User's manual
FLIR EST Screening

FLIR Screen EST and FLIR Exx/T5xx/T8xx

Table of contents

1 Notice to user

1.1 Note about this manual

This manual describes how to set up, configure, and operate a FLIR EST Screening station based on the FLIR Screen EST application and a FLIR Exx, FLIR T5xx, or FLIR T8xx series camera.

For complete information about the FLIR Screen EST application and the FLIR cameras, refer to the respective manuals.

1.2 Online documentation

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

To access the latest online documentation, go to: http://support.flir.com/resources/est.

1.3 Customer help

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.

2 About FLIR EST Screening

FLIR Systems provides different screening solutions for detection of elevated skin temperatures using thermal cameras.

No thermal cameras can detect or diagnose a virus infection, but with a FLIR EST Screening system it is possible to identify individuals with elevated skin temperatures. An elevated temperature may indicate the presence of a fever.

The FLIR EST Screening system measures the temperature of the skin around the tear duct. An alarm will trigger when the measured temperature is higher than the sum of a reference temperature and a specified allowed deviation.

For accurate screening results, it is very important to set up the screening station correctly.

Since the FLIR EST Screening systems measure the surface temperature of the tear duct, the measured temperatures are lower than the ones you may be used to in a fever context. Note that the FLIR EST Screening systems cannot measure fever.

We recommend that you set up a suitable process for those individuals where the system has indicated an elevated temperature.

3 Screening station — General description

3.1 Overview

The screening station consists of a FLIR thermal camera, a computer with a FLIR EST Screening application, a clearly defined screening position, and a backdrop.

For accurate measurements, it is important that the screened person is at the correct distance from the camera. The screening position indicates where the person shall stand for the screening.

A backdrop shall be placed behind the screening position. The backdrop is needed to cut out disturbing background reflections, people, and light. The backdrop can also be used when setting up the system to make sure the camera captures different lengths of people.

The thermal camera measures the temperature at the tear duct of the screened person. The FLIR EST Screening application analyzes the measured temperature and displays a screening result.

3.2 Equipment and material

The following equipment is needed at the screening station:

- FLIR thermal camera with EST software and EST accessories.
- Computer with a FLIR EST Screening application.
- External display.
- Mounting equipment for display and camera; e.g. stand, wall mount, tripod.
- Backdrop, providing a uniform and non-reflective background.
- Marker to indicate the screening position; e.g. floor sticker, tape.

3.3 Typical setup

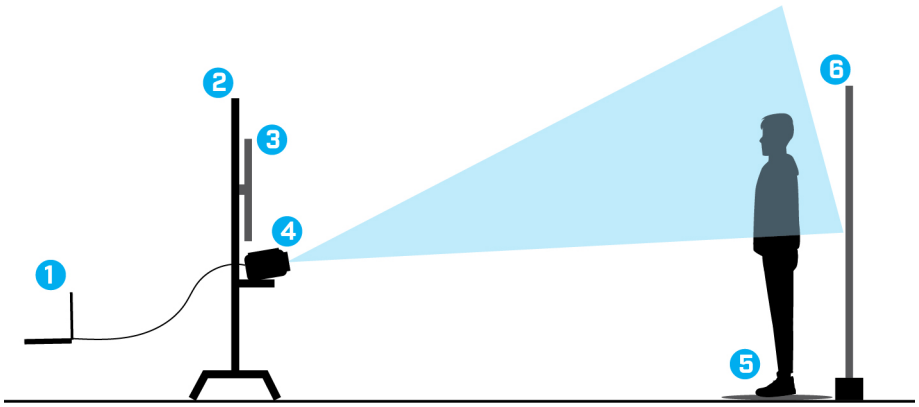


Figure 3.1 Typical screening station setup

1. Computer
2. Stand
3. Display
4. Thermal camera
5. Screening position
6. Backdrop

3.3.1 Mounting and placement considerations

For accurate screening results, the following factors related to mounting, placement, and distances must be considered:

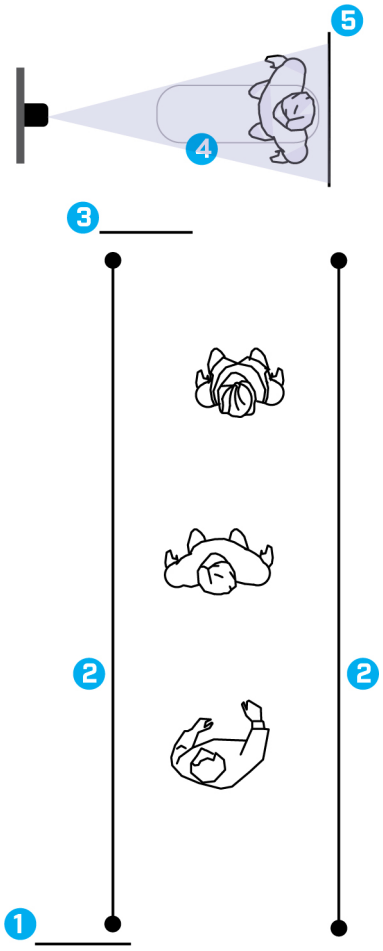
- The camera shall be placed under the display.
- The screening position shall be perpendicular to the camera. The distance between the camera and the screening position shall be 1–2 m (3–6 ft.). The screening position shall be clearly defined, e.g. by marks on the floor.
- The camera shall be angled upwards, so that it aims at the head of a person standing at the screening position.
- A backdrop shall be placed behind the screening position, providing a uniform and non-reflective background.

3.3.2 Environmental considerations

For accurate screening results, the following factors related to the environment around the screening station must be considered:

- The screening area should have a non-reflective background and minimal reflected infrared radiation from the surroundings. This can be achieved by placing a backdrop behind the screened person.
- Make sure there are no glass windows or doors in front of the camera. The windows can cause reflections and incorrect temperature measurements.
- Make sure there are no heat sources near the screened person, including hot lamps, sun light, electrical equipment, etc. This can increase the skin temperature.
- Make sure no beams from intensive energy sources go into the thermal camera. This includes devices that emit laser radiation, or the sun. The beams can have an unwanted effect on the accuracy of the camera. They can also cause damage to the camera.
- The measurements can be influenced if the screened person is sweating. For that reason, the relative humidity in the screening area should be maintained below 50 % and the temperature below 24°C (75°F).
- Prevent drafts from sources such as air conditioning from blowing directly onto the screened person. The air flow can cause cooling or heating of the face.

3.4 Supporting material



1. Screening information (roll-up)
   This roll-up informs people what the screening is about and why they need to do it.
2. Queue management
   Solution to guide the persons to the screening station, e.g. barriers and tape on the floor to indicate distance keeping.
3. Screening instructions (roll-up)
   This roll-up tells people to remove any objects covering their face before they are screened.
4. Floor sticker
   The floor sticker indicates the screening position; that is, where the persons should stand for the screening.
5. Backdrop
   The backdrop is needed to provide a uniform and non-reflective background.

3.4.1 Examples

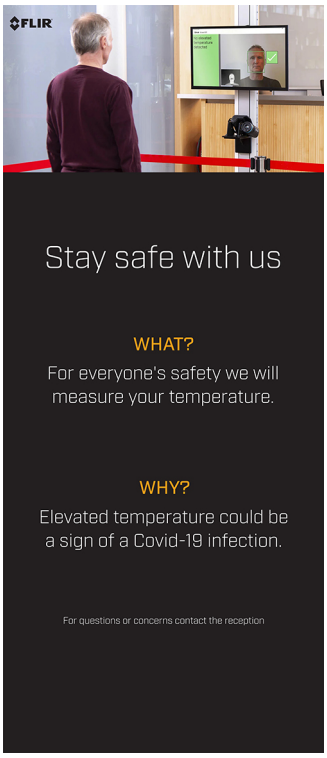


Figure 3.2 Roll-up, screening information

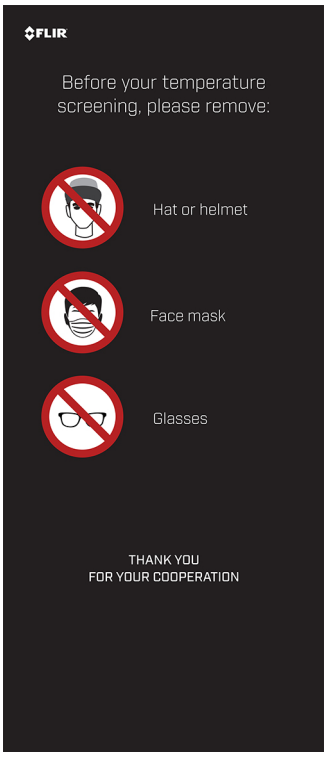


Figure 3.3 Roll-up, screening instructions

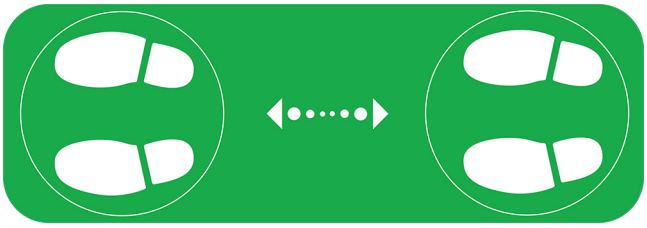


Figure 3.4 Floor sticker

Figure 3.5 Backdrop

3.5 Privacy and processes

In addition to setting up the screening station equipment, you must also consider personal integrity and processes for elevated temperature alarms.

- Personal integrity
  You must make decisions on how to handle personal integrity; e.g. show/hide visitor display for others than the screened person, have/not have an alarm sound, save/not save image and data when an alarm is triggered.
- Process for alarms
  You must establish a process for those individuals where the system has indicated an elevated temperature; e.g. deny the person to enter the premises, let the person sit down for 10 minutes and then do the screening again, further evaluation by medically trained personnel.

4 Screening with the FLIR Screen EST application

FLIR Screen EST is an application for detection of elevated skin temperatures using thermal cameras.

Using face-detection capabilities, the system determines an average skin temperature of people entering the camera field of view and automatically alarms on readings that exceed a selected temperature difference.

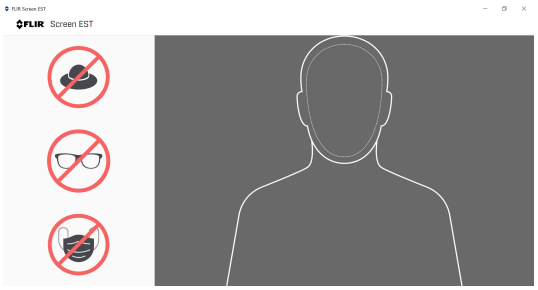
4.1 Screening procedure

The screening of a person is performed in a few steps.

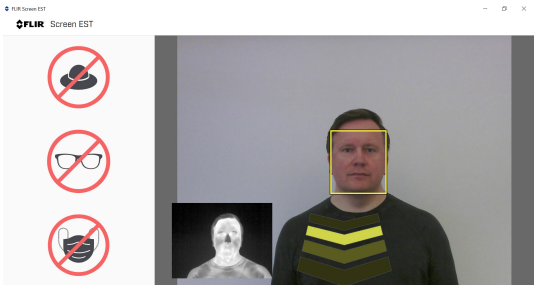
The person stands in front of the screening station, looking at the display. When the system detects a face, live video is shown on the display. The display graphics guide the person into the correct position for the screening. When the system has measured the temperature, the screening result is shown on the display.

Screening procedure:

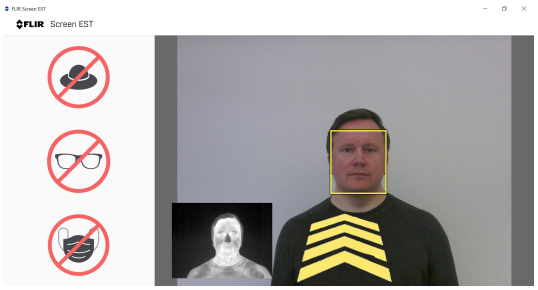
1. The system is in idle mode. Go forward and stand in front of the display. Make sure your eyes are not covered by eyeglasses, hair, or other items.



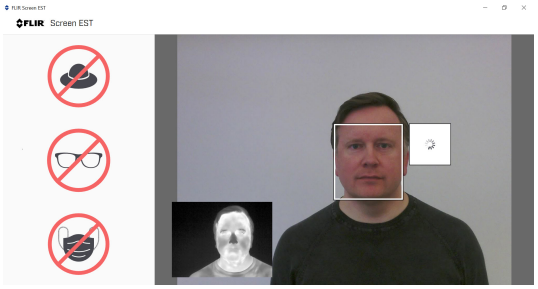
2. You are too far from the camera. Move closer.



3. You are too close to the camera. Move further back.

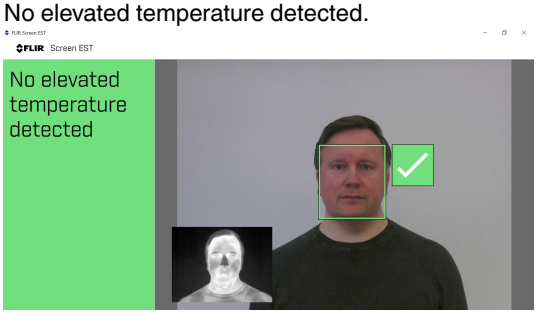


4. You are in a good position. The system is measuring and evaluating your temperature.

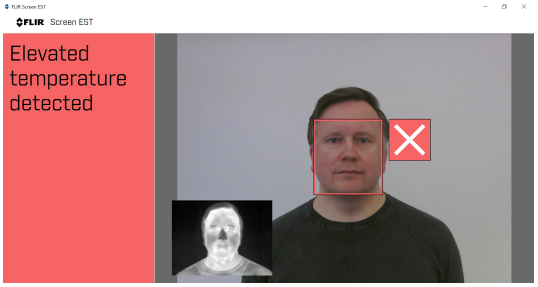


5. The screening is completed and your result is displayed.

   No elevated temperature detected.



   Elevated temperature detected. Follow the instructions from the staff.



5 Setting up the screening station

This chapter provides step-by-step instructions for how to set up a screening station with the FLIR Screen EST application and a FLIR Exx/T5xx/T8xx camera.

Before starting the setup, please read the entire chapter and make sure you have all the needed products, equipment, and material.

5.1 Main steps

1. Prepare the screening station — choose site, secure power supply, solve queue management.
2. Prepare the computer — install the FLIR Screen EST application.
3. Prepare the camera — connect to computer, configure settings related to safety and accuracy.
4. Place the camera, display, and computer.
5. Configure FLIR Screen EST settings.
6. Ensure correct setup of all the parts of the screening system.

5.2 Materials needed

FLIR products:

- FLIR Screen EST, Perpetual license
- FLIR Exx, FLIR T5xx, or FLIR T8xx series camera
- EST Camera kit (FLIR Exx/T5xx/T8xx), including the following:
  - Dual streaming option that enables simultaneous streaming of thermal and visual video.
  - A USB cable for connection of the camera (USB Type-C) to a computer (USB 2.0 Type A). Since the cable also includes a power adapter, the camera will get enough power for continuous operation.

Computer and display:

- Computer with Microsoft Windows 10 (32-bit or 64-bit) operating system.
- External display.
- Display cable.
- Power cables.

Equipment and supporting material:

- Mounting equipment for display and camera; e.g. stand, wall mount, tripod.
- Backdrop, providing a uniform and non-reflective background. The backdrop is needed to cut out disturbing background reflections, people, and light.
- Marker to indicate the screening position; e.g. floor sticker, tape.
- Queue management; e.g. barriers.

Materials and tools:

- Measuring tape or yardstick.
- Screwdriver.
- Masking tape.
- Cable ties.

5.2.1 FLIR part numbers

For FLIR Exx, FLIR T5xx, and FLIR T8xx part numbers, see https://flir.custhelp.com/app/fl_download_datasheets.

Part number	Part
T300342	FLIR Screen EST, Perpetual license
T300344	EST Camera kit (FLIR Exx/T5xx/T8xx) The kit includes the following: • T850111: Option, Dual streaming • T911846: USB 2.0 A to USB Type-C with Power adapter

5.3 Prepare the screening station

5.3.1 Choose the site

- The screening station needs a floor area of approx. 1.5 x 3.3 m (5 x 11 ft.) plus the queue area.
- For important factors related to the area around the screening station, see section 3.3.2 *Environmental considerations*.
- Decide where the visitor display and camera shall be placed and how they shall be mounted.
- Consider personal integrity matters; e.g. if the visitor display should be hidden from others than the screened person.
- Decide where the computer shall be placed, preferably so that the operator can view the screening station and also be of guidance to the screened persons.

5.3.2 Secure power supply

Power outlets are needed for the following equipment:

- USB cable with power adapter (connected to the camera).
- Computer.
- Visitor display.
- Optional: Operator display.

5.3.3 Solve the queue management

- Plan how the persons will flow into the screening station and out, both in low and high flow periods, and enable queueing.
- Plan for any alternative routes:
  - after an alarm
  - for any questions
  - for persons in a wheelchair or with other special requirements

5.4 Prepare the computer

Note The operating system of the computer must be Microsoft Windows 10.

5.4.1 Install the FLIR Screen EST application

To install the FLIR Screen EST application on the computer, follow this procedure:

1. Download the FLIR Screen EST installer package from https://support.flir.com/screenest.
2. To start the installation, double-click the executable installer file.
3. Read and accept the license terms and conditions.
4. Click *Install*.
5. Click *Finish*.
6. Run the application from the Start menu or by double-clicking the desktop icon.
7. The *FLIR Screen EST* dialog box appears where you can activate your license key.

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

5.4.2 Power and sleep settings

Change the computer's settings so it never automatically enters sleep mode or turns off the display.

5.5 Quick guide to FLIR Screen EST

5.5.1 Start application

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

5.5.2 User interface

The FLIR Screen EST application consists of two windows:

- The operator window is used by the operator for setup, control, and monitoring.
- The screening window is what the screened person sees.

The operator window has three pages:

- The *Live* page is where you connect to the camera and control the screening.
- On the *Library* page you can navigate to any saved images.
- The *Settings* page is used to change the settings.

5.5.3 Working principle

The system calculates a moving average temperature value based on a specified number of samples. Only temperatures between specified minimum and maximum temperatures are included in the average calculation. Persons with an elevated temperature do not contribute to the average calculation.

The system detects and measures the temperature of the hottest spot within a face detection box. An alarm will trigger when the measured temperature is higher than the alarm limit. The alarm limit is the sum of the average temperature and a specified allowed deviation.

The face detection box is looking for faces in a part of the image which is called the region-of-interest. The size and position of the region-of-interest can be changed on the *Live* page.

5.5.4 User manual

To access the FLIR Screen EST user manual, click *Usre manual* on the *Library* page or go to https://support.flir.com/screenest.

5.6 Prepare the camera

Note Prepare the camera before you mount it. It can be difficult to do the necessary settings when the camera is mounted.

5.6.1 New camera

If you have a brand new camera, do the following:

1. Charge the battery for 2 hours (FLIR Exx) / 3 hours (FLIR T5xx/T8xx) using the stand-alone battery charger.

   Note This is only needed if you want to use the camera without connecting it to the computer using the USB cable with power adapter.

2. Push the battery into the battery compartment.
3. Open the cover at the top (FLIR Exx) / bottom (FLIR T5xx/T8xx) of the camera. Insert the supplied memory card into the card slot.

5.6.2 Connect the camera to the computer

Note For connection of the camera to the computer, you should use the USB cable with power adapter. This is needed to provide the camera with enough power for continuous operation.

1. Open the cover at the top (FLIR Exx) / bottom (FLIR T5xx/T8xx) of the camera. Connect the USB cable to the USB-C connector in the camera.
2. Connect the USB cable to the computer.
3. Connect the USB cable power adapter to a power outlet.

5.6.3 Turn the camera on/off

- To turn on the camera, push the on/off button .
- To turn off the camera, push and hold the on/off button for more than 0.5 second.

5.6.4 Access the camera settings

1. Tap the menu system button at the bottom of the screen. This displays the menu system.
2. Tap (*Settings*). This displays the *Settings* menu.

5.6.5 Check that dual streaming is installed

For efficient use of the FLIR Screen EST application, the camera must have support for dual video streaming.

To check if the FLIR Dual Streaming option is installed, select (*Settings*) > *Device settings* > *Camera information*. Check that “dual_stream” is included under *Model options*.

5.6.6 Configure the camera

For safety reasons and for accurate screening results, some important settings are needed in the camera.

Note Laser and autofocus are not supported by all camera models.

1. The laser must be disabled. The laser beam can cause eye irritation.

   Disable the laser by selecting (*Settings*) > *Device settings* > *Lamp & laser* > *Disable all*.
2. The camera temperature range shall be set to the temperature range that includes human skin temperatures; 30 to 45°C (86 to 113°F).

   Check the camera temperature range by selecting (*Settings*) > *Camera temperature range*.
3. Continuous autofocus shall be disabled. The focus shall be adjusted manually before starting the screening and must not be changed.

   Disable continuous autofocus by selecting (*Settings*) > *Device settings* > *Focus* > *Continuous autofocus* > *Off*.
4. The autofocus method for shall be set to *Contrast* (not to *Laser*).

   Select (*Settings*) > *Device settings* > *Focus* > *Auto focus* and then select *Contrast*.

5.7 Place the camera, display, and computer

Place the visitor display and the camera at the screening station.

1. Mount the display and camera. The camera shall be placed under the display.
2. Define the screening position: Make a straight line from the camera towards the screening position - use a masking tape. Make a mark on the tape at 1–2 m (3–6 ft.) from the camera, indicating the screening position.
3. Place the backdrop behind the screening position.
4. Tilt the camera upwards, so that the lens aims at the head of a person standing at the screening position. The angle can be adjusted later, when testing the system.

Place the computer where you want to keep it for easy operator access.

1. Connect the visitor display to the computer.
2. Connect the camera to the computer using the USB cable with power adapter, see section 5.6.2 *Connect the camera to the computer*.
3. Connect the USB cable power adapter to a power outlet.
4. Change the computer screen setting so the visitor display acts as an extension to the computer screen.

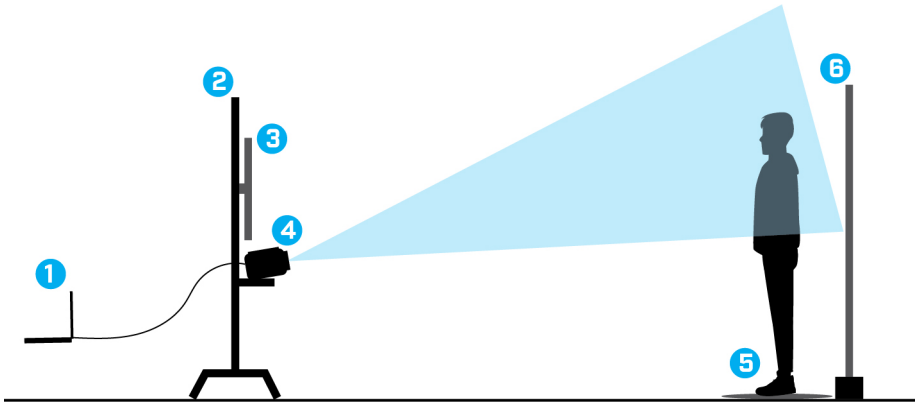


Figure 5.1 Typical screening station setup

1. Computer
2. Stand
3. Display
4. Thermal camera
5. Screening position
6. Backdrop

5.8 Connect the camera to FLIR Screen EST

1. Turn on the camera, by pushing the on/off button ⏻.
2. In the FLIR Screen EST operator window, go to the *Live* page.
3. In the *Discovery* pane, make sure *Dual* is selected.
4. In the *Discovery* pane, click the button to the right to connect to the camera.

5.9 Get familiar with the screening

Note See also section 5.5.3 *Working principle*.

1. Place a person in front of the camera.

2. When the system detects a face, live thermal and visual video is displayed on the *Live* page.

   The system automatically starts to collect the samples that are needed for the average calculation. In the *Face detection* pane, the status indicator shows the sampling status; red when there are no samples, yellow when the system is collecting samples, green when the number of registered samples is according to the *Samples count* setting.
3. When the status indicator is green (OK), the system is ready for screening.

   The *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.
4. When the system is ready for screening, the screening window also becomes operational.

5.10 Configure FLIR Screen EST

5.10.1 Personal integrity

Configuring the FLIR Screen EST application also involves settings related to personal integrity.

You need to make decisions on the following:

- Should there be an alarm sound when the system detects an elevated temperature?
- Should a combined thermal and visual image and a data file be saved when the system detects an elevated temperature?
- Should a separate visual image be saved, in addition to the combined thermal and visual image?
- What output folder should be used for any saved images and data?

5.10.2 Select the FLIR Screen EST settings

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

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

The settings that you may want to change are on the *Face detection* and *General* tabs on the *Settings* page.

5.10.2.1 Face detection tab

Face detection status

- The *Allowed deviation* value is the allowed deviation from the average temperature. If the measured temperature of the screened person is more than the sum of this value and the average temperature, the elevated skin temperature alarm will trigger. It is recommended to use the default setting, but you can experiment with other values.

Alarm

- Select the *Log alarms to output folder* check box to automatically save an image and a data file (*.csv) when the system detects an elevated temperature. By default, this check box is cleared and no images are saved automatically.
- Select the *Use sound alarm* check box to have a sound when an elevated temperature is detected.

Expected face size

- For accurate measurements, it is important that the screened person is at the correct distance from the camera. If the person is too far, the face will be too small for an accurate measurement. If the person is too close, the camera focus will be incorrect. To make sure the person is in a correct position, the system will only measure temperatures when the person's face covers a specified percentage of the so called region-

of-interest. The *Minimum value* and *Maximum value* settings are used to specify this percentage.
Depending on factors such as the distance to the camera and the type of camera lens, you may have to adjust the *Minimum value* and *Maximum value* settings.

Note On the *Live* page you can change the size of the region-of-interest. If you do that, you may have to adjust the *Minimum value* and *Maximum value* settings.

Custom status messages

- You can change the text that the screened person sees on the display. You may, for example, want to add instructions for what the person shall do in case of a detected elevated temperature.

Swap video streams (applicable to the screening window)

- Select the *Swap video streams* check box to change the display of the thermal and visual video streams.
- Select the *Mirror image horizontally* check box to mirror (flip) the image.
- Select the *Swap direction animations* check box to change the direction of the arrows that indicate that the person shall move closer or further back.

When all settings are completed, click *Close* in the bottom right corner of the page. This closes the *Settings* page.

5.10.2.2 General tab

When the *Log alarms to output folder* check box on the *Face detection* tab is selected, an image and a data file (*.csv) is automatically saved when an elevated skin temperature is detected. It is also possible to save images manually on the *Live* page.

Save dual snapshot separately

- When this check box is cleared, a combined thermal and visual image will be saved.
- When this 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.

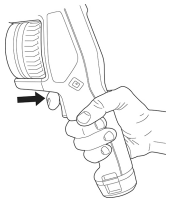
5.11 Ensure correct setup

- Make sure the camera is mounted in a low position.
- Make sure the camera lens is angled a bit upwards, so that it aims at the head of a person standing at the screening position.
- Make sure the backdrop is placed so that it fully covers the background that the camera sees.
- Make sure the screening position is clearly marked, e.g. by a floor sticker.
- For accurate temperature measurements, it is very important that the thermal camera focus is correct. To adjust the focus, do the following:

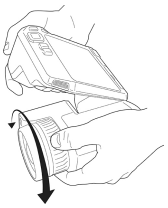
  1. Place a person at the screening position. Make sure the face of the person covers the face detection box.

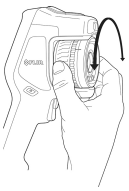
2. Adjust the focus on the face by using the focus controls on the *Live* page. You can also use the autofocus and/or manual focus functions in the camera.

Autofocus



Manual focus





3. Once the focus is correctly adjusted, make sure the focus is not changed.

6 Screening procedure — Operator instructions

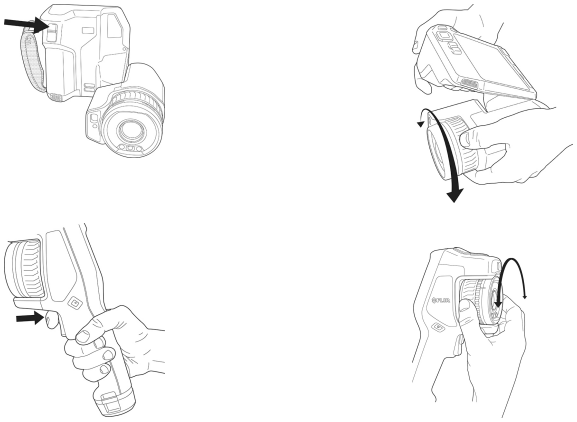
To prepare the system for a new screening session, do the following:

1. Start the FLIR Screen EST application.
2. Drag and drop the screening window to the external display. Click “Maximize” in the upper right corner of the window.
3. Turn on the camera, by pushing the on/off button ⏻.
4. In the *Discovery* pane in the FLIR Screen EST operator window, click the button to the right to connect to the camera.
5. Adjust the thermal camera focus, by doing the following:

   5.1. Place a person at the screening position. Make sure the face of the person covers the face detection box.

   5.2. Adjust the focus on the face by using the focus controls on the *Live* page. You can also use the autofocus and/or manual focus functions in the camera.

Autofocus **Manual focus**



   5.3. Once the focus is correctly adjusted, make sure the focus is not changed.

6. The thermal camera should be allowed to warm up for about 20 minutes before performing the screening. This will help ensure the best results.
7. To build up an accurate reference temperature data series, screen a healthy person first. Make sure this person represents normal people who will pass the screening (e. g. coming directly from outdoors, since this affects the skin temperature). This will create the average used by the system to detect if someone has an elevated skin temperature.

   The status indicator on the *Face detection* pane shows the number of registered samples. When the status indicator is green (OK), the system is ready for screening.

Note

- You can temporarily stop the screening by clearing the *Enable tracking* check box.
- To reset the average value, hover over the *Value* field to display the reset button and then click the button.

Website
http://www.flir.com

Customer support
http://support.flir.com

Disclaimer
Specifications subject to change without further notice. Models and accessories subject to regional market considerations. License procedures may apply. Products described herein may be subject to US Export Regulations. Please refer to exportquestions@flir.com with any questions.

Publ. No.: T810558
Release: AB
Commit: 67023
Head: 67023
Language: en-US
Modified: 2020-06-15
Formatted: 2020-06-15