

St Albans Thermal Imaging Camera Information Pack Oct 2020

Summary

The Sustainable St Albans Thermal Imaging Camera initiative started in 2014, when we obtained at a localities budget grant to purchase the first camera (a Fluke TiR105 camera based in Harpenden). Additional grants in 2016, from Herts County Councillors, Geoff Churchard (Sandridge), Robert Prowse (St Albans East) and Sandy Walkington (St Albans South), enabled us to purchase a second camera, a TiS20 based in St Albans. Since 2014, over three hundred residents have borrowed one of the cameras and our volunteers have organised approximately twenty information sessions each winter.

Thermal Imaging Cameras can be used to see where heat is leaking from your home. The camera works most effectively in the evenings of the winter months when the outside temperature drops low enough to highlight the heat leaking out from inside a house. You can use the camera to

- walk around the inside and outside of your home to see where heat is escaping
- take pictures to view later – these can either be saved directly onto the micro SD memory card supplied with the camera and transferred to your device with the reader supplied, or you can photo the images.

This Information Pack is Sustainable St Albans's own in-house guide to borrowing the camera; it is organised as follows:

Part A: Quick Guide to using the thermal imaging camera

Part B: What might the camera show me?

Part C: What can I do to reduce the heat loss from my house?

Part D: St Albans Thermal Imaging Camera: Our Survey

Part E: Terms of borrowing the St Albans Thermal Imaging Camera

Part F: COVID-19 Procedures for collecting and returning the camera for winter 2020/21

Part G: TiS20 Manufacturer's Safety Information

Annex: Gift Aid form for donations to Sustainable St Albans

Our website provides further information about the camera and its use, with links to the manufacturer's guide to the camera, a video on using the camera, and resources relating in insulating your home.

The St Albans camera, a Fluke TiS20, is an expensive piece of equipment. Please look after it and please do not leave it unattended, such as in a car.

Please note that you must attend a St Albans Thermal Imaging Camera Information Session before you book to borrow the camera. For those that have borrowed the camera before, or downloaded earlier versions of the Information Pack, please note that this Information Pack replaces all the earlier version of the Information Pack/User Guide.

Please also note that arrangements for collecting the camera from and returning the camera to Sustainable St Albans Thermal Imaging Camera volunteers for the winter 2020/21 have been modified. These arrangements have been put in place to minimise the risk to camera borrowers and our volunteers and to comply with COVID-19 regulations (see Part F).

When you have finished using the camera

- Please charge the camera after use so that is ready for the next person to use.
- Pictures left on the camera will periodically be deleted and may also be used (anonymously) for developing this guide or publicity. Please delete your pictures after you have finished with the camera if you do not wish them to be viewed or used in this way (see the part in section 6).

- Please check that the charging cable, microSD card and reader, and the USB lead are in the bag.
- Please also complete the Survey Form online at <http://tinyurl.com/stalbanscamera> (you could also print the survey and return it with the camera.) We welcome any comments that you have on using the camera and also what you have learnt from using the camera, this will enable us to develop the guide for future use.

We hope that you find it useful and interesting to borrow this camera.

The St Albans Thermal Imaging Camera Volunteers

Email: thermal.imaging@sustainablestalbans.org

Website: <https://sustainablestalbans.org/thermal-imaging/>

Part A: Quick Guide to using the thermal imaging camera

1. Before you start

- **Please read the safety information (Part G)**
- The camera works most effectively in the evenings during winter months when the outside temperature drops low enough to highlight the heat leaking out from inside a house. It is optimal for the indoor temperature to be at least **10 degrees** warmer than outside.
- If you use the camera outdoors, please do not point the camera at the sun or use it in the rain or in strong wind; this could damage the camera and the images will be distorted.
- It may help to take written notes about what you are viewing as you go along – many of the images may look similar after the event – or unrecognisable!
- You can ‘freeze’ the images you see with the camera; and save them to view later.
- If you want your own copies of the images, there are four ways to do this (Sections 5 – 8). We recommend you use the Micro SD memory card (supplied), then transfer them to your own PC or device. Alternatively you could simply take a photo of the captured image with your phone or tablet.

2. When borrowing the camera you will have

The St Albans Thermal Imaging Camera Bag containing:

- a. The TiS20 Fluke Thermal Imaging Camera,
- b. The charging cable for the camera,
- c. The micro SD memory card and converter for standard SD memory card reader,
- d. The USB lead to connect the camera to a laptop to use **Fluke Connect** Software.

You are also be able to view the “How to use the St Albans camera” video again from the website.

<https://sustainablestalbans.org/thermal-imaging/>

The manufacturer’s manual for the camera can be download from our website, or using this link:

<https://sustainablestalbans.files.wordpress.com/2020/09/tis20-user-manual.pdf>

3. Getting started

- To switch on: push and hold the green power button to the right of the camera screen.
- **Open the screen cover flap on the back of the camera.**
- Point the camera at the area you want to look at to see a thermal image.
- You will need to stand at least 1.2m from the area you wish to view. There is no facility to ‘zoom’ the image.
- Press the ↓ key to switch from visual to thermal, and combined modes.

4. Looking at the images (pictures) on the camera

- The colour scale moves from blue being cold through red to pale yellow being hot.

- When viewing a property from inside; blue areas show cold air coming into a house and cold spots. When viewing a property from outside; yellow/red shows heat escaping.
- All is relative! Use the temperature scale on the side of the image to understand what you are seeing. You are looking for a big difference in temperatures in places where there shouldn't be a large difference. See Part B.
- The spot temperature shown on the screen relates to the small white target square in the middle of the screen.
- You will need to look obliquely at surfaces that reflect heat e.g. windows, pictures and other reflective surfaces as your own body heat will reflect off reflective surfaces, such as glass.
- The colour palate is set as "*ironbow*" it can however be changed to a variety of other colour scales (***press function button F2, then image, then palette***). Please reset it after you have finished.
- The camera can be used to observe your walls, ceiling etc. as you move around the house.
- To 'freeze' the image, pull the green trigger. Pulling it again unfreezes it. Ignore the black trigger.
- If you would like to save the images to look at after you have returned the camera, the next sections (5 -8) describe ways to do this.

5. Saving images, the easy way (we recommend this way)

- Simply take a photo of the camera screen ('freeze' the image first) with your phone or iPad.

6. Taking and saving JPEG images to a memory card (we recommend this way)

- The camera has internal memory, however it is set up for you to save images onto the Micro SD memory card supplied with it. (You may wish to use your own Micro SD card, but please remember to return SSA's Micro SD memory card before returning the camera!)
- To insert the Micro SD memory card, gently push the card into the slot on top of the camera (see diagram on page 4) until it catches.
- Check the picture will be saved to the SD card - ***Press F2, then settings, then image storage to choose the SD card*** if is not already set to that. *It is important to select this before saving images.*
- To view the pictures later you will probably want them to be in a jpeg format. To check / change to JPEG settings ***Press F2, then settings, then file format and select JPEG***
- You are then ready to take pictures.
- To capture an image, ***pull the green trigger on the back of the camera to 'freeze' it and then choose function button F1*** if you wish to save the image.
- To look at the pictures you have saved on the camera's screen, ***press the black (memory) button*** and it will display mini images, one is highlighted.
- ***Use the arrow buttons*** to select a mini image and ***press F1 to view it.***
- ***To delete an image, select F2.***
- To eject the Micro SD memory card, push in on the exposed edge of the card with a finger nail and release. The card should pop partially out after you release it. Carefully pull the card out of the slot.
- Insert it into the Micro SD card converter supplied to transfer the images to your device.

7. Using Fluke Connect apps to view pictures on your phone and transfer them via email (less reliable)

- First download the '***Fluke Connect***' app onto your phone from iTunes / the App Store.
- The camera can connect via its internal Wi-Fi to your phone or tablet.
- If you see Wi-Fi in white on the camera's screen (top left), this means that the camera's Wi-Fi is ready to connect to your device. If this is not shown, then to switch on the camera's Wi-Fi ***press function button F2, then settings, then wireless, then select Wi-Fi hotspot.*** You will then see ***Wi-Fi*** in white on the camera's screen.
- On your phone or tablet, select "***FLUKE-Camera***" as the Wi-Fi network; *you will also need to switch Bluetooth off.*
- The images need to be in IS2 format; to check that this is the case ***press F2, then settings, then file format, and the format should be IS2;*** if this is not the case, select IS2.

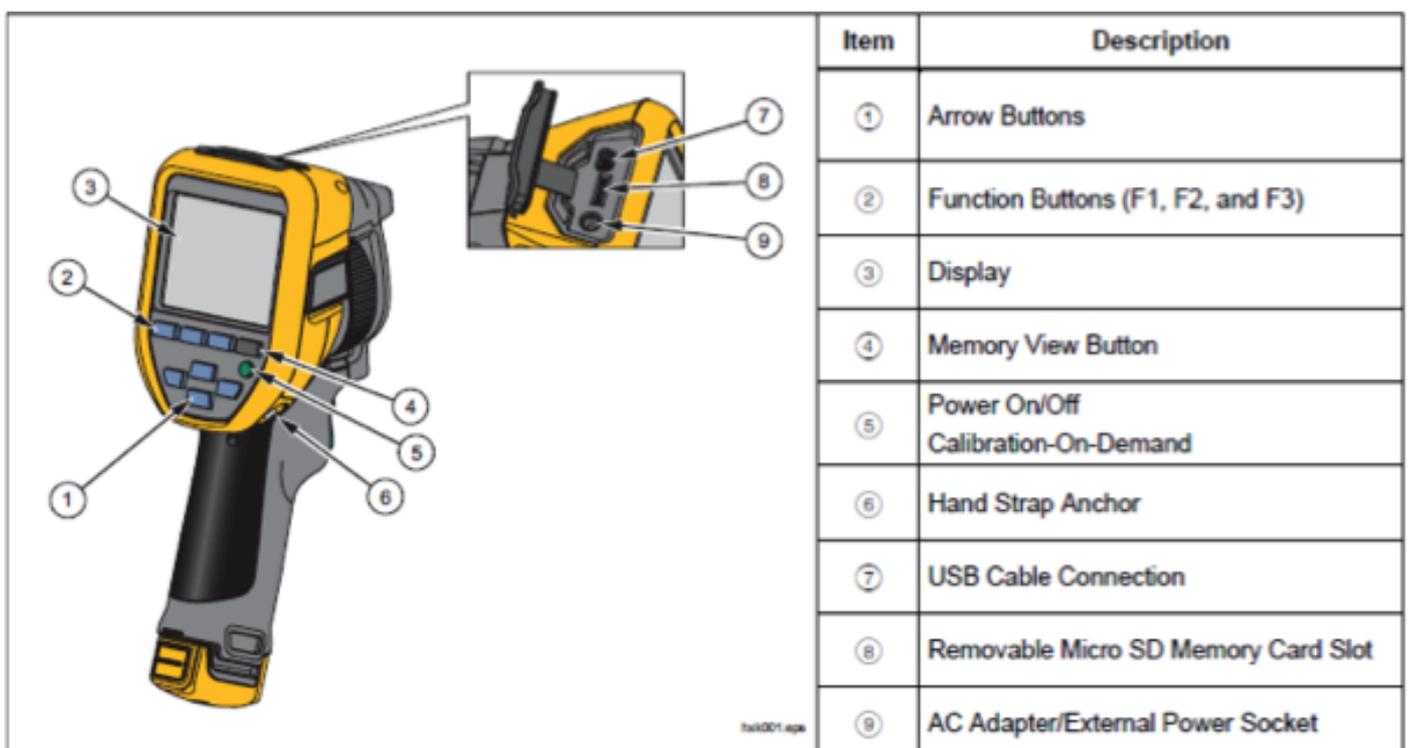
- Open the **'Fluke Connect'** app and select the **'Thermal imager'**.
- Now, when you capture an image it will appear on your phone screen and you just follow the options on your phone to transfer the images via email. There are options to send pictures in various formats including pdf and IS2. You can send a selection of images in one email by going to the **'Measurements'** item on the main menu and selecting them.

8. The images can also be transferred to PCs (but not to Macs) (refer to the Fluke manual).

- You will need to download **'Fluke Connect'** software to your PC; the USB cable supplied can then be used to transfer the images to your PC.

9. How do I manually set the camera temperature range and why would I do this?

- The temperature range is set automatically to encompass the highest and lowest temperatures in your view but it can be adjusted manually.
- In some situations, the automatic temperature range represents an image with a very wide temperature range. Outside at night, the sky temperature may read down to minus 40 degrees. Inside a house, a working radiator would be very hot. This can prevent the camera from showing the more subtle temperature differences that you are looking for.
- You can alter the camera's temperature setting to a range of your choice to block out that hot radiator or discount the cold night sky and therefore improve the thermo-image you are seeing.
- There's a **simple way** to select a preferred temperature range by pointing the camera at a view of objects within this range and holding down **function button F1** until **manual** is displayed above the temperature scale.
- Now **this** range keeps within the temperature limits whatever you view, until **function button F1** is held down again and the temperature range reverts to **auto**.
- Objects below the temperature range appear grey and objects above the temperature range appear green.
- There are instructions in our presentation, and on page 16 of the Fluke manual, if you prefer to set the temperature limits and temperature span manually by using the arrow buttons. It needs a bit of practice and patience.



Part B: What might the camera show me?

Remember that you are looking for a significant temperature difference in an area where you wouldn't expect it. A few degrees difference may not be of concern despite a blue/yellow contrast on the camera. Always refer to the temperature scale on the side of the screen and take a common sense approach.

1. Heat loss through the roof

Around a quarter of heat is lost through the roof in an uninsulated home.

- Figure 1 shows the outside of a semi-detached house with no heat escaping through the roof - the recommended 270mm insulation has been installed throughout the loft.

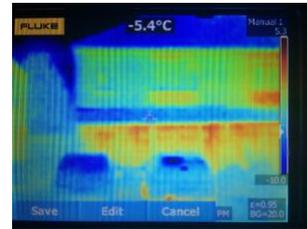


Figure 1

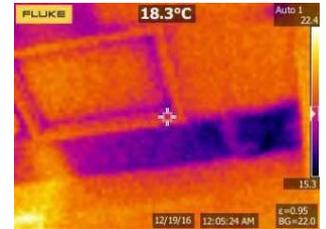


Figure 2

and from poorly-insulated loft/ Ill-fitted loft hatches

- Figure 2 shows the impact of a partially uninsulated loft; also the loft hatch would benefit from draught-excluding strip.

2. Heat loss through the walls

About a third of all the heat lost in an uninsulated home escapes through the walls.

- Figure 1 shows the front of a semi-detached house (which is solid wall) with no insulation. You can see the heat clearly being lost in the lower half of the house (the warmest part of the house by far at the time).
- Figure 3 shows the rear of the house which has a cavity wall with cavity wall insulation installed. Here it's only the old windows/patio doors letting the heat escape! You can clearly see the difference from the front of the house (in Figure 1).
- Figure 4 is an external view showing heat escaping through the house wall (no cavity wall) from a radiator. Reduce by insulating, or fixing reflective foil to the wall behind the radiator.
- In Figure 5, the wall on the left is an outside wall, and the wall on the right is an internal wall.

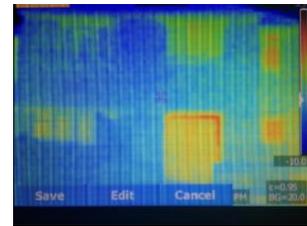


Figure 3

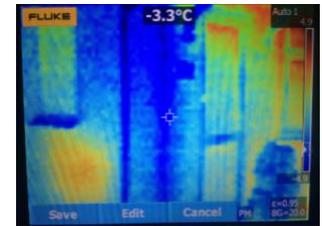


Figure 4

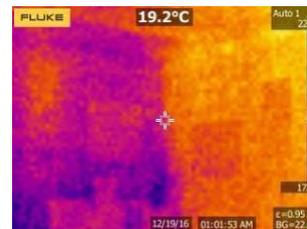


Figure 5

Note – figures 1, 3, and 4 were taken with a camera that was set up with a different colour palette.

3. Heat loss through the floor

- Figure 6 shows the gaps between floorboards, there is insulating tubing between the boards in the lower half of the picture but not the top part.

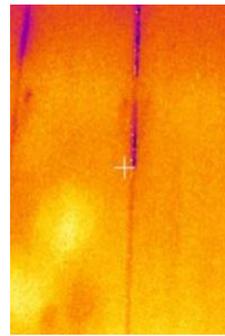


Figure 6

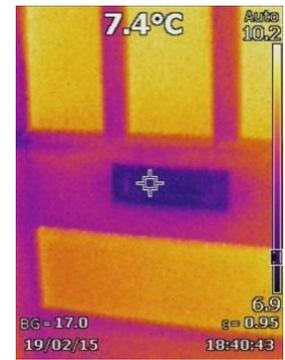


Figure 7

4. Heat loss through the doors and heat leaking from letter boxes

- Figure 7, taken from outside, shows a well-insulated letter box. It also highlights the heat loss from single glazed windows in the door.

5. Cold bridges

- In a house with cavity wall insulation, you would be able to see whether the insulation went around the whole house or whether the cavity was built room by room with bricks going directly from outside to inside at the room junctions. If the cavity wall did not go all the way round the outside of the house there would effectively be a cold bridge where the bricks were (see Figure 8).
- Figure 9 shows a garage conversion interior - the top of the wall (where the eaves are) is markedly colder, and there's patchy insulation in the ceiling
- Figure 10 shows a bedroom roof apex is cold at the join of the two roof sections.



Figure 8

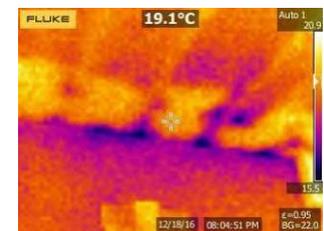


Figure 9

6. Poorly fitted windows

- Figure 8 shows areas where it would be helpful to seal between the window frames and the walls.

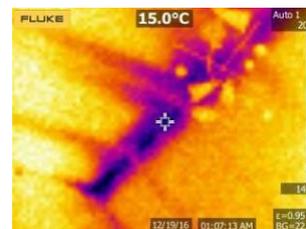


Figure 10

7. Areas that have not been plastered or had plasterboard fitted

- For example in a conservatory you would see a difference in temperature between a breeze block wall and a wall with plasterboard.

Your images?

If you have taken images that we could add to this guide please do email them to us with a few words about the image at thermal.imaging@sustainablestalbans.org.

Part C: What can I do to reduce the heat loss from my house?

Low or no cost ideas

- 1 Always close curtains and blinds at night, even in rooms you're not using, and open them during the day. If you have long curtains over a radiator, tuck the curtains behind the radiator, or shorten the curtains!
- 2 Consider foil behind radiators to reflect heat into the room.
- 3 Close the door on unused rooms to keep the heat where you need it.
- 4 Fill gaps in floor boards and skirting boards; use rugs or carpet where possible.
- 5 Install draft-proofing around doors, windows
- 6 Install a chimney balloon in chimneys that are not used and not required for ventilation
- 7 Try to prevent those small draughts through letterboxes (fit a cover/brush), keyholes (fit a keyhole cover), cat flaps (fill with insulation or blanket flap) and loft-hatch (use draught proofing tape).

Higher cost ideas

1. Consider fitting blinds & curtains where they are not fitted, including over external doors.
2. Loft insulation: see Centre for Sustainable Energy, Loft insulation Guide, <https://www.cse.org.uk/advice/advice-and-support/loft-insulation>
3. Cavity wall insulation: see Centre for Sustainable Energy, Cavity wall insulation, <https://www.cse.org.uk/advice/advice-and-support/cavity-wall-insulation>
4. Look at secondary glazing, double glazing or triple glazing

Further information

1. DIY Draught Proofing Guide, Centre for Sustainable Energy, <https://www.cse.org.uk/advice/advice-and-support/diy-draught-proofing>
2. Draught Proofing Guide, Energy Savings Trust, <https://www.energysavingtrust.org.uk/home-insulation/draught-proofing>
3. Home Insulation, Energy Savings Trust, <https://www.energysavingtrust.org.uk/home-insulation>
4. Loft insulation, Guide Centre for Sustainable Energy, <https://www.cse.org.uk/advice/advice-and-support/loft-insulation>
5. Thermal imaging camera resources are available from "Cambridge Carbon Footprint" at: <http://cambridgecarbonfootprint.org/ti-resources/>
6. Green our Herts: <http://greenourherts.org.uk/>
7. St Albans District Council also has useful advice at: <https://www.stalbans.gov.uk/environmentandwaste/greenerliving/default.aspx>

Part D: St Albans Thermal Imaging Camera: Our Survey

After using the camera please complete this short survey online at: <http://tinyurl.com/stalbanscamera>

We hope that you found it useful, interesting and fun to use the Sustainable St Albans Thermal Imaging Camera. It would greatly help if you could complete the survey only (or you may complete the form below and leave it with the camera when you return it). The survey information enables us to improve the experience of future borrowers of the camera, to provide feedback to our funder and to assess the usefulness of the camera. Data used in reports will be anonymized.

Name	
Postcode	
Date Camera Borrowed	
1. Did you find the thermal imaging camera useful?	
2. Did you learn of anything particularly negative or positive about the heat loss from your house? If so, what?	
3. Will you be taking any action in the next 12 months with regard to any heat loss you found? . If so what?	
4. Did you find it easy to use, once you had read the instructions provided? If no please explain	
5. Do you have any further comments or suggestions? (please email or continue on a separate sheet if more space is needed)	
6. Would you like to received monthly newsletters from Sustainable St Albans? (Y / N)	If yes, please add your email address below

Please also consider making a donation towards the costs of running this project.

The loan of the camera is free for residents of St Albans District. However, Sustainable St Albans suggests a voluntary donation of £10 is made to help fund activities related to Sustainable St Albans's cameras.

Donations can be made by

- bank transfer** (Sustainable St Albans; Sort Code: 08 92 99; Account No 65843671). Please use the reference "St A TiC Donation"
- PayPal** (to trustees@sustainablestalbans.org). Please use the reference "St A TiC Donation"
- cheque or cash** (left with the camera when you return it)

If you are a tax payer and you complete the Gift Aid form in the Annex, we can also reclaim the tax on your donation.

Thank you

Sustainable St Albans Thermal Imaging Camera Volunteers

Email: thermal.imaging@sustainablestalbans.org

Website: <https://sustainablestalbans.org/thermal-imaging/>



Part E: Terms of borrowing the St Albans Thermal Imaging Camera

This is a copy of the terms signed when booking to borrow the camera

The Fluke TiS20 Thermal Imaging Camera is available for individuals in St Albans District to borrow to see where heat is leaking from their home. The Fluke TiS20 Thermal Imaging Camera is an expensive and sophisticated piece of equipment and must be used with care according to the procedures below. The camera is the property of Sustainable St Albans.

I agree that:

1. I will follow the safety guidance provided.
2. I will not hold Sustainable St Albans or its volunteers responsible for any consequences of my use of the camera.
3. I will look after the camera and I will not leave it unattended or in unlocked rooms or vehicles.
4. I will not use the camera in the rain, in direct sun or in strong winds
5. I will provide a security deposit of £200 to Sustainable St Albans (see Part F of the Information Pack for details of how to provide this). The deposit will be returned when the camera package is confirmed to have been returned complete and undamaged (or if the payment is made electronically but the booking is cancelled prior to collection of the camera)
6. I agree that if the camera package is damaged in any way my deposit will be forfeited.
7. I will collect and return the camera at the agree times
8. I will follow the new “COVID-19 procedures for collecting and returning the camera” set out in Part F of the Information Pack
9. I will cancel my camera booking if I or anyone in my household
 - a) has any COVID-19 symptoms,
 - b) has been in contact with anyone who has or has is suspected of having COVID-19 in the last three weeks,
 - c) has been asked to isolate by contact test & trace or to quarantine in the last three weeks or
 - d) I have any other reason to believe that I or any members of my household may have COVID-19

I understand that a booking to borrow the camera may be cancelled at short notice if one of the thermal imaging camera volunteers or a member of their household has any symptoms, is asked to isolate or quarantine or has any other reason to believe they may have COVID-19. If this happens we will contact you immediately to cancel and then in due course to rebook.

Sustainable St Albans Thermal Imaging Camera Volunteers

Email: thermal.imaging@sustainablestalbans.org

Website: <https://sustainablestalbans.org/thermal-imaging/>



Part F: COVID-19 Procedures for collecting and returning the camera for winter 2020/21

The arrangements for collecting the camera from and returning the camera to Sustainable St Albans Thermal Imaging Camera volunteers for the winter 2020/21 have been modified. These arrangements have been put in place to minimise the risk to our volunteers and to comply with COVID-19 regulations.

COVID-19

You may not borrow the camera if you or anyone in your household has or may have COVID-19. Specifically, if you, or any member of your household,

- have any COVID-19 symptoms, or
- have been in contact with anyone who has or is suspected of having COVID-19 in the last three weeks, or
- are isolating as a result of being contacted by the contact tracing system, or
- have returned from abroad in the last three weeks, or
- have any reason to believe they may have COVID-19

If any of the above are true for you or anyone in your household, please contact us to cancel your booking to collect the camera by emailing: thermal.imaging@sustainablestalbens.org. You will be able to book another date to borrow the camera once you and your household is clear of COVID-19. If you have already paid the security deposit electronically, we will return the deposit (unless you ask us to retain it for your later booking).

Collecting the camera

- 1 Please arrive promptly. If you are unable to collect the camera please inform us by emailing: thermal.imaging@sustainablestalbens.org (please specify in the email whether you are contacting the Harpenden or St Albans volunteers).
- 2 Please wear a facemask.
- 3 Please ring the doorbell and then stand more than two metres back
- 4 The camera volunteer will need to check your name and address ID against the booking.
- 5 The volunteer will provide a tray or similar and ask you to place your recent address ID (eg drivers licence, recent utility bill) and the deposit cheque (unless you have paid by PayPal or bank transfer) on the tray and then stand back.
- 6 The volunteer will check the ID, leave it on the tray, take the deposit cheque (if applicable) and put the camera on the tray. They will then stand back for you to take your ID and the camera.
- 7 The camera will have been kept overnight and sanitised following the return by the last borrower.
- 8 Wherever possible, any queries relating to the camera project and use of the camera should be raised by email, rather than on the doorstep.

Using the camera

- 1 The camera will have been left overnight and sanitised following the return by the last borrower.
- 2 You are asked to wash your hands before and after handling the camera.
- 3 Our website (<https://sustainablestalbens.org/thermal-imaging/>) provides links to our **Information Pack** for each of the two cameras (please note the cameras are different) and also to the manufacturer's guides for more technical queries.
- 4 If you have queries whilst using the camera, please review the **Information Pack** and the **How to use the camera video** and the **manufacturer's manual** in the first instance. If you

still have queries please email thermal.imaging@sustainablestalbens.org (please specify in the email whether you are contacting the Harpenden or St Albans volunteers).

- 5 Before returning the camera, please charge it up and ensure you have replaced the Micro SD card in the camera and the card reader/adaptor in the camera bag, and the charging cable.

Returning the camera

- 1 Please arrive promptly at the booked time. If for any reason you are unable to return the camera at the booked time please contact us immediately:
thermal.imaging@sustainablestalbens.org (please specify in the email whether you are contacting the Harpenden or St Albans volunteers).
- 2 Please wear a facemask.
- 3 Please ring the doorbell, leave the camera on the doorstep and then stand more than two metres back.
- 4 The camera volunteer will sanitise the camera, keep it overnight, and check that the camera is in working order. They will email you to confirm this. If you provided the deposit by cheque, they will destroy your deposit cheque (unless you have left a stamped self-addressed envelope in the camera bag in which case the cheque will be ripped in half and returned to you). Deposits paid electronically will be returned within two weeks.

Thermal Imaging Camera deposit options

The camera project has operated with cheques as the main means of paying a deposit for six years now. If you would prefer to pay electronically, or are not able to provide a deposit cheque, PayPal and Bank transfer alternatives are provided below. Like many other charities, our volunteers cannot currently take cash deposits.

Cheques: Please make cheques payable to **Sustainable St Albans**.

Electronic payments: You may pay the security deposit by PayPal or by bank transfer. In either case please make the payment **at least three days** before you are due to collect the camera and please email the thermal imaging camera volunteers on thermal.imaging@sustainablestalbens.org when you have made the payment. Please allow two weeks after the return of the camera for the deposit to be credited back to your account.

PayPal: Please email security deposit to trustees@sustainablestalbens.org. Please note that you will be responsible for the PayPal fees.

Bank transfer: Please transfer the security deposit to the following account. Account Name: Sustainable St Albans; Sort Code: 08 92 99; Account No 65843671. Please include your name and the reference "St A TiC Dep".

Donations

The camera project is run by volunteers from the charity Sustainable St Albans and the camera is free for residents of the St Albans District to borrow. We are however very grateful for any donations towards the costs of running the project, we suggest a donation of £10. Donations can be made by any of the above means. If you are a tax payer and you complete the Gift Aid form in the Annex, we can also reclaim the tax on your donation.



**TiS10, TiS20
 TiS40, TiS45
 TiS50, TiS55
 TiS60, TiS65**
 Performance Series
 Thermal Imagers

Safety Information

Go to www.fluke.com to register your product and find more information.

A **Warning** identifies conditions and procedures that are dangerous to the user.

Warning

To prevent eye damage and personal injury:

- Do not look into the laser. Do not point the laser directly at persons or animals or indirectly off reflective surfaces. *
- Do not open the Product. The laser beam is dangerous to eyes. Have the Product repaired only through an approved technical site.

Additional laser warning information is on the inside of the Product lens cover.



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PN 4633357 July 2015
 ©2015 Fluke Corporation. All rights reserved.
 Specifications are subject to change without notification.
 All product names are trademarks of their respective companies.

Warning

To prevent personal injury:

- Read all safety information before you use the Product.
- Carefully read all instructions.
- Use the Product only as specified, or the protection supplied by the Product can be compromised.
- Replace the batteries when the low battery indicator shows to prevent incorrect measurements.
- Do not use the Product if it operates incorrectly.
- Do not use the Product if it is damaged.
- See emissivity information for actual temperatures. Reflective objects result in lower than actual temperature measurements. These objects pose a burn hazard.
- Do not use the Product around explosive gas, vapor, or in damp or wet environments.
- Do not put battery cells and battery packs near heat or fire. Do not put in sunlight.
- Do not disassemble or crush battery cells and battery packs.
- Remove batteries to prevent battery leakage and damage to the Product if it is not used for an extended period.
- Connect the battery charger to the mains power outlet before the charger.
- Use only Fluke approved power adapters to charge the battery.
- Keep cells and battery packs clean and dry. Clean dirty connectors with a dry, clean cloth.

Safety Specifications

Operating temperature	-10 °C to +50 °C
Storage temperature	-20 °C to +50 °C
Battery charging temperature	0 °C to 40 °C
Altitude	
Operating	2,000 m
Storage	12,000 m

* the TiS20 does not have a laser

Annex:

Please Gift Aid your donation to Sustainable St Albans

You can boost your donation by 25p of Gift Aid for every £1 you donate. Gift Aid is reclaimed by us from the tax you pay for the current tax year. We need your address to identify to HMRC that you are a current UK taxpayer. **In order to Gift Aid your donation please tick the boxes below:**

giftaid it

I want to Gift Aid my donation of £_____ and any donations I make in the future or have made in the past 4 years to Sustainable St Albans

I am a UK taxpayer and understand that if I pay less Income Tax and/or Capital Gains Tax than the amount of Gift Aid claimed on all my donations in that tax year it is my responsibility to pay any difference.

Please complete your details

Title _____ First name or initial(s) _____

Surname _____

Full Home address _____

Postcode _____ Date _____

Please return your form to trustees@sustainablestalbens.org or the address below.

Please let us know if you:

- want to cancel this declaration
- change your name or home address
- no longer pay sufficient tax on your income and/or capital gains

If you pay Income Tax at the higher or additional rate and want to receive the additional tax relief due to you, you must include all your Gift Aid donations on your Self-Assessment tax return or ask HM Revenue and Customs to adjust your tax code.

SUSTAINABLE
St Albans



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