

# User Manual

## ZK-178S Professional Thermal Imager

Date: June 2020

Doc Version: 1.0

English

Thank you for choosing our product. Please read the instructions carefully before operation. Follow these instructions to ensure that the product is functioning properly. The images shown in this manual are for illustrative purposes only.



For further details, please visit our Company's website [www.zkteco.com](http://www.zkteco.com).

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If there is any issue related to the product, please contact us.

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## About the Company

ZKTeco is one of the world's largest manufacturer of RFID and Biometric (Fingerprint, Facial, Finger-vein) readers. Product offerings include Access Control readers and panels, Near & Far-range Facial Recognition Cameras, Elevator/floor access controllers, Turnstiles, License Plate Recognition (LPR) gate controllers and Consumer products including battery-operated fingerprint and face-reader Door Locks. Our security solutions are multi-lingual and localized in over 18 different languages. At the ZKTeco state-of-the-art 700,000 square foot ISO9001-certified manufacturing facility, we control manufacturing, product design, component assembly, and logistics/shipping, all under one roof.

The founders of ZKTeco have been determined for independent research and development of biometric verification procedures and the productization of biometric verification SDK, which was initially widely applied in PC security and identity authentication fields. With the continuous enhancement of the development and plenty of market applications, the team has gradually constructed an identity authentication ecosystem and smart security

ecosystem, which are based on biometric verification techniques. With years of experience in the industrialization of biometric verifications, ZKTeco was officially established in 2007 and now has been one of the globally leading enterprises in the biometric verification industry owning various patents and being selected as the National High-tech Enterprise for 6 consecutive years. Its products are protected by intellectual property rights.

### About the Manual

This manual introduces the operations of the ZK-178S product.

All figures displayed are for illustration purposes only. Figures in this manual may not be exactly consistent with the actual products.








## Document Conventions

Conventions used in this manual are listed below:

### GUI Conventions

| For Device |   |
|------------|---|
| Convention | Description   |
| < >        | Button or key names for devices. For example, press <OK>  |
| [ ]        | Window names, menu items, data table, and field names are inside square brackets. For example, pop up the [New User] window |
| /          | Multi-level menus are separated by forwarding slashes. For example, [File/Create/Folder].                                   |

## Symbols

| Convention  | Description  |
|---|--|
|  | This implies about the notice or pays attention to, in the manual.                     |
|  | The general information which helps in performing the operations faster.               |
|  | The information which is significant.  |
|  | Care taken to avoid danger or mistakes.  |
|  | The statement or event that warns of something or that serves as a cautionary example. |

# Table of Contents

|          |  |           |
|----------|--|-----------|
| <b>1</b> | <b>SAFETY INSTRUCTIONS.....</b>                  | <b>12</b> |
| <b>2</b> | <b>STRUCTURE.....</b>                            | <b>15</b> |
| <b>3</b> | <b>DISPLAY.....</b>                              | <b>16</b> |
| <b>4</b> | <b>POWER ON/OFF .....</b>                        | <b>19</b> |
| <b>5</b> | <b>MENU INTRODUCTION .....</b>                   | <b>19</b> |
| <b>6</b> | <b>OPERATING INSTRUCTIONS.....</b>               | <b>20</b> |
| 6.1      | TEMPERATURE UNIT SELECTION.....                  | 20        |
| 6.2      | CENTER POINT AND HIGH TEMPERATURE TRACKING ..... | 21        |
| 6.3      | COLOR PALETTE SELECTION.....                     | 23        |
| 6.4      | HIGH/LOW TEMPERATURE ALARM .....                 | 24        |
| 6.5      | SETTINGS.....                                    | 25        |
| 6.5.1    | LANGUAGE.....                                    | 26        |
| 6.5.2    | DATE & TIME .....                                | 27        |
| 6.5.3    | EMISSION/TEMPERATURE COMPENSATION .....          | 28        |
| 6.5.4    | AUTO POWER OFF.....                              | 30        |
| 6.5.5    | DISPLAY BRIGHTNESS .....                         | 31        |
| 6.5.6    | TEMPERATURE BAR.....                             | 32        |

|           |                                |           |
|-----------|--------------------------------|-----------|
| 6.5.7     | ALARM TEMPERATURES.....        | 33        |
| 6.5.8     | DEVICE INFORMATION.....        | 34        |
| 6.5.9     | FACTORY RESET .....            | 35        |
| 6.5.10    | FORMAT SD CARD.....            | 36        |
| 6.5.11    | AUTO SAVE .....                | 37        |
| <b>7</b>  | <b>USB COMMUNICATION.....</b>  | <b>38</b> |
| <b>8</b>  | <b>SPECIFICATIONS .....</b>    | <b>38</b> |
| <b>9</b>  | <b>MAINTENANCE.....</b>        | <b>41</b> |
| <b>10</b> | <b>COMMON EMISSIVITY .....</b> | <b>41</b> |

# 1 Safety Instructions

To ensure the proper functioning of this product, please read the instructions carefully before using it.

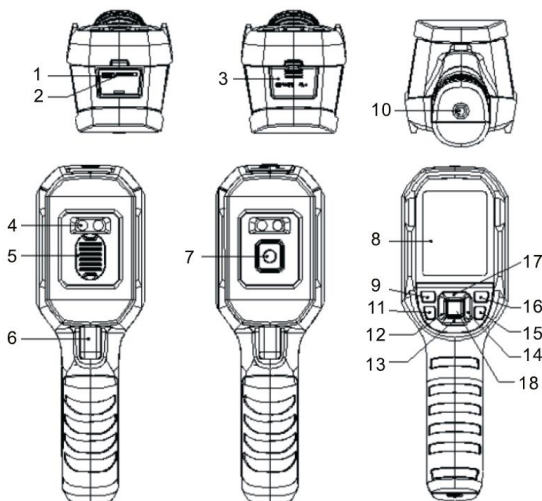
- The optimal measuring distance for this product is 1 meter.
- To ensure measurement accuracy, please use the product in an operating environment of 15°C to 30°C, <85% RH (non-condensing).
- Please use the product indoors without wind.
- When changing to a new environment, please power on the product and leave it for 10 to 15 minutes before measuring.
- The ambient temperature for measurement must be stable. Do not measure in places with large airflows such as fans and air outlets.
- When the object to be measured comes from a place with a large temperature difference from the measurement environment, keep it in the measurement environment for 10 to 30 minutes before measuring.

- The product tests the surface temperature of the object. If temperature compensation is needed, please adjust in the Settings menu.
- The product has a self-calibration function. If the reading jumps quickly, please read the temperature after it gets steady.
- After measuring extremely high or low-temperature objects, please leave the product for 10 minutes before the next use.
- Do not use the product in places with strong sunlight or electromagnetic interference.
- Please do not use this product in flammable, explosive, steamy, wet, or corrosive environments.
- Please stop using the product if it is damaged or modified to avoid inaccurate measurement results.
- Please use the correct emissivity to obtain accurate temperature readouts.
- To ensure the accuracy of the product, please warm it up for 10 minutes before measuring if it has not been used for a long time.
- When being charged, the internal temperature of the product rises, which will lead to inaccurate

temperature measurement. So, it is not recommended to take measurements during or right after charging the product.

- The inherent temperature drift of the sensor will occasionally cause inaccurate measurements. In this case, press the down button under the temperature measurement interface to open the "Calibration" option and automatically calibrate the temperature.

## 2 Components



| Item     | Description          | Item      | Description          |
|----------|----------------------|-----------|----------------------|
| <b>1</b> | Micro SD Card Slot   | <b>10</b> | Tripod mounting hole |
| <b>2</b> | Type-C USB interface | <b>11</b> | Flashlight button    |
| <b>3</b> | Interface cover      | <b>12</b> | Left button          |

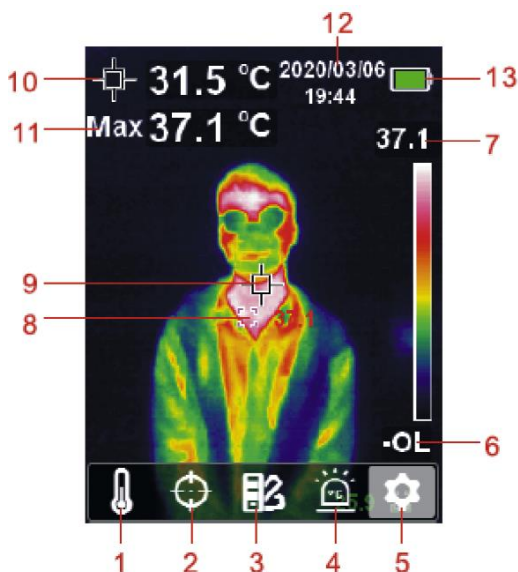


|          |                            |           |               |
|----------|----------------------------|-----------|---------------|
| <b>4</b> | LED light                  | <b>13</b> | Down button   |
| <b>5</b> | Infrared camera lens cover | <b>14</b> | Right button  |
| <b>6</b> | Trigger                    | <b>15</b> | Back button   |
| <b>7</b> | Infrared camera lens       | <b>16</b> | Replay button |
| <b>8</b> | LCD                        | <b>17</b> | Up button     |
| <b>9</b> | Power button               | <b>18</b> | SET button    |

### 3 Display

**Display size:** 2.8"

**Display resolution:** 320 (vertical) x 240 (horizontal) pixels



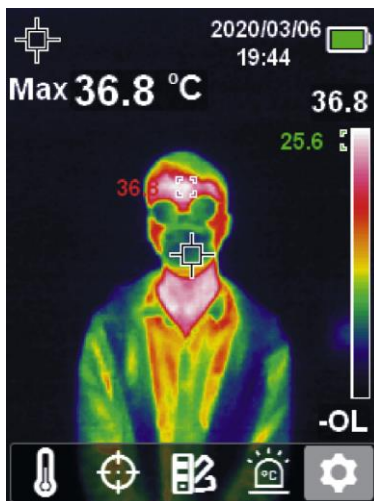
| Item     | Description             | Item      | Description               |
|----------|-------------------------|-----------|---------------------------|
| <b>1</b> | Temperature unit option | <b>8</b>  | Maximum Temperature point |
| <b>2</b> | Cursor option           | <b>9</b>  | Center point              |
| <b>3</b> | Color palette option    | <b>10</b> | Center point temperature  |

|          |                                   |           |                     |
|----------|-----------------------------------|-----------|---------------------|
| <b>4</b> | High/Low-temperature alarm option | <b>11</b> | Maximum Temperature |
| <b>5</b> | Settings option                   | <b>12</b> | Date & Time         |
| <b>6</b> | Low-Temperature Scale             | <b>13</b> | Battery status      |
| <b>7</b> | High-Temperature Scale            |           |                     |

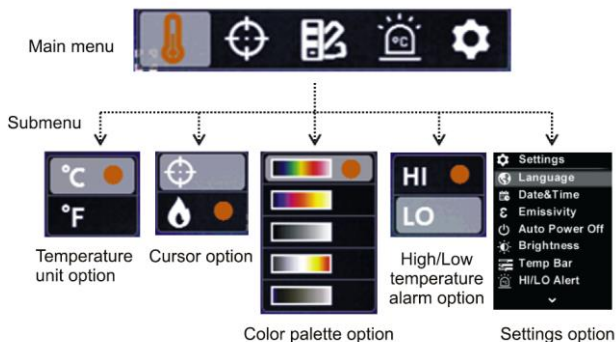
## 4 Power On/Off

Press the **Power** button for 3s to power on the device and press the **Power** button for 1s to power off.

## 5 Menu Introduction

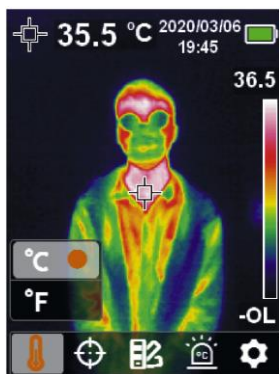



Thermal imaging Screen



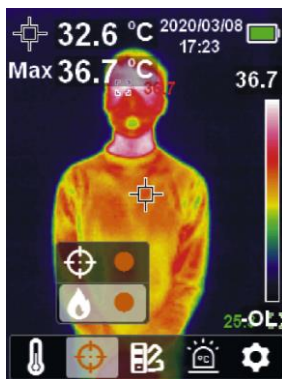
## 6 Operating Instructions

### 6.1 Temperature Unit Selection





1. Press the **SET** button to open the main menu.
2. Press the **Left/Right** button to select the  option.
3. Press the **SET** button to open the temperature unit submenu.
4. Press the **Up/Down** button to select °C or °F.
5. Press the **Back** button to exit the current menu.



## 6.2 Center Point and High-Temperature Tracking



**To track the center point temperature:**

1. Press the **SET** button to open the main menu.
2. Press the **Left/Right** button to select the  option.
3. Press the **SET** button to open the cursor submenu.
4. Press the **Up/Down** button to select the  option.
5. Press the **SET** button to confirm.
6. The center point marker is now turned on (The center point temperature will be displayed in the upper left corner).
7. Press the **Back** button to exit the current menu.

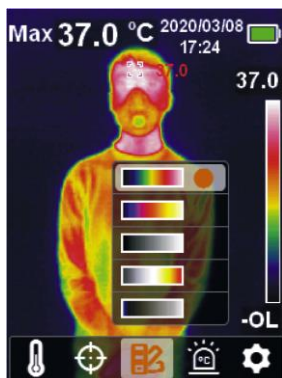
**To track high temperature:**

1. Press the **SET** button to open the main menu.
2. Press the **Left/Right** button to select the  option.
3. Press the **SET** button to open the cursor submenu.
4. Press the **Up/Down** button to select the 

option.

5. Press the **SET** button to confirm.
6. The high-temperature indicator is now turned on and the corresponding temperature will be displayed in the upper left corner.
7. Press the **Back** button to exit the current menu.

### 6.3 Color Palette Selection



1. Press the **SET** button to open the main menu.
2. Press the **Left/Right** button to select the option.





3. Press the **SET** button to enter the color palette submenu.
4. Press the **Up/Down** button to select the desired color from Iron Red, Rainbow, White Hot, Red Hot, and Ice Blue.
5. Press the **Back** button to exit the current menu.

## 6.4 High/Low-Temperature Alarm



### To enable the high/low-temperature alarm:

1. Press the **SET** button to open the main menu.
2. Press the **Left/Right** button to select the

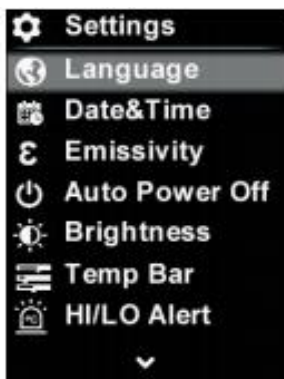
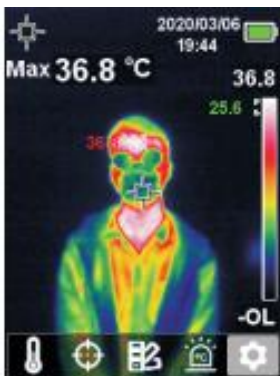


option.

3. Press the **SET** button to enter the high/low-temperature alarm sub-menu.
4. Press the **Up/Down** button to select HI (High) or LO (Low).
5. Press the **SET** button to confirm.
6. Press the **Back** button to exit the current menu.

**Note:** High-temperature alarm and low-temperature alarm can be enabled simultaneously or separately.

## 6.5 Settings



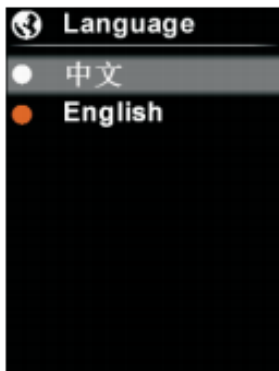
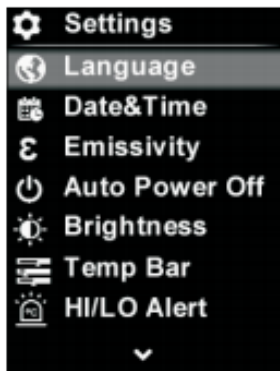
**To open the Settings menu:**

1. Press the **SET** button to open the main menu.

2. Press the **Left/Right** button to select the option.



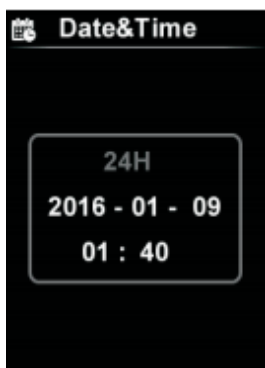
3. Press the **SET** button to confirm.

**6.5.1 Language****To set a Language:**

1. Press the **Up/Down** button to select the Language option in the Settings menu.
2. Press the **SET** button to open the Language submenu.

3. Press the **Up/Down** button to select the desired language from Chinese and English.
4. Press the **SET** button to confirm.
5. Press the **Back** button to exit the current menu.

### 6.5.2 Date & Time



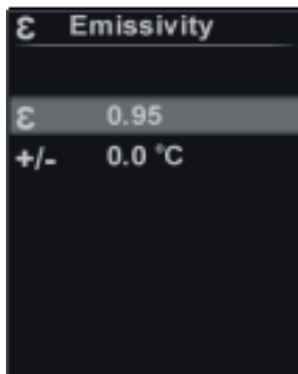
#### **To set the Date & Time:**

1. Press the **Up/Down** button to select the Date & Time option in the Settings menu.
2. Press the **SET** button to open the Date & Time submenu.
3. Press the **Left/Right** button to select the parameter to

be adjusted.

4. Press the **SET** button to enter the parameter adjustment screen.
5. Press the **Up/Down** button to increase or decrease the value.
6. Press the **SET** button to save the settings and return to set other parameters.
7. Press the **Back** button to exit the current menu.

### 6.5.3 Emissivity/Temperature Compensation

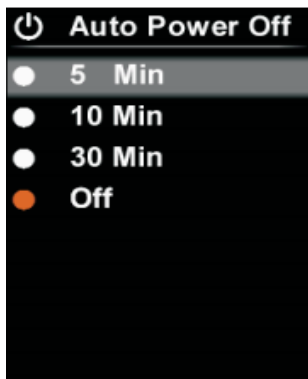


**To set the Emissivity/Temperature Compensation:**

1. Press the **Up/Down** button to select the Emissivity option in the Settings menu.
2. Press the **SET** button to enter the Emissivity submenu.
3. Press the **Up/Down** button to select the emissivity or temperature compensation.
4. Press the **SET** button to enter the parameter adjustment state.
5. Press the **Up/Down** button to increase or decrease the value.
6. Press the **SET** button to save the settings.
7. Press the **Back** button to exit the current menu.

**Note:** For emissivity values of common materials, please refer [Common Emissivity](#).

### 6.5.4 Auto Power Off



#### **To set auto Power-off:**

1. Press the **Up/Down** button to select the Auto Power Off option in the Settings menu.
2. Press the **SET** button to open the Auto Power Off submenu.
3. Press the **Up/Down** button to select the desired option from 5 Mins, 10 Mins, 30 Mins, and Off.
4. Press the **SET** button to confirm.
5. Press the **Back** button to exit the current menu.

### 6.5.5 Display Brightness

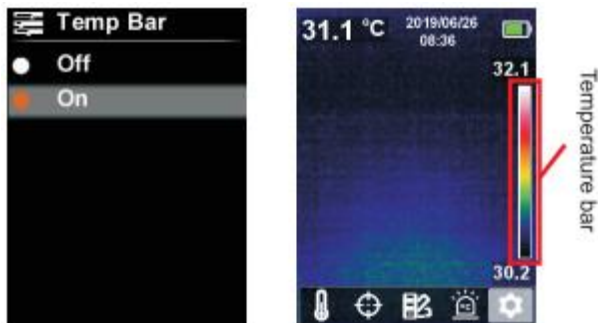


#### **To set the display brightness:**

1. Press the **Up/Down** button to select the Brightness option in the Settings menu.
2. Press the **SET** button to enter the Brightness submenu.
3. Press the **Up/Down** button to select the desired option from Low, Middle, and High.
4. Press the **SET** button to confirm.
5. Press the **Back** button to exit the current menu.



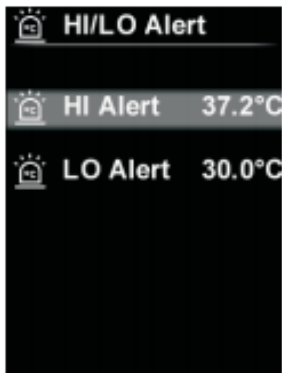
## 6.5.6 Temperature Bar



### To turn on/off the temperature bar:

1. Press the **Up/Down** button to select the Temp Bar option in the Settings menu.
2. Press the **SET** button to enter the Temp Bar submenu.
3. Press the **Up/Down** button to select on or off.
4. Press the **SET** button to confirm.
5. Press the **Back** button to exit the current menu.

### 6.5.7 Alarm Temperature



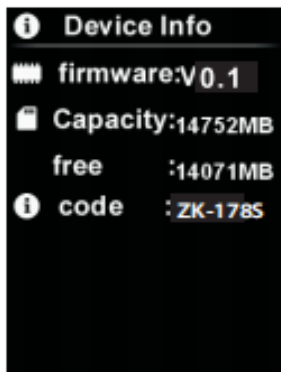
#### **To set the alarm temperatures:**

1. Press the **Up/Down** button to select the HI/LO Alert option in the Settings menu.
2. Press the **SET** button to enter the HI/LO Alert submenu.
3. Press the **Up/Down** button to select the desired option from HI Alert and LO Alert.
4. Press the **SET** button to enter the temperature adjustment state.
5. Press the **Up/Down** button to adjust the temperature.
6. Press the **SET** button to save the settings and return to

set another temperature.

7. Press the **Back** button to exit the current menu.

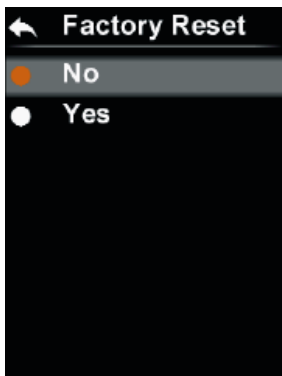
### 6.5.8 Device Information



#### **To view the Device information:**

1. Press the **Up/Down** button to select the Device Info option in the Settings menu.
2. Press the **SET** button to view the detailed information of the device.
3. Press the **Back** button to exit the current menu.

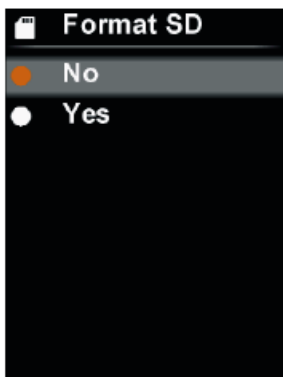
### 6.5.9 Factory Reset



#### **To restore settings:**

1. Press the **Up/Down** button to select the Factory Reset option in the Settings menu.
2. Press the **SET** button to open the Factory Reset submenu.
3. Press the **Up/Down** button and select Yes.
4. Press the **SET** button to confirm.
5. Press the **Back** button to exit the current menu.

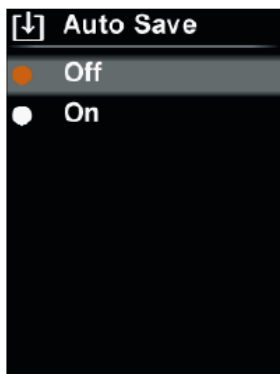
### 6.5.10 Format SD Card



#### **To format the SD card:**

1. Press the **Up/Down** button to select the Format SD option in the Settings menu.
2. Press the **SET** button to enter the Format SD submenu.
3. Press the **Up/Down** button and select Yes.
4. Press the **SET** button to confirm.
5. Press the **Back** button to exit the current menu.

### 6.5.11 AutoSave



**To turn on/off the autosave option:**

1. Press the **Up/Down** button to select the AutoSave option in the Settings menu.
2. Press the **SET** button to open the AutoSave submenu.
3. Press the **Up/Down** button to enable or disable the auto-save option.
4. Press the **SET** button to confirm.
5. Press the **Back** button to exit the current menu.

**Note:** Do not remove or insert the SD card while saving or viewing the pictures. If the SD card is replaced during use, restart the device after the replacement to save the pictures.

## 7 USB Communication

1. Download and install the PC software.
2. Connect the USB cable to the PC.
3. Users can browse the pictures and analyze the data through the PC software. Regarding its usage, refer the Software User Manual from the Help option of the operation interface.

**Note:** Do not unplug the USB cable while the software is loading pictures.

## 8 Specifications

| Feature                | Specifications                       |
|------------------------|--------------------------------------|
| Sensor                 | UFPA                                 |
| Temperature Range      | 30°C to 45°C                         |
| Measurement resolution | 0.1°C                                |
| Accuracy               | ±0.5°C (at 25°C ambient temperature) |

|                                   |   |
|-----------------------------------|---|
| <b>Optimal measuring distance</b> | 1 meter   |
| <b>Minimum measuring distance</b> | 15cm  |
| <b>Response time</b>              | ≤500ms  |
| <b>IR resolution</b>              | 4800 pixels (80 x 60)                           |
| <b>Pixel size</b>                 | 17μm  |
| <b>Color palette</b>              | Iron Red, Rainbow, White Hot, Red Hot, Ice Blue |
| <b>Infrared spectral band</b>     | 8μm~14μm  |
| <b>Field of view (FOV)</b>        | 51°(H)×38° (V)                                  |
| <b>Spatial resolution (IFOV)</b>  | 11mrad  |
| <b>Thermal sensitivity (NETD)</b> | ≤150mK  |
| <b>Frame rate</b>                 | ≤9Hz  |
| <b>Image format</b>               | BMP   |



**General parameters**

| <b>Feature</b>                            | <b>Specifications</b>  |
|---|--|
| <b>Audio Alarm</b>                        | Yes  |
| <b>PC Software</b>                        | Yes  |
| <b>Data transmission</b>                  | Type-C USB interface   |
| <b>Product size (L x W x H)</b>           | 236mm x 75.5mm x 86mm  |
| <b>Display type</b>                       | 2.8" TFT LCD   |
| <b>Display resolution</b>                 | 320 x 240 pixels   |
| <b>Battery</b>                            | 3.6V/5000mAh rechargeable<br>Li-ion battery                  |
| <b>Auto power off</b>                     | 5 minutes, 10 minutes, 30 minutes, off (default: 30 minutes) |
| <b>Battery life</b>                       | ≥6 hours   |
| <b>Charging time</b>                      | 4 hours  |
| <b>Charging voltage/current</b>           | 5V/2A  |
| <b>Image storage</b>                      | Micro SD card  |
| <b>Transportation/storage environment</b> | -20°C to 60°C (-4°F to 140°F),<br><85% RH (non-condensing)   |
| <b>Operating environment</b>              | 15°C to 30°C (59°F to 86°F),<br><85% RH (non-condensing)     |
| <b>Operating altitude</b>                 | ≤2000m   |

**Add-on's**

User manual, USB cable, 16GB  
Micro SD card

## 9 Maintenance

Use a wet cloth or a weak soap solution to clean the outer shell of the device. Do not use abrasives, isopropyl alcohol, or solvents to clean the outer shell, lens, or window.

## 10 Common Emissivity

| Material        | Emissivity | Material      | Emissivity |
|-----------------|------------|---------------|------------|
| Wood            | 0.85       | Black paper   | 0.86       |
| Water           | 0.96       | Polycarbonate | 0.8        |
| Brick           | 0.75       | Concrete      | 0.97       |
| Stainless Steel | 0.14       | Copper oxide  | 0.78       |
| Tape            | 0.96       | Cast iron     | 0.81       |
| Aluminum plate  | 0.09       | Rust          | 0.8        |

|                       |      |               |      |
|-----------------------|------|---------------|------|
| <b>Copper plate</b>   | 0.06 | <b>Gypsum</b> | 0.75 |
| <b>Black aluminum</b> | 0.95 | <b>Paint</b>  | 0.9  |
| <b>Human skin</b>     | 0.98 | <b>Rubber</b> | 0.95 |
| <b>Asphalt</b>        | 0.96 | <b>Soil</b>   | 0.93 |
| <b>PVC</b>            | 0.93 |               |      |

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