Thermal Imaging Camera
IR0280H (for Human Body Temperature)

Instruction Manual

Perfect Prime
www.perfectprime.com
## Table of Contents

1. Overview ................................................................. 2 - 4
2. Safety & Considerations ............................................. 5
3. Product Features ......................................................... 6
4. Product Specifications .................................................. 7 - 8
5. Operation Flow
   5.1. Power On .............................................................. 9
   5.2. Power Off .............................................................. 9
   5.3. Display Off (Sleep Mode) ........................................ 9
   5.4. Menu Screen ......................................................... 9 - 10
   5.5. Measurement Screen ............................................. 11 - 12
   5.6. Display Brightness ............................................... 13
   5.7. Date and Time ....................................................... 13
   5.8. Auto-off Timer ..................................................... 13
   5.9. Hi-Low Temperature Alarm ..................................... 14
   5.10. Auto-monitor Alarm ............................................ 14
   5.11. Temperature Unit ................................................ 15
   5.12. Image Format ..................................................... 15
   5.13. Factory Reset ..................................................... 15
   5.14. Min/Max Crosshair ............................................. 15 - 16
   5.15. Color Palette ..................................................... 16
   5.16. Color Palette Guide ............................................. 16
   5.17. View Images/Videos ............................................ 17
   5.18. Delete Images/Videos ........................................... 18
   5.19. Image Overlay Adjusting ...................................... 18
   5.20. CSV Files .......................................................... 19
   5.21. Emmisivity ........................................................ 19 - 20
   5.22. Body Temperature Mode ....................................... 21
   5.23. Fever Alarm ......................................................... 21 - 22
   5.24. Fever Image Capture ........................................... 22
   5.25. Thermal View ...................................................... 23
   5.26. Body Temperature Filters Selections ....................... 23
IR0280H Thermal Camera is a body temperature thermometer with thermal imaging, which have two types of measurement modes: Human body temperature measurement, and object surface temperature measurement. Object surface temperature measurement mode: It can effectively detect the temperature changes and perform accurate temperature measurement on the target surface. Human body temperature measurement mode: It can measure the human body temperature from a longer distance with the effective range, and has a tracking mode to chase for the highest temperature, fever alarm, and taking photo for fever alarm functions.

The handheld body thermal camera is designed based on ergonomics. It is most suitable for handheld for a long period of time. And, it can also be fixed on the tripod for continuous monitor function. It is suitable for operating in a variety of working environments, such as electricity, mechanical, pipelines, and data center equipment.

The human body temperature measurement function can be used at home, office, shopping mall, school, etc.

The following are the major features of IR0280H:

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

2. **Time-saving:** The traditional infrared thermometer needs to measure every component one by one, this is not necessary for the IR0280H.
1. Overview

3. Easy to use: Turn on the device and start measuring temperature right away.

4. Image & Video: The IR0280H has the capabilities to take both images and videos, making it easier for users to analyze the situation.

5. Adjustable: 9 types of color palettes and wide range of emissivity values provided.

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 re 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.
1. Overview

7. **Night vision**: Measuring the electromagnetic energies given off when objects emit heat, the IR0280H translates those energies into visible light for users to see them in the dark.

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

IR0280H is the ideal selection for electrician, maintenance personnel, technicians and even the emergency personnel.
# 2. Safety & Considerations

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

<table>
<thead>
<tr>
<th>DANGER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not use device in explosive, flammable or corrosive environment.</td>
</tr>
<tr>
<td>Since the product is a precision electronic and sensitive optical device. Do not drop it or allow impacts to occur to prevent damage.</td>
</tr>
<tr>
<td>It is suggested to used the attached USB cable.</td>
</tr>
</tbody>
</table>

3. Product Features

1. Menu Button
2. Up, Down, Left and Right Keys
3. Power Button
4. USB Port & SD Card Slot
5. Visible Light Camera
6. Thermal Camera
7. Measure Button
### 4. Product Specifications

<table>
<thead>
<tr>
<th><strong>Display Screen</strong></th>
<th>2.8&quot; LCD Color Display</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infrared Image Resolution</strong></td>
<td>32 x 32 (1,024 Pixels)</td>
</tr>
<tr>
<td><strong>Visible Image Resolution</strong></td>
<td>0.2 Mega Pixels</td>
</tr>
<tr>
<td><strong>Field Angle / Shortest Focus Length</strong></td>
<td>33° x 33°/0.1m</td>
</tr>
<tr>
<td><strong>Human Mode Temperature Range</strong></td>
<td>32°C<del>42°C (89.6°F</del>107.6°F)</td>
</tr>
<tr>
<td><strong>Industrial Mode Temperature Range</strong></td>
<td>-30 to 1000 °C (-22 to 1832 °F)</td>
</tr>
<tr>
<td><strong>Measuring Accuracy for Human Mode</strong></td>
<td>± 0.3°C (± 0.6°F)</td>
</tr>
<tr>
<td><strong>Measuring Accuracy for Industrial Mode</strong></td>
<td>±2 % or ± 2 °C</td>
</tr>
<tr>
<td><strong>Emissivity</strong></td>
<td>Adjustable from 0.01 to 1.0</td>
</tr>
<tr>
<td><strong>Spectral Range</strong></td>
<td>8-11.5um</td>
</tr>
<tr>
<td><strong>Image Frequency</strong></td>
<td>9Hz</td>
</tr>
<tr>
<td><strong>Focus Mode</strong></td>
<td>Fixed</td>
</tr>
<tr>
<td><strong>Color Palettes</strong></td>
<td>9 Options</td>
</tr>
<tr>
<td><strong>View Option</strong></td>
<td>Full Infrared and Full Vision Thermal Overlay with 25% Increment</td>
</tr>
<tr>
<td><strong>Storage Medium</strong></td>
<td>1GB Internal Memory + 16GB SD Card Included</td>
</tr>
<tr>
<td><strong>Image Format</strong></td>
<td>BMP, JPG, MP4</td>
</tr>
<tr>
<td><strong>Power Supply</strong></td>
<td>3.7V Lithium-ion Chargeable Battery 2500mAh, Size 18650</td>
</tr>
</tbody>
</table>
# 4. Product Specifications

<table>
<thead>
<tr>
<th>USB</th>
<th>Mini USB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto-Power off Time</td>
<td>Selectable from 0 to 30 mins</td>
</tr>
<tr>
<td><strong>Product Size (Length x Width x Height)</strong></td>
<td>215 x 55 x 62 mm</td>
</tr>
<tr>
<td><strong>Product Weight</strong></td>
<td>230g</td>
</tr>
<tr>
<td><strong>Work Temperature</strong></td>
<td>-10 to 50°C</td>
</tr>
<tr>
<td><strong>Storage Temperature</strong></td>
<td>-20 to 60°C</td>
</tr>
</tbody>
</table>
5. Operation Flow

5.1. **Power ON:** Press & Hold Power button for 2 sec.

- Opening Screen (wait for initialization)
- Measurement Screen

5.2. **Power OFF:** Press & Hold Power button for 2 sec.

- A pop-up menu appears for Power Off or Reboot selection.
- Use Up/down button to select, and press Measure button to confirm.

5.3. **Display OFF (Sleep Mode):** Press Power button once to turn off display. Press Power button again to turn on it.

Remark:
a. The Measurement screen is the default screen when turn on the display.

5.4. **Menu Screen:** Press the Menu button to enter Menu mode.

- The default selection is first icon (i.e. Display brightness)
- Use Up/Down/Left/Right button to select the icon.
- Then, press Measure button to open the selected item.
- Press Menu button to back to Measurement Screen.
5. Operation Flow

The summary of Menu icons:

- **Display Brightness**: To set the brightness of display
- **Date and Time**: To set time and date
- **Auto-Off Timer**: To set the auto-off timer for the Display
- **Fever Alarm**: To set the fever temperature alarm
- **Auto-monitor Alarm**: To capture the thermal image when over the Temperature Alarm over a period of time
- **Temperature Unit**: To set temperature unit degree C° / degree F°
- **Emissivity**: To adjust the emissivity from 0.01 to 1.0
- **View Image**: To view the captured thermal image/video
- **Image format**: To set the image output format (Bitmap or JPEG)
- **Factory Reset**: To reset factory setting
- **Color Palette**: To select the thermal image color palette
- **Trash**: To delete image/video permanently
- **Body Temperature Filter**: To enable the body temperature mode
5. Operation Flow

5.5. Measurement Screen

- Press Menu button to enter Menu mode.
- Press Left button to select filter mode: Temporal filter, Wide Gaussian filter, No filter.
5. Operation Flow

- Press Right button to select zoom in or zoom out.

- Press Measure button to capture image; Press & Hold Measure button to take video.

If external SD card is not present, the image will be saved to the internal memory. If external SD card is present, the image will be saved to the SD card.

The recording icon appear to indicate the video recording. The video is saved in mp4 format. When the measure button is released, the recording will stop and be saved.

- Touchable object temperature mark

Touch the screen to move the object temperature mark, and show the temperature of that location.
5. Operation Flow

5.6. Display Brightness

- Press Left/Right button to increase/decrease the % of display brightness.
- Press Measure to confirm.
- Press Menu to return to the previous screen.

5.7. Date and time

- Press Up/Down button to increase/decrease the selected item.
- Press Left/Right button to select the item for change.
- Press Measure to confirm.
- Press Menu to return to the previous screen.

5.8. Auto-off timer

- Press Left/Right to increase/decrease the selected item.
- Press Up/Down to select the Minute or Second.
- Press Measure to confirm.
- Press Menu to return to the previous screen.

Remark:
a. The minimum Auto-off timer is 0 min,30 sec.
b. The maximum Auto-off timer is 30 min,0 sec.
c. The timer is for Display OFF only.
5. Operation Flow

5.9. Hi-Low Temperature Alarm

- Press Left/Right button to increase/decrease the selected item.
- Press Up/Down button to select the High or Low Temperature setting.
- Press Measure to confirm
- Press Menu to return to the previous screen.

Remark:

a. The Hi-Low Temperature Alarm is OFF by default.
b. Press and Hold Measure button to turn ON or OFF the Hi-Low Temperature Alarm

5.10. Auto-Monitor Alarm

- Press Left/Right button to increase/decrease the selected item.
- Press Up/Down button to select the Temperature or Duration.
- Press Measure to confirm.
- Press Menu to return to the previous screen.

Remark:

a. Duration is from 15min, 30min, 45min, 60min, 90min and 120min.
b. The Auto-monitor Alarm Duration is OFF by default.
c. Press and Hold Measure button to turn ON or OFF the Auto-Monitor Alarm.
5. Operation Flow

5.11. Temperature Unit
- Press Left/Right button to select degree °C or degree °F.
- Press Measure to confirm.
- Press Menu to return to the previous screen.

5.12. Image Format
- Press Left/Right to select BMP or JPG image format.
- Press Measure to confirm.
- Press Menu to return to the previous screen.

5.13. Factory Reset
- Press Left/Right button to select YES or NO.
- Press Measure to confirm.
- Press Menu to return to the previous screen.

5.14. Min/Max Crosshairs
Min/Max ON  Min/Max OFF
5. Operation Flow

Remark:

a. When ON, exact maximum and minimum points and temperatures will both show on the measurement screen.

b. When OFF (default), maximum and minimum temperatures will only show at the bottom of the measurement screen.

5.15. Color Palette

- Press Up/Down button to select the color palette.
- Press Measure to confirm.
- Press Menu to return to the previous screen.

5.16. Color palette guide

- Press Left/Right button to select ON or OFF.
- Press Measure to confirm and back to the previous screen.
- Press Menu to back to the previous screen.

- Palette guide ON
- Palette guide OFF
5. Operation Flow

5.17. View Images/Videos

- Press Up/Down/Left/Right button to select Image Icon.
- Press Measure to open image/video; Press and Hold Measure to delete selected item.
- Press Menu to return to the previous screen.

a) View Image or Video

- For the video, press Measure button to start the video
- Press Left/Right button for Previous/Next Image or Video.
- Press Menu button to return to the previous screen

b) View Image with touchable object temperature mark

- Touch the screen to show the temperature of that location.

c) Delete Image or Videos

- Hold the measure button until the pop-up menu appears.
- Press Left/Right button to select BACK or Trash icon.
- Press Measure to confirm.
5. Operation Flow

5.18. Deleted Images/Videos

- Press Up/Down/Left/Right button to select Image Icon.
- Press Measure to open the image or video; Press and Hold Measure to pop-up the recover or permanent delete menu.
- Press Menu to return to the previous screen.

a) Recover Image

- Press and Hold Measure to pop-up the recover or permanent delete menu.
- Select the Recover button, and press Measure to confirm.
- The selected item will be recovered.

b) Permanently delete image

- Select the Permanent Delete button, and press Measure to confirm.
- The selected item will be deleted permanently.

5.19. Image Overlay Adjusting

When using the Image overlay mode (50% infrared, 50% visual), hold on to the menu button until you see the word “calibration” at the top of the screen in red. Use the Up/Down/Left/Right key to adjust the thermal image and visual image until they align (see above images for reference).
5.20. CSV Files

For every image you take, CSV Files of each image would be saved for you to analyze and generate reports. The file shows the temperature point of each 32 x 32 pixel. You can view these files in Internal Storage/SD Card -> DCIM -> Csv.

Here is an example of what the file looks like:

![CSV File Example](image)

5.21. Emissivity

- Press Up/Down button to adjust the emissivity.
- Press Measure to confirm
- Press Menu to return to the previous screen.
There are four types of object measurement mode:

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);

**The table of Emissivity Table:**

<table>
<thead>
<tr>
<th>Substance</th>
<th>Thermal radiation</th>
<th>Substance</th>
<th>Thermal radiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bitumen</td>
<td>0.90-0.98</td>
<td>Black cloth</td>
<td>0.98</td>
</tr>
<tr>
<td>Concrete</td>
<td>0.90</td>
<td>Human skin</td>
<td>0.88</td>
</tr>
<tr>
<td>Cement</td>
<td>0.96</td>
<td>Foam</td>
<td>0.75-0.80</td>
</tr>
<tr>
<td>Sand</td>
<td>0.90</td>
<td>Charcoal dust</td>
<td>0.96</td>
</tr>
<tr>
<td>Earth</td>
<td>0.92-0.96</td>
<td>Paint</td>
<td>0.80-0.95</td>
</tr>
<tr>
<td>Water</td>
<td>0.92-0.96</td>
<td>Matte paint</td>
<td>0.97</td>
</tr>
<tr>
<td>Ice</td>
<td>0.96-0.98</td>
<td>Black rubber</td>
<td>0.9</td>
</tr>
<tr>
<td>Snow</td>
<td>0.83</td>
<td>Plastic</td>
<td>0.85-0.95</td>
</tr>
<tr>
<td>Glass</td>
<td>0.90-0.95</td>
<td>Timber</td>
<td>0.90</td>
</tr>
<tr>
<td>Ceramics</td>
<td>0.90-0.94</td>
<td>Paper</td>
<td>0.70-0.94</td>
</tr>
<tr>
<td>Marble</td>
<td>0.94</td>
<td>Chromium</td>
<td>0.81</td>
</tr>
<tr>
<td></td>
<td></td>
<td>hemitrioxide</td>
<td></td>
</tr>
<tr>
<td>Gypsum</td>
<td>0.80-0.90</td>
<td>Copper oxide</td>
<td>0.78</td>
</tr>
<tr>
<td>Mortar</td>
<td>0.89-0.91</td>
<td>Ferric oxide</td>
<td>0.78-0.8</td>
</tr>
<tr>
<td>Brick</td>
<td>0.93-0.96</td>
<td>Textile</td>
<td>0.90</td>
</tr>
</tbody>
</table>
5. Operation Flow

5.22. **Body Temperature Mode**

- Press Menu button to enter the Menu Mode.
- Select the Body temperature filter icon, and press measure to enter.
- Press Measure to confirm and back to Menu mode.

- Press Left/Right to Select ON or OFF for body temperature filter.

5.23. **Fever Alarm**

- Press Menu button to enter the Menu Mode.
- Select the fever alarm icon and press measure to enter.
5. Operation Flow

- Press Left or Right to adjust the fever temperature alarm.
- Select ON/OFF, and press measure to enter.

- Press measure to confirm the fever alarm setting and back to menu mode.

5.24. Fever Image Capture

- Press Left or Right to ON/OFF the Fever Image Capture.
- Press Measure to confirm and back to Menu mode.
5. Operation Flow

5.25. Thermal View

Body temperature filter ON

Fever Alarm Enabled

5.26. Body Temperature Filters Selections

Press the Right button to switch between the following two filters:

**Mode 1: White Box Mode**
- A rectangle shown on the screen is indicating the target measurement area which pointing to the forehead area is recommended.

**Mode 2: Tracking Mode**
- Measurement will be taking place on whole view. The max. body temperature will be chased and shown on the screen.
5. Operation Flow

Remark: Precautions for body temperature measurement

- The best distance from the thermometer when measuring the forehead temperature with a white box is between 30cm – 50cm.

- The best distance from the thermometer when measuring body temperature in tracking mode is between 50cm – 80cm.

- When using tracking mode, please use special-temporal filter or wide-gaussian filter.

- When measuring the temperature of the forehead, the white box needs to be aligned with the forehead. There should be no hair covering.

- Indoor use.
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Thank you for your understanding.

For more information about our products and services, please send us an email:

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