Thermal Imaging Camera IR0018

Instruction Manual

Contents

IR0018 is an infrared camera that integrates surface temperature measurement and real-time thermal image. With this product, the potential problems can be identified on the color display screen which is helpful for users to locate the problem, take readings and solve the issue.

The product has a visual camera integrated to increase the differentiation degree. The thermal images and full vision images can be stored in the device and can be transferred to a computer to generate report and printing.

The following are the major features of IR0018:

- **High accuracy:** The adjustable radiation coefficient increases the measurement accuracy of reflective surfaces.

- **Time-saving:** The traditional infrared thermometer needs to measure every component one by one, this is not necessary for IR0018.

- **Easy to use:** Turn on the device and start measuring temperatures straight away.

- **User-friendly:** The thermal point and cold point temperature automatically marks the area with the highest or lowest temperature in real time.

- **Adjustable:** Five types of color palettes and emissivity values provided.

1. Overview

The product can be utilized in many fields, for instance:

1. **Detect spills and leaks of chemicals:** which have different thermal signatures to the surroundings.

2. **Fire fighting:** Vision can be obscured by smoke and debris in the event of a fire, thermal imaging can see through this and locate victims or fire spots.

3. **Locate the source of abnormal leaking of heat:** of a house or a machine, find out the problem area and fix it.

4. **Enable drug-enforcement:** units to locate cannabis plants by detecting abnormal amount of heat spot in buildings.

5. **Moisture detection:** Areas with lower temperatures to its uniform surroundings can be a source of moisture staining or damage.

6. **Measure body temperatures:** Point the thermal imaging camera at a person to find their surface body temperature

7. **Night vision:** Measuring the electromagnetic energy given off when objects emit heat, the IR0018 translates those energy into visible light for users to see them in the dark.

8. **Building inspection:** Check that heat is retained uniformly in a building.

IR0018 is the ideal selection for electrician, maintenance personnel, technicians and even the emergency personnel.

DANGER

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

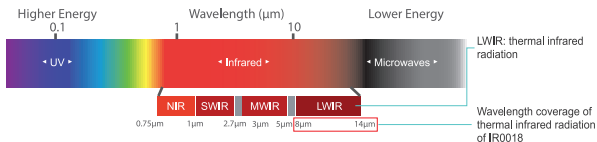|	
🚫	🚫
Do not use the device in explosive, flammable or corrosive environments.	When the product works, there is a tiny clicking sound every several seconds. This is a normal phenomenon as the lens captures images to produce electronic noises.
🚫	🚫
Since the product is a precision electronic and sensitive optical device, do not drop it or allow impacts to occur to prevent damage.	It is suggested to use the attached USB cable
🚫	🚫
Do not dismantle the product, doing so can damage it and revoke the warranty.	Please use a damp cloth or gentle soap to clean the enclosure of the device. Do not use abradant, isopropanol or solvent to clean. Special optical lens cleaner should be used to clean the screen.

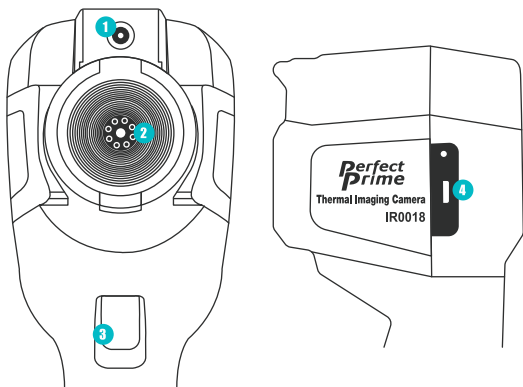|	
Display screen	3.2" full angle TFT display screen
Infrared image resolution	220 ×160
Visible image resolution	640x480 (300,000 pixel)
Field angle/shortest focus length	27°× 35°/0.5m
Thermal sensitivity	0.07°C
Temperature measurement range	-20~300°C (-4°F~572°F)
Test and measurement precision	±2°C or ±2%
Emissivity	Adjustable from 0.01 to 1.0
Image capture frequency	9 Hz
Wavelength coverage	8-14um
Focus mode	Fixed
Color palette	Spectra, iron, cool black and white
View option	Full infrared and full vision Visible image with 25% increments

Storage medium	Built-in 4 GB
Image format	JPG
Power supply	Built-in chargeable 18650 lithium batteries
USB	Micro USB 2.0
Automatic power-off time	Selectable: 5 minutes/20 minutes/ do not power off automatically
Product size (length × width × height)	90 mm×105 mm×223 mm
Product Weight	389g
Work temperature	0℃ -50℃
Storage temperature	-40℃ +80℃
Relative humidity	< 85%RH

Higher Energy   Wavelength (μm)   Lower Energy
0.1   1   10

‹ UV ›   ‹ Infrared ›   ‹ Microwaves ›

NIR   SWIR   MWIR   LWIR
0.75μm   1μm   2.7μm 3μm   5μm 8μm   14μm

LWIR: thermal infrared radiation

Wavelength coverage of thermal infrared radiation of IR0018

4.1. Physical features

① Visible light camera
② Infrared imaging sensor
③ Image capture trigger
④ Micro USB

## 4.2. Key description

1. Central point temperature cursor

This pointer will always remain at the centre of the screen and allow the user to move the camera to identify the temperature of where they point.

2. Thermal point temperature cursor

This pointer will automatically locate and display the highest temperature on the screen.

3. Cold point temperature cursor

This pointer will automatically locate and display the lowest temperature on the screen.
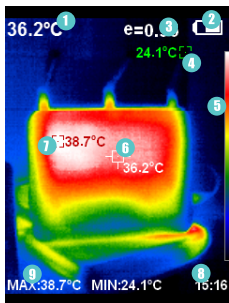
① Central point temperature

② Battery power

③ Current emissivity

④ Cold point temperature cursor

⑤ Color code

⑥ Temperature cursor at central point

⑦ Hot point temperature cursor

⑧ Time

⑨ Maximum /minimum value of field temperature

4.3. Button features
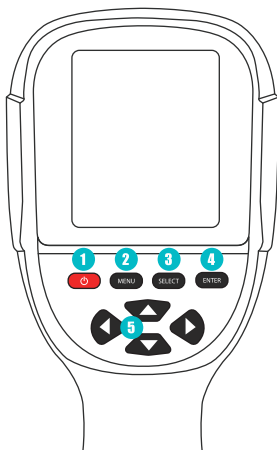
1 On/off key
2 Menu/No key
3 Select/Yes key
4 Enter key
5 Navigation key: Up, down, left and right

1. Charging: when the battery power is low or empty, please charge it using the micro USB cable provided.

2. Power on/off the instrument: hold down " ⏻ " key for several seconds.

3. Change fusion mode: press " ◄ " and " ► " to switch between fusion modes which blend thermal images and visible light images together.

→ The degree of fusion is 0%, 25%, 50%, 75% and 100%.

4. Image capture: press the image capture key, then the screen will display "store photo?":

→ If "yes", please press "MENU" key to save the image.
→ If "no", press "SELECT" key to determine not to save the image.

5. Show or Hide the bottom bar: press " ▲ " to hide the bottom bar of the screen which shows the maximum / minimum value and time of the field temperature. Press " ▲ " again to display the bottom bar.

6. Image export: use the Micro USB cable to connect the IR0018 to a computer to transfer the files.

The location of the visible light camera is above the infrared imaging sensor which is at the centre of the camera. Together they produce an image overlay (in between visible light mode and infrared mode) which would show the visible light image over the infrared image just like the left image below.
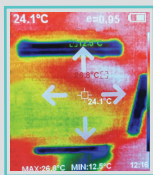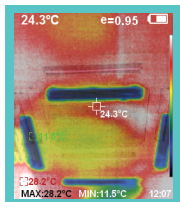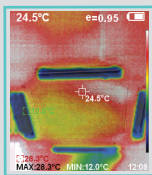

The Image Registration feature helps to adjust the positions of the visible light image and infrared image to make sure they align.

Image registration adjustment mode

Image registration after adjustment

To access this feature, press the menu button, then select Image Registration (see right image above). Use the arrow keys to adjust the position of the images until they align.

Image registration	►
Images	►
Color palette	►
Emissivity	►
Settings	►
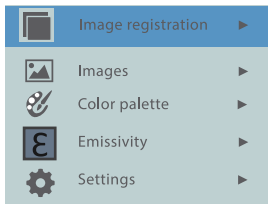
The menu of color palette can change the false color on the display screen or capture infrared image. There are five types of color palettes provided: spectra, iron, cool, black and white .

Suitable selection of color palette displays the details of the target objective better:

1. **Spectra, iron and cool color**
- Focus on display of color
- Suitable for high heat contrast
- Improving the color contrast between high and low temperature

2. **White and black color**
- Provide even linear color.

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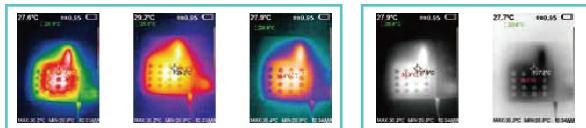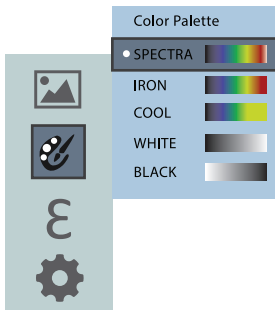

| Spectra | Iron | Cool | White | Black |

8.1. Application of color palette

Color Palette
- SPECTRA
- IRON
- COOL
- WHITE
- BLACK
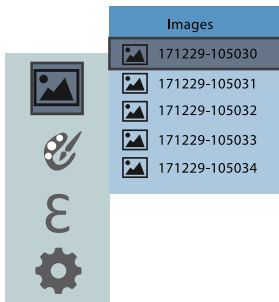
1. Press "MENU " to select;

2. Select "color palette"and press " ► " to enter the color palette list.

3. Press "▲ "and " ▼ " to select color palette.

4. Press "SELECT" to confirm the choice.

5. Press " ◄" to return.

6. Press "MENU" to exit from the menu.

8.2. Check images/Delete images

Images
🖼 171229-105030
🖼 171229-105031
🖼 171229-105032
🖼 171229-105033
🖼 171229-105034

1. Select the images menu and press " ▶ " to enter the image menu
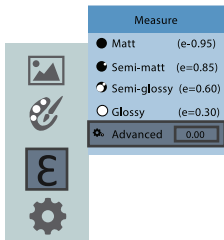2. Press "▲ "/"▼ " to adjust the selected items.
3. Press "SELECT" key to view the image.
4. Press " ◀"/" ▶ " to check the previous/next image.
5. Press "ENTER" key to return. Press "MENU" key to exit.
6. Image deletion: during image checking, press "▲ " key and the deletion mode appears. Press "MENU" key to delete images or press "SELECT" key to cancel deletion.

According to the characteristics of the objects and surfaces to be measured, users may select corresponding measurement modes or enter "advanced" option to adjust the value of emissivity (please refer to the table of "emissivity of common materials").

The operating step is as the following:

1. Select the "measure objects"; press " ► " key to enter the sub-menu.

Measure
- ● Matt (e-0.95)
- ◕ Semi-matt (e=0.85)
- ✺ Semi-glossy (e=0.60)
- ○ Glossy (e=0.30)
- ✿ Advanced   0.00

2. Press " ▲ " and " ▼ " to select the emissivity.

3. When the item is chosen, press "SELECT" to confirm.

4. If "self-defined" emissivity is chosen, press "SELECT" key to enter the edit state.

5. Press " ◄ " and " ► " keys to select the number to be changed.

6. Press " ▲ " / " ▼ " to adjust the value.

7. Press "SELECT" to confirm after editing.

8. Press "MENU" key to exit.

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) will reflect heat energy, so it is easy to obtain high accuracy as a result.

Choosing the correct setting of the emissivity value of different objects and materials is very important for achieving accurate temperature measurement. The surface emissivity will greatly affect the measured temperature and therefore adjusting the emissivity value to match it is essential.

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);

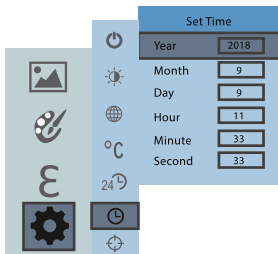| Substance	Thermal radiation	Substance	Thermal radiation
Bitumen	0.90-0.98	Black cloth	0.98
Concrete	0.94	Human skin	0.98
Cement	0.96	Foam	0.75-0.80
Sand	0.90	Charcoal dust	0.96
Earth	0.92-0.96	Paint	0.80-0.95
Water	0.92-0.96	Matte paint	0.97
Ice	0.96-0.98	Black rubber	0.94
Snow	0.83	Plastic	0.85-0.95
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	0.78-0.8
Brick	0.93-0.96	Textile	0.90

Settings

⏻ **Auto shutdown** ▶
No
5 min
20 min

☀ **Display intensity** ▶
Low
Medium
High

🌐 **Language** ▶
English
Chinese
Italian
German

℃ **Unit** ▶
Celsius
Fahrenheit

Time format ▶
24 Hours
AM/PM

🕐 **Set time** ▶

Year	2017
Month	12
Day	28
Hour	15
Minute	15
Second	15

⊕ **Spot** ▶
On
Off

13. Time Setting

Set Time

Year	2018
Month	9
Day	9
Hour	11
Minute	33
Second	33

1. Press " ▲ "/" ▼ " to select year/month/day/hour/minute.

2. Press "SELECT" to enter edit.

3. Press " ◄" and "► " to select the figure to be changed.

4. Press " ▲ "/" ▼ " to adjust the selected items.

5. After editing, press "ENTER" to confirm.

5. Press left key or "MENU" key to return and complete the setting.

14. Capture Thermal Points

Capture thermal points are the three different cursors which measure the temperatures (The central, highest and lowest temperature points).

Find the "Spot" under the "setting" menu to enable and disable the function.

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