

UNI-T®



**UTi640X/UTi640XH
UTi384X/UTi384XH
X系列智能型红外热成像仪
Expert Thermal Imager**

P/N:110401113944X

PREFACE

Thank you for purchasing the new Expert Thermal Imager. In order to use this product safely and correctly, please read this manual thoroughly, especially the Cautions 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 and 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.

This warranty is the only compensation you can obtain. Uni-Trend will not be responsible for any special, indirect, incidental or subsequent damage or loss caused by any reason or speculation. As some areas or countries do not allow limitations on implied warranties and incidental or subsequent damage, the above limitation of liability and stipulation may not apply to you.

CAUTIONS

WARNINGS

1. Use or store the device in permitted operating or storage temperature to avoid damage.
2. Do not aim the device at strong heat sources, such as sun, laser device, spot-welder, etc.
3. Do not knock, toss, or shake the device and accessories.
4. Do not use solvents or similar liquids on the product or cables.
5. Please refer the following instructions to wipe the device:
 - Non-optical surface: If necessary, use a clean and soft cloth to wipe the non-optical surface of the thermal imager.
 - Optical surface: Avoid staining the optical surface of the lens when using the thermal imager, and especially avoid touching the lens with hands, as it can leave traces on the lens glass and may corrode(erode) the optical coating layer on the glass surface. When optical surface is stained, wipe it carefully with a dedicated lens paper.
6. Keep it stable when using the device.
7. Do not disassemble the device to avoid product damage and loss of warranty rights.
8. Do not place battery in high temperature environment or close to the high temperature targets. Do not cause the battery polarity short circuit. Do not place battery into damp condition or water.

NOTES

- 1) Do not expose the device to dust or moisture. Do not splash water to the device when you're using it. Cover the lens when the device is not in use;
- 2) Place the device and all accessories into a dedicated packaging box when the device is not in use,;
- 3) Do not use the included SD card for other purposes;
- 4) Due to different batches, the materials and details of actual products may be slightly different from the graphic information. Please refer to the actual goods received.
- 5) The experimental data provided in this manual are theoretical values obtained from Uni-Trend's internal laboratories and are for reference only. Customers should not use this data as a basis for placing orders. If you have any questions, please contact customer service for detailed consultation.

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1. Specifications

Model No.	UTi640X	UTi384X
IR Parameters		
Detector Type	Uncooled infrared detectors	
IR Resolution	640 x 512	400 x 300
IR Super Resolution	1280 x 1024	800 x 600
IR Spectral Range	7.5~14μm	
Pixel Size	12μm	
Frame Rate	30Hz	
Thermal Sensitivity/NETD	<35mK	
Focus	Manual/Image Contrast/Laser/Auto/Continuous Auto	
Focus Time	<2s	
Lens Recognition	√ (Intelligent calibration)	

Temperature Range and Accuracy

Applications	Lens Types	Temperature Range	Temperature Range	Accuracy
The lens and machine are packaged and shipped together. (Ambient temperature: 23°C±2°C)	Standard lens	-20°C~1200°C	-20°C~120°C	±1.0°C or ±1.0% (whichever is greater): 0°C~120°C, ±2.0°C: -10°C~0°C
	Wide-angle lens		0°C~600°C	±1.5°C or ±1.5% (whichever is greater): 20°C~600°C
	Telephoto lens		500°C~1200°C	±1.5%
	Ultra telephoto lens	-20°C~100°C	-20°C~100°C	±2.0°C: -10°C~100°C
	Macro lens	1000°C~2200°C	1000°C~2200°C	±1.5%
User purchases an additional lens separately. (Ambient temperature: 23°C±2°C)	Standard lens	-20°C~1200°C	-20°C~120°C	±1.5°C or ±1.5% (whichever is greater): 0°C~120°C, ±2.0°C: -10°C~0°C
	Wide-angle lens		0°C~600°C	±1.5°C or ±1.5% (whichever is greater): 20°C~600°C
	Telephoto lens		500°C~1200°C	±1.5%
	Ultra telephoto lens	-20°C~100°C	-20°C~100°C	±2.0°C: -10°C~100°C
	Macro lens	NA	NA	NA

Resolution	0.1°C
Unit	°C/°F
Temperature Display	3 temperature spots (Center spot, HI spot, LO spot)
On Screen Analyzer	Tools of Point/Line/Circle/Rectangle, At most 16.
Isotherm	Auto/ Touch Screen /Interval/Upward/Downward
HI/LO Temperature Tracking	√
HI/LO Temperature Alert	Audible & LCD Animation
Color Alert	Above/below the temperature and between the temperatures
Measurement Parameters	Emissivity, Reflection Temperature, Ambient Temperature, Relative Humidity, Distance, Dew Point Temperature, Atmospheric Temperature, Atmospheric Transmittance.
Temperature Scale Mode	Auto/Manual/Screen Touch
Area Temperature Correction	Support Area Emissivity Correction
Image Display	
Display Screen	5" IPS LCD Touch Display Screen
Display Resolution	1280x 720
Digital Camera Resolution	13MP
Palettes	White Hot, Black Hot, Red Hot, Ironbow, Rainbow, Rainbow HC, Lava; User-defined.
Palettes Inversion	√
Image Modes	Thermal, Visual Image, T-Mix, Fusion, PIP, Dual Channels
Digital Zoom	1X~5X
T-Contrast	√
T-Sharp	√
T-Select	√
Image Format	JPG
Video Format	MP4/UIR

System Functions	
Button	POWER, Laser Ranging, SET, Arrow, Gallery, Return, AI, Photo Trigger, Focus Trigger.
Laser Pointer	✓
Laser Ranging	0.1~50m (Class 2 laser, red)
Storage	Built-in 128GB, external 64GB SD card (up to 2TB)
Data Interface	Type-C USB
QR Code Scanning	✓
Photo Capturing	✓
Full-Image Display	✓
Panorama Stitching	✓
Video Recording	✓
Full-Radiometric Video Streaming	✓
Text Annotation	✓
Voice Annotation	✓
LED Light	✓
Screen Brightness Adjustment	✓
Voice Control	✓
OTA Upgrade	✓
Bluetooth	✓
Smart Meters	UT197 Industrial Digital Multimeter UT251C+ AC Leakage Current Clamp UT219PV CAT III 1500V Professional AC/DC Clamp Meter UT503PV Insulation Tester UT505A Handheld Insulation Resistance Tester UT117C High-Precision True RMS Digital Multimeter UT501E Fast Insulation Tester UT333BT Mini Temperature Humidity Meter UT353BT Mini Sound Level Meter UT363BT Mini Anemometer UT383BT Mini Light Meter UT61E+ Digital Multimeter UT202BT Smart Clamp Meter

FTP Browsing	✓
Wi-Fi Download Photo	✓
Wi-Fi Live Streaming	✓
Mobile APP	iOS, Android
PC Analysis Software	✓
PC Projection	✓
Languages	Simplified Chinese, English
Power Supply Parameters	
Battery	7.2V/5000mAh Rechargeable & Detachable Li-ion battery (Min capacity 4800mAh)
Battery Operating Time	>5h(Battery life is subject to the actual settings and usage)
Charging System	Charge device via Type-C cable; Charge battery pack separately;
Charging Time	2.5 hours to 90% of full charge (Charge in power-off state, or charge battery pack separately)
Charge Voltage/Current	5V/3A 9V/3A support PD3.0
General Specifications	
Product Color	426U+1797C
Working Temperature	-20°C~55°C
Storage Temperature	-40°C~60°C
Working Humidity	10%~95%RH, non-condensing
IP Rating	IP54
Drop Proof	2m
Certificate	CE, FCC, RoHS
Dimension (L×W×H)	140. 7 x 171. 1 x 304. 4mm
Accessories	USB Cable, Wrist Strap, Micro SD Card, User Manual, High Impact-Resistance Carrying Case.

UTi640X/UTi640XH Lens Parameters

Lens	Model No.	Focal Length	Field of View (FOV)	Spatial Resolution/IFOV	Minimum Imaging Distance	Aperture	Wavelength Range	Lens Recognition
Wide-Angle Lens	UT-Z042	18mm	24°×19.3°	> 0.66mrad	0.15m	F1.0	7.5~14μm	Automatic Recognition
Standard Lens	UT-Z043	9.6mm	46°×37°	> 1.28mrad	0.1m	F1.0	7.5~14μm	Automatic Recognition
Medium-tele Lens	UT-Z044	36mm	12°×9.6°	> 0.33mrad	1m	F1.0	7.5~14μm	Automatic Recognition
Tele Lens	UT-Z045	62.8mm	7°×5.6°	> 0.19mrad	2m	F1.3	7.5~14μm	Automatic Recognition
High-Temperature Lens	UT-Z046	18mm	24°×19.3°	> 0.66mrad	0.15m	F1.0	7.5~14μm	Automatic Recognition

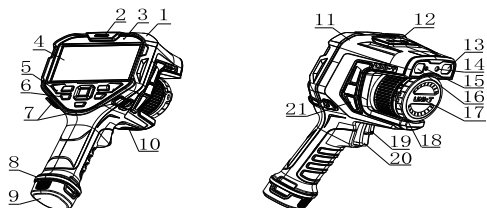
Lens	Model No.	Focal Length	Resolution	Imaging Distance	Aperture	Wavelength Range	Lens Recognition
Macro Lens	UT-Z047	18mm	40μm	20mm~38mm	F1.1	7.5~14μm	Automatic Recognition

UTi384X/UTi384XH Lens Parameters

Lens	Model No.	Focal Length	Field of View (FOV)	Spatial Resolution/IFOV	Minimum Imaging Distance	Aperture	Wavelength Range	Lens Recognition
Wide-Angle Lens	UT-Z048	9.6mm	27.7°×20.6°	> 1.28mrad	0.1m	F1.0	7.5~14μm	Automatic Recognition
Standard Lens	UT-Z049	6mm	46°×34°	> 2.1mrad	0.1m	F1.0	7.5~14μm	Automatic Recognition
Medium-tele Lens	UT-Z050	18mm	14.6°×10.9°	> 0.66mrad	0.15m	F1.0	7.5~14μm	Automatic Recognition
Tele Lens	UT-Z051	36mm	7.2°×5.5°	> 0.33mrad	1m	F1.0	7.5~14μm	Automatic Recognition
High-Temperature Lens	UT-Z052	18mm	14.6°×10.9°	> 0.66mrad	0.15m	F1.0	7.5~14μm	Automatic Recognition

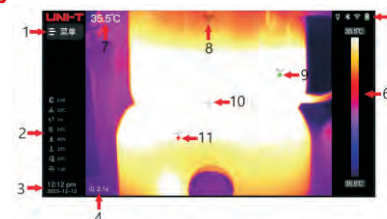
Lens	Model No.	Focal Length	Resolution	Imaging Distance	Aperture	Wavelength Range	Lens Recognition
Macro Lens	UT-Z053	18mm	50μm	24mm~42mm	F1.1	7.5~14μm	Automatic Recognition

2. Structures



Item	Description	Item	Description	Item	Description
1	Rear Case	8	Housing Strap Fastener	15	Laser Pointer
2	Speaker	9	Battery Pack	16	RangeFinder
3	Light Sensor	10	Tripod Mount Nut	17	Infrared Camera
4	LCD Touch Screen	11	Front Case	18	Focusing Ring
5	MIC Hole	12	USB Cover/Charging Interface/SD Card Slot	19	Focus Trigger
6	Functional Buttons	13	Digital Camera	20	Photo Trigger
7	Wrist Strap Hole	14	LED Light	21	Radiator

3. Display



Item	Description	Item	Description
1	Menu	7	Center Spot Temperature
2	Parameters	8	Drop-Down Menu
3	Date & Time	9	LO Spot
4	Magnification Times	10	Center Spot
5	Battery Status	11	HI Spot
6	Temperature Bar		

Notes:

1. Status Bar: Battery Status, Wi-Fi Status, Bluetooth ON/OFF, Flashlight ON/OFF, etc.
2. Date & Time: Enter Menu-Settings-Device Settings-Date & Time Settings, to enter the detailed interface to set the date and time.
3. Drop-Down Menu: In the main preview interface, touch the screen to swipe down from the top of the screen to call out a shortcut menu.

4. Quick Operations Instruction

- 1) Install the battery into the battery holder.
- 2) Long-press POWER button for 2~3s to power on the thermal imager.
- 3) Enter real-time infrared mode, and aim the thermal imager at the target.
- 4) Focusing the target until the image get clear.
- 5) In Photo or Video mode, tap the trigger to save images or record videos.
- 6) Touch the screen or press the button to enable other functions.

5. Focus

5.1 Manual Focus

Rotate the focusing ring until the images get clear.

5.2 TouchScreen Focus

In the real-time preview interface, touch the screen to focus on the target.

5.3 Semi-Auto Focus

Press the Focusing Trigger to focus the image until it is clear.

- ①. Enter "Settings"- "Focus Mode", set the focus mode of Auto Focus (Laser/Contrast), back to the real-time preview interface, and press the Focus Trigger to enable the Auto Focus function.
- ②. When in the Contrast Focus mode, press Focus Trigger to quickly focus the real-time images as per the scene requirements.
- ③. When in the Laser Focus mode, press Focus Trigger to emit a laser point for quickly focusing the real-time images.

5.4 Laser Focus

This function is recommended for use in non-strong light environments, and for observing targets that reflect light well (e.g. blank paper, cables, indoor scene targets, etc.). But not recommended for observing targets that cannot reflect light, or directly absorb or weaken light (e.g. transparent glass, the sky, etc.).

5.5 Image Contrast Focus

Enable this function to focus on the targets by comparing the brightness & contrast parameters of the real-time viewing images, keep the images clear.

5.6 Continuous Auto Focus

1. The thermal imager automatically focuses on the target as per the real-time image change, and keeps real-time images clear, which suitable for use when device stays still.
2. Manually adjust the focusing ring is forbidden during the process of Auto Focus.
3. Enter "Settings"- "Focus Mode", and enable Continuous Auto Focus to realize quickly continuous focus.

6. Menu



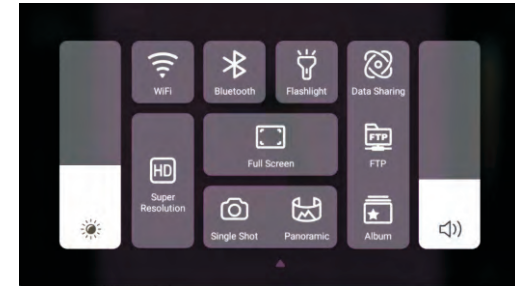
1. Isotherm	Auto/ Manual/ TouchScreen /Interval/Upward/Downward
2. Image Modes	Thermal, Visual Image, T-Mix, Fusion, PIP, Dual Channels
3. On Screen Analyzer	Temperature tools of point, line, circle and rectangle can be added, which can be preset, contrasted and deleted
4. Parameter Settings	Set the temperature measurement parameters, including emissivity, reflection temperature, target distance, humidity, ambient temperature, atmospheric temperature and atmospheric transmittance.
5. Palettes	White Hot, Black Hot, Red Hot, Ironbow, Rainbow, Rainbow HC, Lava, and User-defined.
6. Settings	Details are shown below

7. Settings

Capture Mode	Photo Capturing, Time-Lapse, Video Record, Freeze, Video Format, Countdown.
Focus Mode	Contrast/TouchScreen/Laser/Continuous Auto Focus
Temperature Measurement Range	Selectable: -20~120°C/0~600°C/500~1200°C/Auto Range 1000°C~2200°C (High-temperature Lens)
Temperature Alert	HI/LO temperature alert, LED Alarm, and Audible Alarm
Image Processing	T-Contrast/T-Sharp/Super Resolution
Full-view Display	Enable watermark as needed, including ax temperature value, in temperature value, center value, date & time, temperature bar and measurement parameters, displayed on the main interface.
Connection	Hotspot: Open personal hotspots for connecting by other mobile devices to realize real-time images transmission.
	Bluetooth: Turn Bluetooth on, system will automatically search Bluetooth devices for pairing. After pairing, the device can transfer images successfully. (Currently, only support transferring images from device's gallery to an Android devices or another device.)
	FTP: Start FTP to remotely control files from your computer.
Report Editing	Set parameters in PDF report, including PDF template, report name, company name, lecturer, and approver.
System Settings	Languages: Chinese/English
	Date & Time: The date and time of device can be modified.
	Unit Switch: Temperature Units: °C/°F; Distance Units: m/yd.
	Audio: Volume adjust
	Brightness: Adjust the brightness of screen.
	Auto Backlight: Enable auto light sensing function, and the brightness of screen will change with the ambient brightness.
	Auto Screen OFF: Set the screen-off time as per needed.
	Laser Ranging: Switch on/off laser ranging
	Button Assist: Set the quick operations of the "... " assist button, including temperature range switching, image mode, parameter setting, laser on/off, flashlight on/off, drop-down menu, AI voice. After the setting is completed, back to the real-time image interface and press the assist button to respond to the setting.

	Storage: Display the used and unused space of the device and SD card, and allows clearing data.
	Auto Power Off: Set the auto-power-off time as per needed.
	Factory Reset: Restore the device to factory settings, please exercise caution.
	About: Display the information about device.
	Software Update: Check device version, and support local upgrade.

8. Drop-Down Menu



The drop-down menu calls out a set of shortcut options, such as WiFi, Bluetooth, volume, brightness, etc.

9. Optional Lens Install

- Rotate the lens counterclockwise to remove it;
- Select the needed lens, align the unlock icon of lens with the identification line of device, insert the lens, rotate the lens clockwise, and hear a "click" sound, indicating that the lens is successfully installed.

Note: Be careful to handle it when using it to avoid direct collision and lens damage; when not in use, please place the extended lens into a safe box and store it properly.

10. Measurement Parameters

Emissivity: It refers to the ratio of the measured object to the absolute black body with same temperature. It is an important indicator for measuring the radiation of an object, ranging from 0.00 to 1.00.

Reflected Temperature: It refers to the radiation energy of other heat sources around the measured object.

Target Distance: It refers to the distance between the thermal imager and the measured object.

Ambient Temperature: It refers to the external environment temperature where the thermal imager and the measured object are located.

Relative Humidity: It refers to the moisture content in the air during the transmission of the radiation from measured object.

Atmospheric Temperature: It refers to the air temperature on the path between the thermal imager and the measured object.

Dew Point Temperature: It refers to the temperature when the air is cooled to saturation under the condition that the water vapor content and air pressure do not change, which is related to the ambient temperature and humidity.

Notes:

1. The accurate setting of the above parameters is beneficial to the final temperature measurement results.
2. Recommended values: In general, if you have no idea about these values, please see followings:

Emissivity: 0.95 (Two temperature scales: -20°C~120°C and 0°C~600°C);

1.00 (500°C~1200°C and use high-temperature lens)

Ambient Temperature: 25°C

Relative Humidity: 55%RH

Reflected Temperature: 25°C

Atmospheric Temperature: 25°C

Atmospheric Transmittance: 1.00

Target Distance:

Wide-Angle Lens	0.5m
Standard Lens	0.6m
Medium-tele Lens	1.0m
Tele Lens	2.0m
High-temperature Lens	0.6m

11. Notes

To ensure accurate measurements, please read the instructions carefully. Use the product only as specified in this manual. Otherwise the product damage will not be free warranty. Do not use this product in an inflammable, explosive, steamy, damp or corrosive environment. Do not use the product after it is damaged, broken or corrected to avoid wrong measurement results. Please refer to the radiation coefficient to get the actual temperature. Otherwise, the measured temperature may be inaccurate.

The product can be charged with a USB cable. However, to improve the charging efficiency, it is recommended that users take out the battery pack and charge it separately.

12. FCC Compliance statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Radiation Exposure Statement:

The device has been evaluated to meet general RF exposure requirement. The device can be used in the portable exposure condition without restriction.

13. Mobile App

Step 1

For iOS, download "Thermal Link" on Apple APP Store or scan the following code.

For Android, download "Thermal Link" in UNI-T's official website or scan the following code.



iOS



Android

Step 2

- Turn on Wi-Fi hotspot on thermal device.
- Search Wi-Fi name on mobile device.
- Enter password 12345678 to connect Wi-Fi.
- Access APP to get functions of real-time image transmission, remote viewing and images download, etc.

Note: To ensure stable data transmission, please try to maintain the connection within a range of 10m and ensure there are no obstacles blocking the signal.

14. Emissivity Table

Materials	Emissivity	Materials	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
Adhesive Tape	0.96	Cast Iron	0.81
Aluminum Plate	0.09	Rust	0.8
Copper Plate	0.06	Plaster	0.75
Black Aluminum	0.95	Paint	0.9
Human Skin	0.98	Rubber	0.95
Asphalt	0.96	Soil	0.93
PVC Plastic	0.93		

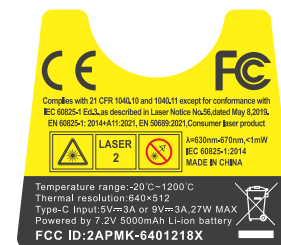
1. Recommended operating environment: indoor use

Pollution degree:2

Altitude : up to 2000m

EMC: EN IEC 61326-1, Class B;

2. Product label.



DO NOT STARE INTO BEAM OR EXPOSE USERS OF TELESCOPIC OPTICS.
CLASS 2 CONSUMER LASER PRODUCT

Warning: If the equipment is used in manner not specified by the manufacturer, the protection provided by the equipment may be impaired

The contents of this manual are subject to change without notice.

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