

# UNI-T®



**UTi165A**  
**Professional Thermal Imager**

P/N:110401108897X

## Preface

Thank you for purchasing the new UTi165A thermal imager. In order to use this product safely and correctly, please read this manual thoroughly, especially the *Safety Instructions* part.

After reading this manual, it is recommended to keep the manual at an easily accessible place, preferably close to the device, for future reference.

## Limited Warranty and Liability

Uni-Trend guarantees that the product is free from any defect in material and workmanship within one year from the purchase date. This warranty does not apply to damages caused by accident, negligence, misuse, modification, contamination or improper handling. The dealer shall not be entitled to give any other warranty on behalf of Uni-Trend. If you need warranty service within the warranty period, please contact your seller directly.

Uni-Trend will not be responsible for any special, indirect, incidental or subsequent damage or loss caused by using this device.

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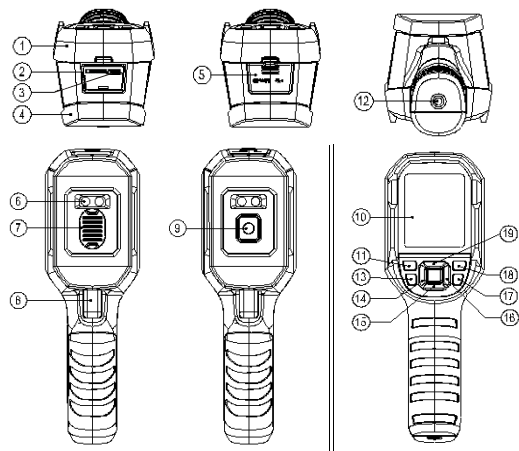
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## 1.Safety Instructions

To ensure accurate measurement results, please read the instructions carefully.

- Please use this product in accordance with the user manual, otherwise the free warranty will be voided if the product is damaged.
- 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 will rise, 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 measurement. In this case, press the down button under the temperature measurement interface to bring out “Calibrating” and automatically calibrate the temperature.

## 2. Structure

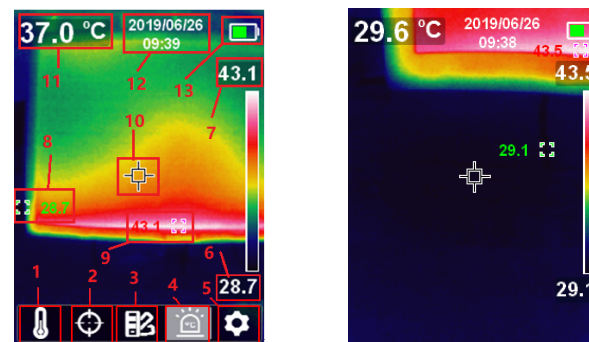


| Item | Description                         | Item | Description             |
|------|-------------------------------------|------|-------------------------|
| 1    | Upper shell                         | 11   | Power button            |
| 2    | Micro SD card slot                  | 12   | Tripod mounting hole    |
| 3    | USB interface                       | 13   | Light button            |
| 4    | Lower shell                         | 14   | Left button             |
| 5    | Interface cover                     | 15   | Down button             |
| 6    | LED light                           | 16   | Right button            |
| 7    | Infrared thermal image window cover | 17   | Back button             |
| 8    | Picture taking trigger              | 18   | Picture browsing button |
| 9    | Infrared thermal image window       | 19   | Up button               |
| 10   | LCD                                 | 20   | SET button              |

## 3. Display

Display size: 2.8"

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

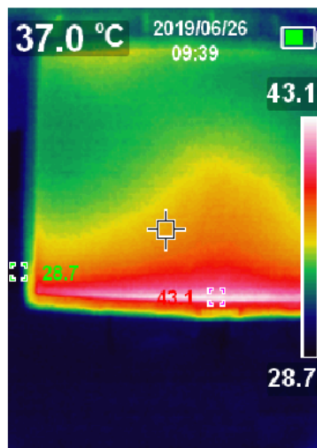


| Item | Description                       | Item | Description               |
|------|-----------------------------------|------|---------------------------|
| 1    | Temperature unit option           | 8    | Minimum temperature point |
| 2    | Cursor option                     | 9    | Maximum temperature point |
| 3    | Color palette option              | 10   | Center point              |
| 4    | High/Low temperature alarm option | 11   | Center point temperature  |
| 5    | Settings option                   | 12   | Date & time               |
| 6    | Minimum temperature               | 13   | Battery status            |
| 7    | Maximum temperature               |      |                           |

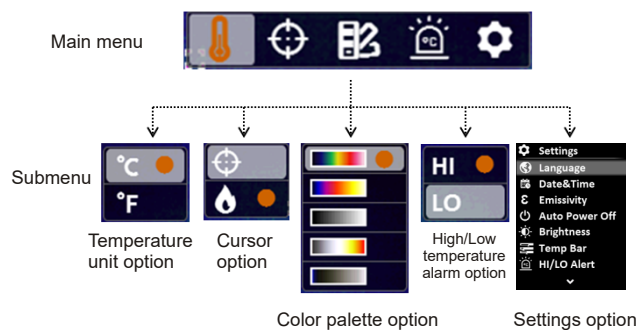
## 4. Power On/Off

Press the power button for 3s to power on, and press the power button for 1s to power off.

## 5. Menu Introduction

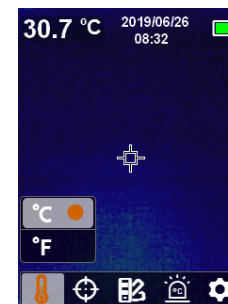



Thermal imaging page



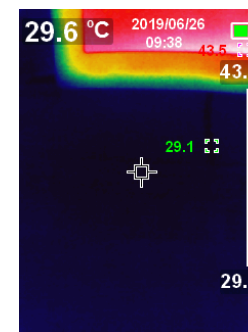
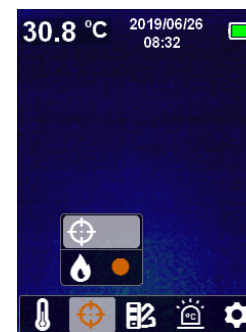
## 6. Operating Instructions

### ● 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 enter 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/Low Temperature Tracking



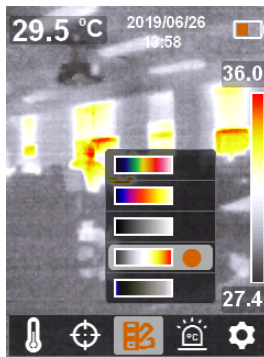
**To track center point:**


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 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 turned on.
7. Press the back button to exit the current menu.

**To track high/low temperatures:**

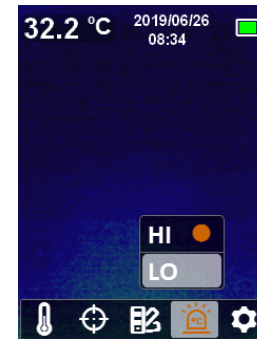
1. Press the SET button to open the main menu.
2. Press the left/right button to select the  option.
3. Press the SET button to enter the cursor submenu.
4. Press the up/down button to select the  option.
5. Press the SET button to confirm.
6. The high/low temperature indicators are turned on and the corresponding temperatures are displayed beside them.
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, Grayscale, Red-White, and Blue-White.
5. Press the back button to exit the current menu.

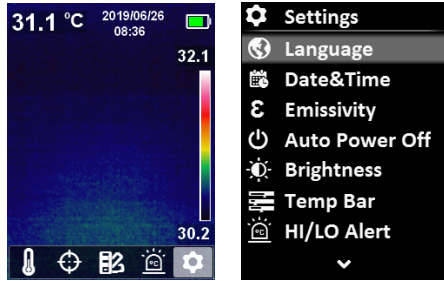
### ● 6.4 High/Low Temperature Alarm

**To enable 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 submenu.
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.

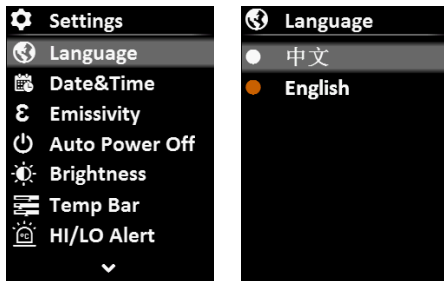
## 6.5 Settings



To enter 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.

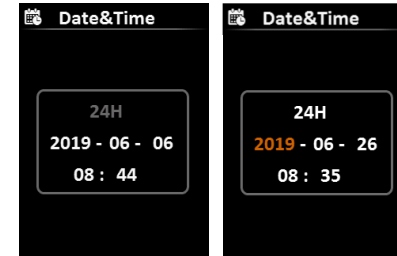
### 6.5.1 Language



To set language:

1. Select the Language option (up/down button) in the Settings menu.
2. Press the SET button to enter 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 date & time:

1. Select the Date & Time option (up/down button) in the settings menu.
2. Press the SET button to enter 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 state.
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



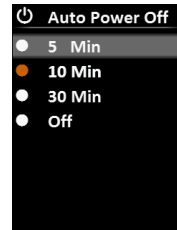
To set emissivity:

1. Select the Emissivity option (up/down button) in the Settings menu.
2. Press the SET button to enter the Emissivity submenu.
3. Press the SET button again.
4. Press the up/down button to adjust the emissivity (step: 0.01; range: 0.01~0.99; default: 0.95)
5. Press the SET button to save the settings.
6. Press the back button to exit the current menu.

**Note:** Selecting correct emissivity is very important for accuracy of temperature measurement, as emissivity has a significant impact on the measured surface temperature.

For emissivity values of common materials, please refer to the common emissivity table in the appendix.

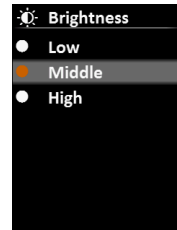
#### 6.5.4 Auto Power Off



##### To set auto power off:

1. Select the Auto Power Off option (up/down button) in the settings menu.
2. Press the SET button to enter the Auto Power Off submenu.
3. Press the up/down button to select the desired option from 5 Min, 10 Min, 30 Min, and Off.
4. Press the SET button to confirm.
5. Press the back button to exit the current menu.

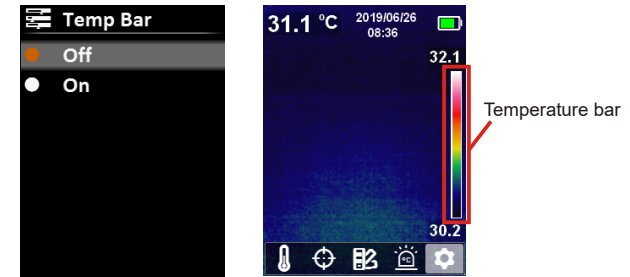
#### 6.5.5 Display Brightness



##### To set display brightness:

1. Select the Brightness option (up/down button) 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.

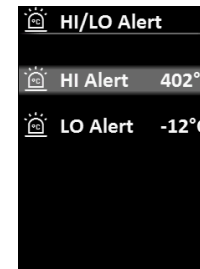
#### 6.5.6 Temperature Bar



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

1. Select the Temp Bar option (up/down button) 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 Temperatures



##### To set alarm temperatures:

1. Select the HI/LO Alert option (up/down button) 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. Select the Device Info option (up/down button) in the settings menu.
2. Press the SET button to view the detail information of the device.
3. Press the back button to exit the current menu.

### 6.5.9 Factory Reset



#### To restore settings:

1. Select the Factory Reset option (up/down button) in the settings menu.
2. Press the SET button to enter the Factory Reset submenu.
3. Press the up/down button to select Yes.
4. Press the SET button to confirm.
5. Press the back button to exit the current menu.

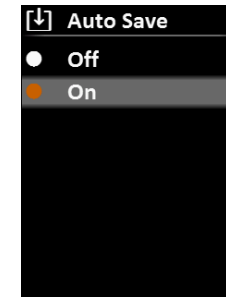
### 6.5.10 Format SD Card



#### To format SD card:

1. Select the Format SD option (up/down button) in the settings menu.
2. Press the SET button to enter the Format SD submenu.
3. Press the up/down button to select Yes.
4. Press the SET button to confirm.
5. Press the back button to exit the current menu.

### 6.5.11 Auto Save



#### To turn on/off auto save:

1. Select the Auto Save option (up/down button) in the settings menu.
2. Press the SET button to enter the Auto Save 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.

## 7.USB Communication

1. Download and install the PC software (refer to UNI-T Documents Download Operation Guide).
2. Connect the USB cable to the PC.
3. Users can browse pictures and analyze data through the PC software. Regarding its usage, retrieve the Software User Manual from the Help option of the operation interface.

## 8. Specifications

|                            |   |
|----------------------------|---|
| Sensor                     | UFPA  |
| Temperature range          | -10°C~400°C   |
| Measurement resolution     | 0.1°C   |
| Mode                       | Auto gain   |
| Accuracy                   | ±2.0°C or ±2%                                       |
| Measuring distance         | 25cm  |
| Response time              | ≤500ms (95% of reading)                             |
| Emissivity                 | 0.01~0.99 adjustable (default: 0.95)                |
| IR resolution              | 19,200 pixels (160 × 120)                           |
| Pixel size                 | 17µm  |
| Color palette              | Iron red, rainbow, grayscale, red-white, blue-white |
| Wavelength range           | 8µm~14µm  |
| Field of view (FOV)        | 56° (H) × 42° (V)                                   |
| Spatial resolution (IFOV)  | 11mrad  |
| Thermal sensitivity (NETD) | <50mK   |
| Frame rate                 | <9Hz  |
| Image format               | BMP   |

## General parameters

|                          |  |
|--------------------------|--|
| PC software              | Yes  |
| Data transmission        | Type-C USB interface   |
| Product size (L x W x H) | 236mm x 75.5mm x 86mm  |
| Display type             | 2.8" TFT LCD   |
| Display resolution       | 320 × 240 pixels   |
| Battery                  | 3.7V/5000mAh rechargeable Li-ion battery                     |
| Auto power off           | 5 minutes, 10 minutes, 30 minutes, off (default: 30 minutes) |
| Battery life             | ≥6 hours   |
| Charging time            | 4 hours  |
| Charging voltage/current | 5V/2A  |
| Image storage            | Micro SD card  |
| Drop test                | 2m   |
| IP rating                | IP65   |
| Certification            | CE   |
| Storage temperature      | -20°C~60°C (-4°F~140°F)                                      |
| Operating temperature    | 0°C~50°C (32°F~122°F)  |
| Operating humidity       | <90%RH (non-condensing)                                      |
| Altitude                 | ≤2000m   |
| Standard accessories     | User manual, USB cable, 16GB Micro SD card                   |

## 9.Maintenance

Use a wet cloth or 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. Appendix

### Emissivity of common objects

| 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       |
| Adhesive tape   | 0.09       | Rust          | 0.8        |
| Copper plate    | 0.06       | Gypsum        | 0.75       |
| Dark aluminum   | 0.95       | Paint         | 0.9        |
| Human skin      | 0.98       | Rubber        | 0.95       |
| Asphalt         | 0.96       | Soil          | 0.93       |
| PVC material    | 0.93       |               |            |

**Note:** This manual can be downloaded from the official website of Uni-Trend (refer to UNI-T Documents Download Operation Guide).

# UNI-T®

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