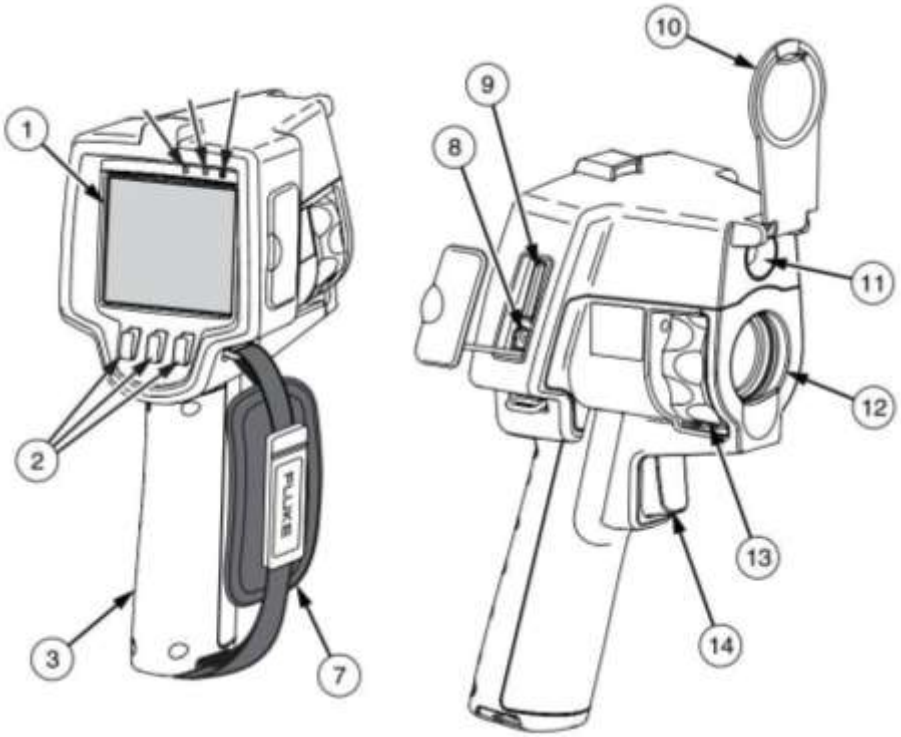
Fluke Thermal Imaging Cameras

Almost £3,000 each for 160 x 120 pixels! But they can reveal a lot:

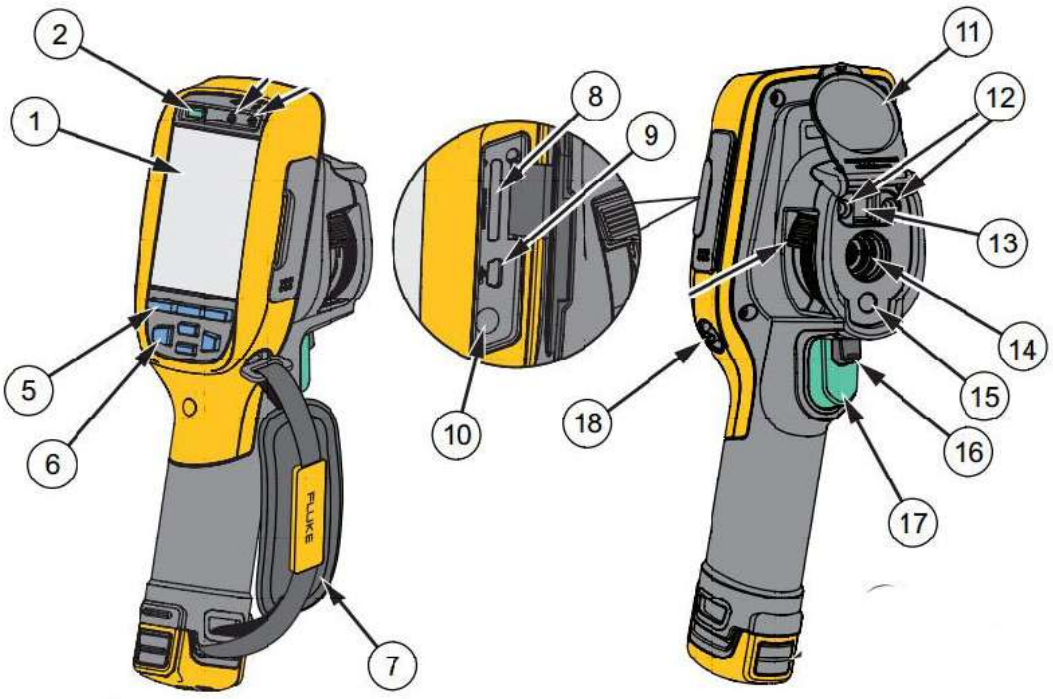
Cambridge Carbon Footprint

TiR CCF's first camera:



1	LCD Display
2	**Softkeys (F1, F2, F3)** ***Hold F2 for ON/OFF***
3	**Battery Cover**
7	Hand Strap
8	**Charger input**
9	**SD Memory Card slot**
10	**Lens Cap**
11	Visual Camera
12	Thermal Camera
13	**Focus wheel**
14	**Trigger**

TiR105 CCF's newer camera:



1	LCD Display
2	**Power On/Off**
5	Function Buttons (F1, F2, F3)
6	Arrow Buttons
7	Hand Strap
8	**SD Memory Card Slot**
9	USB Cable Connection
10	**AC /Charge Input Terminal**
11	Retractable **Lens Cover**
12	Torch/Flashlight
13	Visual Camera and Lens
14	Infrared Camera Lens
15	Laser Pointer
16	**Secondary Trigger**
17	**Primary Trigger**

Keep these cameras safe! Either with you or somewhere locked & out of sight.

Using a Thermal Camera

Preparatory checks

- **Battery**. Charger socket is under flap on side of camera.
- **Memory SD Card** in slot under flap. (USB card-reader in bag)
  - **File format** via menus (see Options, below): **BMP** or **JPG**
    to share with householder via SD Card (or in email or report).
    IS2: to optimise later in SmartView & export as jpg (next page).

Ideal Conditions for Use

- Building interior >10°C warmer than outside
  advise householder to turn up heating in advance, if necessary
- No direct sun (recently), rain or strong winds
- Enough light for visible images (Thermal images fine in the dark)

In Use

- **Switch On**/ Off: Hold F2 (TiR) or Power On/Off (TiR105)
- Open the **lens cap**!
- TiR: **FOCUS:** If tricky, use IR Fusion (below)
  TiR105: No focus: but keep at least 1.2m (4ft) from subject
- **Save images** by pulling trigger **AND** then STORE by pressing F1
- Investigate unexpected hot or cold areas. Make comparisons.
  Heat leaking looks cold from inside building, hot from outside.
- **Avoid reflections** from glass: change your position?
- Metallic surfaces give false temperature readings (low emissivity)
- Ask the householder to **keep notes** of images & what they show.

Options

F2 for menus then *TiR: F2 again for more options, F1 or F3 to select.* TiR105 has arrow buttons

- **IR Fusion** shows thermal image in the middle with a visible surround. Recommended.
  TiR is in focus when a horizontal image feature aligns in the 2 images
- **Range** of temperature shown in image colours: **Auto** (easy) or **Manual** (good for comparisons),
  as displayed, top-right. Change between them by holding F1 (when no menu displayed).
  F3 resets manual range to span the range of temperatures in view.
- **Review stored Images** via Menus, Memory, if needed.

also see Manual –in camera bag, on CD & CCF Website

After Use

- Close the lens cap!
- Re-charge the battery
- Delete images from SD Card
- Fill in "record of survey" booklet in camera bag

SmartView (Optional)

also see SmartView User Manual on CD (in bag)

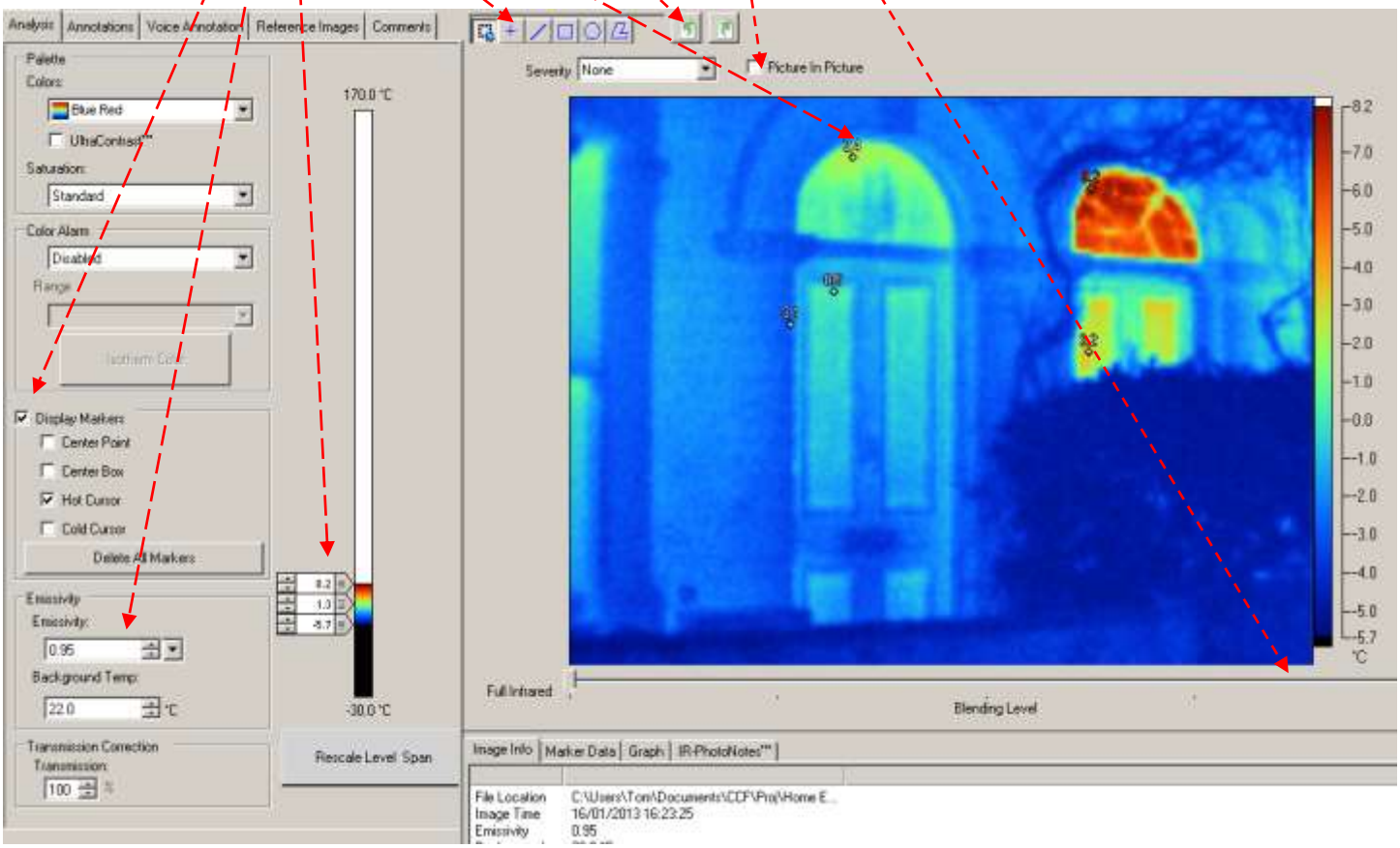
Fluke's PC software for optimising *.is2 thermal images: You can add temperature markers and optimise the colours to best show thermal problems, etc. And then export images as jpg for sharing & reports.

Install onto your Windows PC from CD in bag, by running Setup.exe *Sorry, there's no Mac version!*
or download from: www.fluke.com/fluke/usen/support/software/ti-update.htm
No need to install video driver, as our cameras only do stills.
Run SmartView. Set °C in SmartView Edit / preferences.

Using SmartView

along with your CCF training to interpret the thermal images...

- File / **Open** *.is2 thermal image file(s) of interest
- Double-click an image on SmartView's desktop to **Edit** it, as shown here:
- Check **Visible image**, if you need to clarify what's shown (Picture in Picture = IR Fusion on camera)
- **Rotate** image, if necessary
- Add **temperature markers**, if useful
- Adjust **Level & Span** so that colours best show features of interest
- Adjust **emissivity** for more accurate temperature display of any unusual surfaces



Save (active image) or Save All

- **Export** *.is2 images with File → Export (all) → **JPEG** etc.
- Use jpg images in a report for the householder or to email to them (see p4).

CCF systems

Borrowing a camera

1. Visit http://cambridgecarbonfootprint.org/blog/thermal-imaging-camera-calendar/ and check the calendar for each camera to see when they're free. Click calendar entries for more info on them.
2. To book, email the TI Adminstrator ticamera@cambridgecarbonfootprint.org: which camera and when. Or phone the CCF office on 01223 301842 (Mon-Fri, 9-5). Max borrowing period normally 2-3 days.
3. Cameras can usually be picked up or dropped off at CCF office Mon-Fri 9am to 5pm. Otherwise arrange direct pick up /drop off with whoever's using the camera before/after you & tell the TI Adminstrator.

Arranging & Doing a survey - typically takes about an hour with the householder

- Volunteer to survey homes: check the listing sheet for details of survey requests.
  email the TI Administrator if you don't have access
- Please ask householders to consider making a **donation** to CCF (charity no. 1127376). We normally suggest £5 - £50, dependant on individual circumstances. This is much less than commercial Thermal Imaging rates. It helps CCF's work cutting energy consumption & Carbon emissions.
- If they're eligible, please ask the homeowner fill out a **gift aid** form (in the camera case)
  Donations can be sent to or dropped off at the CCF office, or can be made online
- Please tell the householder about CCF's **other** **events** **&** **projects**, if they're interested

Reporting to the Householder

Show them where their home is leaking heat. Suggest fixes only if you know what's appropriate.

When **sharing** (BMP or jpg) **images directly** with the householder, first, as you go round with them:

- Show the householder each revealing image on the camera (& save it!)
- Ask them to take notes: what's in each image, what's revealed (& any recommendations)

Then, at the end, copy the images to the householder's PC from SD card/ USB reader (or email them later)

OR: If you're **writing a report** for the householder:

- Follow the first 2 bullets above, except you take notes!
- Optimise revealing IS2 images, add temperature markers, etc (SmartView, p3) and export them as jpg.
- Write a report with images inserted, explain what's shown (& recommend fixes?).

Please don't claim more than you know. Suggest the householder gets more advice, if necessary.

After Use

- Fill in "record of survey" booklet in camera bag
- Keep camera safe & return/ hand-on, as arranged, complete with all accessories
- Report any problems by emailing ticamera@cambridgecarbonfootprint.org or phoning 01223 301842

Good Luck! Tom Bragg tom@cambridgecarbonfootprint.org