Thermal Imaging Camera IR0280

Instruction Manual

Perfect Prime

www.perfectprime.com

Contents

1. Overview

IR0280 is a thermal imaging 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 problems, take readings and solve the issue.

The product has a visual camera integrated to increase the differentiation degree. The thermal and full vision images and videos can be stored in the internal memory card or an additional detachable SD card. The image or video can be stored in PC to generate a report and print.

The following are the major features of IR0280:

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 IR0280.

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

4. Image & Video: The IR0280 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.

7. **Night vision:** Measuring the electromagnetic energies given off when objects emit heat, the IR0280 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.

IR0280 is the ideal selection for electrician, maintenance personnel, technicians and even the emergency personnel.

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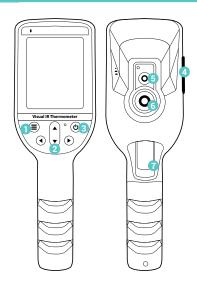
Please read the instructions carefully so as to ensure accurate measurement results and safety:

Do not use device in explosive, flammable or corrosive environment.

Do not dismantle the product, doing so can damage it and revoke the warranty.

Since the product is a precision electronic and sensitive optical device. Do not drop it or allow impacts to occur to prevent damage.

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.

It is suggested to used the attached USB cable.

Visual IR Thermometer

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

4.1. Product Specifications

Power Supply	3.7V Li-ion rechargeable battery, 2500mAh, Size 18650
Panel	2.8" color LCD display
Touch Panel	Resistive type Touch Panel
Keys	7 keys (Power, Up/Down/Left/Right, Menu, Measure)
Sensors	32 x 32 Thermal Array, Humidity Sensor, CMOS sensor
Internal memory	1GB memory
External memory (Micro SD Slot)	16GB SD card included
USB connection	Photo upload to PC, and USB charging battery
Battery life	6hrs
Auto Power-off time	5min
Operating temperature	-10°C ~ +50°C (14°F ~ 122°F)
Storage temperature	-20°C ~ +60°C (-4°F ~ 140°F)
Dimensions	215 x 55 x 62 mm
Weight	230g
Warranty	2 years

4.2. Thermal Image Specifications

Resolution of infrared image	32*32(1024) pixel
Resolution of visible image	0.2 megapixels

Field angle/shortest focal distance	33°x33°/0.1m
Thermal sensitivity	0.15℃ (32.27°F)
Range of temperature measurement	-30℃ ~ 1000℃ (-22°F~1832°F)
Measure accuracy	-30~ 300℃ ±1% or ±1℃ (-22~572°F±1% or ±33.8°F)
	300~1000℃ ±2% or ±2℃ (572~1832°F±2% or ±25.6°F)
Emissivity	0.01 – 1.0
Image capturing frequency	9Hz
Range of wave length	8-11.5µm
Focal distance	Fixed
Vision option	5 variants
Image format	BMP, JPG
Video format	MP4

4.3. Software Features

Blending mode	Hue blending
Temperature Alert	High or Low Temperature Alert
Image & Video recording	BMP/JPG (Image), MP4 (Video)
Brightness	Adjustable Brightness
Auto off function	Adjustable Auto-off function

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.

The summary of Menu icons:

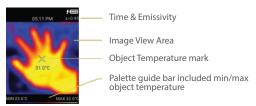|	
	Display Brightness: To set the brightness of display
	Date and Time: To set time and date
	Auto-Off Timer: To set the auto-off timer for the Display
	Hi-Low Temperature Alarm: To set the high or low temperature alarm
	Auto-monitor Alarm: To capture the thermal image when over the Temperature Alarm 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
	Color palette guide: To turn on/off the color palette reference guide
	Trash: To delete image/video permanently
	Max/Min: To show/ not show the maximum and minimum points
	Cast Screen: To connect with a monitor via USB

5.5. Measurement Screen

Time & Emissivity

Image View Area

Object Temperature mark

Palette guide bar included min/max object temperature

- Press Menu button to enter Menu mode.
- Press Up/Down to select image mode: Thermal Image, Visual Image, Overlay Image.

- Press Left button to select filter mode: Temporal filter, Wide Gaussian filter, No filter.

Thermal Image

Visual Image

Overlay Image

Temporal Filter

Wide Gaussian

No filter

PPPP

- 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.

5.6. 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.

5.9. Hi-Low Temperature Alarm

- Press and hold the Measure button to turn ON or OFF the Hi-Lo temperature alarm setting
- 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

Low Temperature Alarm Palette guide (Blue color)

High Temperature Alarm Palette guide (Red color)

5.10. Auto-Monitor Alarm

- Press and hold the Measure button to turn ON or OFF the Hi-Lo temperature alarm setting
- 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.

5.11. 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

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

5.17. 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

Image

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

Original Image

New movable 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.

5.18. 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.
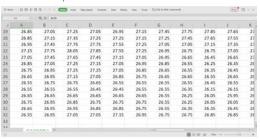
5.19. Image Overlay Adjusting

Before adjusting   After 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:

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:

Substance	Thermal radiation	Substance	Thermal radiation
Bitumen	0.90-0.98	Black cloth	0.98
Concrete	0.90	Human skin	0.88
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	0.9
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

5. Operation Flow

5.22. Connecting to a Monitor

Download Software

USB Cable

Computer

IR0280H

1. Download software from our website: PerfectPrime.com > Manuals > Thermal Camera > IR0280H > Software

2. Find the zip file named: scrcpy-win64-v1.16, then extract and open it

3. Connect the IR0280H to your computer using a USB cable

4. Open the scrcpy file/application. After a few seconds, the IR0280H screen will be shown on the computer.

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