

Keysight U5850 Series TrueIR Thermal Imager



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Safety Information

CAUTION

A CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Safety Symbols

The following symbols on the instrument and in the documentation indicate precautions which must be taken to maintain safe operation of the instrument.



Caution, risk of danger
(refer to this manual for specific Warning or Caution information)



Laser radiation

Safety Considerations

Read the information below before using this instrument.

The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards for design, manufacture, and intended use of the instrument. Keysight Technologies assumes no liability for the customer's failure to comply with these requirements.

WARNING

- Do not use the U5850 Series if it is damaged. Before you use the U5850 Series, inspect the casing. Look for cracks or missing plastic. Do not operate the U5850 Series around explosive gas, vapor, or dust.
 - Always use the U5850 Series with the cables provided.
 - Observe all markings on the U5850 Series before establishing any connection.
 - Turn off the U5850 Series before removing the battery cover.
 - When servicing the U5850 Series, use only the specified replacement parts.
 - Do not operate the U5850 Series with the battery cover or portions of the cover removed or loosened.
 - Use only the designated AC/DC power adapter or charger provided by the manufacturer to avoid any unexpected hazards.
 - Use only the battery pack supplied with the U5850 Series. Do not disassemble/modify the battery pack or leave it under direct heat/sunlight.
 - Keep the battery pack away from water, fire, or heat.
 - Avoid any contact with battery leakage to prevent personal injuries. If there is leakage or strange smell, remove the battery pack immediately from the U5850 Series or the external battery charger.
-

WARNING

- Do not connect the positive terminal and the negative terminal of the battery pack (metallic part) to each other with any metal objects, such as wires.
 - Do not continue to charge the battery pack if it does not become charged within the specified charging time.
 - Do not apply impact to or insert foreign objects into the battery pack.
 - Do not use the camera on a tripod in an area with large vibration or shock.
 - Do not use the U5850 Series under water or with conductive gloves or cloths worn or in a strong electromagnetic field.
 - Do not stare into the torch light.
-

CAUTION

- Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
 - The U5850 Series uses a highly-sensitive infrared detector. Ensure to comply with the requirements in “**Environmental Conditions**” on page 8 when using the U5850 Series.
 - Do not apply excessive stress to the LCD screen, the focus adjustment ring, or the camera lens to avoid damages.
 - Avoid direct rays or shock to the visible or infrared camera lens of the U5850 Series.
 - Do not perform image acquisition directly at the sun or objects with extremely high temperature over a long period of time to avoid damage to the infrared detector.
-

CAUTION

- The following condition may be observed when the U5850 Series acquires or saves a visible image. This condition is not a device failure.
 - The color of the visible image changes periodically or may be different from the real target object when the image is replayed in the freeze mode.

To avoid this condition, perform image acquisitions by changing the camera angle. In this case, it is recommended to acquire visible images by observing the image on the screen.

- The following condition may be observed in outdoor data acquisitions. This condition is not a device failure.
 - If the contrast is great (e.g., due to backlight), the object may appear darker on the camera display as compared to the brightness of the background.

To avoid this condition, control the frame so that it covers only the target object.

- If bright sunlight enters the visible camera, the entire picture may become reddish. To avoid this, shield the camera from bright sunlight.
 - When the U5850 Series is moved from objects with large temperature differences, “ghost” image may be present on the display. This condition is not a device failure. It may take several minutes to dissipate the “ghost” image. You can automatically dissipate the “ghost” image by switching to the freeze mode and back to the run mode (refer to “Image Playback” on page 56).
 - **Do not input laser beam (CO₂ laser, etc.) to avoid damage to the infrared detector.**
 - If the U5850 Series is used in a manner not specified by the manufacturer, the U5850 Series protection may be impaired.
 - Always use a dry cloth to clean the U5850 Series. Do not use ethyl alcohol or any other volatile liquid to clean the U5850 Series.
-

WARNING

Laser pointer precautions:

- This laser pointer is a Class 2 laser product.
- Laser beam contact with the eyes may cause visual impairment.
- Do not point the laser beam towards people.
- Do not stare into the laser beam.
- The U5850 Series is intended for professional use and is not suitable for general use.



Environmental Conditions

The U5850 Series True/R Thermal Imager is designed for indoor use and in an area with low condensation. The table below shows the general environmental requirements for this instrument.

Environmental condition	Requirement
Temperature	Operating condition
	– -15 °C to 50 °C
	Storage condition
	– -40 °C to 70 °C
Humidity	Operating condition
	– 50% RH to 95% RH at 40 °C
	Storage condition
	– 95% RH at 40 °C
Altitude	Up to 2000 m
Pollution degree	2

Regulatory Information

The U5850 Series True/R Thermal Imager complies with the following safety and Electromagnetic Compatibility (EMC) compliances:





Safety compliance

- Laser safety: IEC 60825-1 (Laser Class 2)
- IEC 61010-1

EMC compliance

- IEC 61326-1
- CISPR11, Group 1 Class A
- Canada: ICES/NMB-001: Issue 4, June 2006
- Australia/New Zealand: AS/NZS CISPR 11

Regulatory Markings

<p>CAN ICES NMB-001(A) ISM GRP 1-A</p>	<p>CAN ICES/NMB-001(A) indicates that this ISM device complies with the Canadian ICES-001. Cet appareil ISM est conforme à la norme NMB-001 du Canada.</p>	 <p>MSIP-REM- ATi-THERMAL</p>	<p>This symbol is a South Korean Class A EMC Declaration. This is a Class A instrument suitable for professional use and in electromagnetic environment outside of the home.</p>		<p>This symbol indicates the time period during which no hazardous or toxic substance elements are expected to leak or deteriorate during normal use. Forty years is the expected useful life of the product.</p>	 <p>The RCM mark is a registered trademark of the Spectrum Management Agency of Australia. This signifies compliance with the Australia EMC Framework regulations under the terms of the Radio Communication Act of 1992.</p>		 <p>This instrument complies with the WEEE Directive (2002/96/EC) marking requirement. This affixed product label indicates that you must not discard this electrical or electronic product in domestic household waste.</p>	
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Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC

This instrument complies with the WEEE Directive (2002/96/EC) marking requirement. This affixed product label indicates that you must not discard this electrical or electronic product in domestic household waste.

Product category:

With reference to the equipment types in the WEEE directive Annex 1, this instrument is classified as a “Monitoring and Control Instrument” product.

The affixed product label is as shown below.



Do not dispose in domestic household waste.

To return this unwanted instrument, contact your nearest Keysight Service Center, or visit <http://about.keysight.com/en/companyinfo/environment/takeback.shtml> for more information.

Sales and Technical Support

To contact Keysight for sales and technical support, refer to the support links on the following Keysight websites:

- www.keysight.com/find/trueIRimager
(product-specific information and support, software and documentation updates)
- www.keysight.com/find/assist
(worldwide contact information for repair and service)

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4 Characteristics and Specifications

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1 Introduction

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This chapter guides you to set up the U5850 Series True/IR Thermal Imager for the first time. A summary of all the U5850 Series True/IR Thermal Imager features is also given.

About This Manual

The descriptions and instructions in this manual apply to the Keysight U5855A, U5856A, and U5857A True/R Thermal Imager (hereafter referred to as the U5850 Series or the instrument).

The model U5857A appears in all illustrations.

Documentation map

The following manuals and software are available for your instrument. For the latest version, visit our website at: www.keysight.com/find/truelRimager

Check the manual revision on the first page of each manual.

- **User's Guide**
This manual.
- **Quick Start Guide**
Printed copy, included with shipment.
- **Service Guide**
Free download at the Keysight website.
- **Keysight True/R Analysis and Reporting Tool software**
Free download at the Keysight website: www.keysight.com/find/truelR_ART

Safety notes

Safety notes are used throughout this manual (refer to the [Safety Symbols](#) section for format examples). Familiarize yourself with each of the notes and its meaning before operating your instrument.

More pertinent safety notes for using this instrument are located under the [Safety Considerations](#) section.

Do not proceed beyond a safety notice until the indicated conditions are fully understood and met.

Preparing the U5850 Series

Check the shipment

When you receive your instrument, check the shipment according to the following procedure.

- 1** Inspect the shipping container for damage. Signs of damage may include a dented or torn shipping container or cushioning material that indicates signs of unusual stress or compacting. Save the packaging material in case the instrument needs to be returned.
- 2** Carefully remove the contents from the shipping container, and verify that the standard items are included in the shipment according to the standard shipped items list shown in “Standard shipped items” on page 22.
- 3** For any enquiries, refer to the Keysight contact numbers on the back of this manual.

If any item is found missing or damaged, contact your nearest Keysight Sales Office.

Keep the original packaging in case the U5850 Series has to be returned to Keysight in the future. If you return the U5850 Series for service, attach a tag identifying the owner and model number. Include also a brief description of the problem.

Standard shipped items



Keysight U5850 Series TrueIR Thermal Imager



Hard carrying case



Power adapter



Power cord



Li-Ion rechargeable battery



SD memory card



USB Standard-A to Mini Type-B interface cable, 2 m



Video RCA to RCA interface cable, 2 m

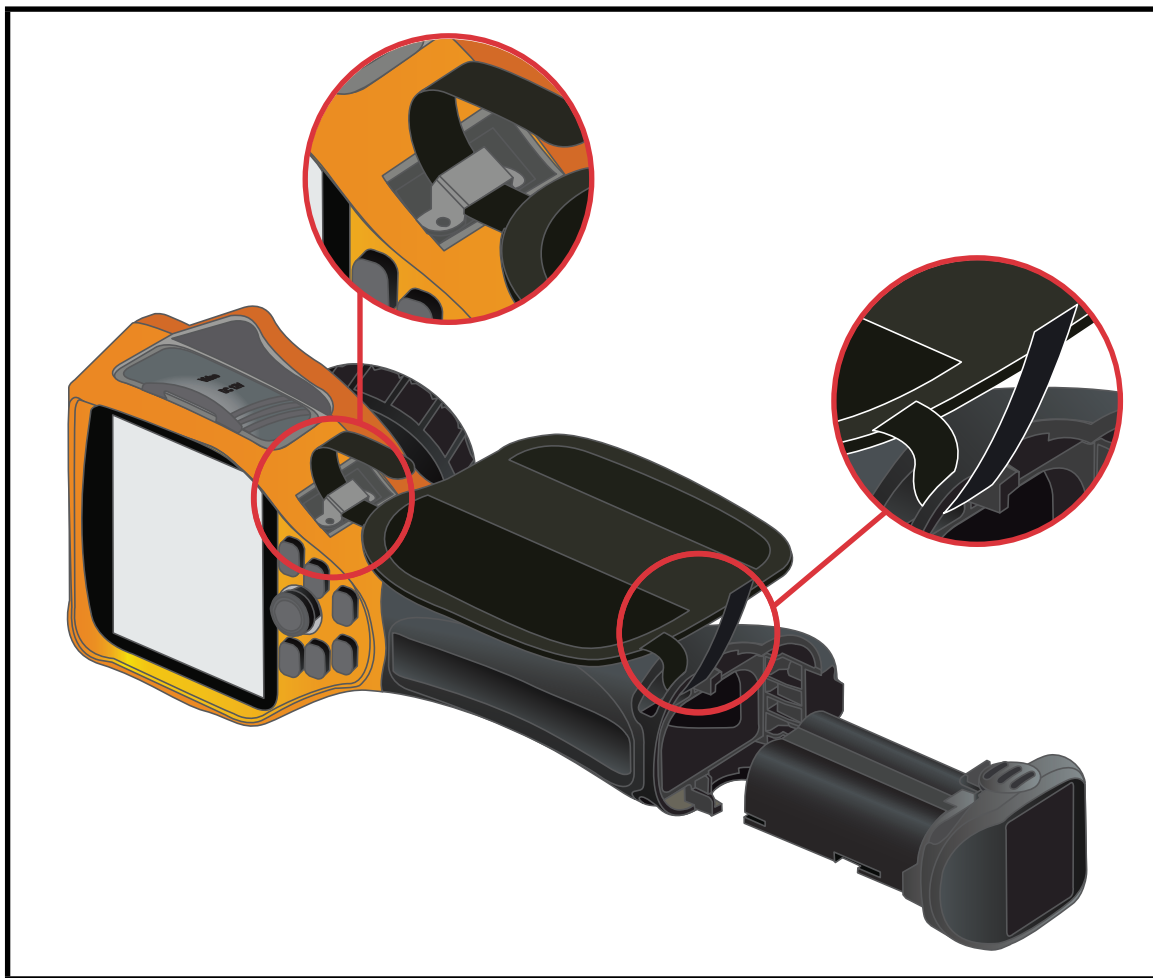


Keysight U5850 Series Quick Start Guide



Certificate of Calibration

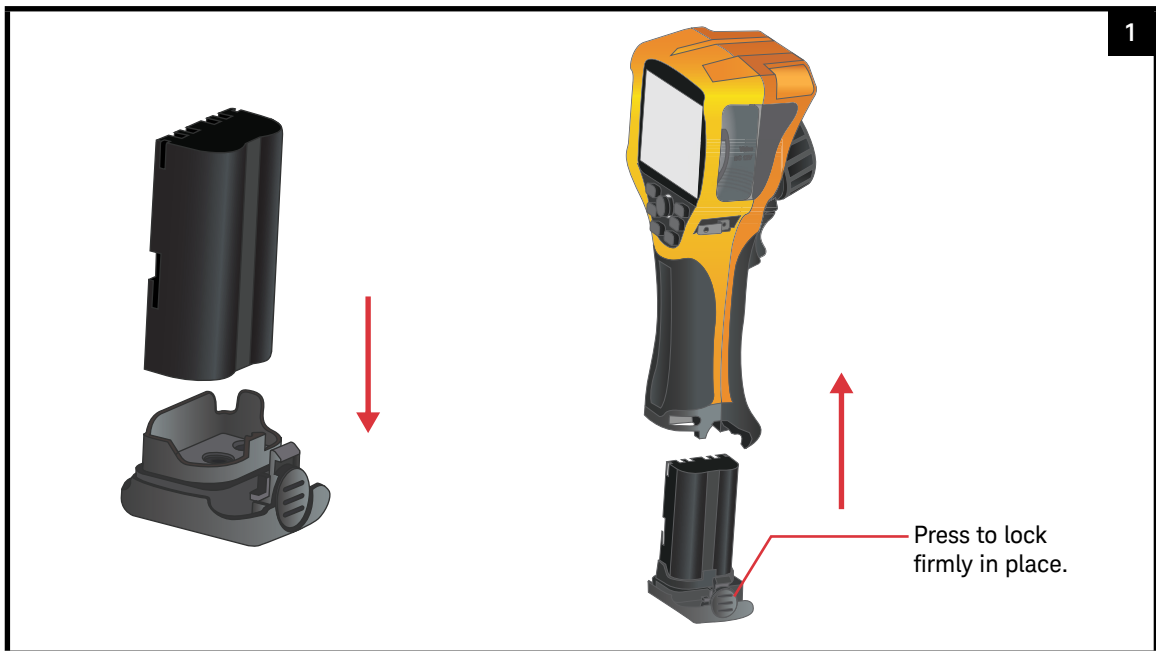
Install the hand strap



Install and charge the battery

NOTE

It is recommended to store the battery in a cool, dry place at normal room temperature. Remove the battery from the device if the device is stored for extended periods.



**NOTE**

Refer to “LED status indication” on page 34 and “Battery status indication” on page 37 for more details.

Insert the SD memory card



Turn on the U5850 Series

CAUTION

DO NOT REMOVE the battery or the SD memory card before power is turned off and the LED light goes off entirely. Otherwise it may damage the U5850 Series or destroy files saved in the SD memory card.

<div data-bbox="189 256 261 378"></div> <div data-bbox="362 288 594 343">Press for 1 seconds to turn on/off.</div>	<div data-bbox="1246 239 1268 265">2</div> <p>When you turn on the U5850 Series for the first time or after a factory reset, you will be prompted to perform initial setups. Refer to “Set up the U5850 Series” on page 27.</p>
<div data-bbox="675 413 696 439">3</div> <p>Quick start tutorial:</p> <div data-bbox="189 465 664 777"> <div data-bbox="339 473 654 491">Tutorial Page 1/8 Next▶</div> <div data-bbox="268 508 582 534">Quick Access Keys (1/2)</div> <div data-bbox="189 552 664 777"> <div>Press briefly – Torch light on/off</div> <div></div> <div>Press and hold – Laser pointer</div> <div>Press briefly – Switch camera modes</div> <div></div> <div>Press for 1 second – Zoom mode</div> <div>Press briefly – Playback mode</div> <div></div> <div>Press for 1 second – Delete operations</div> </div> </div>	<div data-bbox="1246 413 1268 439">4</div> <p>To navigate the tutorial pages:</p> <div data-bbox="925 473 1061 612"></div> <p>To exit:</p> <p>OR</p> <div data-bbox="789 673 861 795"></div> <div data-bbox="1132 673 1203 795"></div>
<div data-bbox="1246 838 1268 864">5</div> <div data-bbox="175 855 289 1012"></div> <div data-bbox="347 925 404 960"></div> <div data-bbox="518 899 911 986"> <div>Show tutorial at next startup? ▾</div> <div>YES</div> <div>NO</div> </div> <div data-bbox="1011 925 1068 960"></div> <div data-bbox="1160 881 1232 1003"></div>	
<div data-bbox="1246 1038 1268 1064">6</div> <p>Ready to take measurements with specified accuracy after warm-up.</p>	

NOTE

- If Auto Off is enabled, the U5850 Series will automatically turns off if idle for 20 minutes (default). Pressing the power key will turn it back on.
- If Auto Sleep is enabled, the U5850 Series will automatically goes to sleep if idle for 10 minutes (default). Pressing any key will turn it back on.
- Refer to **“Set the USB mode”** on page 115 for more details.

Set up the U5850 Series

NOTE

This is only applicable when you turn on the U5850 Series for the first time, or after restoring the factory settings.

Set the language



Set the date, time, and temperature unit

1

Settings	
Date Format	YY/MM/DD
Date	14/02/27
Time	17:15:43
Unit	°C
OK	

Settings: ⬅ To select
Enter to change/confirm

2

Settings	
Date Format	YY/MM/DD
Date	14/02/27
Time	17:15:43
Unit	°C
OK	

Settings: ⬅ To select
Enter to change/confirm

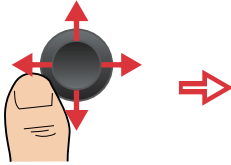
3

Settings	
Date Format	YY/MM/DD
Date	14/02/27
Time	17:15:43
Unit	°C
OK	

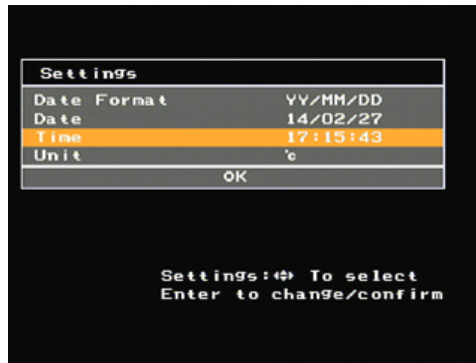
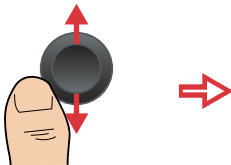
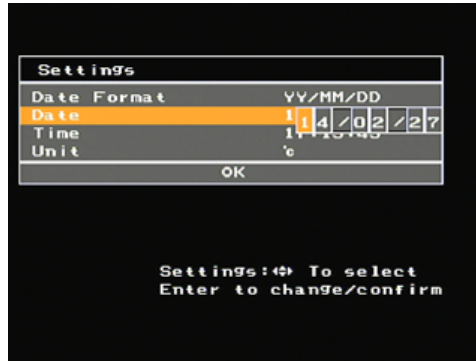
Settings: ⬅ To select
Enter to change/confirm

- Year: 00 to 99 (00: year 2000) - Month: 01 to 12 - Date: 01 to 31

4

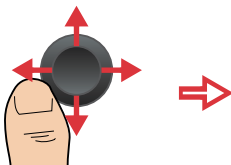


Push left/right to move the indicator.
Push up/down to increase/decrease the digits.

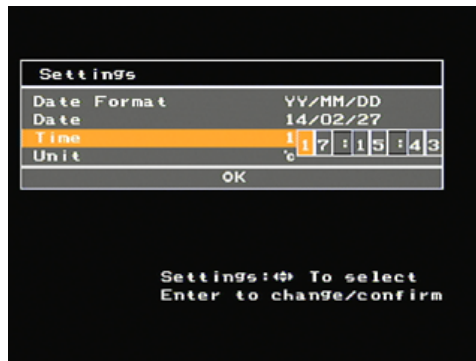


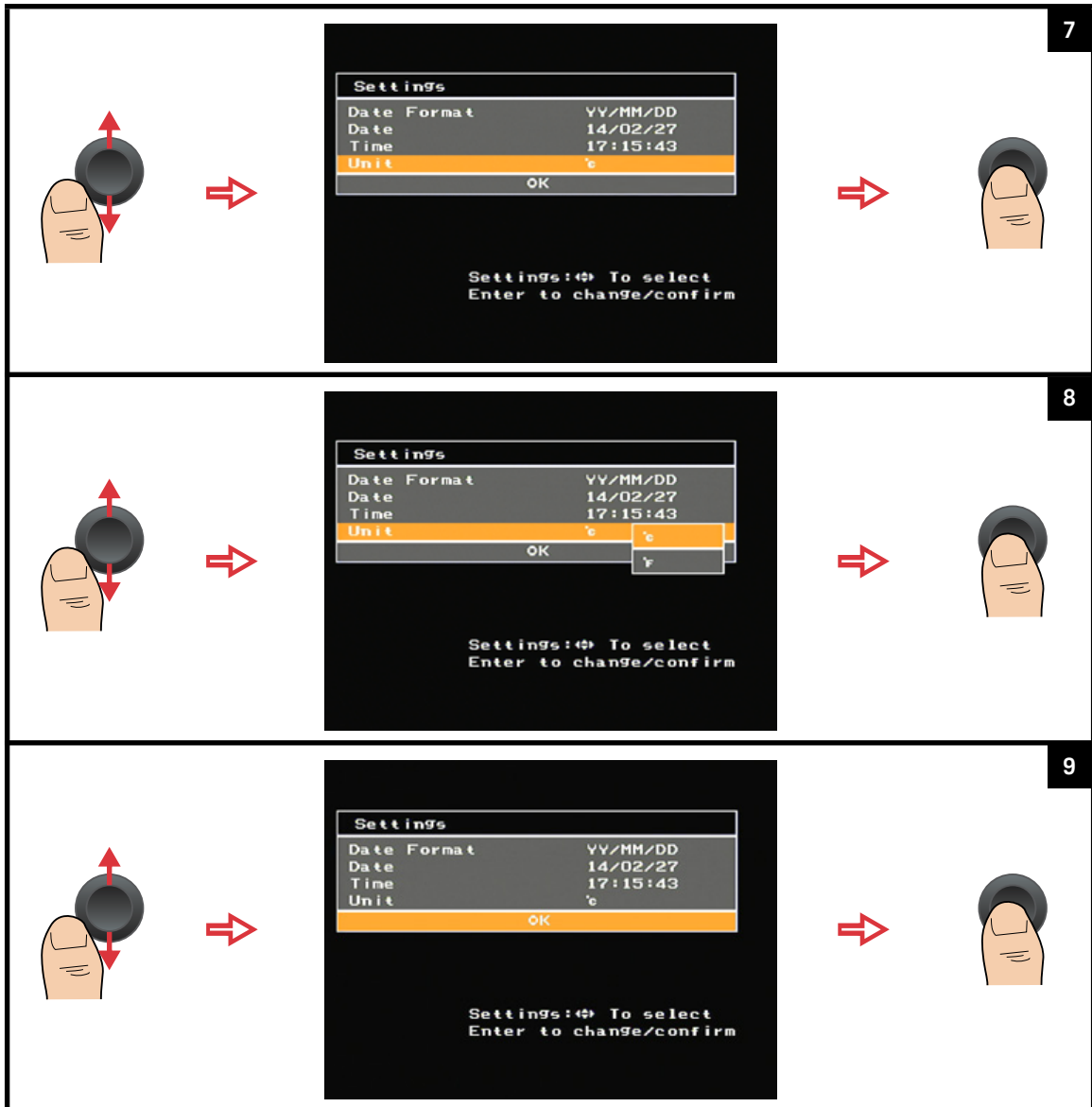
- Hour: 00 to 23 - Minute: 00 to 59 - Second: 00 to 59

6



Push left/right to move the indicator.
Push up/down to increase/decrease the digits.





The U5850 Series in Brief



Figure 1-1 The front and side panels at a glance

[1] Press briefly to toggle between the image freeze (capture) or run operation.
Press for 1 second to perform a quick-save.

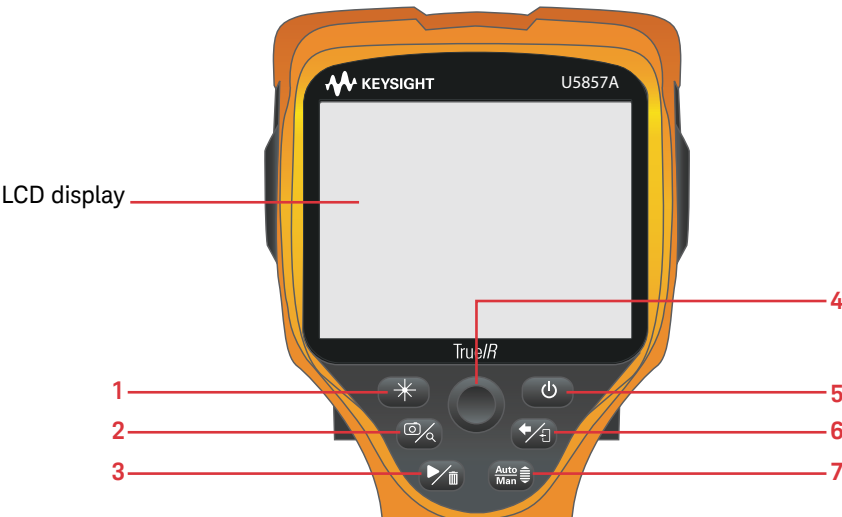
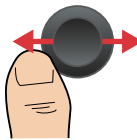
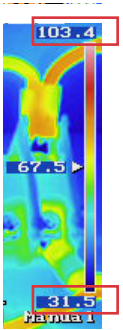
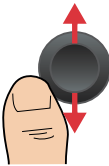
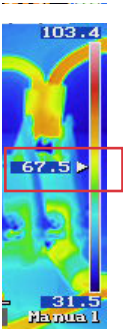


Figure 1-2 The rear panel at a glance

Table 1-1 Rear panel descriptions

Legend	Description
1 Light/Laser control key ^[a]	<ul style="list-style-type: none">– Press briefly to toggle the torch light on or off.– Press and hold to turn on the laser pointer, and release to turn it off.
2 Camera/Zoom key	<ul style="list-style-type: none">– Press briefly to select the camera mode (refer to “Camera mode switching flow” on page 35 for more details).– Press for 1 second to access the zoom mode.
3 Play/Delete key	<ul style="list-style-type: none">– Press briefly to play back saved images.– Press for 1 second for delete operations.
4 Navigation/Enter key	<ul style="list-style-type: none">– Press the center of the key briefly to use as an Enter key or to access the Main Menu.– Push the sides of the key for up/down/left/right navigation. The left/right sides can be pushed to open or close sub-menus.
5 Power on/off key (with LED status indicator)	<p>Press for 1 seconds to turn the U5850 Series on or off.</p>
6 Back/Exit key	<ul style="list-style-type: none">– Press briefly to return to the previous menu.– Press for 1 second to exit any menu.

Table 1-1 Rear panel descriptions (continued)

Legend	Description
	Press briefly to switch from auto to manual scaling. <ul style="list-style-type: none">– In the manual scaling mode, press briefly to perform auto scaling once.– Manual scaling allows you to set the temperature level or the temperature span (upper/lower temperature limits) of the temperature scale.
7 Auto/Manual scale key	<div></div> <p>Adjust temperature level:</p> <p>Adjust temperature span:</p> <p>Press for 1 second to switch from manual to auto scaling.</p>

[a] Torch light and laser pointer are not functional when the U5850 Series is in the power-saving mode.

LED status indication

Table 1-2 LED status indication (power adapter connected)

Unit turned on/off	LED	Status
Off	Red (flashing)	Charging
	Off	Full charge
	Red	Charge error
On	Green	Charging
	Green	Full charge
	Red	Charge error
	Red (flashing)	Laser on
	Green (flashing)	Power saving (Auto-Sleep) mode

Camera mode switching flow

IR image
(with Fine Resolution enabled)



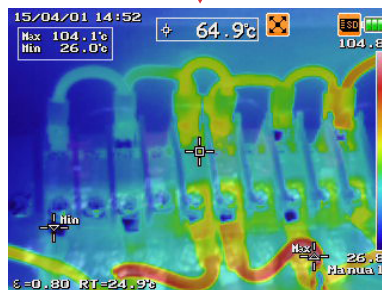
Visible image



Picture-in-picture
(fusion) image



Blend (fusion) image



Display screen

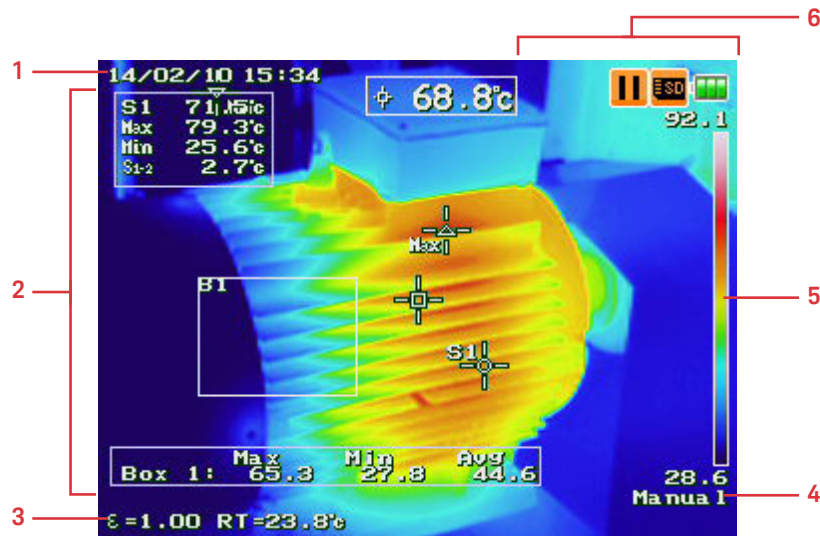











Figure 1-3 The display at a glance

Table 1-3 Display descriptions









Description
1 Date/time
2 Measurement results and tools
3 Info bar (selectable up to four items to display)
4 Auto/manual scaling

Table 1-3 Display descriptions (continued)

Description				
5	Temperature scale/color bar with upper and lower temperature limits			
Icons as status indicators:				
6	 Freeze mode	 Laser on	 SD memory card inserted	 Edit mode
	 Battery status	 Fine Resolution Mode	 Image logging operation	 USB connectivity for mass storage
				 USB connectivity for data streaming

Battery status indication

Table 1-4 Battery status indication^[a]

(~2.5 to 4 hours remaining)	1 to 2.5 hours remaining	15 to 60 minutes remaining	Empty (flashing)
			
Charging	Fully charged (with adapter connected)	No battery (with adapter connected)	Charge error (flashing) (with adapter connected)
			

[a] Typical operating time of a new battery.

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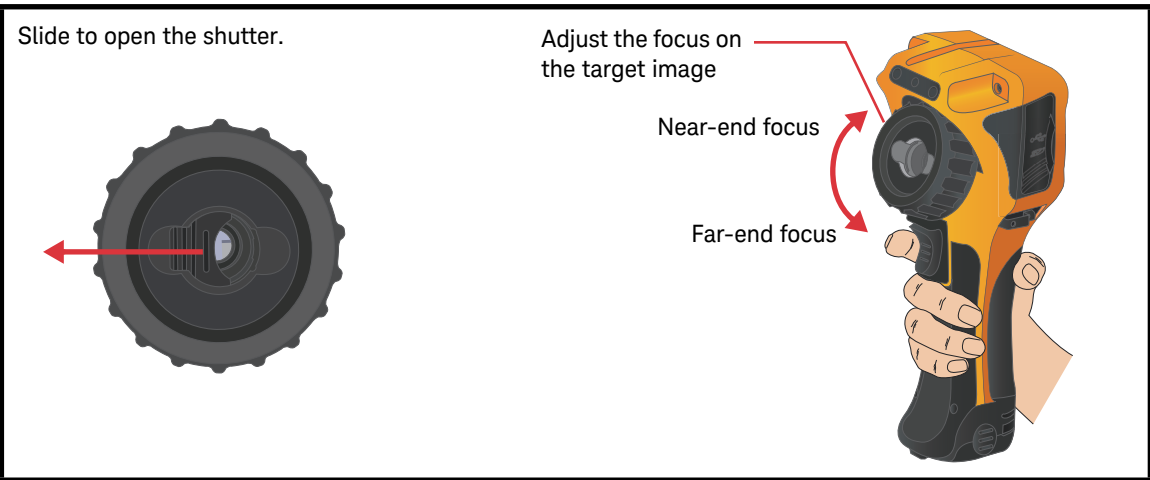
2 Image Capture, Processing, and Measurement Functions

Camera Controls	40
Image Saving	44
Image Playback	56
Measurement Controls	63
Imaging Controls	75
Digital Zoom	83
Parameter Controls	85

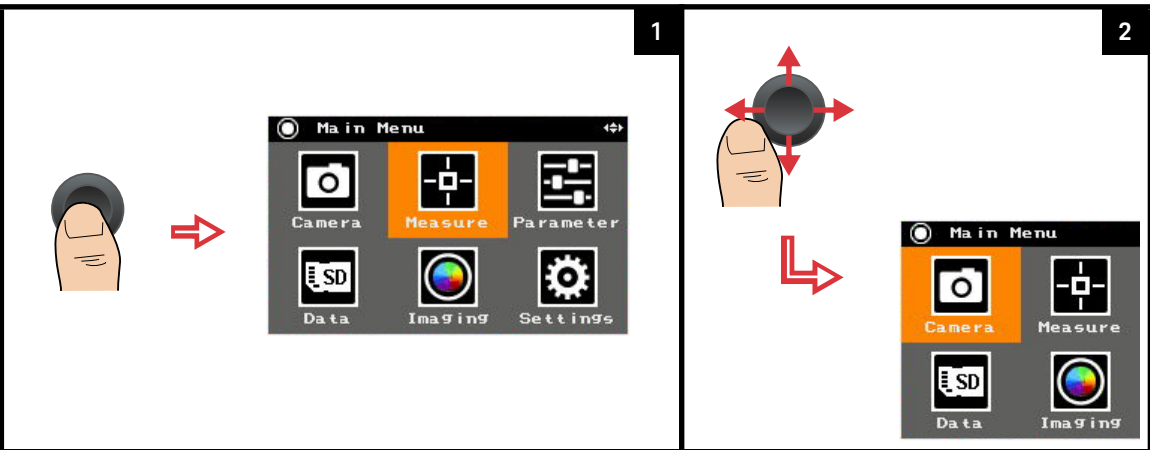
This chapter guides you on how to operate the main functions of the U5850 Series True/R Thermal Imager.

Camera Controls


Capture images



Select a camera mode



3



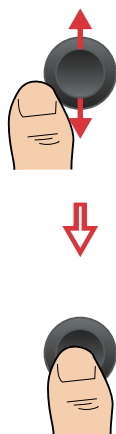
The U5850 Series provides two fusion camera modes:

- Picture in Picture
- Blend

These modes enable you to identify abnormalities easily with a fusion of both IR and visible images.


4

Select a camera mode:



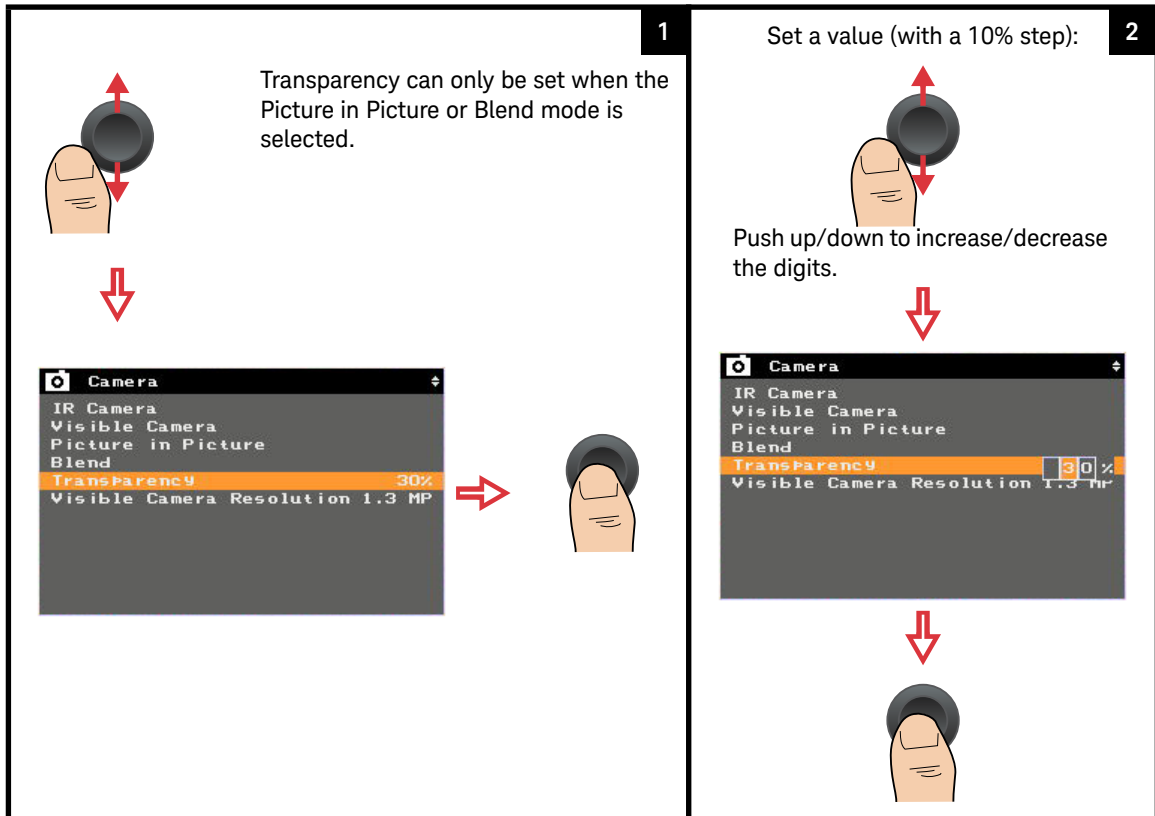
Fine resolution (FR)

Fine resolution thermal imaging produces high quality in-camera IR images by capturing images with 4× more effective IR resolution and approximately 1.5× finer Instantaneous Field of View (IFOV) using multi-frames capturing and sophisticated image processing techniques.

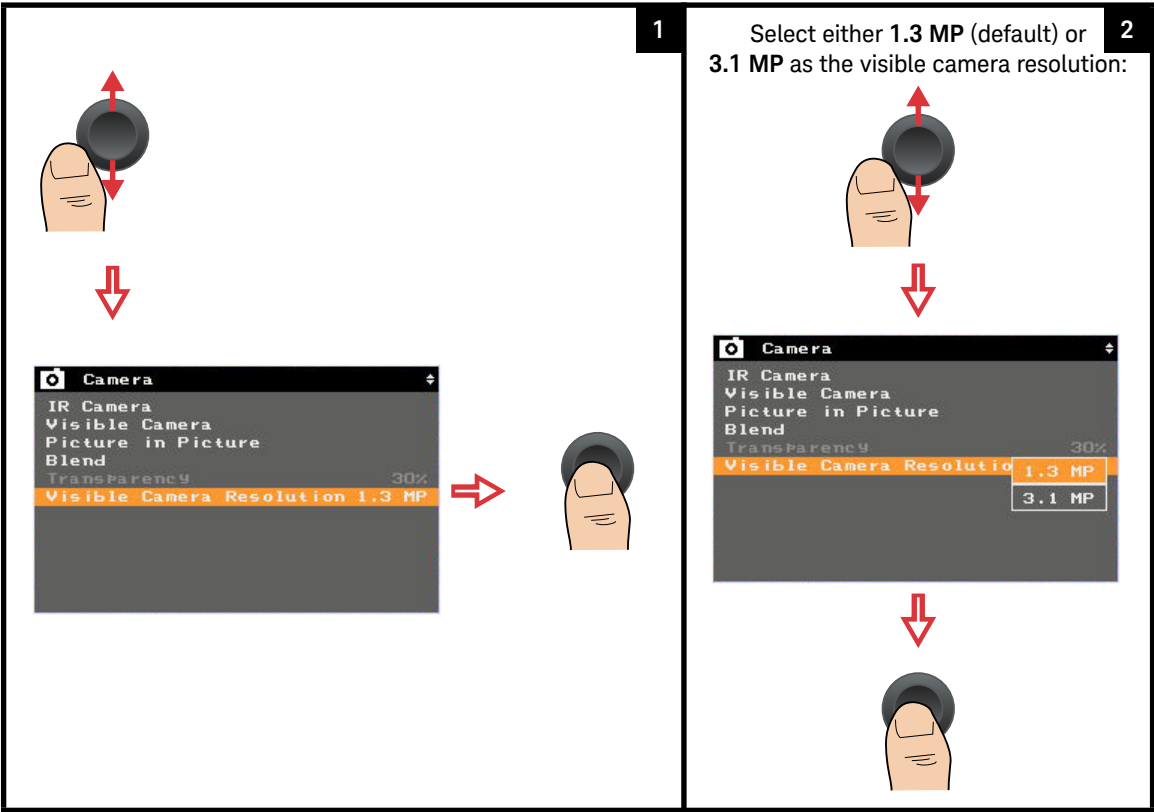


FR indicator

Set the transparency of fusion images



Set the visible camera resolution



NOTE

For better clarity and higher resolution, select **3.1 MP** as the visible camera resolution.

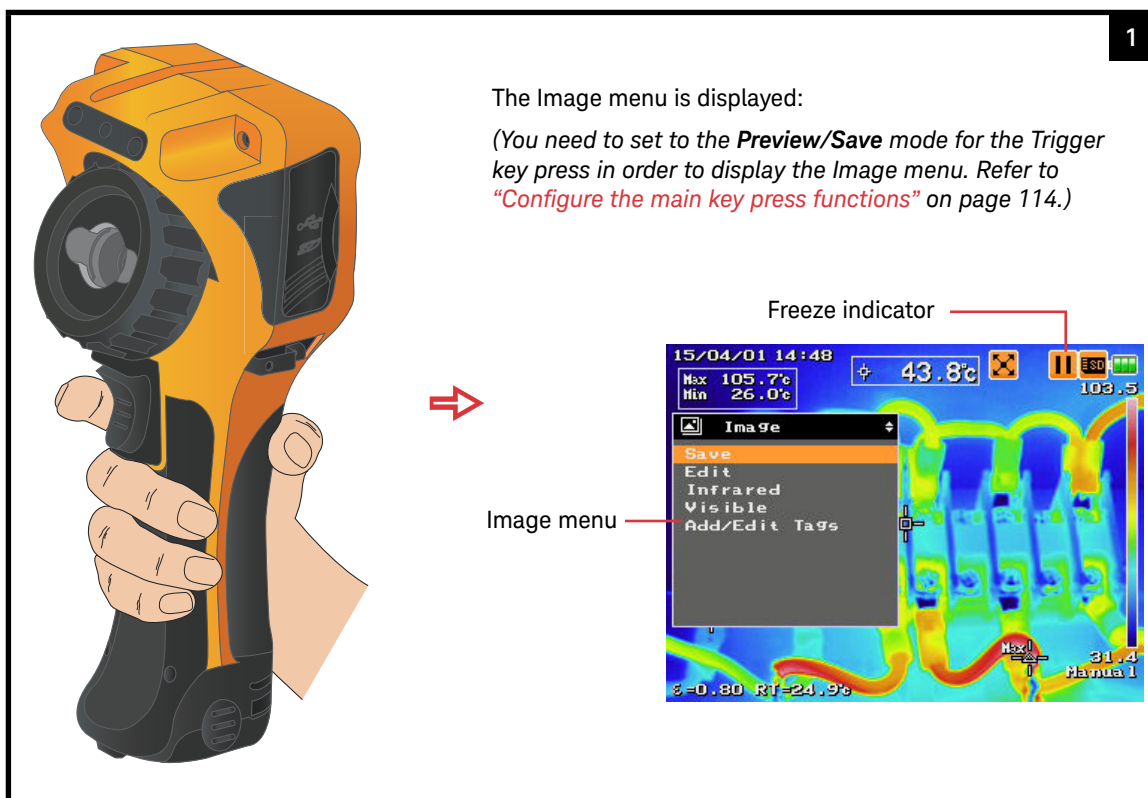
Image Saving

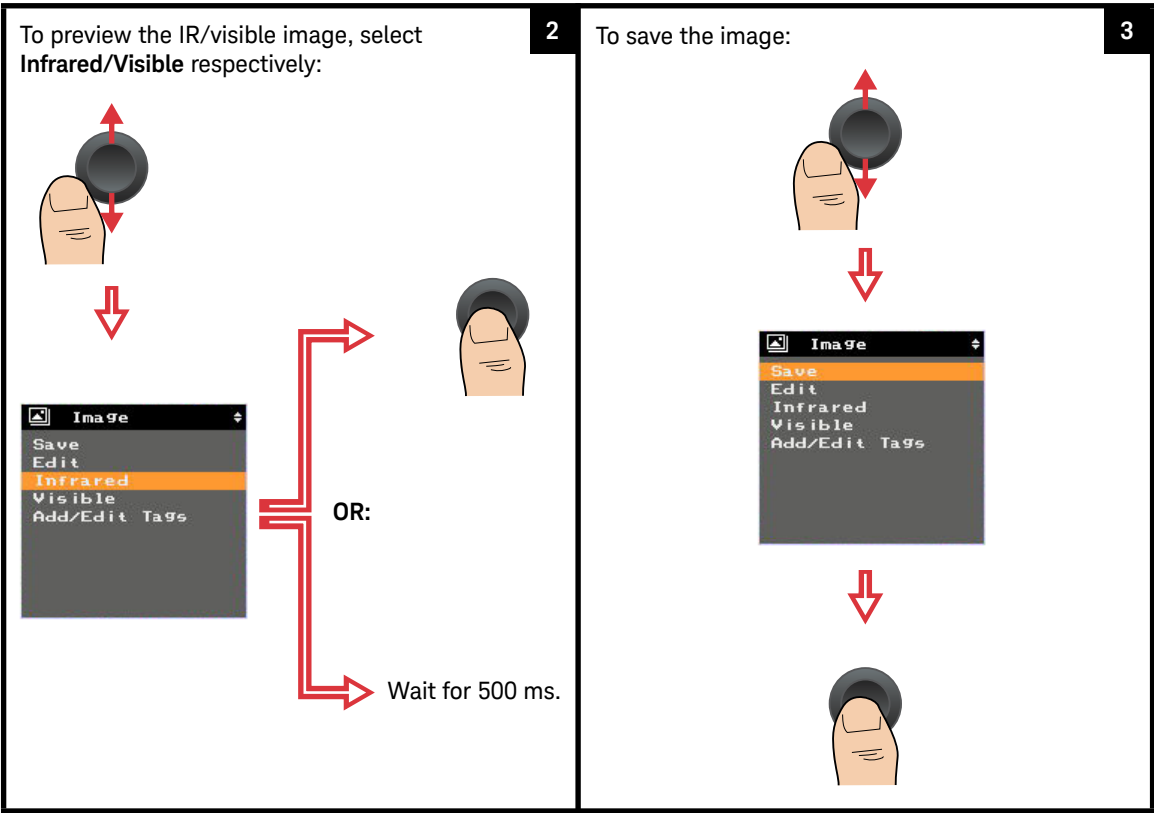
NOTE

- Allow a short warm up before performing image acquisition for accurate measurement.
- It is recommended to power on the U5850 Series before connecting the USB cable to the PC.

After capturing the images, you can save them into the SD memory card inserted in the U5850 Series. You can also add tags and edit the images.

Preview and save an image





Once the image has been saved, it will return to the run mode.

4




- If the auto save visible image setting is enabled, both the IR and visible images will be saved.
- If the auto save visible image setting is disabled, only the IR image will be saved.

Refer to [“Turn on/off visible image auto-save”](#) on page 111 for more details.


Add tags

You can include photo tags (up to three visible images) and note tag that correspond to your IR image analysis.

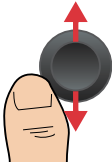
Add photo tags

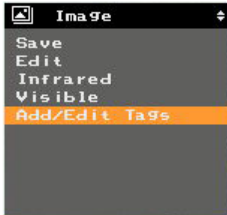



The Image menu is displayed:



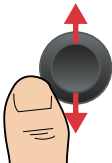
1

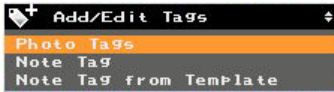







2







3

Visible image is displayed:



4

To capture the photo tag:



5

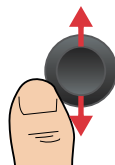
Repeat the same to add more photo tags (up to three).

Photo tag indicators will be added:




6

Save the photo tags with the IR and visible images, and return to the run mode:



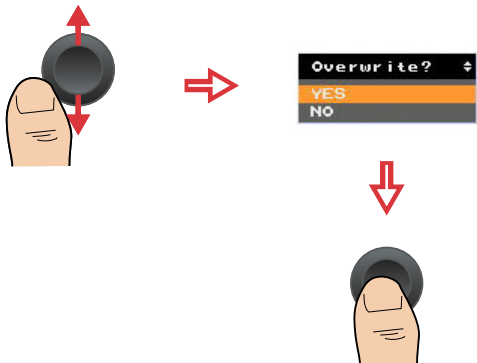
7

If there is already an existing photo tag and you want to add a new tag, a message prompts you to overwrite the existing tag:



8


Select **YES** to proceed with adding tags or **NO** to return to the previous screen:



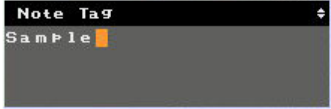
9

Add a note tag


Repeat steps 1 to 2 from “Add photo tags” on page 47.



1



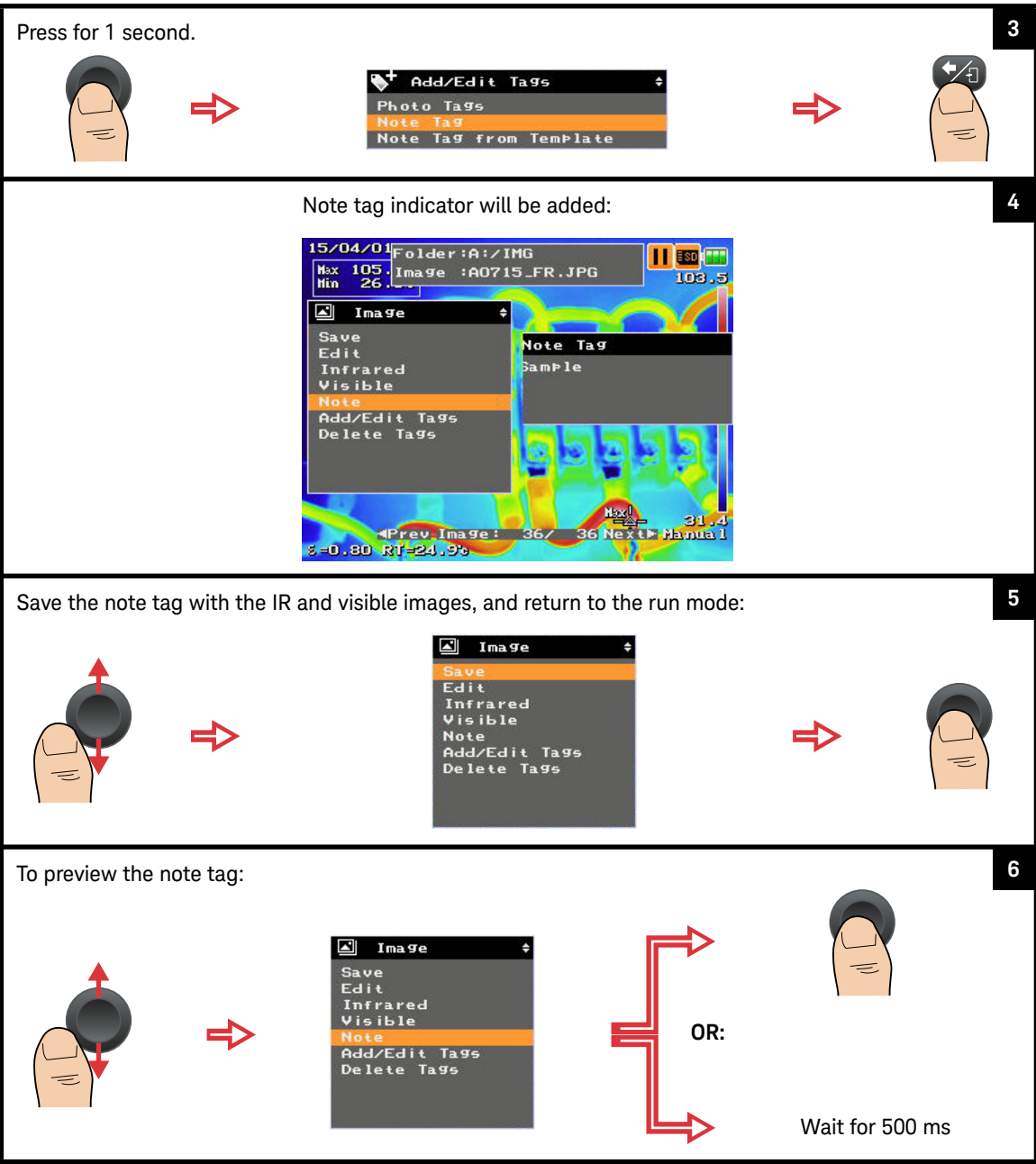
2



Move the character cursor Confirm the cursor position Select and enter the character

If there is no character input, a blank character is inserted.

2 Image Capture, Processing, and Measurement Functions



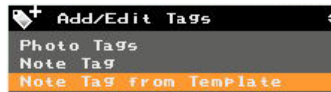
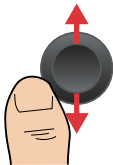
Add a note tag from a template file

You can download the note tag template file from the Keysight website to the SD memory card.

To ensure proper use of this template file, use the following guidelines:

- File name and extension: NOTE_TMP.TXT
- File format: Text file/Notepad
- File location: Root of the SD memory card
- Character code: ASCII (20h to 7Fh)
- Maximum line: 50 lines
- Maximum characters per line: 64 characters

Follow steps 1 to 2 from “Add photo tags” on page 47.

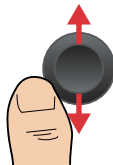


1

The note tag template file that you downloaded will be displayed. Select a template and follow the same procedure from “Add a note tag” on page 49.

2

Edit tags






1



Follow the same procedure as adding tags. Existing tags will be overwritten by the edited tags.



2


Delete tags




















Select **YES** to delete all photo tags, note tag, or all photo and note tags.
Select **NO** to return to the previous screen.







When a tag is deleted, the respective tag indicator will be removed from the Image menu.

Save an image directly

Press for 1 second to save.



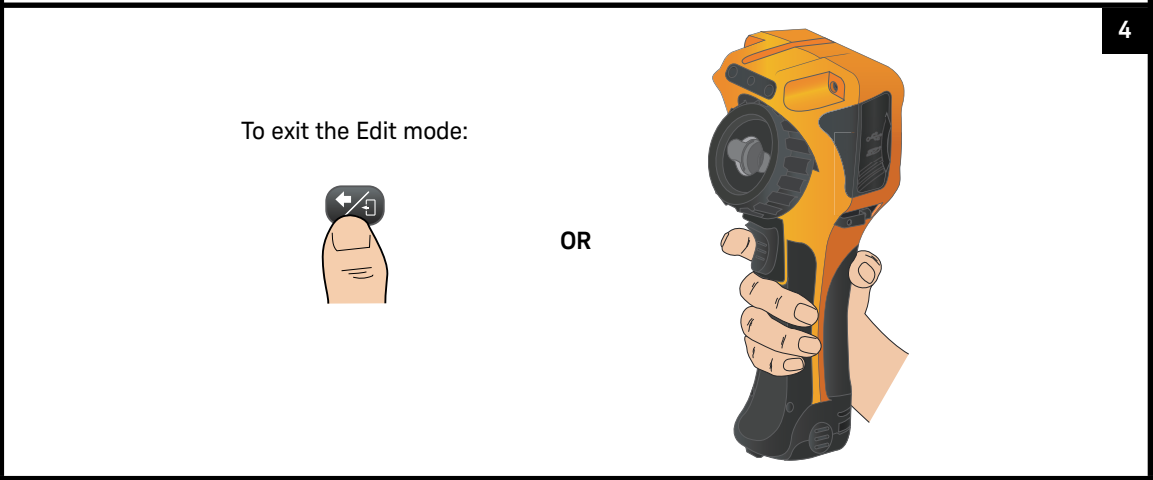
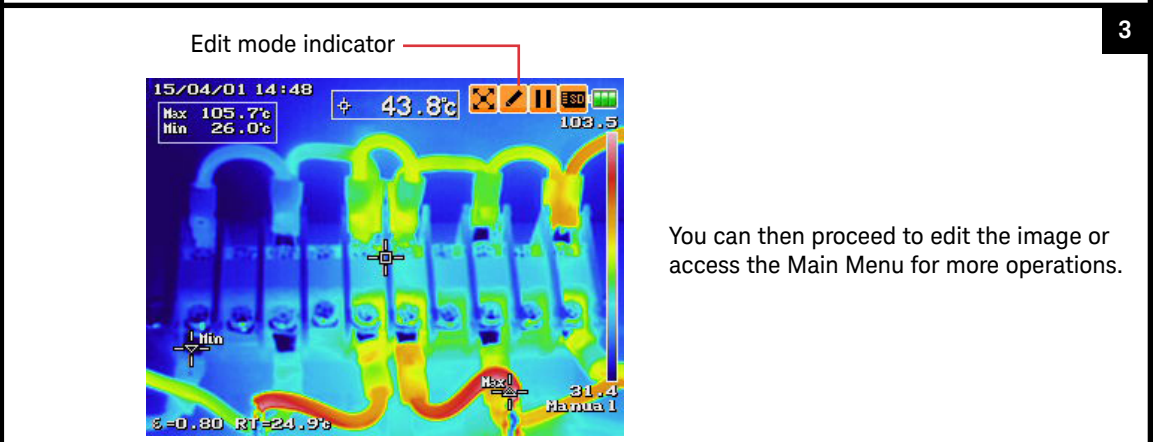
Edit an image

The Image menu is displayed:

1



2 Image Capture, Processing, and Measurement Functions



- Select **Save and exit** to overwrite the existing image and save your new edits, and then exit the Edit mode.
- Select **Exit without saving** to exit the Edit mode without saving your edits.
- Select **CANCEL** to return to the current operation.

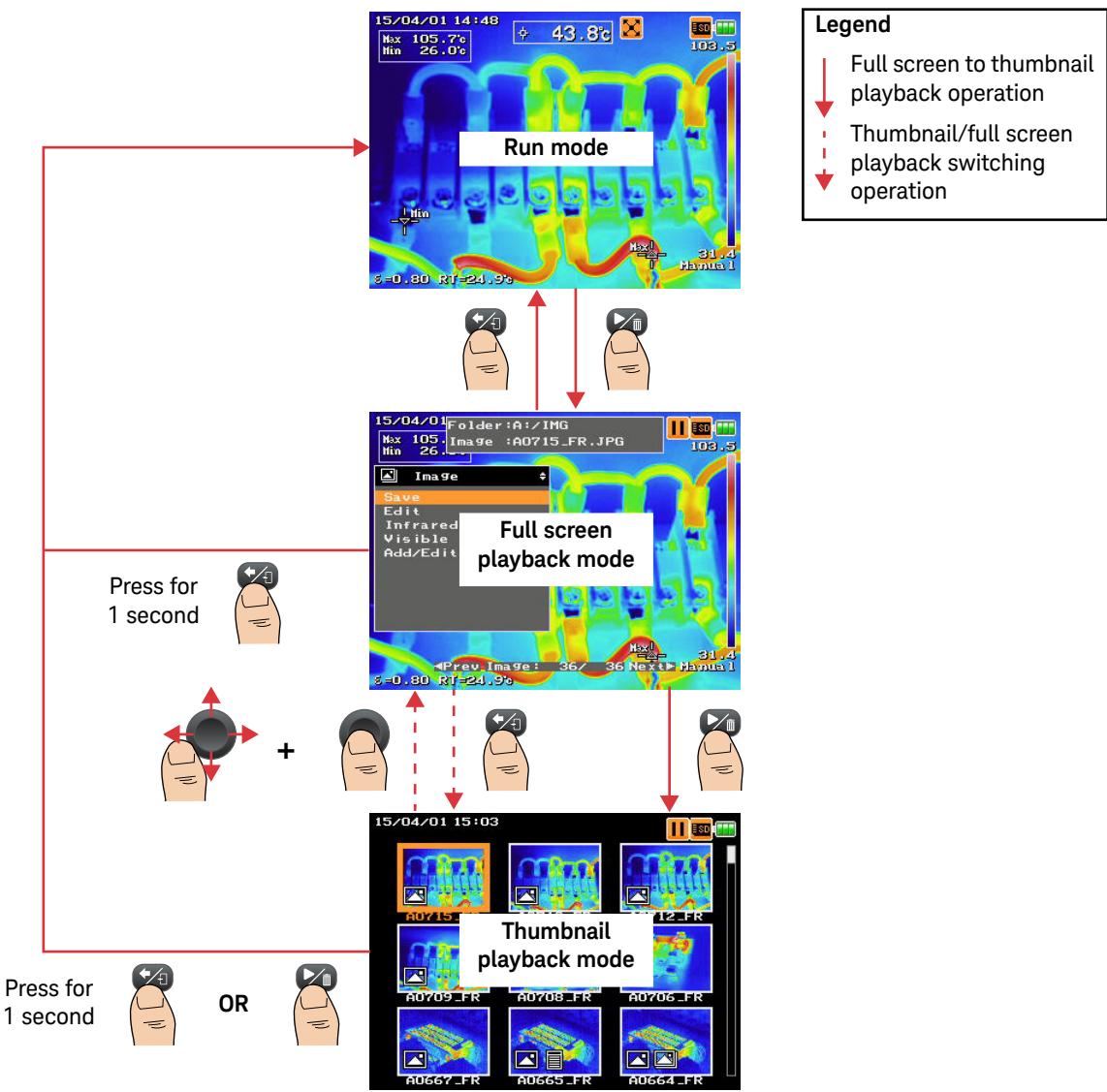
5



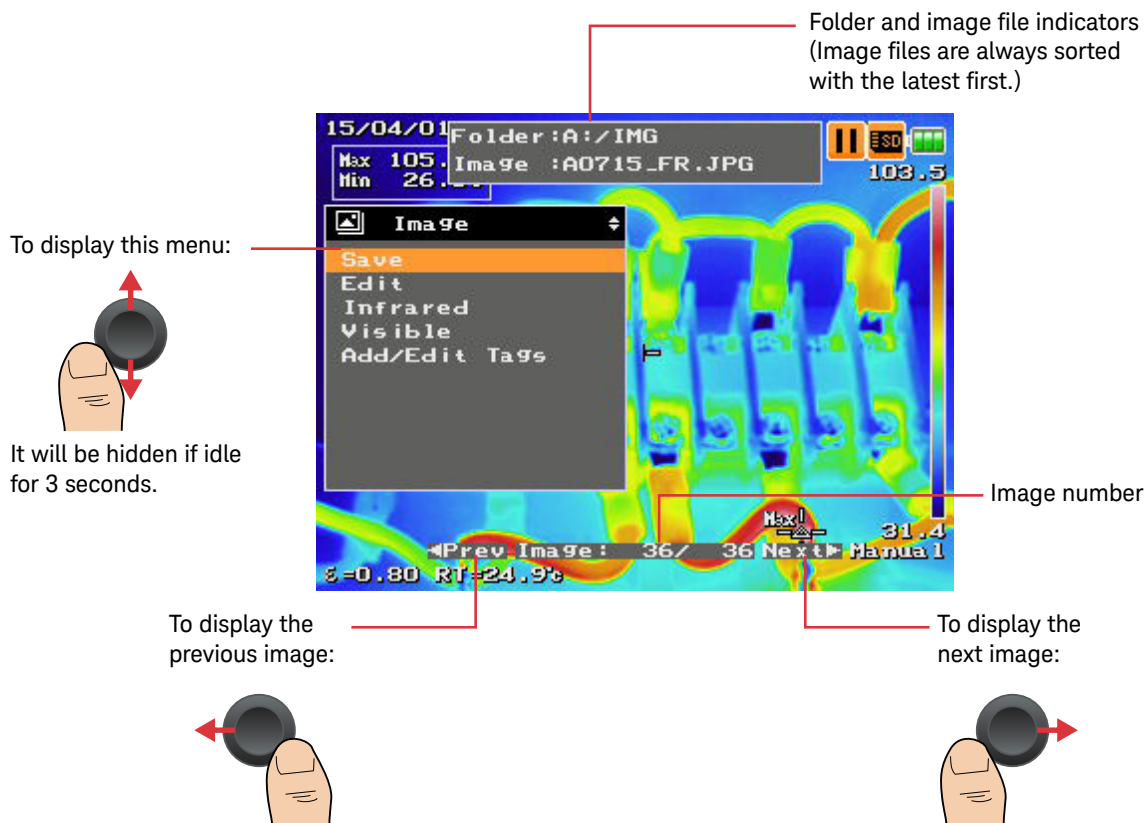
Image Playback

This feature allows you to play back saved images.

Full screen/Thumbnail playback mode operation



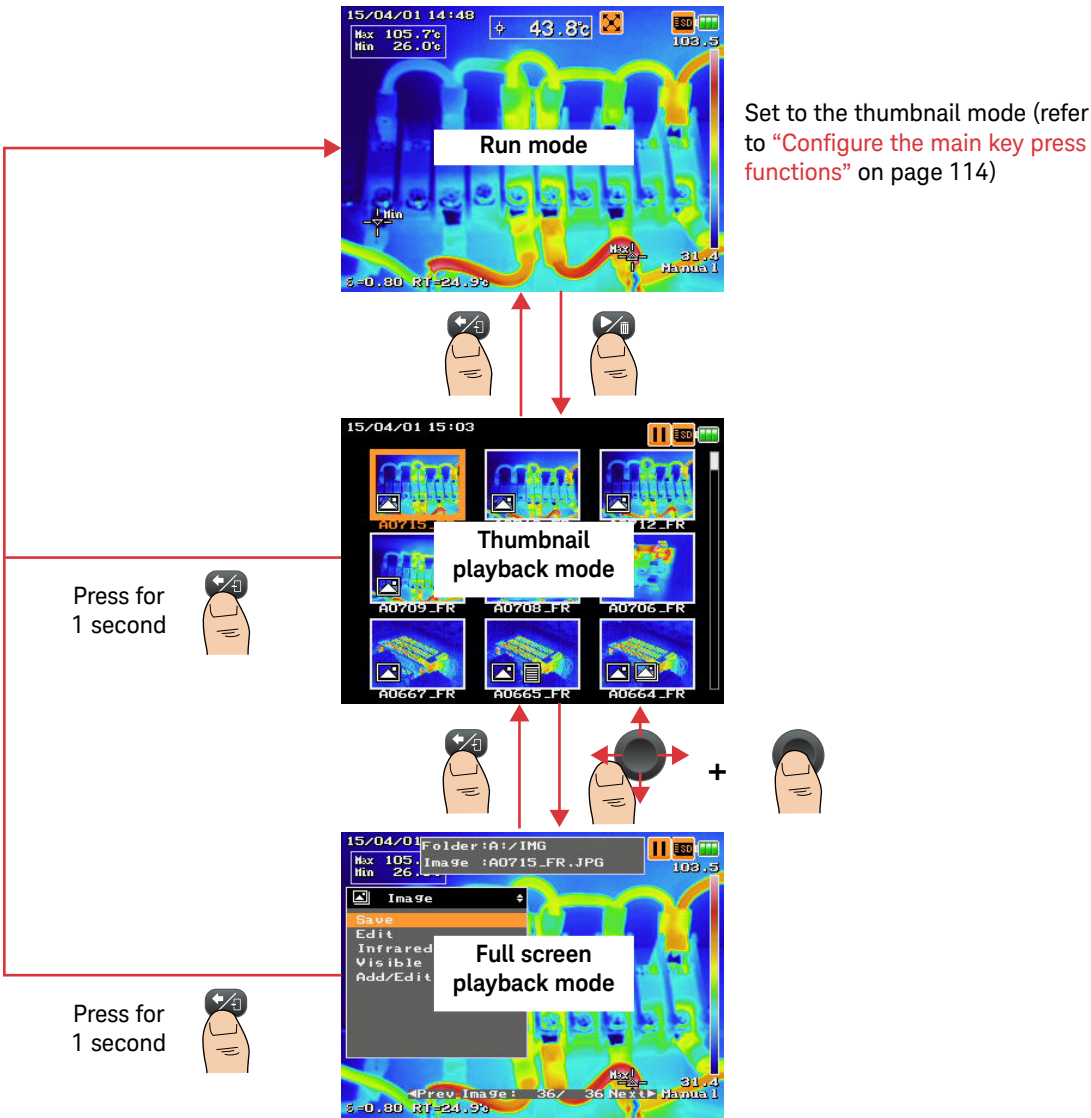
Full screen playback mode overview



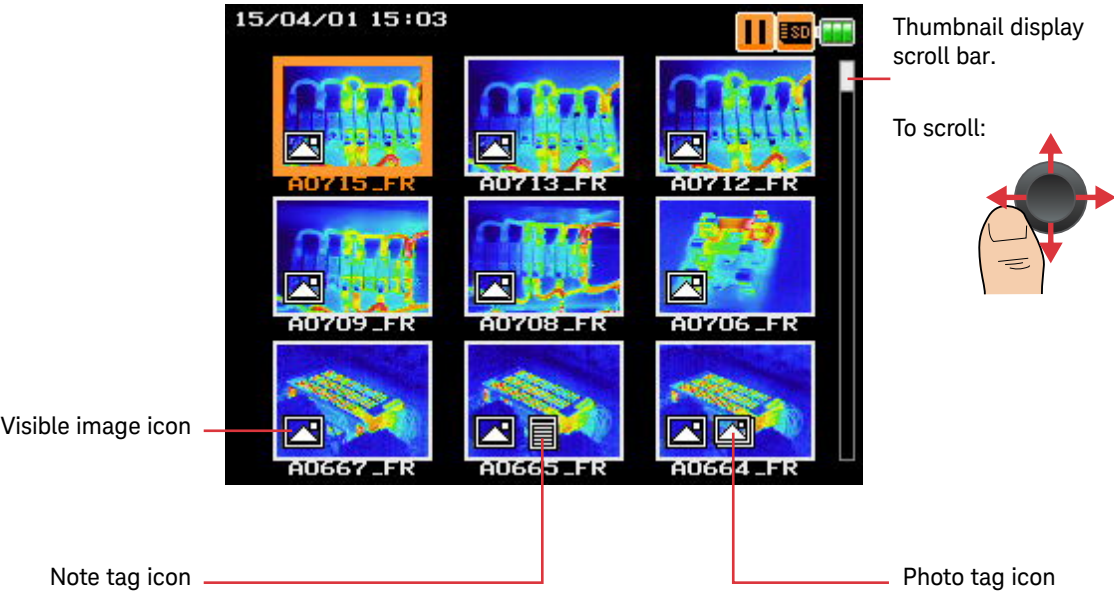
NOTE

In the playback mode, you can perform the same Image menu operations as described in the previous sections of this chapter.

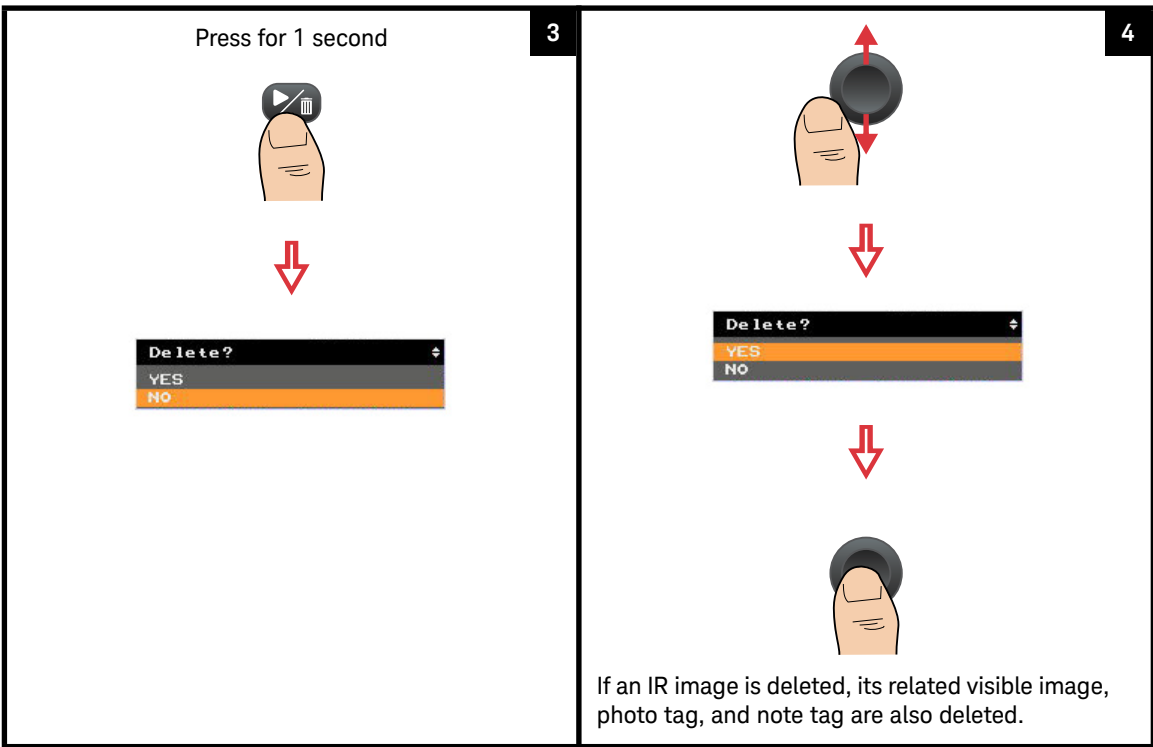
Thumbnail playback mode operation



Thumbnail playback mode overview



Delete an image (full screen playback mode)



Delete multiple images (thumbnail playback mode)

15/04/01 15:03

Press for 1 second

15/04/01 15:03

Select images to delete

15/04/01 15:03

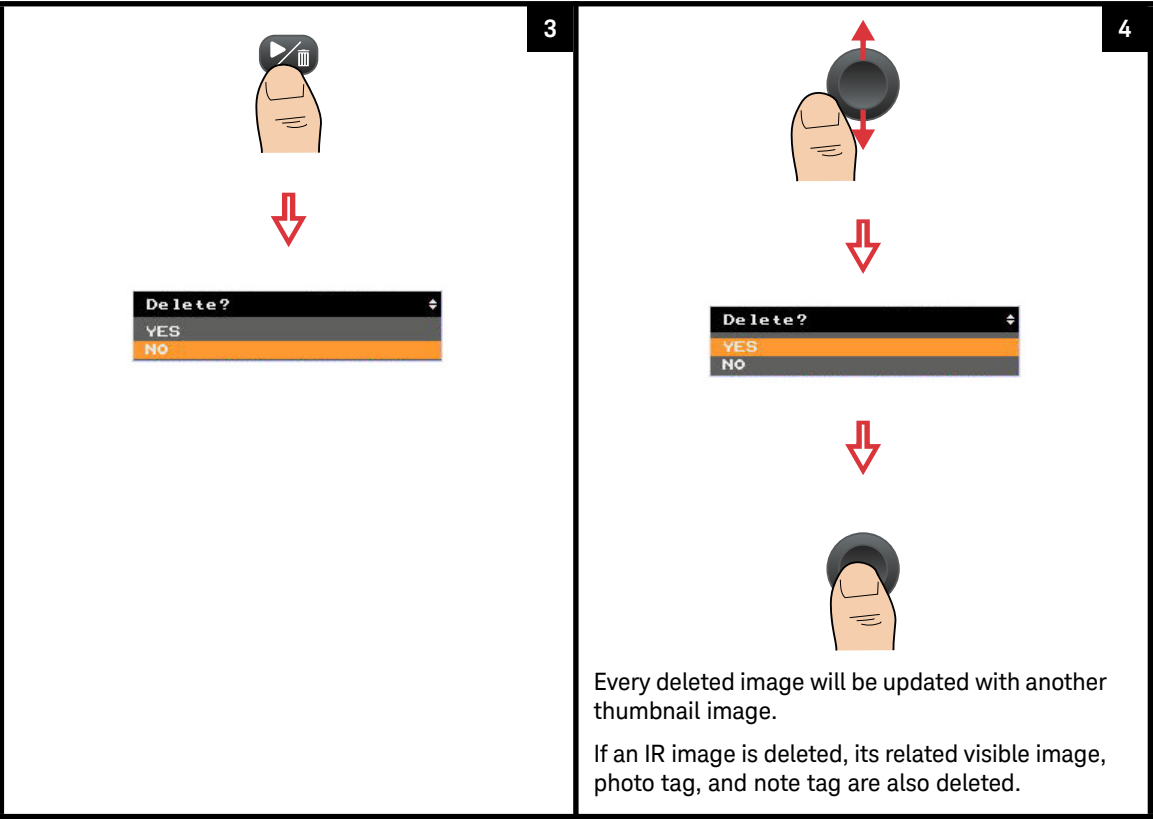
Select images to delete

Indicator for the selected image

Toggle to check/uncheck

Keysight U5850 Series User's Guide

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Measurement Controls

The U5850 Series True/R Thermal Imager measurement controls enable you to identify hot/cold spots and to perform thermal analysis on the move, directly on the camera.

Set the temperature range

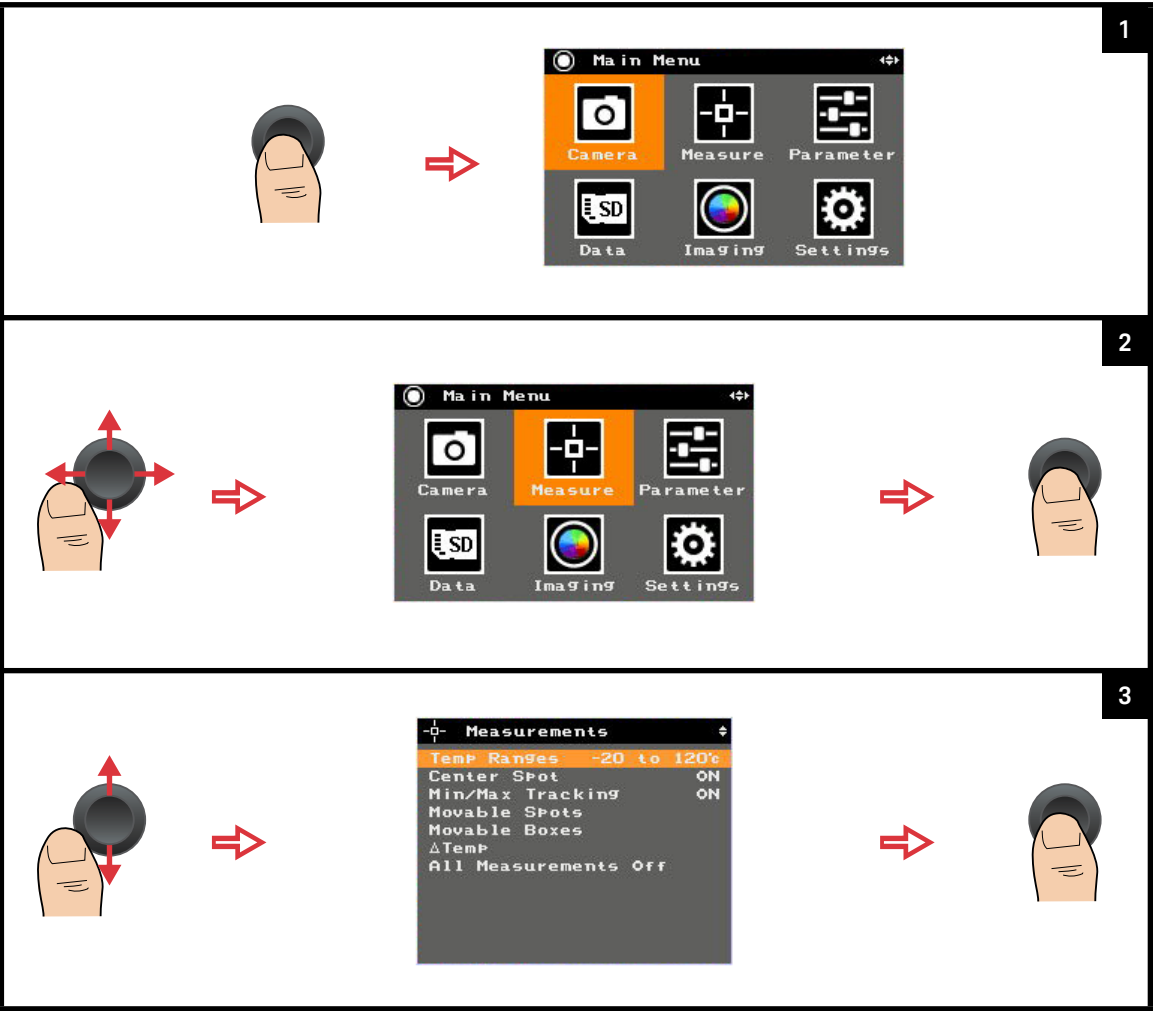
You can set auto range or manual range for temperature measurement.

- Range 1: -20 to 120 °C (U5855A/U5856A/U5857A)
- Range 2: 0 to 350 °C (U5855A/U5857A), 0 to 650 °C (U5856A)
- Range 3: 0 to 1200 °C (U5857A)

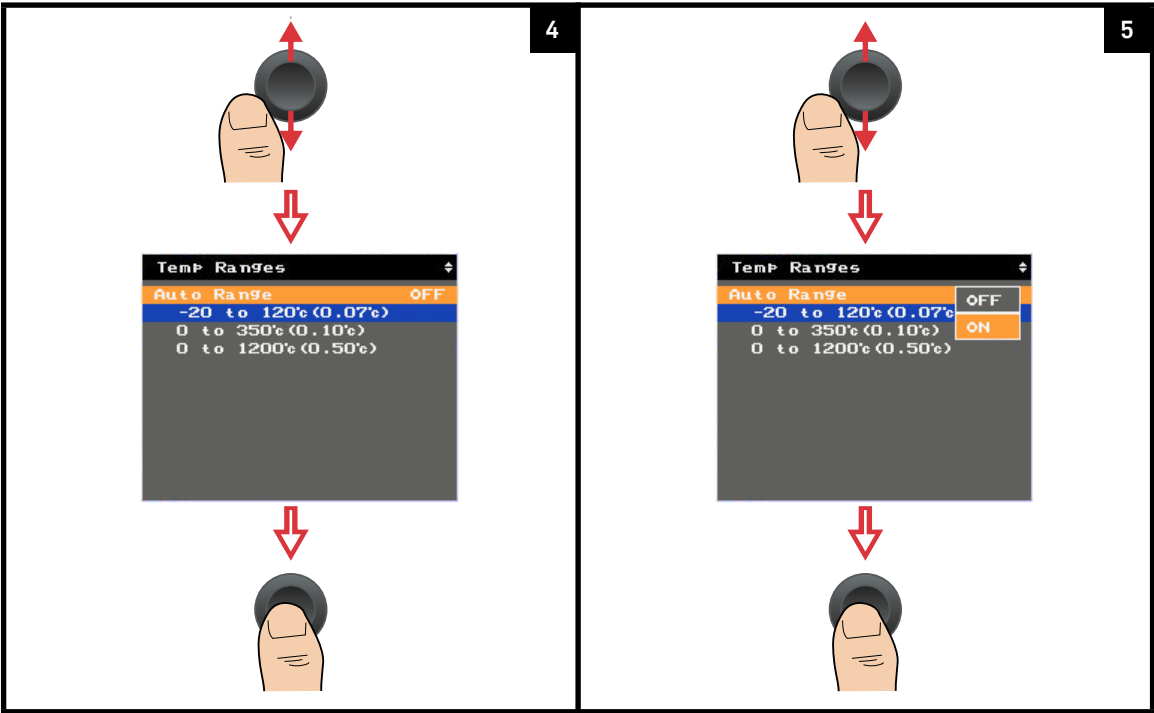
If the maximum temperature (within 80% of the image center area) meets the following conditions, auto ranging will occur:

- > 120 °C:
Automatically switches from range 1 to range 2.
- > 350 °C (for U5857A):
Automatically switches from range 2 to range 3.
- < 108 °C:
Automatically switches from range 2 to range 1.
- < 315 °C (for U5857A):
Automatically switches from range 3 to range 2.

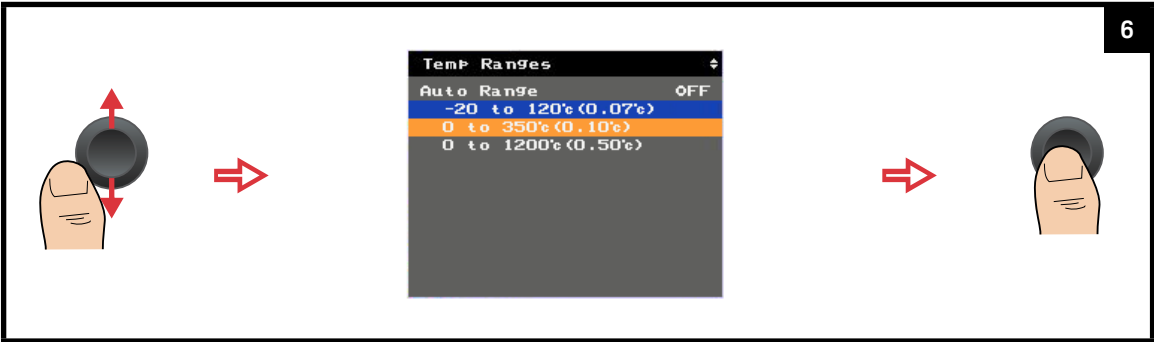
Auto ranging for these conditions only applies in the auto scaling mode.



Enable/disable auto range



Select a manual range (auto range disabled)



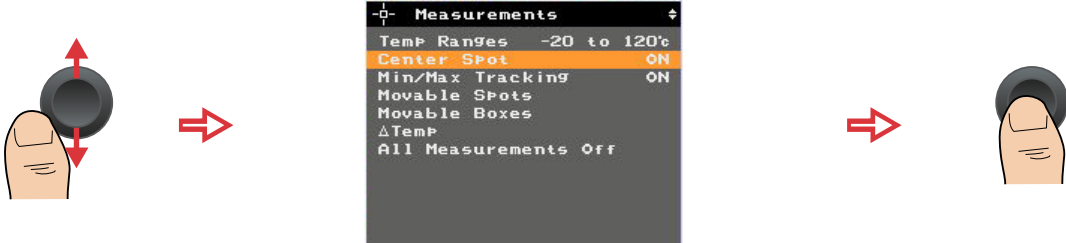
2 Image Capture, Processing, and Measurement Functions

Set the center spot

You can enable or disable the center spot cursor which measures the temperature at the center of the IR image.

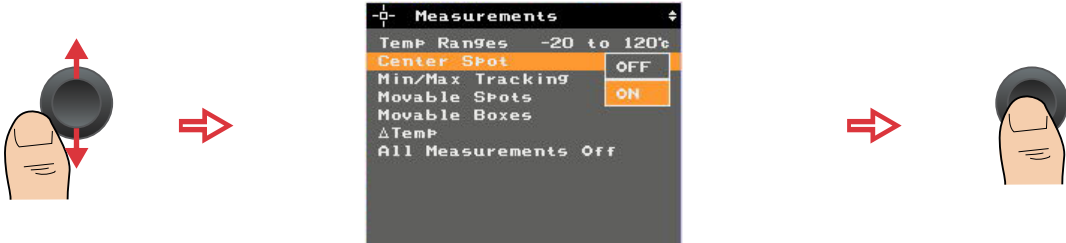
Follow steps 1 to 2 from “Set the temperature range” on page 63.

1



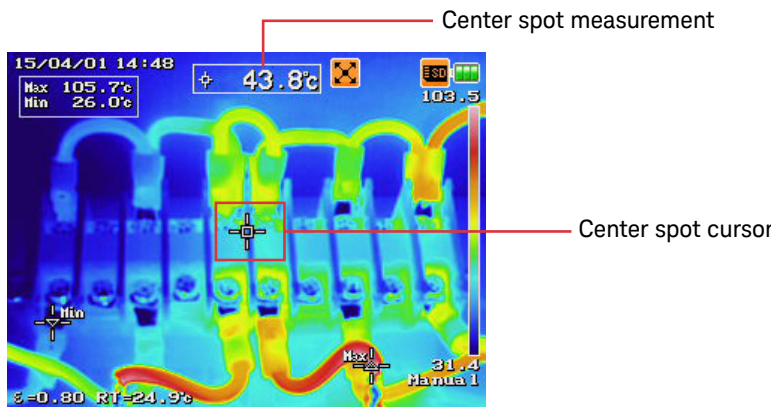
```
Measurements
Temp Ranges -20 to 120°C
Center Spot ON
Min/Max Tracking ON
Movable Spots
Movable Boxes
ΔTemp
All Measurements Off
```

2



```
Measurements
Temp Ranges -20 to 120°C
Center Spot OFF
Min/Max Tracking ON
Movable Spots
Movable Boxes
ΔTemp
All Measurements Off
```

3



Center spot measurement

Center spot cursor

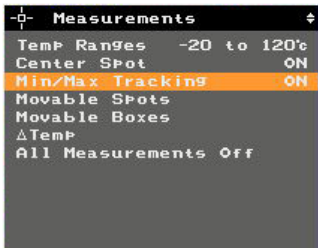
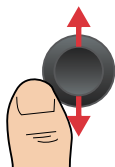
15/04/01 14:48
Max 105.7°C
Min 26.0°C
43.8°C
ESD 103.5
31.4
Manual
Σ=0.80 RT=24.9%

Set the max/min tracking

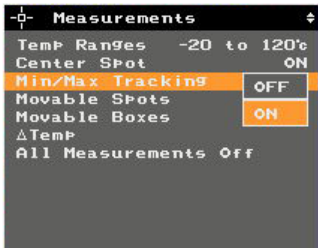
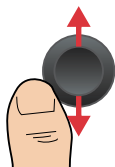
This function tracks the maximum and minimum temperature within the full IR image.

Follow steps 1 to 2 from “Set the temperature range” on page 63.

1



2



3

Max/Min measurements

Min point cursor



Max point cursor

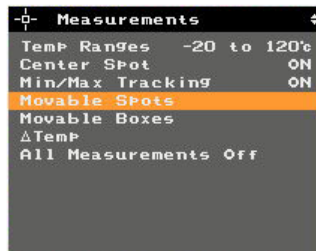
Set the moveable spots and boxes

You can enable measurement spots and boxes to browse and detect the hot/cold areas of the IR image. You can allocate boxes at specific areas of the IR image to perform max, min, and average temperature measurements within the areas. The box size can be adjusted.

Set a measurement spot

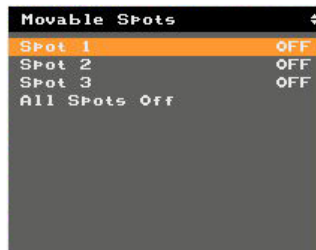
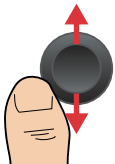
Follow steps 1 to 2 from “Set the temperature range” on page 63.

1


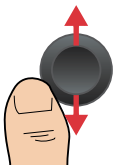


Select any spot or disable all existing spots:

2





For example, to enable or move spot 1:

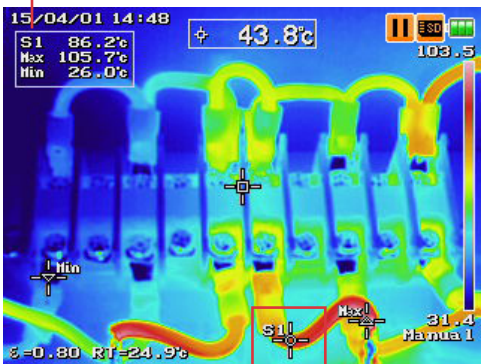


Movable Spots

Spot 1	OFF
Spot 2	
Spot 3	ON/Edit
All Spots Off	


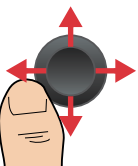



Spot 1 measurement




Spot 1 point cursor

To move spot 1:






To confirm spot 1 location:




To exit spot 1 moving mode:



Set a measurement box

Follow steps 1 to 2 from “Set the temperature range” on page 63.




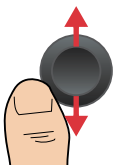
Select any box or disable all existing boxes:



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For example, to enable or move/adjust box 1:



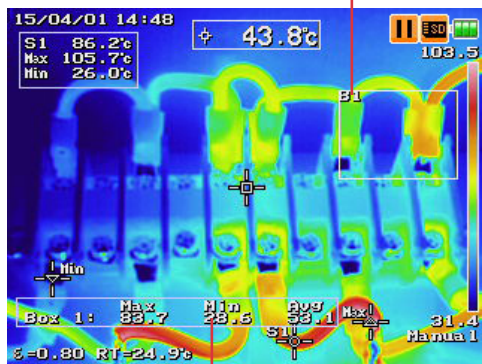
Movable Boxes

Box 1	OFF
Box 2	
Box 3	ON/Edit
All Boxes	Off



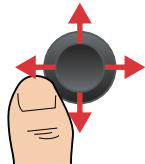


Box 1 cursor

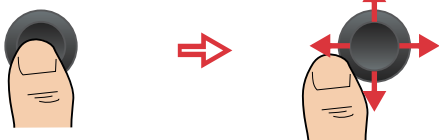


Box 1 max, min, and average readings


To move box 1:




To adjust the size of box 1:



To confirm box 1:



To exit box 1 moving mode or size adjustment:



Keysight U5850 Series User's Guide

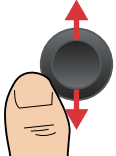
71

Set the delta temperature

You can measure the difference between two temperature readings – you can select from the spot readings or specify your own reference value.

Follow steps 1 to 2 from “Set the temperature range” on page 63.


1



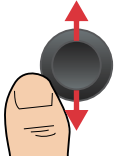
⇒

Measurements	
Temp Ranges	-20 to 120%
Center Spot	ON
Min/Max Tracking	ON
Movable Spots	
Movable Boxes	
ΔTemp	
All Measurements Off	

⇒




2



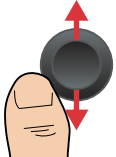
⇒

ΔTemp	
Show ΔTemp	OFF
Temp 1	Spot 3
Temp 1 Ref	30.0%
Temp 2	Ref
Temp 2 Ref	20.0%

⇒




3



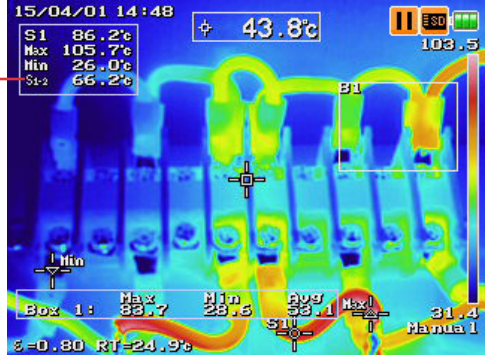
⇒

ΔTemp	
Show ΔTemp	OFF
Temp 1	Spot 3
Temp 1 Ref	30.0%
Temp 2	Ref
Temp 2 Ref	20.0%

↓



Δ Temp indicator



15/04/01 14:48



43.8°C

103.5

Box 1: Max 88.7 Min 28.5 Avg 58.1 Max 31.4 Manual 1

%=0.80 RT=24.9%



4



ΔTemp	
Show ΔTemp	ON
Temp 1	Spot 3
Temp 1 Ref	30.0%
Temp 2	Ref
Temp 2 Ref	20.0%

5


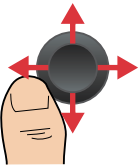
Select the center spot, spot 1, 2, or 3, or a reference value for Temp 1:



ΔTemp	
Show ΔTemp	ON
Temp 1	Center
Temp 1 Ref	Spot 1
Temp 2	Spot 2
Temp 2 Ref	Spot 3
	Ref

6

If you want to enter a reference value:



ΔTemp	
Show ΔTemp	ON
Temp 1	Ref
Temp 1 Ref	30.0%
Temp 2	Ref
Temp 2 Ref	20.0%

Push left/right to move the indicator.

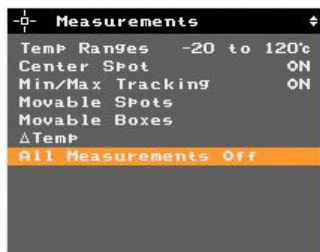
Push up/down to increase/decrease the digits.

7

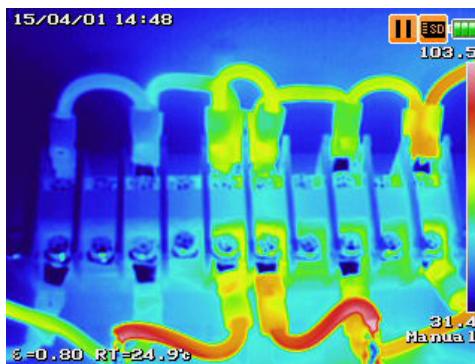
Repeat the same procedure for Temp 2.

Turn off all measurements

Follow steps 1 to 2 from “Set the temperature range” on page 63.



All measurement indicators are removed:

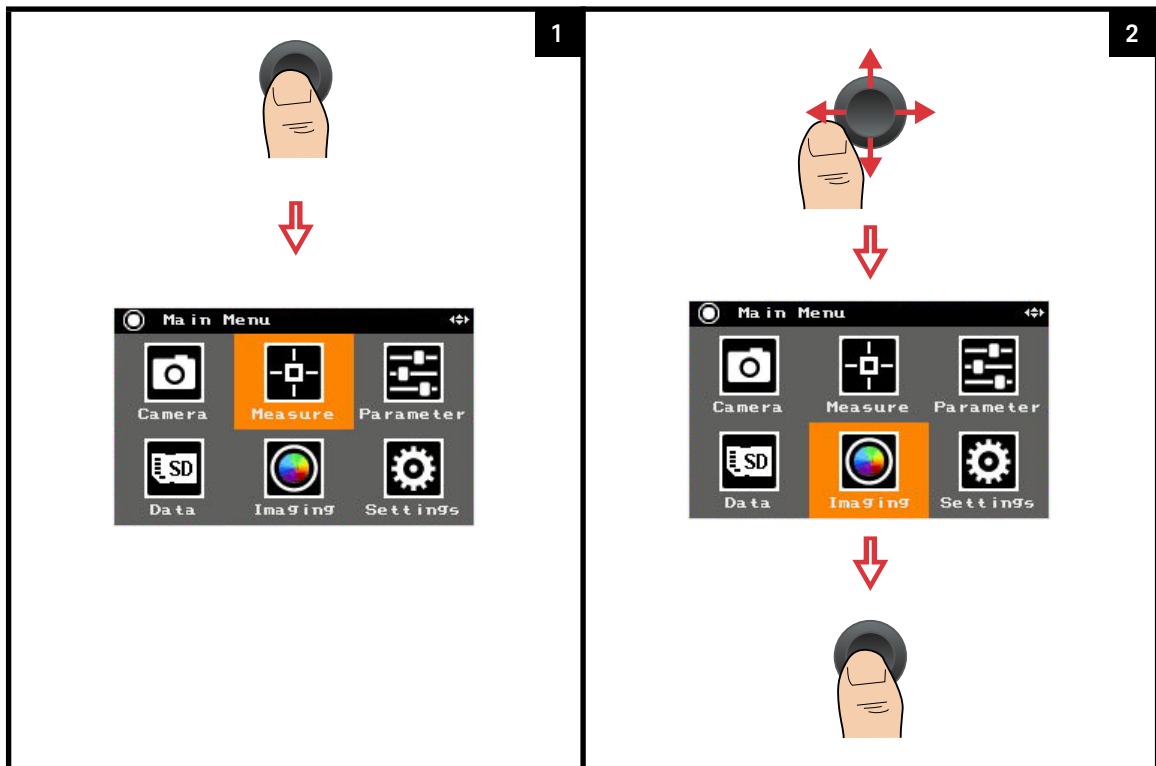


Imaging Controls

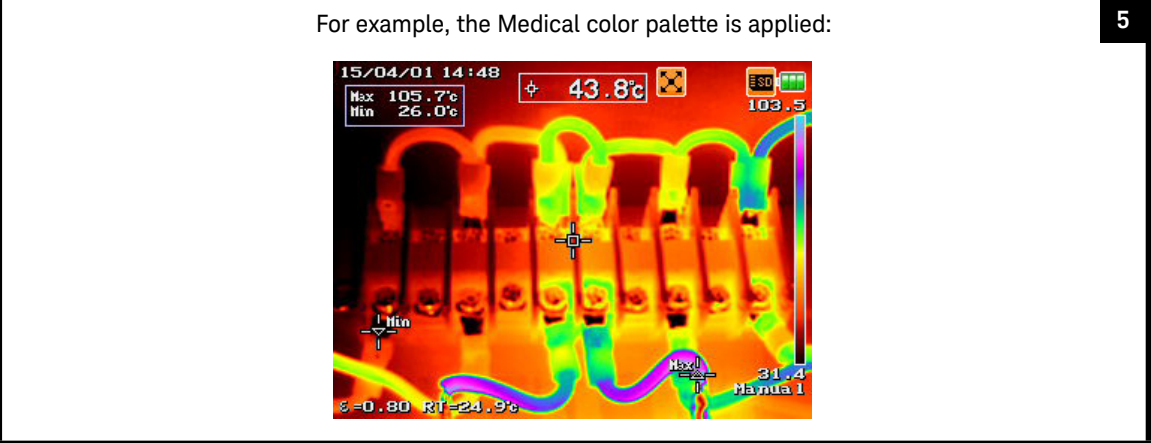
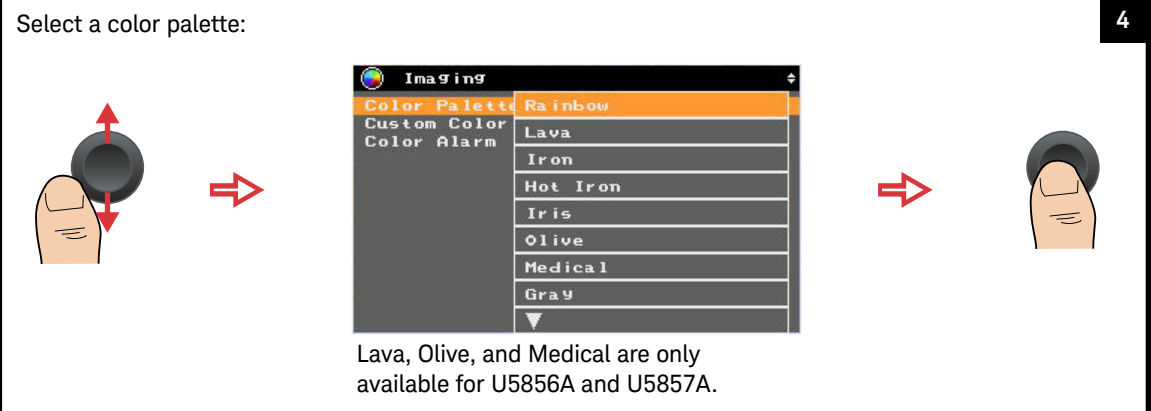
The imaging feature allows you to perform a more comprehensive thermal analysis by configuring the IR image display for different environments.

Set the color palette

You can apply a specific color palette for your IR image to improve contrast and clarity when identifying hot/cold areas.





2 Image Capture, Processing, and Measurement Functions



Load a custom color palette

You can create custom color palette from the Keysight TrueIR Analysis and Reporting Tool. Visit www.keysight.com/find/trueIR_ART to download the software for free.







Imaging

Color Palette Rainbow

Custom Color Palette


Color Alarm






1

- Select **Read from SD Card** to select a custom color palette from the SD memory card to be loaded into the U5850 Series.
- Select **Erase from Camera** to remove the custom color palette from the U5850 Series.







Custom Color Palette

Read from SD Card

Erase from Camera





2

NOTE

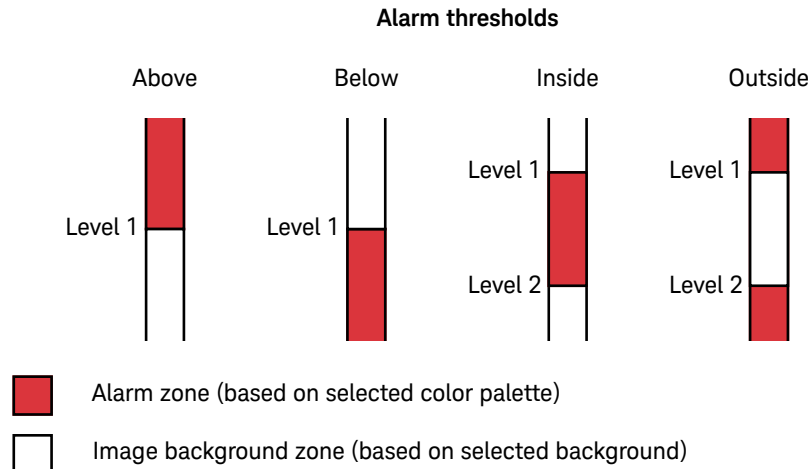
- The custom color palettes must be saved into the root directory of the SD memory card.
- The maximum characters for the custom color palette file name is 8 characters.
- The U5850 Series allows up to 30 custom color palettes (sorted by time) to be displayed from the SD memory card.

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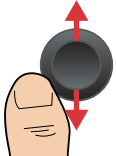
Set the color alarm


The color alarm allows you to set an alarm threshold which only displays IR components on image zones above, below, inside, or outside the alarm threshold.





Turn on/off the color alarm


Follow steps 1 to 2 from **“Set the temperature range”** on page 63. 1













2




Color Alarm

Color Alarm	OFF
Alarm Zone	Above
Level 1	50.0%
Level 2	10.0%
Background	Hot White




3

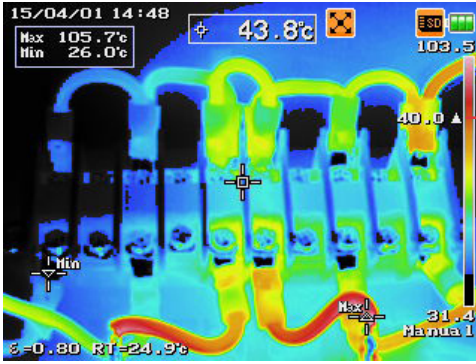


Color Alarm

Color Alarm	OFF
Alarm Zone	Above
Level 1	50.0%
Level 2	10.0%
Background	Hot White



3a



15/04/01 14:48

Max 105.7°C

Min 26.0°C

43.8°C

ESD

103.5

40.0

31.4

Manual

S=0.80 RT=24.9%

Color alarm indicator when enabled

Set the alarm threshold






Color Alarm		⌵
Color Alarm		ON
Alarm Zone		Above
Level 1		50.0%
Level 2		10.0%
Background		Hot white





1

Select the threshold type:







Color Alarm		⌵
Color Alarm		ON
Alarm Zone		Above
Level 1		Below
Level 2		Inside
Background		Outside





2

Set the alarm threshold level



Color Alarm

Color Alarm

Alarm Zone

Level 1

Level 2

Back9round



ON

Above


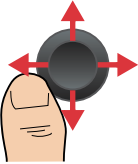
50.0°c

10.0°c

Hot White



1



Color Alarm

Color Alarm

Alarm Zone

Level 1

Level 2

Back9round



ON

Above

40.0°c

10.0°c

Hot White



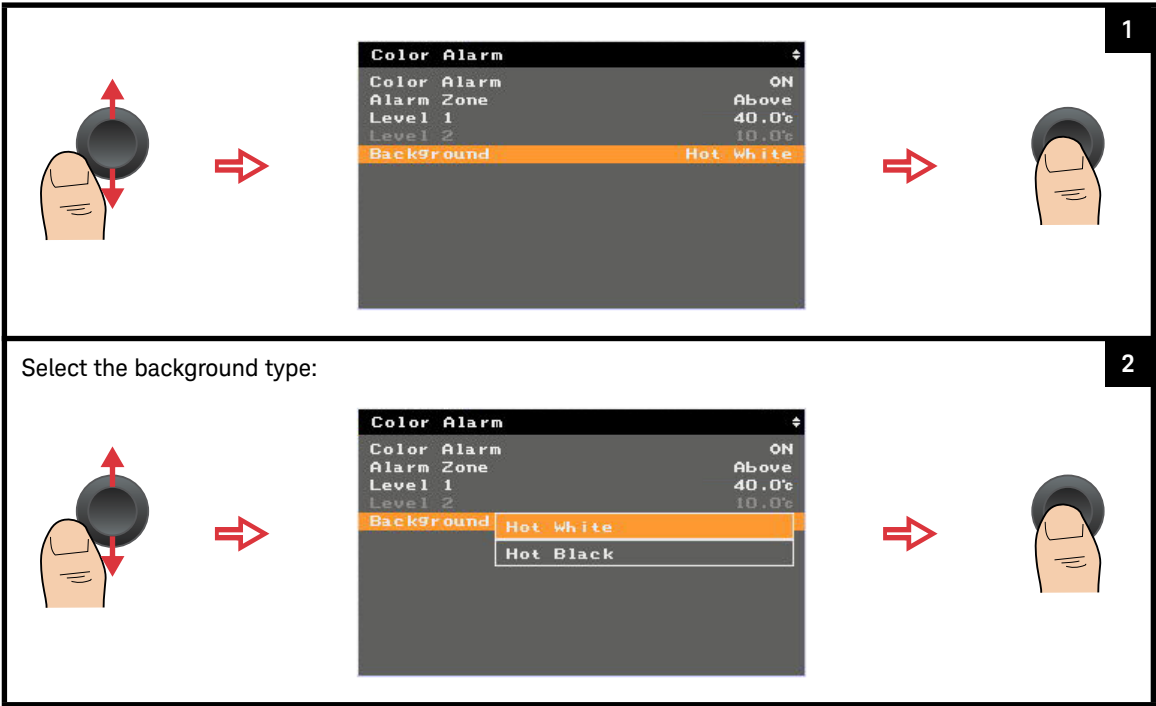
Push left/right to move the indicator.

Push up/down to increase/decrease the digits.

If you have selected the **Inside** or **Outside** threshold, repeat the same procedure to enter the value for **Level 2**.

2

Set the image background








Digital Zoom

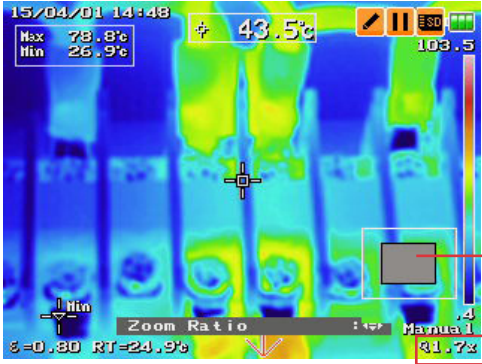
You can zoom in to expand the view of certain areas of the image at a 1× to 4× ratio.

Set the zoom ratio

Press for 1 second.



1





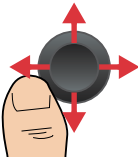
Zoom area

Zoom ratio value


In run mode, the zoom area is always at the center of the image.

2

To change and confirm the zoom ratio:

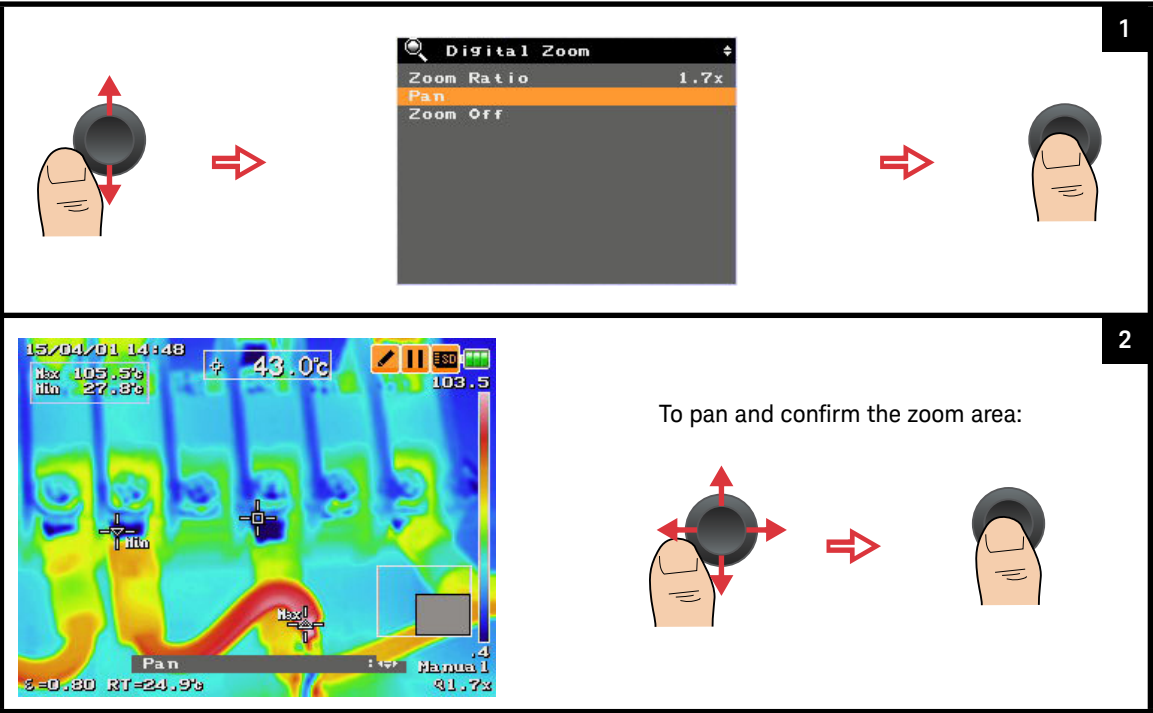


To exit:

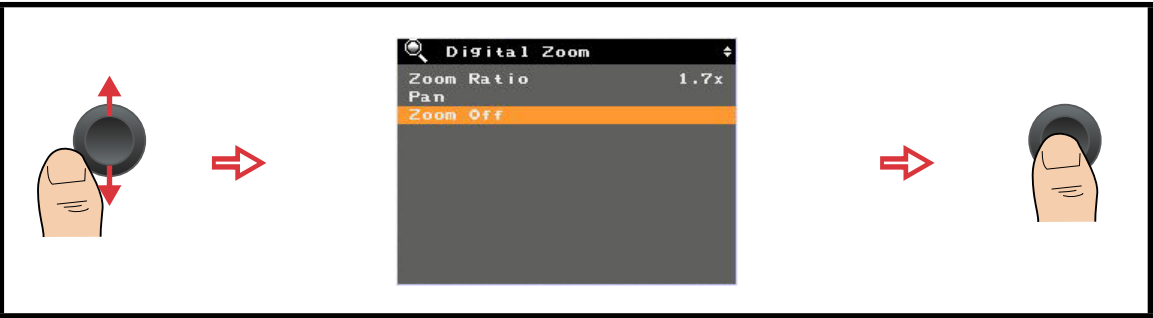


3

Pan (move) the zoom area



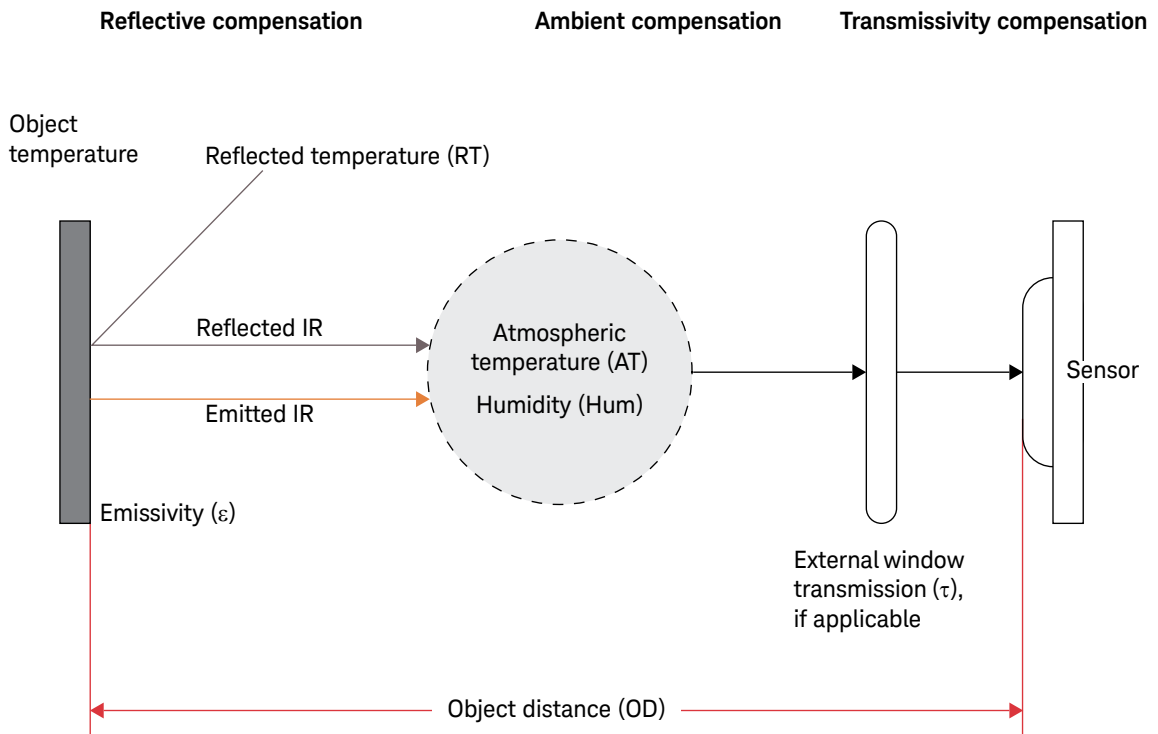
Disable zoom



Parameter Controls

These controls enable you to improve the accuracy of your temperature measurements by making corrections or compensations to the emissivity, reflected temperature, object distance, ambient temperature, humidity, and transmissivity.

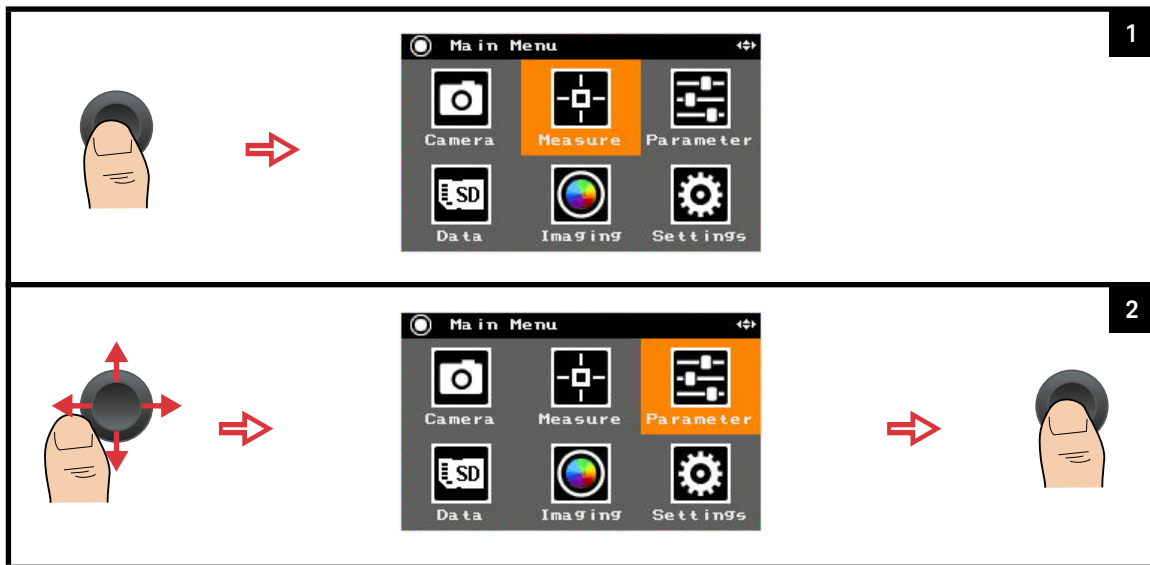
Below illustrates a model of the IR emission energy received by the U5850 Series.

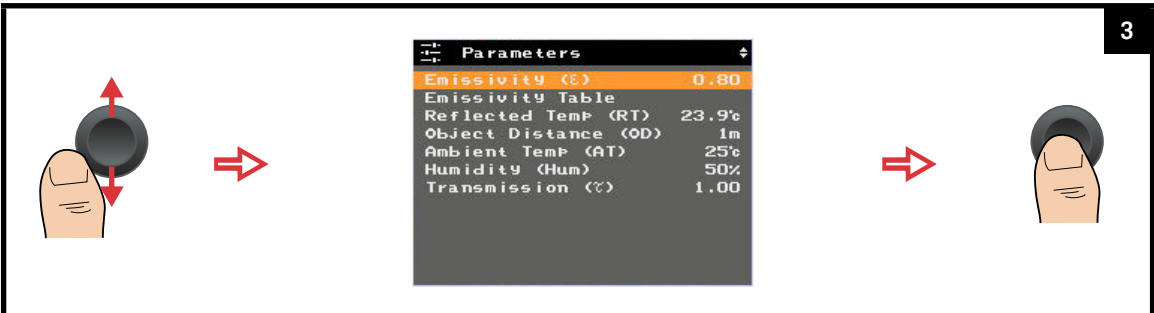


Set the emissivity (ϵ)

Emissivity is the ratio of energy radiated from an object and energy radiated from blackbody. The emissivity varies with the surface condition of the object. The emissivity value is expressed between 0.10 to 1.00.

Enter an emissivity value



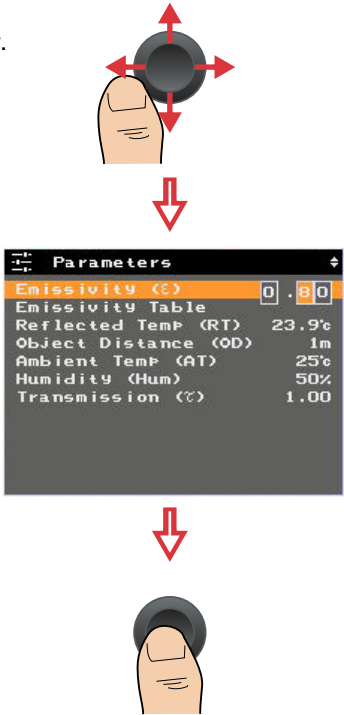


Enter a value from 0.10 to 1.00:

4

Push left/right to move the indicator.

Push up/down to increase/decrease the digits.



5



Emissivity parameter indicator

To display the parameter indicator, refer to “Configure the display items” on page 112.

Select a common emissivity value



Table 2-1 Emissivity table

Common item	Emissivity value	Common item	Emissivity value
Iron (polished)	0.10	Paint (typical)	0.94
Iron (oxidized)	0.70	Brick	0.93
Aluminum (oxidized)	0.15	Paper	0.90
Stainless steel (polished)	0.20	Clay	0.92
Stainless steel (oxidized)	0.80	Graphite (carbon)	0.95
Copper (oxidized)	0.40	Glass	0.90
Nickel (oxidized)	0.37	Rubber	0.90
Brass (oxidized)	0.64	Concrete	0.92
Snow	0.85	Skin	0.98
Cloth	0.90	Water	0.96

Set the reflected temperature (RT)

RT can be corrected to obtain a more accurate temperature measurement especially for low-emissivity objects.

You can manually enter an RT value or run the RT calibration (RT Cal) for reflection source correction. When the source of reflection exists around an object and the temperature of the source of reflection is known, you can enter the RT value manually. If the temperature of the source of reflection is not known, perform RT Cal to obtain the RT value automatically.

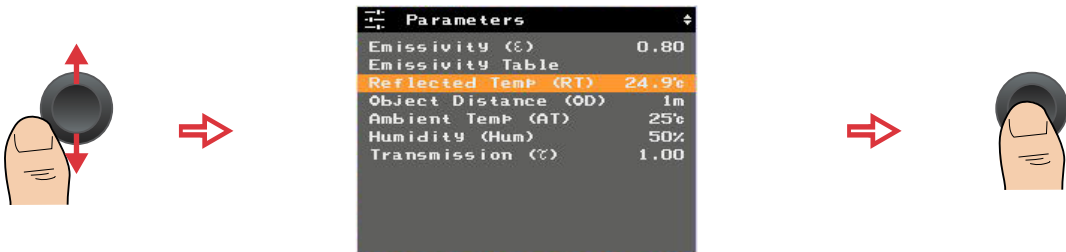
NOTE

RT Cal cannot be executed during freeze mode and image logging.

Enter an RT value

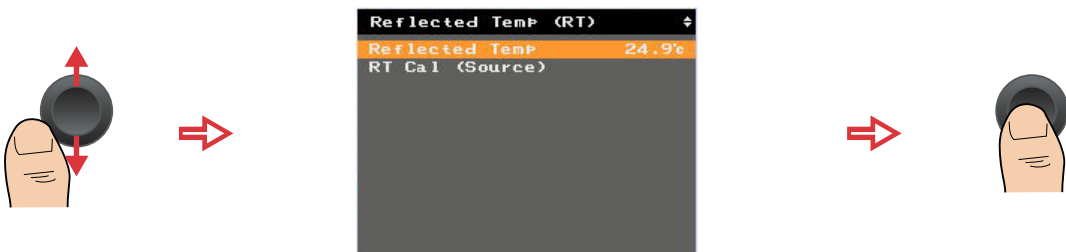
Follow steps 1 to 2 from “Enter an emissivity value” on page 86.

1



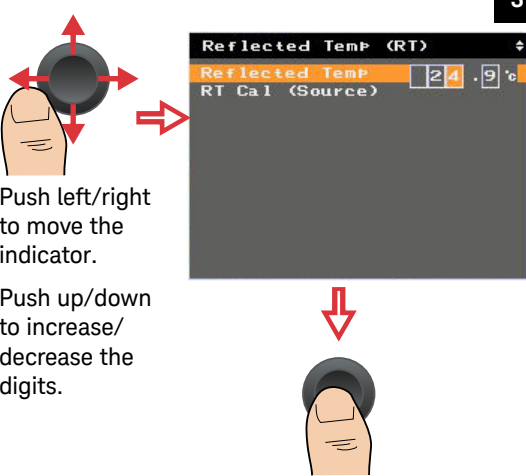
Parameters	
Emissivity (ε)	0.80
Emissivity Table	
Reflected Temp (RT)	24.9%
Object Distance (OD)	1m
Ambient Temp (AT)	25%
Humidity (Hum)	50%
Transmission (τ)	1.00

2



Reflected Temp (RT)	
Reflected Temp	24.9%
RT Cal (Source)	

3




Push left/right to move the indicator.

Push up/down to increase/decrease the digits.

Reflected Temp (RT)	
Reflected Temp	24.9%
RT Cal (Source)	



4





RT parameter indicator

To display the parameter indicator, refer to “Configure the display items” on page 112.

Run RT Cal for reflection source correction





Reflected Temp (RT) ↕
Reflected Temp 24.9%
RT Cal (Source)






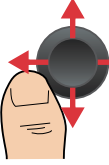
1

If you know the temperature of the reflection source, you may enter the value.
If not, point the U5850 Series at the reflection source and select **YES** to run the calibration to obtain the temperature.





Background Compensation ↕
YES
NO
23.8%







Background Compensation ↕
YES
NO
23.6%





Push left/right to move the indicator.
Push up/down to increase/decrease the digits.

OR



Background Compensation ↕
YES
NO
23.6%



When completed, it will return to the Reflected Temp (RT) menu.

Value updated

Reflected Temp (RT)	
Reflected Temp	23.5%
RT Cal (Source)	

RT indicator updated

3

Set the object distance (OD), ambient temperature (AT), and humidity (Hum)

You can perform compensation for ambient parameters (OD, AT, Hum) to correct atmospheric errors in your temperature measurements.

NOTE

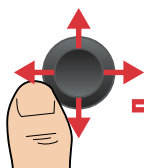
Ambient parameter settings are not supported in the freeze, playback, and image logging modes.


Follow steps 1 to 2 from “Enter an emissivity value” on page 86.
Select **Object Distance (OD)**/Ambient Temp (AT)/Humidity (Hum):

Parameters	
Emissivity (ε)	0.80
Emissivity Table	
Reflected Temp (RT)	24.9%
Object Distance (OD)	1m
Ambient Temp (AT)	25%
Humidity (Hum)	50%
Transmission (τ)	1.00

1

- OD: 1 to 1000 m
- AT: -15 to 50 °C
- Hum: 0 to 100%



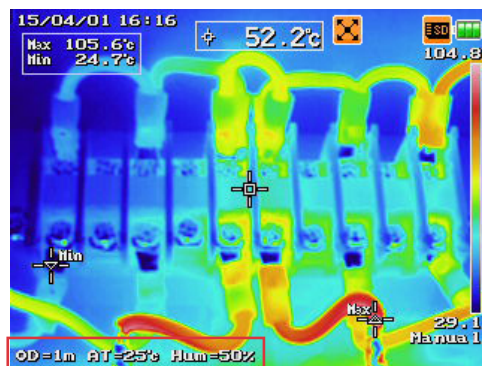
Parameters	
Emissivity (ε)	0.80
Emissivity Table	
Reflected Temp (RT)	24.9%
Object Distance (OD)	 m
Ambient Temp (AT)	25°C
Humidity (Hum)	50%
Transmission (τ)	1.00

Push left/right to
move the indicator.

Push up/down to increase/decrease the digits.



2



Ambient parameter indicators

To display the parameter indicator, refer to **“Configure the display items”** on page 112.

Set the transmissivity (τ)

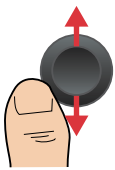
Some IR energy may be lost when transmitted through an external window; this transmissivity error must be corrected to improve the accuracy of your temperature measurements.

NOTE

Transmissivity setting is not supported in the freeze, playback, and image logging modes.

Follow steps 1 to 2 from “Enter an emissivity value” on page 86.

1

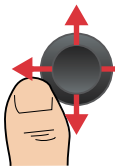


Parameters	
Emissivity (ε)	0.80
Emissivity Table	
Reflected Temp (RT)	24.9%
Object Distance (OD)	1m
Ambient Temp (AT)	25%
Humidity (Hum)	50%
Transmission (τ)	1.00



Enter a value from 0.10 to 1.00:

2



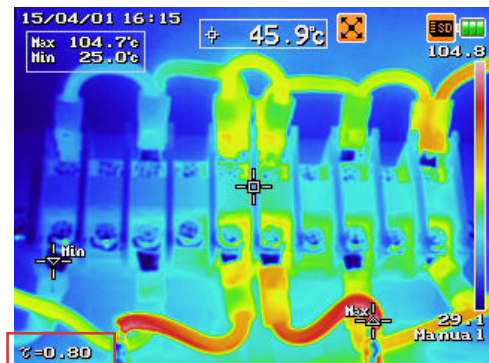
Parameters	
Emissivity (ε)	0.80
Emissivity Table	
Reflected Temp (RT)	24.9%
Object Distance (OD)	1m
Ambient Temp (AT)	25%
Humidity (Hum)	50%
Transmission (τ)	0.80

Push left/right to move the indicator.

Push up/down to increase/decrease the digits.



3



Transmissivity parameter indicator

To display the parameter indicator, refer to “Configure the display items” on page 112.

3 Data Management and System-Related Functions

Data Management Controls	96
System-Related Settings	107

This chapter guides you on how to configure data and system settings for the U5850 Series True/R Thermal Imager.

Data Management Controls

These controls allow you to log images, check the memory status, manage your image folders, and format the SD memory card.

Perform image logging

You can log IR, visible, or fusion images at defined intervals. During logging, folders are automatically created in the SD memory card to store the images. The folder created at the first logging interval will be named LOG_0001, then LOG_0002 at the next interval, and will increase subsequently.

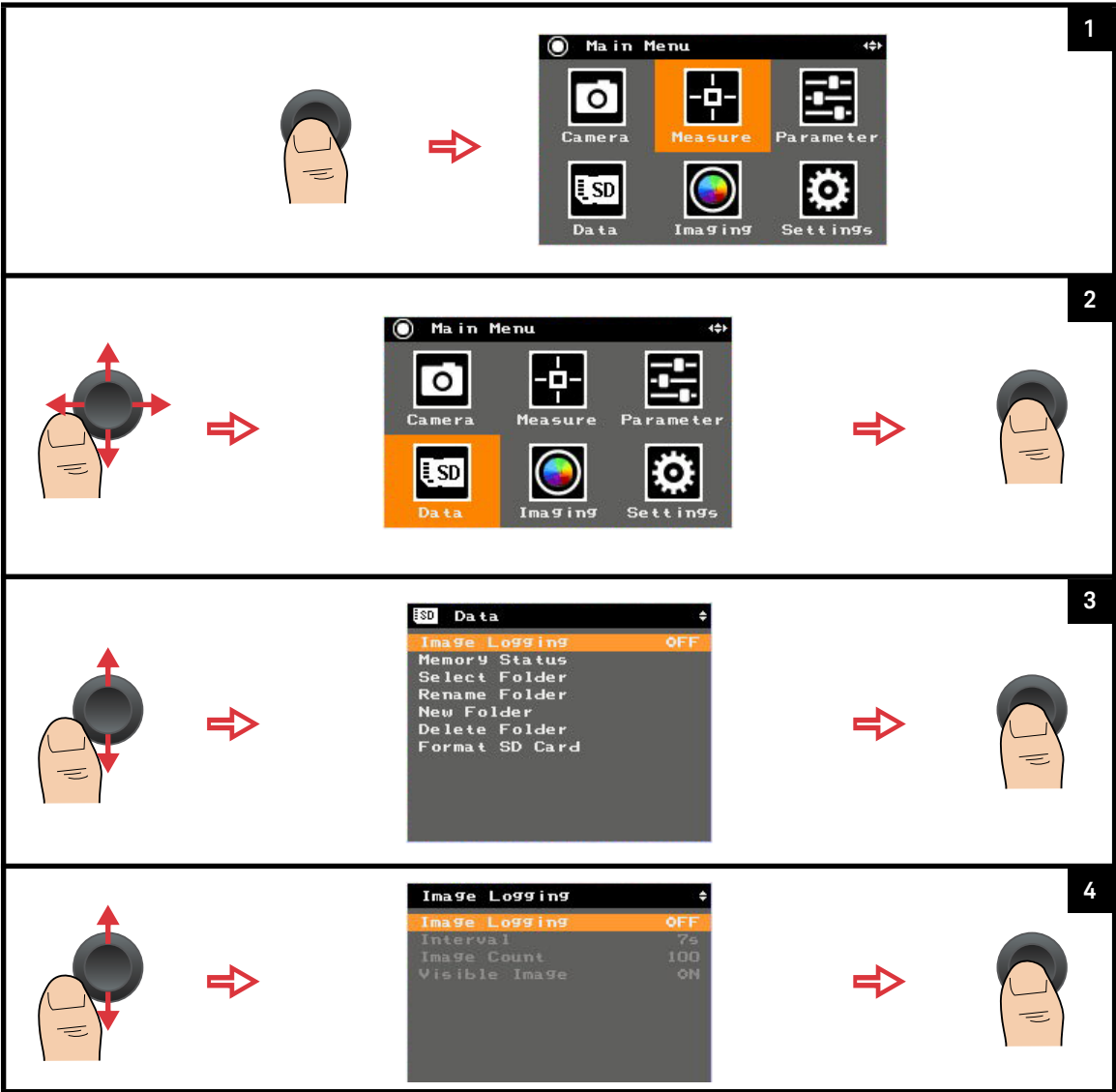
NOTE

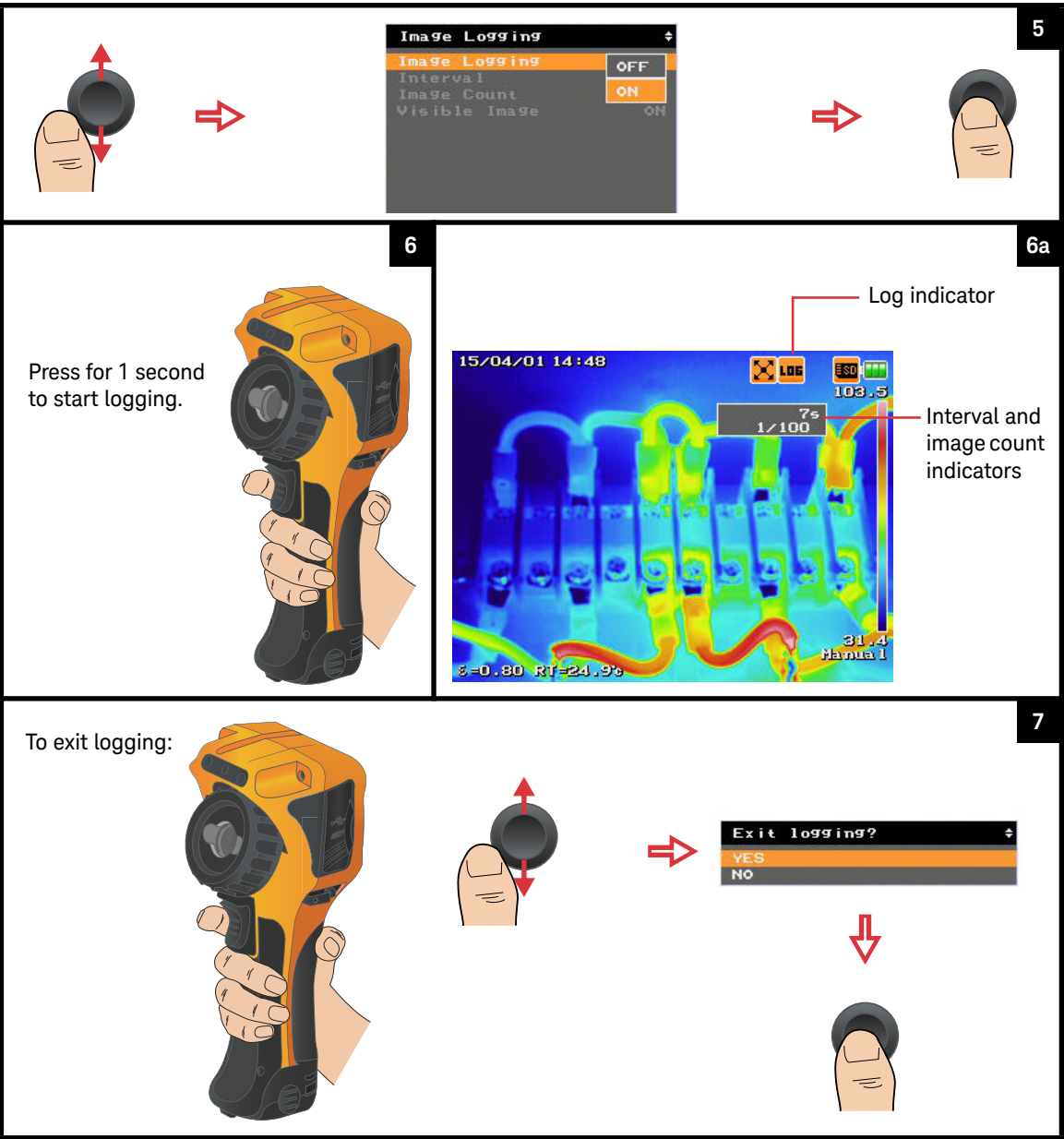
All functions are not accessible during image logging.

CAUTION

Do not perform image logging on objects with extremely high temperature over a long period of time to avoid damage to the infrared detector.

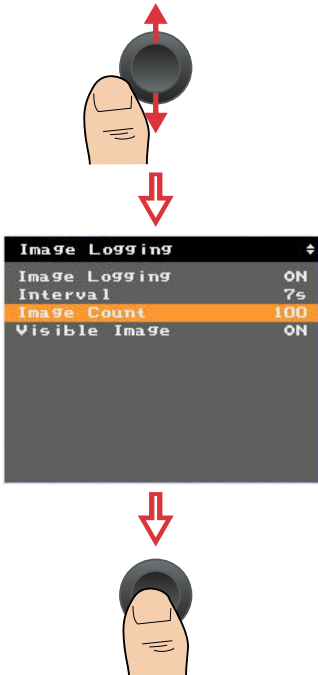
Enable/Disable image logging





Set the image count

1

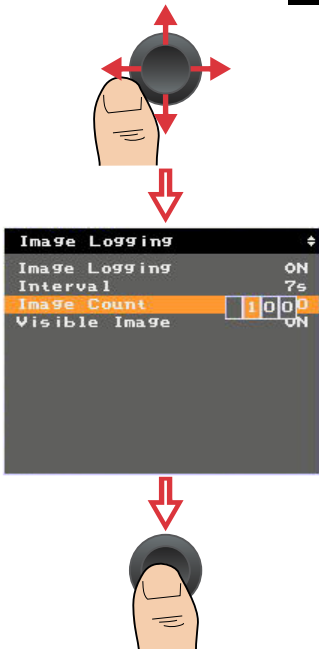


The diagram shows a hand pressing the center of a rotary knob. Below this, a screen displays the 'Image Logging' menu. The menu items are: 'Image Logging' (ON), 'Interval' (7s), 'Image Count' (100), and 'Visible Image' (ON). The 'Image Count' item is highlighted in orange.

2



Enter a value from **1 to 1000**:

Push left/right to move the indicator.
Push up/down to increase/decrease the digits.




The diagram shows a hand pressing the outer ring of a rotary knob. Below this, a screen displays the 'Image Count' field with a numeric keypad overlay. The keypad shows the number '1000' entered. The 'Image Count' item is highlighted in orange.


Enable/Disable logging of visible images



1

Image Logging	
Image Logging	ON
Interval	7s
Image Count	100
Visible Image	ON







2

Image Logging	
Image Logging	ON
Interval	7s
Image Count	100
Visible Image	OFF
	ON





View the memory status of the SD memory card

Follow steps 1 to 2 from “Enable/Disable image logging” on page 97.



SD Data	
Image Logging	OFF
Memory Status	
Select Folder	
Rename Folder	
New Folder	
Delete Folder	
Format SD Card	

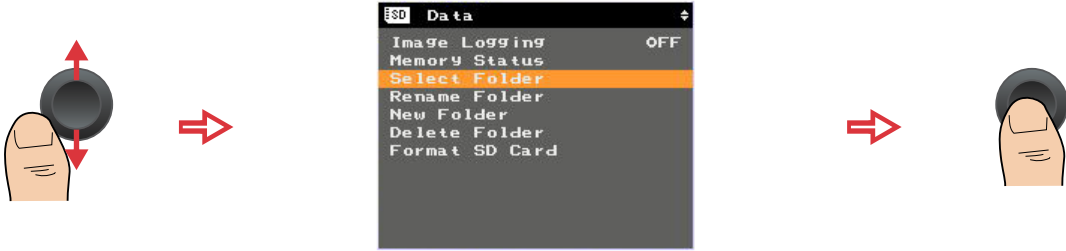


Manage image folders

You can create a new image folder or select, rename, or delete an existing folder for your image saving purposes.

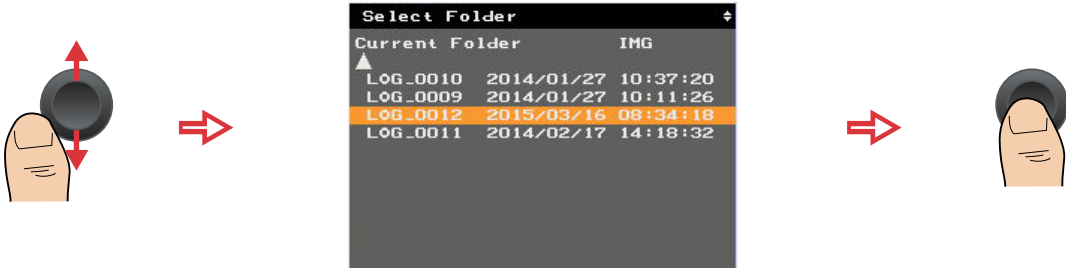
Select a folder

Follow steps 1 to 2 from “Enable/Disable image logging” on page 97.



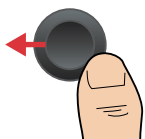
1

Select an existing folder to use:




2

To return to the previous folder list display:


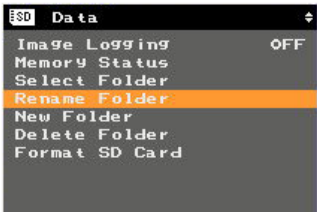


To return to the Data menu:



Rename a folder


1

ESD Data


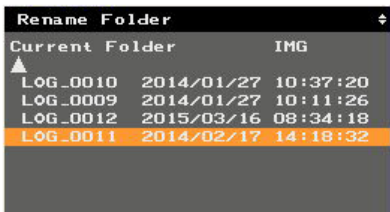
- Image Logging OFF
- Memory Status
- Select Folder
- Rename Folder**
- New Folder
- Delete Folder
- Format SD Card

⇒



2

Select an existing folder to rename:





Rename Folder

Current Folder IMG

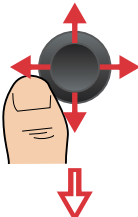

LOG_0010	2014/01/27	10:37:20
LOG_0009	2014/01/27	10:11:26
LOG_0012	2015/03/16	08:34:18
LOG_0011	2014/02/17	14:18:32

⇒



3

Push left/right to move the indicator.
Push up/down to increase/decrease the digits.





Rename Folder

Current Folder IMG

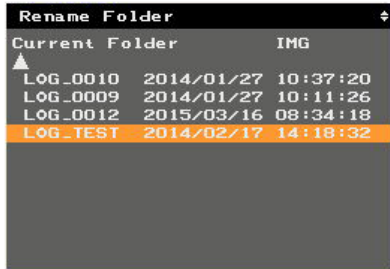
Folder Name LOG TEST

↓



4

The new folder name will be reflected in the list:




Rename Folder


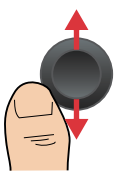
Current Folder IMG


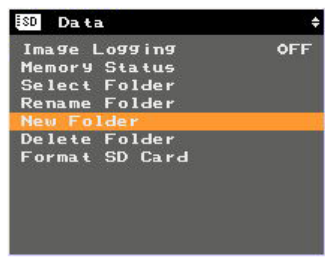
LOG_0010	2014/01/27	10:37:20
LOG_0009	2014/01/27	10:11:26
LOG_0012	2015/03/16	08:34:18
LOG_TEST	2014/02/17	14:18:32


⇒


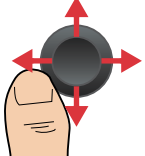




Create a new folder















Push left/right to move the indicator.

Push up/down to increase/decrease the digits.



This will lead you to add another new folder.

To exit,



You can view the new folders under the Select Folder menu.

Delete a folder



SD Data

Image Logging OFF

Memory Status



Select Folder

Rename Folder

New Folder



Delete Folder

Format SD Card



1

Select an existing folder to delete:



Delete Folder

Current Folder IMG



LOG_0010 2014/01/27 10:37:20

LOG_0009 2014/01/27 10:11:26



LOG_0012 2015/03/16 08:34:18

LOG_TEST 2014/02/17 14:18:32

100IMAGE 2015/03/16 09:41:14




2



Delete selected folder?

YES

NO

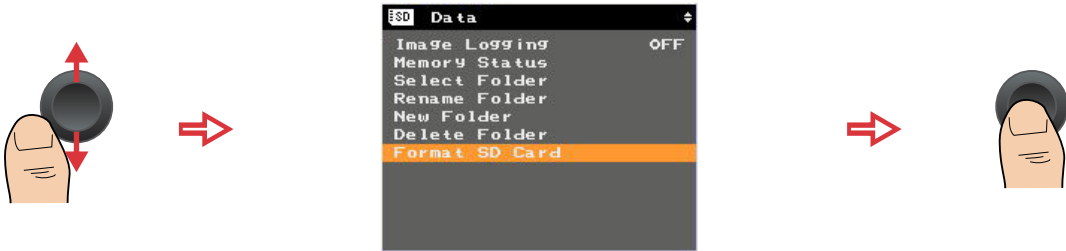


3

Format the SD memory card

Follow steps 1 to 2 from **“Enable/Disable image logging”** on page 97.


1



The diagram illustrates the first step of the process. On the left, a finger is shown pressing the up/down arrow key on the left side of the device. A red arrow points to the right, leading to a screenshot of the 'Data' menu. The menu options are: Image Logging (OFF), Memory Status, Select Folder, Rename Folder, New Folder, Delete Folder, and Format SD Card (highlighted). Another red arrow points to the right, where a finger is shown pressing the right arrow key on the right side of the device.

Select **YES** to proceed and return to the Data menu once completed.

2





The diagram illustrates the second step of the process. On the left, a finger is shown pressing the up/down arrow key on the left side of the device. A red arrow points to the right, leading to a screenshot of the 'Format SD card?' prompt. The prompt has two options: YES (highlighted) and NO. Another red arrow points to the right, where a finger is shown pressing the right arrow key on the right side of the device.

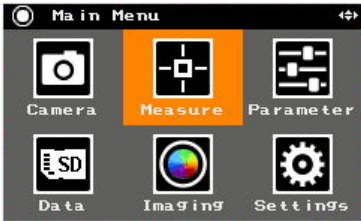
System-Related Settings

These settings allow you to make general system configurations for the U5850 Series.


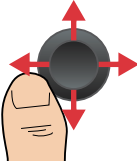
Configure the Quick Start Tutorial


Display the tutorial









1










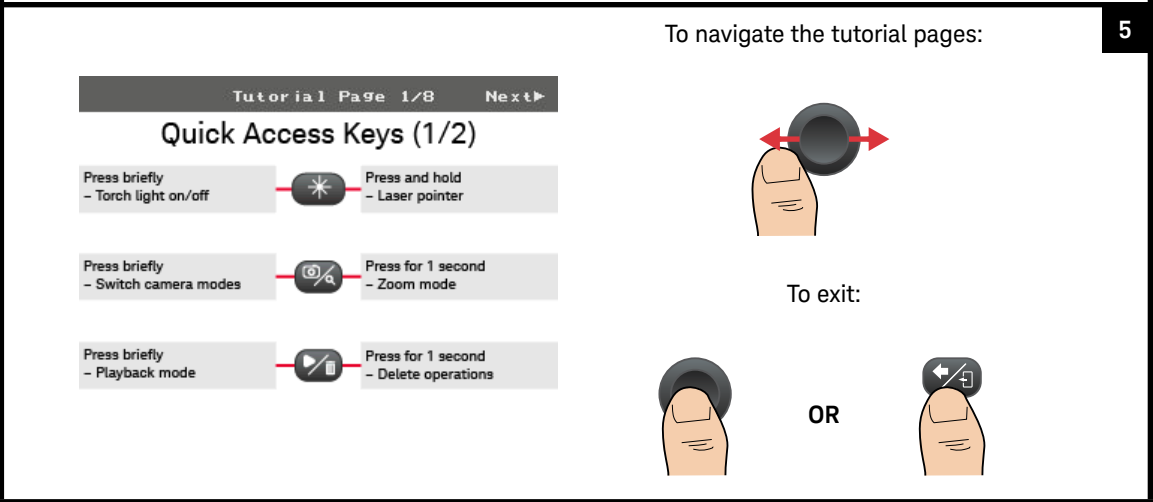
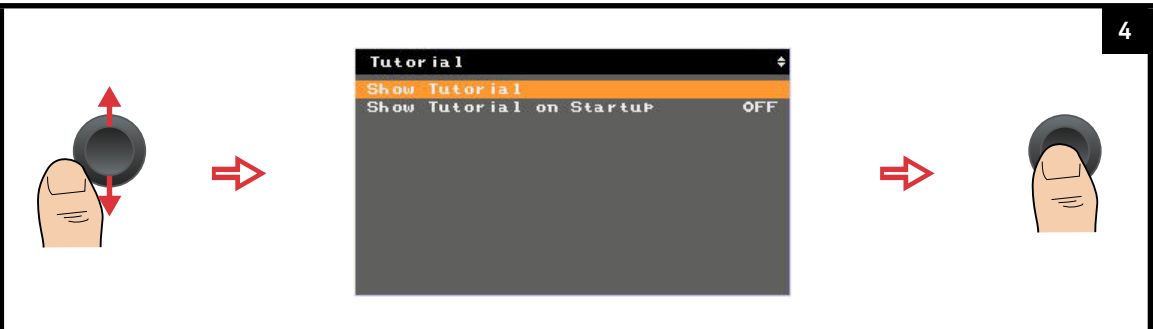
2



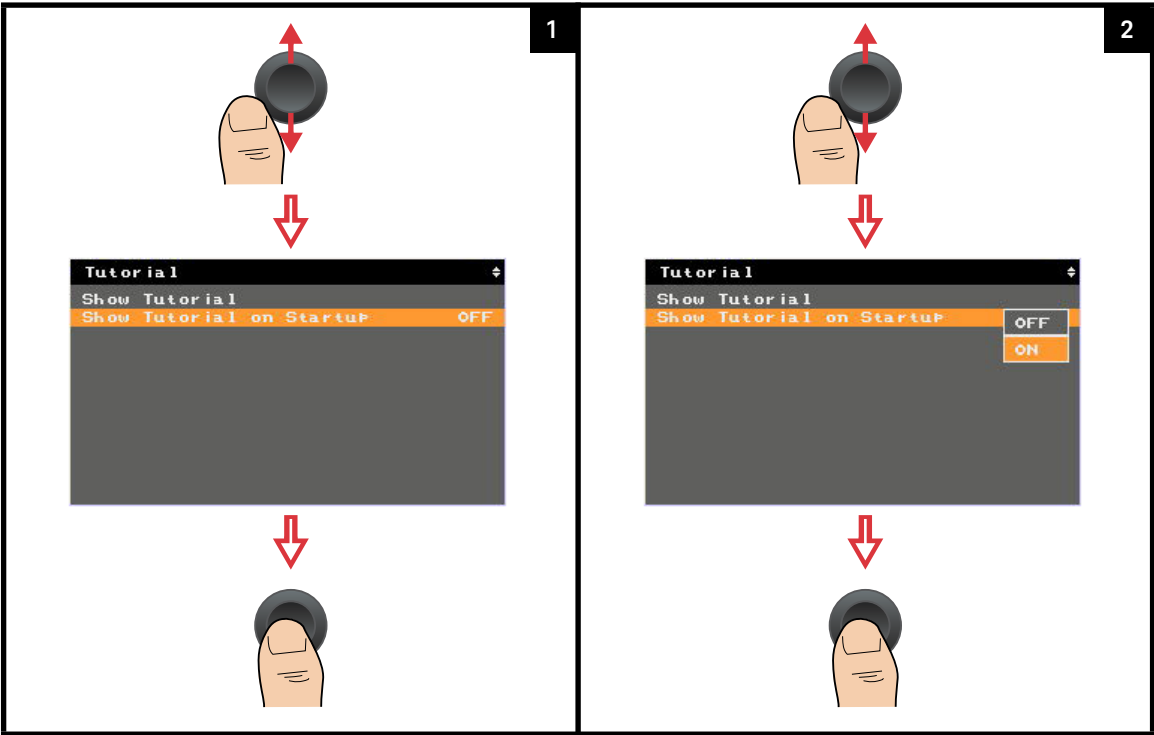




3




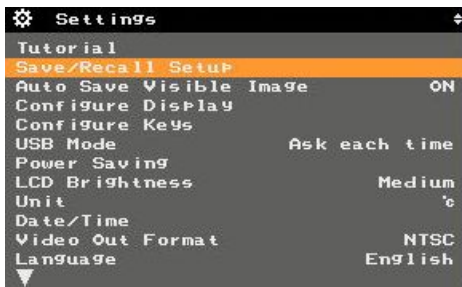
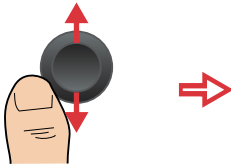
Enable/Disable the tutorial at power-on



Save/recall instrument setups


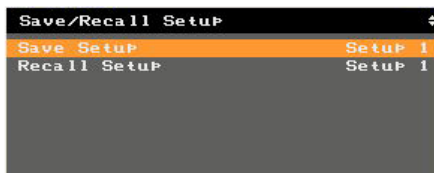
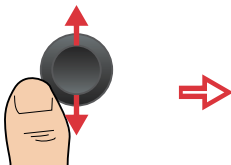
You can save up to three instrument setups at a time into the SD memory card, and recall a setup to use. If there is an existing saved setup and you perform a save for the current setup, the existing setup will be overwritten.

Follow steps 1 to 2 from “Display the tutorial” on page 107.




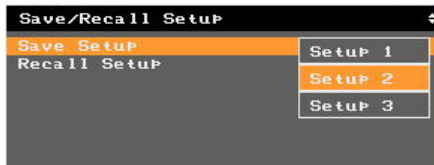
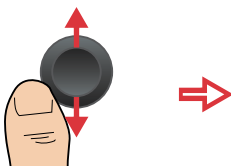
1

Select **Save Setup** or **Recall Setup**:



2

Select a setup storage to save/recall:



3

Turn on/off visible image auto-save

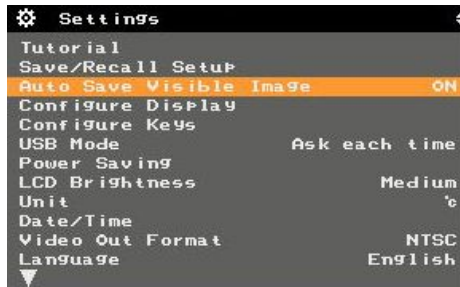
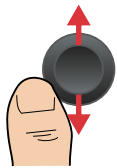
If you enable auto-save for visible images, both the IR and visible images will be saved. If disabled, only the IR image will be saved.

NOTE

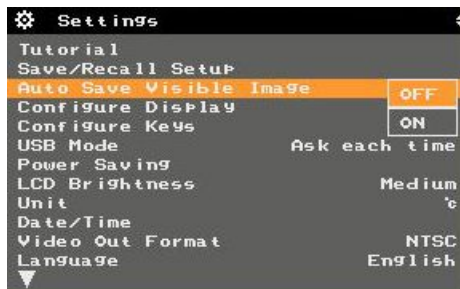
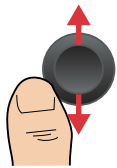
This is only applicable for the IR camera mode. Visible images will always be auto saved in the Visible Camera, Picture in Picture, and Blend modes.

Follow steps 1 to 2 from “Display the tutorial” on page 107.

1



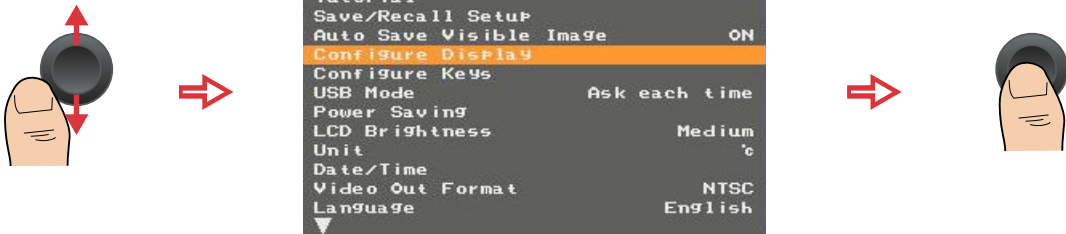
2



Configure the display items


You can set the items that you want to display on the screen.

Follow steps 1 to 2 from “Display the tutorial” on page 107.

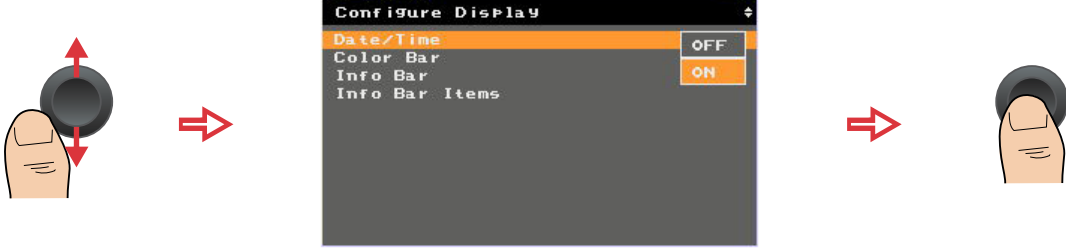


1

Select **Date/Time**, **Color Bar**, or **Info Bar**:





2



3

To select the info bar items to display:

4





Configure Display

Date/Time ON

Color Bar ON



Info Bar ON

Info Bar Items



Select the items (only the first four items selected will be displayed):

5



Configure Display

Date/Time ON

Color Bar ON

Info Bar

Info Bar Items

☒ E



☒ RT

☒ OD

☐ AT

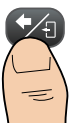
☐ Hum

☐ C



Toggle to check/uncheck

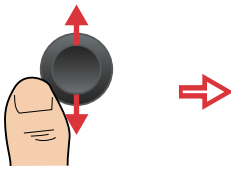
To confirm and exit:



Configure the main key press functions

You can set the default functions for the Camera Trigger, Camera/Zoom, and Play/Delete key presses.

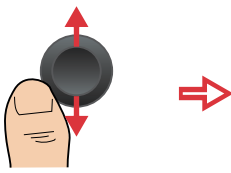
Follow steps 1 to 2 from “Display the tutorial” on page 107.



Settings	
Tutorial	
Save/Recall Setup	
Auto Save Visible Image	ON
Configure Display	
Configure Keys	
USB Mode	Ask each time
Power Saving	
LCD Brightness	Medium
Unit	°C
Date/Time	
Video Out Format	NTSC
Language	English

1

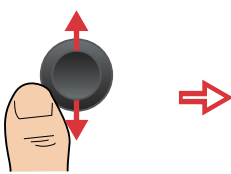
Select **Trigger/Camera/Playback**:



Configure Keys	
Trigger	Preview/Save
Camera	
Playback	Full Screen/Thumbnail

2

For example, if you select **Trigger**, you can set to preview and save the image, preview the image only, or save an image directly when you press the key:



Configure Keys	
Trigger	Preview/Save
Camera	
Playback	Full
	Preview Only
	Direct Save

3

Set the USB mode

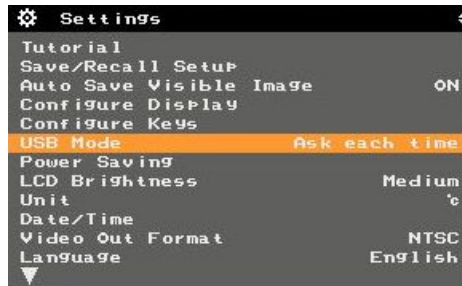
You can set the USB mode to allow mass storage or data streaming when you connect the U5850 Series to the PC using the USB cable. The default selection is Ask each time. If Ask each time is selected, you will be prompted to select between mass storage or data streaming upon the start-up of the U5850 Series. This prompt occurs when you connect the U5850 Series to the PC using the USB cable.

NOTE

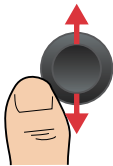
Do not press any keys on the U5850 Series True/IR Thermal Imager when you are connecting its USB cable to the PC and launching the Keysight True/IR Analysis and Reporting Tool software.

Follow steps 1 to 2 from “Display the tutorial” on page 107.

1



2



Data streaming mode

Data streaming mode allows you to stream, capture, and record live IR images using the Keysight True/R Analysis and Reporting Tool software from your PC.



Data streaming indicator

Set the power saving mode

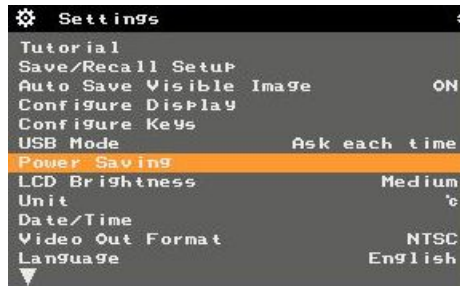
You can enable/disable auto sleep or auto power-off, and change the timer period of these functions.

NOTE

- It is recommended to remove the battery from the U5850 Series when not in use.
- Auto sleep and auto power-off functions are disabled during image logging.

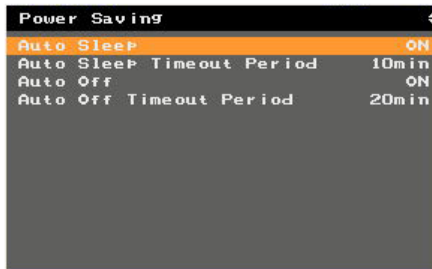
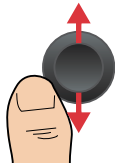
Follow steps 1 to 2 from “Display the tutorial” on page 107.

1



Select Auto Sleep or Auto Off:

2

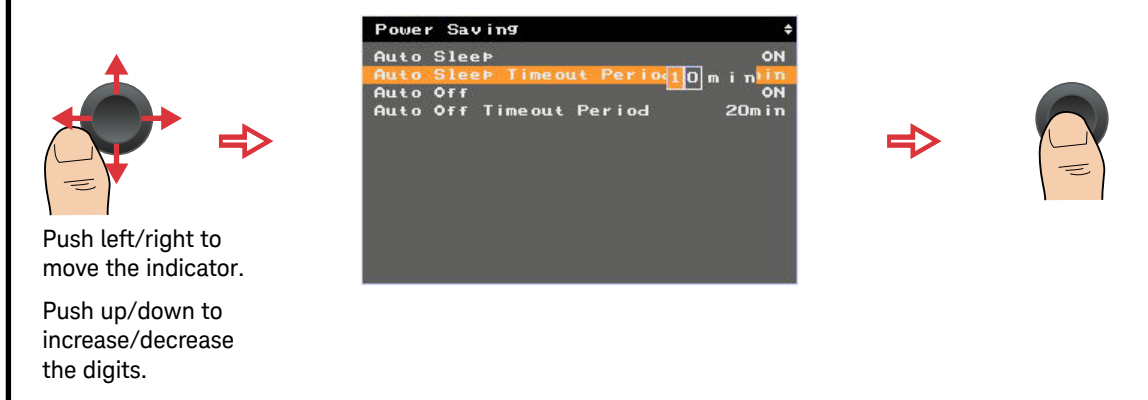




To set the auto sleep or auto power-off timer, select **Auto Sleep Timeout Period** or **Auto Off Timeout Period**:

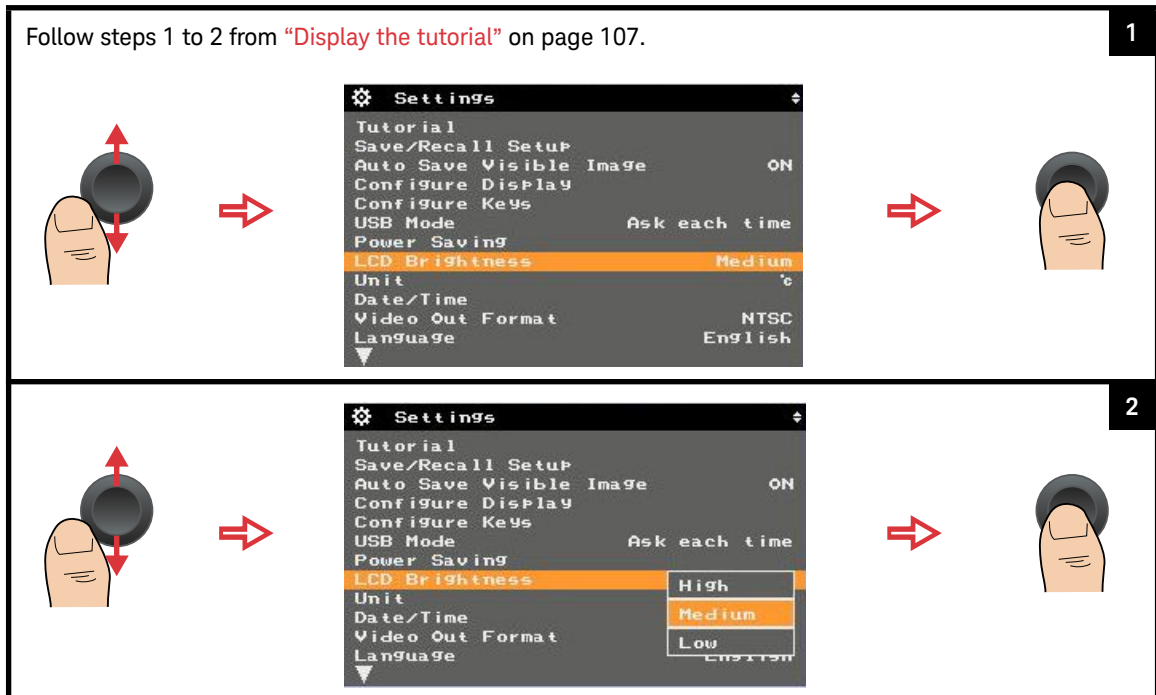


- Auto Sleep: 1 to 15 mins (10 mins by default)
- Auto Off: 5 to 60 mins (20 mins by default)



Set the LCD brightness

If viewing the display becomes difficult in certain conditions, you can adjust the LCD brightness to high, medium, or low.



Set the temperature unit (°C or °F)

Refer to “Set up the U5850 Series” on page 27.

Set the date and time

Refer to “Set up the U5850 Series” on page 27.

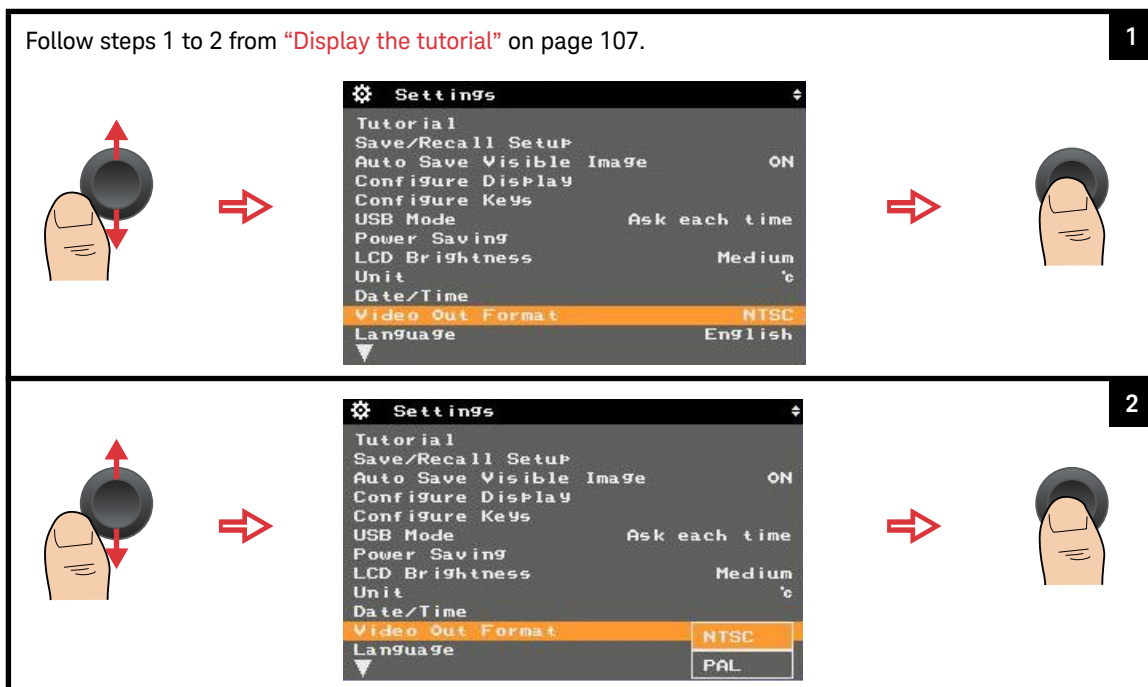
Set the video out format

You can set the video out format to NTSC or PAL when you connect the U5850 Series to an external monitor.

NOTE

- The PAL and NTSC formats are full resolution screen videos. Hence, if a TV/projector/monitor screen is truncated, switch its OVERSCAN function to OFF.
- Video out is disabled in the power-saving mode.

Follow steps 1 to 2 from “Display the tutorial” on page 107.



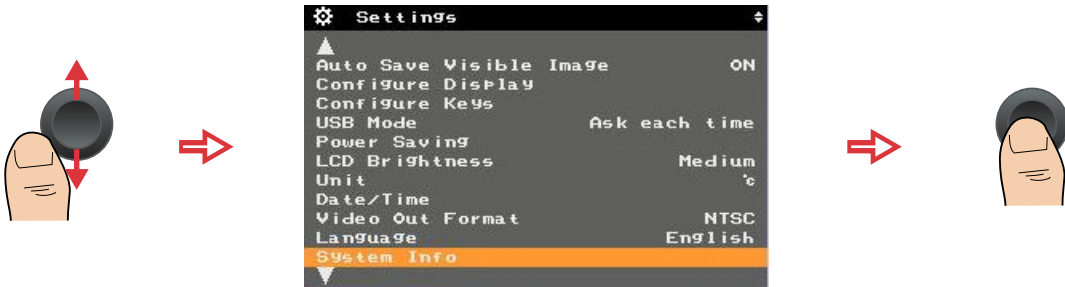
Set the language

Refer to “Set up the U5850 Series” on page 27.

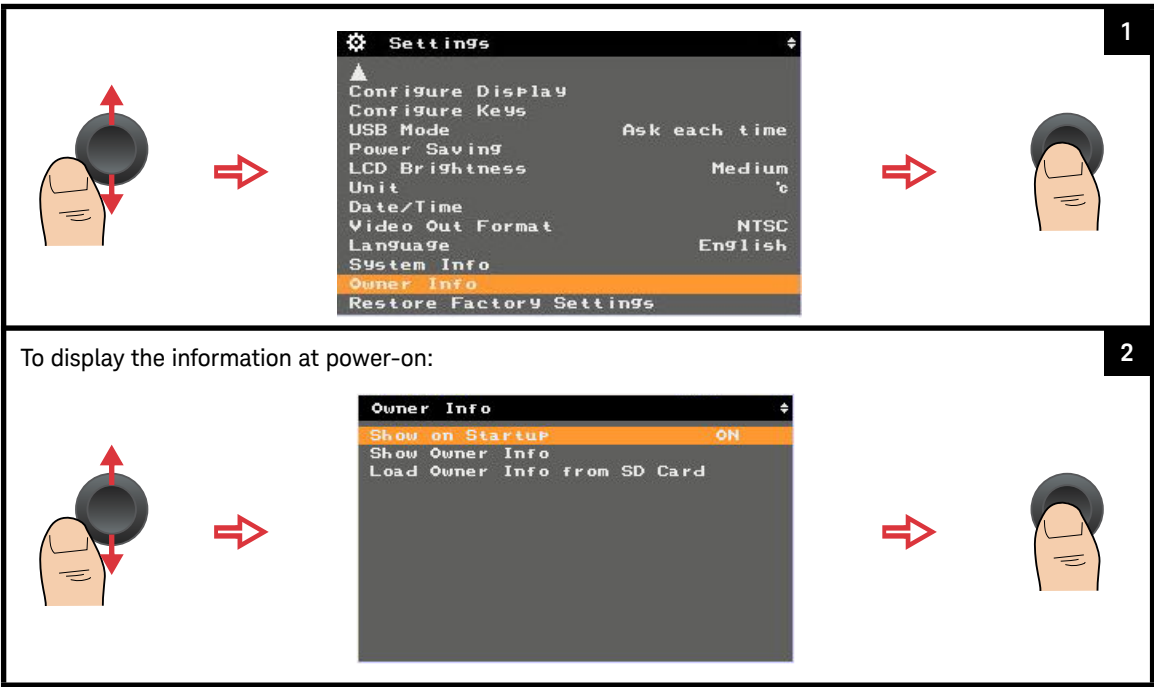
Display the system and owner information

Display the system information

Follow steps 1 to 2 from “Display the tutorial” on page 107.



Display the owner information





Add the owner information from a template file

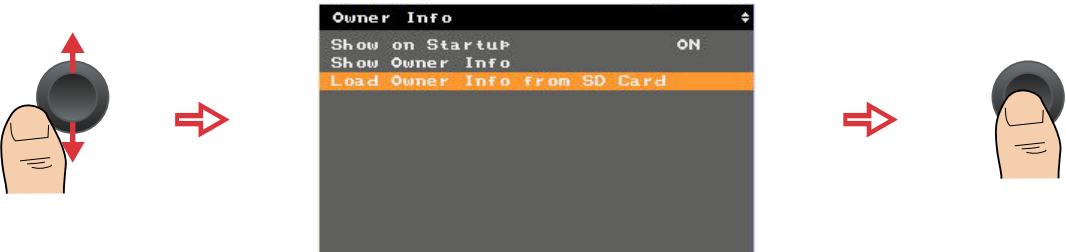
You can download the owner information template file from the Keysight website to the SD memory card.

To ensure proper use of this template file, use the following guidelines:

- File name and extension: OWNERINF.TXT
- File format: Text file/Notepad
- File location: Root of the SD memory card
- Character code: ASCII (20h to 7Fh)
- Maximum line: 8 lines
- Maximum characters per line: 18 characters


When you load the owner information from the template file, the contents of the file are read and registered with the U5850 Series memory.

To view the owner information:



1

Select **YES** to load the info file and return to the Owner Info menu:




2

If the info file does not exist on the SD memory card, an error message is

Reset the U5850 Series to factory default settings

Follow steps 1 to 2 from “Display the tutorial” on page 107.


1



The diagram for Step 1 shows a hand turning a knob upwards, indicated by a red arrow. This action leads to the 'Settings' menu, which lists various system options. The option 'Restore Factory Settings' is highlighted at the bottom of the list. A second red arrow indicates the hand turning the knob downwards.

Settings	
Configure Display	
Configure Keys	
USB Mode	Ask each time
Power Saving	
LCD Brightness	Medium
Unit	°C
Date/Time	
Video Out Format	NTSC
Language	English
System Info	
Owner Info	
Restore Factory Settings	

2



The diagram for Step 2 shows a hand turning a knob upwards, indicated by a red arrow. This action leads to a confirmation dialog box that asks 'Restore factory settings?'. The 'YES' option is highlighted. A second red arrow indicates the hand turning the knob downwards.

Restore factory settings?
YES
NO

4 Characteristics and Specifications

For the characteristics and specifications of the U5850 Series True/R Thermal Imager, refer to the data sheet at <http://literature.cdn.keysight.com/litweb/pdf/5991-4297EN.pdf>.

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This information is subject to change without notice. Always refer to the Keysight website for the latest revision.

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