



INSTRUCTION MANUAL

MTi15

**160 x 120 Pixels
Thermal Imager**



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1. Introduction

- The Thermal Imager is a hand held imaging camera used for predictive maintenance, equipment troubleshooting and verification.
- Focus the lens to the object, then the thermal and visual images are displayed on the LCD and can be saved to a Micro SD Memory card.
- Transferring images to a PC is accomplished by removing the SD memory card and connecting it to a PC through a card reader (not included), or transfer the images and video stream to the smart device with "Thermoview" apps installed.
- In addition to the features mentioned above, the Thermal Imager provides video recording and play back

1. Safety Information

- To prevent eye damage and personal injury, do not look into the laser. Do not point the laser directly at people or animals or indirectly off reflective surfaces.
- Do not disassemble or do a modification to the Thermal Imager.
- Do not point the Thermal Imager (with or without the lens cover) at intensive energy sources, for example devices that emit laser radiation, or the sun.
- This can have an unwanted effect on the accuracy of the camera. It can also cause damage to the detector in the Thermal Imager.
- Do not use the Thermal Imager in a temperature higher than 50°C (122°F), lower than -20°C (-4°F), High temperature or low temperature can cause damage to the Thermal Imager.
- Only use the correct equipment to discharge the battery.
- If you do not use the correct equipment, you can decrease the performance or the life cycle of the battery. If you do not use the correct equipment, an incorrect flow of current to the battery can occur. This can cause the battery to become hot, or cause an explosion and injure the user.
- Do not pull out the battery when the thermal imager is working.
- If you pull out the battery when the thermal imager is working, it may cause the thermal imager to work erroneously.
- Do not disassemble or do a modification to the battery.
- The battery contains safety and protection devices which, if they become damaged, can cause the battery to become hot, or cause an explosion or an ignition.
- If there is a leak from the battery and the fluid gets into your eyes, do not rub your eyes. Flush well with water and immediately get medical care.

- Do not make holes in the battery with objects. Do not hit the battery with a hammer. Do not step on the battery, or apply strong impacts or shocks to it.
- Do not put the battery in or near a fire, or in direct sunlight, or other high-temperature locations. Do not solder directly onto the battery.
- Always charge the battery in the specified temperature range.
- The temperature range through which you can charge the battery is 0 to 50°C (32 to 122°F). If you charge the battery at temperatures out of this range, it can cause the battery to become hot or to break. It can also decrease the performance or the life cycle of the battery.
- Do not get water or salt water on the battery, or permit the battery to get wet.
- Clean the case with a damp cloth and a weak soap solution. Do not use abrasives, isopropyl alcohol, or solvents to clean the case or lens/screen.
- Be careful when you clean the infrared lens. Do not clean the infrared lens too vigorously. This can damage the anti-reflective coating.
- Taking the Thermal Imager from cold to hot may cause condensation in the thermal Imager. To protect the Thermal Imager, you should switch off the Thermal Imager, wait until the Thermal Imager has become warm enough for the condensation to evaporate.
- If you do not use the Thermal Imager, put the Thermal Imager in cool and dry environment. If you store the Thermal Imager with the battery inserted, the power of the battery will be depleted.

3.Packing Lists

Item	Quantity	Description
Thermal Imager	1	
Lens	1	Field of View=20.7°x 15.6°, f=7.5mm
Li-ion Battery	1	3.7V, 2600mAh
AC Adapter	1	Input AC Volts: 100V-240V, 50/60Hz, MAX 0.9A; Output DC Volts: 5V, 2400mA
Micro SD	1	8Gbyt
USB Cable	1	
Non-Slip Strap	1	
User Manual	1	
Warranty Card	1	
PC Software Installation CD	1	
Carrying Case	1	

4. Specifications

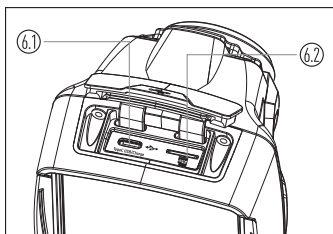
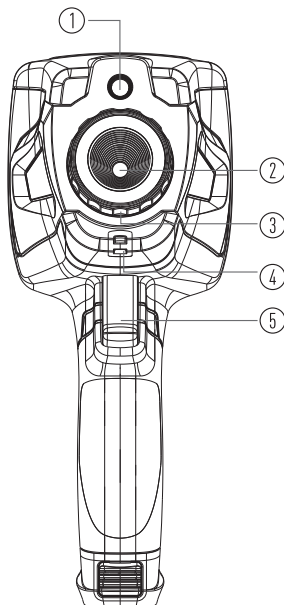
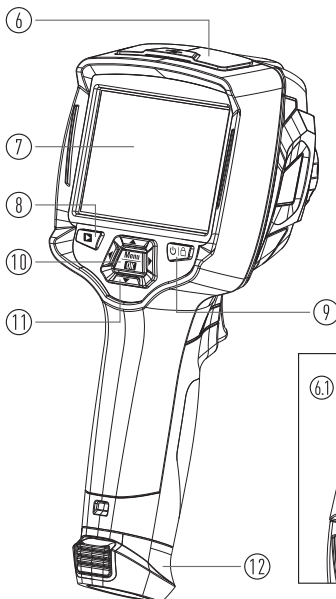
Function	Range
Imaging and Optical Data	
Field of View(FOV)/Minimum Focus Distance	20.7°x 15.6°/0.5m
Spatial Resolution(IFOV)	2.26mrad
Thermal Sensitivity/NETD	<0.05°C at 30°C (86°F) / 50mK
Image Frequency	50Hz
Focus Mode	Manual
Zoom	1-16x continuous, digital zoom
Focal Length	7.5mm
Focal Plane Array(FPA)/Spectral Range	Uncooled microbolometer / 8-14μm
IR Resolution	160 x 120 pixels
Image Presentation	
Display	3.5in. LCD, 640x480 pixels, Touch screen
Image Modes	IR image, Visual image, Picture in picture, Auto fusion, zoom.
Color Palettes	IRON, Rainbow, Grey, Grey Inverted, Brown, Blue-red, Hot-cold, Feather, Above alarm, Below alarm, Zone alarm, Vision zone.
Measurement	
Object Temperature Range	-20 to 150°C (-4 to 302°F) / 0 to 650°C (32 to 1202°F)
Temperature Accuracy	±2°C (3.6°F) or ±2% of reading (Environment temperature 10 to 35°C, Object temperature >0°C)
Measurement Analysis	
Spot	Center Spot, Three manual spots
Automatic Hot/Cold Detection	Auto hot or cold markers
Line	Two lines analyse
Area	Three areas analyse
Measurement Corrections	Emissivity, Reflected temperature
Storage of Videos	
Storage Media	8GB Micro SD card or 3.4GB internal EMMC
Video Storage Format	Standard MPEG-4 encode, 640x480 at 30fps, on memory card >60 minutes
Video Storage Mode	IR/visual images; simultaneous storage of IR and visual images

4. Specifications Continued

Function	Range
Storage of Images	
Image Storage Format	Standard JPEG, or HIR files including measurement data, on memory card >6000 pictures
Image Storage Mode	IR/visual images; simultaneous storage of IR and visual images
Image Analyse	Internal image analyse tools. Complete function
Set-Up	
Set-up commands	Local adaptation of units, language, date and time formats, information of camera
Languages	Multinational
Digital Camera	
Built-in Digital Camera	2 Megapixels
Built-in Digital Lens Data	FOV 65°
Data Communication Interfaces	
Interfaces	USB-Type C
USB	Data transform between camera and PC; Live video between camera & PC
Wifi	802.11, transfer images and realtime video stream
Power System	
Battery	Li-ion battery, 4 hours operating time
Input Voltage	DC 5V
Charging System	In camera (AC adapter)
Power Management	Automatic shutdown
Environmental Data	
Operating Temperature Range	-15 to 50°C (5 to 122°F)
Storage Temperature Range	-40 to 70°C (-40 to 158°F)
Humidity (Operating and Storage)	10% to 90%
Drop Test	2m
Bump	25g (I EC60068-2-29)
Vibration	2g (IEC60068-2-6)
Physical Data	
Camera Weight. Incl. Battery	<500g
Camera Size (L x W x H)	224 x 77 x 96mm

5. Structure Description

- 1 - Visual Camera
- 2 - Infrared Camera Lens
- 3 - Focus Ring
- 4 - Dust Cover Lanyard Hole
- 5 - Trigger
- 6 - Interface and Cover
 - 6.1 - Type-C USB/Charge
 - 6.2 - Micro SD Card Slot
- 7 - LCD Display and Touch Screen
- 8 - Images Browse Button
- 9 - Power/Lock Button
- 10 - Menu/Select Button
- 11 - Up/Down/Right/Left Button
- 12 - Battery



6. Before You Start

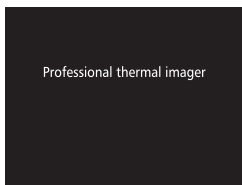
6.1. How to Charge the Battery

- Before you use the Thermal Imager for the first time, charge the battery for three and a half hours.
- The battery status shows on the six-segment charge indicator.
- To charge the battery, use follow before:
 1. Connect the ac power adapter into an AC wall outlet and connect the DC output to the Thermal Imager's AC power socket. The charge light is on, The battery indicator becomes "🔋🔋🔋🔋🔋🔋" while the battery charges with the AC power adapter.
 2. Charge until the charge indicator becomes "🔋" the charge icon will not change.
 3. Disconnect AC power adapter when the battery is fully charged.

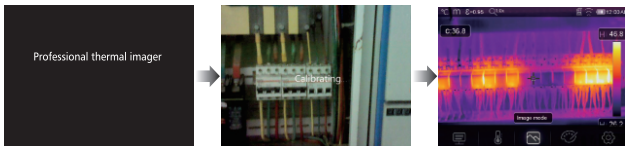
Note: Make sure that the Thermal Imager is near room temperature before you connect it to the charger. Do not charge in hot or cold areas. When you charge in extreme temperature, battery capacity may be damaged.

6.2. Power On

To turn the Thermal Imager on, push the **Power/Lock** "🔌 | 🔒" Button for about 2 seconds.



Note: After turning on the device, the thermal Imager needs sufficient warm-up time for the most accurate temperature measurements and best image quality. So the visible image will first appear, and the thermal sensor will calibrate internal for several seconds. After that the thermal image will be displayed on the screen.



6.3. Power Off

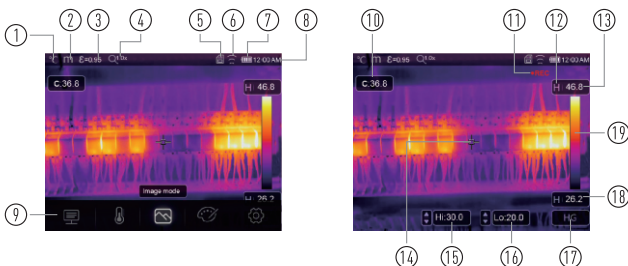
- When the Thermal Imager turns on, Push and hold the **Power/Lock** "⏻|🔒" Button for two seconds, then popup the power off menu, press "OK" to power off the device.
- Push and hold the **Power/Lock** "⏻|🔒" Button for about twelve seconds, the device will be forced to power off directly.



6.4. Desktop

The Desktop is as follows:

- | | |
|-----------------------------|--|
| 1 - Temperature Unit | 10 - Centre Point Temperature Readings |
| 2 - Distance Unit | 11 - Video Recording Indicator |
| 3 - Emissivity | 12 - AGC Mode Status |
| 4 - Zoom Indicator | 13 - Max Temperature of Current Scene |
| 5 - SD Card | 14 - Centre Point Cross |
| 6 - Wifi Status | 15 - Value Adjustment for High Alarm |
| 7 - Battery Capacity Status | 16 - Value Adjustment for Low Alarm |
| 8 - Time | 17 - AGC Mode Select Button |
| 9 - Main Menu | 18 - Min Temperature of Current Scene |
| | 19 - Color Bar |

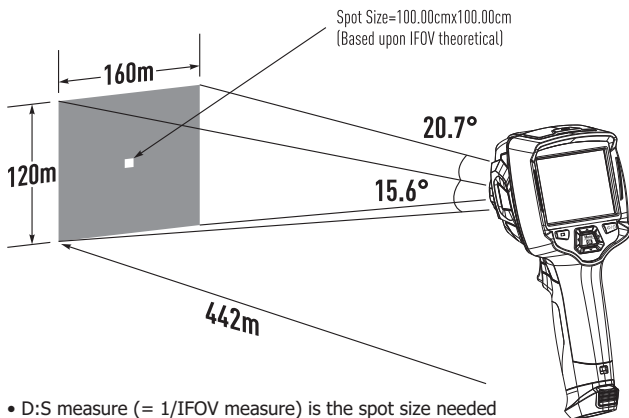


6.5. Lens

- The Thermal Imager has a Lens.
- **FOV** is the largest area that your Imager can see at a set distance.
- This table lists the horizontal FOV, vertical FOV and IFOV for lens.

Focal Length	Horizontal FOV	Vertical FOV	IFOV
7.5mm	20.7°	15.6°	2.26mrad

- **IFOV** (Instantaneous Field of View) is the smallest detail within the FOV that can be detected or seen at a set distance, the unit is rad, The formula is this: **IFOV=(Pixel Size)/(Lens focal length)**.
 - O:S theoretical(= 1/IFOV theoretical) is the calculated spot size based on the pixel size of the Thermal Imager detector array and lens focal length.
- Example:** If Thermal Imager uses 9mm lens, because the Pixel Size of detector is 17 μ m, Horizontal FOV is 20.7°, Vertical FOV is 15.6°, the IFOV is 17 μ m/7.5mm=2.26mrad; O:S theoretical (=1/ IFOV theoretical)=442:1.



- D:S measure (= 1/IFOV measure) is the spot size needed to provide an accurate temperature measure.
- Typically D:S measure is 2 to 3 times smaller than D:S theoretical, which means the temperature measurement area of the target needs to be 2 to 3 times larger than that determined by the calculated theoretical D:S.

Note: IFOV theoretical represents the smallest objects that the thermal imager can detect or see. IFOV measure represents the smallest object form which an accurate temperature can be measured by the thermal imager.

6.6. Focus

- To adjust focus, clockwise or Anti-clockwise rotates the IR Lens.
- When target comes into focus, it shows a sharper image.
- When the target moves out of focus, the thermal image becomes blurry.



Note: Correct focus is important in all imaging applications. Correct focus makes sure that the infrared energy is correctly directed onto the pixels of the detector. Without the correct focus, the thermal image can be blurry and the radiometric data will be inaccurate. Out-of-focus infrared images are frequently unusable or of little value.

6.7. Shutter

- The thermal image of the Thermal Imager becomes blurry, when the Thermal Imager is not correcting after some minutes or the Thermal Imager changes target.
- To get a clearer thermal image, the Thermal Imager will correct itself.
- The Thermal Imager has two modes for correcting, Manual and Auto mode.
- In Manual Mode, hold down the down arrow button, the Thermal Imager will correct.
- In Auto Mode, the Thermal Imager can correct automatically while the thermal image of the Thermal Imager becomes blurry.

6.8. Temperature Measurement

- All objects radiate infrared energy.
- The quantity of energy radiated is base on the actual surface temperature and the surface emissivity of the object.
- The Thermal Imager senses the infrared energy from the surface of the object and uses this data to calculate an estimated temperature value.
- Many common objects and materials such as painted metal, wood, water, skin, and cloth are very good at radiating energy and it is easy to get relatively accurate measurements.
- For surfaces that are good at radiating energy (high emissivity). The emissivity factor is >0.90 .

- This simplification does not work on shiny surfaces or unpainted metals as they have an emissivity of <0.6 . These materials are not good at radiating energy and are classified as low emissivity.
- To more accurately measure materials with a low emissivity, an emissivity correction is necessary.
- Adjustment to the emissivity setting will usually allow the Thermal Imager to calculate a more accurate estimate of the actual temperature.
- For more information please see Emissivity Adjustment to get the most accurate temperature measurements.

6.9. Emissivity Adjustment

- The correct emissivity value is important to make the most accurate temperature measurement.
- Emissivity of a surface can have a large effect on the apparent temperatures that the Thermal Imager observes.
- Understanding the emissivity of the surface, but may not always, allow you to obtain more accurate temperature measurements.

Note: Surfaces with an emissivity of <0.60 make reliable and consistent determination of actual temperature problematic. The lower the emissivity, the more potential error is associated with the Imager's temperature measurement calculations. This is also true even when adjustments to the emissivity and reflected background adjustments are performed properly.

- Emissivity is set directly as a value or from a list of emissivity values for some common materials.
- The global emissivity displays in LCD Screen as $E=x.xx$.
- The following table gives typical emissivity of important materials:

Material	Emissivity	Material	Emissivity
Water	0.96	Tape	0.96
Stainless Steel	0.14	Brass Plate	0.06
Aluminum Plate	0.09	Human Skin	0.98
Asphalt	0.96	PVC Plastic	0.93
Concrete	0.97	Polycarbonate	0.80
Cast Iron	0.81	Oxidized Copper	0.78
Rubber	0.95	Rust	0.80
Wood	0.85	Paint	0.90
Brick	0.75	Soil	0.93

6.10. Reflected Temperature

- Using the offset factor, the reflection is calculated out due to the low emissivity and the accuracy of the temperature measurement with infrared instruments is improved.

- In most cases, the reflected temperature is identical to the ambient air temperature.
- Only when objects with strong emissions with much higher temperature are in the proximity of the object being measured should be determined and used.
- The reflected temperature has only little effect on objects with high emissivity.
- The reflected temperature can be set individually.
- Follow these steps to get the right value for the reflected temperature.
 1. Set the emissivity to 1.0.
 2. Adjust the optical lens to near focus.
 3. Looking in the opposite direction away from the object, take a measurement and freeze the image.
 4. Determine the average value of the image and use that value for your input of reflected temperature.

6.11. Thermal Imager Reporter Software

- Thermal Imager Reporter software is supplied with the Thermal Imager.
- This Software is intended for Thermal Imager and contains feature to analyze images, organize data and information, and make professional reports.
- Thermal Imager Reporter software allows audio annotations and commentary to be reviewed on a PC.

7. Menus

The menus, together with buttons, are access for image measurement, Emiss, Palette, temperature measurement range, take photos and videos, review, and settings.

7.1. Main Menu

- Press "**Menu/OK**" Button or touch the screen, the main menu will pop up.
- Main Menu is the main interface of the Thermal Imager's menus.
- It contains five items such as Measure parameters, Measure tools, Image mode, Palette, system Settings.



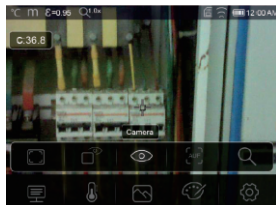
-  **Parameters:** Parameters set for the calculation temperature.
-  **Measure Tools:** Set for the calculation and display of radiometric temperature measurement data related to the thermal images.
-  **Image Mode:** Set image source for the display on the Thermal Imager's LCD. It contains five items such as infrared image, visual image and fusion.
-  **Palette:** Set the type of colour bar.
-  **Settings:** Set for the user preferences such as language, unit of temperature measurement, date, time, restore factory setting and display product information.

7.2. Image Mode

1. In main menu, press "Image Mode" icon button, highlight "Image Mode".
2. Press "Up" button, popup Image submenu which contains five image modes.
3. Press "Left" or "Right" button, or touch the image mode icons, highlight the Image mode which you want to choose.
4. The image mode will change after you choose it.

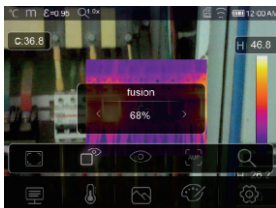


Thermal Imager has 5 kinds of image modes for display: Thermal, Picture in Picture, Camera, Auto Fusion, Measuring Distance.



 **Thermal:** Displays only infrared image.

 **Visible:** Displays only visible image.



Picture in Picture: Display fusion image of infrared and visible images.



AUF: Auto Fusion mode, compare the centre area temperature with full screen, the machine will calculate the mix ratio of infrared and visible images automatically.



Zoom Mode: In this mode, the image can be zoomed in/out continuously.



In the Zoom mode, press left key or slide the zoom bar to zoom in the image. Press right key or slide the zoom bar zoom out the image.

7.3. Image Palette

- The Image Palette lets you change the false-colour presentation of the infrared images on display or captured.
- A variety of palettes are available for specific applications.
- The standard palettes offer an equal, linear presentation of colours that allow for best presentation of detail.

Standard Palette

1. In main menu, press "**Palette**" icon button, highlight "**Palette**".
2. Press "**Up**" Button, popup Image submenu which contains 8 kinds of colour palettes and 4 kinds of special palettes.
3. Press "**Left**" or "**Right**" Button or touch the image mode icons, highlight the palette which you want to choose.
4. The palette mode will be changed after you choose it.



Iron



Rainbow



Grey



Grey invert



Brown hot



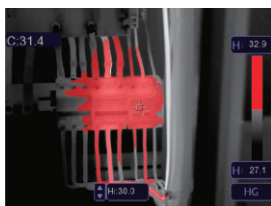
Blue red



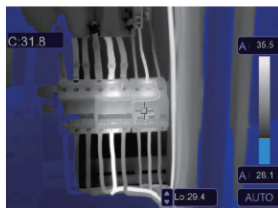
Hot cold



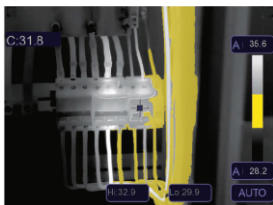
Feather



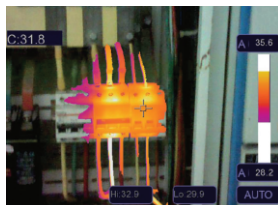
 *** High Alarm:** The temperature higher than the high alarm set value will be coloured to red.



 *** Low Alarm:** The temperature lower than the low alarm set value will be coloured to blue.



 **Zone Alarm:** The temperature between the high alarm and the low alarm set value will be coloured to orange.



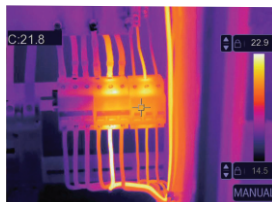
 **Visible Zone:** The temperature between the high alarm and the low alarm set value will be coloured to the palette, other part of the image will displayed as visible image.

7.4. Image Adjustment

There are three kinds of mode for image adjustment, histogram, auto and manual.

7.4.1. Lock Operation

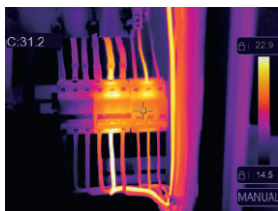
- Press **Power/Lock** "⏻|🔒" Button quickly to lock the current scene temperature range, "🔒" means manual.
- After locking the current scene temperature range, press the adjust button "⬆️|⬆️", you can adjust the high/low temperature level to see what temperature you're interested in range image.



- Lock the low level and adjust the high level of the temperature range:



- Lock the high level and adjust the low level of the temperature range:



7.4.2. Histogram Mode and Auto Mode

- Auto Mode: level and span are decided by the thermal image of minimum temperature and maximum temperature. The relationship between temperature and colour is linear.
- Histogram Mode: the thermal image is enhanced by histogram algorithm. The relationship between temperature and colour is not linear. Some part of the image is enhanced.
- Touch the icon "HG" or "AUTO" below the colour bar to change the mode.



7.5. Measurement Menu

1. In main menu, press **"Measurement"** icon button, highlight **"Measurement"**.
2. Press **"Up"** button, popup Image submenu which contains 5 kinds of Measurement tools.
3. Press **"Left"** or **"Right"** button, or touch the Measurement tools icons, highlight the Measurement tool which you want to choose.
4. The Measurement tool will be enabled after you choose it.



-  **Center Spot:** Measure the center point temperature.
-  **Manual Spot:** Measure the manual point temperature, There are three manual analyse points.
-  **Line Analyse:** Measure the line temperature, There are two analyse lines, One for horizontal, the other is vertical line.
-  **Area Analyse:** Measure the area temperature, There are three analyse areas.
-  **Hi/Lo Spot Analyse:** Capture max/minimum temperature.
-  **Delete all Analyse:** Delete all analyse tools.

7.6. Parameter Menu

In main menu, press **"Up"** and **"Down"** button, highlight **"Emiss"**, press **"Select"** button, popup object parameter submenu.



7.6.1. Ambient Temperature Composition

- In Ambient temperature submenu, press "**Left**" and "**Right**" arrow to change the temperature values.
- Ambient temperature will affect the measurement of the thermal imager, it can be composite from 0 degree to 50 degrees.



7.6.2. Reflective Temperature

- In reflective temperature submenu, press "**Left**" and "**Right**" arrow to change the temperature values.
- The reflective temperature is important for radiometric temperature measurement. Thermal Imager has temperature compensation for reflective temperature.
- To get more accurate temperature measurement, accurately set the reflective temperature.
- In most cases, the reflected temperature is identical to the ambient temperature.
- Only when objects with strong emissions with much higher temperature are in the proximity of the object being measured, the reflected temperature must set.



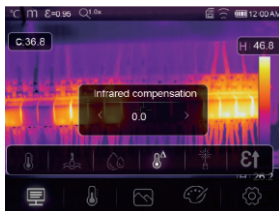
7.6.3. Atmospheric Humidity

- In Atmospheric humidity submenu, press "**Left**" and "**Right**" arrow to change the temperature values.
- Water droplets in the air can absorb infrared rays. The wet air can affect the measurement of the temperature's accurate, the compensation humidity can be set from 10%~100%.



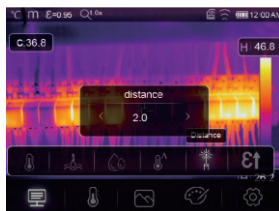
7.6.4. Delta Temperature Compensation

In delta temperature submenu, press "Left" and "Right" arrow to change the temperature values.



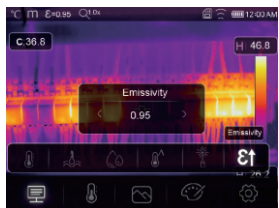
7.6.5. Distance

- In distance submenu, press "Left" and "Right" arrow to change the distance values.
- There are many substances in the air that can absorb infrared rays, so the infrared ray of the object will decrease as the distance increases.
- The distance can be set from 2 meters to 1000 meters.



7.6.6. Emissivity

- In emissivity submenu, press "Left" and "Right" arrow to change the emissivity values.
- "Emiss" sets object emissivity, the value range is 0.01-1.00.



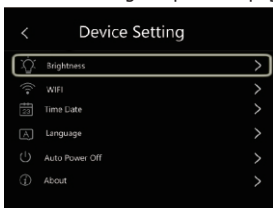
7.7. Settings Menu

1. In main menu, press "Settings" icon button, highlight "Settings".
2. The Settings menu will display.

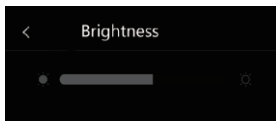


7.7.1. Device Settings

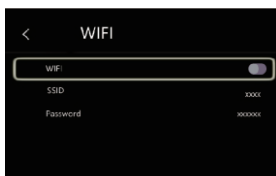
There are multi pages in Device setting, use "▼" icon to go to next page, or use "▲" to go to previous page.



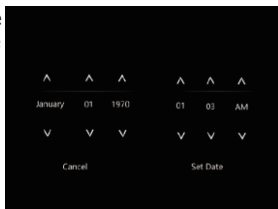
Brightness: Drag the slider bar to adjust the LCD brightness.



- WIFI:**
- Press "☐" → "☑" to turn on the wifi, the wifi model works on access mode, so it needs to be set to the SSID and has a Password to allow other device connect to it.
 - The default SSID is "xxxxx", the default password is "12345678".



Time Date: Press "▲" or "▼" to change time/date, then press "**Set Date**" to save the change, or press "**Cancel**" to quit.

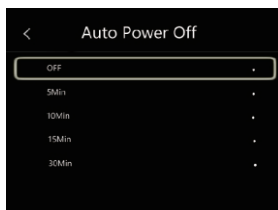


Language: Press "**Up/Down**" Button to select language and use "**MENU/OK**" Button to set selected language to be valid.



Auto Power Off

- There are four options in auto power off menu, as follows: "OFF", "5Min", "10Min", "15Min", "30Min".
- When press the touch screen or keyboard, the timer of Auto Power Off will be cleared and re-timed.



Info: The info menu contains all of the product information, such as: Software Version, Serial Number and so on.



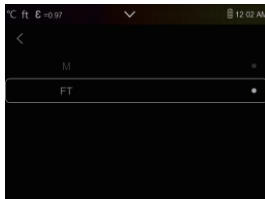
7.7.2. Measure Setting

- Select the "Measure Setting" menu, the Measure Setting menu will be displayed.
- There are four options in the Measure setting menu, as shown in the following pictures:



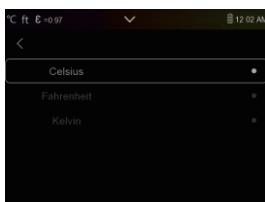
Distance Unit

- Change the distance unit between "m" and "ft", "m" means meter, ft means foot.
- $1 \text{ (ft)} = 0.3048 \text{ (m)}$;
 $1 \text{ (m)} = 3.2808399 \text{ (ft)}$.



Temperature Unit

- Temperature Unit have three types to choose: °C, °F and K.
- Conversion relationship:
 $^{\circ}\text{F} = 1.8 \times ^{\circ}\text{C} + 32$, $\text{K} = 273.15 + ^{\circ}\text{C}$.



Temperature Range

- The temperature measurement ranges have "-20-150°C" and "0-650°C" to choose from.
- The overlap temperature of the two ranges is more accurate to choose "-20-150°C".

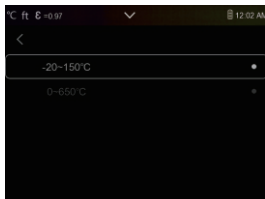
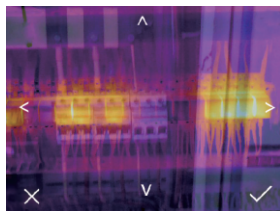
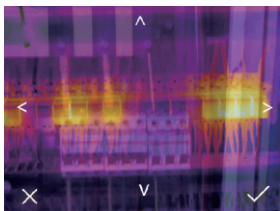
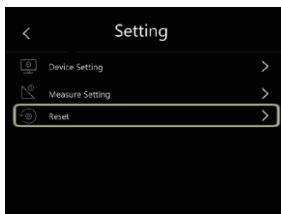


Image Align

Press "< > ^ v" to adjust the vision's position to align the vision and infrared.

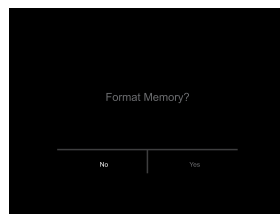


7.7.3. Reset



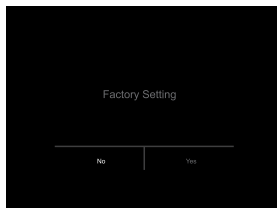
Format Memory

Format Memory operation will format all the Picture Gallery, the device setting is not affected.



Factory Settings

Factory Settings of the Thermal Imager is as follows:



Item	Parameter	Value
Measurement	Center Spot Measurement	off
	Hot Spot Measurement	off
	Cold Spot Measurement	off
Measurement Parameters	Emissivity	0.95
	Reflective temperature	25
	Mode	Infrared
Image	Palette	Iron
	Adjustment	Auto
	Language	English
System Setting	HDMI Output	off
	Laser	off
	Lamp	off

7.8. Camera Menu

- Thermal Imager has photo and video functions.
- In photo function, the Imager can save thousands of images.
- Every image resolution is 1280x960, format is ".jpg", and stores infrared data and visible data in an image.
- In video function, the Imager has ".mp4" video capture for hours, and save infrared data in ".mp4" format.

Note: Images and video files are stored on the SD Memory Card, Images can easily be read and analysed again within Thermal Imager PC software.

7.8.1. Save Image

1. In desktop, press Trigger button to freeze an image. The save menu will display.
2. Press "**MENU/OK**" key save image, and the image will flash for a second, after the image is saved, the image will be unfreezed.



7.8.2. Add Text Note

- Touch the "Text information" icon, it can add some text information into the picture,
- Next time if the saved picture is opened in gallery or PC software, the text info will displayed with the picture.



7.8.3. Change Measure Parameters

Touch the "**Parameters**" icon, it can change the image's measure parameters: emissivity, ambient temperature, humidity, reflect temperature, infrared compensation, distance.



7.8.4. Add Analyse Tools

Touch the "**Measurement**" icon, it can add or change the analyse tools in the image: point analyse, area analyse, line analyse.



7.8.5. Change Image Mode

Touch the "Image Mode" icon, it can change the image mode: thermal, visible, picture in picture, auto fusion, zoom.



7.8.6. Change Color

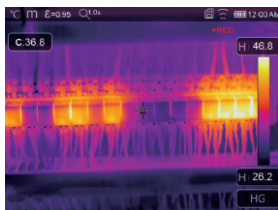
Touch the "Palette" icon, it can change the image colour.



7.9. Video Menu

The Thermal Imager has ".mp4" video capture.

1. In desktop, press Trigger button and hold for about 2 seconds, start video capture with voice.
2. To stop video capture, press Trigger button again. The video will be saved in the video file.



7.10. Files Browser

In desktop, press "Files Browse" button, popup files Browser, Which displays pictures and videos saved in SD Memory Card.



Picture Mode



Video Mode

7.10.1. Analyse an Image

- When current file type is image, press "🔍" to enter image analysis mode.
- Which can change the measure parameters, analyse tools, image mode and color on the image.



7.10.2. Play a Video

When current file type is video, press "▶" to play video.



Play Video



Stop Play Video

7.10.3. View Image Info

Press "i" to read the information of the current file.

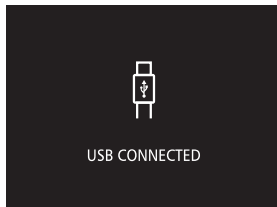


7.10.4. Delete a File

Press "🗑" to delete the current file.

7.11. USB Mode

- Connect USB cable to device, popup the menu as follows:
- There are two modes for USB, Storage and PC Camera. Press up or down button to switch mode.



- There are two modes for USB, Storage and PC Camera. Press up or down button to switch mode.

8. Fault Diagnosis and Exclusion

- If you encounter any problems while using the thermal imager, overhaul according to the following table.
- If the problem persists, disconnect the power and contact with Major tech's technical support department.

Phenomenon of the fault	Cause of the fault	Solution
Thermal imager cannot turn on	No battery No power	Insert the battery Replace the battery or charge it
Thermal imager shut down	No power	Replace the battery or charge it
No Thermal image	The lens cap cover	Open the lens cap

9. Android/iOS APP Thermview

9.1. Software Install and Uninstall

9.1.1. System Required

Android mobile phone: Android 4.0 above, with USB OTG Support

iOS: iPhone4 above

9.1.2. Thermoview App Install

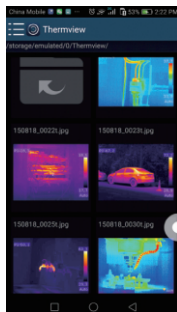
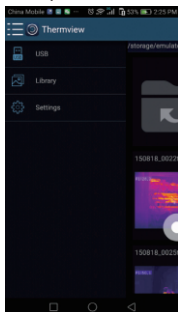
Android: Search "Thermview" on Google Play and install it.

iOS: Search "Thermview" on Apple Store and install it.

9.2. Thermview Function

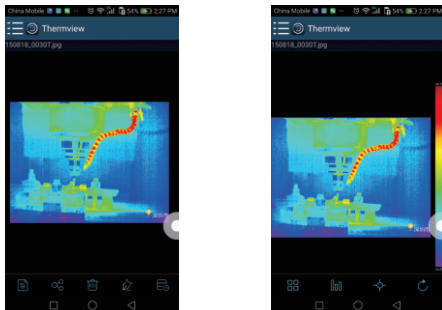
9.2.1. Import Pictures

1. Enable WIFI function on the thermal device.
2. Connect the smart phone to the thermal device through the WIFI.
3. Download the IR pictures from the thermal imager directly or get the realtime video stream.
4. View and analyse the thermal image.



9.2.2. Analyse

Select a IR Picture and click "🔍" icon to analyse it.



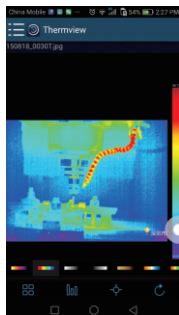
1. Image Mode

Click "🔍" icon to select image mode. There are four modes for you to select.

- (1) ☒ IR Mode: only infrared picture displayed.
- (2) ☐ Visible Mode: only visible picture displayed.
- (3) ☐ IR Fusion Mode: The infrared picture is fusioned with visible picture.
- (4) ☐ Visible Fusion Mode: full screen fusion, the visible picture is fusioned with infrared picture.

2. Colourbar Select

Click "🌈" icon to select colour bar. There are eight colour bars for you choose from.



3. Analyse

Click "🔍" icon to analyse the IR pictures. There are three analyse tools:

- (1)  Point Analyse: Add a point to the picture, it will display the temperature of the point.
- (2)  Line Analyse: Add a line to the picture. It will display the highest, lowest and average temperature of the line.
- (3)  Area Analyse: Add a rectangle to the picture. it will display the highest, lowest and average temperature of the rectangle.
- (4) Save and Exit

Click "↶" to save and return to the main page of the APP.

9.2.3. Report and Share

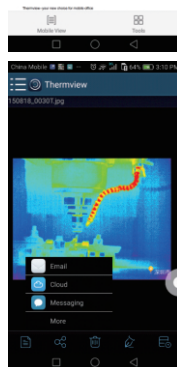
1. Report

Click "📄" icon to report as a ".pdf" file.



2. Share

Click "📶" icon to share the Infrared picture with Email, Cloud or Message and so on.



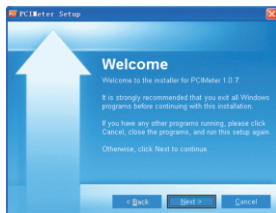
10. PC Software

10.1. System Required

- Window XP or higher version of Windows system, please make sure you have installed Net Framework 2.0 or Net Framework 3.5 (Include 2.0) when you install PCIMeter software.
- If not, please find and install Microsoft. NET_Framework_v2.0.exe that is provided to you.
- Open the net framework 2.0. Follow all tips to install Net Framework 2.0 until it finishes.
- If your system has already installed Net Framework 2.0, there is no need to install it again.

10.2. IRMeter Install

- You can insert your SD Card to install, or you can run "setup.exe" to install it as follows.
- Click "Next" to install, until the installation is finished.
- Installation successful after clicking "Finish" as above.



10.3. Running

After ensuring PCIMeter software has been installed, click shortcuts on the desktop or start menu to run the software.



10.4. Uninstall

Uninstall PCIMeter in the start menu as follow, then click "Next" to finish uninstall.





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