SATIR

Hotfind S

User's manual

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Thumb Index

Introduction of camera components and battery loading.

Description of basic functions, e.g. how to turn on/off the IR camera and work with the control panel and LCD monitor.

Description of analytical software with the camera, from each analysis settings to using the camera's various analysis tools.

Explains how to review recorded images, erase images and playback voice memos.

Explains how to transfer images or video to a computer.

You must read this section before connecting your camera to a computer.

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Read This First

Please Read

Test Shots

- Before making a snapshot of important subjects, we highly recommend that you snapshot several trial images to confirm that the IR camera is operating and being operated correctly.

- Please note that SATIR, its subsidiaries, affiliates and its distributors are not liable for any consequential damages arising from any malfunction of an IR camera or accessory. Any results in the failure of an image are to be recorded in a format that is machine readable.

Safety Precautions

- Before using the camera, please ensure that you read and understand the safety precautions described below. Always ensure that the IR camera is operated correctly.

- The safety precautions noted on the following pages are intended to instruct you in the safe and correct operation of the IR camera and its accessories, and also to prevent any injuries or damages to yourself, others and the equipment.

- **Avoid damaging eyesight**

   Warning **:** Do not trigger the laser pointer in human or animal eyes. Exposure to the produced by the laser pointer may damage eyesight.

- **Do not disassemble**

   Do not attempt to disassemble or alter any part of the equipment that is not expressly described this guide.

- **Stop operating immediately if it emits smoke or noxious fumes**

   Failure to do so may result in fire or electrical shock. Immediately turn the IR camera's power off, remove the IR camera battery or unplug the power cord from the power outlet. Confirm that smoke and fume emissions have ceased.

- **Stop operating immediately if it is dropped or the casing is damaged**

   Failure to do so may result in fire or electrical shock. Immediately turn the IR camera's power off, remove the IR camera battery or unplug the power cord from the power outlet.

- **Do not use substances containing alcohol, benzene, thinners or other flammable substances to clean or maintain the IR camera**

   The use of these substances may lead to fire.

In dusty, humid or greasy environments, the dust that collects around the plug over long periods of time may become saturated with humidity and short-circuit, leading to fire.

■ **Do not handle the power cord if your hands are wet**

Handling it with wet hands may lead to electrical shock. When unplugging the cord, ensure that you hold the solid portion of the plug. Pulling on the flexible portion of the cord may damage or expose the wire and insulation, creating the potential for fires and electrical shocks.

■ **Do not cut, alter or place heavy items on the power adapter cord**

Any of these actions may cause an electrical short circuit, which may lead to fire or electrical shock.

■ **Use only the recommended power accessories**

Use of power sources not expressly recommended for this IR camera may lead to overheating, distortion of the IR camera, fire, electrical shock or other hazards.

■ **Do not place the batteries near a heat**

source or expose them to direct flame or heat

Neither should you immerse them in water. Such exposure may damage the batteries and lead to the leakage of corrosive liquids, fire, electrical shock, explosion or serious injury.

■ **Do not attempt to disassemble, alter or apply heat to the batteries**

This is serious risk of injury due to an explosion. Immediately flush with water any area of the body, including the eyes and mouth, or clothing, that comes into contact with the inner contents of a battery. If the eyes or mouth contact these substances, immediately flush with water and seek medical assistance.

■ **Avoid dropping or subjecting the batteries to severe impacts that could damage the casings**

It could lead to leakage and injury.

■ **Do not short-circuit the battery terminals with metallic objects, such as key holders**

It could lead to overheating, burns and other injuries.

■ **Before you discard a battery, cover the terminal with tape or other insulators to prevent direct contact with other objects**

Contact with the metallic components of other materials in waste containers may lead to fire or explosions. Discard the batteries in specialized waste facilities if available in your area.

- ■ **Use only recommended batteries and accessories**

  Using of batteries not expressly recommended for this equipment may cause explosions or leaks, resulting in fire, injury and damage to the surroundings.

- ■ **Disconnect the compact power adapter from both the IR camera and power outlet after recharging and when the IR camera is not in use to avoid fires and other hazards**

  Continuous use over a long period of time may cause the unit to overheat and distort, resulting in fire.

- ■ **Do not use the battery charger or compact power adapter if the cable or plug is damaged, or if the plug is not fully inserted into the power outlet**

  The battery charger varies according to region.

- ■ **Exercise due caution when screwing on the separately sold tele-lens, close-up lens**

  If the lens is loosened and fallen off, the glass shards may cause an injury.

- ■ **If your camera is used for prolong periods, the IR camera body may become warm**

  Please take care when operating the IR camera for an extended period as your hands may experience a burning sensation.

Prevent Malfunction

- ■ **Avoid damaging the detector of the IR camera**

  Warning: Do not aim the IR camera directly into the

sun or at other intense heat source which could damage the detector of the IR camera.

- **Avoid Condensation Related Problems**
  - ✧ Moving the IR camera rapidly between hot and cold temperatures may cause condensation (water droplets) on its external and internal surfaces.
  - ✧ You can avoid this by placing the IR camera in the plastic case (bundle) and letting it adjust to temperature changes slowly before removing it from the case.

- **If Condensation Forms Inside the IR Camera**
  Stop using the camera immediately. Continuing to use the camera may cause damage. Remove the SD card, and battery or a household power source, from the IR camera and wait until moisture evaporates completely before resuming use.

- **Extended Storage**
  When not using the IR camera for extended periods of time, remove the battery from the IR camera or battery charger and store the IR camera in a safe place. Storing the IR camera for extended periods with battery installed will run down the battery.

- **Right Reserved**
  SATIR reserves the right to change the functions and configurations of our products without prior notice.

Component Guide

Figure

Explanation

1	Laser pointer
2	Visual Camera
3	Illuminator
4	IR lens
5	Focus ring
6	Definable trigger
7	LCD Display
8	Micro USB
9	TF Card Slot
10	Battery

Component Guide

Figure

Explanation

1	Power Indicator
2	Cancel
3	Auto adjust
4	Enter
5	Power switch
6	Freeze/Active
7	Omni selector
8	Video output

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Quick Guide

Procedure

1	Charge the battery pack fully before using it for the first time.
2	Insert the battery pack.
3	Installing the TF Card and selecting TF card as the file path.
4	Press and hold the power switch ⏻ for 3 seconds.
5	Setting the date and time and the global settings.
6	Aim the IR camera at the subject then turn the focus on the target until the image is clear. You can add the analysis tools as you need.
7	If you want to save the image, you can freeze the image first by press the **[s]** key, then you can click the icon 🖼 and **[Snapshot]** to save it.
8	Download the images via TF card ● You can get the TF card out of camera, and download the images to the computer via the supplied card reader. ● You can also copy the files from camera to computer through the USB cable. Please select **[UDisk]**.
9	Copy the images to your computer.
10	Press power switch ⏻ and then there will pop-up a prompt box and click the **[OK]**.
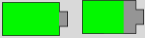
Preparing the IR Camera

Charging the Battery Pack

General   Follow the procedures to charge the battery pack for
the first time and subsequently when the low battery
icon appears on the display panel.

The following icons indicate the battery status on the LCD
display.

	Sufficient battery charge
	Low battery
	Replace or recharge the battery

Recharge

The battery   **Method 1:** Put the battery into the battery charger.

Attach the power cord to the battery charger and

plug the other end into a power outlet.

- ■ The charge indicator light is red while the battery

  pack is charging and it turns blue when charging

  is completed.

- ■ After charging, unplug the battery charger and remove

  the battery pack.

Method 2: Install battery pack into the camera, then plug a USB cable into the USB interface on the host and recharge the camera directly.

NOTE

1	This is a lithium ion battery pack so there is no need to discharge it completely before recharging. It can be recharged at any time. However, since the maximum number of charge cycle is approximately 300 (battery life), you are recommended to only charge the battery pack after having discharge it completely to prolong battery life.
2	Charging times will vary according to the surrounding temperature and battery pack charge state.

Preparing the IR Camera

Installing the Battery Pack

General   Fully charge the battery before using it for the first time.

Procedure

1	**Insert the battery pack**: Fit the battery pack into the slot, and then push down the battery pack until it's fixed.

2	**Pull out the battery pack**: Press the battery pack cover . Push forward the battery pack locker and then lift up the cover.

Connecting and Installing the TF card

Connecting and Installing the TF Card

Figure

Explanation

1	Micro USB

2	TF card
3	Video output

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Preparing the IR Camera

Turning the Power On / Off

General   The power indicator is lit while the power of the camera

is on.

Procedure

1	**Press and hold the power switch for 3 seconds.** •The power indicator will be on.
2	**After some time, a startup image will appear on the screen.**
3	**Turn off the camera.** Press power switch and then there will pop-up a prompt box and click the **[OK]**. •The power indicator goes off.

Preparing the IR Camera

Checking the Information on the LCD Monitor

General   The LCD monitor has a field of vision of 100% of the actual shooting image.

The following displays in information view.

Main interface：
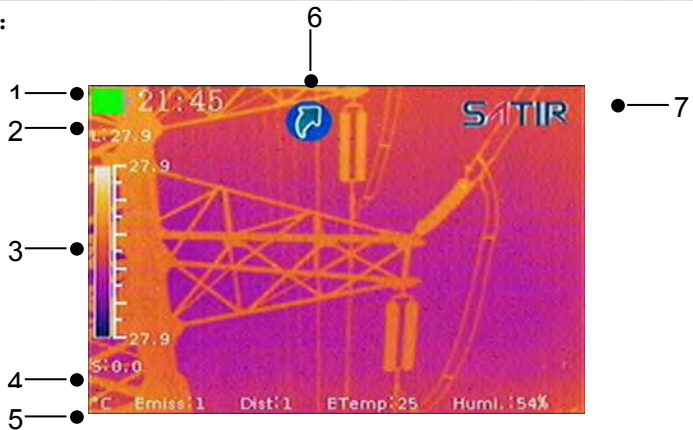
Explanation

1	Power and time display
2	Level （click to modify）
3	Color scale
4	Span （click to modify）
5	Temperature unit；Emissivity；Distance；Environment temperature；Humidity；
6	Quick launcher
7	SATIR trademark（Click to bring up the main menu）

NOTE   You can show/hide the Quick launcher with the following step: click **[Settings]**–**[Image]**–**[Quick Launcher]** on/off.

Preparing the IR Camera

Setting the Date and Time

General   You need to set the Data & Time when the IR camera is turned on for the first time.

Procedure

1	Press the **[C]** key or click the SATIR icon.
2	Press the *LEFT* and *RIGHT* arrow to select the **[Settings]** menu and press *ENTER* key.
3	Press the *UP* or *DOWN* arrow on the Omni selector to select the **[System]** menu and click the **[Date &Time]** menu.
4	**Click Set date** • Slide the date item up and down to modify the date. • After modifying, click [**OK**] button to save, click [**Cancel**] button to quit.
5	**Click Set time** • Slide the time item up and down to modify the time. • After modifying, click [**OK**] button to save, click [**Cancel**] button to quit.
6	**Click Set timezone** • Slide up and down the time zone item to modify the time zone. • After modifying, click [**OK**] button to save, click [**Cancel**] button to quit.

Preparing the IR Camera

Language Setting

General   In this menu item, you can display style of the built-in menu system.

Procedure

1	Press the **[C]** key or click the SATIR icon
2	Press the *LEFT* and *RIGHT* arrow to select the **[Settings]** menu and press *Enter* key.
3	Press the *UP* or *DOWN* arrow on the Omni selector to select the **[System]** menu and then click **[Language]**.
4	**Language Setting:** • Slide up and down to select an item to change. • After modifying click [**OK**] button to save, click [**Cancel**] button to quit.

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About the local settings

You can set the following options in the system setting.

Language	Selects the language of the menus and messages.
Update	Update/Backup/Recovery thermal imager operating system
Date & Time	Set the system date and time display, set time zone.
Control	Set thermal imager video output and the output mode / LED switch /laser switch / set USB Mode /set the multifunction key.
Unit Setting	Sets the format of the displayed temperature or distance unit of the camera. °C or °F, Meter or Feet.
System Info	Check thermal imager serial number / version / produce date information and restore default settings
Bluetooth	Open / search / bind bluetooth devices and view the connected devices / matched equipment
Power Manger	Set time of screen saver and automatic power off.

Preparing the IR Camera

Local Setting

Unit Setting

Procedure		
	1	Press the **[C]** key or click the **SATIR** icon
	2	Press the *RIGHT* arrow on the Omni selector to select **[Settings]**, then press the *ENTER* key.
	3	Press the *DOWN* arrow on the Omni selector to select **[System]** then click **[Unit Setting]**.
	4	Click to select the unit and click [**OK**] to finish the setting. •Length：Meter, Feet •Temperature:℃,℉

Preparing the IR Camera

TV-OUT Modes Setting

Procedure

1	Press the **[C]** key or click the **SATIR** icon.
2	Press the *RIGHT* arrow on the Omni selector to select **[Settings]** then press *ENTER* key.
3	Press the *DOWN* arrow on the Omni selector to select **[System]** then click **[Control]**.
4	Slide the *RIGHT* area of **[TV-Out]** item and choose **on** to open TV-OUT after linked to monitor. And click **[TV-Out Mode]** to select a mode.
5	Slide to select **NTSC** or **PAL** mode.
6	Press the *UP* and *DOWN* at the same time to turn off the TV-Out.

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Preparing the IR Camera

Update/Backup/Recovery

Procedure

1	Copy the installation package to the TF Card.
2	Turn off the IR Camera and insert the TF Card.
3	Turn on the IR Camera.
4	Press the **[C]** key or click the **SATIR** icon.
5	Press the *RIGHT* arrow on the Omni selector to select **[Settings]** then press *ENTER* key.
6	Press the *DOWN* arrow on the Omni selector to select **[System]** then click **[Update]**.
7	Click the **Update/Backup/Recovery.**
8	Click **Close** to quit the update menu.(After the update ,the Camera will restart automatically)

NOTE   Before updating the program, it is better to backup first.

If   the system crashes, recover it with the following procedure.

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1	Turning the power on.
2	When the LOGO showed on the screen after the "**Booting...**"then press and hold the *UP* and *DOWN* key at the same time about 15s until the screen show the "**In Restore Mode**".
3	Press the *Enter* key to restore the system. Press the *C* key to Exit the recovery.

Preparing the IR Camera

Power Manage

General

You can set the screensavers and the Auto-off time at the power manage.

1	Press the **[C]** key or click the SATIR icon.
2	Press the *LEFT* and *RIGHT* arrow keys to select **[Settings]**, press the *ENTER* key.
3	Press the *DOWN* arrow on the Omni selector to select **[System]** then press the *RIGHT* arrow.
4	Press the down arrow key to select **[Power Manager]** then click.
5	Click the **[Set screen saver]** or **[Set power off]** and then slide to select the value and click **[ok]** to finish the change.

Basic Functions

Using the LCD Monitor

General   If you wish to use the LCD monitor for shooting, playing back thermal images and adjusting menu settings, follow the instructions below.

Figure

Procedure   Follow this procedure to use the LCD Monitor

1	**Open the LCD displayer in the direction of the arrow.**
2	**Aim the IR camera at a subject.**

NOTE   When you close the LCD displayer, the screen will be black, it will help you save the power.

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Basic Functions

Selecting Menus and Settings

General   The camera comes with two methods of control, keypad and touch screen. The user can operate the camera depending on their preference and application.

keypad

1	Press the **[C]** key.
2	Press the *LEFT* or *RIGHT* arrow on the Omni selector.
3	Press the *UP* or *DOWN* arrow on the Omni selector.
4	Press the *ENTER* button.

Touch screen

1	Click the SATIR icon, the main menu will pop up.
2	Click the function icon you want to deal with.

Main menu

	Spot analysis

	Area analysis	
	Line analysis	
	Isotherm analysis	
	Image	
	Media	
	Settings	

Basic Functions

Resetting the Settings to Default

General   You can reset the menu and button operation settings to default.

Procedure   Follow this procedure to reset the settings to default

1	Press the **[C]** key or click the **SATIR** icon.
2	Press the *LEFT* and *RIGHT* arrow keys to select **[Settings]**, press the *ENTER* key.
3	Press the down arrow key to select **[System]**. Click to select **[System Info]**.
4	Click **[Default Settings]** and **[OK]** . Please reboot the machine after a successful recovery.

NOTE   After factory defaults, for the user data already stored in the internal memory which will delete all the settings are reset, and the external memory with the user data will not be deleted.

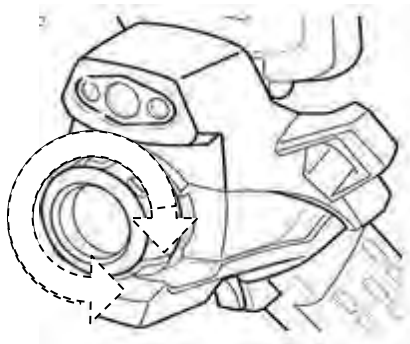# Shooting

Focus

Manual focus and digital zoom

Figure

Procedure   Follow this procedure to adjust the focal length.

1	Aim the IR camera at the object.
2	Turn the focus ring to focus on the target.
3	Do not stop turning until the image is clear.

NOTE   You can press *LEFT +UP/DOWN* to realize the digital
                 zoom.

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Shooting

Display Modes DuoVision Display modes

Thermal, Visual and DuoVision image display

General This IR camera records visual images with its built-in digital camera. You can capture a visual image as a reference to the thermal image.

Procedure Follow this procedure to switch the display mode

1	Click the icon .
2	In the pop-up menu, click **[IR]** to switch the corresponding display mode.
3	In the pop-up menu, click **[CCD]** to switch the corresponding display mode.
4	In the pop-up menu, click **[Merg]** to switch the corresponding display mode.

Shooting

In **DuoVision** display mode, you can see the thermal images 'merge' into the visible images.

Explanation This table explain the different display mode.

IR	In this mode, you can use the analysis tools to analyze the target. But what you see is the image with pseudo color.
CCD	In this mode, you can see the image with full color. But you cannot use any analysis tools to analyze the target.
Merg	In this mode, you can see the background image is full color visible image. And the thermal image 'fusion' on it in the center square. At the same time you can use any analysis tools to analyze the target.

NOTE In the **Merg** mode, click **Pos** or **%**, moving your finger up and down to adjust the position or percent of the visible picture to fit into the infrared picture. After you finish

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settings, please click **[Done]**.

Figure

NOTE   **1.** Set the ratio of IR images and Visual images. The value is from 1% to 100%. After you finish these things please click **[Done]**.

2. The items above are activated only in **[Merg]** mode.

Shooting

Image adjustment

General   You can adjust the Level (brightness) and Span (contrast) of the image captured by IR camera, manually or automatically.

Explanation **Auto adjust** The IR camera will automatically adjust the brightness and contrast, and calibrate when you press the *A* key.

Manual Adjustment

1	Click the left showed **L:xx** and **S:xx** of the main interface to call the level or span adjustment menu.
2	Slide to select the value of the Level and click **[Close]** to finish the change. You can also adjust the Level by press the *LEFT/RIGHT* when hide the main menu, and keep pressing will adjust faster.
3	Slide to select the value of the span and click **[Close]** to finish the change. You also can adjust the span by press the *UP/DOWN* when hide the main menu, and keep pressing will adjust faster.

NOTE   You can define the adjustment mode as M.L/S, A.L/S, A.Level, and A.Span at the **Image** function**.**

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Shooting

Palette settings

Procedure

1	Press the **[C]** key or click the **SATIR** icon.
2	Press the *LEFT* or *RIGHT* arrow on the Omni selector to select the **[Image]**, press the *ENTER* key to call the image toolbar.
3	Click **[Palette]**.
4	Slide to select the palette mode and then click **[Close]** to finish the setting.

NOTE   The camera provides 6 kinds of palettes: **Iron**, **Iron inverted**, **Rainbow**, **Feather**, **Grey** and **Grey inverted**.

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Shooting

Shutter automatically

Procedure

1	Press the **[C]** key or click the S∧TIR icon.
2	Press the *RIGHT* arrow on the Omni selector to select **[Settings]** and then press *ENTER* key.
3	Press the *DOWN* arrow on the Omni selector to select **[Image]** then click **[Shutter Interval]**.
4	Slide to set the shutter interval and then click the **[Close]** to finish settings.

Shooting

Turning the LED and Laser on/off

Warning   Do not trigger the laser pointer in human or animal eyes. Exposure to the light produced by the laser pointer may damage eyesight.

Procedure

1	Press the **[C]** key or click the **SATIR** icon.
2	Press the *RIGHT* arrow on the Omni selector to select **[Settings]** and then press *ENTER* key.
3	Press the *DOWN* arrow on the Omni selector to select **[System]** then click **[Control]**.
4	Click the right switch of **LED** or **Laser** to open the LED or laser. Click again to turn **off** the tool.

About control

TV-OUT	Click to turn on and press the *UP* and *DOWN* arrow on the Omni selector to close.
TV-OUT Mode	Slide to select the NTSC or PAL mode.
LED	Click to turn on when using **CCD** in darkness.
Laser	Click to turn on the laser to aim at the object.
USB Mode	Slide to select the **UDisk** or **Trans.** Mode.
Multi-Func. Key	Slide to set the **Multi-Function key**.

Shooting

USB mode setting

Procedure

1	Press the **[C]** key or click the **SATIR** icon.
2	Press the *RIGHT* arrow on the Omni selector to select **[Settings]** and then press *ENTER* key.
3	Press the *DOWN* arrow on the Omni selector to select **[System]** and click **[Control]**, slide up the list and click **[USB Mode]**.
4	Slide to select **[UDisk]** or **[Trans.]** mode and then click **[Done]** to finish the setting.

Shooting

Setting the multifunction key

General   You can set the multifunction key with different functions such as Shutter, Freeze, Snapshot, Laser and LED through the system.

Procedure

1	Press the **[C]** key or click the ЅᐱTIR icon.
2	Press the *LEFT* or *RIGHT* arrow on the Omni selector to select the **[Settings]** menu, then press the *Enter* key.
3	Press the *DOWN* arrow to select the **[System]** menu, then click the **[Control]** menu.
4	Click **[Multi-func. key]** option, slide up and down to select a function, click **[Done]** to save the changes and exit the menu.

NOTE   About the function of multifunction key.

Shutter	The machine will shutter one time by pressing the multifunction key.
Freeze	You can activate / freeze a thermal image by pressing the multifunction key.
Snapshot	Save the image by pressing the multifunction key.
Laser	You can light up the laser by pressing the multifunction key.

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Shooting

Bluetooth setting

Procedure

1	Press the **[C]** key or click the **SATIR** icon.
2	Press the *RIGHT* arrow on the Omni selector to select **[Settings]**, then press the *ENTER* key.
3	Press the *DOWN* arrow on the Omni selector to select the **[System]** then slide up and click **[Bluetooth]**.
4	Press the *DOWN* arrow on the Omni selector to select the **[Start Bluetooth]** and press the *ENTER* key to edit the name of the camera's Bluetooth. Then you can search and connect to the Bluetooth headset.(p.64)

Shooting

Measurement range

Procedure

1	Press the **[C]** key or click the **SATIR** icon
2	Press *RIGHT* arrow on the Omni selector to select the **[Settings]** then press the *ENTER* key
3	Press the *UP* arrow on the Omni selector to select the **[Analysis]** then click the **[Temp. Range].**
4	Click the number to select the measurement range of the object and click [**OK**] to finish the settings. Then press the [**C**] key to back to the main interface.

NOTE   The camera offers two Temp. Range:

-20~150℃,**140~600**℃

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Shooting

Freezing / Activating an Image

General   You can activate / freeze a thermal image by pressing
the **S** key on the keypad.

Procedure

1	Press the **[S]** key, then the image is freezing.
2	Press the **[S]** key again then the image is active.

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Shooting

IR Camera Adjustment

Checking the emissivity table

Procedure

1	Press the **[C]** key or click the **SATIR** icon
2	Press *LEFT* or *RIGHT* arrow on the Omni selector to select **[Settings]** then press the *ENTER* key.
3	Press *UP* arrow on the Omni selector to select **[Analysis]**, then click **[Emiss Table].**
4	Press *LEFT* or *RIGHT* arrow on the Omni selector to checking the emissivity of the measuring target. Press the **[C]** key to exit after checking.

Shooting

Setting object/global settings

Procedure

1	Press the **[C]** key or click the **SATIR** icon.
2	Press the *RIGHT* arrow on the Omni selector to select the **[Settings]** then press the *ENTER* key.
3	Press the *UP* arrow on the Omni selector to select the **[Analysis]** then click the **[Global Param.]**.
4	**Setting analysis parameter** • Press the *UP* or *DOWN* arrow on the Omni selector to select an item to change. • Press the *LEFT* or *RIGHT* arrow on the Omni selector to set the values.
5	Click **[Save]** and **[OK]** to save the settings**.**

NOTE About the analysis parameters

Emissivity	Different material has different emissivity. Use different emissivity to measure different material.
Distance	Different object has different distance to the IR camera. Use different distance to measure different object.
Ambi. Temp	Input ambient temperature.
Refl. Temp	Set a reference temperature to compare with the spot/area/profile tool.
Humidity	Input ambient humidity.
Offset	Offset the measurement temperature.
Background	Hide or show the background.

Shooting

Restore the default settings

Procedure

1	Press the **[C]** key or click the **SATIR** icon.
2	Press the *RIGHT* arrow on the Omni selector to select **[Settings]** then press *ENTER* key.
3	Press the *DOWN* arrow on the Omni selector to select **[Analysis]** and click **[Reset]**.
4	Click **[OK]** to finish the setting.

Shooting

1	Press the **[C]** key or click the **SATIR** icon
2	Press the *LEFT* or *RIGHT* arrow on the Omni selector to select the **[Spot]** menu**,** and press the *ENTER* key.
3	**Setting the spot analysis.** • Click to choose a spot, then press the *ENTER* key. • Press the *UP* or *DOWN* arrow on the Omni selector to select what you want to be changed, then press the *LEFT* or *RIGHT* arrow on the Omni selector to change it, keep pressing the *LEFT* or *RIGHT* arrow can quickly change the value of Alarm Temp.
4	**Moving the spot.** • Click to choose a spot and the spot will be green. Then drag the spot directly on the touch screen. • Press the *UP, DOWN, LEFT, RIGHT* arrow on the Omni selector to move the spot.
5	**Removing the spot.** • Keep pressing the spot you want to remove, then you will find an ashcan appears on the right bottom of the screen .Drag the spot into the trashcan to

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	clear it.

Spot analysis

General   This topic briefly explains how to set the analysis tools on the thermal image.
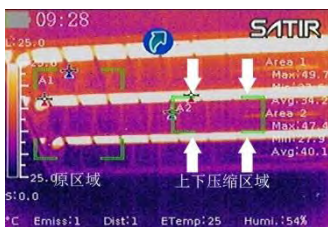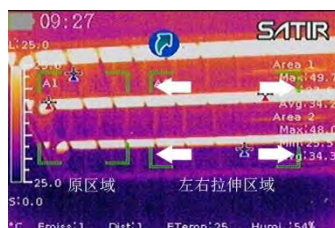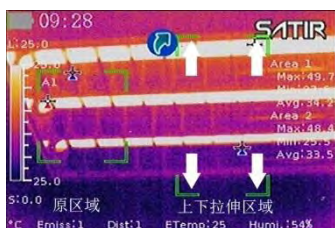
Procedure

Shooting

Fulfill the Analysis Function

Area analysis

Figure About changing the shape of the analysis area.
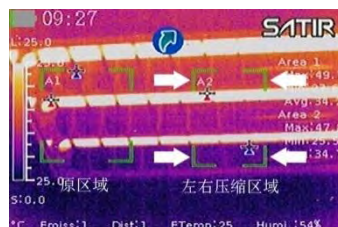
Procedure   Follow this procedure to fulfill Area analysis

1	Press the **[C]** key or click the SATIR icon
2	Press the *LEFT* or *RIGHT* arrow on the Omni selector to select the **[Area]** menu.
3	**Setting the analysis area.** •Double click the center or the four corners of the area. •Then, the menu bar of this area will pop up, you can click the options what you want to change directly on the screen.
4	**Moving the area.** •Select the area you want to move by click the area. •One way：Press the *UP, DOWN*, *LEFT, RIGHT* arrow on the omni selector to move the area. The other way：Click the area you want to move and drag it to anywhere of the image.
5	**Removing the area.** •Keep pressing anywhere of the area you want to remove, then you will find a ashcan appears on the bottom of the touch screen. Drag the area into the trashcan to clear the area.
6	**About changing the shape of the analysis area**

•Select the area you want to move by click the area.

•By pressing *LEFT* and *UP* you can elongated the length of the area on vertical direction；

By pressing *LEFT* and *DOWN* you can shorten the length of the area on vertical direction；

By pressing *RIGHT* and *UP* you can elongated the length of the area on horizontal direction；

By pressing *RIGHT* and *DOWN* you can shorten the length of the area on horizontal direction.

You can also click to select the area and then drag the corner of the area to change the size.

Shooting

Line analysis

Procedure

1	Press the **[C]** key or click the **SATIR** icon.
2	Press the *LEFT* or *RIGHT* arrow on the omni selector to select the **[Line]** menu.
3	**Moving the line.** •Select the line you want to move by click the line. •One way：Press the *UP* or *DOWN* key to move the line, press the *LEFT*, *RIGHT* arrow on the omni selector to move the Inverted triangle. The other way：Keep pressing the inverted triangle that on the line and drag it to anywhere of the image.
4	**Removing the line.** •Keep pressing the inverted triangle that on the line ,then you will find a trashcan appears on the screen. Drag the inverted triangle into the trashcan to clear it.

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Shooting

Isotherm analysis

Procedure

1	Press the **[C]** key or click the SATIR icon.
2	Press the *LEFT* or *RIGHT* arrow on the Omni selector to select the **[ISO]** menu.
3	**Setting isotherm range.** •Start from Step 1 to set or select isotherm analysis. •One way：Press *UP* or *DOWN* arrow to select upper limit or lower limit. Press *LEFT* or *RIGHT* arrow to adjust the number. The other way：Click the number, and then slide to select the value of the isotherm range on the pop-up menu.

NOTE   When you want to change the value of the number in this

camera, you can accord the above way to adjust the value
of the item.

Shooting

Setting the Alarm temperature

Procedure

1	Press the **[C]** key or click the SATIR icon.
2	Press *LEFT* arrow on the Omni selector to select **[Spot]**, press the *ENTER* key to add a spot and press the **ENTER** key again to call the setting window of the spot.
3	Press *UP/DOWN* arrow on the Omni selector to select **[Alarm Mode:]** or **[Alarm Temp:]**, press *LEFT* or *RIGHT* arrow to set the value of alarm mode or temperature.

Shooting

Setting the comparing temperature

Procedure

1	Press the **[C]** key or click the ꜱⴰᴛɪʀ icon.
2	Press *LEFT* or *RIGHT* arrow to select **[Spot]** or **[Area]**. Press the *ENTER* key to add spot or area analysis tools.
3	Press the **[C]** key. Press *RIGHT* arrow to select **[Settings]** and press the *ENTER* key. Press *UP* arrow to select **[Analysis]** and click **[Comp. Temp.]**.
4	Click the upper right corner of the interface to turn on comparing temperature. Slide to select the target and base, click [**+/-**] to set the value of reference temperature and keep pressing on [**+/-**] can change the value quickly.
5	Press the **[C]** key twice to back to the main interface. Press the **[C]** key again to hide the menu. You can see the values of difference as '△: **XX.X**' on lower right area of the screen.

Shooting

Fulfill the Analysis Function

Remove analysis tools

General

This topic briefly explains how to remove analysis tools you place on the screen.

Procedure

1	Click the icon on the screen.
2	In the pop-up menu bar on the right side click **[Clear]** key to clear all the analysis tools.

Shooting

Saving the Image

General   After you freeze an image, you can click the ![icon] icon on the screen in the pop-up menu bar on the right side, click **[Snapshot]** to save the image, or you can also save the image with the next steps.

Procedure

1	Press the **[C]** key or click the 5ΛTIR icon.
2	Press the *LEFT* or *RIGHT* arrow on the Omni selector to select the **[Media]** menu, then press the *Enter* key.
3	Press the *LEFT* or *RIGHT* arrow on the Omni selector to select the **[Snapshot]**.
4	Successfully saved there will have a sign be displayed on the screen.

NOTE   When you want to save an IR image, you can choose to save the IR screenshot or save the pure IR image only.

1	Press the **[C]** key or click the 5ΛTIR icon.
2	Press the *LEFT* or *RIGHT* arrow on the Omni selector to select the **[Settings]** menu, then press the *Enter* key.

Shooting

Voice/Text recording

General　　　You can introduce an image with voice or text recording.

Procedure

1	Install the Bluetooth headset.
2	Press the **[C]** key, then press the *LEFT* or *RIGHT* arrow on the omni selector to select the **[Media]** menu, then press the **Enter** key.
3	Press the *LEFT* or *RIGHT* arrow on the Omni selector to select the **[File]** menu, then press the **Enter** key.
4	Click to open the image you need to add note，press the *UP* or *DOWN* arrow on the omni selector to select the voice or text icon of the top toolbar, then press the **Enter** key.
5	In the pop-up menu bar, click the 🎤 icon , When 🎤 change into 🎤 , it means start recording, click again to stop the recording. Click the [**Save**] key to save the voice, click the [**Play**] to play the voice you just recorded. Click the [**Close**] to exit the menu.

Z

NOTE　　　The storage capacity of the memory will not decrease when you

Shooting

Snapshot and Edit the image

Snapshot/Edit

Procedure

1	Press the **[C]** key or click the **SATIR** icon.
2	Press the *LEFT* or *RIGHT* arrow on the Omni selector to select the **[Media]** menu, then press the *Enter* key.
3	Press the *LEFT* or *RIGHT* arrow on the Omni selector to select the **[Snapshot]** and press the *ENTER* key then the image will be saved automatically.
4	Press the *LEFT* or *RIGHT* arrow on the omni selector to select the **[Edit]**, press the *ENTER* key, edit the image like adding the text or voice note.

NOTE   About the Media

	Snapshot	Select and press the *ENTER* key to capture the present image.
	Edit	Edit the image.
	Voice	Record voice for the image.
	Video	Record a video.
	Replay	Replay the recorded video.
	File	Manage the file.
	Back	Back to the main menu.

Shooting

Record/Replay the Video

Procedure

1	Press the **[C]** key or click the **SATIR** icon.
2	Press the *LEFT* or *RIGHT* arrow on the Omni selector to select the **[Media]** menu, then press the *Enter* key.
3	Press the *LEFT* or *RIGHT* arrow on the Omni selector to select the **[Video]** and press the *ENTER* key to start recording the video.
4	Select **[Video]** and press the *ENTER* key again to stop recording.
5	Press the *LEFT* or *RIGHT* arrow on the Omni selector to select **[Replay]** and press the *ENTER* key to replay the recorded video.
6	Press the **[C]** key to exit after replaying.

About the Replay toolbar.

	Play	Play or pause the playing.
	Stop	Stop playing the video.
	Last	Playing the last video.
	Next	Playing the next video.
	Full Screen	Playing the video full screen.
	Select File	Select a video.
	Back	Back to the [Media] menu.

Playback and Erase

Opening Images

General   You can view and analyze the recorded images on the LCD monitor.

Procedure

1	Press the **[C]** key or click the SATIR icon
2	Press the *LEFT* or *RIGHT* arrow on the Omni selector to select the **[Media]** menu, then press the *Enter* key.
3	Press the *LEFT* or *RIGHT* arrow on the Omni selector to select the **[Edit]**, then press the *ENTER* key.
4	Press *LEFT or RIGHT* arrow on the Omni selector to select an image，then press *ENTER* key to open it. How to select an image, refer to p.60.

NOTE   Image edit sub menu description

Analysis	Analysis tools can be used to analyze the IR images.
Delete	Delete the currently selected picture.
Slideshow	All current picture slideshow.
Full screen	Watch the images full screen.
Text Note	Add text notes for the current picture.
Voice Note	Add voice notes to the current picture.

Selecting the file path

Procedure

1	Press the **[C]** key or click the **SATIR** icon
2	Press the *LEFT* or *RIGHT* arrow on the Omni selector to select the **[Media]** menu, then press the *Enter* key.
3	Press the *LEFT* or *RIGHT* arrow on the Omni selector to select the **[File]**, then press the *ENTER* key.
4	Press the *UP* or *DOWN* arrow on the Omni selector to select the **[SD Card]** option (save files in SD Card), select **[User Data]**(save files in inside memory) then press the *UP* and *RIGHT* arrow to select .
5	Press the *ENTER* key and all files will be saved in the file path.

Playback and Erase

File manager

Procedure

1	Press the **[C]** key or click the SATIR icon.
2	Press the *LEFT* or *RIGHT* arrow on the Omni selector to select the **[Media]** menu, then press the *Enter* key.
3	Press the *LEFT* or *RIGHT* arrow on the Omni selector to select the **[File]**, then press the *ENTER* key.
4	Press *LEFT* or *RIGHT* arrow on the Omni selector to select file or tool, press the **[C]** key to shift file to tool. Press the *ENTER* key to execute the operation on the chosen file**.**

NOTE　　　　About the File manager

Home	Enter the home directory.
Previous	Back to the parent directory.
Remove	Remove the file or directory.
Rename	Rename the file or directory.
New	Build a directory.
Copy	Copy the file.
Paste	Paste the file.
Refresh	Refresh the file list.
SaveFolder	Setting the saving path.
Close	Close file manager.

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Connection and Download

Procedure

1	Please select **Settings-System-Control-USB Mode-UDisk**.
2	Open the battery / card cover.
3	Use the original configuration of the micro USB cable to connect your camera with a computer.
4	Copy pictures to a computer, using image analysis software for analysis.

NOTE   **When you need file transfer, please use USB cable to connect the computer directly. Don't remove the memory card, or the file may lost.**

Connection and Download

Connecting to a monitor

General   A video-compatible monitor connected via the video
                cable (supplied) can be used to view and analyze
                images you shoot.

Figure
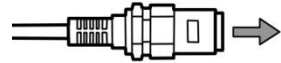
To the video in jack

Picture1   **Picture2**

Procedure   Follow this procedure to connect to a monitor.

1	Attach video cable to the video out terminal on bottom of camera.(Picture1)
2	Plug the other end of the video cable to the video in jack on the monitor.(Picture2)

Connection and Download

Connection

General   Connect the USB cable to the computer's USB port and the camera USB port.

NOTE
- You do not need to turn off the computer or camera when making this connection.
- Please refer to your computer manual for information regarding the location of the USB port

Figure

USB PORT
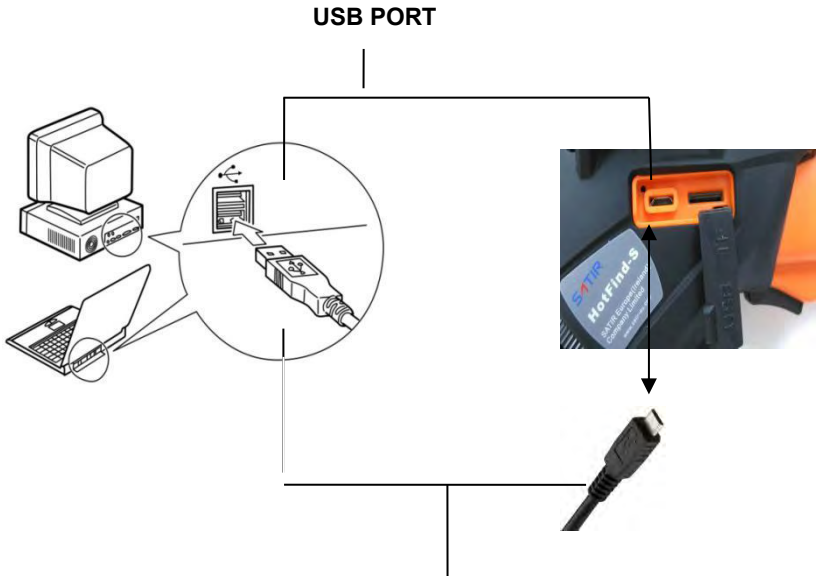
Connection and Download

Use the Bluetooth headset

Procedure

1	Turn on the camera and Bluetooth headset.
2	Turn on the Bluetooth headset first. Press and hold the power button about 10 seconds. And then you can see the power indicator begins to blink red and blue. The headset is in pairing status in 120 seconds.
3	Turn on the camera. Go to **Settings**-**System**-**Bluetooth**-**Start Blue tooth** and input the camera's Bluetooth name. Click **Search-Search** to search the Bluetooth headset, then click **Bind** and input the PIN (**0000** or **1234**) to bind the Bluetooth headset. Click **Connected Dev** to check the headset.
4	Once bound successfully, set the Bluetooth headset to pairing status, then go to **Paired Dev** to click **Bind** and input the PIN to bind the headset.
5	Try again step 1 to 4 if fail to bind. Press **[C]** key and *Enter* key together to free the Bluetooth headset.
6	Wear the headset, you can record the voice memos or play back the memos now.

Troubles Shooting

Problem	Cause	Solution
Camera will not operate	Power is not turned on	• Turn on the camera. See Turning the power on / off (p.15).
	Insufficient battery voltage	• Fully charge the battery.
	Poor contact between camera and battery terminals	• Wipe the terminals with a clean, dry cloth.
Camera will not record	Internal memory is full	• If required, download the images to a computer and erase them to make some space.
	Internal memory not formatted correctly	• Format the internal memory in FAT32 format.
Battery pack consumed quickly	Battery pack capacity reduced because of disuse for one year or more after being fully charged.	• Replace the battery pack with a new one.
	Battery life exceeded.	• Replace the battery pack with a new one.
Battery pack will not charge	Poor contact between battery pack and battery charger.	• Clean the battery terminals with clean cloth. • Connect the power cord to the battery charger and insert its plug firmly into the power outlet.

	Battery life exceeded	• Replace the battery pack with a new one.

Appendix

How to set up for optional Lens

General   There are various lenses for HotFind series available, from

tele-lens to close-up lens.

When an optional lens is installed, please enter "Setting-Analysis-Lens" to setup the correct mode for lens**.**

Procedure

1	Press the **[C]** key or click the SATIR icon.
2	Press the *LEFT* or *RIGHT* arrow on the Omni selector to select the **[Settings]** menu, then press the *Enter* key. Press *UP* arrow to select **[Analysis]** and click **[Lens]**.
3	Slide up and down to select the lens you have installed.

Appendix

Camera Care and Maintenance

Care and   Use the following procedures to clean the camera body,
maintenance lens, LCD monitor and other parts.

Camera Body	**Wipe the body clean with soft cloth or eyeglass lens wiper.**
Lens	**First use a lens blower to remove dust and dirt, then remove any remaining dirt by wiping the lens lightly with soft cloth.** • Never use synthetic cleaners on the camera body or lens.
LCD monitor	**Use a lens blower brush to remove dust and dirt. If necessary, gently wipe the LCD monitor with soft cloth or an eyeglass lens wiper to remove stubborn dirt.** •Never rub or press forcefully on the LCD monitor. These actions may damage it or lead to other problems.

NOTE   Never use thinners, benzene, synthetic cleaners or water
to clean the camera. These substances may distort or
damage the equipment.

Appendix

Emissivity table

Material	Temperature（°C）	Emissivity approximation
Metal		
Aluminum		
Polished aluminum	100	0.09
Commercial aluminum foil	100	0.09
Electrolytic chromeplate alumina	25～600	0.55
Mild alumina	25 ~ 600	0.10 ~ 0.20
Strong alumina	25 ~ 600	0.30 ~ 0.40
Brass		
Brass mirror (highly polished)	28	0.03
Brass oxide	200 ~ 600	0.61 ~ 0.59
Chrome		
Polished chrome	40 ~ 1090	0.08 ~ 0.36
Copper		
Copper mirror	100	0.05
Strong copper oxide	25	0.078
Cuprous oxide	800 ~ 1100	0.66 ~ 0.54
Liquid copper	1080 ~ 1280	0.16 ~ 0.13
Gold		
Gold mirror	230 ~ 630	0.02

Appendix

Material	Temperature（°C）	Emissivity approximation
Iron		
Polished cast iron	200	0.21
Processed cast iron	20	0.44
Polished tempered Iron	40 ~ 250	0.28
Polished steel ingot	770 ~ 1040	0.52 ~ 0.56
Raw welded steel	945 ~ 1100	0.52 ~ 0.61
Surface ferric oxide	20	0.69
Completely rusty surface	22	0.66
Rolled iron plate	100	0.74
Oxidized steel	198 ~ 600	0.64 ~ 0.78
Cast iron (Oxidizing at 600°C)	198 ~ 600	0.79
Steel (Oxidizing at 600°C)	125 ~ 520	0.78 ~ 0.82
Electrolytic ferric oxide	500 ~1200	0.85 ~ 0.89
Iron plate	925 ~ 1120	0.87 ~ 0.95
Cast iron, heavy ferric oxide	25	0.80
Tempered iron, ferric oxide	40 ~ 250	0.95
Melting surface	22	0.94
Melting cast iron	1300 ~ 1400	0.29

Melting mild steel	1600 ~ 1800	0.28
Liquid steel	1500 ~ 1650	0.42 ~ 0.53
Pure liquid iron	1515 ~ 1680	0.42 ~ 0.45

Appendix

Material	Temperature（°C）	Emissivity approximation
Lead		
Pure lead (Non-oxidization)	125～225	0.06～0.08
Mildly oxidized	25 ~300	0.20 ~ 0.45
Magnesium		
Magnesia	275 ~ 825	0.55 ~ 0.20
Magnesia	900 ~ 1670	0.20
Hg	0 ~ 100	0.90 ~ 0.12
Nickel		
Electroplate polishing	25	0.05
Electroplate	20	0.01
non-polishing		
Nickel wire	185 ~ 1010	0.09 ~ 0.19
Nickel plate	198 ~ 600	0.37 ~ 0.48
Nickel oxide	650 ~ 1255	0.59 ~ 0.86
Nickel alloy		
Nickel-chrome (heat-resistance) alloy wire (shining)	50～1000	0.65～0.79
Nickel-chrome alloy	50 ~ 1040	0.64 ~ 0.76
Nickel-chrome (heat resistance)	50～500	0.95～0.98
Nickel-silver alloy	100	0.14
Silver		

Polished silver	100	0.05

Appendix

Emissivity table (continue)

Material	Temperature（°C）	Emissivity approximation
Stainless steel		
18-8	25	0.16
304(8Cr,18Ni)	215 ~ 490	0.44 ~ 0.36
310(25Cr,20Ni)	215 ~ 520	0.99 ~ 0.97
Tin		
Commercial tin plate	100	0.07
Strong oxidization	0 ~ 200	0.60
Zinc		
Oxidizing at 400°C	400	0.01
galvanized shining iron plate	28	0.23
Ash zinc oxide	25	0.28
Non-metal materials		
Brick	1100	0.75
Fire brick	1100	0.75
Graphite(lamp black)	96 ~ 225	0.95
Porcelain enamel (white)	18	0.90
Asphaltum	0 ~ 200	0.85
Glass (surface)	23	0.94
Heat-resistance glass	200 ~ 540	0.85 ~ 0.95
Calcimine	20	0.90
Oak	20	0.90

Appendix

Material	Temperature（°C）	Emissivity approximation
Carbon piece		0.85
Isolation piece		0.91〜0.94
Sheet metal		0.88 ~ 0.90
Glass pipe		0.90
Loop type		0.87
Porcelain enamel products		0.90
Porcelain enamel designs		0.83〜0.95
Solid materials		0.80 ~ 0.93
Ceramics (vase type)		0.90
Film		0.90 ~ 0.93
Mica		0.94 ~ 0.95
Flume mica		0.90 ~ 0.93
Glass		0.91 ~ 0.92
Semiconductor		0.80 ~ 0.90
Transistor (plastics sealed)		0.30〜0.40
Transistor (metal) Diode		0.89〜0.90
Transmitting loop		
Pulse transmission		0.91 ~ 0.92
Level chalkiness layer		0.88 ~ 0.93
Top loop		0.91 ~ 0.92

Appendix

Emissivity table (continue)

Material	Temperature（°C）	Emissivity approximation
Electric materials		
Epoxy glass plate		0.86
Epoxy hydroxybenzene plate		0.80
Gilded sheet copper		0.30
Solder-coated copper		0.35
Tin-coated lead wire		0.28
Brass wires		0.87 ~ 0.88
Block talcum terminal		0.87

Specification

All data is based on SATIR's testing standard. Subject to change without notice.

Type	HotFind-S
Image performance	
FOV/Min.focus distance	24° x18°/0.15m
Spatial resolution	1.3 mrad
Thermal sensitivity	≤0.05°C@30°C
Detector type	UFPA
Resolution	384 x288
Spectral range	8-14um
Focus	Manual
Image presentation	
Image mode	IR/CCD/Duo-vision
LCD Display	3.5" Capacitive touch screen
Visible pixels	High definition CCD , 5 million pixels
Video output	NTSC (60Hz) or PAL (50Hz) composite video
Temperature measurement	
Measurement range	-20℃ ~ +150℃ , +140℃ ~ +600℃

Accuracy	±2°,±2% of readings
Measurement mode	8 movable spots, auto hot/cold spot, profile, 2 area boxes, isotherm
Correction	Emissivity, ambient temperature, distance, relative humidity
Delta T	Yes
Alarm	Yes
Image storage	
Type	16GB removable TF card
File format	.JPG(Thermal/Visual)
Annotation	Voice annotation, text annotation
Battery system	
Working voltage	DC 4V-4.8V
Battery operating time	5 hours
Environment specification	
Operating temperature range	-20°C to +50°C
Storage temperature range	-40°C to +70°C
Humidity	10% to 95%, non-condensing
Encapsulation	IP54
Shock	25G
Vibration	2G
Drop resistance	1.8 meter drop test

Physical characteristic	
Weight	Less than 600g
Size	215 mm ×80mm ×219mm
Tripod mounting	1/4"_20
Additional features	
Illuminator	Yes
Laser pointer	Yes
Built-in memory	Yes
Video record	Yes
Ports	USB port , Analog video output