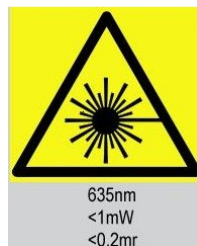
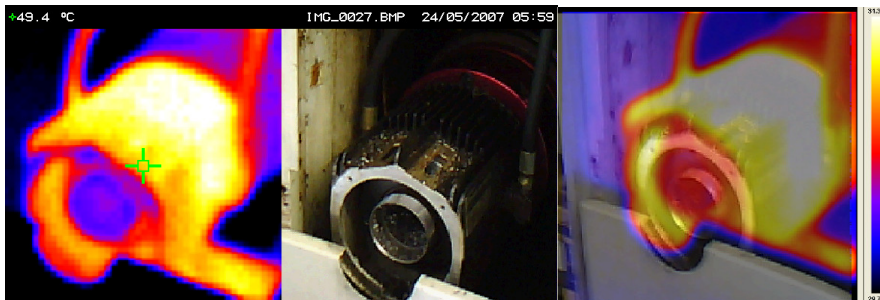


IRI2010 Thermal Imaging Camera Frequently Asked Questions



InfraRed Integrated Systems Ltd
 Park Circle, Tithe Barn Way, Swan Valley, Northampton, NN4 9BG, UK
 Tel: +44 (0) 1604 594200 Fax: +44 (0) 1604 594210
 Email: support@irisys.co.uk www.irisys.co.uk




© 2009 InfraRed Integrated Systems Limited (Irisys). No part of this publication may be reproduced without prior permission in writing from Irisys. Whilst Irisys will endeavor to ensure that any data contained in this product information is correct, Irisys do not warrant its accuracy or accept liability for any reliance on it. Irisys reserve the right to change the specification of the products and descriptions in this publication without notice. Prior to ordering products please check with Irisys for current specification details. All brands and product names are acknowledged and may be trademarks or registered trademarks of their respective holders.

Contents

Page

1. What Temperature Measurement Options are there?.....	3
2.   How do I select and move cursors?	3
3.  What is area analysis?	4
4.  What is Tracking?.....	5
5.   What are Isotherms and how do I select them?	6
6.   Why use Auto/Manual temperature range and span adjustment?	7
7.   What is a temperature profile?	8
8.   How do I turn the visible camera on and off?.....	9
9.   How do I blend thermal and visible images?.....	10
10.  How do I align the thermal and visible images?.....	11
11.   How does illumination work?	12
12. How do I save an image?.....	13
13.  How does the voice and text caption recording work?	14
14.   How do I set alarms?.....	16
15.  How do I change the screen colours?	17
16. What is Emissivity?	18
17. What is Reflected Temperature?	19
18. What is Integration used for?	20
19. Do I need to turn Interpolation off?.....	21
20. Can I reduce camera battery power consumption and how?	22
21. What does camera reset do?	23

1. What Temperature Measurement Options are there?

1. One  or two   measurement cursors. (see q 2).
2. Area analysis (see q 3).
3. Tracking Hot, or Cold, or both Hot and Cold (see q 4).
4. Isotherms (see q 5).

The first three options are mutually exclusive and only one of the options can be selected at any one time.

2. How do I select and move cursors?

There is a choice of one or two cursors. The temperature measurement value of the selected cursor(s) is shown at the top of the screen. When two cursors are selected the temperature difference between them is also displayed. See Fig 4.

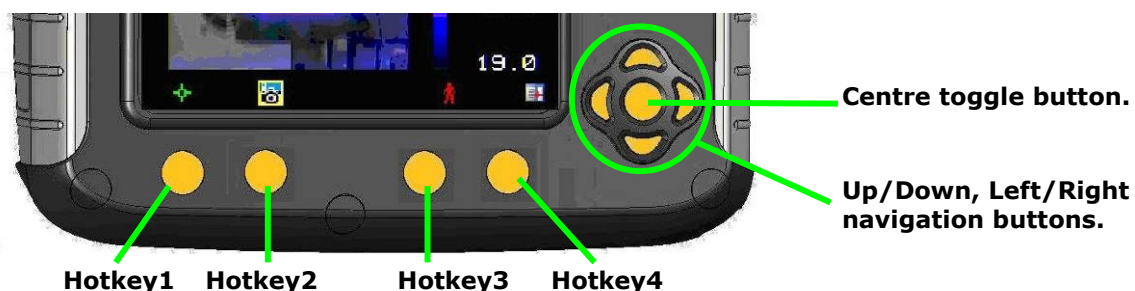












Fig 1.

1. Select the cursor by pressing Hotkey 1  (Fig 1).
2. Move the cursor using the navigation buttons . The cursor can be moved in both live and frozen images
3. To select between one  or two  cursors press Hotkey 4  to select the menu (Fig 1).
4. Using the left/right navigation buttons  move to the Measurement Options menu  (See Fig 2) and Press Hotkey 3  to select it (Fig 3).
5. The cursors option will be highlighted.
6. Use the left/right navigation buttons  to toggle between one or two cursors.
7. Press Hotkey 4  to exit (Fig 4).

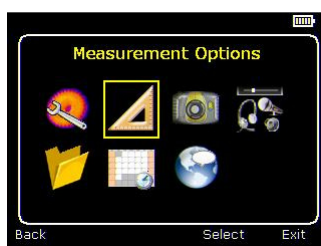


Fig 2

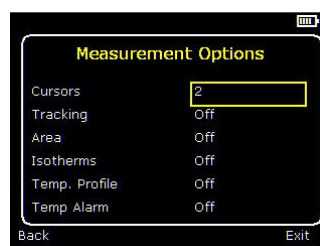


Fig 3

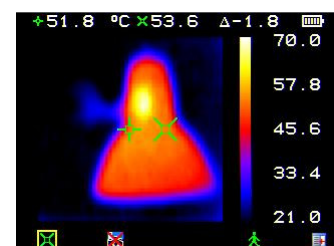












Fig 4

3. What is area analysis?

Area Analysis is used to measure the maximum, minimum, and average temperature within a defined region of the scene. There are three area sizes to choose from.

1. Press Hotkey 4  to select the menu (Fig 1).
2. Using the left/right navigation buttons  move to the Measurement Options menu  (See Fig 2) and Press Hotkey 3  to select it (Fig 3).
3. Use the up/down navigation buttons  to move to the Area option.
4. Use the left/right navigation buttons  to toggle between On and Off.
5. Press Hotkey 4  to exit.
6. Use Hotkey 1  to toggle through until the area size icon appears .
7. Use the navigation buttons  to select the different area sizes. (Figs 4 to 6).

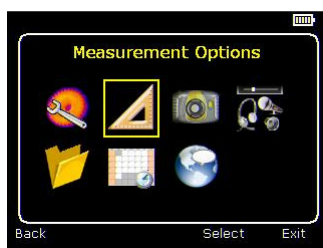
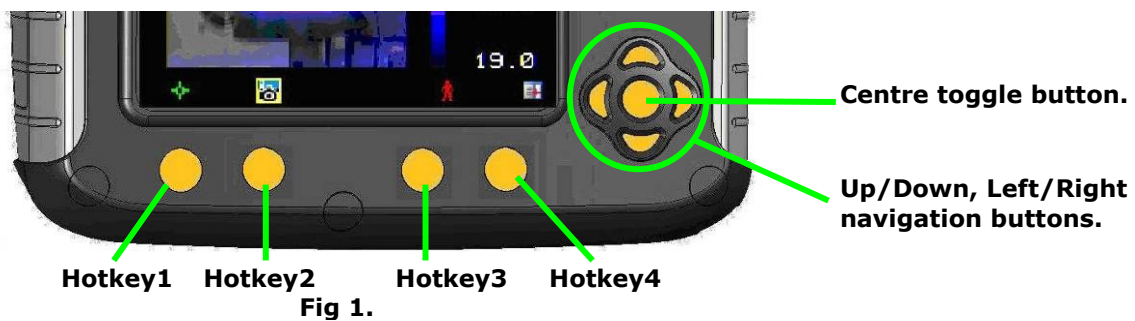


Fig 2

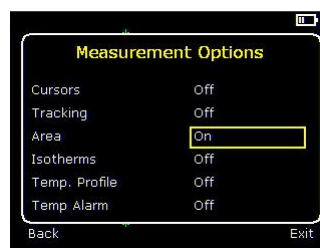


Fig 3

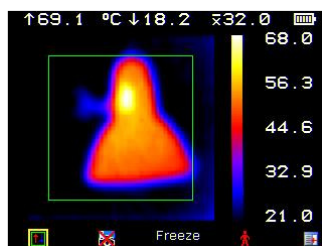


Fig 4

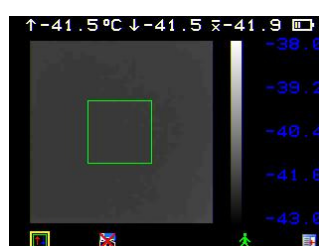


Fig 5




Fig 6

4. What is Tracking?

Tracking gives the choice of locating the following:-

- ❖ The hottest part of the scene.
- ❖ The coldest part of the scene.
- ❖ Both the hottest and coldest parts of the scene.

How do I set tracking .

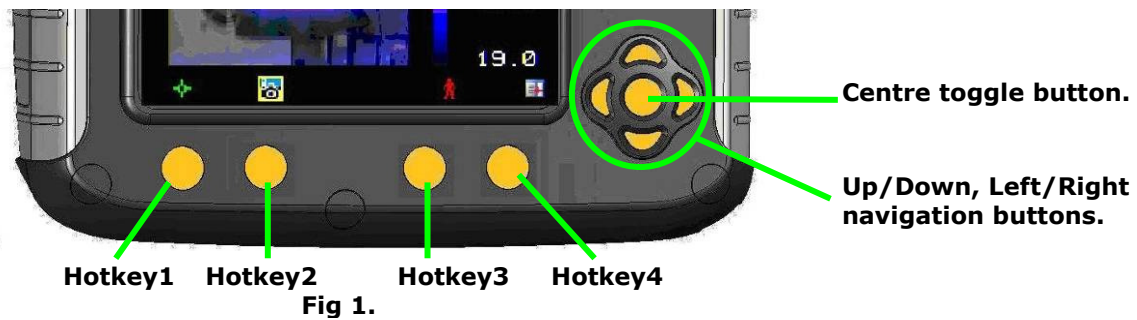


Fig 1.

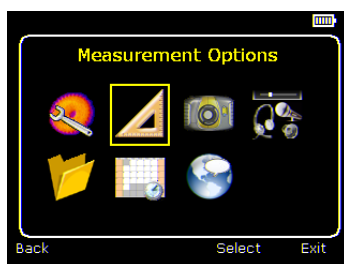


FIG 2

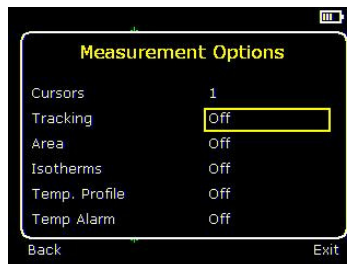









FIG 3



FIG 4

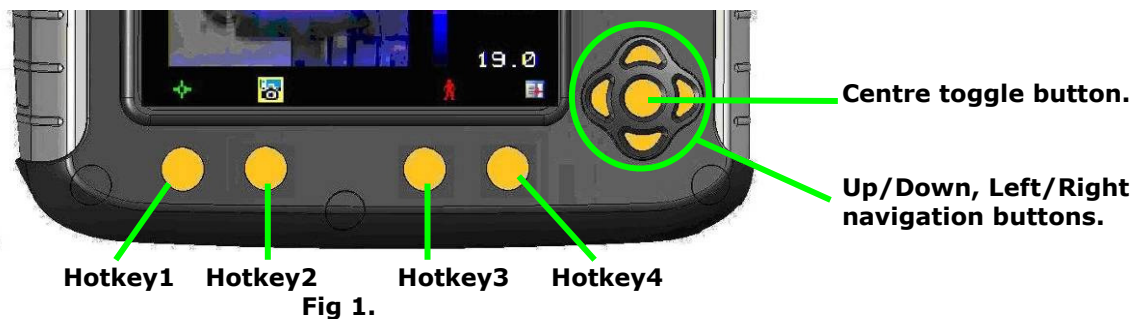












FIG 5

1. Press Hotkey 4  to select the menu (Fig 1).
2. Using the left/right navigation buttons  move to the Measurement Options menu  (See Fig 2) and Press Hotkey 3  to select it (Fig 3).
3. Use the up/down navigation buttons  to highlight the tracking option (Fig 3).
4. Use the left/right navigation buttons  to toggle between "Off", "High", "Low", and "High & Low" options.
5. Press Hotkey 4  to exit (Fig 4).

5. What are Isotherms and how do I select them?

Isotherms are regions within the scene having the same temperature range which are shown in the same colour. This is best seen using either the White Hot or Black Hot palettes. For example it can be useful to see all electrical connections in a electrical cabinet that are within the same, user defined, temperature range. This could very easily identify all components that may be overheating.



1. Press Hotkey 4  to select the menu (Fig 1).
2. Use the left/right navigation buttons  to move to the Measurement Options menu  (See Fig 2) and Press Hotkey 3  to select it (Fig 3).
3. Use the up/down navigation buttons  to move to the Isotherms option (Fig. 3).
4. Use the left/right navigation buttons  to toggle through the Isotherms options- "High", "Low", "High & Low", and "Off".
5. Press Hotkey 4  to exit.
6. Press Hotkey 1  to toggle through until the isotherm icons appear. 
7. Use the left/right navigation buttons  to adjust the isotherm range and span (Fig 4).

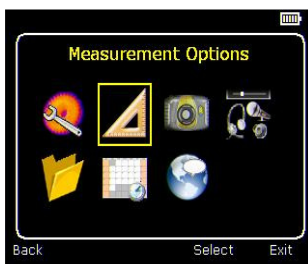


FIG 2

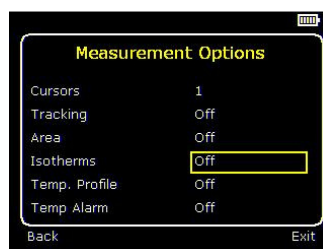


FIG 3



FIG 4

6. Why use Auto/Manual temperature range and span adjustment?

Auto.

Automatically adjusts the image to allow for the highest and lowest temperature in the scene. Useful when starting the camera to be able to view images quickly and to be able to view the full range of temperatures in the scene.

Manual.

The user defines the range of temperatures to be displayed. Manual setting is useful when the user wants to examine various pieces of similar equipment, or to exclude high or low temperatures of no interest. By having a fixed temperature range any anomalies or discrepancies can be highlighted visually very easily.

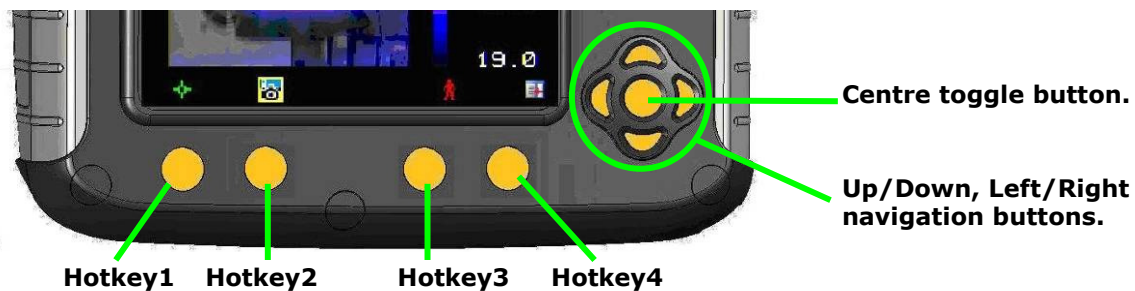









Fig 1.

How to select and use Auto.

Toggle Hotkey 2  until either the auto icon  or the manual icon  appears (Fig 1).

Use the centre toggle button  to toggle between the auto and manual options. As previously stated the auto function will select the correct temperature range for the scene that is viewed. (See Fig 2).

How to select and use Manual.

Toggle Hotkey 2  until either the auto icon  or the manual icon  appears (Fig 1).

Use the centre toggle button  to toggle between the auto and manual options. With the



manual  function selected (Fig 3), use the navigation keys  to adjust the temperature range and span.




FIG 2.



FIG 3.

7. What is a temperature profile?

A temperature profile is a histogram showing the temperature values through a cross-section of the scene. The profile is displayed on the right hand side of the screen. The user can choose to display either a profile of a horizontal cross-section or a profile of a vertical cross-section.

How do I set a temperature profile  ?

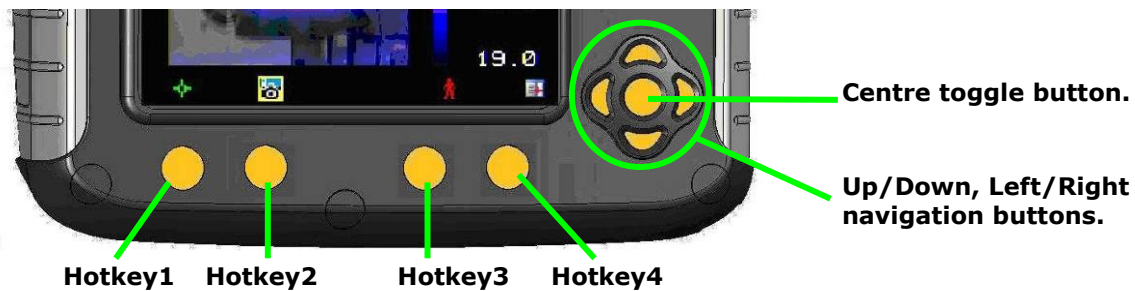











Fig 1.

1. Press Hotkey 4  to select the menu (Fig 1).
2. Using the left/right navigation buttons  move to the Measurement Options menu.  (See Fig 2) and Press Hotkey 3  to select it (Fig 3).
3. Use the up/down navigation buttons  to move to the Temp. Profile option (Fig 3).
4. Use the left/right navigation buttons  to toggle between "Off", "Horizontal", and "Vertical".
5. Press Hotkey 4  to exit (Fig 4).
6. Press Hotkey 1 to select  or  then use the navigation buttons to move the position of the cross section within the image.

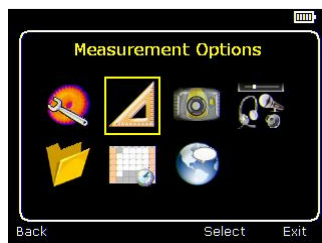


Fig 2

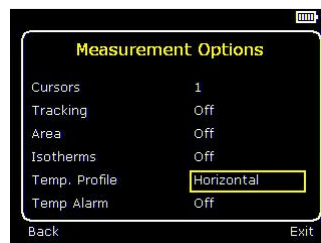


Fig 3

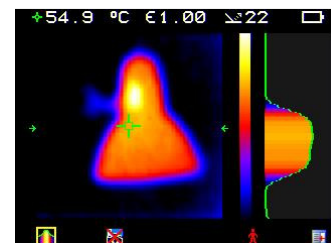








Fig 4

8. How do I turn the visible camera on and off?

1. Press Hotkey 2  to toggle through to the visible camera on/off options   (Fig 1).
2. Press the centre toggle button  to toggle between visible off  and visible on  (See Figs 2 & 3).

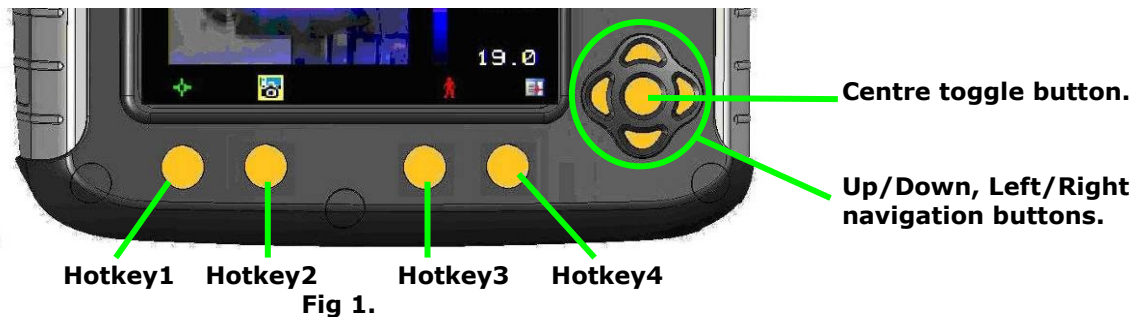


FIG 2

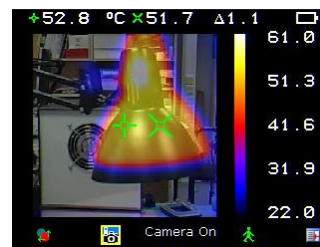


FIG 3

9. How do I blend thermal and visible images?

The user can select to view the scene in:

1. Thermal Only. This is the default when the camera is switched on (Fig 1).
2. Visible only (Fig 2).
3. Or a blend of both. A blend superimposes the thermal image on to a visible image. The extent of the blend is adjustable (Fig 3).

In all of the above choices, all the temperature measurement options are available.

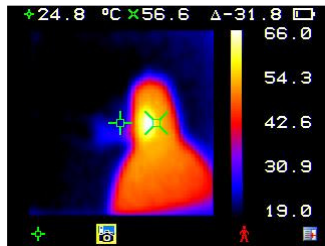


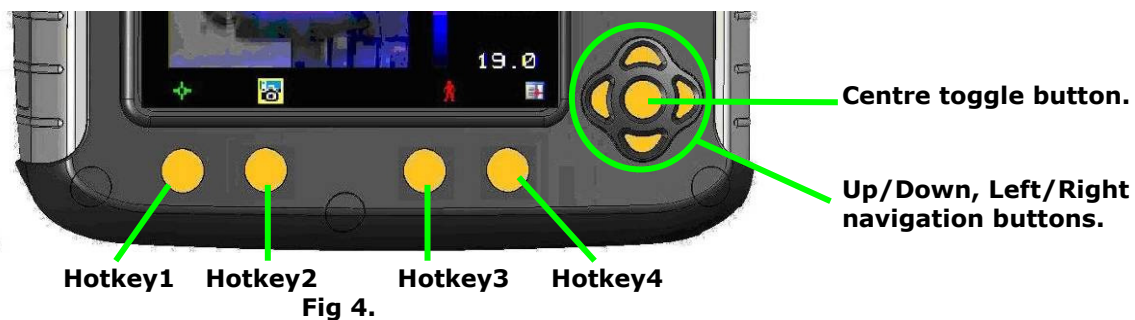
FIG 1
















FIG 2



FIG 3






Blending Thermal and Visible Images

1. Using Hotkey 2  toggle through until either the visible camera on icon  or visible camera off icon  appears. Use the centre toggle button  to toggle between visible off  and visible on  (Fig 4).
2. With the visible camera on, blend between the visible and thermal image by using the navigation keys .
3. This will blend the thermal and visible image on a percentage scale 0%, 25%, 50% 75% and 100%.
4. There is a light which can be turned on  for use in poor lighting conditions. Using Hotkey 2  toggle through until the light on/off  icon appears. Press the centre toggle button  to toggle between light on  and light off .

10. How do I align the thermal and visible images?

As the thermal camera and visible camera are not co-axial, the alignment controls allow the user to align the thermal and visible image. The alignment controls move the visible image.

1. Use Hotkey 1  to toggle through until the alignment icon  appears.
2. Use the navigation keys  to align the thermal and visible images (Fig 1).

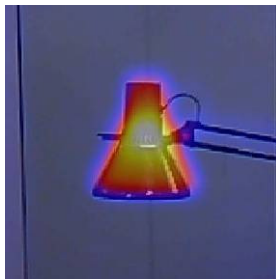
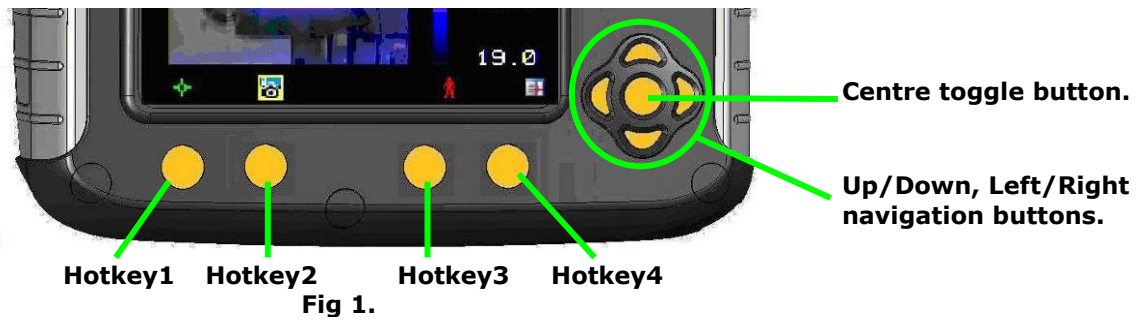


Fig 2 Aligned



Fig 3 Align to the left

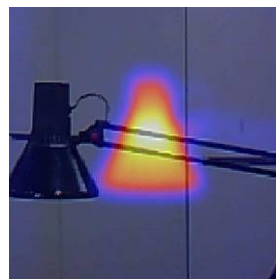


Fig 4 Align to the right



Fig 5 Align up





Fig 6 Align down

Four pre-programmed alignment distances are included. These are at 0.5m, 1m, 2m and 4m ranges. With the alignment option selected by HK1, pressing the toggle button once aligns at 2 metres. Pressing the toggle button again allows you to cycle through to 4m, 0.5m and 1m.

11. How does illumination work?

In poor lighting conditions the illuminator allows the user to see the scene with the visible camera.

How to select the illumination (light)   option?







1. To turn the light on press Hotkey 2  to toggle through until either the light on  (See Fig 2) or light off  icon appears (See Fig 1).
2. Use the centre toggle button  to toggle between light off  and light on .

Fig 3 shows the illuminator at the front of the camera.

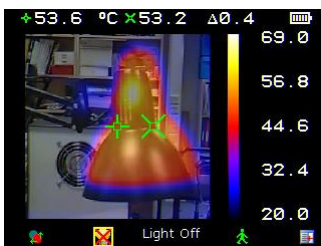


Fig 1

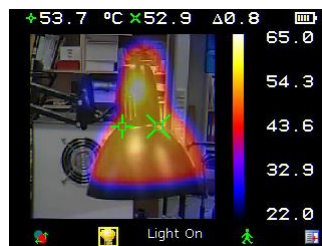


Fig 2



Fig 3

12. How do I save an image?



Fig 1

To save press the save button.












Fig 2

To save either a live or frozen image, press the save button on either the camera or handle (See Fig 1 and Fig 2).

If either individual voice annotation or text caption options are switched on, these can be attached to the saved image. Default is text and voice on.

More details on voice annotation and text caption are in Q 13.

Images are saved on a micro-SD card and may be viewed using the Browser.

1. Press Hotkey 4  to select the menu.
2. Using the up/down navigation buttons  to go to the Browser.  and press Hotkey 3  to select it.
3. Use the navigation keys  to highlight the chosen image.
4. Press Hotkey 3  to select it.
5. Press Hotkey 2  to delete the image and press Hotkey 3  to confirm deletion.
6. Press Hotkey 3  to exit from the browser.

13. How does the voice and text caption recording work?









A saved image can have the following attachments to provide further information about it:

- a. Voice message
- b. Text caption
- c. Both Voice and Text.
- d. Nothing attached.








In addition, in the voice message attachment there are the following options:

- i. Add voice message per image (individual).
- ii. Add the same voice message to a set of images (session).
A session ends when the camera is switched off.
- iii. Add both individual and session voice messages.






Setting Voice Annotation




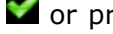






1. Press Hotkey 4  to select the menu.
2. Using the left/right navigation buttons  move to the Audio Settings menu  and press Hotkey 3  to select it.
3. Use the up/down navigation buttons  to move to "Voice Annotation" (Fig 3).
4. Use the left/right navigation buttons  to toggle through "Off", "Individual" or "Session".
5. Select "Individual" to record a separate message for each saved image or "Session" for a set of images.
6. Use the up/down navigation buttons  to go to "Voice Playback" and select "Speaker"  or "Headset".

Setting Caption Mode

1. Press Hotkey 4  to exit or Hotkey 1  to go back to the main menu.
2. In the main menu using the left/right navigation buttons  move to the camera settings menu  and press Hotkey 3  to select it.
3. Use the up/down navigation buttons  to move to "Caption Mode". See Fig 9.
4. Use the left/right navigation buttons  to toggle between "On" and "Off".

Voice and Text Caption entry

1. When saving an image, the option of adding a voice message is selected by pressing Hotkey 3  for yes  or press Hotkey 2  for no . See Fig 4
2. If Yes is selected press hotkey 3  to start the recording. See Fig 5.

3. The message "Recording" appears. Stop recording by pressing hotkey 3 again. Then there is the option to "Play"  the recording, "Re-record" it and then save the voice message. See Figs 6, 7 and 8.
4. After the Voice message recording is completed, there is the option to add a Text Caption if selected. Press Hotkey 3  for yes  or press Hotkey 2  for no . See Fig 10.
5. Enter the text message using the up/down navigation buttons to select characters and  to move to the next character. Use the left/right navigation buttons  to move to the next character. The available symbols are:
ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789
6. Press Hotkey 2  to clear the whole text.
7. Press Hotkey 4  to exit or Hotkey 1  to go back.

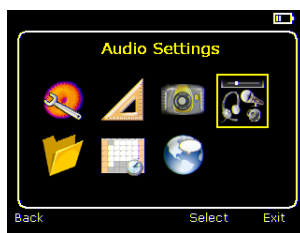


Fig 2



Fig 3

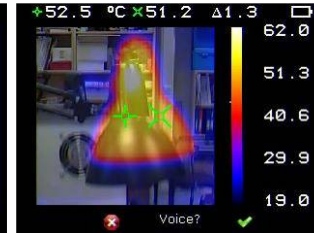


Fig 4

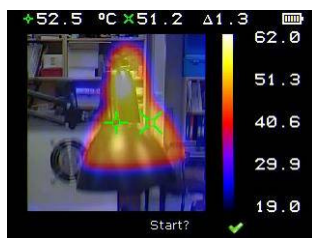


Fig 5

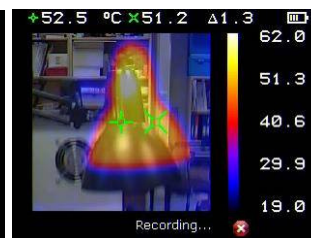


Fig 6

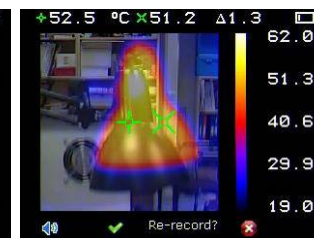


Fig 7

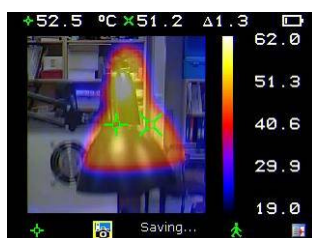


Fig 8

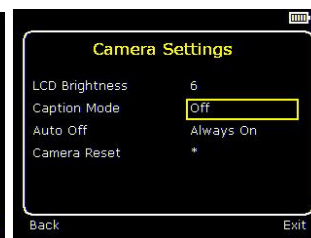


Fig 9

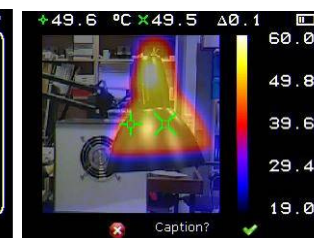


Fig 10



Fig 11



Fig 12

Note: Pressing hotkey 4 at any point during the above, will abort the process and revert to a live image.

14. 📢🔊 How do I set alarms?

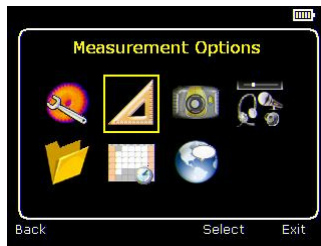
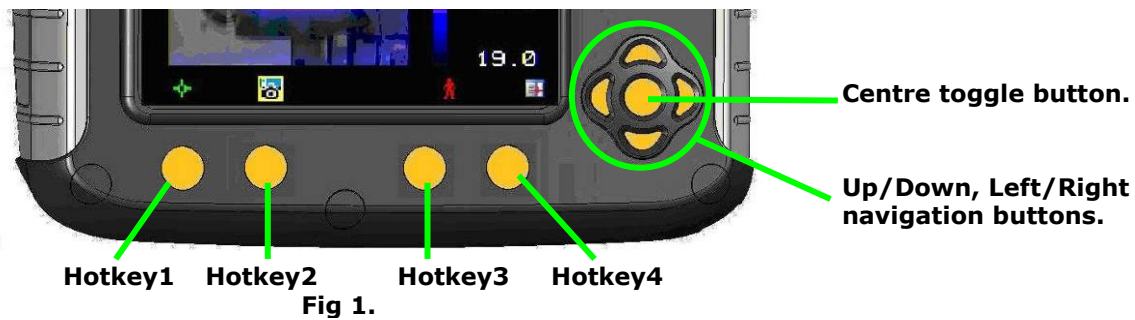


Fig 2

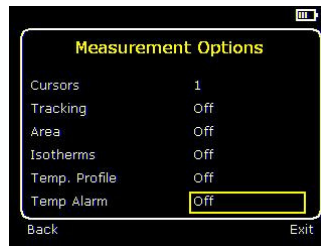


Fig 3

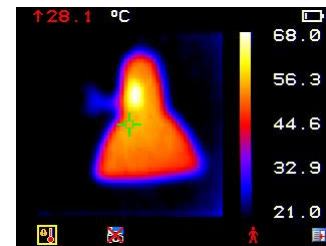


















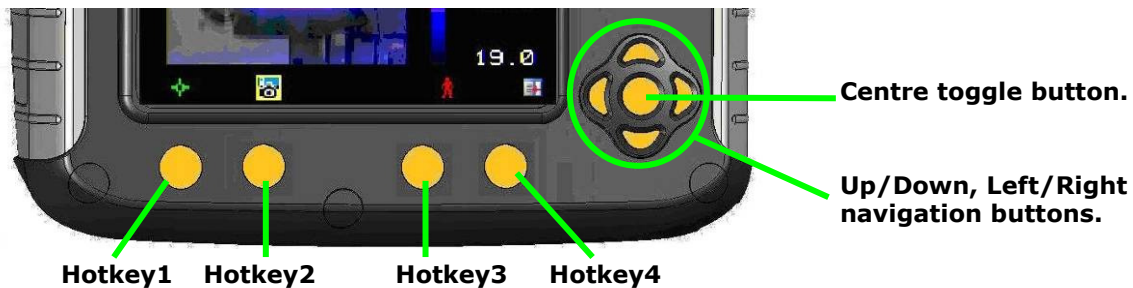
Fig 4







1. Press Hotkey 4  to select menu (Fig 1).
 2. Use the left/right navigation buttons  to move the Measurement menu  and Press Hotkey 3  to select it (Fig 2).
 3. Use the up/down navigation buttons  to move to the temperature alarm option (see Fig 3).
 4. Use the left/right navigation buttons  to toggle through "Off", "High", "Low" or "High & Low". (In the example below we will select a high alarm).
 5. Press Hotkey 4  to exit.
 6. Use Hotkey 1  to toggle through until the high alarm icon  appears (Fig 4).
 7. Use the up/down navigation buttons  to select a higher limit temperature.
 8. If the temperature at the cursor or within the measurement box is above the upper limit value a message "Over Limit" will flash at the bottom of the screen.
 9. In addition to the visible caption an audible alarm can also be set.
 - a. press Hotkey 4  to select menu.
 - b. Use the left/right navigation buttons  to go to the Audio Settings menu and press the Hotkey 3 to select it.
 - c. In Imager Sounds use the left/right navigation buttons  to toggle the sound on.
 - d. Press Hotkey 4  to exit.
 10. If the temperature at the cursor or within the measurement box is above the upper limit an audible "Bleeping" will now be heard.
- It is also possible to set a low limit  or both the high & low limit together .

Note: Default is sound on.

15. 🚩 How do I change the screen colours?

Different colour palettes are useful in viewing objects and scenes for different requirements. As a simple rule of thumb, palettes with a lot of different colours are more helpful when looking for hot spots or cold spots, whereas palettes with fewer and gradually changing colours are more useful in viewing changes of temperatures in a scene or object.



1. Press Hotkey 4  to select the menu (Fig 1).
2. "Infrared Settings"  is highlighted press Hotkey 3  to select it (Fig 2).
3. Use the up/down navigation buttons  to move to the palette option (see Fig 3).
4. Use the left/right navigation buttons  to toggle through the palette options which are, "Ironbow", "Rainbow", "Isotherm Style", "Hot Metal", "High Contrast", "Rainbow 16", "Black Hot" and "White Hot". (Please see examples below).
5. Press hotkey 4  to exit.

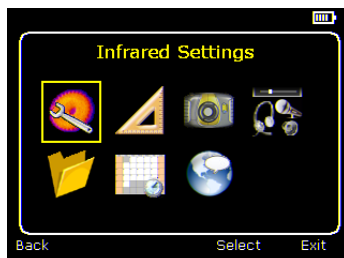


Fig 2

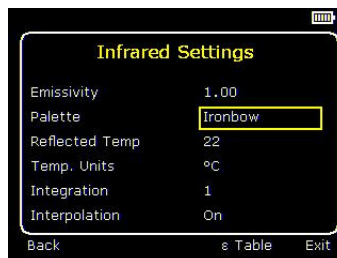
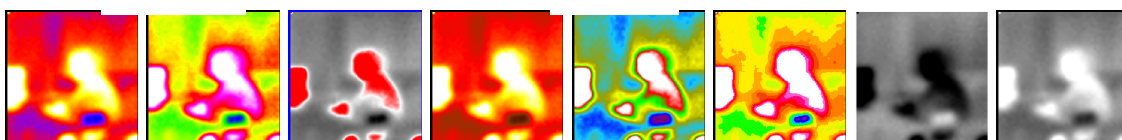


Fig 3



1 2 3 4 5 6 7 8

- | | |
|-------------------|------------------|
| 1. Ironbow | 5. High Contrast |
| 2. Rainbow | 6. Rainbow 16 |
| 3. Isotherm Style | 7. Black Hot |
| 4. Hot Metal | 8. White Hot |

16. What is Emissivity?

The amount of infrared radiation emitted by a surface depends on both its temperature and its emissivity. Surfaces that are good reflectors (e.g. polished metal) are poor emitters, and surfaces that are good emitters (e.g. human skin) are poor reflectors. A **black body** is defined as an object that absorbs all radiation falling on it; and it is a perfect emitter of radiation.

The **emissivity** of a surface (usually written ϵ) is the ratio of energy radiated by that surface to energy radiated by a **black body** at the same temperature. For accurate temperature measurements, the emissivity of the surface being measured must be entered into the camera. This is done by entering a number in the range 0.10 (for polished chromium) to 1.00 (for a black body). An emissivity lookup table is provided, which lists the emissivities of a range of common materials.

It is not recommended that temperature measurements be attempted when emissivity values lower than 0.70 are required, because large errors are likely due to reflected radiation from surrounding objects.

How do I set Emissivity?

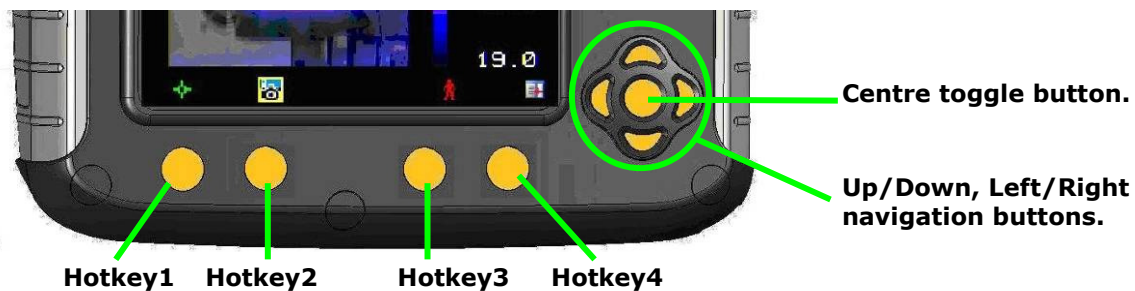









Fig 1.

1. Press Hotkey 4  to select the menu (Fig 1).
2. "Infrared Settings"  will be highlighted. Press Hotkey 3  to select it.
3. Emissivity is the first item in the "Infrared Settings" menu, and will be highlighted. See Fig 2.
4. Use the left/right navigation buttons  to change the emissivity value.
5. Or select the emissivity table by pressing Hotkey 3 , and use the up/down navigation buttons  to highlight the desired value/surface.
6. Press Hotkey 4  to exit.

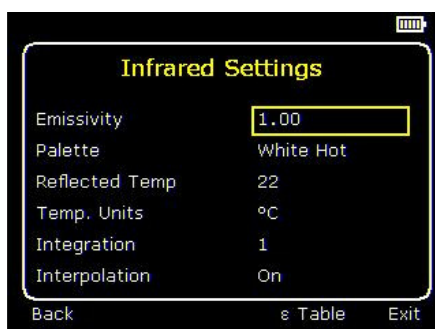


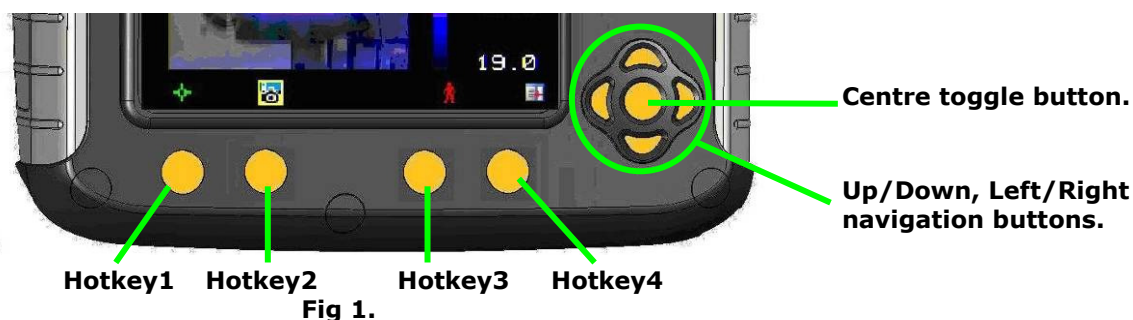
FIG 2

17. What is Reflected Temperature?


This is only applicable if an emissivity of less than 1 is selected.

Some of the infrared energy seen by the camera from a surface with an emissivity of less than 1.00 is reflected background energy. If there is a hot object in the background, this can have a significant effect on the temperature measured. By entering a reflected temperature value, the camera can correct for the effect of this reflected background energy.


How to set Reflected Temperature?




1. Press Hotkey 4  to select the menu (Fig 1).

2. "Infrared Settings"  will be highlighted. Press Hotkey 3  to select it.

3. Use the up/down navigation buttons  to move to the Reflected Temp. option.

4. Use the left/right navigation buttons  to change the value.

5. Press Hotkey 4  to exit.

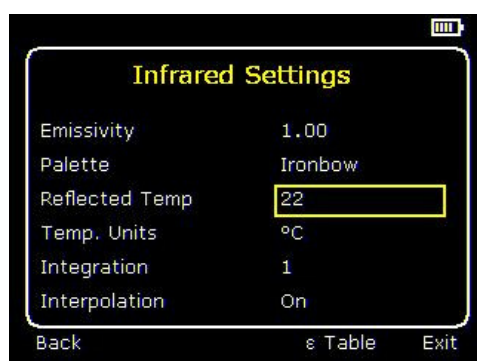


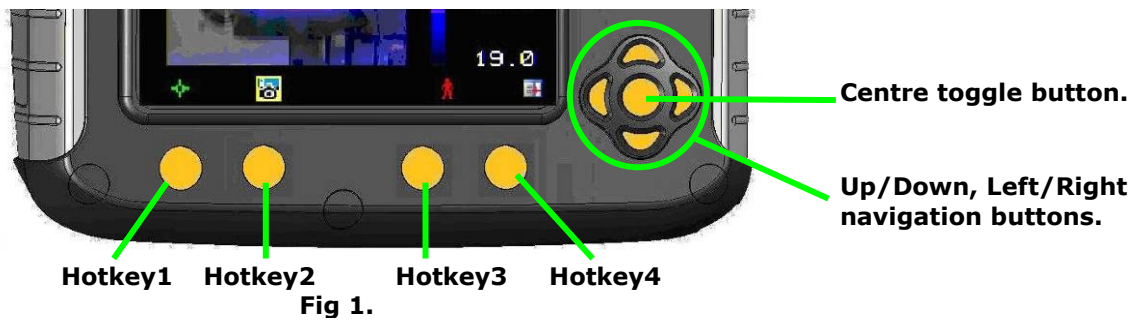
Fig 2

TIP - A good method to determine the reflected temperature in a room or setting is to set the emissivity to 1.00, turn 180 degrees from the object being measured, and take an average temperature measurement, using area mode (see question 3), of the background or of any hot object.



18. What is Integration used for?

The camera normally operates at a frame rate of 8Hz (i.e. the image is updated 8 times per second). For viewing scenes in which there is very little temperature variation, however, the image may be improved by integrating over several frames to reduce the noise.


How do I set the Integration?




1. Press Hotkey 4  to select the menu (Fig 1).

2. "Infrared Settings"  is highlighted. Press Hotkey 3  to select it.

3. Use the up/down navigation buttons  to move to the Integration option.

4. Use the left/right navigation buttons  to change the value.

5. Press Hotkey 4  to exit.

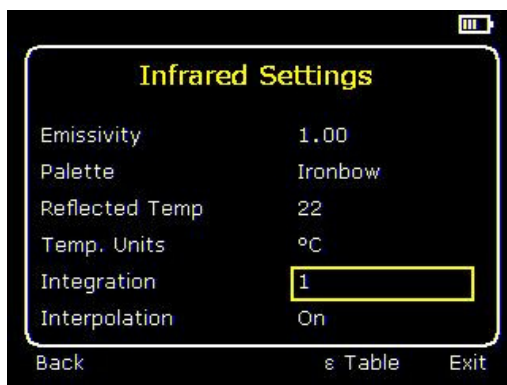
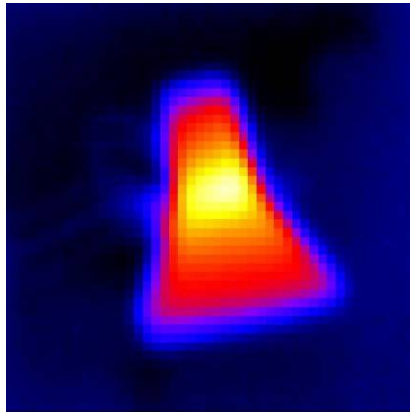


Fig 2

Note: The image update rate is slower when integration is increased, so the camera must be held still or moved very slowly when high integration numbers are used.

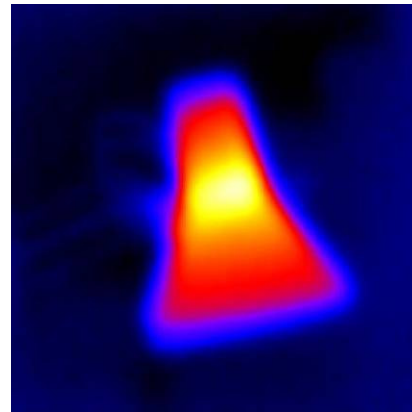
19. Do I need to turn Interpolation off?

Interpolation is on by default as it smoothes the image to provide a better visual image. Turning it off gives a more pixelated image. Some users may wish to observe the scene with the actual resolution of the detector.



Interpolation off







Fig 1



Interpolation on

Fig 2

How to set the Interpolation?

1. Press Hotkey 4  to select the menu (Fig 3).
2. Infrared Settings"  is highlighted. Press Hotkey 3  to select it
3. Use the up/down navigation buttons  to highlight the Interpolation option (Fig 4).
4. Use the left/right navigation buttons  to toggle between on and off.
5. Press Hotkey 4  to exit.

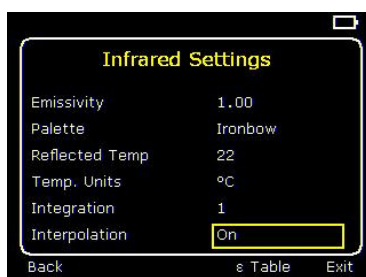
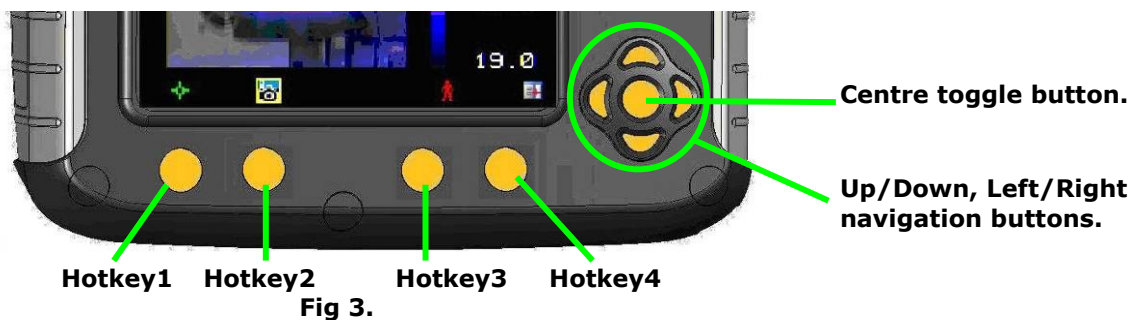









FIG 4

20. Can I reduce camera battery power consumption and how?

Battery power consumption can be reduced by either or both of the following:

- a Reducing the LCD display brightness
- b Setting the camera to switch off automatically if not used for a period of time. The switch off time is defined from the last press of a button.

1. Press Hotkey 4  to select menu (Fig 1).
2. Use the left/right navigation buttons to move to the Camera Settings  (Fig 2) and press Hotkey 3  to select.
3. The LCD Brightness option will be highlighted (Fig 3).
4. Use the left/right navigation buttons  to adjust the LCD brightness level. Higher numbers indicate a brighter LCD. The Brightness numbers range from 1 to 9.
5. Use the up/down navigation buttons  to highlight the Auto Off option (Fig 4).
6. Use the left/right navigation buttons  to select the automatic turn off time. The options are "5 Mins", "10 Mins", "20 Mins" and "Always On". These are the times after the last button press for which the camera will stay on, before turning itself off.
7. Press Hotkey 4  to exit.

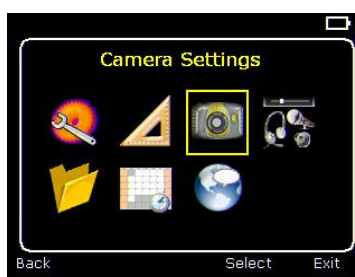
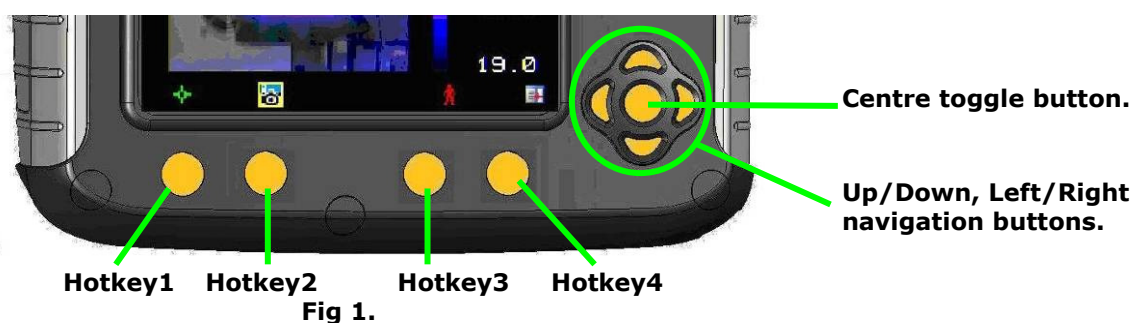


Fig 2

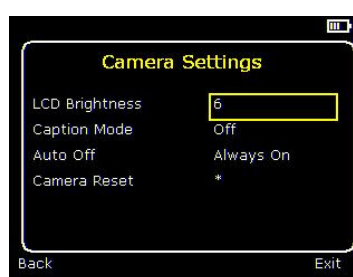


Fig 3

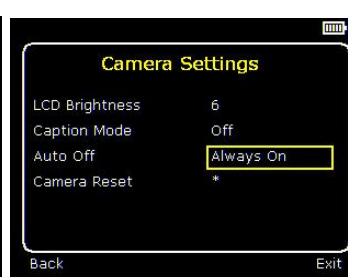


Fig 4

21. What does camera reset do?

Camera Reset changes the following values to the factory default setting:

Infrared Settings

Emissivity	1.00
Palette	Ironbow
Reflected Temp.	22
Temp. Units	°C
Integration	1
Interpolation	On

Measurement Options

Cursors	1
Tracking	Off
Area	Off
Isotherms	Off
Temp. Profile	Off
Temp. Alarm	Off

Camera Settings

LCD Brightness	6
Caption Mode	On
Auto Off	20 Minutes

Audio Settings

Imager Sounds	On
Voice Annotation	Individual
Voice Playback	Speaker
Volume	9

Date & Time Settings

Date format	DD-MM-YYYY
-------------	------------

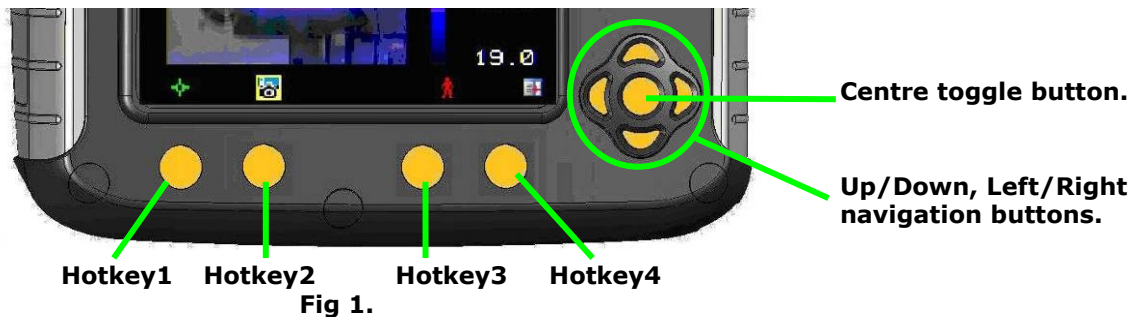
Language Selection






English

Camera Reset does not change the date.

Note bold items above are also reset on switching off the camera.

How to reset the camera.



1. Press Hotkey 4  to select menu (Fig 1).
2. Use the left/right navigation buttons to move to the Camera Settings  (See Fig 3) and press Hotkey 3  to select it.
3. Use the up/down navigation buttons  to move to the Camera reset option. (Fig 4)
4. Press Hotkey 3  to select and activate the camera reset function.

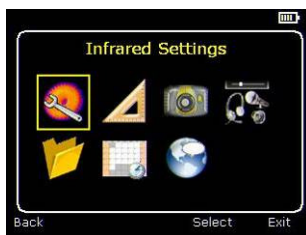


Fig 2

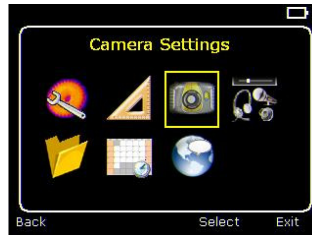


Fig 3

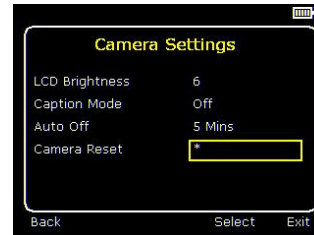


Fig 4