

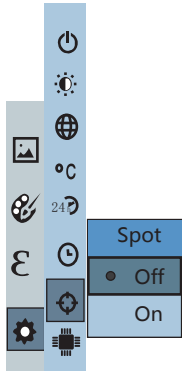
Thermal Imaging Camera

Instruction Manual



9.2. Enable/disable of the highest and lowest temperature cursor

As shown in the figure, after entering the “setting” sub-menu, select the cursor point (spot). Press “▷” key in the navigation key to enter cursor point (spot) setting.



Press “△” / “▽” key to select
“enable” or “disable” the option



Then press “SELECT” key to
determine selection



After the setting is completed,
press “◀” key to return. Press
“MENU” key to exit from the menu

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1. Overview

Thermal Imaging Camera integrates surface temperature measurement and real-time thermal image. The traditional infrared thermometer needs to measure every component one by one while it is not necessary for infrared imaging camera, thus saving time. The potential problems may be displayed on color display screen clearly. Moreover, the central point measurement cursor is used to locate quickly and accurately to measure the temperature of the target object.

In order to increase the differentiation, the product is provided with a visible light camera. The thermal images and visible images are stored in the device and can be read through USB or stored in a computer to generate a report or for print. The supported operating system through verification includes: win XP, win7, win 8, win10, Apple system. It is suggested to use the attached USB cable or USB cable with higher quality.

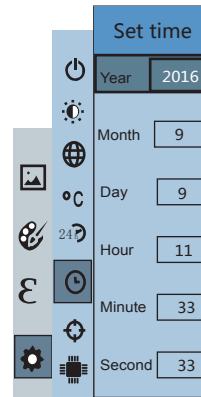
The product can be used in fields of medical treatment, fire fighting, archaeology, traffic, agriculture, geology, energy, smelting, electronic manufacture, etc and is the ideal selection for electrician and maintenance personnel and technicians and can be used to find the problem area quickly.

The following major functions increase the product's accuracy and usability:

- The radiation coefficient may be adjusted to increase the measurement accuracy of objects with half reflection surface.
- The highest temperature and lowest temperature cursor may guide the users to the areas with highest and lowest temperature of the thermal images.
- The selectable color palette.

9.1 Time Setting

As shown in the figure, goto "Setting" sub-menu, then select "setting time menu, Press "▷" key in navigation keys go to "Set time" sub-menu to setup the time, day, month and years.



Press "△" / "▽" to select year/
month/day/hour/minute.



After selecting, press "SELECT"
key to enter the edit state.



Press" <" and ">" keys to select
the figure to be changed. Press
"△" / "▽" key to change the value.
After completing the change, press
"ENTER" to confirm.











After the time setting is completed,
press "<" key to return. Press
"MENU" exit from the sub menu.

9. Introduction to “Setting” Sub-menu

Press “MENU” key to select the “setting” option in the main menu.

Press “▶” key again to enter the “setting” sub-menu.

Settings		
 Auto shutdown ▶	Auto shutdown	NO 5min 20min
 Intensity ▶	Intensity	Low Medium High
 Language ▶	Language	English Chinese
 Unit ▶	Unit	Celsius Fahrenheit
 Time format ▶	Time Format	24 hour AM/PM
 Set time ▶	Set time	Year 2017 Month 12 Day 28 Hour 15 Minute 15 Second 15
 Spot ▶	Spot	Off On
 Version	Version	V2. x. x

2. Considerations and Safety Maintenance

Please read the instruction for use carefully in order to ensure correct measurement result:

- Don't use the device in explosive, flammable or corrosive environment.
- The product belongs to precision electronic and sensitive optical devices. Don't impact and drop it to avoid damage.
- Don't disassembly and remodel the products.
- When the product works, there is light sound of clicking every several seconds. This is normal phenomenon that the lens captures images.
- Please use damp cloth or weak soap to clean the enclosure of the device. Don't use abrasant, isopropanol or solvent to clean. Special optical lens cleaner is used to clean the screen and lens.

3. Performance index

Display screen	3.2 " full angle TFT display screen
Infrared image resolution	220*160
Visible image resolution	300,000 pixels
Field angle/shortest focus length	27°x35° / 0.5m
Thermal sensitivity	0.07°C
Temperature measurement range	-25°C to 450°C (-13°F to 842°F)
Measurement accuracy	±2% / ±2°C
Emissivity	Adjustable from 0.01 to 1.0
Frame rate of thermal images	9Hz
Wavelength coverage	8-14μm
Focus mode	Fixed
Color palette	Rainbow, iron oxide red, cold color, black & white, white & black
Storage medium	Built-in 3G
File format	JPG
USB	Micro USB 2.0
Power supply	Built-in rechargeable battery
Automatic power-off time	Selectable: 5 minutes/20 minutes/ not power off automatically
Product size(length × width × height)	90mm×105mm×223mm
Product weight	389g
Working temperature	0°C to 45°C
Storage temperature	-40°C to 60°C
Relative humidity	< 85%RH

If to select "self-defined" emissivity, please press "SELECT" key to enter the edit state. Press "<" and ">" keys to select the number to be changed. After the change is completed, press "ENTER" key to enter. Then press "△" and "▽" keys to change the value. Press "MENU" key to exit from the menu.

8.3 The Emissivity Value of Common Materials

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

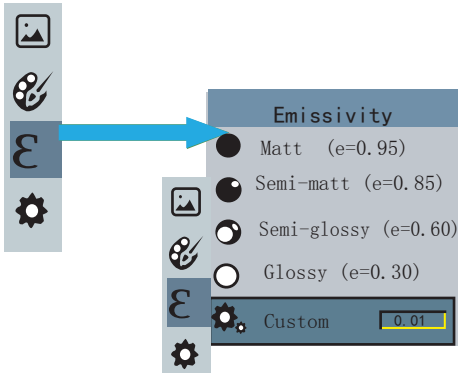
8.2. Emissivity setting

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

- Coarse object (0.95)
- Semi-matte object (0.85)
- Semi-shiny object (0.60)
- Shiny object (0.30)

According to the characteristics of the measured objects, users may set the emissivity value through the “self-define” option (please refer to the table of “emissivity of common materials”).

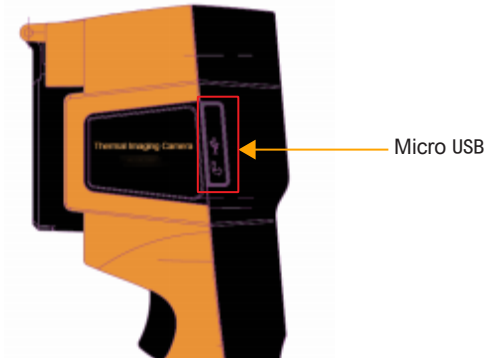
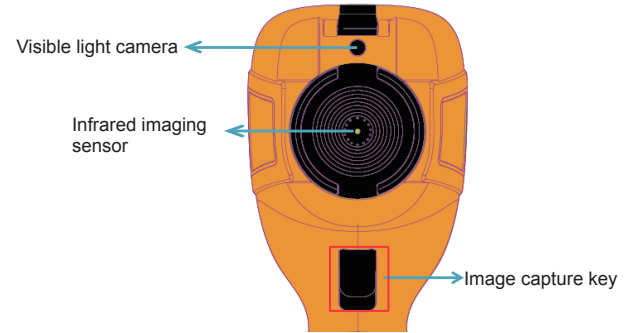
The operating step is as the following:



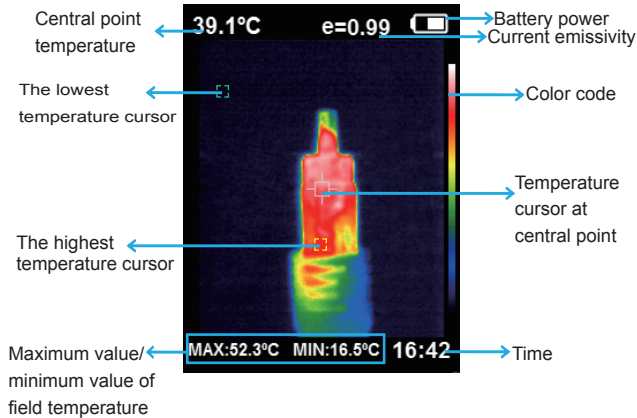
As shown in the figure, press “MENU” key to enter the main menu and select “emissivity” option and press “>” key to enter the emissivity list. Press “△” and “▽” keys in navigation key to select the emissivity. Then press “SELECT” key to confirm selection of the emissivity. Press “<” key again to return.

4. Product Description

4.1. Instruction to structure

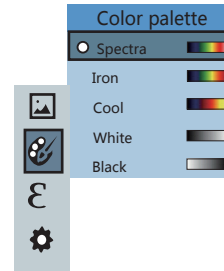


4.2. LCD Screen Description



1. Color code: used to mark the color corresponding to the relative temperature from low to high in the field of view.
2. The central point temperature cursor: used to indicate the central position in the screen area. The cursor color displays white. The temperature value is displayed top left corner of the screen.
3. The highest temperature cursor: used to indicate the highest temperature position in the screen area. It will move with the movement of the highest temperature. The cursor displays red. The temperature value is displayed at bottom left corner of the screen.

7.2 Application of color palette



As shown in the figure, press "MENU" key to enter the main menu and select "color palette" option and press ">" key to enter the color palette list. Press "△" and "▽" keys in navigation to select the color palette. Then press "SELECT" key to select the color palette. Press "<|" key to return. Press "MENU" key to exit from the menu.

8. Introduction to "emissivity" sub-menu

8.1 Emissivity Description

The emissivity of the product can be adjusted from 0.01 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. The emissivity is usually set as 0.95 when the coarse objects that are easy to give out energy. For semi-matte objects that give out less energy, the emissivity is usually about 0.85 and the emissivity of semi-gloss objects is 0.6. The shiny objects are divided into materials with low radiation coefficient. The emissivity is usually set as 0.3 at the time of measurement. Correct setting of the value of emissivity is very important for you to carry out the most correct temperature measurement. The surface emissivity will produce giant impact on surface temperature measured by the product. Understanding the surface emissivity will enable you to obtain correct temperature measurement result.

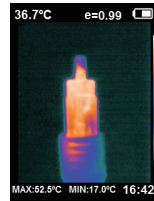
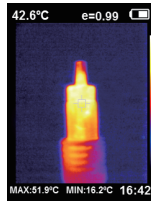
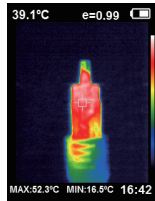
7. Introduction to “color palette” sub-menu

7.1 Color Palette Description

The menu of color palette can change the false color of infrared thermal image. The product provides five types of color palette: rainbow, iron oxide red, cold color, white heat and black heat.

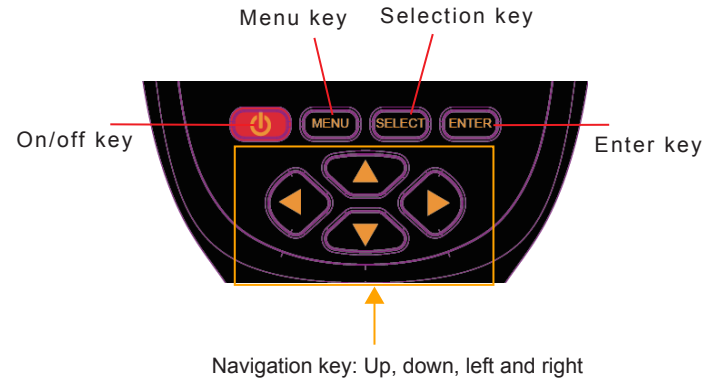
Suitable selection of color palette displays the details of the target objective better. Rainbow, iron oxide red and cold color palettes focus on display of color. Such color palettes are very suitable for high heat contrast and are used to improve the color contrast between high temperature and low temperature. But the black & white and white & black color palettes provide even linear color.

The following is the image of the same object with selection of different color palettes.



- The lowest temperature cursor: used to indicate the lowest temperature position in the screen area. It will move with the movement of the lowest temperature. The cursor displays green. The temperature value is displayed at the central position of the screen.

4.3. Key Description



5. Operation Instruction

5.1 Charging: the product is provided with built-in 18650 lithium battery. When the battery power is not sufficient, please charge it through Micro USB interface in time.

5.2 On/off key: hold down “ \mathcal{U} ” key to power on /off.

5.3 Switching between infrared thermal image and visible image: press “ \triangleleft ” or “ \triangleright ” key to switch the degree of fusion between infrared thermal images and visible images (the degree of fusion is 0%, 25%, 50%, 75% and 100%).

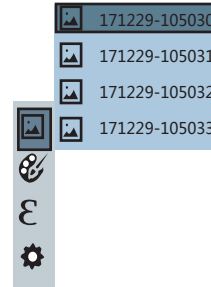
5.4 Image capture: press the image capture key. When the capture is successful, the screen will display “store photo?” prompt. If “yes” is selected, please press “MENU” key to confirm to save the image. If “no” is selected, press “SELECT” key to confirm not to save the image.

5.5 The function to hide highest/lowest temperature column at the screen bottom: under the operation after normal start up, press “ \triangle ” key and the screen bottom will display highest/lowest temperature column. Press “ \triangle ” can also hide it.

5.6 Image output: The saved images through capture may be checked and output by connecting with a computer through Micro USB.

6. Introduction to “image” sub-menu

6.1. View image



As shown in the figure, press “MENU” key to select “image” option in the main menu. Then press “ \triangleright ” key to enter image list. Press “ \triangle ” or “ ∇ ” key in navigation to select the image. Then press “SELECT” key to view image. When viewing the images, press “ \triangleleft ” key to view the previous image. Press “ \triangleright ” to view the next image. Press “ENTER” key to return. Press “MENU” key to exit from the menu.

6.2. Delete images

When viewing the images, the screen will show the prompt of “Delete photo?” by pressing “ \triangle ” key. If “yes” is selected at the moment, press “MENU” key to confirm to delete the image. If “no” is selected, press “SELECT” key to confirm not to delete the image.