

INFRARED CAMERA

Operation Manual



SATIR



About this IR Camera User Guide

HotFind – S

Trade mark Acknowledgments

- SATIR is trade mark of SATIR Europe (Ireland).LTD.
- Microsoft Windows and Windows logo is either registered trade marks or trade marks of Microsoft Corporation in the United States and / or other countries.
- Other names and products not mentioned above maybe registered trade marks or trade marks of the irrespctive companies.

Copy right © 2014 SATIR.LTD.All rights reserved.

Thumb Index

Introduction of camera components and battery loading.

Preparing the
IR Camera

Describes basic functions, learning how to turn on/off the IR camera and work with the control panel and LCD monitor.

Basic
function

Describes working with the camera, from each analysis settings tousing the camera'svarious analysis tools.

Shooting

Explains how toreview recorded images, erase images and playback voice memos.

Playback
and erase

Explains how totansfer images or video to a computer.

Connection
and download

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

Table of Contents

Read This First	0
Front View	5
Back /Bottom View	6
Quick Guide	6
Follow this procedure to acquaint with this machine.	7
Preparing the IR Camera	8
Charging the Battery Pack	8
Installing the Battery Pack / TF Card	10
Connecting and Installing the TF Card	11
Turning the Power On / Off	12
Checking the Information on the LCD Monitor	13
Setting the date and time	14
Local Settings	15
Language setting	15
Unit setting	17
TV-OUT modes Setting	18
Update/Backup/Recover	19
Power manage	20
Basic Functions	21
Using the LCD Monitor	21
Selecting Menus and Settings	22
Resetting the Settings to Default	23
Shooting	23
IR Camera Adjustment	24
Focus Manual Focus and digital zoom	24
Image adjustment	28
Palette settings	29
Shutter automatically	30
Turning the LED and Laser on/off	31
USB Mode Setting	33
Setting the multifunction key	34
Bluetooth setting	35

Measurement range	36
Freezing / Activating an image	37
Checking the emissivity table	38
Fulfill the Analysis Function.....	39
Setting object/global settings.....	39
Restore the default settings	41
Spot analysis tools.....	42
Area analysis.....	43
Line analysis	45
Isotherm analysis.....	46
Setting the Alarm temperature.....	47
Setting the comparing temperature	48
Remove analysis tools.....	49
Saving the Image	50
Attaching Voice Memos Images.....	51
Voice recording	51
Snapshot and Edit the image	52
Record/Replay the Video	53
Playback and Erase	55
Opening Images.....	55
File Manager	57
Connection and Download.....	58
Download the images via TF card.....	58
Connecting to a monitor	59
Connecting to a computer	60
Use the Bluetooth headset.....	61
Appendix	63
How to setup for optional Lens.....	63
Camera Care and Maintenance	64
Emissivity table	65
Specification.....	71

Read This First

Please Read

Test Shots

- Before you try to shoot important subjects, we highly recommend that you shoot several trial images to confirm that the IR camera is operating and being operated correctly.
- Please note that SATIR, its subsidiaries and affiliates, and its distributors are not liable for any consequential damages arising from any malfunction of an IR camera or accessory that results in the failure of an image to be recorded or to be recorded in a format that is machine readable.

Safety Precaution

- 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 to prevent injuries or damage to your self, other persons and equipment.

Warnings

Read on to learn about using IR camera properly.

- **Avoid damaging eyesight**

.Warning : Do not trigger the laser pointer in human or animal eyes. Exposure to the laser 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.

- **Remove the power cord on a regular periodic basis and wipe away the dust and dirt that collects on the plug, the exterior of the power outlet and the surrounding area**

In dust, 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 directly to 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

Read on to learn about preventing malfunction of IR camera.

■ **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 if you detect condensation. Continue to use may damage the IR camera. Remove the PC 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

Front View

Figure



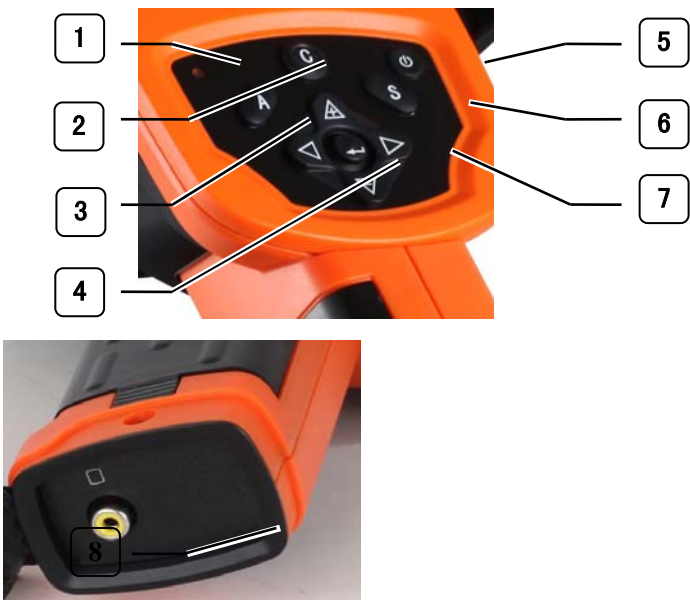
Explanation This table explains the figure above

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
10	Battery

Component Guide

Back /Bottom View

Figure



Explanation This table explains the figure above




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

Quick Guide

Quick Guide

Procedure

Follow this procedure to acquaint with this machine.

1	Charge the battery pack 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 that 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 freezing 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 <ul style="list-style-type: none">● 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 [Trans.].
9	Copy the images to you computer .
10	Press power switch  and then there will pop-up a prompt box and click the [ok] .

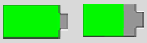


Preparing the IR Camera

Charging the Battery Pack

General

Use the following 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

One way : Put the battery into the battery charger
Attach the power cord to the battery charger and
plug the other end into a power outlet.

Recharge the battery



- The charge indicator light is red while the battery pack is charging and it turns green when charging is complete
- After charging, unplug the battery charger and remove the battery pack

The other way : Install Battery Pack into the camera first, 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 discharged it completely to prolong battery life.
2	Charging times will vary according to the surrounding humidity and battery pack charge state.

Preparing the IR Camera

Installing the Battery Pack / TF Card

General Charge the battery pack before using it for the first time

Procedure Follow this procedure to install / take out the Battery Pack

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



- | | |
|---|---|
| 1 | Pull out the battery pack:
Press the battery pack cover ;
Push forward the battery pack locker and then lift up the cover. |
|---|---|



NOTE 1. Remove the battery pack when the camera is not in use.

Connecting and Installing the TF card

Connecting and Installing the TF Card

Figure



1	Micro USB
2	TF card
3	Video output

Explanation This table explains the figure above

NOTE The TF card must be formatted in FAT32. Otherwise, the IR camera may not recognize the TF card

Preparing the IR Camera

Turning the Power On / Off

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

Procedure Follow this procedure to turning the power on /off

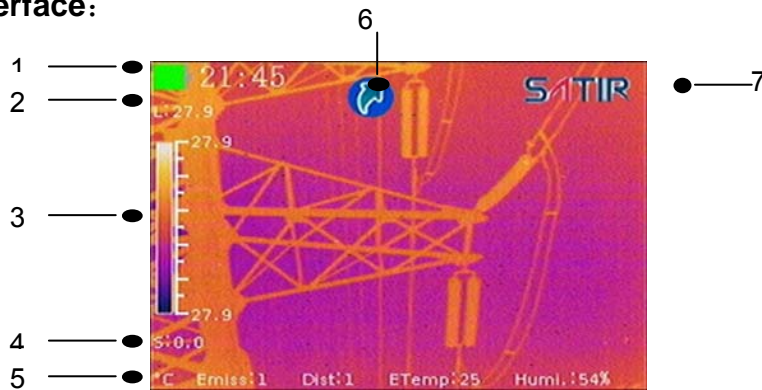
1	Press and hold the power switch for 3 seconds. •The power indicator will be on
2	After a while, a startup image will appear on the screen
3	Turn off the camera. Press power switch and then there will pop-up a prompt box and click the [ok] . •The power indicator goes off.

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: This table explains the figure above

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 Follow this procedure to set the Date/time

1	Press the [C] key or click the  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	Setting date: <ul style="list-style-type: none">• Slide up and down the date item to modify the date;• After modifying click [OK] button to save, click [Cancel] button to quit.
5	Setting time: <ul style="list-style-type: none">• Slide up and down the time item to modify the time;• After modifying click [OK] button to save, click [Cancel] button to quit.
6	Setting time zone: <ul style="list-style-type: none">• 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

Local Settings

Language setting

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

Procedure Follow this procedure to set language

1	Press the [C] key or click the  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	Local setup: <ul style="list-style-type: none">• Slide up and down to select a item to change;• After modifying click [OK] button to save, click [Cancel] button to quit.

About the local settings You can set the follow options in the system setting


Language	Selects the language of the menus and messages.
Update	update / backup / restore 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 / auxiliary lighting switch / load or unload SD card /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 Foot.
System Info.	Check thermal imager serial number / version / release date information and restore factory settings
Bluetooth	Open / search / bind bluetooth devices and view the connected devices / matched equipment

Preparing the IR Camera

Local Setting

Unit setting

Procedure Follow this procedure to set unit.


1	Press the [C] key or click the  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. <ul style="list-style-type: none">•Length: Meter,Feet•Temperature:℃,℉

Preparing the IR Camera

Local Setting

TV-OUT modesSetting

Procedure Follow this procedure to set the TV-OUTmodes

1	Press the [C] key or click the  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 onto open TV-OUT after linked to your PC and click [TV-OUT Mode] to select a mode(while the TV-OUT is on the screen is black , you can close the LCD monitor first and then open it , at this time the screen will turn on).
5	Slide to select NTSC or PAL mode
6	Press the UP and DOWN at the same time to turn off the TV-OUT


Preparing the IR Camera

Update/Backup/Recover

Update/Backup/Recovery

Procedure

Follow this procedure to update/backup/recovery the operating system of the IR Camera.

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  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)


Preparing the IR Camera

Power manage

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  icon.
2	Press the LEFT and RIGHT arrow keys to select [Settings] , press the ENTER key.
3	Press the down arrow key to select [Power Manager] .
4	Click the [Set screensaver] or [Set power off] and then slide to select the value of the Level and click [ok] to finish the change.

Basic Functions

Using the LCD Monitor

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.

Basic Functions

Selecting Menus and Settings

General

The camera comes with two methods of control, keypad and touch screen. The user can control 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
	Profile 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  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 [SystemInfo.]
4	Click [Default Settings] . Please reboot the machine after a successful recovery

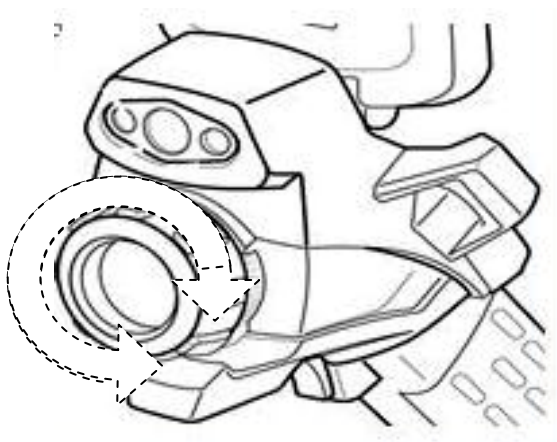
NOTE After factory defaults, for the user data already stored in the internal memory which will delete all the settings are reset, and the external memory with the user data will not be deleted.

Shooting

IR Camera Adjustment

Focus Manual Focus and digital zoom

Figure



Procedure Follow this procedure to adjust the focal length

1	Aim that the IR camera at the subject.
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.

Shooting


IR Camera Adjustment

Display Modes DuoVisionDisplay 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 displaymode.

Shooting

IR Camera Adjustment



In **DuoVision** display mode, you can see the thermal images ‘fuse’ into the visible images.

Explanation This table explanation 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 integration mode, you can click **[position]**, by moving your finger up and down to adjust the position of the visible picture to fit into the infrared picture. After you finish these things please click **[Done]**.

Figure



- NOTE**
1. Sets 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 **[Duo-Vision]** mode.

Shooting

IR Camera Adjustment

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 / or 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 also can adjust the Level by press the UP/DOWN when hide the main menu.
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 LEFT/RIGHT when hide the main menu.


NOTE You can define the adjustment mode as Manual L/S, Auto L/S, Auto L, and Auto S at the **Image**.

Shooting

IR Camera Adjustment

Palette settings

Procedure Follow this procedure to set palette mode

1	Press the [C] key or click the  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**.

Shooting

IR Camera Adjustment

Shutter automatically

Procedure Follow this procedure to set the Shutter automatically

1	Press the [C] key or click the  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

IR Camera Adjustment

Turning the LED and Laser on/off

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

Procedure Follow this procedure to turn the LED and Laser on/off

1	Press the [C] key or click the  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	Slide the right area of the list and choose on to open the LED and laser. Choosing off to close the tool.

About control

This table explains the function of 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
SDcard	Click to mount/unmount the TF card.
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

IR Camera Adjustment

USB Mode Setting

Procedure Follow this procedure to set the USB mode

1	Press the [C] key or click the  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

IR Camera Adjustment

Setting the multifunction key

General You can set the multifunction key with different functions such as shutter, freeze snapshot and Laser through the system.

Procedure Follow this procedure to set the multifunction key

1	Press the [C] key or click the  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 UP or DOWN arrow on the Omni selector to select the [System] menu, then press the [Control] menu.
4	Click [Multi-function key] option, slide up and down to Edit menu, click [Finish] 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.
snapshot	Save the image by pressing the multifunction key
freeze	You can activate / freeze a thermal image by pressing the multifunction key
Laser	You can light up the laser by pressing and holding the multifunction key.

Shooting

IR Camera Adjustment

Bluetooth setting

Procedure Follow this procedure to set the Bluetooth.


1	Press the [C] key or click the  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

IR Camera Adjustment

Measurement range

Procedure Follow this procedure to set the measurement range

1	Press the [C] key or click the  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 right range and click [OK] to finish the settings. Then press the [C] key to back to the main interface

Shooting

IR Camera Adjustment

Freezing / Activating an image

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

Procedure Follow this procedure to Freezing / Activating an image


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

Shooting

IR Camera Adjustment

Checking the emissivity table

Procedure Follow this procedure to check the emissivity table


1	Press the [C] key or click the  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

Fulfill the Analysis Function

Setting object/global settings

Procedure Follow this procedure to set object/global settings

1	Press the [C] key or click the  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 <ul style="list-style-type: none">• 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] to save the settings.

NOTE About the analysis parameters


Object	Selects the object of which you want to set the 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.
Humidity	Input ambient humidity.
Offset	Offset the measurement temperature
Background	Hide or show the background

Shooting

Fulfill the Analysis Function

Restore the default settings

Procedure Follow this procedure to restore the default settings

1	Press the [C] key or click the  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 [Restore] .
4	Click [OK] to finish the setting.


Shooting

Fulfill the Analysis Function

Spot analysis tools

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

Procedure Follow this procedure to set Spot analysis

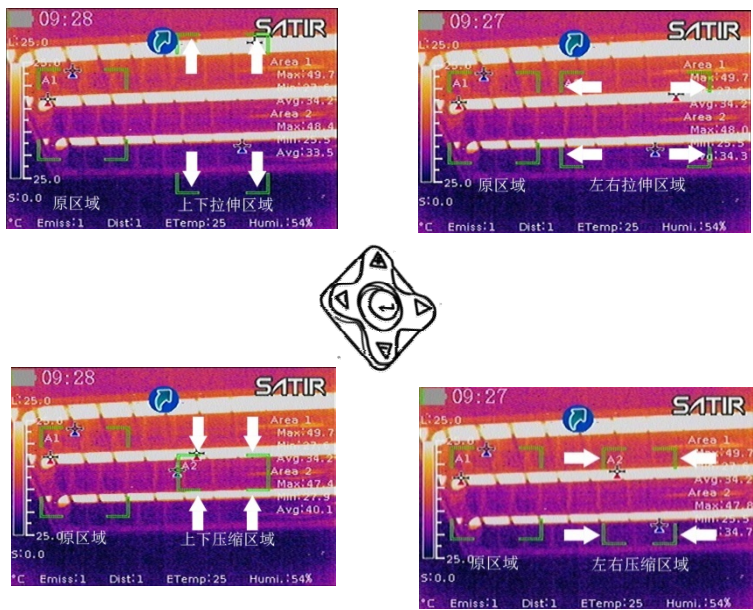
1	Press the [C] key or click the  icon
2	Press the LEFT or RIGHT arrow on the Omni selector to select the [spot] menu.
3	Setting the spot analysis. <ul style="list-style-type: none">• Press the arrow keys and choose a spot, then press the ENTER key.• Press the UP or DOWN arrow on the Omni selector to select what you want to be changed, then press the LEFT or RIGHT arrow on the Omni selector to change it.
4	Moving the spot. <ul style="list-style-type: none">• Press the arrow keys and choose a spot. then press the ENTER key. This spot will be green• Press the UP, DOWN, LEFT, RIGHT arrow on the Omni selector to move the spot.
5	Removing the spot. <ul style="list-style-type: none">• Keep pressing the spot you want to remove, then you will find an ashcan appears on the screen .Drag the spot into the trashcan to clear it.

Shooting

Fulfill the Analysis Function

Area analysis

Figure About changing the shape of the analysis area.



Procedure Follow this procedure to fulfillArea analysis

1	Press the [C] key or click the  icon
2	Press the LEFT or RIGHT arrow on the Omni selector to select the [Area] menu.


3	<p>Setting the analysis area.</p> <ul style="list-style-type: none"> •Double click the center or the four corners of the need to change area. •Then, the menu bar of this area will pop up ,you can click the Options what you want to be changed directlyon the screen
4	<p>Moving the area</p> <ul style="list-style-type: none"> •Select the area you want to move byclick the area. •One way: Press the UP,DOWN, LEFT,RIGHT arrow on the omni selector to move the area. <p>The other way: press anywhere of the area you want to move and drag it toanywhere</p>
5	<p>Removing the area.</p> <ul style="list-style-type: none"> •Keep pressing anywhere of the area you want to remove ,then you will find a ashcan appears on the screen .Drag the pressed place into the trashcan to clear the area.
6	<p>About changing the shape of the analysis area</p> <ul style="list-style-type: none"> • 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; <p>By pressing LEFT and DOWN you canshorten the length of the area on vertical direction;</p> <p>By pressing RIGHT and UP you can elongated the length of the area on horizontal direction;</p> <p>By pressing RIGHT and DOWN you can shorten the length of the area on horizontal direction</p>

Shooting

Fulfill the Analysis Function

Line analysis

Procedure Follow this procedure to fulfill Line analysis


1	Press the [C] key or click the  icon
2	Press the LEFT or RIGHT arrow on the omni selector to select the [Line] menu
3	<p>Moving the line.</p> <ul style="list-style-type: none">•Select the line you want to moveby click the line.•One way: Press the UP, DOWN, to move the line, press theLEFT, RIGHT arrow on the omni selector to move the Inverted triangle. <p>The other way: Keep pressing the inverted triangle that on theline and drag it to anywhere.</p>
4	<p>Removing the line.</p> <ul style="list-style-type: none">•Keep pressing the inverted triangle that on the line ,then you will find a ashcan appearason the screen. Drag the inverted triangle into the trashcan to clear it.

Shooting

Fulfill the Analysis Function

Isotherm analysis

Procedure Follow this procedure to fulfill Isotherm analysis

1	Press the [C] key or click the  icon
2	Press the LEFT or RIGHT arrow on the Omni selector to select the [ISO] menu
3	<p>Setting isotherm range.</p> <ul style="list-style-type: none">• 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. <p>The other way: Click the number, and then slide to select the value of the isotherm range on the pop-up menu.</p>


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 numerical.

Shooting

Fulfill the Analysis Function

Setting the Alarm temperature

Procedure Follow this procedure to set the Alarm temperature


1	Press the [C] key or click the  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 Temp:] or [Alarm Mode] , press LEFT or RIGHT arrow to set the value of alarm temperature or mode.

Shooting

Fulfill the Analysis Function

Setting the comparing temperature

Procedure Follow this procedure to set the comparing temperature

1	Press the [C] key or click the  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 <i>right</i> corner of the interface. Slide to select the target and base, click [+/-] to set the value of reference temperature.
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 beside 'Comp:' on downer 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 Follow this procedure to remove analysis tools.


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

Ganeral After you freeze an image, you can click the  icon on the screen In the pop-up menu bar on the right side, click **[snapshot]** key to save the image, or you also can save the image with the next steps.

Procedure Follow this procedure to save the picture

1	Press the [C] key or click the  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.





Shooting

Attaching Voice Memos Images

Voice recording

General You can introduce an image with voice recording.

Procedure Follow this procedure to attach voice memos images

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	Select the picture you need to add a voice, Press the UP or DOWN arrow on the omniselector to select the  menu ,then press the Enter key.
5	In the pop-up menu bar, click the  Icon,when change  into  This means the voice being recorded , click the [save] key to save the voice ,click the [Play] to play the voice you just recorded. Click the [close] you can Exit the menu.


NOTE The storage capacity of the memory will not decrease when you attach voice comment to an image

Shooting







Snapshot and Edit the image

Snapshot / Edit

Procedure Follow this procedure to snapshot and edit the image

1	Press the [C] key or click the  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] , then press the ENTER key, you can 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.
	Voice	Record voice for the image.
	Video	Record a video.
	Replay	Replay the record video.
	File	Manage the file.
	Back	Back to the [Media] menu.

Shooting

Record/Replay the Video








Record/Replay the Video

Procedure Follow this procedure to Record/Replay the Video

1	Press the [C] key or click the  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.

NOTE

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 Follow this procedure to playback the images



1	Press the [C] key or click the  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 photo edit sub menu description

Analysis	Analysis tools can be used to analyze the heat images.
Delete	Delete the currently selected picture.
Set to boot logo	Set the currently selected image as boot logo.
Slideshow	All current picture slideshow.
Full screen	Watch the images full screen.
Text Note	Add text notes for the current picture.
Record	Add voice notes to the current picture.

Selecting the file path

Procedure Follow this procedure to select the file path

1	Press the [C] key or click the  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

File manager

Procedure Follow this procedure to deal with the file

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.
5	Press the ENTER key and all files will be saved in the file path.

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 folder
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

Connection and Download

Download the images via TF card

General You can get the TF card out of camera, and download the images to the computer via the supplied card reader.

1	Open the battery / card cover
2	Press the TF card lightly, and then the TFcard wills pop-up automatically.
3	You can download the IR images via the supplied card reader

NOTE You can also copy the files from Camera to computer through the USB cable. Please select **[Trans.]**.

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



Picture1



To the video in jack

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

Connecting to a computer

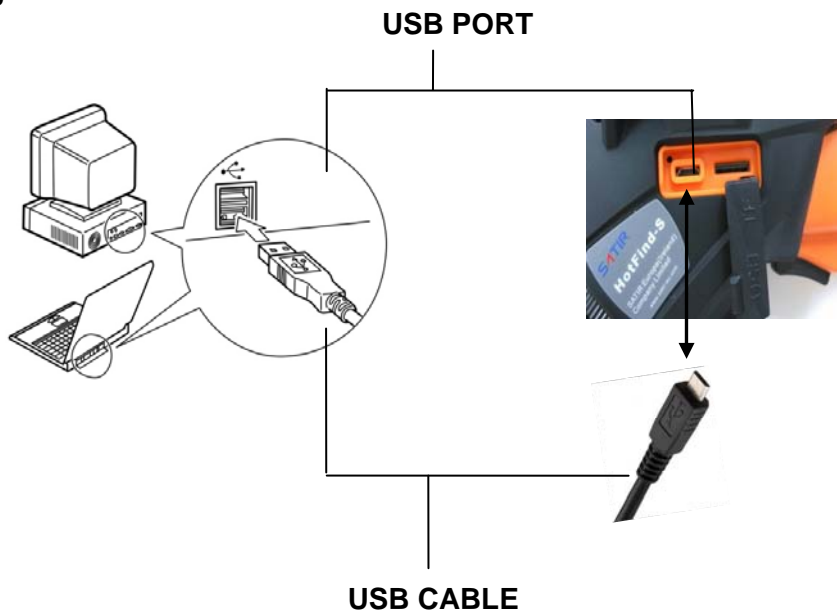
Connection

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



Connection and Download

Use the Bluetooth headset

Procedure Follow this procedure to install the Bluetooth headset for the first time

1	Turn off 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. You can see the green indicator of camera lights and the blue indicator flashes at the same time. In this mode, camera is preparing to pair the Bluetooth headset.
4	Press the power button of Bluetooth headset to pair the headset and camera. When the pairing is successful, blue indicator of the headset flashes slowly. Then you can see the Bluetooth icon on the middle-bottom screen.
5	After pairing the camera and headset first time. In next time, turn on the headset to check the power indicator blinks blue, and then turn on the camera, you can use it.(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	<ul style="list-style-type: none"> • Turn on the camera. See <i>Turning the Power On / Off</i> (p.14).
	Insufficient battery voltage	<ul style="list-style-type: none"> • Fully charge the battery.
	Poor contact between camera and battery terminals	<ul style="list-style-type: none"> • Wipe the terminals with a clean, dry cloth.
Camera will not record	Internal memory is full	<ul style="list-style-type: none"> • If required, download the images to a computer and erase them to make some space.
	Internal memory not formatted correctly	<ul style="list-style-type: none"> • 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.	<ul style="list-style-type: none"> • Replace the battery pack with a new one.
	Battery life exceeded.	<ul style="list-style-type: none"> • Replace the battery pack with a new one
Battery pack will not charge	Poor contact between battery pack and battery charger.	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Replace the battery pack with a new one.


Appendix

How to setup 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 “Manual Adj.” to setup the correct mode for lens.

Procedure Follow this procedure to setup the optional lens.

1	Press the [C] key or click the  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 Maintenance Use the following procedures to clean the camera body, lens, LCD monitor and other parts.

Camera Body	Wipe the body clean with soft cloth or eyeglass lens wiper.
Lens	<p>First use a lens blower to remove dust and dirt, then remove any remaining dirt by wiping the lens lightly with soft cloth</p> <ul style="list-style-type: none">• Never use synthetic cleaners on the camera body or lens.
LCD monitor	<p>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.</p> <ul style="list-style-type: none">•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

Emissivity table (continue)

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

Emissivity table (continue)

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

Emissivity table (continue)

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° / 0.1m
Spatial resolution	1.1 mrad
Thermal sensitivity	≤0.05°C@30°C
Detector type	UFPA
Resolution	384 x288 pixels
Spectral range	7.5~14 um
Focus	Manual
Image presentation	
Image mode	IR/CCD/Duo-vision
LCD Display	3.6" 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°C ~ +150°C , 120°C ~ 600°C
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 (std.)
File format	.JPG (thermal / Visual)
Annotation	Voice annotation (Optional)
Battery system	
Working voltage	DC 4V-4.8V
Battery operating time	> 4 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	2.0 meter drop test
Physical characteristic	
Weight	Less than 800g
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

Manufacturer information

Manufacturer : SATIR Europe (Ireland) Company Limited

**Factory address : First Floor, Building 2Finnabair
Business ParkDundalk Co. Louth, Ireland**

TEL : 353 42 9341540

URL : www.satir-eu.com

E-mail : service@satir-eu.com