

Thermal Imaging Training Handout

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Using a Thermal Imaging Camera


Ideal Conditions for Use

- Indoors >10°C warmer than out - if necessary turn up heating a few hours before.
- No direct sun recently, rain or strong winds
- Enough light for visible images, although thermal images work fine in the dark

Check before

- **Battery.** Check on-screen icon:  Charger socket is under flap on side of camera.
- **Memory SD Card** in slot under flap. (USB card-reader in bag)
- **File format** via menu (see Options, below): **BMP or JPG** to share with householder. **IS2** only for later optimisation, labelling, etc in SmartView (next page)

In Use

- **Switch On/ Off:** Hold F2 (**TiR**) or Power On/Off (**TiR105**) 
- **Lens cap** - open it!
- **FOCUS:** **TiR:** Essential - if tricky, use IR Fusion (see 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 leaks look cold from inside building, hot from outside.
- **Avoid reflections** from glass or metal: change your position?
- Metals also give false temperatures because of low emissivity
- **Keep notes** (ask householder to?) of images & what they show



Options

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

IR Fusion shows thermal image in the middle with a visible surround. Recommended 

TiR is in focus when horizontal and infrared images align vertically.

- **Range**, displayed top-right: **Auto** (easy) or **Manual** (good for comparisons or if temp extremes in view).
Change between Auto/Manual by holding F1 for 1 sec (when no menu displayed)
F3 resets manual range to the temperatures then in view
- **Review stored Images** via Menu, Memory, if needed.
See more in **Manual** in bag, on CD & **CCF Website:** cambridgecarbonfootprint.org/ti-resources

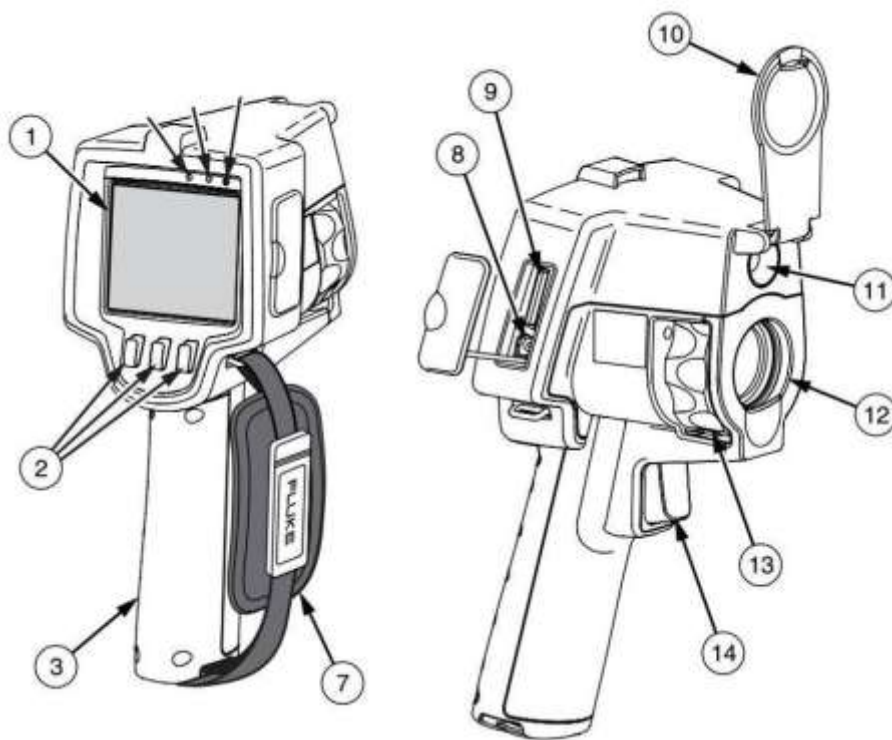
After Use

- Close the lens cap!
- Save images to PC & delete them from SD Card
- Re-charge the battery
- Fill in 'Record of surveys' booklet in camera bag
- keep camera safe & return or hand-on, as arranged.
- Report any problems

Fluke Thermal Imaging Cameras

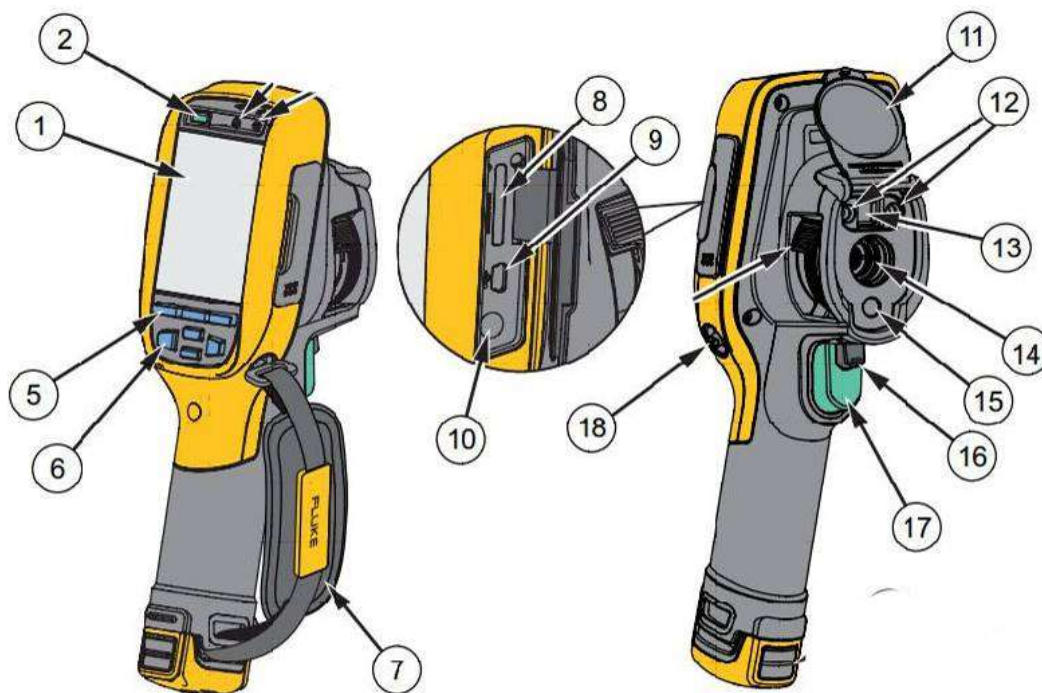
£2,800 each for 160 x 120 pixels! But they can reveal a lot:

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! Keep with you or somewhere locked & out of sight.

SmartView (Expert Option)

also see [SmartView User Manual](#) on CD (in bag)

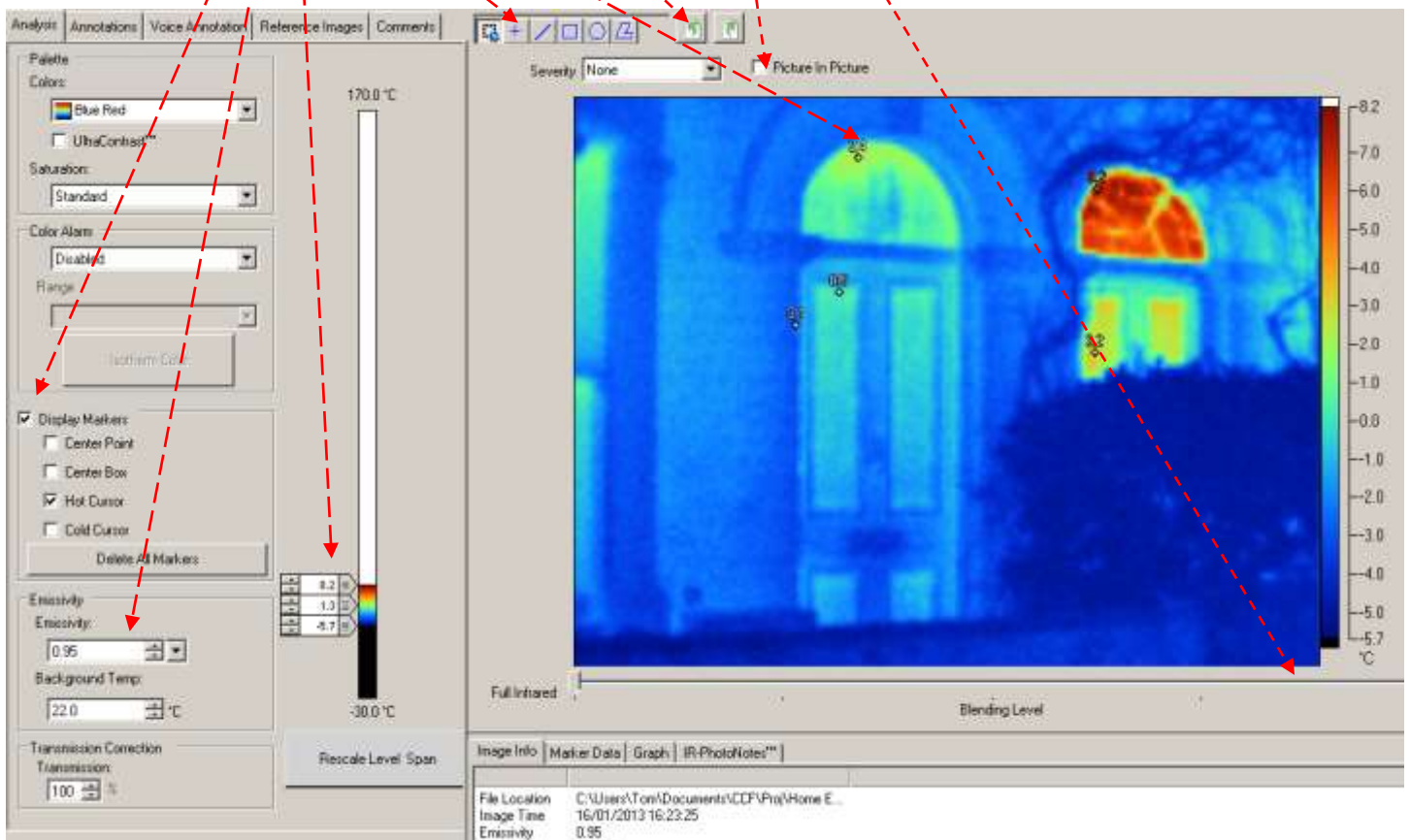
Fluke's PC software for optimising *.is2 thermal images: You can add temperature markers and optimise the colours to best show thermal problems, etc. And then export images as jpg for sharing & reports.

Install onto Windows PC from CD in bag (run Setup.exe) (or [SmartView Mobile](#) for iPhone,iPad) or from: <http://assets.fluke.com/SmartView/TUpdates/Setup.exe> No need for video driver.

Run SmartView. Set °C in SmartView Edit / preferences.

Using SmartView

- 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).

Borrowing a Camera, etc

Contacts:

TI Administrator ticamera@cambridgecarbonfootprint.org for camera booking, etc.

CCF Office usually open Mon-Fri, 9-5 - location: cambridgecarbonfootprint.org/contact-us

TiR camera kept there. Arrange to collect/return: 01223 301842 alana@cambridgecarbonfootprint.org

Newer **TiR105** lives at [Cambridge Architectural Research](#), 25 Gwydir St, CB1 2LG. Arrange with Jason Palmer jason@carltd.com Office phone: 01223 460475 to collect /return it, normally Mon-Fri, 9-5.

Borrowing a camera

1. Visit <http://cambridgecarbonfootprint.org/blog/thermal-imaging-camera-calendar/> and check the 2 calendars for cameras, now kept in different locations, as above. Click calendar entries for more info.
2. **To book**, contact TI Administrator or CCF Office (above). Max borrowing period normally 2-3 days.
3. Collect & return at [CCF office](#) for TIR or [Cambridge Architectural Research](#) for newer TRI105 Sometimes Administrator or office can arrange a direct transfer with who's before/after you.

Doing a survey - typically takes about an hour, maybe more

- Survey your own home and/or those of friends, family, neighbours, community buildings, etc
- *Examine unexpected hot or cold places for poor insulation, draughts*
- Show householder where heat is leaking out. Ask them to take notes.
- Only suggest fixes if you know what's appropriate
- share images with the householder's PC or device from SD card, via USB adaptor, if necessary - or email them later, if necessary

Then:

- Please ask householders to consider making a **donation** to CCF We normally suggest £5 - £50. This is much less than commercial rates. It enables more CCF work support people in moving to low-carbon living
 - If they're eligible, please ask the homeowner fill out a **gift aid** form (in the camera case)
 - Donations can be sent or delivered to [CCF office](#), or can be made [online](#)
- Please tell the householder about CCF's other [events](#), if they're interested
- Please report any problems to TI Administrator or CCF Office.
- Keep the camera safe and return it, with all accessories, as arranged

For more info, see: cambridgecarbonfootprint.org/ti-resources



Good Luck! **Tom Bragg** tom@cambridgecarbonfootprint.org