



# Thermal Imaging Camera Instruction Manual




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## Charging of the battery and description

### Use USB data line to charge:

- The product has built-in chargeable 18650 lithium batteries.
- When the battery level is low, the top right of the screen will display “  ”.Please charge in time through Micro USB interface (When the product is off, you can charge) .
- Pull off the USB line after fully charging.

### To make the lithium ion battery can play the perfect performance:

- Don't place the battery on the charger exceeding 24 hours.
- The thermal imaging device should be charged for two hours at least every three months so as to extend the battery service life to the greatest extent.
- Don't try to charge the battery in extremely cold environment.

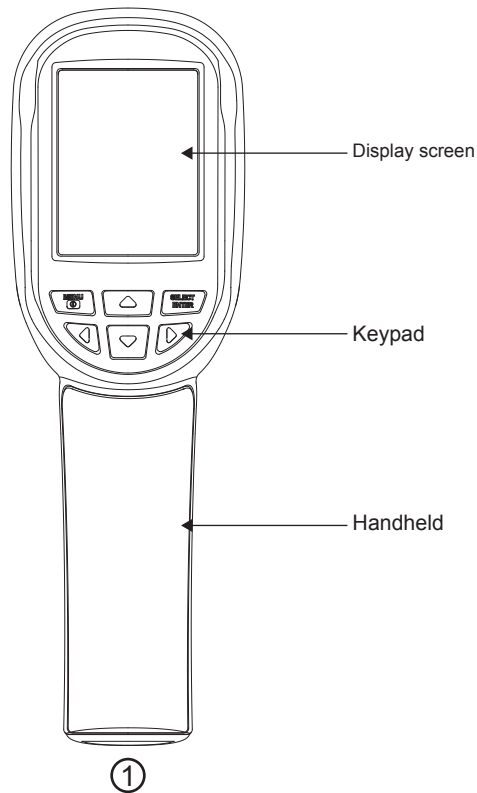
## Performance index

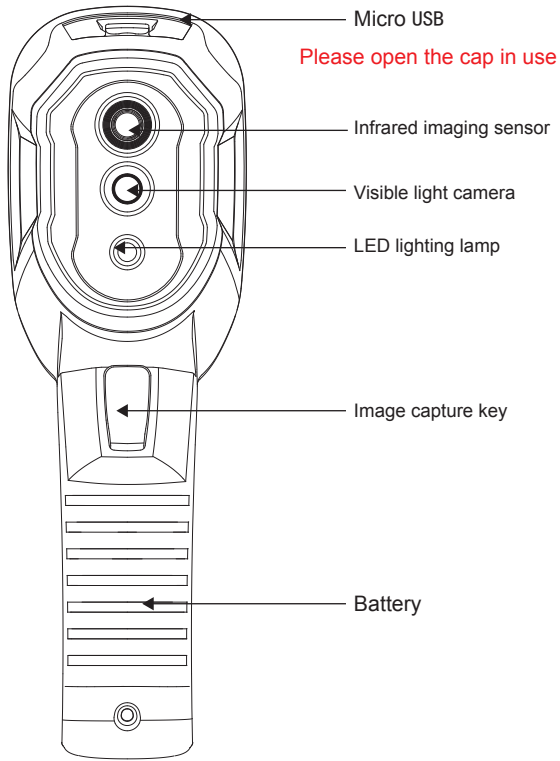
Model	HT-04D	HT-04(new)
Display screen	2.8-inch full-view TFT display	2.8-inch full-view TFT display
Temperature measurement range	-20°C to 450°C (-4°F to 842°F)	-20°C to 300°C (-4°F to 572°F)
Measurement accuracy	±2°C/±2% (Greater than 300°C accuracy is ± 5%)	±2°C/±2%
Infrared image resolution	160×120	220×160
Visible image resolution	300000 pixel	35200 pixel
LCD resolution	320×240	320×240
Field angle	35°×26°	35°×26°
Shortest focus length	0.15M	
Thermal sensitivity	0.07°C	
Frame rate of thermal images	9Hz	
Focus mode	Fixed	
Wavelength coverage	8-14um	
Emissivity	Adjustable from 0.01 to 1.00	

Color palette	Rainbow, iron oxide red, cold color, black & white, white & black
Storage capacity	Built-in 3G (above 20 thousand image stored)
File format	JPG
USB	Micro USB 2.0
Power supply	Built-in chargeable 18650 battery Detachable
Working time	2-3 hours
Setting command	Unit, language, date, time, information
Language	English、 Chinese、 Italian、 German
Automatic power-off time	Selectable: 5 minutes/20 minutes/ not power off automatically
Product size	96mm×72mm×226mm
Product weight	389g
Work temperature	0 C to 45 C
Storage temperature	-20 C to 60 C
Relative humidity	< 85%RH

## Product description

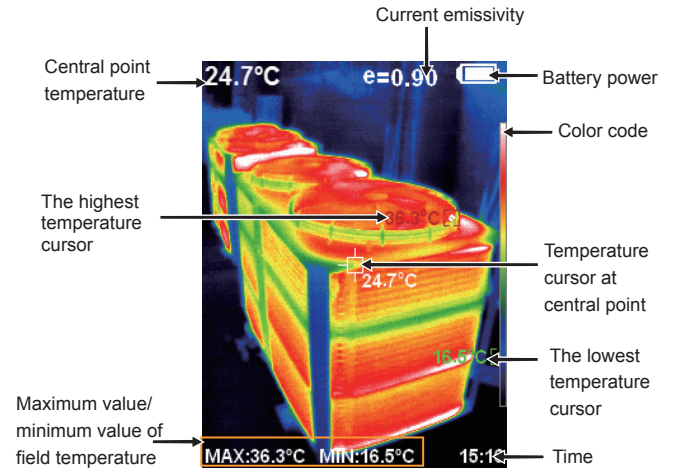
### 1. Instruction to structure





②

## 2. Display description



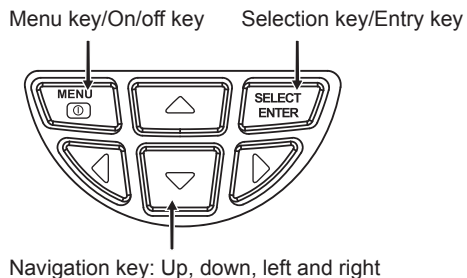
Color code: used to mark the color corresponding to the relative temperature from low to high in the field of vision.

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.

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.

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 red. The temperature value is displayed at the central position of the screen.

### 3. Key description



## Initial operation

- Product boot/shutdown

Press and hold the “ MENU/ ⏻ ” button for more than 3 seconds to turn the Thermal Imaging on or off.

- LCD screen display

After turning on the power, the screen shows the thermal imaging status.

Note:

Time adjustment may be required when you move the camera between environments with widely varying ambient temperatures.

- On/off of LED lighting lamp

Hold down the “image capture” key for about 5 seconds to power on/off the LED lighting lamp.

- Switching between infrared thermal image and visible image

press “ ◀ ” or “ ▶ ” key to switch the degree of fusion between inferred thermal images and visible images (the degree of fusion is 0%, 25%, 50%, 75% and 100%).

- 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 determine to save the image. If “no” is selected, press “ SELECT/ENTER ” key to determine not to save the image.

- The function to hide highest/lowest temperature column at the screen bottom

under the operation after normal start up, press “ ▲ ” key and the screen bottom will display highest/lowest temperature column. Press “ ▲ ” can also hide it.

- Image output

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

- Read images

Open the USB protective cover as shown in ② . Use USB line to connect the USB port and then computer to read the images or save it into computers.images or save it into computers.

The supported operating system through verification includes: winxp, win7, win 8, win10, Apple system.

It is suggested to use the attached USB line or USB line with higher quality.

Note:

When connecting with a computer, pull off the data line after selecting “pop out device safely” to avoid causing file system damage and other problems. If “unable to save” and other problems occur, you may find the hard disc in the computer and fix it.

## Introduction to the menu


Press the left of “ MENU/ ⏻ ” key and the menu bar appears. They are “image overlapping”, “image”, “color palette”, “emissivity” and “setting” submenus.

### 1.“Image overlapping” submenu

#### 1.1. Description of image overlapping

Image overlapping makes it easier for users to understand the infrared images by using aligned visible images and infrared images. The use of image overlapping can capture the visible image of every infrared image so as to display the temperature distribution in the target region correctly and share with other people more effectively.

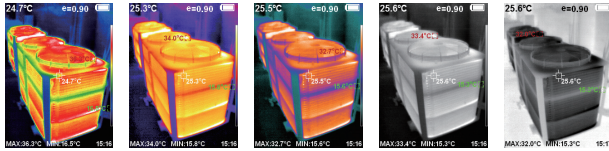
#### 1.2. Application of Image overlapping

Press the “ MENU/ ⏻ ” button to enter the main menu, and select “  ” (Image registration) in the main menu.

Press the “ SELECT/ENTER ” button to enter the image overlap adjustment mode.Press the navigation keys (up, down, left and right buttons) to perform the visible image shift operation.

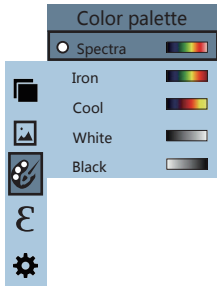
Press the “SELECT/ENTER” button to exit the image blending mode (Note: If there is no operation for more than 6 seconds, the image blending mode will be automatically exited).

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



Rainbow Iron oxide red Cold color White heat Black heat

### 3.2. Application of color palette



As shown in the figure, press “ MENU/  $\cup$  ” key to enter the main menu and select “  $\text{☉}$  ” (color palette) option and press “  $\blacktriangleright$  ” key to enter the color palette list. Press “  $\blacktriangle$  ” and “  $\blacktriangledown$  ” keys in navigation to select the color palette. Then press “SELECT/ENTER” key to select the color palette. Press “  $\blacktriangleleft$  ” to return. Press “MENU/  $\cup$  ” key to exit from the menu.

## 4. Introduction to “emissivity” sub-menu

### 4.1. 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.

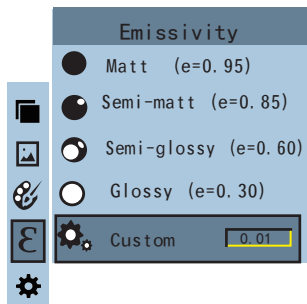
## 4.2. Emissivity setting

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 “  $\epsilon$  ”(emissivity) option and press “  $\blacktriangleright$  ” key to enter the emissivity list.

Press “  $\blacktriangle$  ” and “  $\blacktriangledown$  ” keys in navigation key to select the emissivity. Then press “ SELECT/ENTER ” key to determine selection of the emissivity. Press “  $\blacktriangleleft$  ” key again to return.

If you select "self-defined" emissivity, press the " SELECT/ENTER " button to enter the editing state. Press “  $\blacktriangleleft$  ” / “  $\blacktriangleright$  ” keys to select the number to be changed, press “  $\blacktriangle$  ” “  $\blacktriangledown$  ” keys to change the value. After themodification is completed, press “ SELECT/ENTER ” to confirm, then press“  $\blacktriangleleft$  ” to return. The “ MENU/⏏ ” button exits the menu.

## 4.3. 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