

# THERMAL IMAGING CAMERA – INSTRUCTION GUIDE

Thank you for borrowing the **Thermal Imaging Camera.** This camera can help you save energy, reduce costs and greenhouse gas emissions and improve the comfort of your home.

You may also like to borrow the Home Energy Saver Toolkit from the Frankston Library.

## Informative videos

In addition to this Instruction Guide, we have developed some simple videos that you can watch to learn more about the Thermal Imaging Camera (and Home Energy Saver Toolkit) and how to use each of the items. You can view the videos here: https://www.frankston.vic.gov.au/HomeEnergySaverKit

## **Energy efficiency and climate**

Australian households generate <u>at least one-fifth of Australia's greenhouse gas emissions</u>. Making our homes more energy efficient and shifting to renewable energy are important actions we can take to reduce our carbon footprint and tackle climate change.

#### **Our Climate Emergency response**

In November 2019, Frankston City Council declared a climate emergency calling for urgent action to reverse global warming. Offering this camera to our residents to loan is part of our commitment to supporting and enabling community climate action.

#### We want your feedback

After using the camera, we would love to know how you found it. We are trialling this camera to see if there is enough interest to provide more. Did you find the camera easy to use, or implement any changes as a result of using it, and what else would you need to help you on your energy saving journey? To provide your feedback click on the QR code or go to: <a href="https://www.surveymonkey.com/r/HomeEnergySaverKit">https://www.surveymonkey.com/r/HomeEnergySaverKit</a>







# For more information

Frankston City Council Environmental Services team E: <u>info@frankston.vic.gov.au</u> (please mark attention of 'Environmental Services') P: 1300 322 322 W: <u>frankston.vic.gov.au</u>

# Stay in touch

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### THERMAL IMAGING CAMERA

A thermal imaging camera is a valuable inspection tool to help reveal where hot or cold air is leaking in and out of your home. The thermal images are used to locate the sources of unwanted heat loss and heat gain (that are invisible to the naked eye), and identify where improvements can be made. The images can also be used to assess how well any improvements have been completed.

In particular, the thermal imaging camera will help you to identify any potential gaps in ceiling, floor and wall insulation, in identifying air leaks and draughts around doors and windows, as well as leaky fridge seals and high energy using appliances.

# **▲** Safety Precautions

- Do not point the camera laser at your eyes, or anybody else's, including animals.
- Do not point the laser beam at a mirror or other reflective surfaces.
- Do not point the laser beam at any gas substances, such as your stove or how water system.
- Do not allow the camera to get wet or expose it to excessive heat, i.e. a vehicle in direct sunlight.
- Do not use the camera, or the USB-C cable, if they appear to be damaged.

## If you have any problems, please return the camera to the library and notify the Library staff.

**DISCLAIMER:** The Thermal Imaging Camera is provided as a guide to help Frankston City households save energy. While Council has carefully selected the equipment, Council cannot guarantee the reliability of the readings as individual circumstances may vary.

## HOW TO USE

#### Kit contents

The camera comes as a kit with everything you need, including:

- Flir TG267 thermal imaging camera and case
- USB-C charging cable
- Instruction guide (this guide)



1. Display area

- 2. Return button (to back up in the menu system)
- 3. Laser pointer button
- 4. Up/Down Navigation buttons and Power button (long press)/Menu button (short press)
- 5. Lanyard post
- 6. Accessory mount
- 7. High temperature lever switch (TG297)
- 8. 160 x 120 pixel Lepton® IR camera
- 9. Laser pointer with circular target-spot assist
- 10. USB-C and Thermocouple jack compartment
- 11. Spot thermal sensor
- 12. Work light (LED)
- 13.2M pixel visible spectrum camera
- 14. Image capture trigger (also used to exit the menu system)





# Camera power (ON/OFF)

- Look at the product description to get to know each of the parts first (see diagram on this page).
- Long press the centre power button to switch the camera ON or OFF.
- A rechargeable lithium battery supplies power. If the camera does not power ON, charge the battery by connecting the camera to an AC wall charger using the supplied USB-C cable. The USB-C jack is located on the top of the camera. Please do not use the camera while it is charging.
- <u>Note</u>: The camera will switch OFF automatically if no buttons are pressed for 5 minutes to save power.

## Accessing the menu

- To access the menu, short press the centre power/menu button. Use the up and down arrow buttons to navigate and scroll.
- Pull the Trigger to exit the menu system (see diagram over page).
- Use the return button at any time to return to the last step in the menu system.

# Taking an image and temperature reading

- Long press the power button to switch the camera ON.
- Point the camera towards an area (e.g. a corner of a room). If the image you see is not similar to the one in **Figure 1** (i.e. where you can see a coloured image and temperature reading), then you may need to select the MSX mode in the menu system. Go to the menu and using the up/down arrow select *Image Adjustments*, then *Image Modes*, then *MSX*. To exit the menu pull the Trigger.
- To capture a camera image, pull and release the Trigger. The image you see will likely have a combination of lighter (orange/yellow) and darker (purple/blue) colours. The lighter colours show the warmer areas in the room, while the darker ones show the cooler areas.
- The temperature reading on the display screen represents the temperature measurement of the targeted spot. See Figure 1.
- Optional: You can use the laser pointer button to show the laser beam on the testing area. If the laser beam does not appear when the button is pressed, you can enable it in the menu system (select *Settings*, then *Device Settings*, then *Laser* on). To exit the menu pull the Trigger.



Figure 1. Combined Thermal and Visible Image (MSX®)





Note: The display will show 'OL' if a measurement is out of range. You will need to move closer to the area you want to test. The minimum target distance is 26cm.

<u>Tip</u>: Thermal imaging works best when there is a large temperature difference between the inside and outside of a building. The most accurate readings occur when there is a temperature difference of at least 14°C between inside and outside temperatures. Therefore, it is best to use the camera when it is warm outside and cool inside, or vice versa, or after adjusting the thermostat of your heating and cooling system.





## What to look out for

The camera is great for locating gaps in insulation. In particular, look at your walls, floors and ceilings for insulation gaps (Figure 2).

Also, look for air leaks and draughts around doors and windows (**Figure 3**) that would benefit from draught proofing. In addition to draught proofing, window coverings such as curtains can help to reduce heat loss and gain into a home (**Figure 4**).



**Figure 2.** Thermal image showing wall insulation gaps in a brick veneer house on a cold day (the purple/blue area shows where there is no insulation between the timber studs/frame).



**Figure 3.** Thermal image showing air leaking from under the door (purple/blue area) that would be suitable for draught proofing.



**Figure 4.** Thermal image showing cool areas around the window and the warmer area of the curtains/ window coverings.





Thermal imaging can also be used to identify leaky fridge seals, high energy using appliances, water leaks, as well as the location of hot water pipes.



**Figure 5.** Thermal image showing hot water pipes in the wall of a brick veneer house (the bright yellow line shows where the pipes are) between the bricks and the plaster.



**Figure 6.** The same image of the wall from Figure 5 without the thermal imaging.



Figure 7a. Image showing ceiling with duct.

**Figure 7b.** Thermal image showing the same area with cool areas around the heating duct and patches of missing insulation identified.





#### Capturing and working with images

- To help keep track of what images you take and where they are located, consider taking a thermal image (MSX) and switching to an ordinary image (Visual or High Res Visual). Then you will have both the thermal image and a normal image to compare to. This will help to remind you of exactly what you are looking at (see figures 5, 6, 7a. and 7b. as example). To switch between image modes short click the ON/OFF button, choose *Image Adjustments* (by short clicking the ON/OFF button again), select *Image modes* (short click ON/OFF button), then use the up and down buttons to move between MXS, Visual and High-Resolution Visual. Once you have the image mode you want, you can either click the Trigger or click the ON/OFF button to select it and take the image.
- To send/view/delete images, access the *Gallery* mode in the main menu. In the *Gallery*, scroll through the stored images with the up/down arrows and open an image with the menu button. Once an image is opened, press the menu again to see the options to send, cancel, delete the file, or delete all files.
- To save images for future reference, connect the camera to the PC by using the supplied USB-C cable. The USB jack is located at the top of the camera.
- Once connected, locate the FLIR device on your PC and click to view the images. Save the images to your PC.

**Privacy Note:** Remember to access the *Gallery* and select the DELETE ALL IMAGES command to erase any stored images. For privacy reasons, we recommend that you delete all stored images before returning the camera to the Frankston Library.





## **TIPS AND RESOURCES**

If you would like to learn more about saving energy in your home and ways to make your home more environmentally sustainable, here are some recommended resources:

A **Home Energy Saver Toolkit** is also available to loan from the Frankston Library. The kit includes thermometers, a water flow measuring cup and an energy meter to help you understand where you are using power, check how much energy your appliances are costing, and identify other ways to save energy around the home.

Frankston City Council's website has information for residents on saving energy and water, going solar, as well as rebates and other financial incentives for installing energy saving products and appliances and installing solar. Visit: <u>https://www.frankston.vic.gov.au/Community-and-Health/Environment</u>

**Sustainability Victoria** is an excellent resource providing advice and information on energy efficiency, home insulation, draught proofing and the costs associated with running heating/cooling and household appliances in your home. Visit: <u>www.sustainability.vic.gov.au/You-and-your-home/Save-energy</u>

Sustainability Victoria's Household Energy Action Guide is another great resource designed to offer some simple but cost-effective actions to help reduce your energy bill and improve the comfort of your home. Visit: <u>https://assets.sustainability.vic.gov.au/susvic/Report-Energy-Households-Energy-Action-Guide.pdf</u>

Your Home Technical Manual is a comprehensive Federal Government guide for environmentally sustainable homes. It is available for free online or you can purchase a printed book. Visit: <u>www.yourhome.gov.au</u>

