

- Thermal Imaging Camera








# C.A 1879



ENGLISH

User's manual

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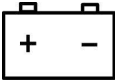
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Thank you for purchasing a **thermal imaging camera C.A 1879**.

To obtain the best service from your unit :

- **read** these operating instructions carefully,
- **comply with** the precautions for use.

**Meaning of symbols used.**

	The rubbish bin with a line through it means that in the European Union, the product must undergo selective disposal for the recycling of electric and electronic material, in compliance with Directive WEEE 2002/96/EC;
	WARNING, risk of DANGER ! Refer to the user's manual. Failure to perform the instructions in this operating manual preceded by this symbol, or to perform them correctly, may cause bodily injury or damage to the instrument and the installations.
	Conforms to European Union directives.
	Earth terminal.
	Equipment protected throughout by double or reinforced insulation.
	Battery

## 1. PRECAUTIONS FOR USE

**Safety warning :**

The equipment described in this document uses a Class 2 laser. Under no account should anyone look directly into the laser beam or the laser beam exit aperture, irreversible damage to the eye may occur. The laser should not be operated when there are personnel in the imager's field of view.

Caution – use of controls or adjustments or performance of procedures other than those specified in this document may result in hazardous laser radiation exposure.



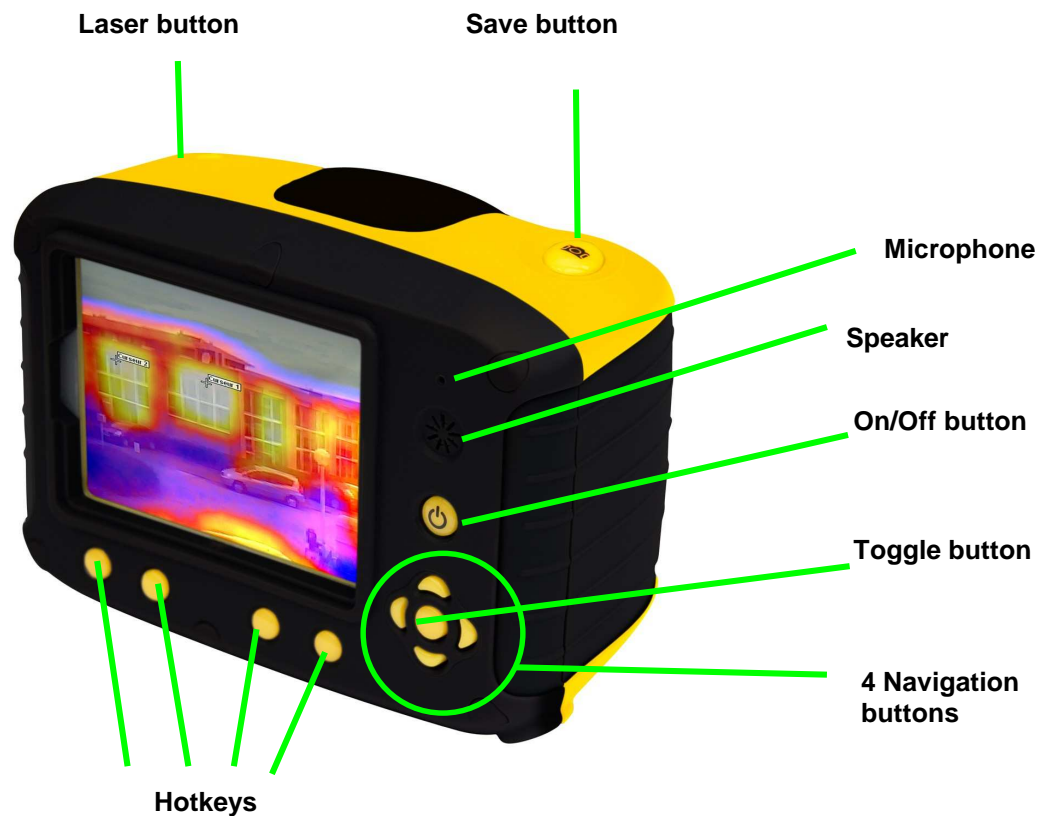
## 2. CONTENTS OF THE CASE

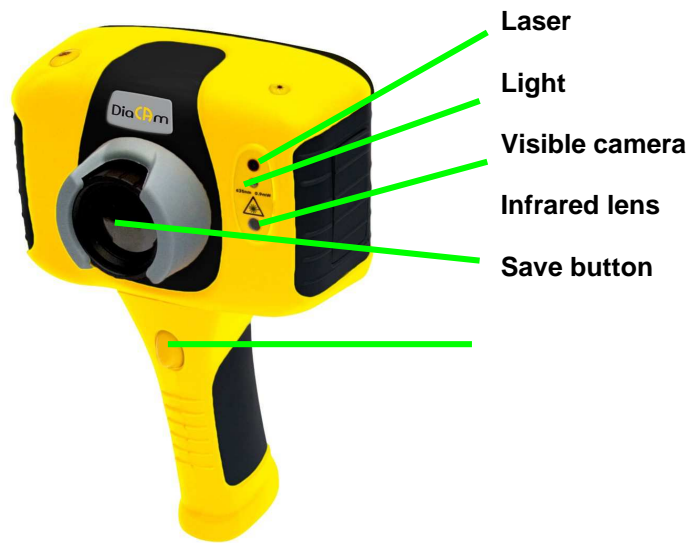
---

The case  
Camera  
PSU and International adaptors,  
CD – User’s manual and software,  
USB cable (camera to PC),  
Handle,  
Quick start guide.

## 3. MAIN FEATURES AND CONTROLS

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## 4. GETTING STARTED

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### a) Switching the camera on/off

Press the on/off button to switch the camera on.

Press and hold for a few seconds to switch the camera off.

### b) Charging the internal battery

The camera's built in battery is charged via the charging port. A fully charged battery will last approximately 6 hours. A red LED indicates charging which turns to green when the battery is charged.



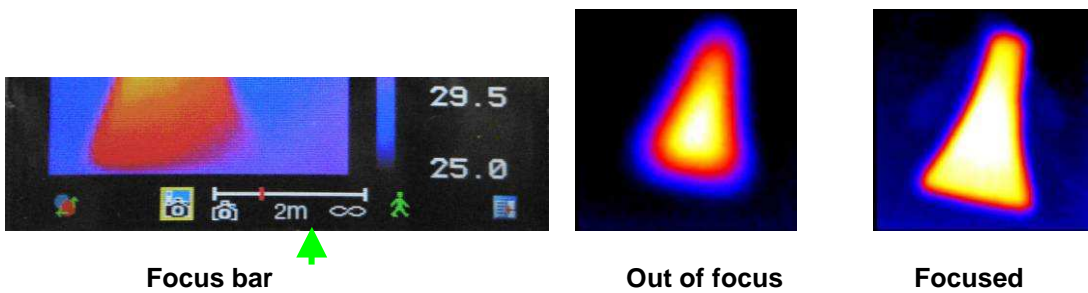
**Note: When the camera is connected to a PC via the USB cable the camera will charge but extremely slowly.**

**c) Focusing**



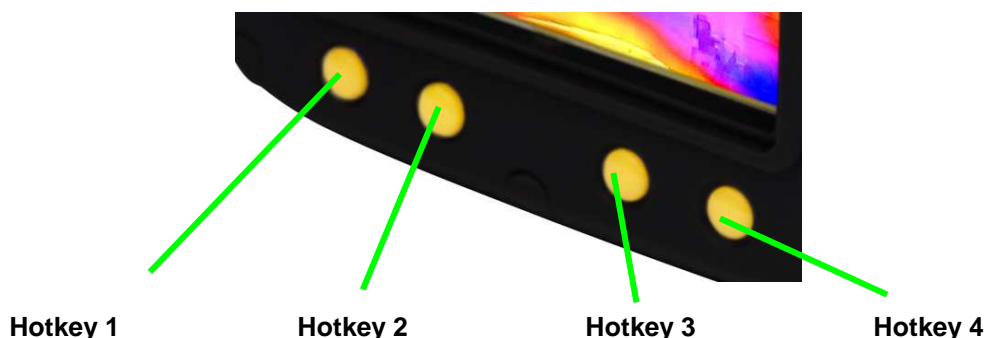
Gently rotate the lens clockwise and anti-clockwise to focus the image.

- Remember to remove the lens cap.



When focusing a focus bar appears on the screen to assist in focusing the image. It indicates the approximate distance in metres (in feet when F is selected ) of a focussed target from the camera.

**d) Hotkey buttons**



The Hotkey functions are indicated by the icons or text displayed on the screen above them. These

functions vary according to the operating options chosen by the user. A yellow box around the icon for Hotkey1 or Hotkey2 indicates that this option is selected and this defines the operation of the navigation and toggle buttons. In normal imaging mode, Hotkey 3 may be used to freeze the image; pressing it again returns the camera to live operation. Hotkey 4 is used to enter and exit the menu. See appendix A2 for a full icon list.

**e) Menu**

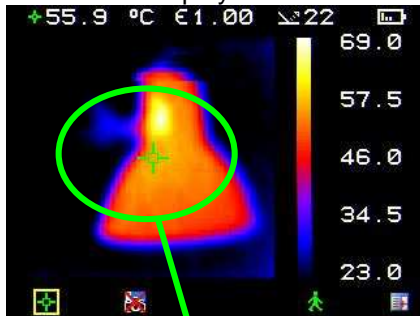
The Menu is selected by Hotkey 4. Use the Navigation buttons to move around and use Hotkey 3 to select a menu function. Full details of menus in section 5.

**f) Saving an image**

To save a live or frozen image, press the Save button once. If Caption Mode or Voice Annotation has been turned on, a text caption or voice annotation can be attached to the image (see section 6). Please note that Hotkey 3 can be used to toggle between a live image and a frozen image.

**g) Temperature measurement**

Temperature readings are displayed at the top of the display. In the default mode, a single temperature in °C is of the centre point of the cursor. The other readings at the top of the display are emissivity settings and reflected temperature setting. Two cursors or a measurement area can be selected from the measurement options menu (see section 5). The temperature range within the scene is indicated by a scale on the right hand side of the display.



One cursor

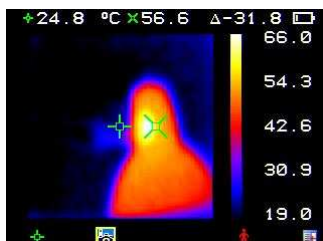


Two cursors

} Temperature difference between cursors

## 5. THERMAL AND VISIBLE IMAGE BLENDING

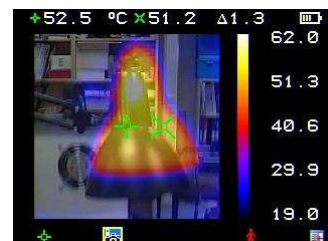
The camera can show a thermal image or a visible image of the scene, or a mixed blend of both.



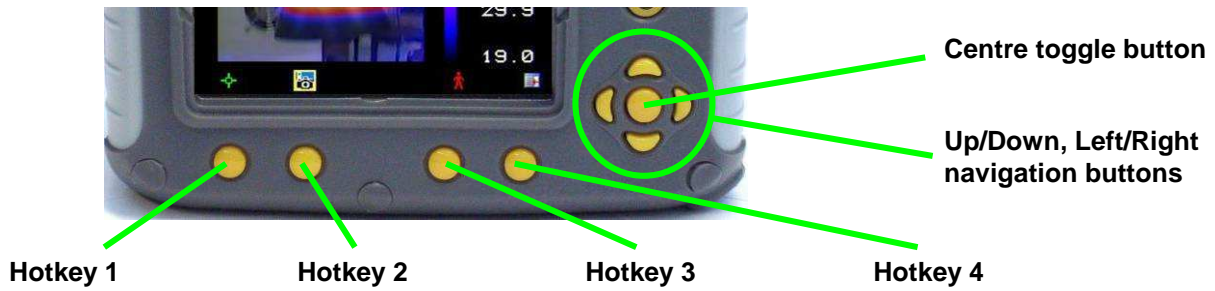
a) 100 % Thermal only










b) 100 % Visible only












c) 50 % Thermal and 50 % visible



1. Press Hotkey 2  until the Visible On/Off icon appears  .
2. If off  press the centre toggle button  to toggle to Visible On .
3. Use either the up/down, or left/right navigation buttons  to merge (blend) the visible and thermal images. Blend options are 0%, 25%, 50% 75% and 100%.

### Image alignment

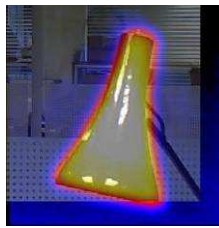
As the visible and thermal camera are not co-axial the visible and thermal image often need to be aligned. This is usually required when moving to view objects at different distances.

1. Press Hotkey 2  to toggle through to the Visible On/Off icon  . If off  toggle the centre button  to turn the visible option on .
2. Press Hotkey 1  to toggle through to the alignment option .
3. Use the up/down and left/right navigation buttons  to align the thermal and visible images.
4. The alignment facility is only available when the camera is on and in live mode.

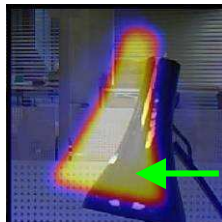
◆ **Note the visual image is moved during alignment**



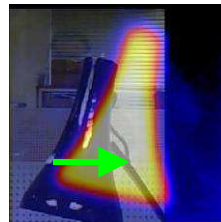
**Examples of alignment.**



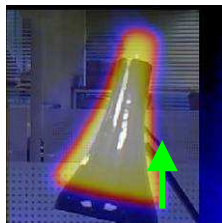
**Fully Aligned**



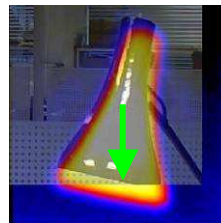
**Align left**



**Align right**












**Align up**

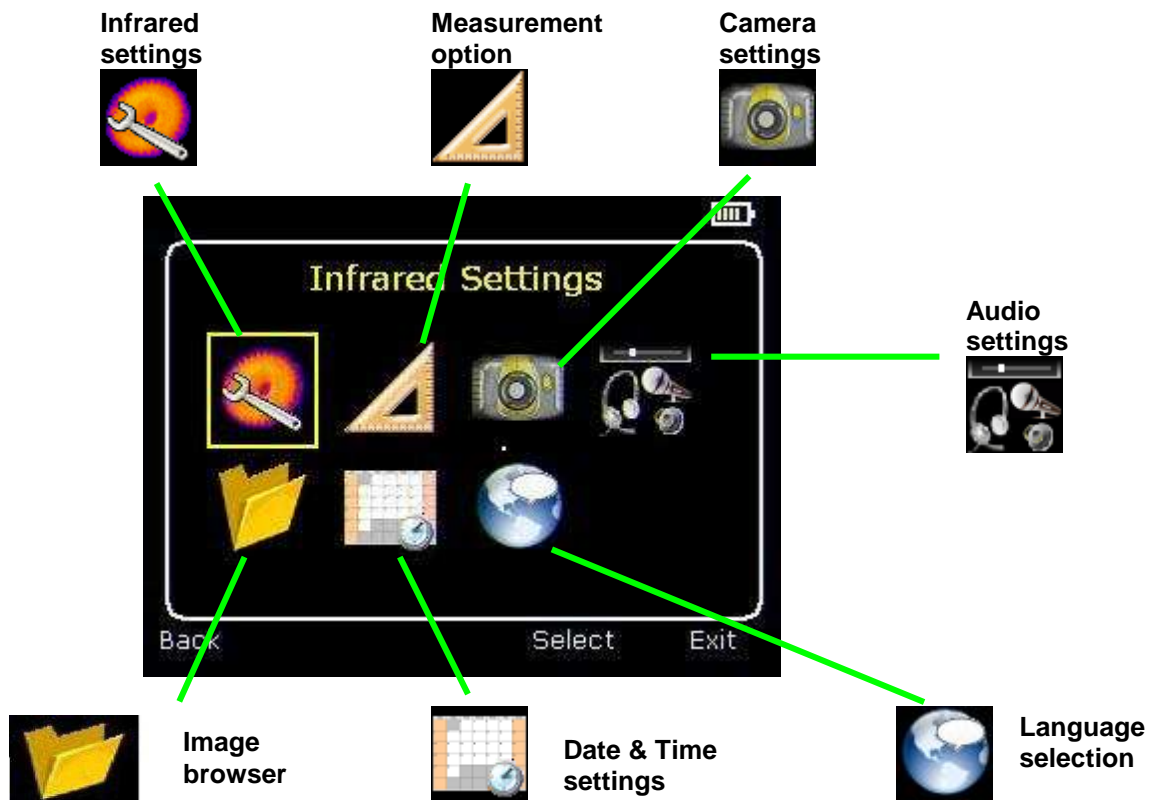


**Align down**

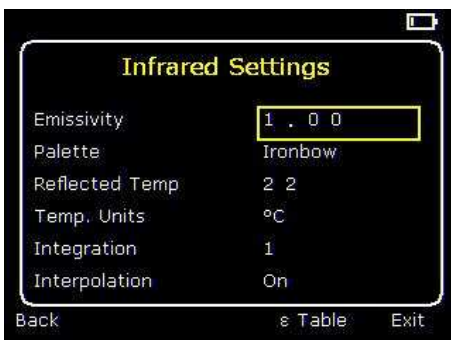
5. Four pre-programmed alignment distances are included. These are at 0.5m, 1m, 2m and 4m ranges. With the alignment option selected by HK1, pressing the toggle button once aligns at 2 metres. Pressing the toggle button again allows you to cycle through to 4m, 0.5m and 1m. These values appear in feet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

## 6. MENU STRUCTURE

- a) Select the menu  by pressing Hotkey 4 .
- b) Navigate through the menu using the navigation buttons  and press Hotkey 3  to select the required option. The highlighted item will have a yellow box  around it.
- c) Use the up/down buttons  to move in the selected list and select the required item.
- d) Use the left/right buttons  to change values and options for the specific item.
- e) Press Hotkey 4  to exit or Hotkey 1  to go back to the previous menu.



## 6.1. Infrared settings



### Emissivity:

- ◆ Set emissivity value between 0.10 and 1.00 for measuring temperature.
- ◆ Pressing Hotkey 3 (e Table) gives a table of emissivity values of common materials from which a selection can be made.

### Palette :

- ◆ Display in image using different colour palettes.

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

### Reflected Temp :

- ◆ Général Usually set to the ambient temperature.
- ◆ Applies only when emissivity of less than 1 is selected..

**Temp units :**

- ◆ Choose between °C and °F.

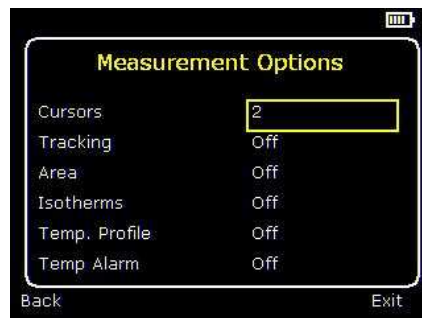
**Integration :**

- ◆ Choose an integration period from 1 (fast) to 9 (slow).
- ◆ This determines the trade off between display speed and noise.

**Interpolation :**

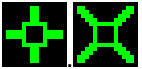
- ◆ Choose Off or On.
- ◆ This shows or hides the thermal image pixelation.

## 6.2. Measurement options



This menu enables the selection of options for temperature measurements. The symbols shown below indicate the icons shown for Hotkey 1 when the various options are selected.

- ◆ Cursors :



Choose between one or two cursors. When two cursors are chosen, the temperatures at both cursors and the temperature difference between them will be displayed. When one of the cursors is selected by Hotkey 1, it can be moved around on the display by the navigation buttons.

- ◆ Tracking :



Select "High", "Low", or "High & Low" in order to track and measure the hottest point, the coldest point, or both hottest and coldest points in the image.

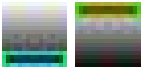
- ◆ Area :



If this option is turned on, the highest, lowest, and average temperatures within the designated area will be displayed. Three different area size boxes can be selected via Hotkey 1.

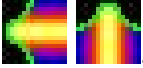
*Note that the above three items are mutually exclusive, i.e. when one is turned on the other two are disabled.*

- ◆ Isotherms :



Select "High", "Low", or "High & Low" in order to highlight areas of the scene with temperatures within one or two temperature bands. The temperature bands are adjustable by means of Hotkey 1 and the navigation keys.

◆ Temp profile :



Select "Horizontal" or "Vertical" to enable a histogram of temperature values along a horizontal or vertical cross section to be displayed on the right hand side of the display. The position of the cross section is indicated by small arrows at the left and right or top and bottom of the image and can be adjusted by means of Hotkey 1 and the navigation buttons.

◆ Temp alarms :



Select "High", "Low", or "High & Low". Visual and audio alarms will be triggered if either cursor or a point within the designated area is higher or lower than a set temperature. The high and low set temperatures may be adjusted by means of Hotkey 1 and the navigation buttons.

### 6.3. Camera settings



◆ LCD brightness :

Select from 1 (low) to 9 (high) to control the screen brightness to save battery power.

◆ Caption mode :

Select "On" to enable the addition of a text caption when saving an image. Options will then be displayed when saving an image, to be selected by means of Hotkey 2 and hotkey 3.

◆ Auto off :

Select "5 Mins", "10 Mins", "20 Mins" to allow the camera to switch itself off after a defined period of inactivity in order to save power. There is also an "Always On" option.

◆ Camera reset :

Select with Hotkey 3  to restore the factory settings

## 6.4. Audio settings



◆ Imager sounds :  
Select "Off" to mute all audible outputs.

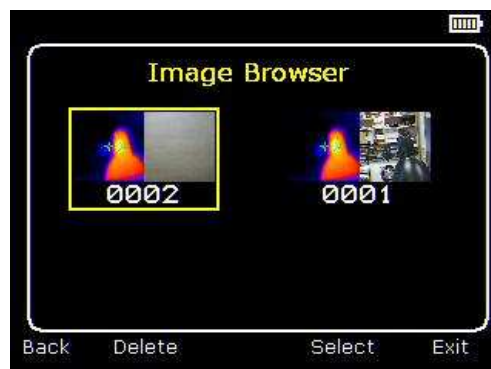
◆ Voice annotation :  
Select "Session" to add a voice message at the start of a set of images (A session ends when the imager is switched off).  
Select "Individual" to add a voice message to each saved image.  
Select "Combined" to add a common voice message at the start of a set of images and add additional comments for each image.

◆ Voice playback :  
Select "speaker" or "headset" for the desired method of audible outputs.

◆ Volume :  
Select the volume of the audible outputs from 1 to 9.

If session is selected the voice message is recorded in the audio settings by pressing Hotkey 3. Recording is stopped by pressing Hotkey 3 again. Hotkey 2 can be used to play back the recorded message. Hotkey 3 can be used to re-record if necessary.

## 6.5. Image browser



The saved images are shown on the screen with the most recently saved image first.

Select the desired image by means of the navigation keys.



To display the selected image press Hotkey 3.

To delete the selected image press Hotkey 2, to confirm deletion press Hotkey 3.

When a stored image is displayed, press Hotkey 3 to return to live imaging.

## 6.6. Date & Time settings



- a) Use the left/right buttons  to navigate in this menu, the item that can be changed is highlighted in red. In the picture above the day (DD) 14 is highlighted.
- b) Use the up/down buttons  to change the value.
- c) The date formats can be changed by pressing Hotkey 2 to cycle through DD-MM-YYYY, MM-DD-YYYY and YYYY-MM-DD options. Pressing Hotkey 4 will select the option on the display.

## 6.7. Language selection



When the language is highlighted (shown by a yellow box around it) press Hotkey 3  to select.

## 7. ADDING CAPTIONS WHEN SAVING IMAGES

### 7.1. Voice message

When saving an image with Individual Voice Annotation turned on, there is the option of saving a voice message with each image. The screen shots below describe the procedure:

 <p>a) Do you wish to attach a voice message to this saved image? Hotkey 2 for no . Hotkey 3 for yes .</p>	 <p>b) Start voice recording?  Hotkey 3 for yes.</p>
 <p>c) Stop recording. Hotkey 3  to stop.</p>	 <p>d) Option to Re-record the voice message ? Hotkey 2 for Yes  Hotkey 3 for No </p>
 <p>e) If caption mode is selected this option will now be offered to save a text caption.(see 6.2)</p>	 <p>f) Image with voice message is being saved.</p>

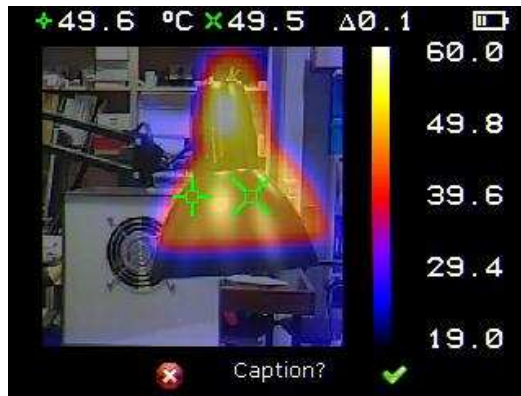
#### Playback

The voice recording can be played back when viewing saved images in the browser.

**Note :** *The abort icon  on Hotkey 4. Pressing Hotkey 4 at any stage aborts the saving process*

### 7.2. Text captions

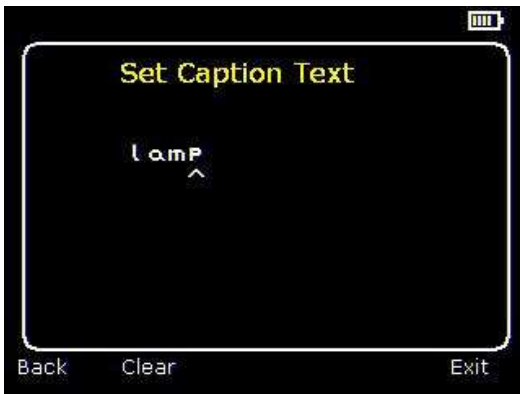
When saving an image with Caption Mode turned on, there is the option of attaching a text caption to each image. The screen shots below describe the procedure:



a) Do you wish to attach a text caption message to this image?  
 Hotkey 2 for No  Hotkey 3 for Yes 



b) Start Caption Entry




c) Example of a Caption.

- ◆ Captions cannot be viewed with the saved images in the browser due to display constraints. The captions can be viewed using the PC software.


## 7.3 Technical specification

### Performance

Temperature range:	-10°C to +350°C
Field of view (FOV):	20°x 20°
Spectral Response:	8mm to 12 μm
Sensitivity:	£0.3°C @ 30°C
Detector:	47 x 47 pixel array
Frame rate:	8Hz
Focus Range:	0.5m to infinity

1. Use the up/down arrow buttons  to cycle through letters and numbers until the one required appears. The available symbols are:

2. ABCDEFGHIJKLMNOPQRSTUVWXYZabcd  
 efghijklmnopqrstuvwxyz0123456789

3. Use the left/right arrow buttons  to move to the next space and repeat the above step until the caption is completed.

4. Press Hotkey 2  to clear the whole message.

5. Press Hotkey 4  to exit and save the image and caption.



**Image storage**

Number: Up to 1000 images on SD card supplied  
 Medium: Micro SD Card

**Display**

3½" colour LCD with LED Backlight. 8 colour palettes. Mixed thermal and visible images.

**Laser pointer**

A built in Class 2 laser is supplied to highlight the centre of the thermal image. (Aligned at 2 metres)

Beam Divergence <0.2mrad  
 Maximum Output <1mW

**Measurement**

Temperature range: -10°C to +350°C  
 Radiometry: Two moveable temperature measurement cursors  
 Temperature difference measurement  
 Emissivity Correction: User selectable 0.10 to 1.00 in steps of 0.01 with reflected ambient temperature compensation  
 Accuracy: The greater of ±2°C or ±2% of reading in °C

**Imager power supply**

Battery: Lithium-ion field rechargeable.  
 Operation time: Up to 6 hours continuous operation  
 AC operation: AC adaptor supplied

**Mechanical**

Housing: Impact Resistant Plastic with over moulded soft plastic and detachable handle  
 Dimensions: 130mmx95mmx90mm (excluding handle)  
 Weight: 0.70kg  
 Mounting: Handheld & tripod mounting 1/4" BSW

**Settings and controls**

- ◆ On/Off soft power control
- ◆ User selectable span control
- ◆ User selectable level control
- ◆ Auto adjust span and level
- ◆ Laser trigger switch
- ◆ Readout in °C or °F
- ◆ User selectable image integration
- ◆ User selectable emissivity setting
- ◆ User selectable reflected temperature
- ◆ Two moveable temperature measurement cursors
- ◆ Area analysis
- ◆ X-Y profiles
- ◆ Isotherms
- ◆ Text annotation
- ◆ Voice annotation
- ◆ Image capture, time and date
- ◆ Visual/audio alarm high and low

**Computer requirements (for pc software)**

PC: IBM compatible PC with a minimum of: 300MHz processor, MS Windows XP 128MB RAM.  
 16 bit colour  
 graphics with 1024x768 capability

**Environment**

Temp. operating range: -5°C to +45°C

Humidity: 10% to 90% non condensing  
Temp. storage range: -20°C to +60°C  
CE Mark (Europe)  
IP rating: IP54  
Operating temp for stated accuracy: 23 °C

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

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## 8. MAINTENANCE

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For maintenance, use only the spare parts specified. The manufacturer cannot be held liable for any accident that occurs following a repair not performed by its customer service department or by an approved repairer.

### Cleaning

- ◆ Disconnect the unit completely and turn the rotary switch to OFF.
- ◆ Use a soft cloth, dampened with soapy water. Rinse with a damp cloth dry rapidly with a dry cloth or forced air. Do not use alcohol, solvents or hydrocarbons.
- ◆ Make sure that no foreign body interferes with the operation of the snap device of the sensor.

### Replacement of the battery

- ◆ Change the batteries when the LCD shows 
- ◆ To change the batteries, turn the camera off, remove the screw of the battery cover and replace the batteries with new AAA 1.5V.

### Metrological check



**Like all measuring or testing devices, regular instrument verification is necessary.**

This instrument should be checked at least once a year; For checks and calibrations, contact one of our accredited metrology laboratories (information and contact details available on request), at our Chauvin-Arnoux subsidiary or the branch in your country.

### Repair

For all repairs before or after expiry of warranty, please return the device to your distributor.

## 9. WARRANTY

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Except as otherwise stated, our warranty is valid for twelve months starting from the date on which the equipment was sold; Extract from our General Conditions of Sale provided on request.

The warranty does not apply in the following cases :

- Inappropriate use of the equipment or use with incompatible equipment;
- Modifications made to the equipment without the explicit permission of the manufacturer's technical staff;
- Work done on the device by a person not approved by the manufacturer;
- Adaptation to a particular application not anticipated in the definition of the equipment or not indicated in the user's manual;
- Damage caused by shocks, falls or floods.

## 10. TO ORDER

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**C.A 1879.....P01.6512.50**

Supplied in case with 1 handle, 1 AC adapter to charge, 1 USB cable, 1 user's manual, 1 Software CD-ROM, 1 quick start guide on paper.

# APPENDIX

## A1. Emissivity tables

### Emissivity look up tables in Camera

1.00 0.98 = Human skin 0.95 0.94 = Paint, oil 0.93 = Brick red 0.92 = Concrete 0.90 = Planed Oak Wood 0.85 0.80 0.79 = Oxidized steel 0.78 = Oxidized Copper 0.76 = Sand 0.75 0.70 = Red Rust 0.67 = Water 0.65 0.64 = Oxidized Cast Iron	
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### General Emissivity look up tables

0.98 = Carbon filed surface 0.98 = Frost crystals 0.98 = Human skin 0.97 = Slate 0.96 = Water distilled 0.96 = Ice smooth 0.95 = Soil saturated with water 0.95 = Carbon candle soot 0.94 = Glass polished plate 0.94 = Paint, oil 0.93 = Brick red 0.93 = Paper white bond 0.92 = Concrete 0.92 = Soil dry 0.91 = Plaster rough coat 0.90 = Wood planed oak 0.90 = Glazed earthenware 0.89 = Snow, granular 0.88 = Glazed Silica 0.87 = Cuprous Oxide at 38°C 0.86 = Emery Corundum 0.85 = Snow 0.85 = Stainless oxidized at 800°C 0.84 = Oxidised Iron at 500°C 0.83 = Cuprous Oxide at 260°C 0.82 = Snow, fine particles 0.81 = Brass, unoxidised 0.80 = Glass, convex D	0.79 = Steel oxidised 0.78 = Copper heavily oxidised 0.77 = Cotton cloth 0.76 = Sand 0.75 = Unglazed silica 0.74 = Oxidised iron at 100°C 0.73 = Coating No. C20A 0.72 = Basalt 0.71 = Graphitised carbon at 500°C 0.70 = Red Rust 0.69 = Iron sheet heavily rusted 0.67 = Water 0.66 = Black Loam 0.65 = White cement 0.64 = Iron cast oxidised 0.63 = Lead oxidised at 1100°F 0.62 = Zirconia on inconel 0.61 = Cu-Zn, brass oxidised 0.58 = Inconel sheet at 760°C 0.56 = Smooth white marble 0.55 = Al anodised chromic acid 0.21 = Iron cast polished 0.20 = Brass rubbed 80 grit emery 0.16 = Stainless steel 18-8 buffed 0.09 = Aluminium as received 0.07 = Steel polished 0.05 = Aluminium polished sheet 0.05 = Copper polished 0.03 = Brass highly polished
--	--

**A2. Full icon list**

<b>Hotkey one</b>		 Isotherm low
 Cursor one		 Profile horizontal
 Cursor two		 Profile vertical
 Alignment		 Alarm high
 Tracking		 Alarm low
 Area		 Playback
 Isotherm high		
<b>Hotkey two</b>		 Light off
 Camera off		 Light on
 Camera on		 No
 Auto temperature range		 Yes
 Manual temperature range		
<b>Hotkey three</b>		 No
 Live		 Yes
 Freeze		
<b>Hotkey four</b>		 Abort
 Menus		
<b>Other icons</b>		 Span out
 Level down		 Span in
 Level up		 Span maximum
 Level maximum		 Span minimum
 Level minimum		
 No memory card		



05 - 2009  
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