ45 port of camera.

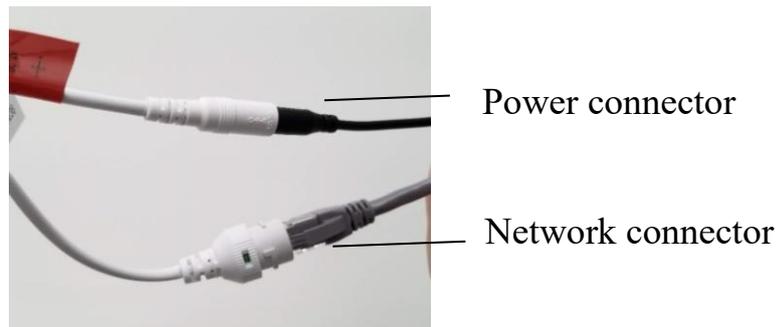


Figure3.4 Camera Cables Connection

- Connect the power cable, network cable (from camera), USB cable (from mouse) to the DC-in port, LAN1 port, USB1 port of server. If need a monitor, connect it to HDMI port.



Figure3.5 Server Cables Connection

- Power on camera and server. And the shutter working sound can be heard. For the

accurate measurement, please measuring human after running camera 60 minutes.

3.3 Blackbody Specification and Installation

Table2 Blackbody specification

HTB-70 blackbody specification	
Power supply	AC100~240V
Max. power consumption	260W
Environment temperature	0°C~40°C
Temperature range	Ambient temperature +5°C~50°C
Temperature resolution	±0.1
Accuracy	±0.2°C@35°C
Emissivity	0.97±0.02
Settling time	≤5min
Temperature stability	± (0.1°C~0.3°C) /h
Effective radiant surface	100mm×80mm
Dimension (L×W×H)	195mm×150mm×110mm

- The top and bottom of the blackbody are reserved with the American standard 1/4-20UNC tripod interface, which is convenient to install for users. Four foot-pads are distributed at the bottom of the four corners, can be used for horizontal placement.

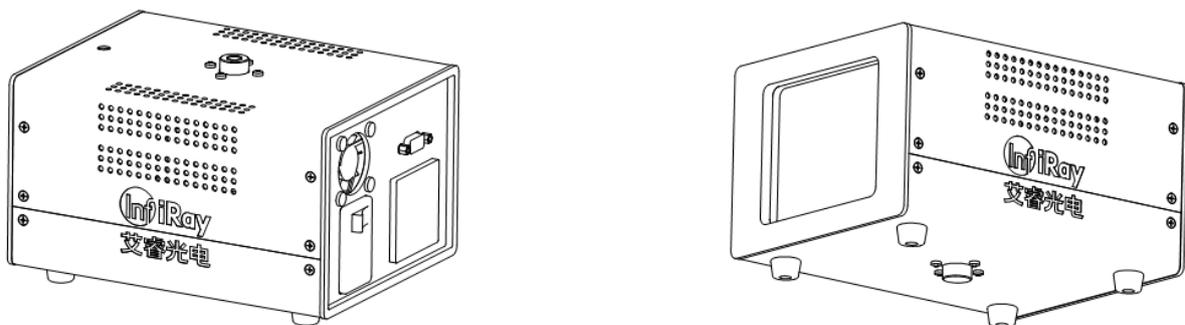


Figure 3.6 Drawing of Blackbody

3.4 Site Layout Solution

1) Reference layout

Refer to Figure 3.7 for the layout plan in a wide space area. The external reference blackbody is placed directly in front of the infrared camera and made it observable in the imaging field of view. Pedestrians need to be guided and make sure all of them can be observed with the thermal imaging camera.

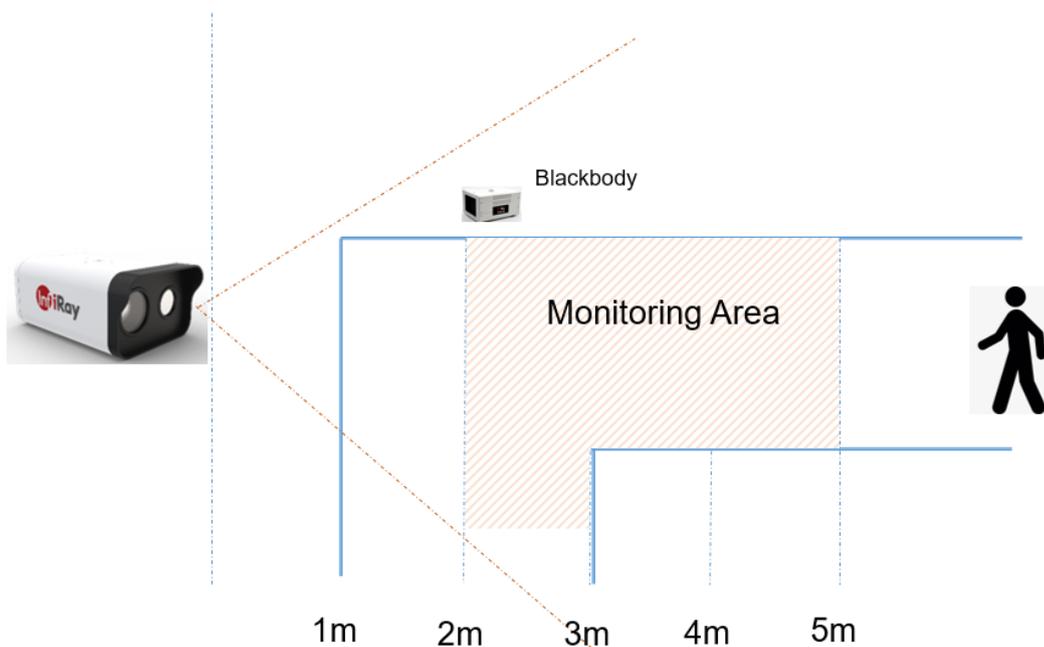


Figure3.7 Arrangement of Thermal Imaging Camera

- Installation direction and height of camera

The installation height and distance of infrared measurement thermal imaging camera and external reference blackbody are determined according to the specific application scene and specific model, but the following principles should be followed:

A) The height of the thermal imaging camera should be set so as to be able to take horizontal pictures of the face of the target (person) and facilitate the operator's operation; The height of the reference blackbody is set so as not to be blocked by the target (person);

B) The installation distance between the infrared thermal imaging camera and the external reference blackbody shall be limited to the range of temperature measurement;

C) The size of the blackbody in the actual imaging should not be less than 10 pixels.

When selecting the reference blackbody in the operation interface, it is recommended to select the 1/2 center area of the reference blackbody surface;

D) In the process of temperature measurement, it is better to make sure that the measured target (person) is in the same cross section with the reference blackbody.

E) It is recommended to put the blackbody at the position of 1.5m away from camera.

2) Reference black body layout

As shown in Figure 9, adjust the direction and position of the infrared human body thermal imaging camera and the reference black body so that the reference black body appears in the 2/3 central area of the camera market and shall not be shielded by pedestrians.

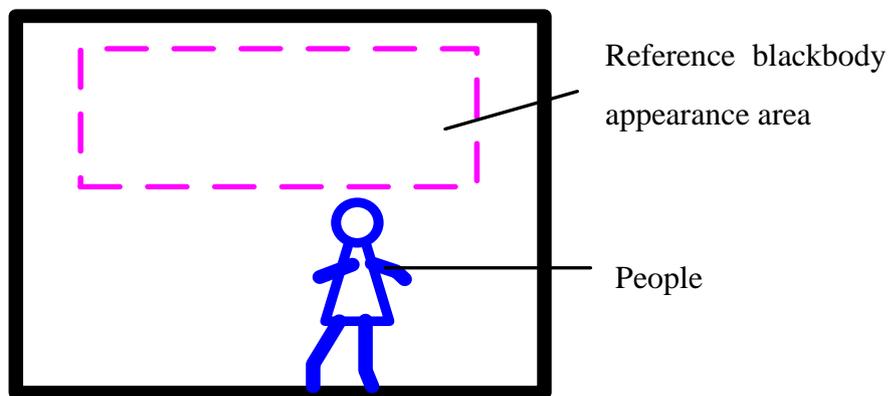


Figure 9 Infrared Imaging on PC

● Environmental requirements

The infrared temperature measuring camera is arranged in an environment where the temperature is relatively constant and there is no direct sunlight, to avoid temperature measurement errors caused by the temperature changing environment affecting the human skin surface temperature. According to the above installation requirements, the following installation methods can be used to install equipment in halls and aisles.

3.5 Site Installation and Layout Considerations

1) Avoid placing it at the entrance with airflow disturbance

Avoid the temperature rise and fall caused by the air surface disturbance of the skin of the person being tested, which will affect the false alarm or miss alarm of the infrared temperature measuring camera.

2) Select the right monitoring scenario

Avoid using infrared cameras in environments with large areas of high temperature objects (such as electronic billboards, large area light boxes, glass walls that are exposed to the sun, etc.). These hot objects may cause false alarms or missed alarms.

3) The ground of the monitoring site should not be too smooth

Avoid the temperature rise and fall caused by the airflow disturbance on the skin surface of the person being tested, which will affect the false alarm or leakage of the infrared thermometers.

4) Reserve a long enough channel

Prevent the person being tested from entering the room and testing directly in a hot / cold outdoor environment. Since the skin temperature is higher or lower than real skin temperature when they first enter a room with a constant temperature from a hot / cold outdoor environment, at this time, a long enough channel needs to be reserved to allow the subject's body surface temperature to gradually stabilize before testing, to avoid false alarms or missed alarms of the infrared camera.

3.6 Parameter Setting Guidance

Atmospheric temperature: set according to the site environment temperature.

Reflection temperature: if there is no hot object in the environment, set it to the environment temperature.

Emissivity: if the body temperature is measured, it is recommended to set it to 0.98.

Atmospheric transmittance: for indoor or better visibility, keep the default parameter 1.

Distance: set according to the conditions of use, default 2m.

Temperature measurement mode: the standard mode and the human body temperature measurement mode are provided for selection. The temperature measured in the standard mode is the real temperature. The temperature measured in the human body temperature measurement mode is the internal temperature of the human body calculated from the skin surface temperature.

4. Software User Guide

4.1 Default Settings

For the software detailed manual, please refer it from software package.

The default settings are below:

Default super administrator ID: admin.

Default super administrator PW: admin.

Default IPv4 address: Network card1: 192.168.1.124, Network card2: 192.168.1.125.

4.2 System Login

There are two ways to login ITS II system: one is login local server via GUI, and another is login Web server via Explorer.

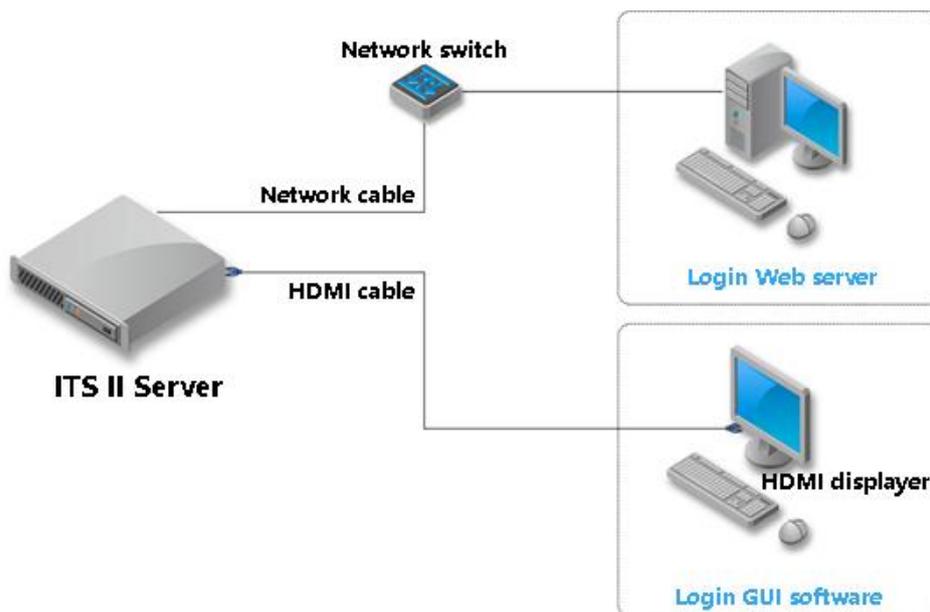


Figure4.1 System Login

- Login GUI software

Connected displayer to server before power on server. After power on server, input the ID & PW, it will enter the main user interface.

- Login Web service

There is a web server in Service, and support remote web access. After Server accessed to LAN, input the IP address in Explorer can browse web server.

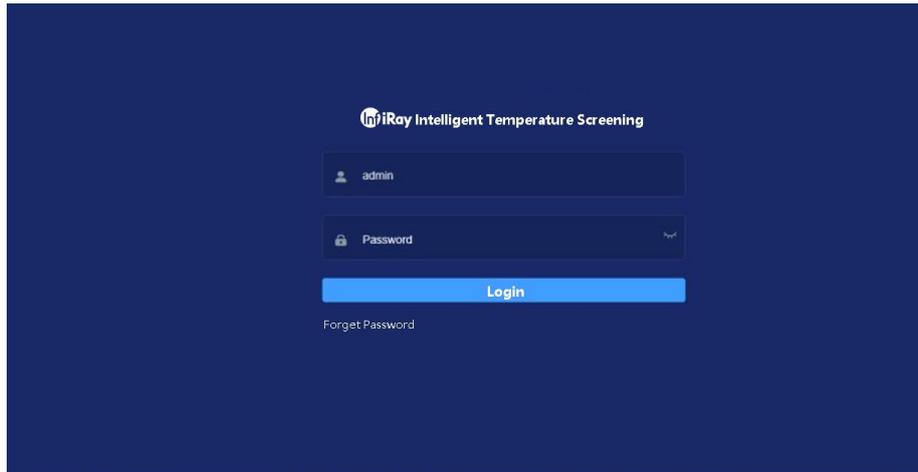


Figure4.2 Web Server Login UI

Detailed steps:

- 1) Run Explorer (recommend IE11).
- 2) Input the Service IP address: <http://xx.xx.xx.xx>, as <http://192.168.1.124>, to the Address bar of Explorer. And the login UI as above image.
- 3) Input the right ID and PW (default ID & PW is admin/admin).
- 4) Click Login button to access Server, or else it will warning login error.

5 Troubles Shooting

Troubles Shooting

Fault description	Possible Causes	Method of exclusion
Boot failure	Power connector is loose.	Check whether the power interface is connected reliably.
Web server could not access	The network IP address is set incorrectly	Modify the computer's fixed IP address to the correct network segment
Low measuring accuracy	The thermal camera stabilization time is too short	Keep the camera stable for more than 40 minutes
	Reference blackbody position setting is incorrect	Reset the position of blackbody

	Unfocused	Aim at the target position for auto focus calibration
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6 Maintenance

6.1 Attention

- Make sure the camera is fixed firmly when the camera is installed on wall, ceiling or pillar.
- The camera shall not fall on the equipment, especially vigorous vibration equipment. Keep the camera away from the presence of magnetic field interference, avoid mounting camera to the surface where occurs vibration or shocks easily. (The camera may be damaged ignoring this item).
- The camera lens shall not be aimed at the high temperature target such as sun, incandescent light etc., or it may damage the lens or detector.
- Equipment used indoors should not be installed exposed to rain or very wet areas.
- Do not place the equipment in an environment with corrosive gas, which may cause damage to the equipment.
- Avoid placing equipment in the area where has direct sunlight, poor ventilation, or near heat sources such as heaters (ignoring this can lead to fire hazards).
- Please keep all original packing materials of the equipment properly, so that in case of any problem, use packing materials to pack the equipment and send it to the agent or return it to the manufacturer for treatment. IRay shall not be responsible for any accidental damage in transit caused by materials other than the original packaging.

6.2 Cleaning and Maintenance

- Do not use cleaning products that corrode or scratch optical glass components.

- The germanium window surface is coated with anti-reflection coating, dust, grease, fingerprints will produce harmful substances and lead to its performance decline or cause scratches, once found dirt, please follow the following methods.

1) Use a blown balloon or a soft brush to clean the lens surface and avoid dust particles scratching the anti-reflection film on lens surface during the wiping process.

2) Use soft cotton cloth or lens wiping paper to dip in alcohol or lens wiping liquid, gently wipe the lens surface from the middle to the edge, pay attention to do not squeeze the lens surface, wipe liquid also can not dip in too much, make sure the cloth is wet, but wipe liquid can not be extruded. If still not clean, replace the cloth and repeat operation.

6.3 Safety Codes

- Please use standard power supply, to avoid the camera is damaged by over-voltage.
- Short-circuit is prohibited.
- Hitting or beating the product with sharpen object is prohibited;
- The product shall not be exposed in the high temperature environment which is higher than 80°C.
- Do not put the product into the fire.

7 After Sales Service

The ITS II precision body temperature measuring infrared camera is developed by our company and has good after-sales service guarantee such as equipment maintenance and repair. If you have any needs, please contact our company.

8 Company Information

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