INFRARED GAS DETECTION THERMAL IMAGING CAMERA

ThermalTronix

TT-607FG-HTI

User Manual

Intellisystem Technologies S.r.l.
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Warnings and Precautions

· Infrared gas leak temperature imager uses a very sensitive thermal sensor, so in any case (power on or off) shall not be directed at the device lens strong radiation sources (such as the sun, direct laser beam or reflection, etc.) , Otherwise it will cause permanent damage to the Infrared Gas Leak Detector Imager.

· Do not strongly shake or hit the equipment during transportation and use.

· It is recommended to use the original packing box when storing the equipment, and place it in a cool, dry, ventilated environment without strong electromagnetic field.

·Avoid oil stains and all kinds of chemical contamination of the lens surface and damage the surface. When finished, close the lens cap.

· It is recommended to backup. In order to prevent the potential danger of data loss, please copy (backup) the data to the computer frequently.

· An infrared gas leak detector may require 8-10 minutes of warm-up before the data can be read accurately.

· Each Infrared Gas Leak Detector has been calibrated at the factory. Temperature correction is recommended every year.

· Do not open the cabinet or modify it. The maintenance can only be carried out by our authorized personnel.

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1 Introduction

Thank you for choosing TT-607FG-HTI infrared gas leak detection temperature imager.

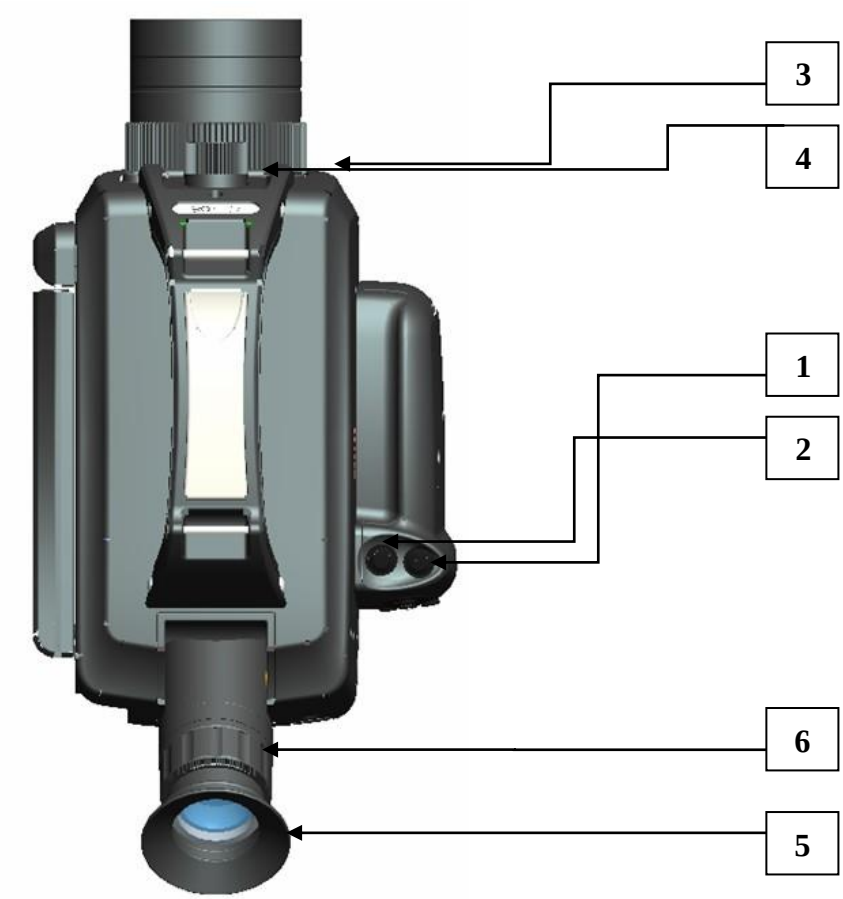
TT-607FG-HTI infrared gas leak detection temperature imager is infrared system, long-wave infrared quantum well focal plane array detector, electronic processing systems and image processing software, the infrared radiation measurement object is converted to visual thermal images, to long-range Detection of sulfur hexafluoride gas and other trace leakage point, and quantitatively shows the target surface temperature, is a fast, accurate, non-contact detection of live equipment and other micro-leakage and thermal fault of advanced measuring instruments.

1.1 Standard Accessories.

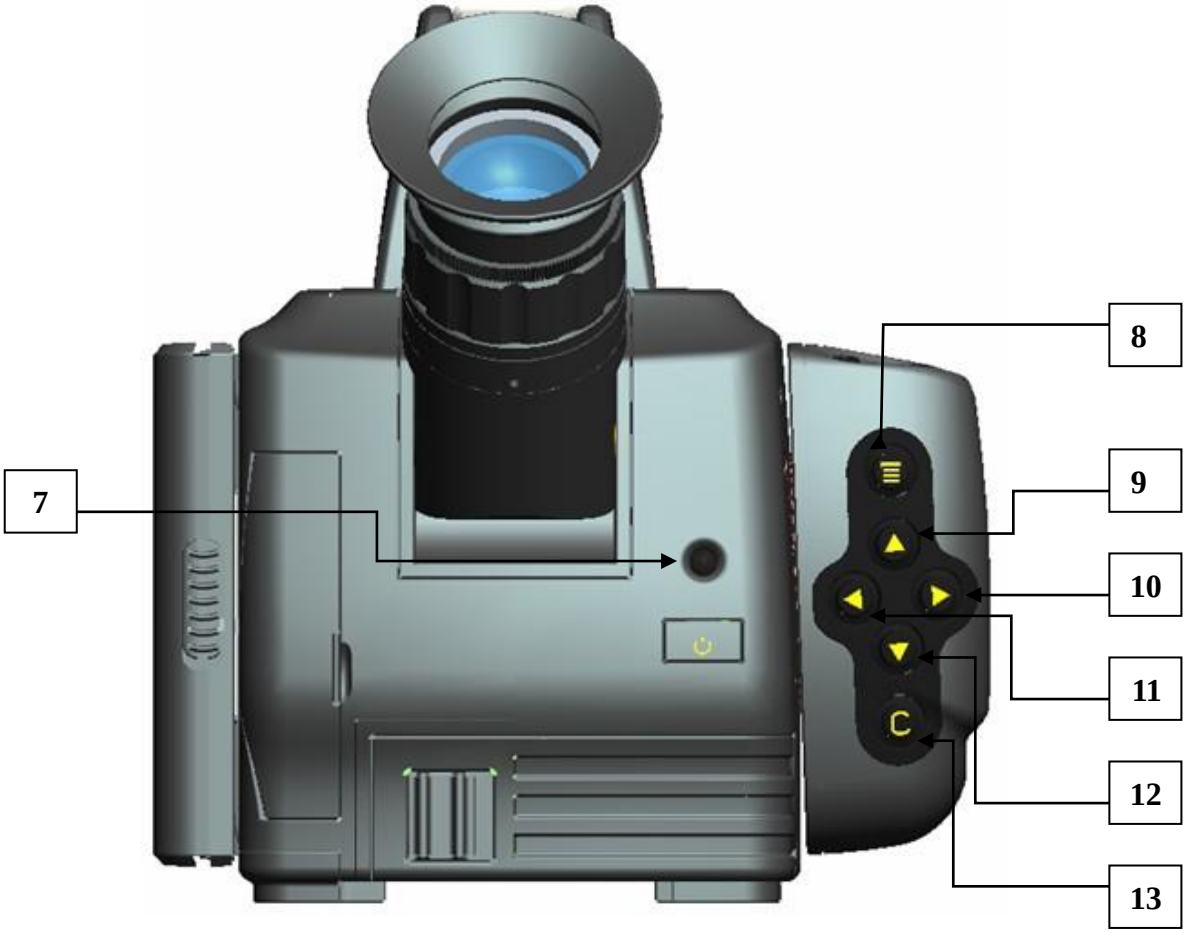
- **TT-607FG-HTI** infrared gas leakage imager
- Safety box
- Lens cap
- Li-on Battery (2pcs)
- Charger
- HDMI Video cable
- USB cable
- SD Card
- SD Card reader
- User manual

2 Function keys and interface

2.1 Function keys



Pic 2-1-1 TT-607FG-HTI Top View



Pic 2-1-2 TT-607FG-HTI Back view

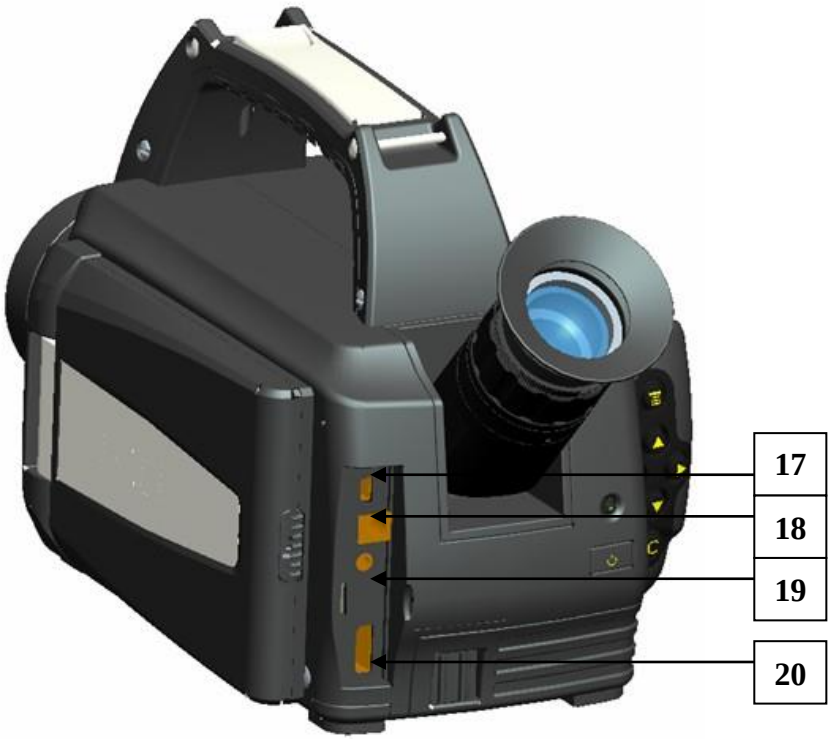
Pic 2-1-3 TT-607FG-HTI Bottom view

Pic 2-1-4 TT-607FG-HTI Side view

No.	Name	Function
1	Freeze/Save (Mark S)	To freeze or activate the thermal image. Twice press to save photo in imaging. There will be a "*" mark besides the **Intellisystem** Logo when the imaging is feezed.
2	Calibration (Mark A)	Long press to make calibration. One press to choose Color, contrast, temperature measurement mode
3	Leaser Pointer	Leaser Pointer.
4	CCD camera	Daylight camera, manual focus.
5	View Finder	To see imaging.
6	Adjustment Knob of view finder	Adjust the sharpness in view finder.
7	Power On/Off	Long press to turn on/off the imager.
8	OK	Enter/Select settings in menu.
9	Up	Hot Key or Menu Selection.
10	Right	Enter/Select in second level menu. Manual focus when infrared imaging mode (long/short press).
11	Left	Quit second level menu. Manual focus when infrared imaging mode (long/short press).
12	Down	Hot Key or Menu Selection.
13	Cancel/ Mode switch/ Auto	Cancel or Quit the setting menu；switch between CCD camera and Infrared camera； Long press to make Auto focus.

	focus (Mark C)	
14	SD Card	For SD card to save file.
15	Microphone	For voice recording
16	LCD Screen	To see imaging

2.2 Interface



Pic 2-2-1 TT-607FG-HTI Interface at back side.

17	Mini USB	Data transfer.
18	Power supply	DC10~15V
19	Audio output	
20	HDMI	Video output

3 Basic Operation.

1.3 Mounting Accessories.

3.1.1Battery

3.1.1.1 Install /Uninstall

Install：push the battery into the camera as this photo.

Uninstall：Press the battery latch to the right, then pull out the battery.

Note: The device can only use the standard battery, or the battery may be stuck, the voltage does not damage the device and so on. If the battery pops up may be away from the equipment, please pay attention to protection.

3.1.1.2 Battery safety use common sense

1、The battery should be kept as far as possible -20 ℃ ~ 20 ℃ ambient temperature, the battery during storage due to the existence of a small amount of self-discharge phenomenon, in order to avoid the battery during storage may have the impact of over-discharge battery capacity, the battery should be fully charged Save, and at regular intervals for a charge. The time interval is as follows:

- Ambient temperature is -20°C ~ 20°C, once every 6 months
- Ambient temperature is 20°C ~ 45°C, once every 3 months
- Ambient temperature is, 45°C ~ 60°C, once every month

Each charge must be greater than 50% of battery capacity.

2、Charging the battery at ambient temperature of 0 ℃ ~ 40 ℃, 0 ℃ ambient temperature will cause the battery charge loss, 40 ℃ ambient temperature when charging the battery temperature may be too high.

3、**Notes**:

Do not disassemble, squeeze, jab the battery;
Do not short-circuit the battery external contacts;
Do not place the battery in fire or in water;
Do not place the child in touch.

3.1.2 SD Card

Memory card installation: Open the SD card door, insert the SD card, and then cover the SD card door cover.
Memory card unloading: Open the SD card door, press the SD card down, will automatically eject, and remove the SD card.
Note: Do not hot swap the SD card, otherwise it may cause an exception, you need to restart after shutdown.

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2.3 Quick Guide.

3.2.1 Get infrared imaging

1. Load the battery or power supply.
2. Connect with the monitor if needed.
3. Long press the power button and wait for the camera imaging.
4. Open the lens cap and towards the imager to the target object.
5. Manual/Auto focus the lens to get the best imaging quality.

3.2.2 Measure temperature.

1. Towards the target position at the Cross cursor in the screen, then the temperature value will be at the Top-Left corner. Long press A key to calibration, then you can get a better measurement result.
2. Menu—Measurement mode—Add area then press A, then press Ok, to add more area in imaging then to see Highest/Lowest/Average temperature.
3. Press Freeze button to freeze the imaging, then add more point/area/line to measure more temperature.
4. The temperature will show <xxx or > xxx when the target temperature is higher or lower than the range, then the user need to change the temperature range.

3.2.3 Save photo/Voice note.

1. Manu save：Menu->**Document**->**Save**, then press OK button. We suggest to freeze the imaging before save photo.
2. Fast save：Press “S” button to freeze the imaging, then press “S” button to save photo.
3. Voice not：choose the microphone icon when imaging play back to record the voice **note**.

Note: please make voice towards to the microphone when record voice.

3.2.4 Imaging and voice playback.

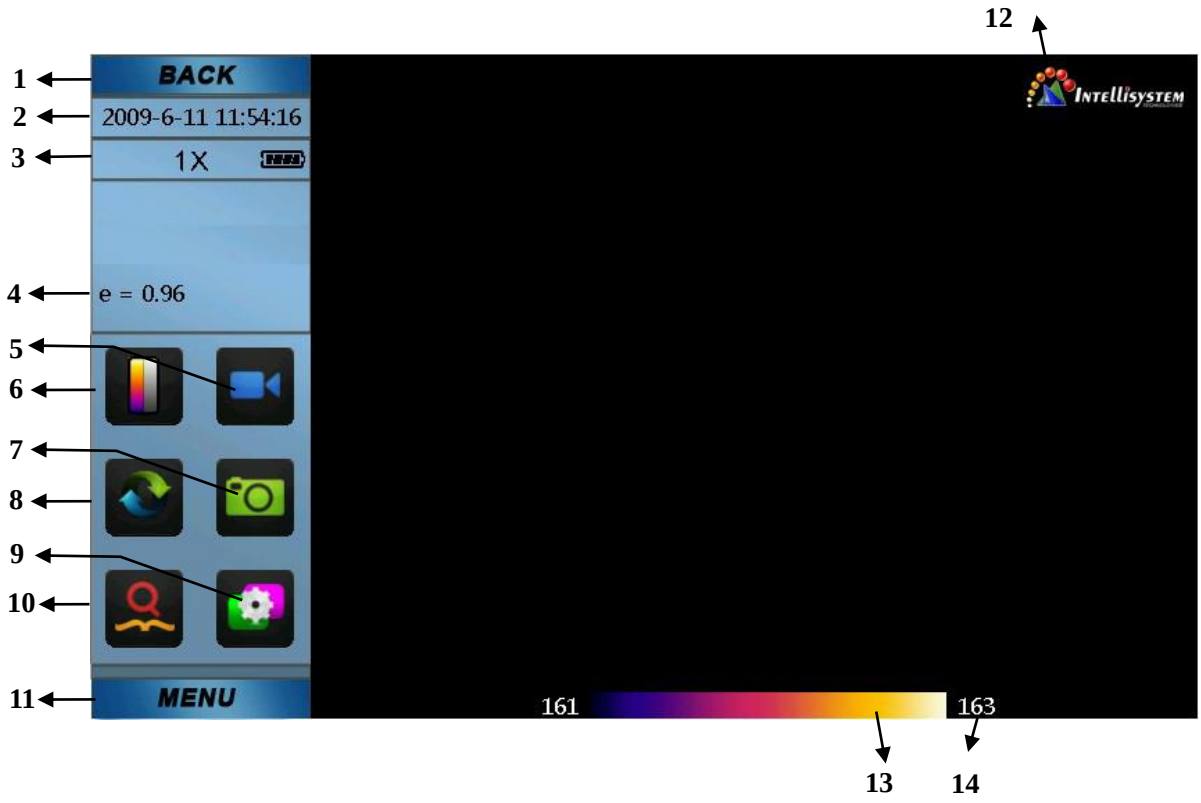
1. Menu->**File**->**Open**, then you will see the documents management interface. The files there will be in 3 formats: raw, jpg and m4v.
2. Use Left and Right button to choose the file, then press a button to enter, or u can press the screen to select photo.
3. Press stop icon  in the screen, then press C button to quit playback.
4. Voice playback：connect the voice output with headset to hear the voice playback.

3.2.5 Output the saved file.

USB cable or SD card reader to connect with PC to output saved file.

4 Operation Guide

1.4 Interface description



Infrared mode CCD mode

Pic 4-1-1 Main interface

No.	Name	Description
1	Back	Back to real time imaging
2	Time	Time
3	Save/Electrical zoon/Battery	Show Save/Electrical zoon/Battery states
4	Specific radiation coefficient	Specific radiation coefficient
5	Record video	Hot key to record video
6	Color Palette	Choose different color palette
7	Take photo	Take photo
8	Auto/Manual	Switch auto/manual calibration
9	System setting	System setting
10	Preview	Preview Photo/Video
11	Menu	Main Menu
12	Company	Company Logo
13	Current Color Palette	/
14	Contrast	/

2.4 Menu Functions

System setting menu has three Secondary menus:

Settings, Documents, Measurement Mode.

4.2.1 Settings.

Measurement settings, temperature correction, analysis settings, time settings, system settings, color palettes setting, system information and factory settings.

4. 2. 1. 1 Measurement settings

Temperature range： -40/180℃、100/500℃ for temperature measurement, Observed、Shake mode for gas detection.

Extend lens：need to change if the camera fixed with any extend lens.

Temperature Units: The currently available temperature units are ℃, K.

Ambient Temperature: Infrared Gas Leak Detector When the imager is turned on, it automatically detects the ambient temperature.

Reference temperature: When the reference temperature is set to "On", the temperature of each object displayed on the screen is the difference with the reference temperature.

Reference temperature: This is effective when the reference temperature setting is set to "On." A fixed temperature can be used as the reference temperature degrees; you can also select the temperature of any object temperature as a reference temperature.

4. 2. 1. 2 Temperature correction

Specific radiating factor: Because different objects have different emissivity, different emissivity can be set for different measuring points, and when not set, the system default ratio coefficient is applied. The accessory provides specific radiation Rate for reference.

Correction temperature: used to set the system temperature correction when the temperature.

Distance: Set the distance between the infrared gas leak detector and the temperature measurement target, in order to make the temperature measurement accurate.

Humidity: Sets the relative humidity of the environment in which the Infrared Gas Leak Detector is used.

Background temperature: This function is required when there are other objects that are higher than the temperature of the measured object and affect the measured value. This function is to eliminate the influence of other super-high background temperature on

the temperature of the measured object.

4.2.1.3 Analysis settings

Temperature alarm: This setting is valid only in the area temperature measurement. When the temperature alarm is set to "On", if the target temperature in the temperature measurement area exceeds or falls below the alarm temperature, the infrared gas leak detector Automatic sound and color alarm. The color of the alarm is set by the "Alarm Color" field.

Alarm Temperature: Set the alarm temperature only when the temperature alarm is set to "On".

Alarm Color: When the target temperature exceeds the set alarm temperature, the color of the area exceeding the alarm temperature will be displayed in the alarm color. The system provides 9 colors, when set to "Auto", it will not change the original screen s color.

Isothermal: displays the color of the image in a certain temperature range in the set isothermal color system. The system provides 9 colors, when set to "automatic", it does not change the original color of the screen.

Isothermal temperature: the temperature of the isothermal center point.

Isothermal height: used to set the range of isothermal range, such as isothermal temperature is set to 50 ℃, isothermal height of 1 ℃, the isothermal range: 49.5 ℃ ~ 50.5 ℃.

4.2.1.4 Time settings

Infrared gas leak detection temperature imager in a long time to put aside, because the internal battery power is limited, boot after the need to re-adjust the system time.

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4.2.1.5 System settings

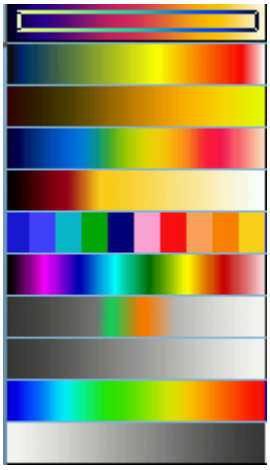
Language: Set the infrared gas leak detection temperature imager using the language.

Auto Calibration: Set the auto calibration interval to get better thermal image and improve the accuracy of temperature measurement.

Electronic magnification: electronic magnification, there are three options: X1, X2 and X4.

Laser: Set the laser on and off. Turning on the laser enables more accurate image positioning.

4.2.1.6 Color palettes setting



Infrared mode only.

4.2.1.7 System information

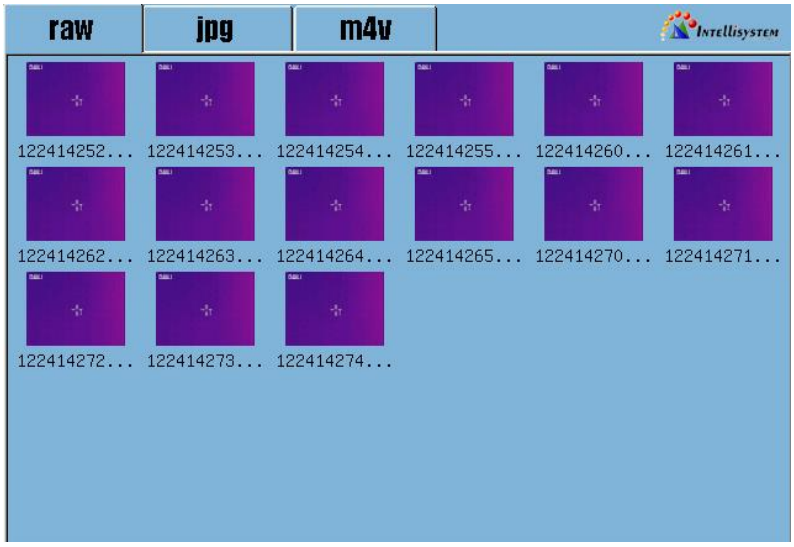
To check the Device number, and system version number.

4. 2. 1. 8 Factory settings

Reset to factory initial state.

4.2.2 Document menu

4. 2. 2. 1 Open



a) Playback jpg

Record voice, 40secs at mots Save Play

b) Playback mpeg4 (m4v)

c) Playback raw (DLV original data)

4. 2. 2. 2 Save

0 second means no auto save.

4. 2. 2. 3 Record

Note：mpeg4 meet standard ISO14496-2, for play in PC. DLV for analysis software.

4. 2. 2. 4 SD Choice. Choose from SD1 and SD2.

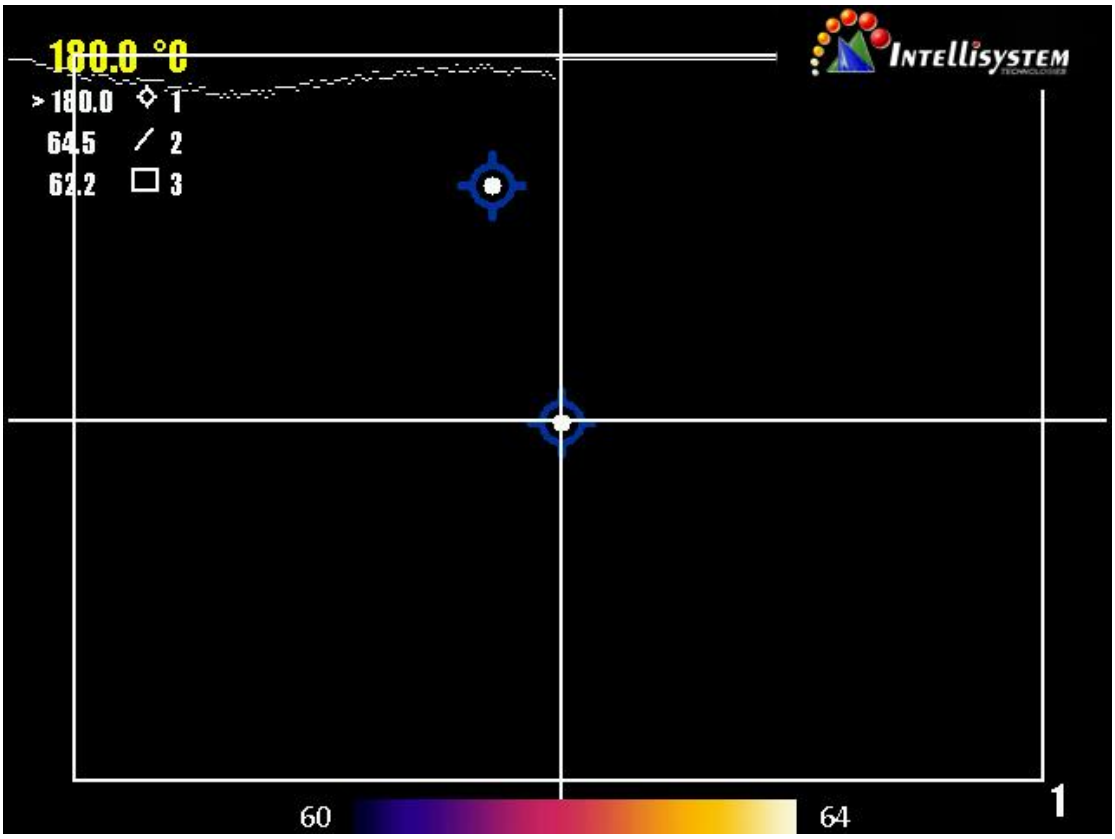
4. 2. 2. 5 SD unload

Please remember to unload the SD card here before remove the SD card.

4. 2. 2. 6 **Delete file.**

4. 2. 2. 7 **SD format**

4.2.3 Measurement mode



Add point: Add the temperature measurement point
Add line: Add the line temperature line
Add area: Add the regional temperature measurement area
Clear: Cancel all temperature Auxiliary item
Note: Only Infrared mode is active.

5 Factory setting parameter table

Temperature setting table

Name	Number
Specific radiation coefficient	0.96
Correct the temperature	0
Distance	2.0
Humidity	60

Analysis Settings Table

Name	Number
Temperature range	-40/180°C
Area temperature measurement	Highest temperature
Alarm	Off
Alarm temperature	50.0°C
Alarm color	Auto
Reference temperature	Off
Reference temperature Value	0.1°C
Color Palette	Auto
Temperature unit	°C
Distance unit	Meter
Auto calibration	60S

Image setting table

Name	Number
Color palette	No. 1
Upper limit color	Auto
Lower limit color	Auto
Isothermal color	Auto
Isothermal height	1.0°C
Color palette display	On

System Settings Table

Name	Number
Language	English
Storage	SD Card
Store voice	Off
Leaser pointer	Off
CCD camera	Off

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Appendix

Specific Emissivity of Materials

Material	Surface	Temperature °C	Emissivity (ε)
Aluminum	Non- oxidized	100	0.20
	Oxidized	100	0.55
Brass	Burnished to Brown	20	0.40
	Dull luster	38	0.22
	Oxidized	100	0.61
Copper	Seriously Oxidized	20	0.78
Iron	Oxidized	100	0.74
	Rusty	25	0.65
Cast iron	Oxidized	200	0.64
	Non- Oxidized	100	0.21
Wrought iron	Quarry-faced	25	0.94
	Polished	38	0.28
Nickel	Oxidized	200	0.37
Stainless steel	Oxidized	60	0.85
Steel	Oxidized	200	0.79
Common brick	Surface	20	0.93
Concrete	Surface	20	0.92
Glass	Polished plate	20	0.94
Lacquer	White	100	0.92
	Black	100	0.97
Carbon	Smoke black	25	0.95
	Candle soot	20	0.95
	Rough lead surface	20	0.98
Oil paint	Value of 16 colors	100	0.94
Paper	White	20	0.93
Sandy soil	Surface	20	0.90
Timber	Dressed	20	0.90
Water	Distilled water	20	0.96
Skin	Human	32	0.98
Ceramic	Thin	21	0.90
	Thick	21	0.93

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Technical Specifications

Item		*ThermalTronix* TT-607FG-HTI
Detector	Detector Type	Cooled QWIP detector
	Array size	320*256
Image Characteristics	Field of View/min focus distance	14.5°×10.8°/0.5m or 24°×18°/0.3m
	Spatial resolution	0.79mrad or 1.13mrad
	NETD	<0.025℃
	Frame rate	60Hz
	Focus	Automatic/Manual/electric focusing
	Zoom	9.8～11.2μm，Summit 10.55μm
	CCD	320million pixel CMOS，AF
Image display	View finder	High resolution 0.6’ color OLED, band amplifier
	LCD	High resolution 5’ digital color LCD touch screen
	Image adjustment	Automatic/manual adjust contrast, brightness
	Color palette	11 color palette (including iron oxide red; optional rainbow; black and white; black and white inversion, etc.)
Measurements	Temp range	-40℃～+500℃
	Accuracy	±2℃ or ±2% (reading range), large value
	Measurement correction	Automatic/manual
	Mode	Up to 10 movable spots, Up to 5 movable areas (maximum, minimum and average temperatures) Up to 2 movable lines, Line profile, Isotherms; Temperature difference. Alarm (voice, color)
	Setup	Date/time; temperature unit℃/℉/k language
	Emissivity Correction	0.01 to 1 radiation rate adjustable
	Background temp adjustment	Automatically, according to the type of the background temperature
	Atmospheric transmission correction	Automatically, according to the type of the target distance; relative humidity; environment temperature.

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Image Save	Storage Card	8G SD card，could up to 32G
	Storage mode	Manual/automatic single-frame image storage, continuous visible, infrared video recording
	Storage mode	Thermal/CCD, CCD thermal image automatic association of the corresponding
	Single frame	JPEG, 14-bit thermal image with measurement data
	Video	MPEG-4 or 14-bit thermal image with measurement data
	Single frame	JPEG format or with single frame image stored (PIP)
	video	MPEG-4
	Voice annotation	40S, saved together with the image
Target designation	Laser pointer	Second level，1mW/635nm red
Power supply	Battery type	Li-ion, rechargeable
	Battery operating time	3 hours continuous operation
	Charging system	Intelligent charge or power supply adaptor online charge
	Power saving	Automatic screen saver, automatic shutdown
	External power	10-15V DC
Environment	Working temp	-20℃~ +50℃
	Encapsulation	IP54
	Humidity	≤95%（non-condensing）
Physical features	Weight	2.5Kg
	Dimension	335mm×160mm×172mm
Interface	External DC input	Yes
	Audio output	Yes
	USB 2.0	USB2.0，measurement date and voice transfer to PC
	Video output	HDMI
Detection of Gas		Six sulfar fluoride; ammonial; ethyl cyanoacrylate; Chlorine dioxide; acetic acid; Chloro two methyl fluoride; ethylene; methyl ethyl ketone, etc.