



UNI-T®



UT180 UT1100 UT160A Operating Manual

Thermal Infrared
Imager



P/N:110401103323

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I、 Safety Instruction

Before using this product, please ensure that you have read and understood the safety precautions described below, so that you can operate the product in correct way.

The following safety precautions set out aim to correctly guide you to operate this product as well as its accessories safely and correctly in order to avoid damage and loss to user itself, others and equipment.

Warning

Warning identifies the actions that may pose hazards to users. In order to avoid electric shock or personal injury, please follow these guidelines below: Avoid Eye Harm

 **Warning:** Do not aim the laser designator at the eyes of human or animal. The laser emitted by laser designator may cause injury to vision.

If the product emits smoke or smell, please immediately stop using this product.

In such cases, please immediately cut off the power of host machine or remove the battery. After ensuring that the phenomenon of smoke or odor has been stopped completely, please contact your local Uni-Trend dealer or agent.

If the product shell has been damaged, please do not continue using this product.

In such cases, please contact your local Uni-Trend dealer or agent.

Do not use alcohol, benzene, diluting agent or gaseous organic solvents to clean the product shell.

Such operations may damage the product shell or cause a fire.

Regularly remove charger's power cord and remove the dust around plug, electrical outlet and nearby.

In case of being exposed to dusty and humid environment for a long time, the dust around plug and electrical outlet will accumulate moisture, thus short circuit and fire may be caused.

Do not touch the cable with wet hands.

Electric shock may be caused in case of touching the cable with wet hands. When the cable is pulled out, user should grip the cable head and then pull out the cable. Do not pull the cable directly, or else cable breakage, electric shock and fire may be caused.

Do not modify battery charger and cables.

Otherwise, these modifications may cause short circuit or fire.

Do not use non-originally recommended power accessories.

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Unauthorized use of non-factory recommended power accessories may cause overheating, electric shock, fire and other serious consequences.

Neither place battery near heat source nor allow them to be exposed directly to the place with flame or hot object. Similarly, it is forbidden to immerse battery into water.

Otherwise, such operations may damage battery and cause leakage of corrosive liquid inside battery, fire, electric shock, explosion and serious injury on human body.

Do not attempt to disassemble, modify or heat the battery. This will cause battery to explode and serious injury on human body. If any part of human body including eyes and mouth or clothes come into contact with the chemicals inside battery, please wash it with water immediately. If eyes or mouth comes into contact with these substances, please wash with water immediately and seek medical treatment in time.

Avoid battery under attack (such as impact, throw etc.). Such operations may damage battery shell or even cause battery to leak and explode.

Battery should be avoided to be placed with other metal objects together, or else short circuit of battery may be caused.

Similarly, do not short circuit battery's electrodes. Short circuit will lead to battery overheating, combustion, explosion and other damages.

Before batteries are discarded, please use adhesive tape or other insulation objects to cover the battery's electrodes in order to avoid battery short circuit.

Discarding battery into trash directly might result in short-circuit of battery, cause fire and explosion. For your and others' safety as well as environmental protection, it is recommended that you should use a dedicated battery recycling container or directly contact a professional battery recycling company.

Please Use recommended batteries and other accessories. Use of the battery which is not designed for this product may cause equipment overheating, electric shock, fire, leakage of battery's internal chemicals, explosion and other serious consequences.

Please disconnect the battery charger on power socket when it is not charging.

The battery charger is likely to become overheating, deformed or even fire after being connected to electricity for a long time.

Please make sure that the charger plug is inserted into the

designated power outlet.

Battery charger plugs vary from region to region. Before use, please make sure that the specifications of charger remains consistent with that of your local region. Otherwise, it may cause equipment overheating, electric shock, fire, leakage of battery's internal chemicals, explosion and other serious consequences.

Please stop using immediately when the cable or plug of battery charger is damaged.

Please ensure that the charger plug is inserted into outlet completely before charging battery.

Please install the purchased telephoto lens, wide-angle lens and close-up lens carefully.

Incorrect installation will be likely to lead to loose, falling and breaking of additional lens. Lens fragments may cause injury.

The product temperature may rise after prolonged use.

Please take care when you use this machine for a long time. Your hands may feel hot.

★ Caution

Please follow these guidelines below to ensure that the product is not damaged:

Do not assemble or disassemble this product without prior

permission.

This product is quite sophisticated equipment. Do not attempt to disassemble or modify any part of the product. Internal inspection or warranty should be conducted by qualified technical personnel specified by Uni-Trend.

Avoid damaging the product's detector.

★ Caution: Do not point the product directly to the sun or other strong heat sources (such as electric iron); otherwise, it may damage the product's detector.

Avoid problems caused by condensation.

When the product is brought from high temperature to low temperature or from low temperature to high temperature, condensation (water droplets) may be generated on product case and internal parts. In such cases, you can put the product in the supplied carrying case. The product is gradually adjusted to ambient temperature before use. Then you can take out the product and operate.

* If the internal parts of product have generated condensation, please immediately turn off the device and remove the battery. Otherwise, the equipment may be damaged. You can not operate it until condensation disappears completely.

Avoid products under attack (e.g. impact, throw etc.)

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Such operations may result in product damage. Please be careful to avoid them.

The product temperature may rise after prolonged use. Please take care when you use this machine for a long time. Your hands may feel hot.

Long-term storage.

If the products are not used for a long term, please remove the battery on the product or charger, and then place it in a cool and dry environment.

* If the products are stored with battery for a long term, power will be exhausted.

II、 Product Overview

UTi80/UTi100/UTi160A infrared thermal imager takes the advanced infrared detector with UFPA Uncooled focal plane and high-quality optical lenses as core, combines with the convenient operating system, leading ergonomic structure design and expansion accessories with perfect function. It is an ideal temperature measurement tool with “clear imaging, accurate measurement, simple operation and portable to carry” for applicable users. It is the optimum choice for on-site temperature detection, preventive maintenance and other application occasions.

It can be widely used in electrical, electronic and manufacturing, construction, energy, metallurgy, petrochemical, railroad, automotive and other industries.

Measuring principles:

Infrared radiation: In nature, any objects with temperature above absolute zero (-273°C) will emit infrared radiation to the outside world. The size of radiation energy of object is related to the surface temperature of object.

Infrared detector: it is the device which can convert the change of amount of infrared radiation of measured object into power change, i.e. convert light signals into electrical signals.

Infrared thermal imager will focalize the infrared energy radiated from measured objects to infrared detector by optical devices. After the infrared data which each pixel on detector receives are processed, compare the pre-calibrated temperature data; convert them into standard video format and display, thus the process can be achieved that the heat distribution of measured objects is converted into infrared thermal map.

This infrared thermal map corresponds to the thermal distribution on the surface of measured objects. The different colors on thermal images represent different temperatures of measured objects.

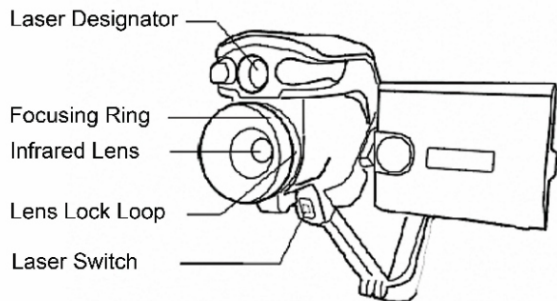
III、 Out of box audit

Open the package and check whether the following items are missing or damaged or not. If damaged or missing, please contact the nearest after-sales service office.

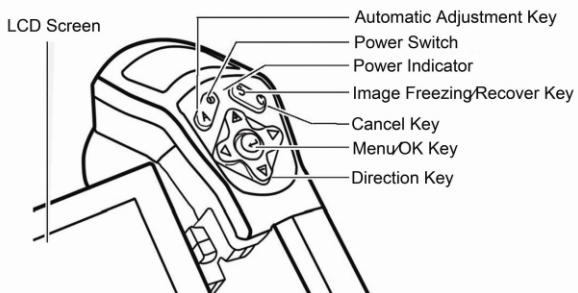
- 1、 Host machine ----- One set
- 2、 Instructions ----- One
- 3、 Chargeable battery ----- One piece
- 4、 Battery charger ----- One piece
- 5、 2G SD card ----- One piece
- 6、 SD card reader ----- One piece
- 7、 Lens cap ----- One piece
- 8、 Software Cd ----- One piece
- 9、 Thermometric report ----- One

IV、 Product Structure

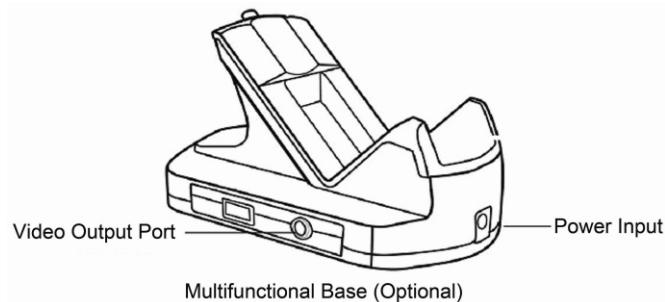
1、 Positive part



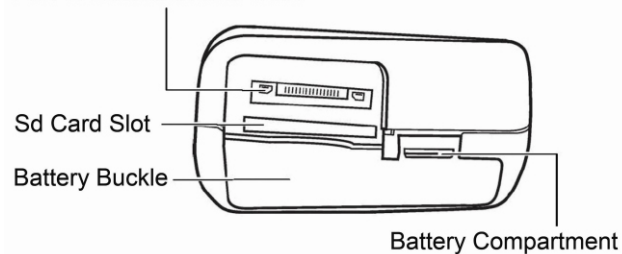
2、 Key Parts

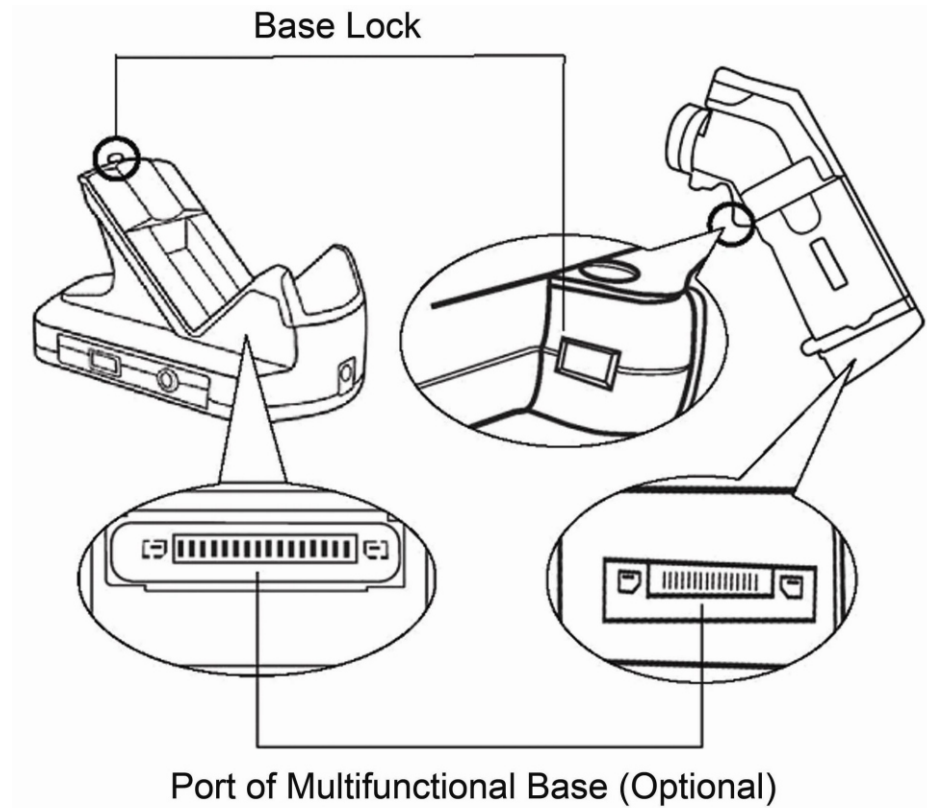


3、 Multifunctional Base (Optional)



Port of Multifunctional Base





V、 Product Operations

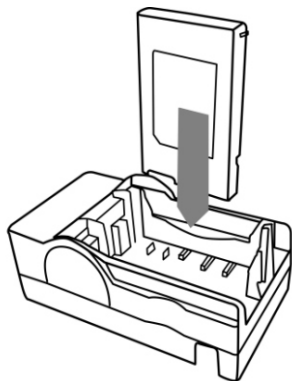
1、 Guidance to Operations

1) Charge Batteries

When the LCD displays low battery, please charge battery as the following steps.

The edges of battery should be aligned at battery slot of battery charger.

Insert the charger plug into power outlet.

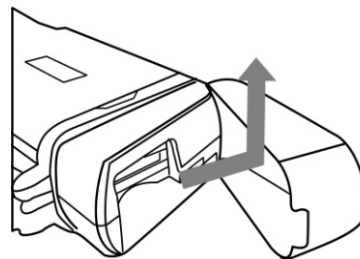


- During the process of charging, the power indicator on charger will be lit as red for long. After charging, the power indicator on charger will be lit as green for long.

- After charging, please unplug the battery charger and remove the battery.
- This product uses intelligent Lithium-polymer chargeable battery. Prior to each charge, it is not necessary to discharge battery. You can charge battery under any power state. However, as the maximum charging number is about 300 times (service life of battery), in order to prolong the service life of battery, it is recommended that the battery should be charged after power runs out naturally to extend the service life of battery.
- Charging time will vary with the different temperatures of external environment and charging states of battery.
- Before using battery for the first time, please charge the battery.

2) Install Batteries/SD Card

Make sure that the power is cut off, and then pull out the SD card /battery compartment as the direction of arrow.

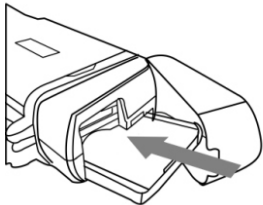


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Insert battery


Push the battery into battery compartment along the direction of battery. After the battery is fully inserted, the battery lock will utter a rattling sound.

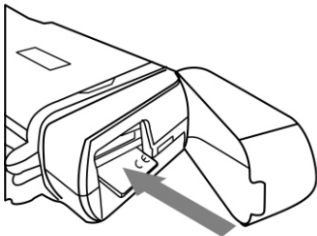
To remove battery, release the battery lock as the direction of arrow.



Insert SD card

Push SD card into the slot until clicks sound is heard. To remove the SD card, Press edge of card towards inside, the SD card will pop up automatically and then pull out the card.






If SD card is inserted under the state of starting up and after SD card is recognized,  will appear on the LCD screen.



Close up the battery compartment / SD card cap

- * Please remove the battery when the machine is not used.
- * Please format SD card by using FAT32 format.

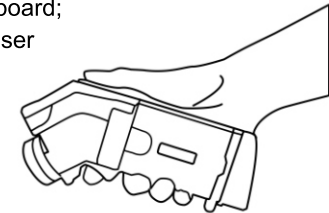
Instructions on displaying the electric quantity of battery:


Displaying Status					
Status Description	The battery is with adequate electric quantity.			The battery is with weak electric quantity.	Replace battery or charge the battery.

3) Turn on/off Power Source

Hold the product properly.


Hold the product with your right hand; your thumb is placed above the keyboard; your index finger is placed on the laser shortcuts keyboard.



Turn the power on: Press down the power switch key “

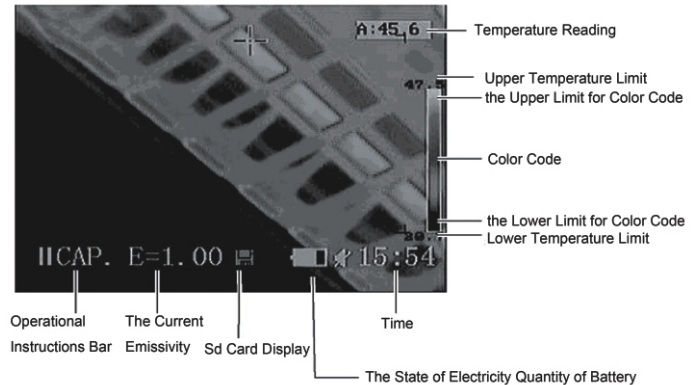
After a few seconds, the LCD screen will display equipment activation frame.



Turn off the power: Press power switch key “

4) Display Information

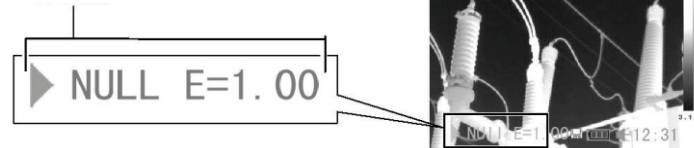
The LCD screen of the products possesses 100% view of the images captured by actual lens. The following is actually displayed frame.




About Operational Instructions Bar

Instrument status (including the current working models and analysis tools) and the hot keys which can be used under the current status will be displayed in the operational Instructions Bar.

Status Indicator



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Status Display	Menu	The current state is menu mode. The menu of instrument is called out.
	Null	The current state is null model. Currently menu or analysis tool is not selected.
	SP1	The current state is point analysis mode. The current analysis tool is temperature measurement point I.
	CAP.	The current state is auto-capture mode. The current analysis tool is automatically capture point.
	E	The currently set emissivity.
		SD card has been inserted and recognized.

Method for entering null model [Null]:

Press [Cancel] key repeatedly till the information of [Null] appears on the status display column.

5) Set Date and Time

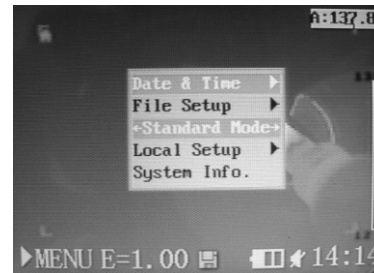
Please set date and time at the first use of this product.

Make the product in Null model.

Press [Menu / OK] key “ \leftarrow ” to open menu option, Press [Up/Down] key “ \triangle / ∇ ” to select [System Setup], and then Press [Menu / OK] key “ \leftarrow ” to open system setup options.

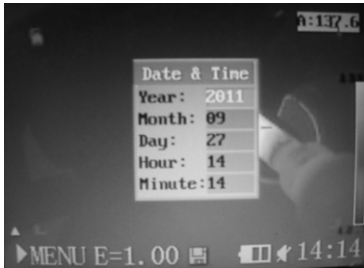


Press [Up/Down] key “ \triangle / ∇ ” to select [Date & Time], then press [Menu / OK] key “ \leftarrow ” to enter the modification options for time / date.



Set Date and Time

Press [Up] [Down] key “ \triangle / ∇ ” to select the item which need to be modified. Press [Left] [Right] “ $\triangleleft / \triangleright$ ” key to change the settings of this item.



After modification, Press [Menu / OK] key “ \leftarrow ”, the equipment will save the modifications which have been made. If you do not want to save the modifications which have been made, just press [Cancel] “**C**” key.

6) Set Operating Mode

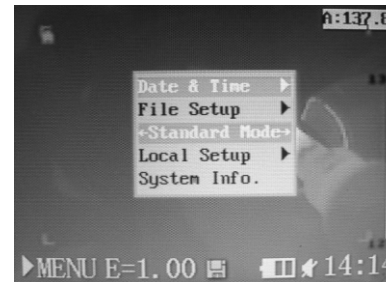
You can set appropriate working mode including standard mode and Low Power according to your needs.

Make the product in Null model.

Press [Menu / OK] key “ \leftarrow ” to call out the menu, then Press [Up / Down] “ \triangle / ∇ ” key to select [System Setup], and press [Menu / OK] “ \leftarrow ” key.



Press [Left / Right] “ $\triangleleft / \triangleright$ ” key to select [Standard Mode] / [Low Power].



* The system is defaulted as Low Power.

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2、 Functions of Product

1) Use LCD Screen

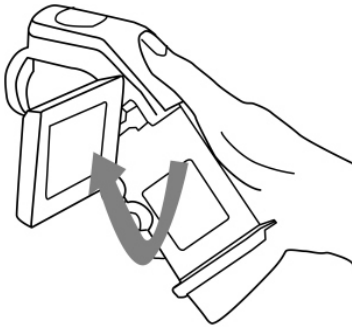
You can easily observe or playback images by the open side LCD screen. Please Use LCD screen as the following steps.

Open the LCD screen

This machine uses a 2.5-inch full color LCD screen.

When you hold the product, open the LCD screen as 90 degrees with the product. Then turn it to the best angle for observation.

The swivel angle of LCD screen is 270 degrees allowing you to observe from all angles.



Align the product at the target which you want to observe.

* In order to obtain the best quality of captured image, please adjust the angle of product to make the objects which need to be observed in the middle of displayed image on LCD screen.

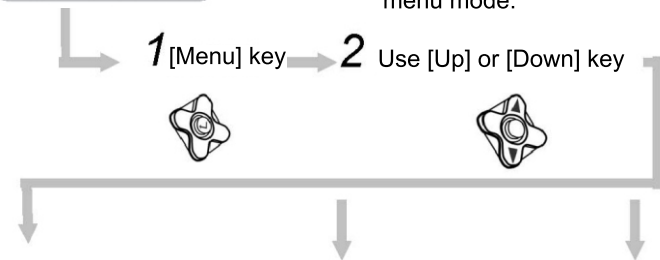
* When the product is not used for a short period of time, you can close up the LCD screen to turn off display for longer battery service time.

2) Operation of Menu

Enter / exit menu mode as the following steps:



- 1) Press [Menu / OK] key to enter menu mode. The status display column will show [Menu].
- 2) Press [Left] or [Right] key to select submenu.
- 3) Press [Up] or [Down] key to select submenu items.
- 4) Press [Menu / OK] key or [Cancel] key to exit from menu mode.



Playback



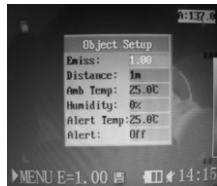
Temp • Setup



System Setup



3 Use [Up] or [Down] key



4 Use [Menu / OK] key or [Cancel] key






Exit

- The contents of the above menu items will vary with the change of the setting of thermal imager.

3) Restore Factory Settings

You can restore the product's factory settings as the following steps.

- Press [Power Switch] key “” to turn off product power.
- Press [Cancel] key “” and [Power Switch] key “” simultaneously for three seconds to start up the product.

The product's setup parameters will restore factory settings.

- * After restoring factory setting, the data which have been stored in the built-in memory will not be deleted.

3、 Image Capture

1) Regulation of Thermal Imager

- Image Adjustment

In order to facilitate your observations, you can choose to have the product adjust image automatically or adjust image's medium value of color temperature and the range of color temperature manually.

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Automatic adjustment: During shooting process, just Press [Automatic Adjustment] key “**A**”, the instrument will automatically adjust image.

Manual adjustment: adjust image's medium value of color temperature and the range of color temperature through the direction keys on host machine.

Press [Up] key “**△**” or [Down] key “**▽**” to alter the range of color temperature; Press [Left] key “**◁**” or [Right] key “**▷**” to alter the medium value of color temperature.

●Palette Setting

Press [Menu / OK] key “**←**” .

Press [Up] key “**△**” or [Down] key “**▽**” to select [Iron].

Press [Left] key “**◁**” or [Right] key “**▷**” to select different palettes.

Press [Menu / OK] key “**←**” to save the changes which have been made. If you do not want to save the changes which have been made, just press [Cancel] key “**C**”

* Six pseudo-color modes are available for the product:
Iron, Iron Inverted, Rainbow, Feather, Grey, Grey Inverted.

●Frozen / Activate Image

During shooting, you can freeze image by pressing the [Image Freeze / Activate] key “**S**”, and then make a simple analysis on host machine. Freeze or activate image by pressing the [Image Freeze / Activate] key “**S**” .

* When shooting, if you click the [Image Freeze / Activate] key “**S**” for once, image is frozen. Click the [Image Freeze / Activate] key “**S**” again, then the image will be activated.

2) 、 Thermometric Setting

Goals, environmental parameters and alarm settings.

Press [Menu / OK] key “**←**” .

Press [Up] key “**△**” or [Down] key “**▽**” to select

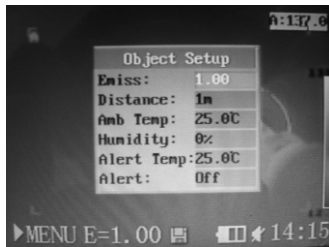
[Temp • Setup].

Press [Menu / OK] key “**←**” to enter the menu.



Set emiss, distance, amb temp and humidity, alert temp and alert.

- * Press [Up] key or [Down] key to select the options which need to be modified.
- * Press [Left] key or [Right] key to change the value of the selected option.



Press [Menu / OK] key “↵” to save the changes which have been made. If you do not want to save the changes which have been made, just Press [Cancel] “C” key.

On Analysis of Parameters

Emiss	Set the emissivity of the object which goal (analysis tools) points to. As emissivity is a parameter which has great influence on the results of temperature measurement, therefore please make sure that the emissivity setting is correct before conducting measurement in order to ensure the accuracy of temperature measurement.
Distance	Set the distance between the object which goal (analysis tools) points to and the lens of thermal imager.
Amb Temp	Set the ambient temperature of measurement site.
Humidity	Set the environment humidity of measurement site.
Alert Temp	Set the temperature which alarm corresponds to. When [Alarming Switch] is set as “On”, if the point setting is set as the measured temperature value on [the highest point on full screen] is greater than the preset alarming temperature, the instrument will utter an alarming sound; on the contrary, if the point setting is set as the measured temperature value on [the highest point on full screen] is less than the preset alarming temperature, the instrument will still utter an alarming sound.
Alert	Set the alarming state is on or off.

3)、Thermometric Function

Point Analysis Tool

In NULL mode, Press [Menu / OK] key “←” .
 Press [Up] key “△” or [Down] key “▽” to select the first line of menu bar, among which four options are available respectively [Vision Only], [Movable Spot], [Hot Spot] and [Cold Spot].
 Select the desired option, then Press [Menu / OK] key “←” .



Select the [Movable Spot], and Press [Menu / OK] key “←” , then press [Up] key “△” or [Down] key “▽” or [Left] key “◀” or [Right] key “▶” to move a thermometric point on the screen.

The temperature on this thermometric point will be displayed and alter with the movement of thermometric points.



Select the [Hot Spot] or [Cold Spot]; Press [Menu / OK] key “←” , then the instrument will automatically capture the highest temperature point or the lowest temperature point on screen. The corresponding temperature readings will be displayed on the upper right corner of screen.



- * If you select [Vision Only], Press [Menu / OK] key, the point on screen and the corresponding temperature readings etc. will be cleared.
- * You can turn on the laser designator and conduct fixed-point analysis on the target.

4) Save and Playback of Images

● Save of Images

Under null (NULL) state, Press [Image Activation / Freeze] “S” key for long to save image directly. After save is successfully done, there will be corresponding prompt. Picture will be saved in the current folder. For specific details, please refer to the “save catalogue name of file and file name” section at the back.

● Playback of Images

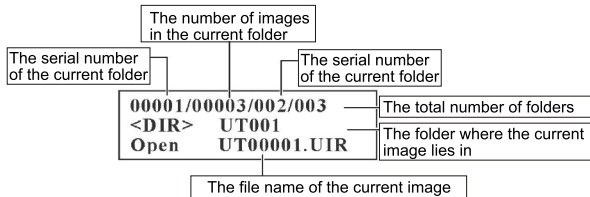
Press [Menu / OK] key “←” .

Press [Up] key “△” or [Down] key “▽” to select [Playback], and Press [Menu / OK] key “←” .

Press [Up] key “△” or [Down] key “▽” or [Left] key “◀” or [Right] key “▶” to select the image you want to open, and press [Menu / OK] key “←” to open image.

● Choose an Image

After image is opened, the following information will be displayed on the lower left corner of the screen:



Press [Up] key “△” or [Down] key “▽” and Press [Menu / OK] key “←” , then image will be opened. You can view the images which need to be analyzed.

Press [Menu / OK] key “←” , you will see the information of the following selection directory, or press [Cancel] “C” to return, or Press [Freeze / Activation] key “S” to activate the current image.

● Choose the directory name and file name of the current image saved.

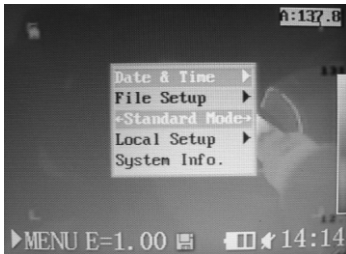
Press [Menu / OK] key “←” .

Press [Up] key “△” or [Down] key “▽” to select [System Setup], and Press [Menu / OK] key “←” .

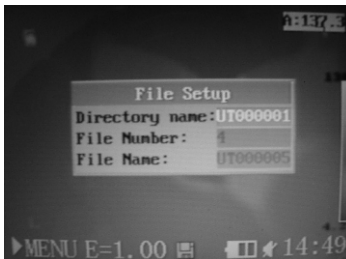


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Press [Up] key “△” or [Down] key “▽” to select [File Setup],
And Press [Menu / OK] key “↵” .



Press [Up] key “△” or [Down] key “▽” to select [Directory Name].
Press [Left] key “◀” or [Right] key “▶” to select to save file directory.

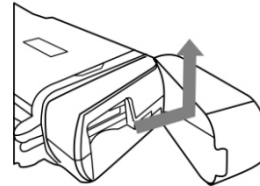


The number of files means the number of files under this directory.
Press [Up] key “△” or [Down] key “▽” to select [File Name],
Press [Left] key “◀” or [Right] key “▶” to select to save file name.

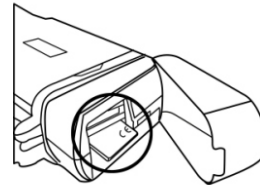
4. Upload Images

Upload images via SD card: take SD card from the host machine, and then upload the infrared thermal map via SD card reader to your computer.

Open battery compartment.



Push it with your hand gently towards inside as the direction of arrow; then SD card will pop up automatically.



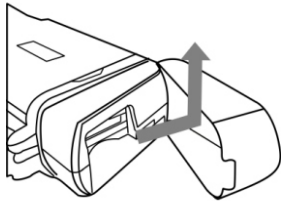
Remove the SD card and insert it into card reader. After the card reader is connected to a computer, you can send infrared thermal map to your computer.

* After infrared thermal map is sent to your computer, you can analyze the infrared thermal map better with the help of Uni-Trend PC software.

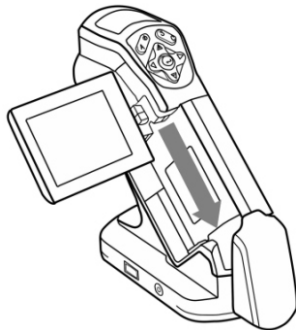
5. About Multifunctional Base (Optional)

1)、Connecting Base

Open the rubber cushion of thermal imager battery along the direction of the arrow.



Place the base on a flat surface. Fix the thermal imager on the base as the direction of arrow in icon.

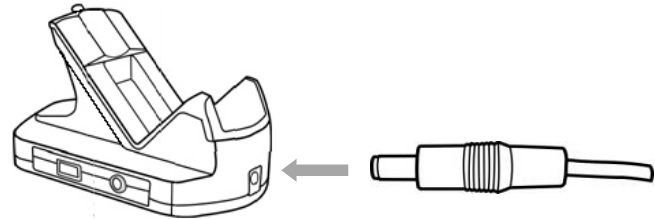


The connection of host machine with base is completed.

2)、Use Base to Charge

Charge the battery inside host machine through the base and power adapter.

Insert the DC plug of power adapter into the power input port of the base.



Insert the other end plug of power adapter into 220V AC outlet.

* When charging, the power lamp of host machine will flash in green light. When it is fully charged, green light will be lit for long.

Notes:

After battery is fully charged, unplug the plug of power adapter. You had better use battery charger (standard seat charger) to charge battery.

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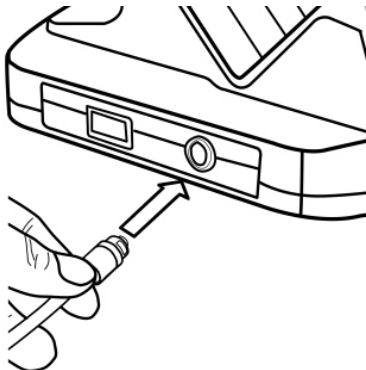
3)、Video Output

You can connect the external monitor through the video output port on multifunctional base and observe the image which the product has taken. The interfaces at both ends of video signal cable are identical.

* You can select a composite video cable to connect monitor.

Close up thermal imager.

Insert the video signal cable into the video output interface of multifunctional base as the direction of the arrow.



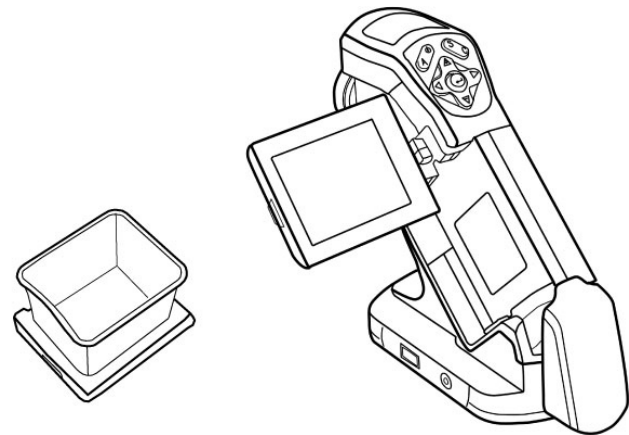
Insert the other end of video signal cable into the video input interface of monitor.

Turn on the thermal imager.

6. Use of Sunshade (Optional)

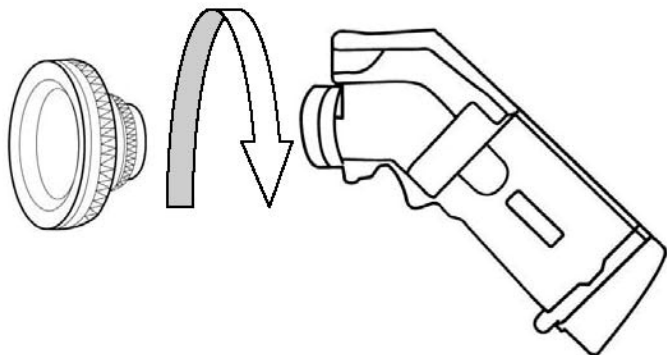
Under outdoor highlight conditions, you can use sunshade to observe screen clearly.

Please install sunshade as the direction of the arrow below.



7. Change of Lens (Optional)

Firstly, remove the original lens; then replace it with new lens as shown in the diagram.



Press [Up] key “ \triangle ” or [Down] key “ ∇ ” select different lens. The following table is the type of lens which the lens with different angles correspond to on machine.

Type	Null	A	B	D	E
Lens	20°	12.8°	38°	6.4°	3.8°

Then Press [Left] key “ \triangleleft ” or [Right] key “ \triangleright ” to select thermometric grade.

VI. Technical Index

1. Technical Parameters

Infrared Thermal Imager	UTi80	UTi100	UTi160A
Imaging Performance			
Resolution	80*60 Pixel	100*80 Pixel	160*120 Pixel
Thermal Sensitivity	0.08°C @ 30°C		
Visual Angle / Minimum Imaging Distance	10° x 7.5° / 0.1m	12° x 9.4° / 0.1m	20° x 15° / 0.1m
Spatial Resolution	2.2mrad		
Focus Ways	Manual Focusing		
Type Of Sensor	Uncooled Focal Plane		
Operating Band	8~14um		
Thermometric Performance			
Thermometric Range	-20°C to +300°C		
Measurement Accuracy	±2% or 2°C (select the greater one)		
Thermometric Mode	Thermometric on fixed center point / automatical capture of the highest temperature / the lowest temperature on full screen		
Temperature Correction	Ambient Temperature / Emissivity / Humidity / Distance		
Palette	Six types (iron oxide red / anti-iron oxide red / color red / zooerythrin / white heat / black heat)		
Temperature Alarming Setting	High and low temperature alarms can be set.		
Laser Designator	√		

Image Display / Storage Performance	
Screen Size	2.5" TFT screen
Image Storage	Standard 2GB SD card, support up to 16GB
File Format	*.UIR
Video Output	PAL (50Hz) or NTSC (60Hz) composite video (with optional base)
Environmental Parameters	
Operating Ambient Temperature	-15°C to +50°C
Ambient Temperature for Storage	-40°C to +70°C
Humidity	95%RH (non-condensing)
Waterproof / Dustproof	IP54
Shock Resistance / Earthquake-Resistance Capability	25G/2G
Power Source System	
Battery	Chargeable lithium batteries (It can work for 3 hours consecutively)
Power Adapters	8V ~ 11V DC output
Operating Mode	Dual modes (Standard mode and energy conservation mode are optional)
Product Specifications	
Color Of Machine Body	Red + grey
Weight of Whole Machine	<500 grams (including battery)
Product Size	170 x 160 x 80 mm

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2. Product Accessories

Standard Accessories		Battery, charger, 2G memory card, card reader, lens cap, PC software CD and instructions.
Optional	General Accessories	Base, power adapter, video cable, 16G memory card, vehicle power cable and sunshade.
	* Lens	38° wide-angle lens, 12° 2X telescope lens, 6.4° 3X telescope lens and 3.8° 5X telescope lens.
	* Customized Temperature	600°C、1000°C、1500°C。

*This kind of accessory is only for UTi160A; Temperature for UTi160A settable up to 1500°C.

Appendix: Table of Common Accessories Models

Name of Accessory	Base	Battery	Power Adapter	Composite Video Cable	Vehicle Power Cable
Model of Accessories	UTi-A01	UTi-A02	UTi-A03	UTi-A04	UTi-A05
Name of Accessories	38° wide-angle lens	12° telescope lens	6.4° telescope lens	3.8° telescope lens	600°C customized temperature
Model of Accessories	UTi-C380	UTi-C120	UTi-C64	UTi-C38	UTi-C600
Name of Accessory	1000°C customized temperature	1500°C customized temperature			
Model of Accessories	UTi-T1000	UTi-T1500			

VII. Maintenance and Repair

1. Product Maintenance

Please clean the body, lens, LCD screen and other components of thermal imager as the following method.

Body of Thermal Imager	Use a clean soft cloth or other special cloth to wipe the body.
Lens	Please blow the dust on lens by the dedicated rubber pipette bulb ; and then use special lens cleaning cloth or clean soft cloth to wipe lens surface gently. ● Do not wipe the lens by hand or other dirty cloth to avoid lens scratches.
LCD Display Screen	Please blow the dust attached on the surface by dedicated rubber pipette bulb. If you encounter stubbornly attached dirt or water vapor, please use a special clean cloth or clean soft cloth to wipe it gently. ● Do not wipe the LCD screen with force lest cause damage or other display issues.



Warning

Do not use alcohol, benzene, diluting agent, gaseous organic solvents or water to clean the thermal imager lest cause any harm to thermal imager or equipment damage.

2. Common Trouble Shooting

Troubles	Possible Causes	Solutions
Product can not be operated.	The power switch is not turned on.	● Turn on the power source of product.
	Lack of electricity.	● Charge battery.
	The electrodes connection of thermal imager and battery are poor.	● Use a piece of clean cloth to clean electrode.
Product can not store images.	The built-in memory becomes full.	<ul style="list-style-type: none"> ● Insert a new built-in memory. ● If necessary, download the images in the flash memory card of built-in memory to your computer; and then delete the images to vacate room.
	The built-in memory can not be properly identified.	<ul style="list-style-type: none"> ● Please format the built-in memory by FAT32 format on computer. ● If the built-in memory still can not be used normally after reformat, then the built-in memory may be damaged. Please replace it with another piece of built-in memory.
The electric quantity of battery runs out soon.	As the battery is not used for one year or more after being fully charged, the battery capacity is reduced.	● Replace it with new battery.
	Exceed the service life of battery.	● Replace it with new battery.
Battery can not be charged.	The connection of charger and battery electrodes are poor.	<ul style="list-style-type: none"> ● Use a piece of clean cloth to wipe electrodes. ● Insert battery firmly into charger. ● Insert the power cord of charger firmly into charger and power outlet.
	Exceed the service life of battery.	● Replace it with new battery.

VIII. Emissivity Table of Common Materials

Materials	Materials	Approximate Value of Emissivity
Metal		
Aluminum		
Polished Aluminum	100	0.09
Commercial Aluminium Foil	100	0.09
Chromium Electroplating Aluminium Oxide		0.55
Mild Alumina	25~600	0.10~0.20
Strong Alumina	25~600	0.30~0.40
Brass		
Brass Mirror Face (Highly Polished)	28	0.03
Oxidized Brass	200~600	0.61~0.59
Chrome		
Polished Chrome	40~1090	0.08~0.36
Copper		
Bronze Mirror Face	100	0.05
Strong Copper Oxide	25	0.078
Cuprous Oxide	800~1100	0.66~0.54
Fluid Copper	1080~1280	0.16~0.13
Gold		
Gold Mirror Face	230~630	0.02
Iron		
Polished Cast Iron	200	0.21

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Cast Iron Machining	20	0.44
Polished Tempering Iron	40~250	0.28
Polished Steel Ingot	770~1040	0.52~0.56
Welding Steel by CO2 Gas Shielded Arc Welding	945~1100	0.52~0.61
Surface Oxide Iron		
Completely Rusty Surface	20	0.69
Rolled Iron Plate	22	0.66
Oxidized Steel	100	0.74
Cast Iron (Oxidized at 600 °C)	198~600	0.64~0.78
Steel (Oxidized at 600 °C)	198~600	0.79
Electrolytic Iron Oxide	125~520	0.78~0.82
Iron Oxide	500~1200	0.85~0.89
Iron Plate	925~1120	0.87~0.95
Cast Iron, Heavy Iron Oxide	25	0.80
Tempering Iron, Iron Oxide	40~250	0.95
Melted Surface	22	0.94
Melted Cast Iron	1300~1400	0.29
Melted Low-Carbon Steel	1600~1800	0.28
Molten Steel	1500~1650	0.42~0.53
Pure Molten Iron	1515~1680	0.42~0.45
Lead		
Pure Lead (Non-oxidized)	125~225	0.06~0.08
Mildly Oxidized	25~300	0.20~0.45

Magnesium		
Magnesium (as Magnesium Oxide)	275~825	0.55~0.20
Magnesium Oxide	900~1670	0.20
Mercury	0~100	0.09~0.12
Nickel		
Electroplating Polish	25	0.05
Electroplating without Polishing	20	0.01
Nickel Wire	185~1010	0.09~0.19
Nickel Plate (Oxidized)	198~600	0.37~0.48
Nickel Oxide	650~1255	0.59~0.86
Nickel Alloy		
Nickel-Chromium (Heat Resistant) Alloy Wire (Light)	50~1000	0.65~0.79
Nickel-Chromium Alloy	50~1040	0.64~0.76
Nickel-Chromium (Heat Resistant)	50~500	0.95~0.98
Alloy Wire (Oxidized)		
Nickel-Silver Alloy	100	0.14
Silver		
Polished Silver	100	0.05
Stainless Steel		
18-8	25	0.16
304(8Cr,18Ni)	215~490	0.44~0.36
310(25Cr,20Ni)	215~520	0.90~0.97

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Tin		
Commercial Tin Plate	100	0.07
Strong Oxidizing	0~200	0.60
Zinc		
Oxidized at 400°C	400	0.01
Bright Galvanized Iron Plate	28	0.23
Grey Zinc Oxide	25	0.28

Nonmetal Materials

Brick	1100	0.75
Firebrick	1100	0.75
Graphite (Lamp Black)	96~225	0.95
Enamel (White)	18	0.90
Asphalt	0~200	0.85
Glass (Surface)	23	0.94
Heat Resistant Glass	200~540	0.85~0.95
Wall Powder	20	0.90
Oak	20	0.90
Carbon Plate		0.85
Insulating Strip		0.91~0.94
Metal Strip		0.88~0.90
Glass Pipe		0.90

Coil-Type		0.87
Enamelware		0.90
Enamel Pattern		0.83~0.95
Solid Materials		0.80~0.93
Capacitor		
Rotary Type		0.30~0.34
Chemical Type		0.25~0.36
Ceramic (Plate Type)		0.90~0.94
Ceramic (Bottle Type)		0.90
Film		0.90~0.93
Mica		0.94~0.95
Liquid Mica		0.90~0.93
Glass		0.91~0.92
Semiconductor		
Transistor (Plastic)		0.80~0.90
Transistor (Metal)		0.30~0.40
Diode		0.89~0.90
Transmitting Coil		
Pulse Transmission		0.91~0.92
Flat Chalk		0.88~0.93
Top Ring		0.91~0.92
Electronic Materials		
Epoxy Glass Sheet		0.86

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Epoxy Phenolic Sheet		0.80
Gold-Plating Copper Sheet		0.30
Copper Coated with Solder		0.35
Lead Line Coated with Tin		0.28
Copper Wire		0.87~0.88
Steatite Terminal		0.87

The manual information is subject to changes without prior notice.

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