



# Infrared Camera

Instruction Manual: IR0001

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# 1. Overview

IR0001 is an uncooled infrared camera that integrates surface temperature measurement and real-time thermal image. With this product, the potential problems can be displayed on color display screen clearly which is helpful for users to locate the measurement cursor of the central point quickly and measure the temperature.

The product is provided with a visual camera to increase the differentiation degree. The thermal images and full vision images can be stored in the detachable memory card. IR0001 can store up to 25,000 images on the micro SD card. The image can be stored in PC to generate a report and print.

The following are the major features of IR0001:

- High accuracy: The adjustable radiation coefficient and reflection background compensation increase the measurement accuracy of half reflection surface.
- Time-saving : The traditional infrared thermometer needs to measure every component one by one while it is not necessary for thermal image of IR0001.
- Easy to use : Test can be conducted in several seconds after powering on.
- User-friendly : The thermal point and cold point temperature mark guide the users to the area with highest or lowest temperature of thermal image.
- Highly selectable: Five types of color palettes and emissivity values provided.

The product can be utilized in fields of medical treatment, for instance:

1. Detect spills and leaks of chemicals which have different thermal signatures with the surroundings,
2. Fire fighting: search where the fire burns and locate people trapped by fire,
3. Locate the source of abnormal leaking of heat of a house or a machine, find out the problem area more quickly,
4. Allow drug-enforcement units to find where Marijuana is planted,
5. Moisture detection in walls and roofs,
6. Measure body temperatures,
7. Night vision,
8. Building inspection and etc.

IR0001 is the ideal selection for electrician, maintenance personnel, technicians and even the emergency.

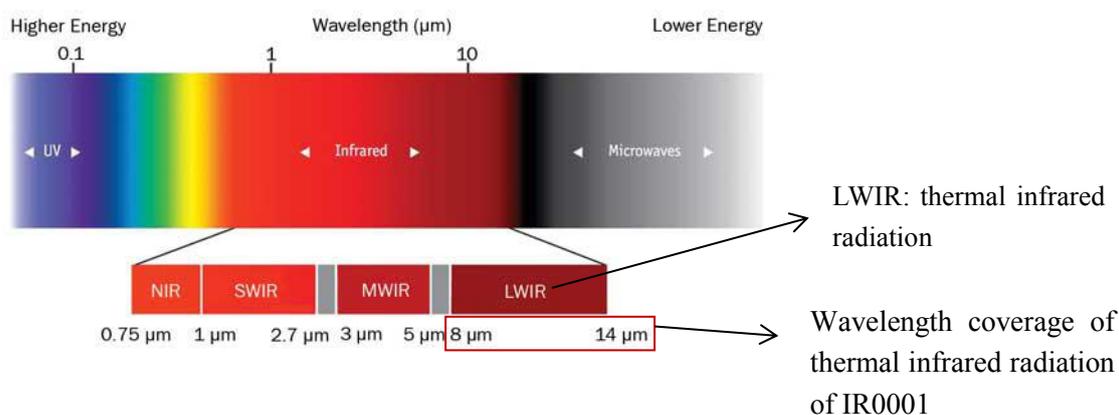
## 2. Considerations and Safety Maintenance

Please read the instructions carefully so as to ensure accurate measurement results and safety:

- ✧ Do not use the device under explosive, flammable or corrosive environment.
- ✧ Since the product is a precision electronic and sensitive optical device. Do not impact and drop it to avoid damage.
- ✧ Do not dismantle and remodel the products.
- ✧ When the product works, there is a tiny clicking sound for every several seconds. This is a normal phenomenon as the lens captures images to produce electronic noises.
- ✧ Measured temperature might be lower than actual temperature because of reflective surface and these surfaces might cause potential burning hazard to users.
- ✧ Please use damp cloth or weak soap to clean the enclosure of the device. Do not use abrasant, isopropanol or solvent to clean. Special optical lens cleaner should be used to clean the screen.

### 3. Performance Index

Display screen	2.4 full-angle high resolution
Infrared image resolution	32 * 32 (1024 pixels)
Visible image resolution	0.3 mega pixels
Thermal sensitivity	0.15°C
Temperature measurement range	-20~300°C (-4°F~572°F)
Measurement precision	±2% or ±2°C (±2% or ±4)
Wavelength coverage	8-14um
Field angle/shortest focus length	20*20/0.5m
Emissivity	Adjustable from 0.1 to 1.0
Focus mode	Fixed
Image capturing frequency	6 Hz
Color palette	Rainbow, iron oxide red, rainbow high contrast, gray scale (white glow) and gray scale (black glow)
Vision option	25% step infrared to visual to infrared and visual image
Image storage	Mini SD Card
Image format	bmp
Battery type	AA battery ×4
Battery service life	6 hours
Auto power-off time	12 minutes
Authentication	CE (EN61326-1:2006)
Warranty period	2 years
Size	212×95×62mm
Weight	320g
Work temperature	-5°C to ±40°C
Storage temperature	-20°C to ±50°C
Humidity	10% RH to 80% RH



## 4. Product Description

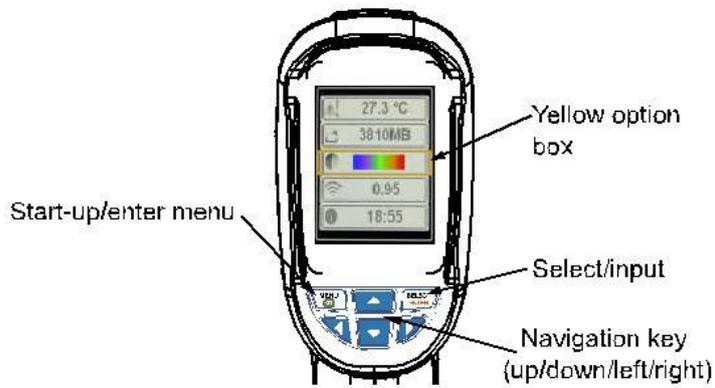
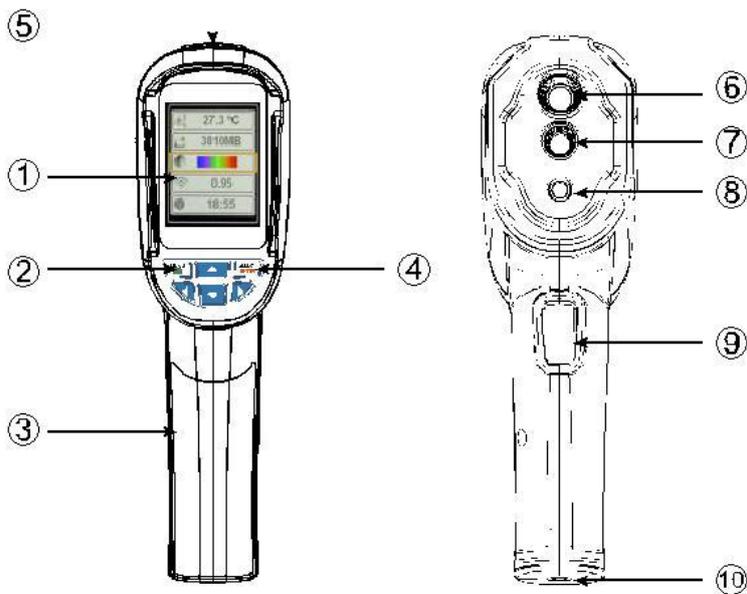


Figure 1- Basic Functions



Item	Description	Item	Description
①	TFT HD color screen	⑥	Infrared imagery sensor
②	Power-on/menu key	⑦	Visible light camera
③	Battery cover	⑧	LED lighting lamp
④	Selection/enter key	⑨	Image captures key
⑤	Small SD card	⑩	Installation port of tripod

## 5. Menu Description

Icon	Description
 12:12	<input data-bbox="874 432 1110 495" type="text" value="Time setting"/>
 5000	<input data-bbox="874 533 1110 595" type="text" value="Save image"/>
 50%	<input data-bbox="799 622 1185 685" type="text" value="Background light setting"/>
 °C	<input data-bbox="783 712 1185 775" type="text" value="Temperature unit setting"/>
 25°C	<input data-bbox="767 801 1201 864" type="text" value="Background temperature setting"/>
 11088MB	<input data-bbox="783 891 1185 954" type="text" value="Capacity of memory card"/>
	<input data-bbox="831 981 1137 1043" type="text" value="Color palette setting"/>
 0.95	<input data-bbox="831 1070 1137 1133" type="text" value="Emissivity setting"/>

## **6. Basic Operations**

### **6.1. Elimination of noise**

1. Start up the instrument.
2. Put the head of sensor close to the worktop.
3. Press “ $\Delta$ ” key for 5 seconds to eliminate the noise.

### **6.2. LED light**

Press “image capturing” key for 5 seconds to turn on LED light.

### **6.3. Battery Installation**

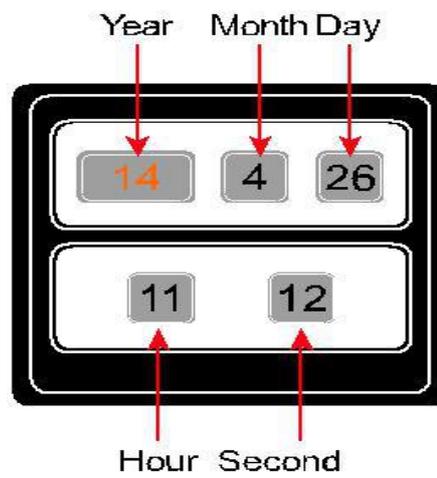
1. Slide the battery cover open for inserting new batteries into IR0001.
2. Ensure polarity of batteries inserted are correct.
3. Close the battery cover.

### **6.4. Product Operation**

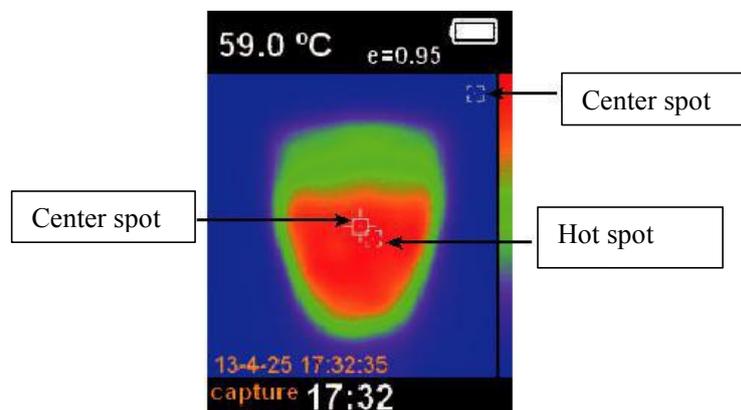
1. Press “Start-up” key for 5 seconds to power up the instrument.
2. Press “menu” for 1 second to enter mode setting of basic functions.
3. The LCD shows 5 function setting options on the screen, press “ $\Delta$ ”/“ $\nabla$ ” to scroll.
4. Select the function for adjustment by the yellow option box
5. Press “select” and select “menu” option and edit the value.
6. Press “ $\Delta$ ”/“ $\nabla$ ” to edit the value.
7. After adjustment, confirm the new value and press “menu” key to exit the edit mode.

## 7. Time setting

1. Under Time Setting menu, press “◀”/“▶” to select digit for adjustment.
2. Press “△”/“▽” to increase or decrease the time value.
3. After setting, press “menu” to exit.



## 8. Measurement



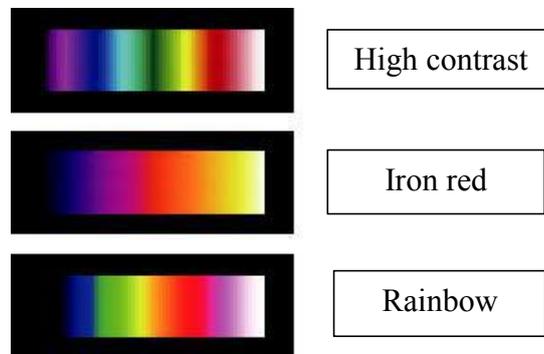
- The measured temperature at the pixel center is displayed at the upper left corner.
- The radiation coefficient is displayed at the upper right corner.

1. Move the product until hot spot or cold spot coincides with the center of pixel.
2. Direct the product to the object to get the optimum measured results. (object temperature is higher or lower than the surroundings temperature.)

## 9. Color palette

“Color palette” menu can change the representation color of the infrared image displayed on the screen or captured. A number of color palettes are available as below:

1. Gray-scale color: provides balanced linear color, help to reveal full details.
2. High-contrast color: emphasize the displayed color, and the color contrast of high-temperature and low-temperature can therefore be improved.
3. Iron red and rainbow color: provide a mixed high-contrast gray-scale color palette.



## 10. Temperature of reflective background

Set the temperature compensation for reflective background in the option of background. The background temperature can be set between 0°C and +36°C.

The surface temperature and measurement accuracy of measured object may be influenced by over-hot or over-cold object (When the radiation coefficient of the surface of the measured object is low, this phenomenon is obvious).

Under many situations, the temperature of reflective background should be adjusted to get the optimum measured result.

# 11. Marking of spot temperature

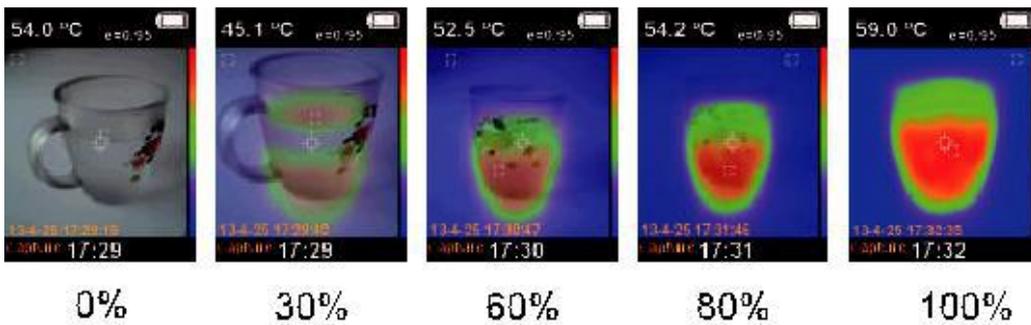
Turn on or off the marking of spot temperature:

1. If turning on, the marking of spot temperature indicates that the hot or cold spot on screen needs additional appraisal.
2. If turning off, it indicates that user can focus on the measured pixel per time.

# 12. Image mixing

IR0001 can capture visible image of infrared image with the temperature distribution of target area clearly displayed on screen, resulting in a easier understanding of infrared image.

To use this function, press “◀”/“▶” to adjust the mixed image from 0% to 100%.



# 13. Image capturing and checking

## 13.1. Image capturing

1. Press image capturing button and the symbol of “store photos yes no” will display on screen.
2. Press “MENU” to store image; press “SELECT” to delete the captured image.

-If “NO SD” displayed at the lower left corner of screen, it indicates SD card is not installed.

-If “FULL” is displayed at the lower left corner of screen, it indicates that SD card is full.

## 13.2. Image checking

1. Press “menu” to enter into the mode of menu.
2. Select the image storage module using the arrow keys.
3. Press the “SELECT” button to choose the picture you want to view.
4. Press the arrow keys to view other pictures.
5. Press the “SELECT” button to view pictures.
6. Press the above key on the screen will display "Delete photo yes no":
  - Press “MENU” to delete the picture
  - Press "SELECT" to cancel.
7. Press the “MENU” button to exit Review.

## 14. Emissivity

The emissivity of the surface of a material is its effectiveness in emitting energy as thermal radiation. The emissivity of the product can be adjusted from 0.10 to 1.00 with the default value of 0.95. Many common objects and materials (such as timber, water, skin and textile fabric) can reflect the heat energy effectively, so it is easy to obtain relatively correct measurement value.

Correct setting of the emissivity value of different objects and materials is very important for carrying out the most accurate temperature measurement. The surface emissivity will produce giant impact on surface temperature measured by the product.

## 15. The Emissivity Value of Common Materials

The product is provided with four types of object measurement modes:

1. Coarse object (easy to give out energy)(0.95);
2. Semi-matte object (0.80);
3. Semi-shiny object (0.60);
4. Shiny object (0.30);

Substance	Thermal radiation	Substance	Thermal radiation
Bitumen	0.90-0.98	Black cloth	0.98
Concrete	0.94	Human skin	0.98
Cement	0.96	Foam	0.75-0.80
Sand	0.90	Charcoal dust	0.96
Earth	0.92-0.96	Paint	0.80-0.95
Water	0.92-0.96	Matte paint	0.97
Ice	0.96-0.98	Black rubber	0.94
Snow	0.83	Plastic	0.85-0.95
Glass	0.90-0.95	Timber	0.90
Ceramics	0.90-0.94	Paper	0.70-0.94
Marble	0.94	Chromium hemitrioxide	0.81
Gypsum	0.80-0.90	Copper oxide	0.78
Mortar	0.89-0.91	Ferric oxide	0.78-0.82
Brick	0.93-0.96	Textile	0.90