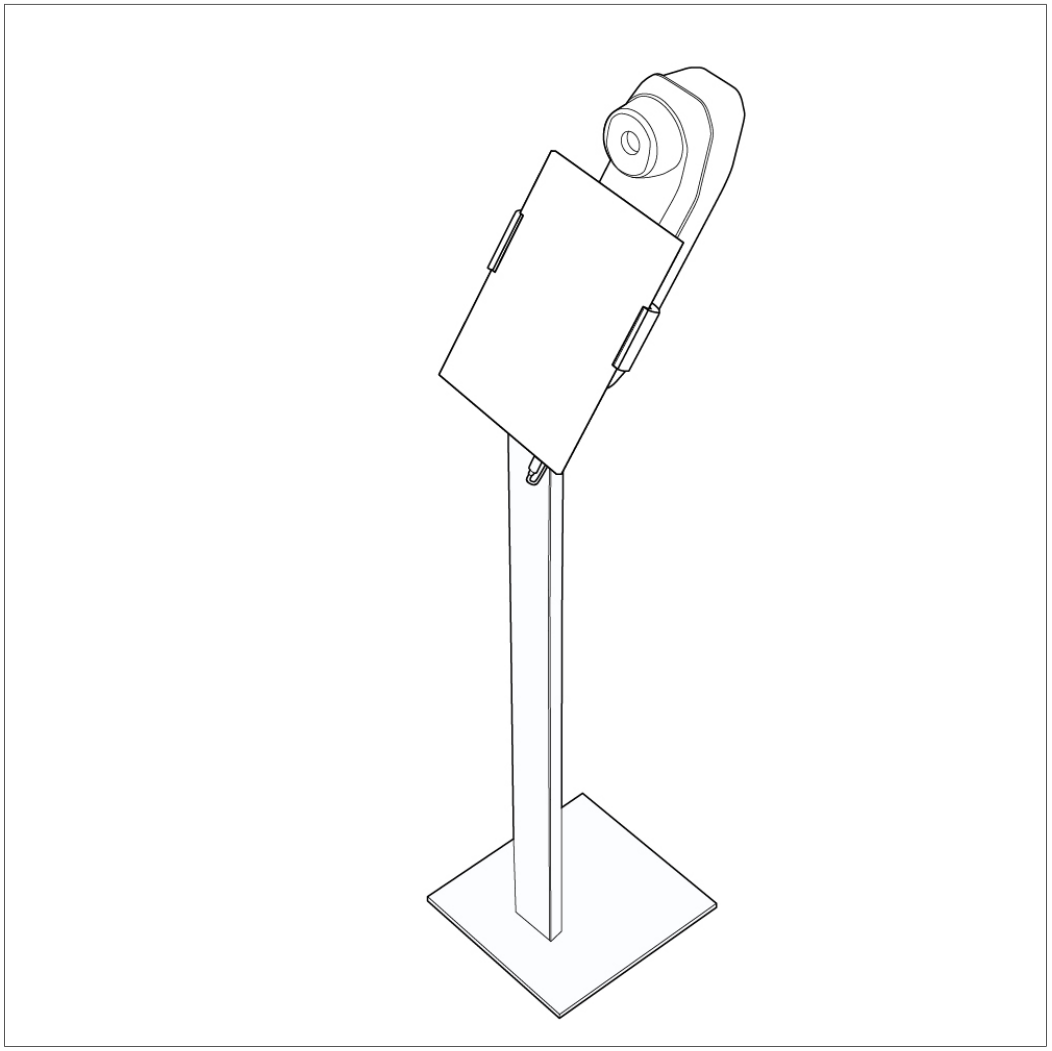
User's manual
FLIR Screen-EST Kiosk



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1 Disclaimers

1.1 Legal disclaimer

For warranty terms, refer to https://www.flir.com/warranty.

1.2 U.S. Government Regulations

This product may be subject to U.S. Export Regulations. Send any inquiries to export-questions@flir.com.

1.3 Patents

This product is protected by patents, design patents, patents pending, or design patents pending. Refer to the FLIR Systems' patent registry:

https://www.flir.com/patentnotices

1.4 Quality assurance

The Quality Management System under which these products are developed and manufactured has been certified in accordance with the ISO 9001 standard.

FLIR Systems is committed to a policy of continuous development; therefore we reserve the right to make changes and improvements on any of the products without prior notice.

1.5 Third-party licenses

Information about third-party licenses is available in the user interface of the product.

1.6 Usage statistics

FLIR Systems reserves the right to gather anonymous usage statistics to help maintain and improve the quality of our software and services.

1.7 Copyright

2 Safety information

WARNING

Applicability: Class B digital devices.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING

Applicability: Digital devices subject to 15.19/RSS-GEN.

NOTICE: This device complies with Part 15 of the FCC Rules and with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

1. this device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

WARNING

Applicability: Digital devices subject to 15.21.

NOTICE: Changes or modifications made to this equipment not expressly approved by FLIR Systems may void the FCC authorization to operate this equipment.

WARNING

Applicability: Digital devices subject to 2.1091/2.1093/KDB 447498/RSS-102.

Radiofrequency radiation exposure Information: The radiated output power of the device is far below the FCC radio frequency exposure limits. Nevertheless, the device should be used in such a manner that the potential for human contact during normal operation is minimized.

CAUTION

Do not point the infrared camera (with or without the lens cover) at strong energy sources, for example, devices that cause laser radiation, or the sun. This can have an unwanted effect on the accuracy of the camera. It can also cause damage to the detector in the camera.

CAUTION

Do not use the camera in ambient temperatures higher than +40°C (+122°F), unless other information is specified in the user documentation or technical data. High temperatures can cause damage to the camera.

CAUTION

The surface of the camera becomes hot. Use protective equipment when handling the camera in ambient temperatures higher than +40°C (+122°F).

CAUTION

Do not apply solvents or equivalent liquids to the camera, the cables, or other items. For cleaning, refer to 12.1 *Cleaning*.

CAUTION

Do not use too much force when you clean the infrared lens. Damage to the infrared lens or to the anti-reflective coating of the lens can occur. For cleaning, refer to 12.1 *Cleaning*.

CAUTION

Applicability: Cameras where you can remove the lens and expose the infrared detector.

Do not use compressed air of lower quality than “Process air” when you remove dust from the detector. Air of lower quality than “Process air” can contain high levels of contaminants. Damage to the detector can occur.

CAUTION

Applicability: Cameras with an automatic shutter that can be disabled.

Do not disable the automatic shutter in the camera for a long time period (a maximum of 30 minutes is typical). This can have an unwanted effect on the accuracy of the camera.

CAUTION

Do not look into the camera torch LED when you operate it. Injury to your eyes and skin can occur.

Note The encapsulation rating is only applicable when all the openings on the camera are sealed with their correct covers, hatches, or caps. This includes the compartments for data storage, batteries, and connectors.

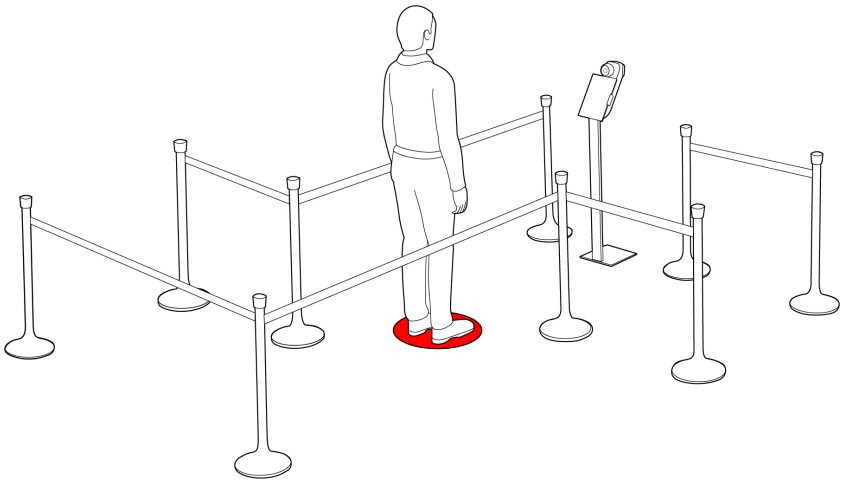
2.1 Disposal of electronic waste

Electrical and electronic equipment (EEE) contains materials, components and substances that may be hazardous and present a risk to human health and the environment when waste electrical and electronic equipment (WEEE) is not handled correctly.

Equipment marked with the below crossed-out wheeled bin is electrical and electronic equipment. The crossed-out wheeled bin symbol indicates that waste electrical and electronic equipment should not be discarded together with unseparated household waste, but must be collected separately.

For this purpose all local authorities have established collection schemes under which residents can dispose waste electrical and electronic equipment at a recycling centre or other collection points, or WEEE will be collected directly from households. More detailed information is available from the technical administration of the relevant local authority.

3 Getting started



The FLIR Screen-EST Kiosk is used to screen persons for elevated skin temperatures.

For accurate and efficient screening, it is recommended to install, set up, and operate the FLIR Screen-EST Kiosk screening station as described in this manual.

3.1 Install the FLIR Screen-EST Kiosk

The installation of the FLIR Screen-EST Kiosk includes the following main steps

1. Mount the stand, tablet, and camera unit.
2. Connect the tablet to a Wi-Fi network (recommended).
3. Activate the FLIR Screen-EST application.

For detailed instructions, see chapter 5 *Installation — FLIR Screen-EST Kiosk*.

3.2 Set up the screening station

The setup of the screening station includes the following main steps:

1. Plan and prepare the screening station.
2. Set up the FLIR Screen-EST Kiosk.
3. Define the screening position.
4. Connect the camera to FLIR Screen-EST.
5. Make sure the camera focus is correct.
6. Place the queueing system and supporting materials.
7. Optional: Place the operator display.
8. Test the setup.
9. Clearly mark the screening position.
10. Mark the positions of all equipment.

For detailed instructions, see chapter 6 *Setup — Screening station*.

3.3 Operate the screening station

The operation of the screening station includes the following operator tasks:

1. Prepare the system for a new screening session.
2. The screening normally does not require any action from the operator. Depending on the company specific workflow, the operator may need to be available for guidance and alarms.

For detailed instructions, see chapter 8 *Operation — Operator instructions*.

3.4 Customer support

Do not hesitate to contact our Customer Support Center if you experience problems or have any questions.

For customer help, go to http://support.flir.com.

3.5 Online documentation

The FLIR EST Thermal Screening documentation is continuously updated and published online.

To access the latest user manuals, product information, and other FLIR EST Thermal Screening resources, go to: http://support.flir.com/resources/est.

4 About FLIR Screen-EST Kiosk

The FLIR Screen-EST Kiosk offers a quick and easy way to screen passengers, customers, or employees for signs of elevated skin temperature. This is a turnkey solution that combines the temperature measurement capabilities of a FLIR EST Thermal camera and the FLIR Screen-EST software with a tablet and floor stand.

The FLIR Screen-EST Kiosk uses the thermal data stream for face detection and measures the temperature in the tear duct, since that has been demonstrated to be a robust measurement point. The system uses FLIR relative temperature screening - comparing subject temperatures to a dynamic average baseline of non-elevated skin temperatures.

Key benefits:

- Fast setup and simple operation.
- Fully automated, self-service station.
- Safe, accurate screening.

The FLIR Screen-EST Kiosk automatically measures the surface temperature around the tear duct, analyzes the measured temperature, and displays a screening result. If the measured temperature is higher than a reference average, an alarm will trigger.

To improve the accuracy of the screening results, it is important to set up the screening station correctly.

Since the FLIR Screen-EST Kiosk measures surface temperatures, the measured temperatures are lower than the ones you may be used to in a fever context. Note that the FLIR Screen-EST Kiosk cannot measure core body temperature or diagnose a fever.

It is up to you to set up a suitable core body temperature measuring process, and a process for those individuals where the system has indicated an elevated skin temperature in accordance with applicable local data protection, employment, and health & safety laws.

5 Installation — FLIR Screen-EST Kiosk

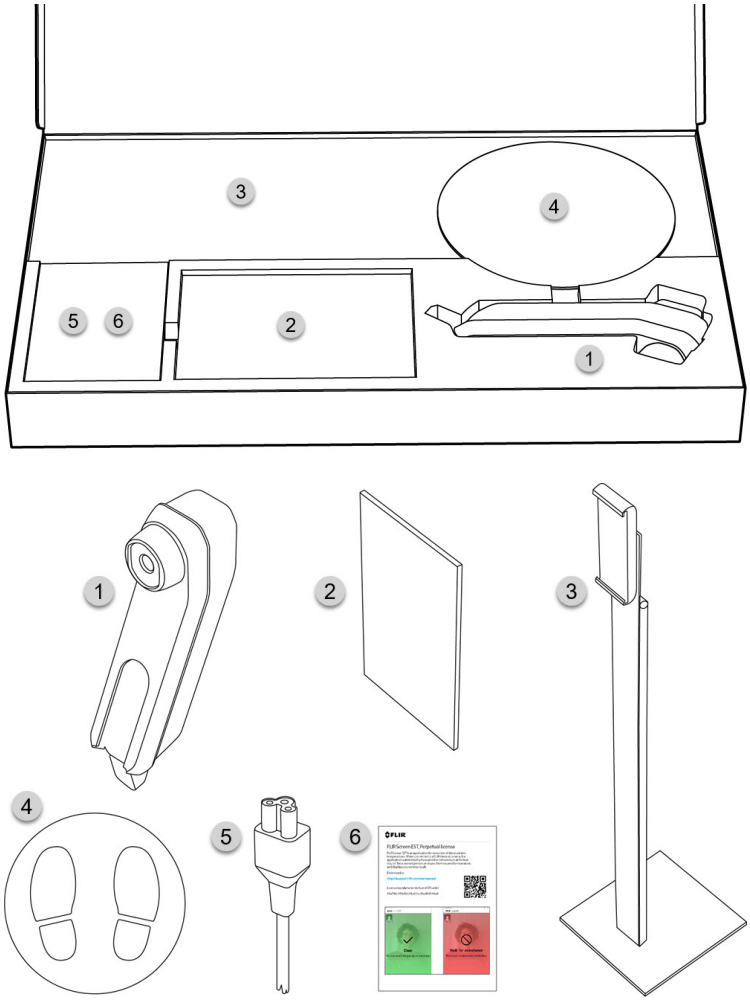
This chapter describes how to install the FLIR Screen-EST Kiosk.

The installation includes the following main steps:

1. Mount the stand, tablet, and camera unit.
2. Connect the tablet to a Wi-Fi network (recommended).
3. Activate the FLIR Screen-EST application.

Note For step-by-step instructions, see the following sections.

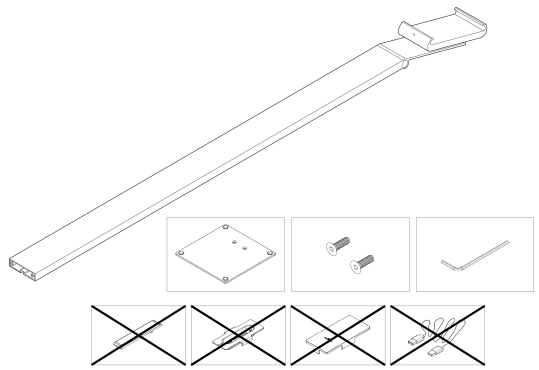
5.1 List of contents



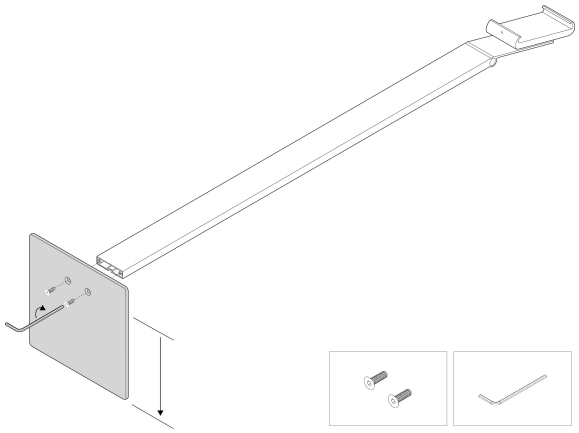
1. Camera unit
2. Surface Pro7 tablet
3. Tablet stand
4. Screening position floor sticker
5. Mains cable
6. Printed documentation, including FLIR Screen-EST license card

5.2 Mount the stand, tablet, and camera unit

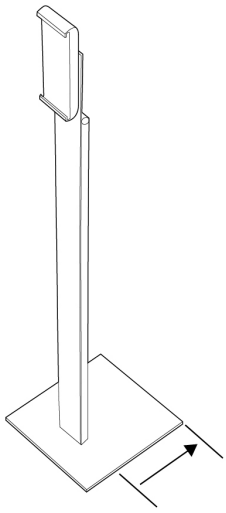
Note While you mount the equipment, be careful and hold all parts firmly to prevent the stand from tipping over.



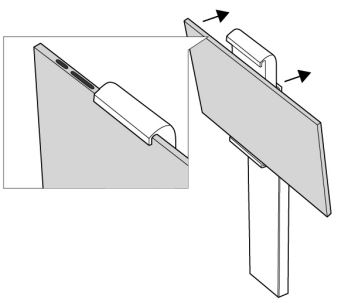
1. Open the stand box and find the stand, foot, 2 screws, and Allen key. The other parts are not needed for this installation.



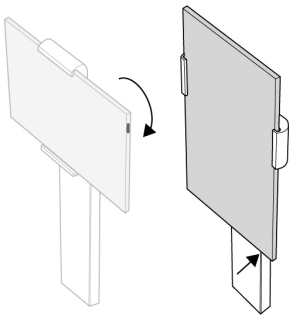
2. Mount the foot. Make sure the orientation of the foot is correct.



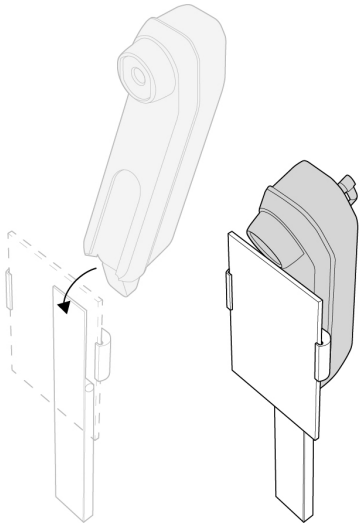
3. Check the orientation of the foot. Incorrect mounting can cause the stand to tip over.



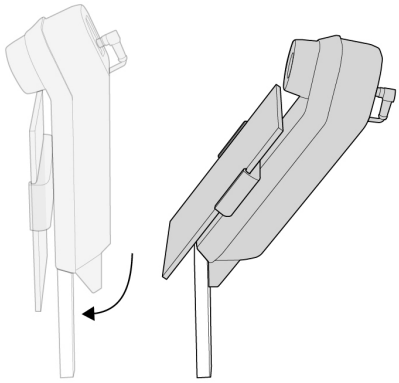
4. Fit the tablet in place, with the clamp close to the buttons. By that, there will be room for the camera unit.



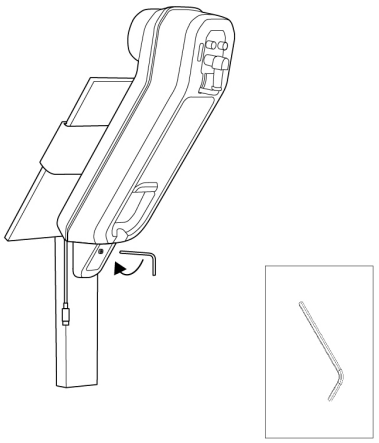
5. Rotate the tablet to portrait mode. Make sure the USB connector is at the bottom.



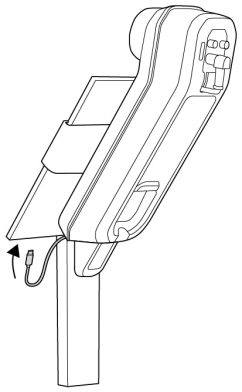
6. Slide the camera unit onto the stand.



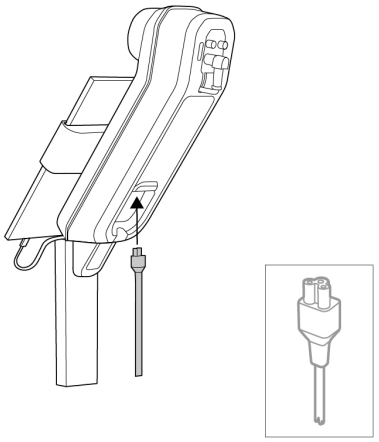
7. Tilt the assembly backwards until it stops.



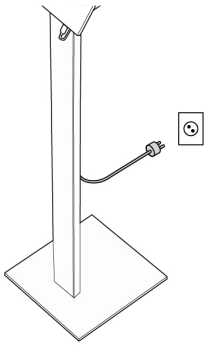
8. Lock the camera unit in place.
Tighten the screw until it stops.



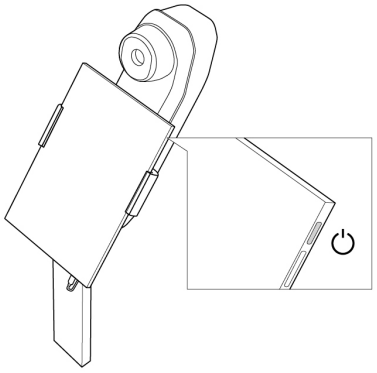
9. Connect the cable from the camera unit to the USB connector on the tablet.



10. Connect the power cable to the camera unit.



11. Connect the power cable to a power outlet.



12. Turn on the tablet.

5.3 Connect to Wi-Fi

To take advantage of our latest software, it is important that you keep your FLIR Screen-EST Kiosk updated. When the FLIR Screen-EST Kiosk is connected to the internet, automatic checks for updates and installation of new software versions is possible. For more information, see section 13.1 *FLIR Screen-EST software update*.

To connect the tablet to the internet, swipe in from the right edge of the screen. This opens the *Action center*, where you can connect to a Wi-Fi network.

5.4 Activate FLIR Screen-EST

FLIR Screen-EST is the application used to perform the screening. FLIR Screen-EST is pre-installed on the tablet, but you must activate it. The activation is easiest if the tablet is connected to Wi-Fi, but you can also do an offline activation.

Note If a Windows Defender Firewall message is displayed, select to *Allow access* for FLIR Screen-EST.

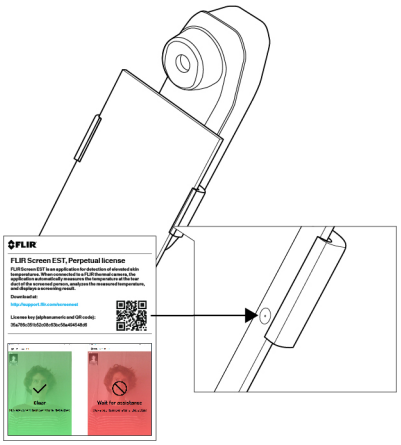
To activate the FLIR Screen-EST, do the following:

1. Make sure you have the FLIR Screen-EST license card. This is a printed card included in the FLIR Screen-EST Kiosk package.
2. Start the FLIR Screen-EST application from the Start menu or by double-tapping the desktop icon. The activation dialog is displayed.

   Note FLIR Screen-EST starts automatically when you turn on the tablet the first time.

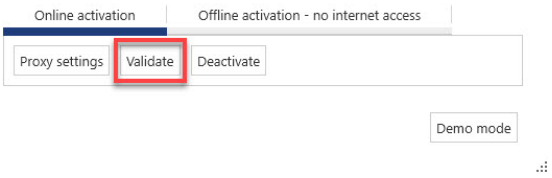
3. Online activation (internet access):

   3.1. Hold the FLIR Screen-EST license card with the QR code in front of the tablet camera (located to the right of the screen). This enters the license key.



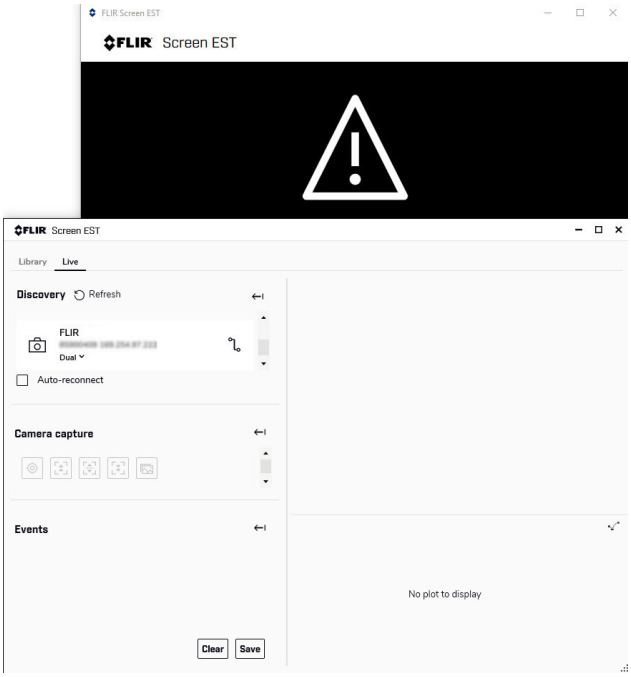
   3.2. Enter contact details, e.g. to your IT department, in the *Customer name* and *Customer e-mail* text boxes.

   3.3. Tap *Validate*.



   Offline activation (no internet access): See section 5.4.1 *Offline activation*.

4. When the activation is completed, the FLIR Screen-EST application opens in two windows:
   - The operator window is used by the operator for setup, control, and monitoring.
   - The visitor window is what the screened person sees.



5.4.1 Offline activation

1. Start the FLIR Screen-EST application.
2. Click *Offline activation - no internet access.*
3. Make a note of the information in the *Machine identifier* text box.
4. On a device with internet access, go to https://support.flir.com/screenest.
5. Click the link *Offline activation*.
6. Click the link of your preferred language.
7. Enter your contact details in the *Name* and *E-mail* text boxes.
8. In the *Serial number* text box, enter the license key available on the FLIR Screen-EST license card.
9. In the *Machine code* text box, enter the *Machine identifier* from step 3 above.
10. Click *Request activation code*. This displays the generated activation code that at the top of the page.
11. Return to the *FLIR Screen-EST* application, and then enter the code into the *Activation code* text box.
12. Click *Validate*.
13. The activation is completed and FLIR Screen-EST starts.

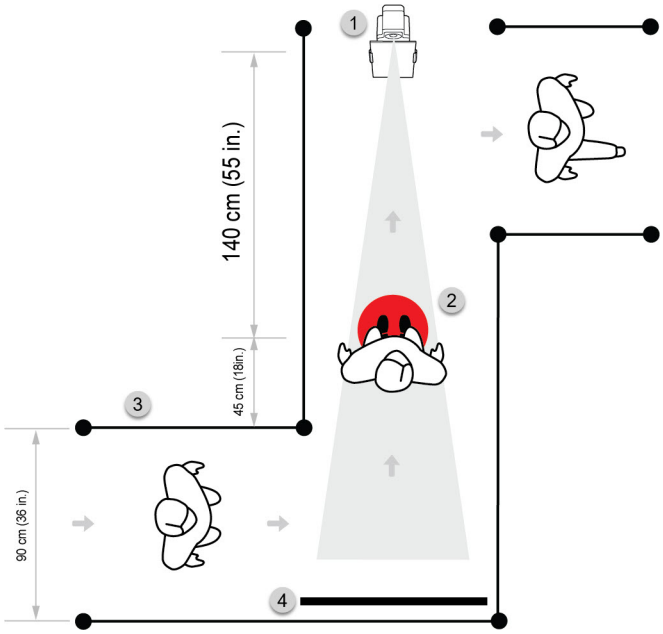
6 Setup — Screening station

This chapter describes how to set up a FLIR Screen-EST Kiosk screening station.

- For accurate and efficient screening, it is recommended to set up the screening station as outlined in section 6.1 *Screening station setup*.
- For step-by-step instructions, see section 6.3 *Step-by-step setup instructions*.
- If you run into problems, see section 6.5 *Trouble shooting*.

6.1 Screening station setup

The figure below shows a typical screening station setup. For more information, see chapter 7 *Description — Screening station*.



1. FLIR Screen-EST Kiosk.
2. Screening position.
   It is important to clearly mark the screening position (where the person should stand for the screening). The distance from the foot of the FLIR Screen-EST Kiosk to the center of the screening position shall be 120 cm (47 in.).
3. Queueing system, e.g. barriers and arrow floor stickers.
   The queueing system will guide the visitors into the screening station, to the correct screening position, and out of the screening station. A recommended standard is to keep the queue at least 90 cm (36 in.) wide. To make sure people do not cut the corner and end up too close to the FLIR Screen-EST Kiosk, about 45 cm (18 in.) should be added to the barrier leading in to the screening station.
4. Optional: Backdrop.
   A backdrop may be needed to prevent background disturbances from reaching the camera, such as passing or queueing people.

Additional, not in the figure:

- Optional: Operator display.
  Secondary display placed near the operator for monitoring.
- Optional: Information roll-up.
  Roll-up that informs people what the screening is about and why they need to do it.
- Optional: Instruction roll-up.
  Roll-up that tells people to remove eyeglasses before they are screened.

  Note Removing eyeglasses is crucial for a correct screening result.

6.2 Equipment, materials, tools

For the screening station, you need the following equipment:

- FLIR Screen-EST Kiosk, installed as described in chapter 5 *Installation — FLIR Screen-EST Kiosk*.
- Screening position floor sticker (included in the FLIR Screen-EST Kiosk package).
- Queueing system; e.g. barriers, arrow stickers.

Optional equipment:

- Operator display, including power cable and wireless display adapter.
- Backdrop, preventing background disturbances.
- Information materials; e.g. roll-ups.

Note For available roll-ups and other supporting materials from FLIR Systems, go to https://www.flir.com/.

The following materials and tools can be useful:

- Measuring tape or yardstick.
- Screwdriver.
- Masking tape.
- Cable ties.
- Extension cords.
- Cable covers (to prevent people from stumbling over the cables).

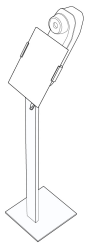


Figure 6.1 FLIR Screen-EST Kiosk

Figure 6.2 Screening position floor sticker

Figure 6.3 Backdrop

6.3 Step-by-step setup instructions

Before starting the setup, please read the instructions for the entire setup procedure.

Make sure you have all the equipment and tools needed, see section 6.2 *Equipment, materials, tools*.

The setup of the screening station includes the following main steps:

1. Plan and prepare the screening station.
2. Set up the FLIR Screen-EST Kiosk.
3. Define the screening position.
4. Connect the camera to FLIR Screen-EST.
5. Make sure the camera focus is correct.
6. Place the queueing system and supporting materials.
7. Optional: Place the operator display.
8. Test the setup.
9. Clearly mark the screening position.
10. Mark the positions of all equipment.

Note For step-by-step instructions, see the following sections.

6.3.1 Plan and prepare the screening station

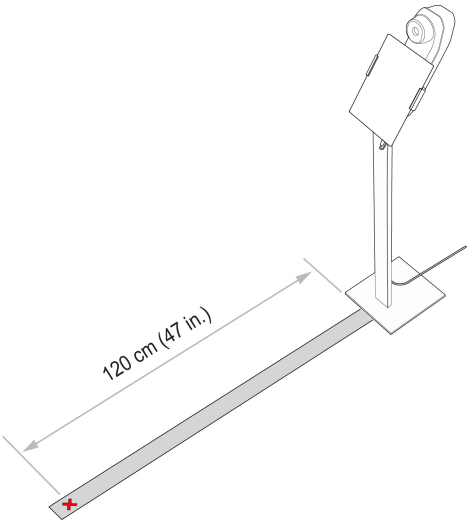
Before you set up the screening station, you need to do some planning. Where will you conduct the screening? How should the visitors flow into the screening station and out? Who will be the operator? What should happen in case of a screening alarm?

- For factors to consider related to the area around the screening station, see section 7.3 *Screening station considerations*.
- For factors to consider related to the policies of your company, see section 7.4 *Company policies*.

6.3.2 Set up the FLIR Screen-EST Kiosk

1. Place the FLIR Screen-EST Kiosk.
2. Connect the power cable to a power outlet.

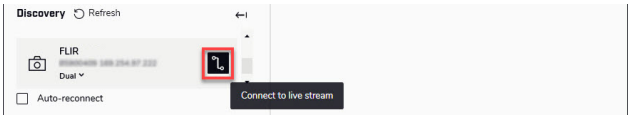
6.3.3 Define the screening position



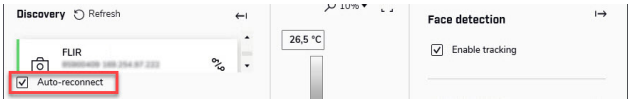
1. Make a straight line from the foot of the FLIR Screen-EST Kiosk stand towards the screening position - use a masking tape.
2. Make a mark on the tape at 120 cm (47 in.) from the foot of the stand, indicating the screening position.

6.3.4 Connect the camera to FLIR Screen-EST

1. Turn on the tablet and start the FLIR Screen-EST application.
2. Find the FLIR camera in the *Discovery* list and tap the connect button. This connects the camera and displays live video.



3. Make sure the *Auto-reconnect* check box is selected. This will make the camera connect automatically the next time you start FLIR Screen-EST.

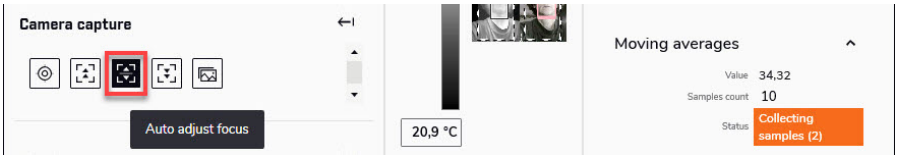


6.3.5 Make sure the camera focus is correct

1. Place a person at the marking on the tape that indicates the screening position.

   Note It is important that the person stands at the marking for the screening position (not closer or further away from the camera).

2. In the FLIR Screen-EST operator window, click the *Auto adjust focus* button. This adjusts the focus automatically.



Note For accurate screening, the camera focus must be correct. If the focus should be changed by mistake, a new focus adjustment must be made.

6.3.6 Place the queueing system and supporting materials

Queueing system.

1. Place the barriers that will guide the persons through the screening station.
2. Place the arrow stickers.

   Note You may want to start with temporary markings and wait with the arrow stickers until you have tested the screening station for a few days.

Optional: Backdrop.

1. Place the backdrop behind the screening position.
2. Look at the live image in FLIR Screen-EST and make sure the camera only sees the backdrop.

Optional: Information materials.

1. Place the information roll-up
2. Place the instruction roll-up

6.3.7 Optional: Place the operator display

1. Place the operator display.
2. Connect power to the display.
3. Connect the display to the tablet using a wireless display adapter.

6.3.8 Test the setup

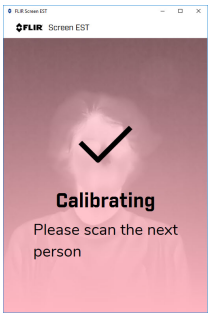
Make sure the system detects faces of persons with different heights.

1. Start the FLIR Screen-EST.
2. Collect reference samples.
   Before the screening can start, you must record samples for the calculation of the reference temperature average. You do this by screening 10 healthy persons.

   To collect reference samples, do the following:

   2.1. Place a healthy person at the screening position.

2.2. The system automatically measures and registers the sample. When completed, a message is displayed in the visitor window.



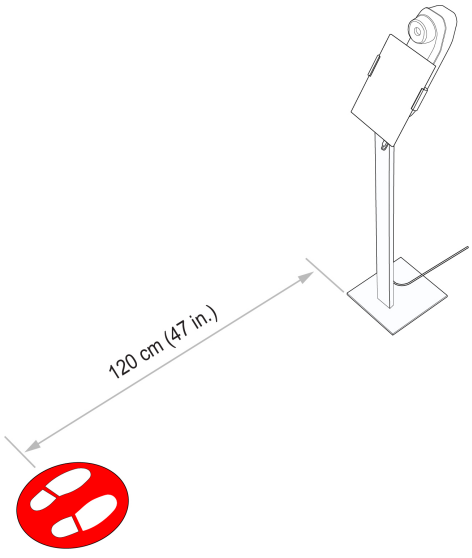
2.3. Repeat the two steps above until 10 healthy persons have been screened. The *Status* indicator shows the number of registered samples.

2.4. When the *Status* indicator is green (OK), the system is ready for screening.

3. Maximize the visitor window.
4. Check that a screening result is displayed when persons of different heights stand at the screening position.
   - Tall persons may have to bend their knees.
   - Short persons may need e.g. a high chair to sit on.

   Note Do not move the FLIR Screen-EST Kiosk or the screening position. Changing the distance between the FLIR Screen-EST Kiosk and the screening position will affect the accuracy of the screening result.

6.3.9 Clearly mark the screening position



Note You may want to start with a temporary marking and wait with the supplied floor sticker until you have tested the screening station for a few days.

1. Attach the supplied screening position floor sticker to the floor.
   The distance from the foot of the FLIR Screen-EST Kiosk stand to the center of the floor sticker shall be 120 cm (47 in.).
2. Remove the masking tape.

6.3.10 Mark the positions of all equipment

Mark the positions of any movable equipment (e.g. FLIR Screen-EST Kiosk, backdrop, barrier poles) e.g. by tape on the floor. This to ensure that everything is put back in the right place after e.g. cleaning of the floor.

Note You may want wait with the permanent markings until you have tested the screening station for a few days.

6.4 Optional: Customize FLIR Screen-EST

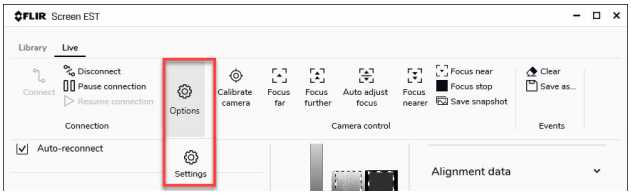
It is possible to run FLIR Screen-EST with the default settings. It is also possible to customize FLIR Screen-EST according to your company policies (see section 7.4 *Company policies*). You can select what the visitors see on the screen. There is also a sound alarm option.

Note For other settings in FLIR Screen-EST, it is recommended to use the default settings.

6.4.1 Open the *Settings* page

To open the *Settings* page, do the following:

1. In the FLIR Screen-EST operator window, tap the *Live* tab. This displays the toolbar.
2. Tap the *Options* button and then the *Settings* button. This opens the *Settings* page.



6.4.2 Visitor window

You customize the visitor window on the *User screen* tab.

Custom status messages

- Here you can change the status messages, e.g. translate the messages to your local language.

Message font size

- Select the font size for the status messages.

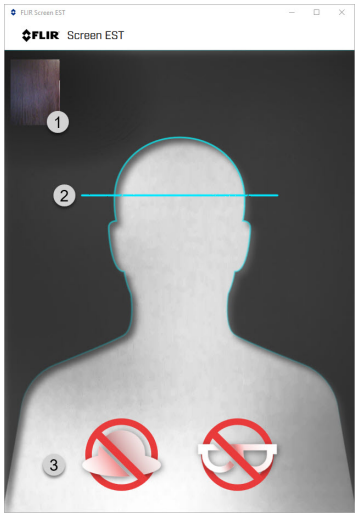
  Note Make sure the font size is as large as possible so people can read the text from the screening position.

Visibility settings

- Select the *Show secondary image* check box to display both thermal and visual video.
- Use the *Show hats/glasses/masks* check boxes to select what symbols to display.

  Note Display of the glasses symbol is recommended (select the *Show glasses* check box). Removing eyeglasses is crucial for a correct screening result.
- Select the *Enable animations* check box to have a moving blue line in the visitor window, indicating that the system is in operation.

- Use the *Swap video streams* check box to select the display of thermal or visual video.



Visitor window screen elements:

1. Secondary image.
2. Animation.
3. Symbols.

6.4.3 Sound alarm

It is possible to have a sound when the system detects an elevated temperature. You select this on the *Output* tab.

Alarm

- Select the *Use sound alarm* check box to have a sound when an elevated temperature is detected.

6.4.4 Save and exit

When all settings are completed, tap *Close* at the bottom right of the page. This closes the *Settings* page.

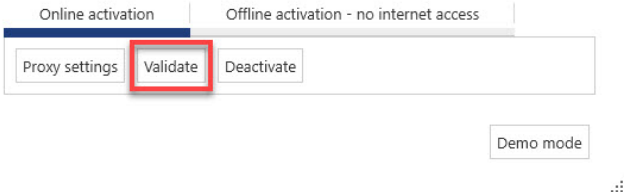
6.5 Trouble shooting

Note At FLIR Support Center, you can search our knowledge base to find answers to frequently asked questions. Go to http://support.flir.com.

6.5.1 Must enter license key every time

If you must enter the license key every time you start FLIR Screen-EST, the application has not been successfully activated.

Follow the instructions in section 5.4 *Activate FLIR Screen-EST*. When you have entered the license key, make sure you tap the *Validate* button (not the *Demo mode* button).



6.5.2 FLIR Screen-EST cannot find the camera

If FLIR Screen-EST cannot find the camera, try the following:

1. Restart the FLIR Screen-EST application.
2. Restart the tablet.

3. Restart the camera by disconnecting and then re-connecting the power cable to a power outlet.
4. Check the tablet firewall settings.
   Open the Windows Defender Security Center and go to the Firewall settings. Make sure the FLIR Screen-EST application is allowed to communicate through the firewall.
5. Check the camera firewall settings, see section 11.2.3 *Firewall configuration*.

6.5.3 False triggering

A backdrop prevents background disturbances from reaching the camera. If no backdrop is used, objects in the background can cause false triggering. To avoid this, you may need to adjust the *Skin maximum temperature* setting on the *Face detection* tab.

The *Skin maximum temperature* is the highest temperature the system will evaluate. For example, you can lower this value to prevent a face-like hot lamp from triggering the alarm.

6.5.4 False alarms

If you are experiencing many false alarms, you may need to adjust the *Allowed deviation* setting on the *Face detection* tab.

The *Allowed deviation* is how much the measured temperature can differ from the average temperature without triggering an alarm. A higher value will lead to fewer false alarms, but there will also be a risk of missing people with elevated skin temperatures. A lower value will detect smaller elevations in skin temperatures, but it will also generate more false alarms.

6.5.5 Cannot screen short/tall persons

The screening station is set up to screen persons with a height of 145-190 cm (4.8–6.2 ft.).

The screened person shall stand at the screening position (not closer or further away from the camera).

- Tall persons may have to bend their knees.
- Short persons may need e.g. a high chair to sit on.

The screening works best when the FLIR Screen-EST is configured for portrait mode. On the *Settings* page, select the *Face detection* tab and ensure the following settings:

- Set *Image orientation* = *Portrait*.
- Set *Region of interest*: *Initial horizontal size* = 80,0 and *Initial vertical size* = 98.0.

7 Description — Screening station

This chapter describes the FLIR Screen-EST Kiosk screening station.

7.1 Overview

The screening station consists of the FLIR Screen-EST Kiosk, a clearly defined screening position, and a queueing system.

The FLIR Screen-EST Kiosk measures the temperature around the tear duct of the screened person, analyzes the measured temperature, and displays a screening result.

For improved measurement accuracy, it is important that the screened person is at the correct distance from the FLIR Screen-EST Kiosk. The screening position indicates where the person should stand for the screening.

For an efficient screening flow, a queueing system is needed to guide the visitors into the screening station, to the correct screening position, and out of the screening station. A backdrop may be needed to prevent background disturbances from reaching the camera.

7.2 Typical setup

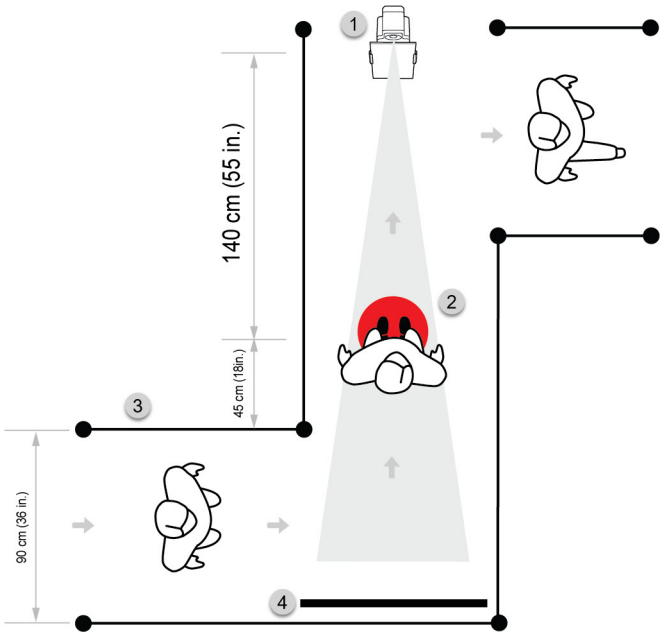


Figure 7.1 Typical screening station setup

1. FLIR Screen-EST Kiosk.

2. Screening position.
   It is important to clearly mark where the person shall stand for the screening. This is called the screening position. The face of the screened person should be at the center of the screening position.
   The screening position shall be perpendicular to the FLIR Screen-EST Kiosk camera, so that the screened person directly faces the camera. The distance from the foot of the FLIR Screen-EST Kiosk stand to the center of the screening position shall be 120 cm (47 in.).

   Explanation:

   - For accurate temperature measurements, it is important that the thermal camera focus is correct. With a fixed screening position, the focus can be adjusted once and for all during the setup of the screening station (no need to adjust the focus for every screened person).

3. Queueing system, e.g. barriers and arrow floor stickers.
   The queueing system will guide the visitors into the screening station, to the correct screening position, and out of the screening station. A recommended standard is to keep the queue at least 90 cm (36 in.) wide. To make sure people do not cut the corner and end up too close to the FLIR Screen-EST Kiosk, about 45 cm (18 in.) should be added to the barrier leading in to the screening station.
4. Optional: Backdrop.
   The camera should only see the screened person, no other people in the background. This can be achieved by placing a backdrop behind the screening position.

Additional, not in the figure:

- Optional: Operator display.
  Secondary display placed near the operator for monitoring.
- Optional: Information roll-up.
  Roll-up that informs people what the screening is about and why they need to do it.
- Optional: Instruction roll-up.
  Roll-up that tells people to remove eyeglasses before they are screened.

7.3 Screening station considerations

For accurate screening results and an efficient screening flow, the following factors related to the screening station area should be considered.

Screening accuracy

- Screening is best with room temperatures maintained below 24°C (76°F) and relative humidity below 50 %.
- Screening should be carried out in an area with no air movement, out of direct sunlight, and away from heat sources.
- Avoid locations with reflective backgrounds (e.g. windows, glass doors, or metallic surfaces).

Equipment

- The FLIR Screen-EST Kiosk is intended for indoor use.
- The FLIR Screen-EST Kiosk shall preferably be placed so that the operator can see the screening station and be of guidance to the screened persons.
- It can be useful to have a secondary display for the operator, e.g. on the reception desk.
- Power outlets are needed for the FLIR Screen-EST Kiosk and any operator display.
- Avoid reflections in the tablet screen. Otherwise, it can be difficult for the visitors to see the graphics and messages on the screen.

Visitors and queueing

- Plan how the visitors will flow into the screening station and out, both in low and high flow periods. Plan for any alternative routes, e.g. after an alarm, for any questions, for persons in a wheelchair or with other special requirements.
- Consider personal integrity matters; e.g. if the FLIR Screen-EST Kiosk should be hidden from others than the screened person. See also section 7.4 *Company policies*.
- Allow for appropriate distancing between people in the screening queue.
- Allow for people to stabilize their temperature if it was raised by exercise or physical activity.

7.4 Company policies

The FLIR Screen-EST Kiosk only detects elevated skin temperatures. It is up to your company to set up a suitable screening process in accordance with applicable local data protection, employment, and health & safety laws.

These are some of the factors your company need to consider:

- Personal integrity
  Make decisions on how to handle personal integrity, e.g. show/hide the FLIR Screen-EST Kiosk for others than the screened person, have/not have a sound alarm, save/not save image and data when an alarm is triggered.
- Process for alarms
  Establish a process for those individuals where the system has indicated an elevated temperature, e.g. let the person sit down for 10 minutes and then do the screening again, further evaluation by medically trained personnel.
- Visitor information
  Provide visitors with information and instructions about the screening, e.g. by roll-ups and FLIR Screen-EST Kiosk symbols and messages.

8 Operation — Operator instructions

This chapter focuses on the operator. It describes how the FLIR Screen-EST Kiosk screening station works and how you operate the station.

8.1 FLIR Screen-EST Kiosk screening station

The FLIR Screen-EST Kiosk is used to screen persons for elevated skin temperatures.

The FLIR Screen-EST Kiosk measures the temperature of the skin around the tear duct. For that reason, it is important that the eyes of the screened person are not covered by eyeglasses, hair, or other items.

An alarm will trigger when the measured temperature is higher than a reference temperature. The reference temperature is calculated based on measurement samples registered by the system. Before the screening can start, the operator must collect the first reference samples. This is done by screening 10 healthy persons.

It is up to your company to establish a process for screening alarms. You must know what you and the visitor shall do if the system indicates an elevated temperature.

For accurate and efficient screening, it is recommended that the screening station is set up as described in chapter 6 *Setup — Screening station*. Figure 8.1 *Typical screening station* shows a typical screening station.

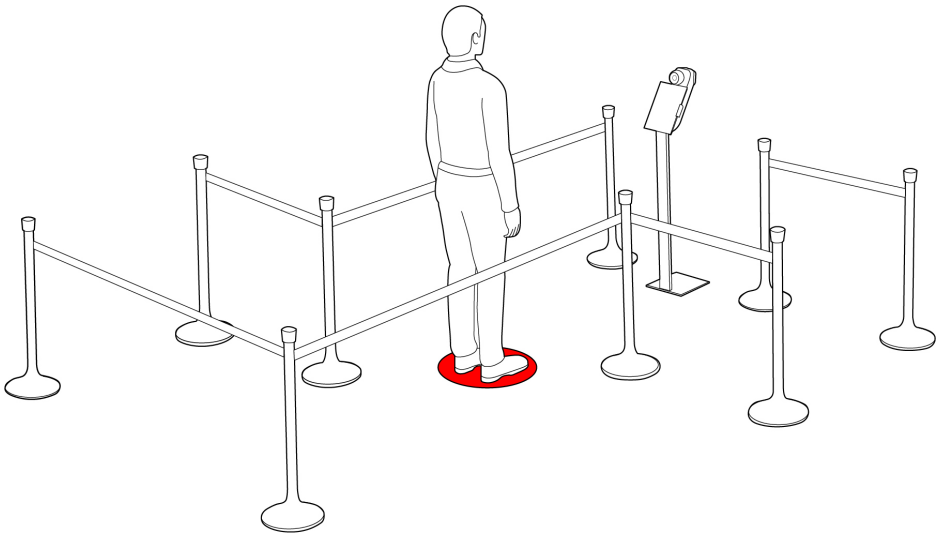


Figure 8.1 Typical screening station

The screening station typically includes the following equipment:

- FLIR Screen-EST Kiosk.
- Screening position.
  It is important that the screened person stands at the correct distance from the FLIR Screen-EST Kiosk. This is called the screening position. During the setup of the screening station, the screening position should have been clearly marked by a floor sticker.
- Queueing system, e.g. barriers and arrow floor stickers.
  The queueing system guides the visitors into the screening station, to the correct screening position, and out of the screening station.
- Information roll-up.
  Roll-up that informs people what the screening is about and why they need to do it.
- Instruction roll-up.
  Roll-up that tells people to remove eyeglasses before they are screened.

  Note Removing eyeglasses is crucial for a correct screening result.

- Optional: Backdrop.
  A backdrop may be needed to prevent background disturbances from reaching the camera, such as passing or queueing people.
- Optional: Operator display.
  Secondary display placed near the operator for monitoring.

8.2 Quick guide to FLIR Screen-EST

The FLIR Screen-EST application consists of two windows:

- The operator window is where you control the screening. For more information, see section 10.2 *Operator window*.
- The visitor window is what the screened person sees. For more information, see section 9 *Visitor — Screening procedure*.

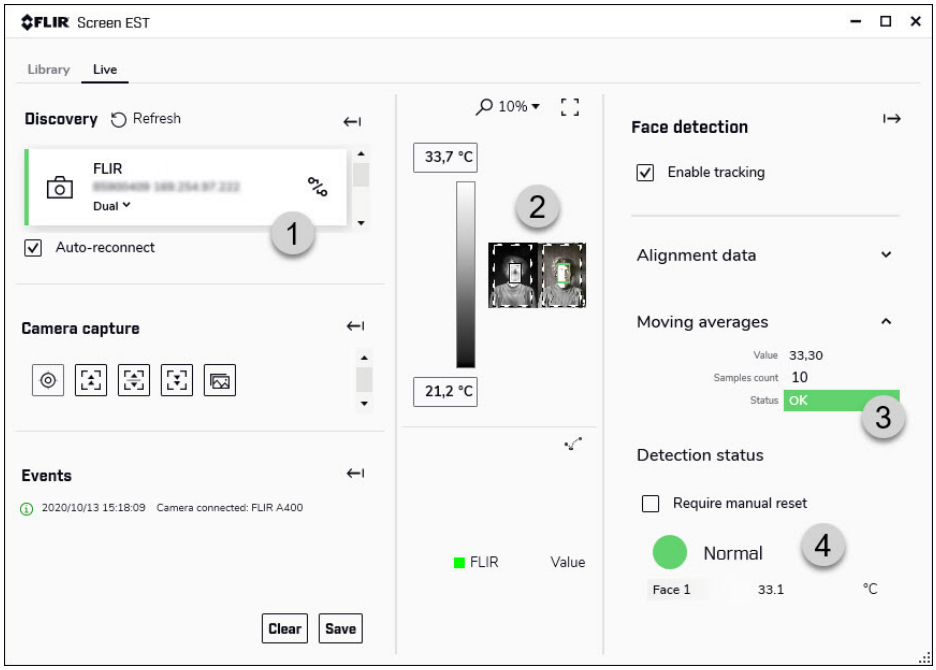
8.2.1 Start application

You start the FLIR Screen-EST application by double-tapping the desktop icon.

8.2.2 Operator window

The operator window has two tabs. You will only use the *Live* tab.

This image shows what the user interface looks like when a camera is connected.



1. This is where you connect the camera. Find the FLIR camera and use the button to the right to connect.
   When the *Auto-reconnect* check box is selected, the camera connects automatically.
2. The live image from the camera is displayed here.
3. The *Status* indicator shows the system status; red when the system is off, orange when the system is collecting samples, green when the system is ready for screening.
4. The screening result is displayed here; green when the temperature is normal, red when an elevated temperature is detected.

8.3 Normal operation

The normal screening workflow includes the following operator tasks:

1. Prepare the system for a new screening session, see section 8.3.1 *Start a new screening session*.
2. The screening normally does not require any action from you. Depending on your workflow, you may need to be available for guidance and alarms. See also section 8.3.2 *Screening procedure*.

If you run into problems, see section 8.4 *Problems — What shall I do?*.

You may get questions from the visitors about the screening. For answers to common questions, see section 8.5 *Visitor FAQ*.

8.3.1 Start a new screening session

To prepare the system for a new screening session, do the following:

1. Make sure the screening station is in order:
   - The FLIR Screen-EST Kiosk is placed at the correct position in front of the screening position.
   - The screening position is clearly marked.
   - The FLIR Screen-EST Kiosk power cable is connected to a power outlet.

     Note The thermal camera starts automatically when the FLIR Screen-EST Kiosk is connected to power. The camera should be allowed to warm up for about 20 minutes before performing the screening. This will help ensure the best results.
   - The barriers, roll-ups, etc. are in place.
2. Turn on the tablet.
3. Start the FLIR Screen-EST application by double-tapping the desktop icon.
4. Make sure the camera is connected to FLIR Screen-EST.
   The camera is connected if live image is displayed in the operator window. If not, see section 8.4.1 *Connect the camera*.
5. Collect reference samples, see section 8.3.1.1 *Collect reference samples*.
6. Maximize the visitor window.

7. The screening station is now ready for visitors.

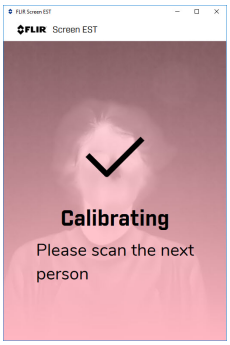
8.3.1.1 Collect reference samples

Before the screening can start, you must record samples for the calculation of the reference temperature average. You do this by screening 10 healthy persons.

To collect reference samples, do the following:

1. Place a healthy person at the screening position.

2. The system automatically measures and registers the sample. When completed, a message is displayed in the visitor window.



3. Repeat the two steps above until 10 healthy persons have been screened. The *Status* indicator shows the number of registered samples.

4. When the *Status* indicator is green (OK), the system is ready for screening.

8.3.2 Screening procedure

Once the screening station is up and running, the FLIR Screen-EST Kiosk normally does not require any action from you. Depending on your workflow, you may need to be available for guidance and alarms.

8.3.2.1 Screening procedure

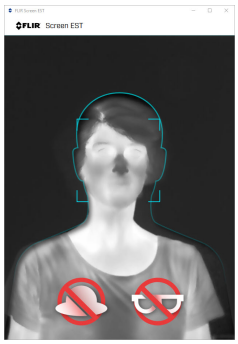
This is what happens during the screening:

1. The visitors enter the queue to the screening station.
2. One visitor at the time goes to the screening position.

Note

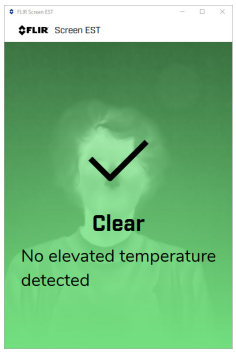
- Removing eyeglasses is crucial for a correct screening result.
- It is important to stand at the screening position (not closer or further away from the camera).
- The eyes must not be covered.

3. The visitor stands still and looks at the visitor display. The system automatically measures the temperature.

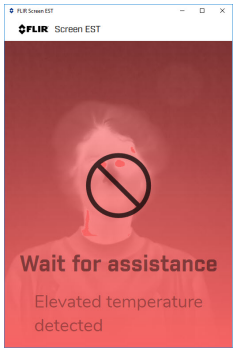


4. The system displays a screening result.

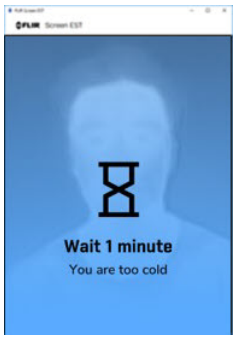
   - **No elevated temperature detected**
     The visitor exits the screening station.

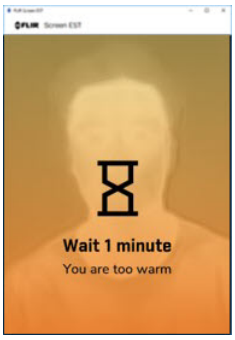


   - **Elevated temperature detected**
     You and the visitor follow the process for screening alarms that your company has established.



   - **Too low/high temperature**
     The measured temperature is too low/high to be evaluated by the system. The visitor returns to the queue, waits, and then tries the screening again.

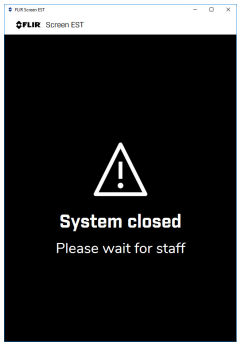




8.3.2.2 Pause the screening

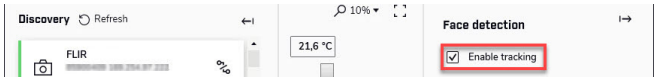
You can temporarily pause (stop) the screening. This does not affect the reference temperature average, meaning that the screening can continue directly when you start the screening again.

While the screening is paused, the visitor window displays the *System closed* message.



To temporarily stop the screening, clear the *Enable tracking* check box in the *Face detection* pane.

To resume the screening, select the *Enable tracking* check box.



8.3.3 Turn on/off the FLIR Screen-EST Kiosk

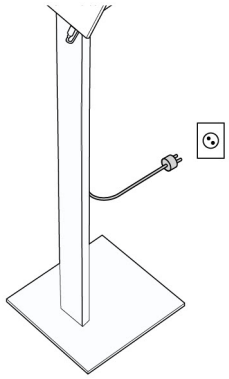
The FLIR Screen-EST Kiosk can be powered continuously, but you may want to turn of the equipment, e.g. to save energy or make room for cleaning.

Note

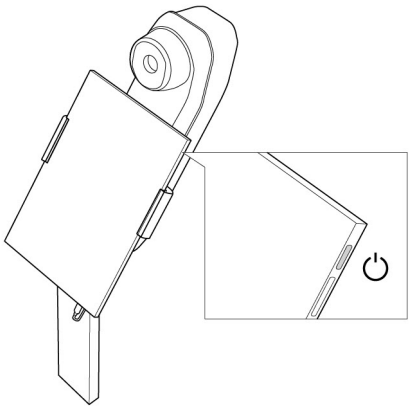
- The tablet gets power from the camera unit. If the camera unit is disconnected from power, the tablet runs on battery. To save the battery, you should also turn off the tablet.
- When you turn on the FLIR Screen-EST Kiosk again after power off, you must prepare the system before the screening can start, see section 8.3.1 *Start a new screening session*.

Turn on/off the FLIR Screen-EST Kiosk, do the following:

1. To turn on/off the camera unit, connect/disconnect the power cable to a power outlet.



2. To turn on/off the tablet, push the power button.



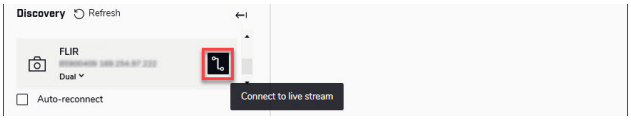
8.4 Problems — What shall I do?

This section describes some actions you may need to perform and what you shall do in case of problems.

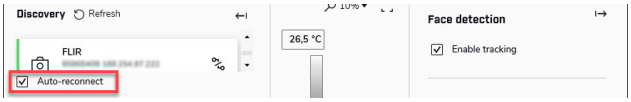
8.4.1 Connect the camera

To connect the camera to the FLIR Screen-EST application, do the following:

1. In the FLIR Screen-EST operator window, find the FLIR camera in the *Discovery* list and tap the connect button. This connects the camera and displays live video.



2. Make sure the *Auto-reconnect* check box is selected. This will make the camera connect automatically the next time you start FLIR Screen-EST.



8.4.2 Restart the system

To restart the system, do the following:

1. Reset the reference temperature, see section 8.4.3 *Reset the reference temperature*.
2. Collect new reference samples, see section 8.3.1.1 *Collect reference samples*.

8.4.3 Reset the reference temperature

To reset the reference temperature average, do the following:

1. Tap somewhere in the *Value*/*Samples count*/*Status* area. This displays the reset button.

2. Tap the reset button.

3. The *Status* changes to *Off* (red). New samples have to be collected before screening is possible, see section 8.3.1.1 *Collect reference samples*.

8.4.4 All visitors get screening alarms

If all visitors get screening alarms and there is reason to believe that these are false alarms, do the following:

1. Restart the system, see section 8.4.2 *Restart the system*.
2. If the problem still remains after the restart, some FLIR Screen-EST settings should be adjusted. For more information, see section 6.5.4 *False alarms*.

8.4.5 Camera focus changed by mistake

For accurate screening, the camera focus must be correct. The camera focus is adjusted as part of the screening station setup and must not be changed.

If you happen to tap one of the *Camera capture* buttons in the FLIR Screen-EST operator window, the camera focus changes. If this happens, a new focus adjustment must be made.

To adjust the camera focus, do the following:

1. Place a person at the screening position.

   Note It is important that the person stands at the marking for the screening position (not closer or further away from the camera).

2. In the FLIR Screen-EST operator window, tap the *Auto adjust focus* button. This adjusts the focus automatically.

3. When the focus adjustment is completed, make sure you do not tap any of the *Camera capture* buttons.

8.4.6 Somebody moved the equipment

The screening station is carefully set up to make sure the screening position is at the correct distance from the FLIR Screen-EST Kiosk.

If the FLIR Screen-EST Kiosk or the screening position floor sticker has been moved, do one of the following:

- If the position of the FLIR Screen-EST Kiosk is marked, e.g. by tape on the floor, make sure to put the FLIR Screen-EST Kiosk back in the correct position.
- If there are no markings for the FLIR Screen-EST Kiosk or if the marking for the screening position has been moved, the entire screening station should be set up again following the instructions in chapter 6 *Setup — Screening station*.

8.5 Visitor FAQ

This section helps you with answers to questions you may get from the visitors.

Is the screening dangerous?
No, a thermal camera is like a regular camera, except that it is sensitive for heat (thermal radiation) instead of visual light.

Do you save any information about me?
The answer depends on your company policies and how the system has been configured.

- No, nothing is saved.
- If an elevated temperature is detected, an image and/or the measured temperature is saved.

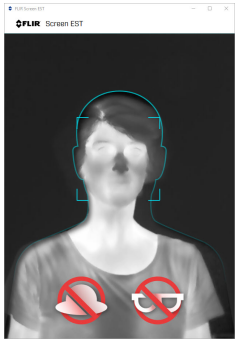
9 Visitor — Screening procedure

This chapter focuses on the visitor and describes the screening procedure.

1. The system is in idle mode. Go to the screening position, which is marked on the floor. Make sure your eyes are not covered by your hair or any other items.

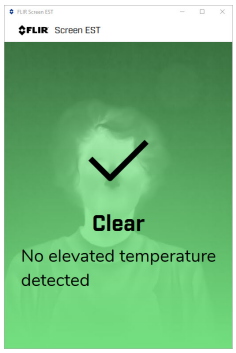
   Note Removing eyeglasses is crucial for a correct screening result.

2. Stand still and look into the display. The system measures your temperature.

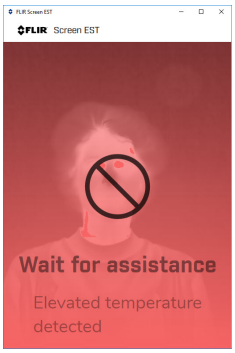


3. The screening is completed and your result is displayed.

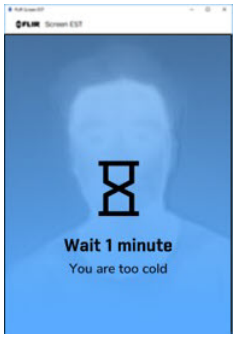
No elevated temperature detected.

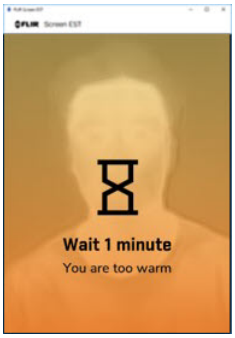


Elevated temperature detected. Follow the instructions from the staff.



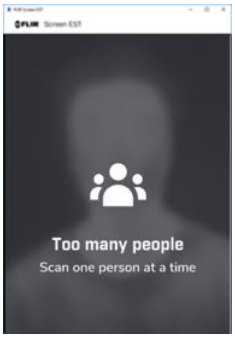
The measured temperature is too low/high to be evaluated by the system. Wait one minute and then try again.





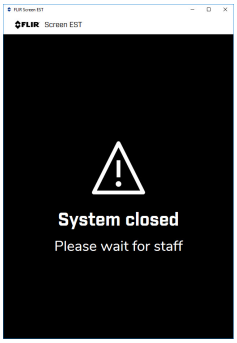
9.1 Too many people

The system can only screen one person at the time. If the system detects more than one face, a message is displayed.



9.2 System closed

When the system is closed, a message is displayed.


FLIR Screen EST
System closed
Please wait for staff

10 Description — FLIR Screen-EST

The FLIR Screen-EST application consists of two windows:

- The operator window is used for setup, control, and monitoring. For more information, see section 10.2 *Operator window*.
- The visitor window is what the screened person sees. For more information, see section 9 *Visitor — Screening procedure*.

For configuration of FLIR Screen-EST, see section 6.4 *Optional: Customize FLIR Screen-EST*.

10.1 Start application

You start the FLIR Screen-EST application from the Start menu or by double-tapping the desktop icon.

10.2 Operator window

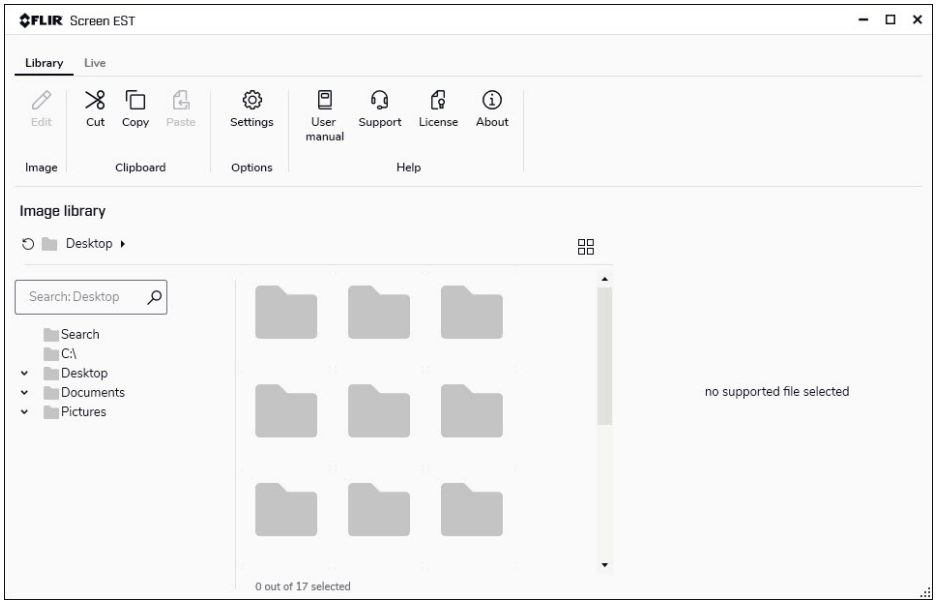
The operator window has one main page with two tabs, *Library* and *Live*, and a *Settings* page.

10.2.1 *Library* tab

The *Library* tab shows the File Explorer. Here you can navigate to any folder with saved images.

When you click a folder, the images in that folder are presented in the center pane. When you click an image in the center pane, information about that image is shown in the pane to the right.

Clicking the *Library* tab displays a toolbar, with options for settings, user manual, support, license, and more.



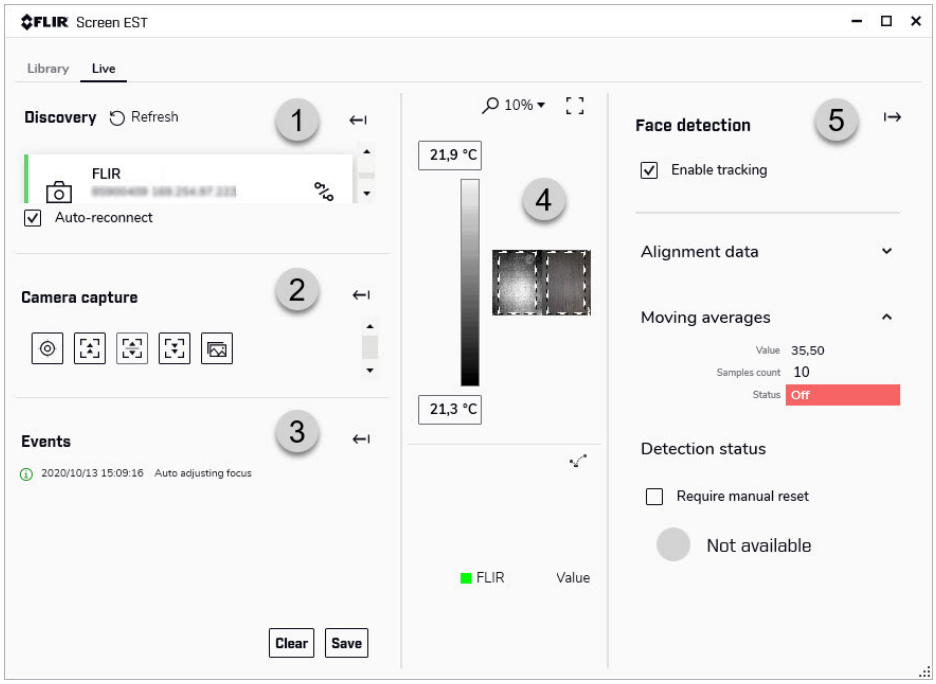
10.2.1.1 User manual

To access the FLIR Screen-EST user manual, select *User manual* on the *Library* page toolbar or go to http://support.flir.com/resources/est.

10.2.2 *Live* tab

The *Live* tab is where you initiate and monitor the screening.

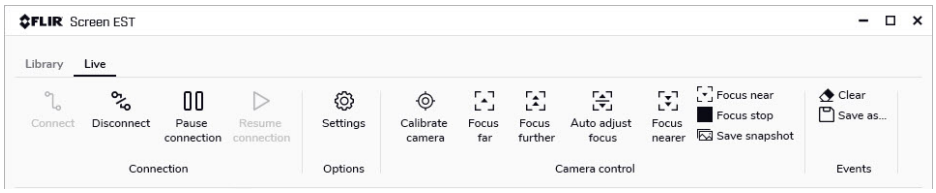
The image below shows what the user interface looks like when a camera is connected.



1. Discovery pane
   This pane displays the available cameras. Find the FLIR camera and use the button to the right to connect.
   When the *Auto-reconnect* check box is selected, the camera connects automatically next time FLIR Screen-EST starts.
2. Camera capture pane
   This pane includes buttons for camera control, e.g. autofocus.
3. Events pane
   This pane displays all events and operations performed to a connected camera. Use the buttons to clear or save the logs to a file.
4. Camera image pane
   The live image from the camera is displayed here.
   The system is looking for faces in a part of the image which is called the region-of-interest. The dotted box on the images here indicates the region-of-interest for the face detection. The size of the region-of-interest box is defined by a setting (see section 10.3.1 *Face detection tab*). You can change the size of the box by a drag-and-drop operation here.

5. Face detection pane
   - When the *Enable tracking* check box is selected, the face detection and screening functionality is enabled. To temporarily stop the screening, clear the check box.
   - *Moving averages*: *Value* shows the current average. *Samples count* is the number of samples included in the average calculation. *Status* shows the sampling status; red when there are no samples, orange when the system is collecting samples, green when the number of registered samples is according to the samples count setting. Hovering over the *Value*/*Samples count*/*Status* area displays a reset button. Click the button to reset the average value. After a reset, new samples have to be collected before screening is possible.
   - *Detection status* shows the screening result; green when the temperature is normal, red when an elevated temperature is detected, grey when no result is available. When the *Required manual reset* check box is cleared, alarms are automatically reset when the screened person moves away from the camera. When the *Required manual reset* check box is selected, the operator must manually reset alarms by clicking inside the red *Detection status* box.

Clicking the *Live* tab displays a toolbar, with options for connection, settings, camera control, and events.



10.3 Settings page

You access the *Settings* page via the toolbar on the *Library* and *Live* tabs in the operator window.

To exit the *Settings* page, click *Close* at the bottom right of the page.

Note For most settings in FLIR Screen-EST, it is recommended to use the default settings.

10.3.1 *Face detection* tab

Moving average

- The *Default samples count* is the number of samples that are included in the average calculation.

Face detection status

- The system will only evaluate measured temperatures between the *Skin maximum temperature* and *Skin minimum temperature* values.
- There will be an alarm if the measured temperature is more than the sum of the average temperature and the *Allowed deviation* value. Setting a low value will detect smaller elevations in skin temperatures, but it will also generate more false alarms. With a high value, there is a risk of missing people with elevated skin temperatures.

Detector type

The application can use either the thermal data stream or the visual data stream to detect faces.

- Use the *Detector type* list to select thermal or visual face detection.

Image settings

These settings apply to the live camera images in the operator window.

- Select the *Mirror image* check boxes to mirror (flip) the image.
- Use the *Image orientation* list to select portrait or landscape orientation.

Region of interest

The system is looking for faces in a part of the image which is called the region-of-interest. On the *Live* page, the dotted box indicates the region-of-interest for the face detection.

- The *Initial size* values define the size of the region-of-interest box (in percentage of the image).

10.3.2 *User screen* tab

The settings on the *User screen* tab apply to the visitor window.

Custom status messages

- Use these fields to change the status messages. You may, for example, want to translate the messages to your local language.

Font size

- Select the font size for the status messages.

Visibility settings

- Use the *Screen orientation* list to select portrait or landscape orientation.
- Select the *Show secondary image* check box to display both thermal and visual video.
- Use the *Show hats/glasses/masks* check boxes to select what symbols to display.

  Note Display of the glasses symbol is recommended (select the *Show glasses* check box). Removing eyeglasses is crucial for a correct screening result.
- Select the *Enable animations* check box to have a moving blue line in the visitor window, indicating that the system is in operation.
- Use the *Swap video streams* check box to select the display of thermal or visual video in the main image.

10.3.3 *Output* tab

FLIR Screen-EST can be configured to save images and data when an elevated skin temperature is detected. It is the responsibility of your company to handle any saved images and data in accordance with applicable local data protection laws.

Output options

- When the *Save dual snapshot separately* check box is selected, a separate visual image will be saved in addition to the combined thermal and visual image.
- When the *Open output folder after saving snapshot* check box is selected, the folder with the saved image will open when the saving is completed.
- To change the file path to the folder where you want to store saved images, click *Browse* and then select the folder.

Alarm

- When the *Log alarms to output folder* check box is selected, an image (combined thermal and visual image) and a data file (*.csv) is automatically saved when an elevated skin temperature is detected. By default, this check box is cleared and no images are saved automatically.

- When the *Use sound alarm* check box is selected, there will be a sound when an elevated temperature is detected.

Digital output

The screening result can trigger an external device, such as a gate, lights, or a siren, connected to the digital I/O connector on the camera.

Cameras that support multiple digital outputs will send a signal on digital output 1 for a positive condition (Elevated temperature) and a signal on digital output 2 for a negative condition (Normal temperature).

- When the *Enable digital output* check box is selected, a digital pulse will be output after a Normal temperature or Elevated temperature screening result.
- Use the *Elevated temperature signal's timespan* and *Normal temperature signal's timespan* fields to define the time (in milliseconds) that the digital output is enabled when a positive/negative result is detected by the camera. Set the value to 0 milliseconds to make the output enabled as long as a positive/negative condition is met.

10.3.4 *Webhooks* tab

The *Webhooks* tab is used to control the webhooks functionality. For more information, see section 10.4.2 *Webhooks*.

- Use the button to activate/deactivate webhooks. The settings can only be changed when webhooks is inactive (red *Off*).

  Note To activate webhooks, you must run FLIR Screen-EST as administrator. You do this by right-clicking FLIR Screen-EST on the Start menu and select *Run as administrator*.
- Select the *Run on application start* check box to activate webhooks automatically when the FLIR Screen-EST starts.
- Use the *Computer port* field to specify the path port on which FLIR Screen-EST shall listen to incoming POST requests.
- Use the *URL* fields to specify the URL for the callbacks.
  The callback URL format is:
  http://address:port/api/callback/#
  where # = alarm/pass/misreading/ready/waiting/error/standby
  - *Default alarm URL* (alarm): The screening result is Elevated temperature.
  - *Default no elevated skin temperature URL* (pass): The screening result is Normal temperature.
  - *Default misreading URL* (misreading): There is no successful screening result within the time limit set by the *Misreading timeout* setting.
  - *Default system's readiness URL* (ready): The system is ready to perform a screening.
  - *Default system awaiting URL* (waiting): The system is waiting for a person to screen.
  - *Default system error URL* (error): System error, e.g. no camera is connected or not enough samples have been collected.
  - *Default system stand-by URL* (standby): The screening is deactivated and the system closed message is displayed in the visitor window.
- Use the *Misreading timeout* field to set the time limit for a successful screening result (normal or alarm).

10.3.5 *General* tab

General options

- Click *Factory default settings* to reset the application to factory settings. FLIR Screen-EST will restart to apply the new settings.
- Click *Clear cache* to delete locally cached content. FLIR Screen-EST will restart to apply the new settings.

- Click *Settings panel password* to protect the *Settings* page with a password. This opens a dialog box. Select the *Protect settings panel with password* check box and enter the password.

10.3.6 *Updates* tab

Select how you want to manage updates of the FLIR Screen-EST.

When the *Check if updates are available* check box is selected, a check for updates will automatically be performed every time the application is started.

When the *Prompt to install updates* check box is selected, you will be asked to install any available updates. The *Check if updates are available* option must also be enabled.

If updates need to be downloaded via a proxy service, an additional configuration is needed. In the *Proxy settings* dialog box, select the *Use proxy* check box, and then enter the requested information. Click *OK* to save.

Note To check for and download updates, internet connection is required.

10.3.7 *Theme* tab

Change the theme of the user interface. FLIR Screen-EST will restart to apply the new settings.

10.3.8 *File explorer* tab

Select if you want to show hidden files and display folder previews.

10.3.9 *Editor* tab

Change the file path to the folder where your custom palettes are located.

10.3.10 *Regional settings* tab

Select the language and units to be used in the user interface. FLIR Screen-EST will restart to apply the new settings.

10.4 Integration with external systems

There are two ways to integrate FLIR Screen-EST with an external system:

- Digital output.
- Webhooks.

10.4.1 Digital output

A basic level of integration is possible if the FLIR camera has a digital I/O connector.

1. Connect an external device such as a gate, lights, or a siren to the digital I/O connector of the camera.
2. Configure FLIR Screen-EST to trigger a digital pulse depending on the screening result; Normal temperature or Elevated temperature. For digital output settings, see section 10.3.3 *Output tab*.

10.4.2 Webhooks

Webhooks is a method for HTTP communication between different systems. By using webhooks, FLIR Screen-EST can be controlled by a third-party system. As an example, you can include FLIR Screen-EST screening in your access control system.

General workflow for a third-party access control system with FLIR Screen-EST screening:

1. The visitor starts the sign-in process through the access control system.
2. The access control system prompts the visitor to perform a screening and sends a **Start** command to FLIR Screen-EST.

3. The FLIR Screen-EST displays live image in the visitor window, measures and analyzes the temperature, and displays a screening result in the visitor window.
4. FLIR Screen-EST sends the screening result, Normal temperature or Elevated temperature, to the access control system.
   If there is no screening result within a specified time limit, a Misreading response is sent instead.
5. The access control system sends a **Sleep** command to FLIR Screen-EST.
6. The screening functionality in FLIR Screen-EST is deactivated and the visitor window displays the system closed screen.

10.4.2.1 POST requests to FLIR Screen-EST

FLIR Screen-EST is configured to listen for POST requests on the following paths:

Start request: http://workstationAddress:port/screenest/start

Sleep request: http://workstationAddress:port/screenest/sleep

where:

- workstationAddress can be the local IP (localhost) or an external IP address.
- The path port must be the same as the computer port specified in the FLIR Screen-EST settings, see section 10.3.4 *Webhooks tab*.

10.4.2.2 Callbacks from FLIR Screen-EST

After receiving a Start/Sleep POST request, FLIR Screen-EST will make a callback on the address defined in the POST request body. If the callback address is missing in the request, the address specified in the FLIR Screen-EST settings will be used.

This means you can specify the callback address (URL) in two ways:

- Send the URL via the POST request body.
- Specify the URL in the FLIR Screen-EST settings, see section 10.3.4 *Webhooks tab*.

The callback URL format is:

http://address:port/api/callback/#
where # = alarm/pass/misreading/ready/waiting/error/standby

10.4.2.3 Events after a Start request

When FLIR Screen-EST receives a **Start** request, the following happens:

- If FLIR Screen-EST is not ready for screening, it responds with an **error** callback.
- If FLIR Screen-EST is ready for screening, the following happens:
  1. In the operator window, the *Enable tracking* check box is selected.
     The visitor window displays live image.
  2. FLIR Screen-EST sends a **ready** callback, indicating that the system is ready for screening.
  3. FLIR Screen-EST sends a **waiting** callback, indicating that the system is waiting for a person to screen.
  4. FLIR Screen-EST sends one of the following callbacks:
     - **pass** — if the screening result is Normal temperature.
     - **alarm** — if the screening result is Elevated temperature.
     - **misread** — if there is no successful screening result within the specified time limit.

10.4.2.4 Events after a Sleep request

When FLIR Screen-EST receives a **Sleep** request, the following happens:

1. In the operator window, the *Enable tracking* check box is cleared.
   The visitor window displays the system closed screen.
2. FLIR Screen-EST sends a **standby** callback.

10.4.2.5 Webhooks settings

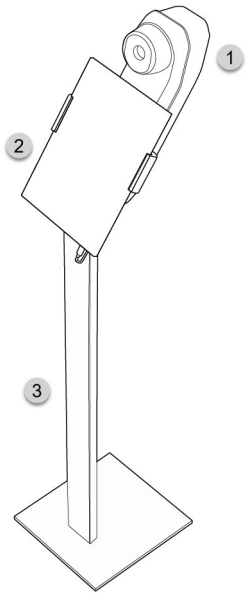
For webhooks settings, see section 10.3.4 *Webhooks tab*.

10.4.2.6 Configurations for external system outside localhost

For FLIR Screen-EST to receive incoming POST requests and return callbacks from outside the localhost, you may need to configure the firewall and port settings of the computer where FLIR Screen-EST is installed.

11 Description — FLIR Screen-EST Kiosk

11.1 System parts



1. Camera unit
2. Tablet
3. Stand

11.2 Camera web interface

The FLIR Screen-EST Kiosk camera has a web interface. If the camera has been reset to factory default settings, you must log in to the camera web interface to re-configure the firewall settings.

To log in to the camera web interface, you need to find the camera on the IP network by using the FLIR IP Config software.

11.2.1 Install FLIR IP Config

FLIR IP Config is a software used to detect cameras in an IP network.

FLIR IP Config is pre-installed on the tablet. If FLIR IP Config has been removed, you have to re-install the software.

To install the FLIR IP Config software, do the following:

1. Go to https://flir.custhelp.com/.
2. In the search field, enter “FLIR IP Config” and then click the *Search* button. In the search results, click the *Download FLIR IP Config* link.
3. Download the latest version of FLIR IP Config (zip file).
4. Unzip the file and run the *.exe file.
5. Follow the instructions in the installation wizard.

11.2.2 Open the camera web interface

To log in to the camera web interface, you need the administrator password. The password is available on the camera calibration certificate, which is included in the FLIR Screen-EST Kiosk package.

To open the camera web interface, do the following:

1. Start the FLIR IP Config software by double-tapping the desktop icon.

   Note If a Windows Defender Firewall message is displayed, select to *Allow access* for FLIR IP Config.

2. The FLIR IP Config automatically scans for cameras. When a camera is detected, FLIR IP Config displays the IP address of the camera.
3. Double-tap the camera in FLIR IP Config. This opens the camera login page in a web browser.

   Note If FLIR IP Config finds several cameras, you can identify your camera by the MAC address printed on a label at the back of the camera (see section 11.3 *Camera connectors and buttons*).

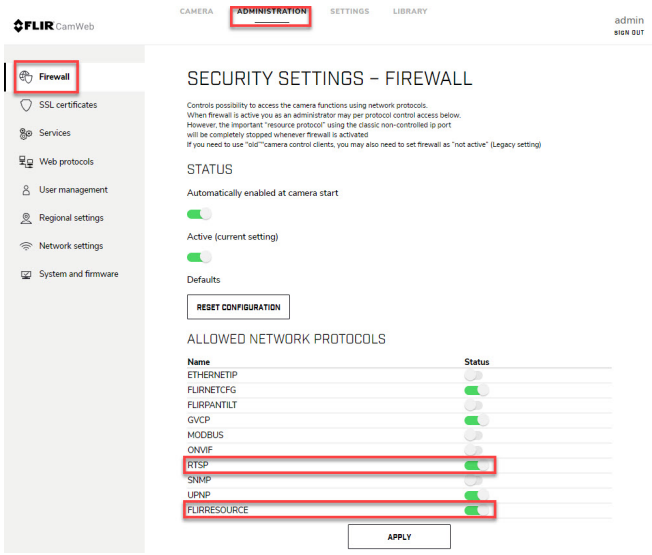
4. Log in with the username *admin* and the default administrator password available on the camera calibration certificate. This displays the web interface of the camera.

11.2.3 Firewall configuration

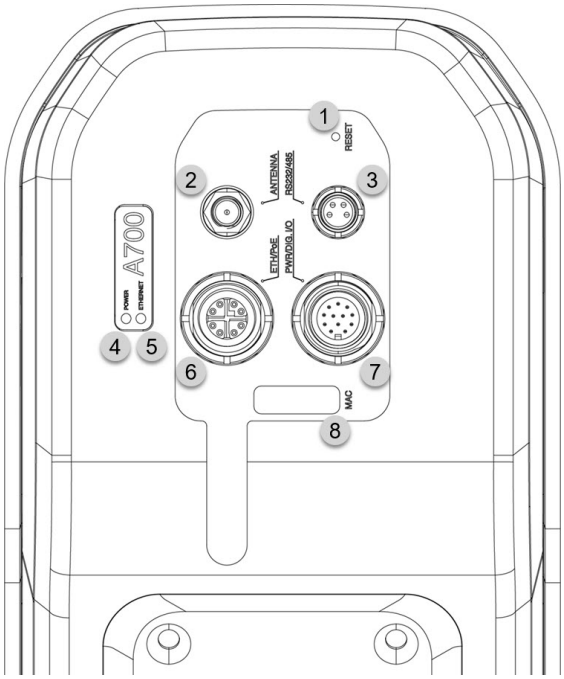
The camera is pre-configured to open up the firewall. If the camera has been reset to factory default settings, you must configure the firewall settings.

To configure the firewall settings, do the following:

1. Log in to the camera web interface, see section 11.2.2 *Open the camera web interface*.
2. Go to the *Administration* tab and select *Firewall*.
3. Make sure the *RTSP* switch is set to ON.
4. Make sure the *FLIRRESOURCE* switch is set to ON.
5. Tap *Apply* at the bottom of the page.



11.3 Camera connectors and buttons



1. Factory reset button.
2. Antenna.
3. RS232/485 connector.
4. Power/error indicator LED (blue/red).
5. Ethernet communication indicator LED (green).
6. Ethernet/Power over Ethernet connector.
7. Power and Digital I/O connector.
8. MAC address label.

11.3.1 Factory reset button

Note

- Do not hold down the factory reset button when connecting the FLIR Screen-EST Kiosk to power.
- After a factory reset, the firewall configuration required for connection to FLIR Screen-EST is deleted. To configure the camera to open up the firewall, see section 11.2.3 *Firewall configuration*.

Factory reset button depression time period	Indicator LED status	Explanation
> 1 second	A continuous red light	When the factory reset button is released: • A factory reset is executed. • The main camera application is restarted. • The indicator LED status resumes the status it had before the button was depressed.
> 4 seconds	A flashing red light	When the factory reset button is released: • A factory reset is executed. • The main camera application is restarted. • The camera's IP settings are reset to the factory defaults (DHCP assigned). • The indicator LED status resumes the status it had before the button was depressed.
> 10 seconds	A rapidly flashing red light	When the factory reset button is released: • A factory reset is executed. • The firewall configuration required for connection to FLIR Screen-EST is deleted. • The camera's IP settings are reset to the factory defaults (DHCP assigned). • All added users are deleted. • All passwords are deleted. • The camera is restarted.

11.3.2 Power/error indicator LED and power modes

Indicator LED status	Explanation
A flashing blue light.	Normal operation.

11.3.3 Ethernet communication indicator LED

Indicator LED status	Explanation
A flashing green light	The camera is connected to a network and the network activity is indicated.
No light (i.e., it is switched off).	The camera is not connected to any network.

11.3.4 Digital I/O

For information about the Digital I/O connector, refer to the FLIR A500/A700–EST User's manual (available online at http://support.flir.com/resources/ds6g).

12 Maintenance — Cleaning and Calibration

12.1 Cleaning

12.1.1 Camera unit housing, cables, and other items

12.1.1.1 Liquids

Use one of these liquids:

- Warm water
- A weak detergent solution

12.1.1.2 Equipment

A soft cloth

12.1.1.3 Procedure

Follow this procedure:

1. Soak the cloth in the liquid.
2. Twist the cloth to remove excess liquid.
3. Clean the part with the cloth.

CAUTION

Do not apply solvents or similar liquids to the camera unit housing, the cables, or other items. This can cause damage.

12.1.2 Infrared lens

12.1.2.1 Liquids

Use one of these liquids:

- A commercial lens cleaning liquid with more than 30% isopropyl alcohol.
- 96% ethyl alcohol (C_2H_5OH).

12.1.2.2 Equipment

Cotton wool

CAUTION

If you use a lens cleaning cloth it must be dry. Do not use a lens cleaning cloth with the liquids that are given in section 12.1.2.1 above. These liquids can cause material on the lens cleaning cloth to become loose. This material can have an unwanted effect on the surface of the lens.

12.1.2.3 Procedure

Follow this procedure:

1. Soak the cotton wool in the liquid.
2. Twist the cotton wool to remove excess liquid.
3. Clean the lens one time only and discard the cotton wool.

WARNING

Make sure that you read all applicable MSDS (Material Safety Data Sheets) and warning labels on containers before you use a liquid: the liquids can be dangerous.

CAUTION

- Be careful when you clean the infrared lens. The lens has a delicate anti-reflective coating.
- Do not clean the infrared lens too vigorously. This can damage the anti-reflective coating.

12.2 Calibration

12.2.1 About calibration

When ”Calibrating…” is displayed on the screen, the camera is performing what is called a ”non-uniformity correction” (NUC). The camera performs a NUC automatically, for example at start-up and every now and then during operation.

12.2.2 Verify calibration

FLIR Systems recommends that you verify the camera calibration yearly. You can verify the calibration yourself or with the help of a FLIR Systems Partner. If preferred, FLIR Systems offers a calibration, adjustment, and general maintenance service.

To verify the camera calibration, do the following:

1. Close the screening software and log in to the camera web interface using a web browser.
2. Log into the camera using the credentials found on the calibration certificate.
3. Add a measurement spot and aim it at a black body set to a known temperature.
4. Make sure the camera is in focus and note the temperature. The value provided by the camera should be the black body temperature ±0,3 C”

13 Update — FLIR Screen-EST and Camera firmware

This chapter describes how you update the FLIR Screen-EST software and the camera firmware.

13.1 FLIR Screen-EST software update

By default, a check for updates is performed automatically every time you start the FLIR Screen-EST application. You will be asked to install any available updates.

The settings for software updates are available on the *Updates* tab, see section 10.3.6 *Updates tab*.

Note To check for and download updates, internet connection is required.

13.1.1 Offline update

If the FLIR Screen-EST Kiosk is not connected to the internet, you can update FLIR Screen-EST offline.

1. On a device with internet access, go to https://support.flir.com/screenest.
2. Download the FLIR Screen-EST installer package.
3. Transfer the installation package to the FLIR Screen-EST Kiosk tablet using e.g. a USB memory stick.
4. On the tablet, start the installation by double-clicking the executable installer file.
5. Read and accept the license terms and conditions.
6. Click *Install*.
7. Click *Finish*.

Note To complete the installation, the tablet may need to be restarted. Follow the instructions on the screen.

13.2 Camera firmware update

To update the camera, you need an update package with the firmware update file(s).

To update the camera firmware, do the following:

1. Make sure the power cable is connected to the FLIR Screen-EST Kiosk and to a power outlet. This powers the camera.
2. Turn on the tablet.
3. Save the firmware update file(s) to the tablet desktop.
4. Run FLIR IP Config from the Start menu or by double-tapping the desktop icon.
5. The FLIR IP Config automatically scans for cameras. When a camera is detected, FLIR IP Config displays the IP address of the camera.
6. Double-tap the camera in FLIR IP Config. This opens the login view of the camera web interface in a web browser.

   Note If FLIR IP Config finds several cameras, you can identify your camera by the MAC address printed on a label at the back of the camera (see section 11.3 *Camera connectors and buttons*).

7. Log in with the username *admin* and the default administrator password available on the camera calibration certificate. This displays the web interface of the camera.
8. In the camera web interface, go to the *Administration* tab and select *System and firmware*.
9. In the *System* section, tap *Upgrade firmware*. This displays a dialog box.
10. Tap *Select file*. The standard Windows Open dialog box appears.
11. Browse to the location of the firmware file, select the file, and then tap *Open*.
12. Tap *Upgrade firmware*.
13. When the upgrade is completed, tap *Close and reboot*. This restarts the camera.

14 Privacy notice — FLIR EST Thermal cameras

FLIR designs and sells thermal cameras which detect heat emitted by objects and equipment in order to identify malfunctions, movements, and other scene dynamics based on the detection of surface temperature of objects in a scene. FLIR thermal cameras can also be used to detect, from a distance, heat emitted by facial skin and automatically alarms in case of a reading that exceeds a selected threshold, which may indicate that the individual has an elevated skin temperature. FLIR's EST Software and algorithms are specially adapted for face detection, and data analysis and decision ("Thermal Screening").

Thermal screening is a suitable measure for helping to identify individuals that may have fever symptoms, though screening results will need to be verified by a cleared medical device such as an oral thermometer.

The use of FLIR's EST thermal cameras for purposes of screening skin temperature involves or allows for all or some of the following personal data processing operations (each of which may involve multiple operations such as: collection, recording, storage, consultation, disclosure, transmission, erasure or destruction):

- **Setting a baseline temperature**, by screening the skin around the tear duct of a number of individuals entering in the camera field of view with skin temperature that falls between a specified min. and max. temperature, and which are stored in the algorithm to set or adjust the baseline temperature; A face detection algorithm uses visual video stream to detect the face, then Infrared (IR) and visual stream are synchronized and measurement is done on the IR stream (Therefore, for optimum use of EST Software, pre-installation of dual streaming is highly recommended); EST screening will only capture temperature reading of these 10 individuals as input into EST algorithm to adjust reference temperature);
- **Screening** individuals entering in the camera field of view (the screening app analyzes and measures temperature) and **displaying** live thermal and/or visual images of their face, the screening result of the temperature reading (reflected as "elevated (red) / non-elevated (green) temperature detected"), with or without alarm sound (if temperature reading is above the fixed threshold);
- **Saving** of thermal and/or visual images and data file (screening result) when systems detects elevated temperature and alarm is triggered, with/without **alarm sound** on the Software (memory card) when an alarm has been triggered;
- **Transfer** of the images and data collected, via a cable connection, to user's IT, badge, video management or other systems.

These processing operations may hence involve the processing of the following data that may qualify as personally identifiable data (i.e, **to the extent these data can actually be connected to an individual)**:

- thermal and visual images of the faces of people screened;
- temperature reading results (displayed as "elevated (red) / non-elevated (green)" temperature), which are also sensitive (health) data;

FLIR's EST cameras must be used in accordance with the applicable Product Manual and the environmental conditions described therein for optimum measurement accuracy: humidity and temperature, avoid air flow in people's face, people screened must be placed at a correct distance from the camera (as indicated by the screening position), a non-reflective background is required (a backdrop must be installed behind screening station to cut out disturbing background reflection, people, light); to build up an accurate reference temperature data series, healthy people must be screened first, in normal real life screening conditions (coming from outdoors).

As a manufacturer of thermal cameras which potentially allow for the processing of personal data, FLIR has embedded (or is planning to embed in the near future) the following **Privacy by Design and Data Security** features in its cameras (which at the same time shows FLIR is continuously enhancing its products, and adding features, models and versions that take into consideration Privacy by Design principles, to allow Users to only collect personal data that is strictly needed in regard to user's purpose, or to avoid the collection of personal data altogether):

- **Data Minimization**: the camera only targets the meaningful area of the body and face (tear duct)[1];
- **Measurement accuracy and error rate** (false-positive and false-negative results): variations due to external conditions, physical activity, other illness are generally accounted for through the use of relative measurement; the camera measures & alarms in comparison to surrounding people. **Resolution, image accuracy: even if the image of the face is taken in very high resolution, no other data is detected (other illness, biometric data etc.)**[2];
- **Display**; user can show, or hide Visitor display from other individuals; in the desktop interface, user can choose to show the IR or visual stream; **Alarm sound:** must be enabled; Intended future modifications include: display/save of an avatar instead of images, distorted/blurred images;
- **Save**: there is no automatic save of any images or data (screening result) when an alarm is triggered; this must be enabled (if the system is configured that way, all processing and saving of images will occur on the PC hard drive or server which is connected to the camera and monitor);
- **Transfer**: a cable connection to allow transfer of data collected by the camera to user's other systems is available, but must be enabled; Planned modifications include an all-in (with integrated monitor) model, without cable connection (but which can rely on Wifi connections), which will also be available in operator-free version).

As a result, the following set-up options, which may impact data privacy compliance of thermal screening, are possible with FLIR EST thermal cameras:

- Identification of individuals can be avoided ;
- Screening without recording of measurements;
- Measurements not linked to individuals (through immediate deletion of the measurement with just a pass/no pass output);
- Cameras can be used as a standalone solution (User can choose not the use the available cable connection to transfer data collected to other systems that may allow identification of the screened individual);
- Screening is entirely avoidable, and not automatically activated when an individual simply walks through an entrance: human intervention is required to operate the camera and to place the individual correctly in the camera's field of view, which allows for by-passing the system and voluntary screening, and the accomplishment of applicable consent-information formalities (similarly, when available, the standalone

1. Research studies and ISO standards show that the best correlation to core body temperature is the tear duct or inner corner of the eye: it is smaller and more protected than the surface of the skin on your forehead or cheeks (These areas are very susceptible to environmental influences: wind, perspiration, and clothing, such as head coverings and hats (ex.: if someone takes off a hat before screening, you'll see a warm band across the forehead, which could trigger a false alarm)). In addition, the tear duct is typically the hottest part of the face, making it easy to have your IR camera lock onto that location, quickly and consistently.
2. A thermal screening system must focus on how well the system as a whole performs at identifying if the individual being screening has EST relative to other persons being screened. It's in identifying that delta temperature that the system proves it's accuracy as an EST screening tool. The problems with screening using an absolute temperature threshold are due to the natural variation with core body temperatures and impact of environment on core body temperature (It is common to see body temperature differ from person to person due to activity level, diet, gender, ethnicity, and age, and to differ on an individual basis due to time of day). FLIR's EST screening mode helps work around those challenges to get the best measurements of EST. FLIR's cameras with EST screening mode have a built in screening alarm setting. A delta temperature defines the alarm threshold. This delta can remain unchanged throughout the screening period. Before the screening starts, measurement samples of persons with normal body temperature are registered and the system stores the readings in a buffer. The average of the reading buffer becomes the screening reference. Since the buffer is continuously updated when new persons are screened, the reference will increase or decrease along with the natural body temperature fluctuations throughout the day. No need to adjust the alarm threshold, as it will adjust with the temperature screening reference, ensuring the current person being screened is compared to an alarm threshold set on top of the reference average. This helps limit false positives and false negatives that would result from a strict alarm temperature setting. This method only works if you have an extremely stable thermal camera as your measurement tool).

operator-free model will require the individual to place itself (voluntarily) in front of the camera);
- If used as part of an (automated) access control system (or if otherwise linked to user's IT/badge/video system), it is not necessary for the measurements to be logged or otherwise allocated to the individuals;
- The camera can be operated by the company doctor (or similar function), subject to strict confidentiality obligations, or by the individual (when the operator-free model will be available);

Thermal Screening is a **suitable** measure to help detect elevated skin temperature which may be indicative of an infection (see supra); It can also be considered as **necessary**, as there are no less intrusive measures (like masks, social distancing, surveys, etc.) that are just as effective (masks and social distancing have no effect on detection; health surveys may help detection, but take considerably more time). In addition, user's interest in Thermal Screening must outweigh the individual's interest that their temperature is not measured. This is a case-by-case determination, and also depends on how exactly the screening is set up (If results are immediately deleted, user's interest will likely prevail).

Responsibility of the data owner/processor. Users of FLIR's thermal cameras are processing personal data in their own name and to their own benefit ("data Controller" per the GDPR) or as a processor acting on behalf of such controllers or data owners. According to applicable privacy laws such data owners must implement appropriate safeguards in order to ensure that processing is performed in a way that protects personal data. **Data protection by design** implies that **the data owner** shall both at time of determination of the means for processing (prior to any start of data processing) and at any time during the processing itself, implement appropriate safeguards (such as pseudonymisation), which are designed to implement data protection principles (such as data minimization). **Data protection by default requires that** the said safeguards ensure that, by default, only personal data that are necessary for each specific purpose of the processing are processed (This obligation applies to the amount of data collected, the extent of the processing, the period of storage and accessibility).

Hence it is incumbent upon Users to ensure that their use of FLIR's thermal EST cameras complies with applicable privacy requirements (including as relates to timely information to data subjects, data breach notification, prior impact assessment of high risk processing operations, appointment of a Data Privacy Officer etc.) and any other applicable local legislation (employment and health & safety laws, health regulations). User's compliance with applicable data privacy requirements will depend on the specific User profile (private company, public authority, airport, etc.), User's decisions (in regard to the choice of available legal grounds for processing personal data, user's intended purpose with the Thermal Screening etc.), the exact circumstances of use and set up of FLIR's EST cameras, and whether personal data will be processed at all. However, User can largely impact data privacy compliance and even rule out applicability of privacy laws, as shown by the set-up options made possible by FLIR thermal cameras.

Website
http://www.flir.com

Customer support
http://support.flir.com

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