

When to make best use of a thermal imaging camera

Thermal imaging cameras demonstrate differences in temperatures, and work best when there is a large difference between the temperature inside your house and outside. As a minimum we recommend a 10°C difference, for example 20°C inside and 10°C outside. This restricts the use of the camera to the winter typically between November and March when the outside temperature is mainly below 10°C at night and early mornings. You will be able to see much greater temperature differences if the outside temperature is below 0°C, but even an outside temperature of 5°C should be low enough to enable suitable Thermal Imaging Camera results to be obtained (provided the house temperature is above 15°C).

Other weather conditions which make thermal imaging more difficult include:

1. Wind: makes it difficult to see air leaks from your house from the outside
2. Sunshine: warms the outside walls making it difficult to see leaks or areas missing insulation
3. Rain: causes outside walls to appear colder than they actually are, due to evaporation

All 3 of the above make *imaging from inside a home more effective than outside a home*. The suggestion is to heat your home for a couple of hours before carrying out your thermal imaging, and to as high a temperature as possible, to allow the heat to distribute evenly and to maximize the heat difference that can be seen.

INTRODUCTION to the camera

The FLIR C3 Thermal Imaging camera helps to identify areas that can be insulated or draught-proofed; leading to lower energy bills. This link gives you a quick introduction into how to use this equipment:

www.youtube.com/watch?v=l__uutf7E.



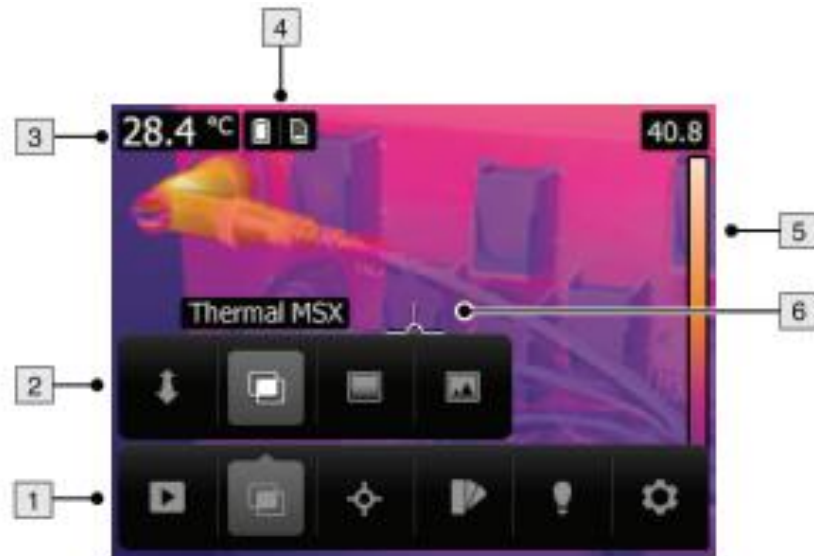
The smaller button, on the top left-hand side (when you're looking at the images on the rear screen of the camera), is the "On/Off" button.

The longer "Big Snapshot Button" is for saving images. This is quite hard to press, so squeezing it between with both hands can make saving images easier.

Saving images means that if, after using the TIC, you carry out some Retrofit Projects to remove "cold spots", you could check the location again, at a later date, to see if the Retrofit Action has really had an impact (eg. there are fewer cold spots).

LOOKING ROUND the camera

First turn the camera on (smaller button, top left). Wait a short time (possibly 20 seconds) for the thermal image to appear with the coloured temperature-scale bar on the right of the screen.



1. Main menu toolbar.
2. Submenu toolbar.
3. Result table.
4. Status icons.
5. Temperature scale.
6. Spotmeter.

Take note of the Temperature Scale, in degrees C (on the right-hand side of the screen). Colours indicate the temperatures of the different places in the image on the screen. "Warm" colours indicate warm places - "cold" colours indicate cold places. The temperatures shown constantly change as the camera is moved to examine different parts of a room.

Press the touch screen once and a menu bar arrives (see 1 above), with options for settings. We suggest leaving settings as they are - but you can play with them on the touch screen. The camera works best in the Thermal MSX where photo and thermal images are overlaid. This allows you to identify the exact areas of a room or space that are potentially of concern (ie. too cold, due to draughts or cold spots).

The small white circle (see 6 above) gives the temperature for that exact spot (shown as °C, on the top left of the screen, see 3, above).

To remove the menu bar, touch the screen again.

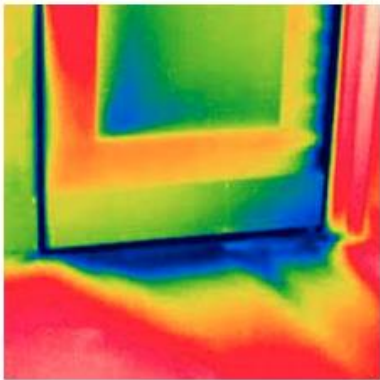
NOW MAKE A START

You'll get the most useful information when it's cold outside (ideally $< 5^{\circ}\text{C}$) and warm inside - which is why it is suggested to warm your place up for a couple of hours before carrying out the tests.

Inspect the corners of a room or the edges of windows and doors. You should notice that it's cooler there, and the screen should show these as areas of blue. Room corners can be cold because any warm air in the room isn't circulating there. Now you can go round your house checking out places of interest.

Below are some examples of places that you can check with the Thermal Imaging Camera, and possible actions that you can carry out. The Go Green Widcombe website suggests more areas that you may want to investigate for potential cold spots and draughts.

External doors

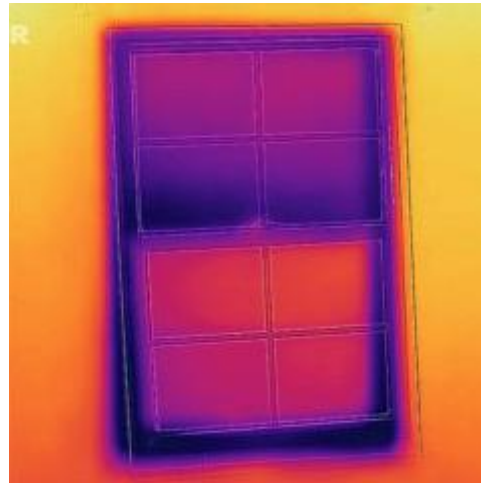


The dark blue areas show where there is cold air coming in around this external door.

There are various draught proofing options for reducing draughts around doors. These include installing draught proofing brush strips on the bottom of the door.



Windows



Again, the dark blue areas show where there is cold air coming in around this sash window. Once more, draught proofing strips are a good option.

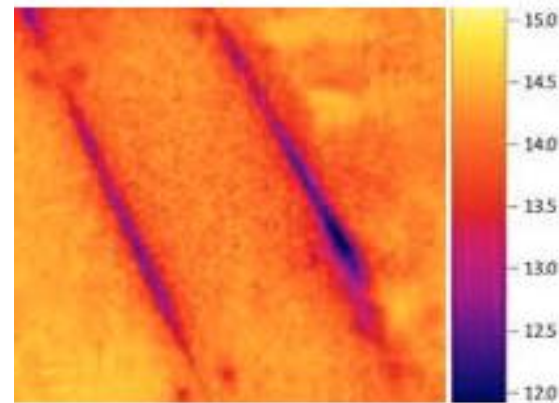
Even closing your curtains or blinds, at night, can help reduce heat loss.

Attic



This image suggests that the attic insulation may be patchy. Therefore, the attic should be inspected and either more insulation is needed, or the old material needs to be replaced. Sometimes the edges of the attic need insulating... but not over an external Cavity Wall.

Floors



This image shows cold air coming through the floor boards from below.

Options here include underfloor insulation, or, more simply, just sealing the gaps.

This link, to the Bristol-based Centre for Sustainable Energy's website, gives quick guidance to various options for dealing with draught-proofing in homes: <https://www.cse.org.uk/advice/diy-draught-proofing/>.

If you want to save images squeeze the "Big Snapshot Button" (see page 2). Once you've taken and saved all the images that you need, then you can transfer them to your laptop, iPad, PC or whatever, by connecting the Thermal Imaging Camera to your chosen device using the USB cable that comes with the Thermal Imaging Camera (TIC) kit.

Once connected then check the USB options on your device. If you only have one USB option, then it's easy to know which one is connected to the TIC Camera. If you have more than one USB option, then check each one, and look for the one that includes a Folder with the title "DCIM". This might show as USB Drive (D): > DCIM. Then click on this DCIM Folder. This should throw up at least two new options. These are (i) 100_FLIR and (ii) MISC. Click on the 100_FLIR option. This should then have your TIC images stored with automatic names which will start with FLIR, and then finish with a 4 digit number (eg. FLIR0098). Alongside the image name you should be able to see other Headings such as (a) Date modified, which will also include the time (but this may show as an hour ahead of GMT), (b) File Type (which should be JPG) and (c) File Size (in KB).

Alternatively, you might find it easier to let Go Green Widcombe download the images from the Thermal Imaging Camera, when you return the camera to us, and then we can email the images to you.

FINALLY

Please turn the camera off when you've finished taking photos by pressing the on/off button, on the top left of the Thermal Imaging Camera, as you look at the images on the rear screen.

If you have any questions, call Tim Williamson on 07800 964458.