DERMALOG THE BIOMETRICS INNOVATION LEADER

MADE IN GERMANY

**User Guide**

# DERMALOG Fever Detection Application for FLC1 Light Edition

**Version 1.2** **July 31, 2020**

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## Revision history

| Document Version | Software Version | Date | Author | Changes |
|---|---|---|---|---|
| 1.0 | 1.40.5 | 2020-07-30 | DERMALOG | Initial document |
| 1.1 | 1.40.5 | 2020-07-31 | DERMALOG | Minor changes |
| 1.2 | 1.40.5 | 2020-07-31 | DERMALOG | Minor changes |

Table 1: Revision history

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## Introduction

This user guide describes the installation, calibration and operation of the DERMALOG Fever Detection Application. The system is designed for the contactless measurement of a person's temperature at a distance of 0.5 m to 2 m. The forehead of the person is captured with a camera and the system identifies whether the person has fever. The system can be applied to passengers at national borders and airports, but also on exhibitions, in shops, in offices etc.

Fever is the major symptom of infections like COVID-19, called "coronavirus" (see Figure 1).

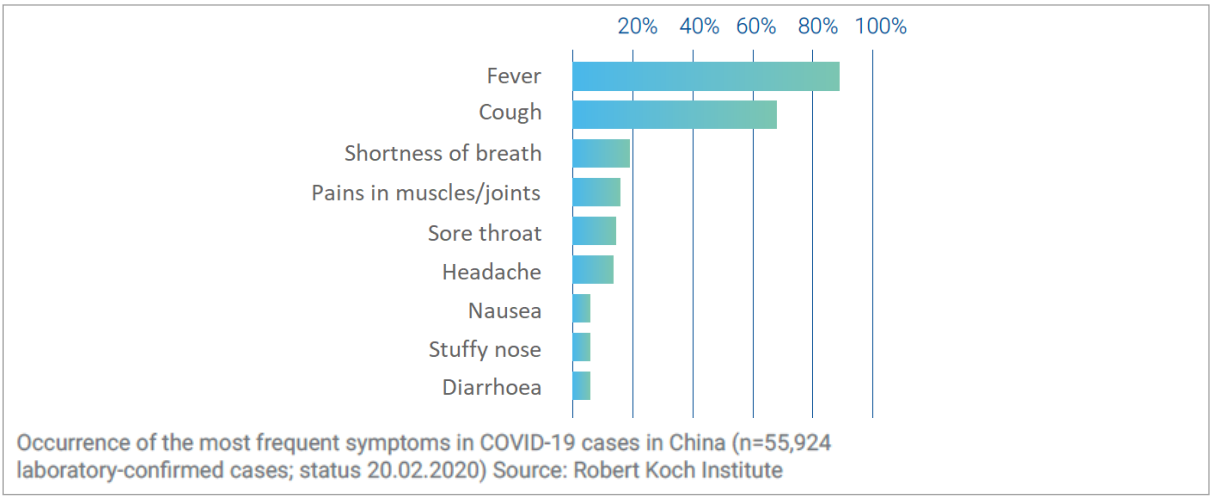



Figure 1: Fever as the major symptom of COVID-19

**The DERMALOG FLC1 Light Edition detects the temperature of a person in order to make a preselection. The temperature detection is no medical fever measurement. In suspected cases, a reference measurement with a medical thermometer is necessary.**

## Safety instructions

Before using the DERMALOG Fever Detection Application, read this user guide thoroughly. Use the application in an appropriate manner. Keep the user guide handy for future reference.

Only authorized and trained personnel is permitted to use the DERMALOG Fever Detection Application.

The system uses external devices listed in the chapter Hardware devices. For information on use and safety instructions, see the device manufacturer's documentation. For information on DERMALOG devices, see chapter 6.2.

## Hardware devices

Before you start the DERMALOG Fever Detection Application, make sure that the following device is connected to your computer:

- DERMALOG FLC1 Light Edition

For instructions for use and instructions on safety, see the *DERMALOG FLC1 Light Edition User Guide*.

# 1 Audience

This document is provided for the operator of the DERMALOG Fever Detection Application.

# 2 Document conventions

### TERMS AND DEFINITIONS

| Term | Definition |
|---|---|
| FLC1 Light Edition | DERMALOG's camera for contactless measurement of persons' temperatures |
| COVID-19 | Dangerous viral disease effecting people's lungs and airways, also known as "coronavirus" |
| SSD | Modern type of hard drive for computers ("solid-state drive") |
| HDMI port | Computer interface for the connection of HDMI cable (a standard common for computer monitors, cameras or television systems) |

Table 2: Terms and definitions

### TYPOGRAPHIC CONVENTIONS

| Typographic Convention | Used for |
|---|---|
| **bold** | Important text passages<br>In step-by-step instructions and their prerequisites: names of applications, products, chapters, GUI elements, tabs, screen sections and areas, keys, menu paths |
| *italic* | Directories, file names, values, document names, messages, email addresses and place holders in screen descriptions |
| *lowercase* | URLs and websites |

Table 3: Typographic conventions

### SYMBOLS AND ICONS

| Symbol / Icon | Meaning |
|---|---|
| ▶ | Introduces a system response |
| | Notes, usage tips, or additional information |
| | Indicates an important text passage |
| **NOTICE** | NOTICE is used to address practices to property damage (and not related to personal injury). |

Table 4: Symbols and icons

# 3 Overview

In today´s world of fast global travel, outbreaks of infectious diseases can cross national borders within the shortest time. The DERMALOG Fever Detection Application is designed for a fast and reliable fever check without disrupting passenger flow. The system is easy to use and detects persons with elevated temperature accurately.

The DERMALOG Fever Detection Application works with the DERMALOG FLC1 Light Edition. This is a dynamic real-time camera system using infrared thermal imaging for temperature measurement. For this purpose, the camera is fitted with a thermal sensor, an RGB sensor and two 3D sensors. As a result, the system displays on a screen the live image of the screened area with temperature displayed above the head of a person recognized. Temperatures are shown in colors, depending on the temperature range, so the operator can easily identify any critical cases.

Suitable places to install the system are border control posts or check-in processing posts, as travelers stop here, one by one, for a moment.

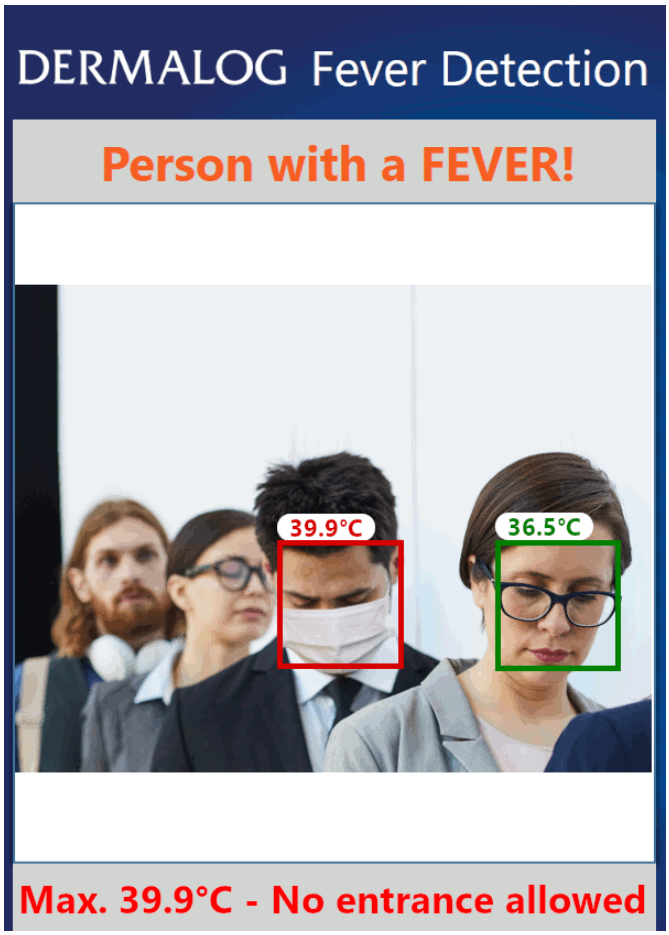



Figure 2: Fever Detection screen

# 4 Before you start

## 4.1 Installation process

### 4.1.1 Technical requirements

To run the DERMALOG Fever Detection Application, your computer must meet the following hardware minimum requirements:

- Processor Intel i5/ 8th generation with 4 cores
- At least 2.55 GHz clock speed
- At least 8 GB RAM
- At least 1 GB hard drive space (SSD recommended)
- USB 3.0 interface
- HDMI port for display
- Additional graphics card recommended

Also, the following software requirements must be met:

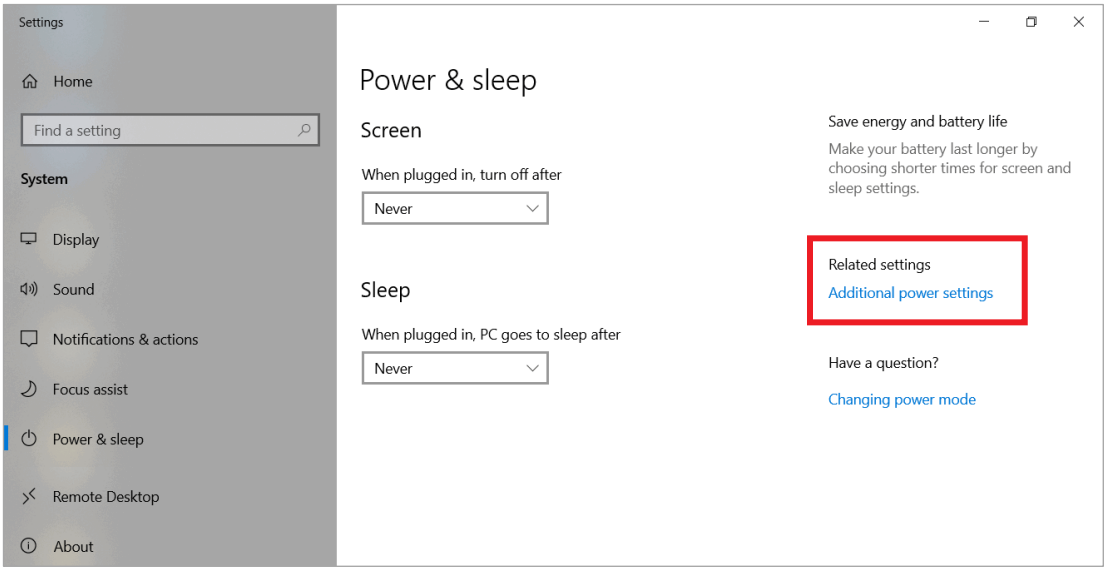
- Your computer is running the **Microsoft Windows 10** operating system.
- .Net Framework 4.7.2 is installed.

### 4.1.2 Adjust the power settings

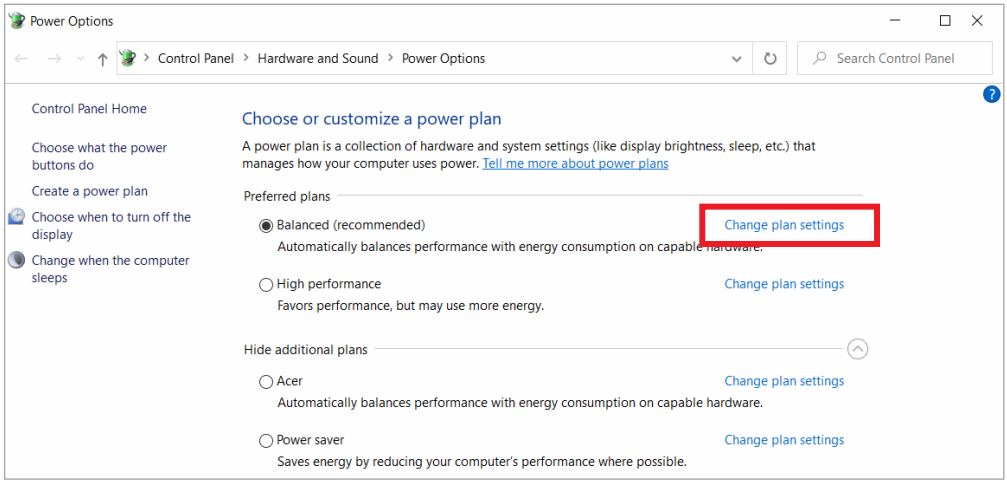
To run the DERMALOG Fever Detection Application, the power settings of your computer must be adjusted.

**START:**

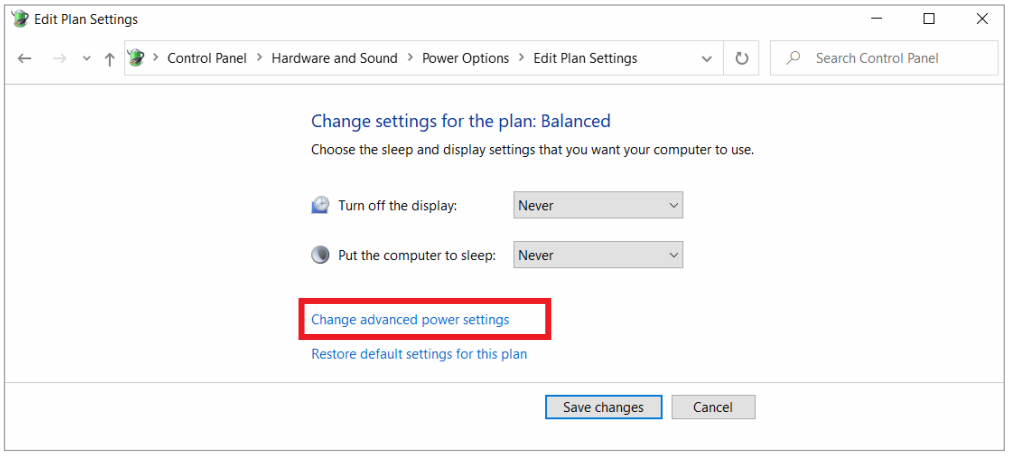
**STEP 1** Open the Windows settings and navigate to the **Power & sleep** section.



**STEP 2** In the **Related settings** area, click the **Additional power settings** link.




**STEP 3** On the **Power Options** window, click the **Change plan settings** link for the activated power plan.

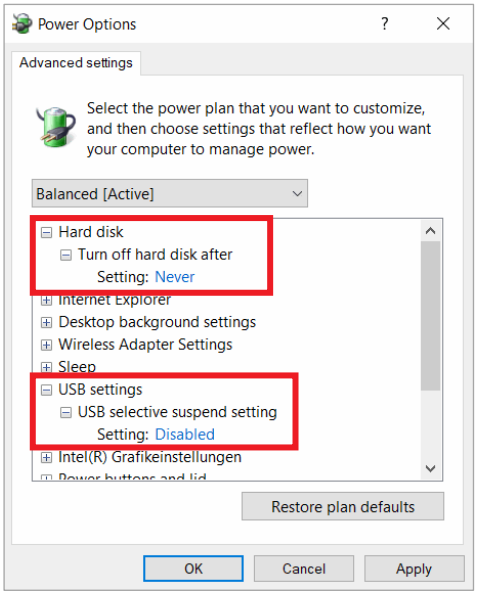



**STEP 4** On the **Edit Plan Settings** window, fill in the following:

**Turn off the display** – Select *Never* from the drop-down list.

**Put the computer to sleep** – Select *Never* from the drop-down list.

**STEP 5** Click the **Change advanced power settings** link.



**STEP 6** On the **Advanced settings** window, change the following settings:

**Hard disk** – Change the setting to *Never*.

**USB settings** – Change the setting to *Disabled*.

**STEP 7** Click the **Apply** button.

**STEP 8** Click **OK**.

**STEP 9** On the **Edit Plan Settings** window, click the **Save changes** button.

**FINISH: You have adjusted the power settings.**

### 4.1.3 Install the DERMALOG Fever Detection Application

**Prerequisites:**

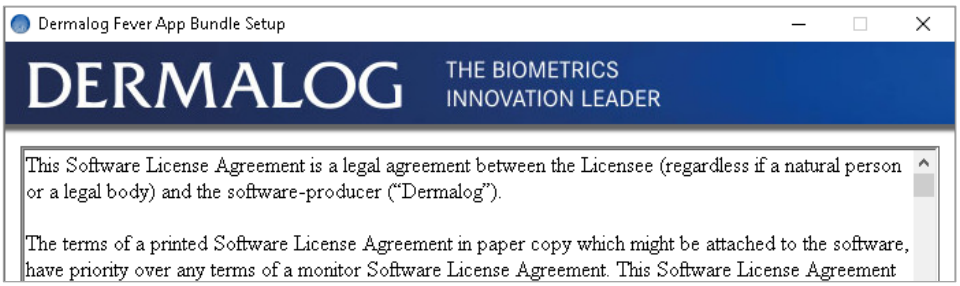
- Your computer meets the requirements stated in chapter 4.1.1.
- The DERMALOG FLC1 Light Edition is connected to your computer.
- You have administrator user rights.
- If an older version of DERMALOG Fever Detection Application is already installed, you must uninstall it (see chapter 4.1.4).

**START:**

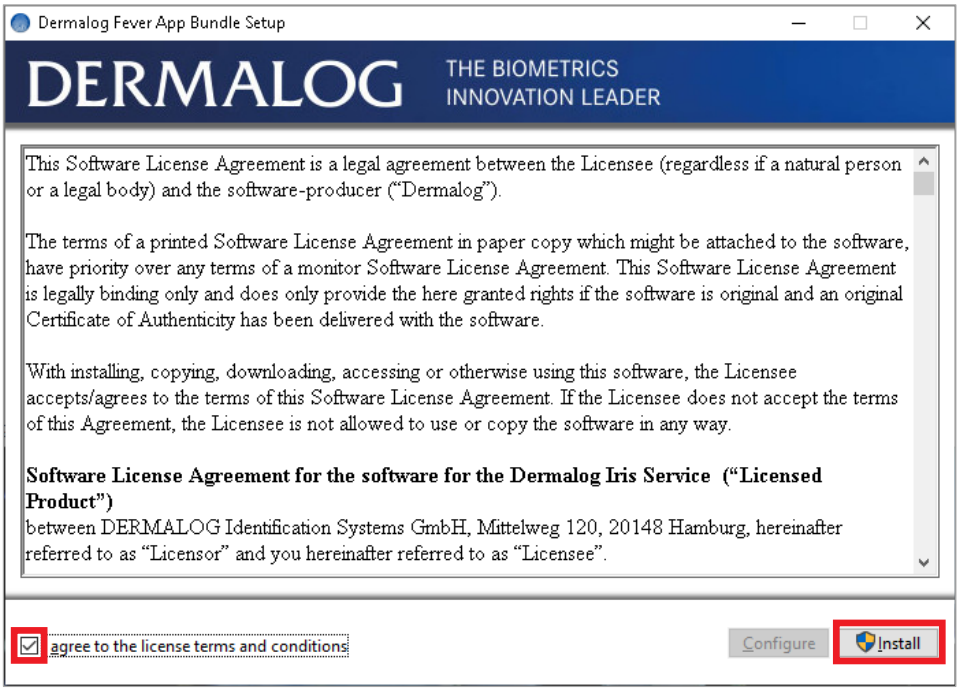
**STEP 1** Download the file *DermalogFeverAppInstaller.msi* from the DERMALOG Support Center at *https://support.dermalog.com* and save the file on your computer.

**STEP 2** Navigate to the position where you have saved the download and double-click the file.

▶ The **DERMALOG Fever App Bundle Setup** window is shown.

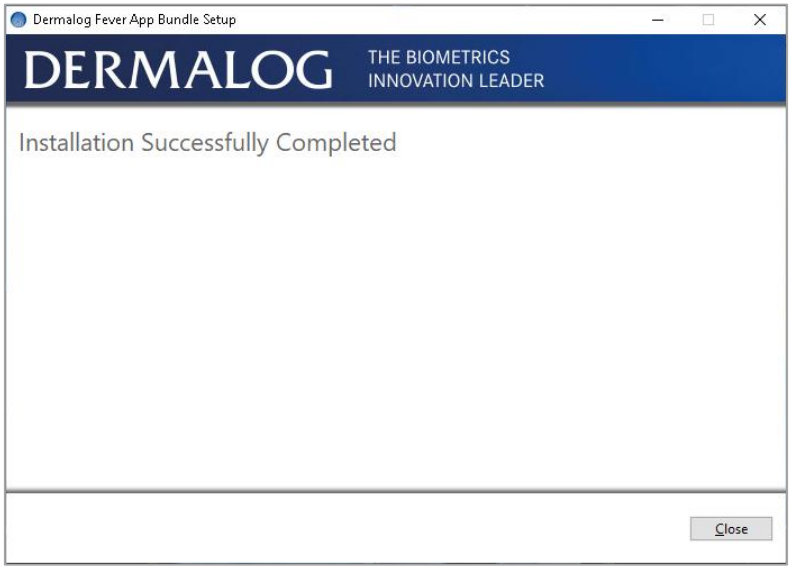



**STEP 3** Select the check box, click the **Install** button and click **Yes** in the confirmation dialog.



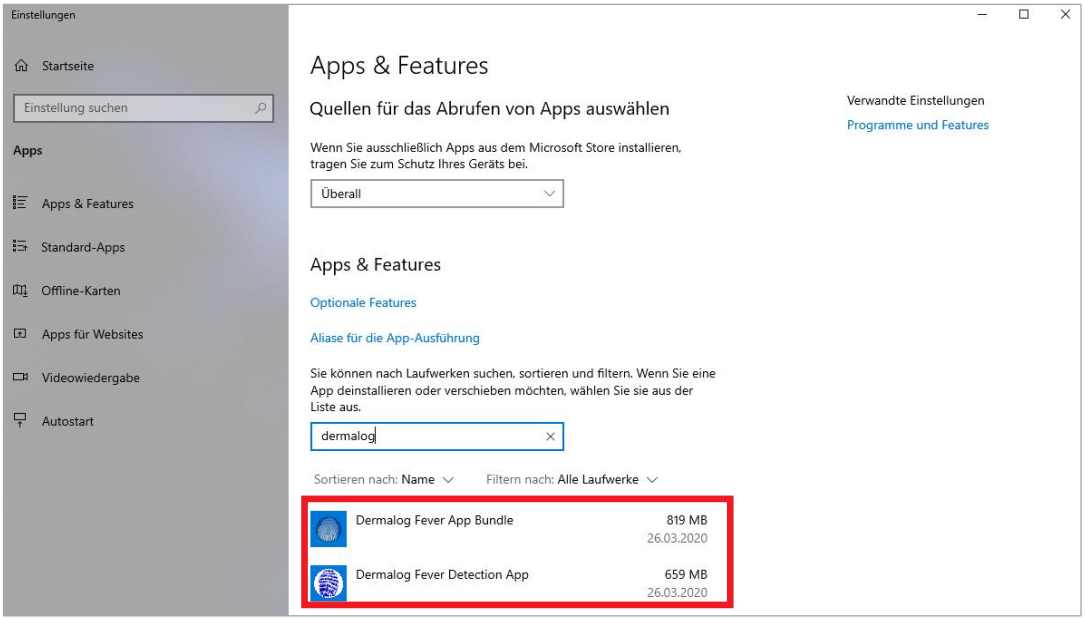

▶ The software is being installed.

- The application files are stored in the directory *C:\Program Files\DERMALOG\FeverDetectionApp*.
- A message shows the successful completion.




**STEP 4** Click **Close**.

**STEP 5** To ensure the application is installed, you can open the windows settings and search in the **Apps & Features** section for *Dermalog*. You shall find the **DERMALOG Fever Detection App** and the **DERMALOG Fever App Bundle** installed.




**FINISH:** **You have installed the DERMALOG Fever Detection Application.**

### 4.1.4 Uninstall the DERMALOG Fever Detection Application

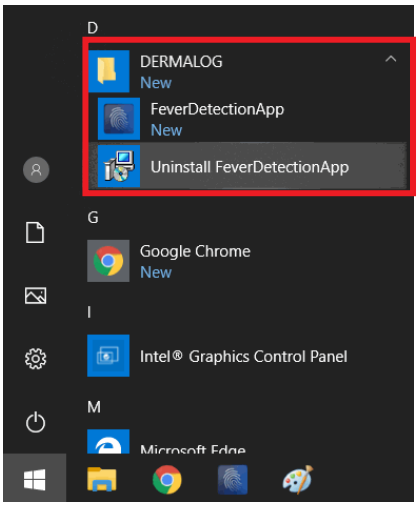
**Prerequisites:**

- The DERMALOG Fever Detection Application has been installed (see chapter 4.1.3).

**START:**

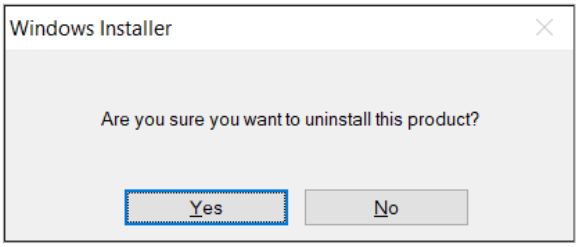
**STEP 1** On the **Windows** desktop, click the **Windows** symbol.

**STEP 2** On the **Windows** menu, search for the **DERMALOG** file.

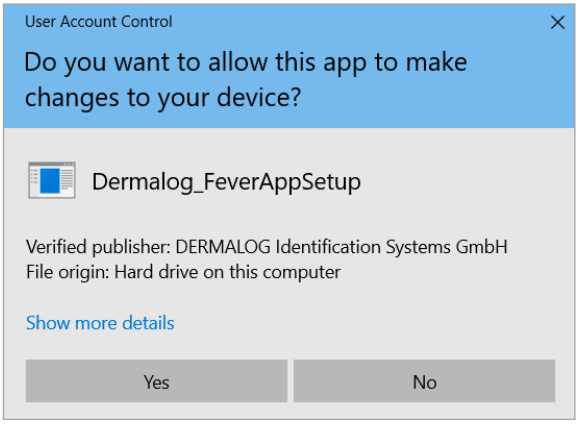



**STEP 3** In the **DERMALOG** file, click the **Uninstall FeverDetectionApp** link.

**STEP 4** On the **Windows Installer** dialog, click **Yes**.




**STEP 5** On the confirmation dialog, click **Yes**.




▶ The **DERMALOG Fever Detection Application** is being uninstalled.

The DERMALOG folder itself remains if the folder contains an individual logo.

In rare cases, you will be prompted to uninstall the application again during a reinstallation. This is no malfunction but it is required to perform a correct reinstallation.

**FINISH:** **You have uninstalled the DERMALOG Fever Detection Application.**

## 4.2 Best practices

Follow these recommendations to protect the DERMALOG FLC1 Light Edition and to obtain the best results for measuring the person's temperature.

### 4.2.1 Observe the operating conditions for the DERMALOG FLC1 Light Edition

***NOTICE***

Only use the DERMALOG FLC1 Light Edition indoors.

Place the DERMALOG FLC1 Light Edition on a suitable mount, e.g. a stable tripod.

Observe the recommended ambient conditions for the DERMALOG FLC1 Light Edition to operate:
10 °C to 30 °C (50°F to 86°F), humidity 20 – 75 % non-condensing

**Please note:**

To achieve the best possible results, it is recommended to operate the DERMALOG FLC1 Light Edition under the following conditions: 20 °C to 24 °C (68° F to 76 °F), humidity 20-50 %

Provide adequate space around the DERMALOG FLC1 Light Edition for operation and maintenance. Air circulation is required to cool the device. Do not restrict the air flow around the device.

Use the DERMALOG FLC1 Light Edition only in a dry environment.

Keep the working environment always clean and dust-free.

Do **NOT** expose the DERMALOG FLC1 Light Edition to:

- direct sunlight
- excessive dust, heat or humidity (for example, through water heater or humidifier)
- an atmosphere where ammonia gas or volatile or flammable chemicals are present (for example, alcohol, paint thinner)
- vibrations
- rapid temperature changes
- magnetic fields (for example, if placed near loudspeakers, televisions or radios)

### 4.2.2 Position person and device properly

**Do NOT point the DERMALOG FLC1 Light Edition at a heat source because this may lead to inaccurate measurements of the person's temperature. The person must also not directly be exposed to radiation from heat sources (e.g. from a heater in the room or a lamp placed directly above the person).**

**Make sure that light sources (e.g. windows) are NOT behind the person. Position the camera such that light sources are behind the camera to ensure frontal lighting.**

- The main source of light must be stable white light or daylight.
- The main source of light must be significantly stronger than light sources placed between the camera and the person.
- The background behind the person must be homogenous and must not move.
- The DERMALOG FLC1 Light Edition should be positioned at the person's eye level.
- The distance between the person and the DERMALOG FLC1 Light Edition is 1 m.
- The person views directly into the DERMALOG FLC1 Light Edition.

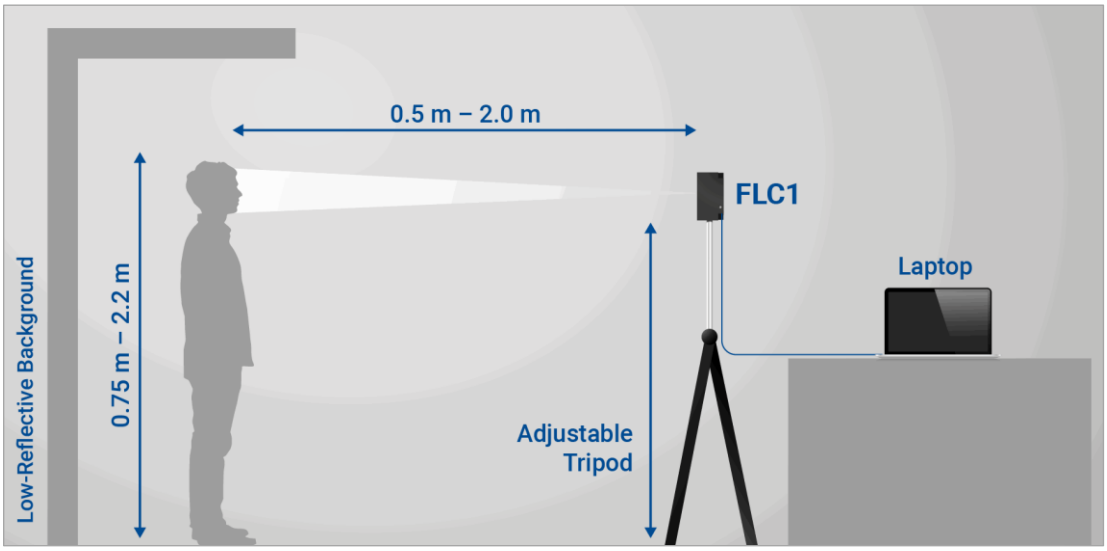



Figure 3: Recommended alignment of DERMALOG FLC1 Light Edition

### 4.2.3 Mind the person's individual conditions

#### 4.2.3.1 Allow sufficient free space on the forehead

Because the temperature is measured on the forehead, the forehead must not completely be covered by a cap, a veil, hair, or similar.

Figure 4: Minimum free area on the forehead

#### 4.2.3.2 Allow acclimation time if people come from colder or warmer areas

If a person's forehead was exposed to cold or heat before entering the room, an acclimatization time of at least 20 seconds should be elapsed before measuring the person's temperature. This applies, e.g., if the person comes from a cold outside temperature without having the forehead protected.

If a person is sweating, the sweat should be wiped off before temperature screening.

#### 4.2.3.3 Avoid too many persons in the screening area

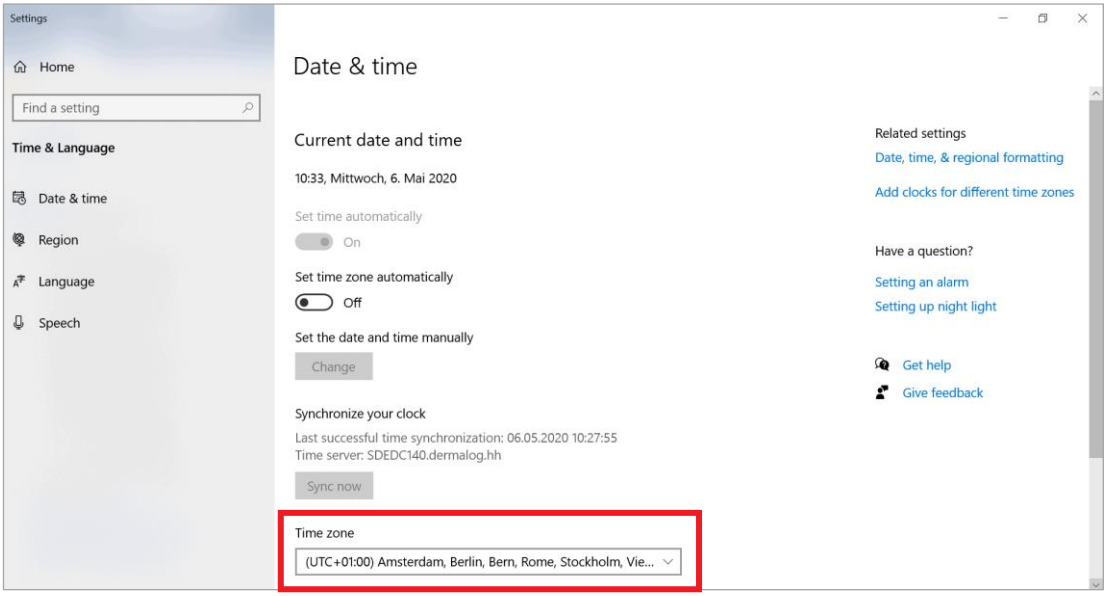
The system works reliable for up to 2 persons within the captured area at the same time. If this number is exceeded, people may pass through the area without being recognized by the camera.

## 4.3 Change the time zone of the operating system

The DERMALOG Fever Detection Application provides the option to define a camera operation time (see chapter 5.3.7). The camera operation time only works correctly if the time setting of the operating system on the computer matches the time zone of your country. This chapter shows how to correct the time zone of the operating system.

**START:**

**STEP 1** Open the Windows settings and navigate to the **Date & time** section.




**STEP 2** On the **Time zone** drop-down list, select the appropriate time zone.

**STEP 3** On the upper right corner of the window, click the cross to close the windows settings.

**FINISH:** **You have changed the time zone of the operating system.**

## 4.4 Change the logo

This chapter shows you how to change the logo shown on the graphical user interface.

**Prerequisites:**

- The logo image file format is PNG (.png), JPEG (.jpg) or BMP (.bmp).
- The DERMALOG Fever Detection Application has been installed (see chapter 4.1.3).
- The DERMALOG Fever Detection Application is closed.
- You have administrator user rights.

**START:**

**STEP 1** Open the path: **C:\Program Files\DERMALOG\FeverDetectionApp**

**STEP 2** In the directory, create a folder named **Logo**.

**OPTIONS**

- To change the path where the logo is searched, open the file *FeverDetectionApp.exe.config* and enter the path as highlighted in red below. Save the file.

```
<?xml version="1.0" encoding="utf-8"?>
<configuration>
  <applicationSettings>
    <Dermalog.FeverDetectionApp.Properties.Settings>
      <setting name="LogoDirectory" serializeAs="String">
        <value>.\Logo</value>
      </setting>
    </Dermalog.FeverDetectionApp.Properties.Settings>
  </applicationSettings>
</configuration>
```

**STEP 3** If you want to add a logo for both orientations of the screen (horizontal and vertical): "

- Rename the logo image file to: *logo.png, logo.jpg* or *logo.bmp*
- Copy the logo image file into the folder **Logo**.

**STEP 4** If you want to add a logo for the vertical orientation of the screen:

- Rename the logo image file to: *vertical_logo.png, vertical_logo.jpg* or *vertical_logo.bmp*
- Copy the logo image file into the folder **Logo**.

**STEP 5** If you want to add a logo for the horizontal orientation of the screen:

- Rename the logo image file to: *horizontal_logo.png, horizontal_logo.jpg* or *horizontal_logo.bmp*
- Copy the logo image file into the folder **Logo**.

If there is at least one logo for a specific orientation available, the logo for both orientations will be ignored.

**STEP 6** Start the **DERMALOG Fever Detection Application**.

▶ The logo has been implemented in the graphical user interface.

**FINISH:** **You have changed the logo.**

## 4.5 Change the user interface language

As a default setting, the DERMALOG Fever Detection Application is shown in the system language of the operating system on the computer. This chapter shows how to change the user interface language.

If no translation is available in the system language of the operating system, the DERMALOG Fever Detection Application is shown in American English (en-US) as default.

**Prerequisites:**

- The DERMALOG FLC1 Light Edition is connected to your computer.
- The DERMALOG Fever Detection Application has been installed (see chapter 4.1.3).
- You have selected the correct system language for the operating system on the computer.
- The **Fever Detection** screen is shown.

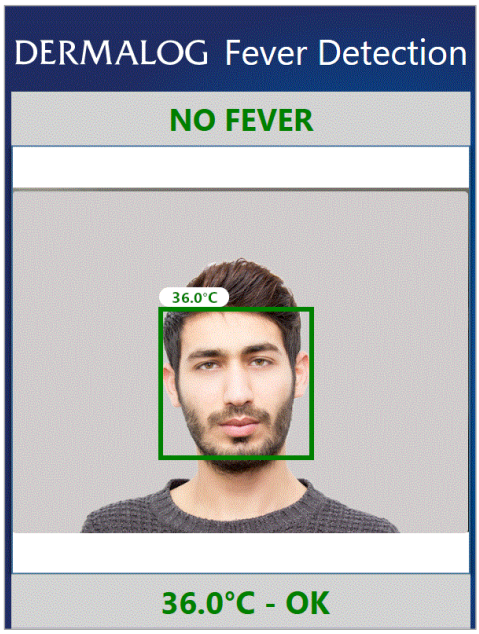



Figure 5: Fever Detection screen – 1 person shown (example)

**START:**

**STEP 1** On the keyboard press **Ctrl** + **C** simultaneously.

▶ The **Settings window** is shown.

**STEP 2** On the **Settings window**, open the **Application Settings** tab.

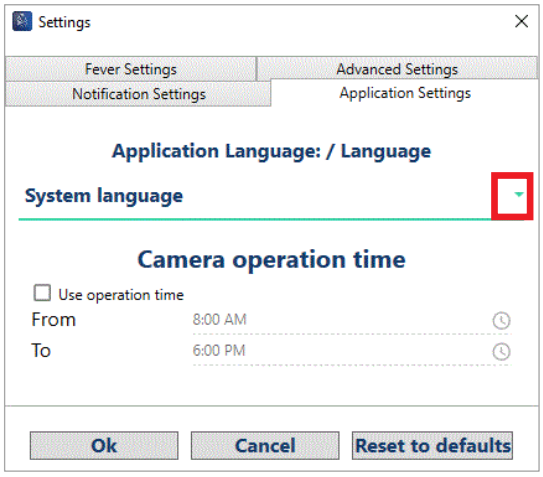



Figure 6: Application Settings tab – Opening System Language drop-down list

**STEP 3** In the **Application Language** section, open the **System Language** drop-down list.

**STEP 4** Select a language from the drop-down-list.

**OPTIONS**

- To reset all parameters in the **Settings window** to default values, click the **Reset to defaults** button. This also resets the **System Language**. The application is restarted. The **Warm up** screen is shown (see chapter 5.1).

**STEP 5** To save the setting, click **Ok**.

The application must be restarted to apply the change of language.

**STEP 6** On the confirmation dialog, click **Yes**.

- ▶ The **DERMALOG Fever Detection Application** is restarted.
- ▶ The **Warm up** screen is shown.

**FINISH: You have changed the user interface language.**

## 4.6 Prepare configuration file to receive images via DERMALOG Notification Service

If you want to receive images (e.g. facial images) via the DERMALOG Notification Service, you need to change the configuration file as shown in this chapter.

**Prerequisites:**

- The DERMALOG Fever Detection Application has been installed (see chapter 4.1.3).
- The DERMALOG Fever Detection Application is closed.
- You have administrator user rights.

**START:**

**STEP 1** Open the path: **C:\Program Files\DERMALOG\FeverDetectionApp**

**STEP 2** Open the file *FeverDetectionApp.exe.config*.

**STEP 3** Change the entry with the name *ImageServiceBaseAddress* as shown in red below.

```
<applicationSettings>
    <Dermalog.FeverDetectionApp.Properties.Settings>
      <setting name="ImageServiceBaseAddress" serializeAs="String">
        <value>http://localhost:6020</value>
      </setting>
```

**STEP 4** Save the file.

**STEP 5** Restart the computer.

**STEP 6** Start the **DERMALOG Fever Detection Application**.

**FINISH:** **You have prepared the configuration file to receive images via the DERMALOG Notification Service.**

# 5 How do I ...?

## 5.1 Warm up the DERMALOG FLC1 Light Edition

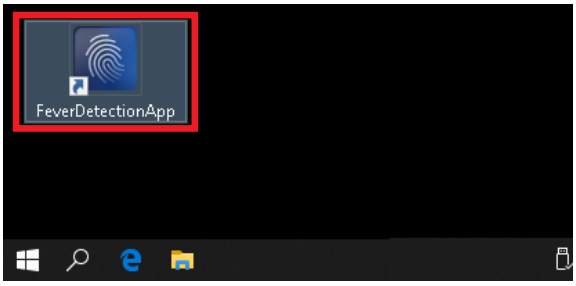
**The DERMALOG FLC1 Light Edition must always be warmed up before use. The warming up is required to obtain reliable measuring results.**

**Prerequisites:**

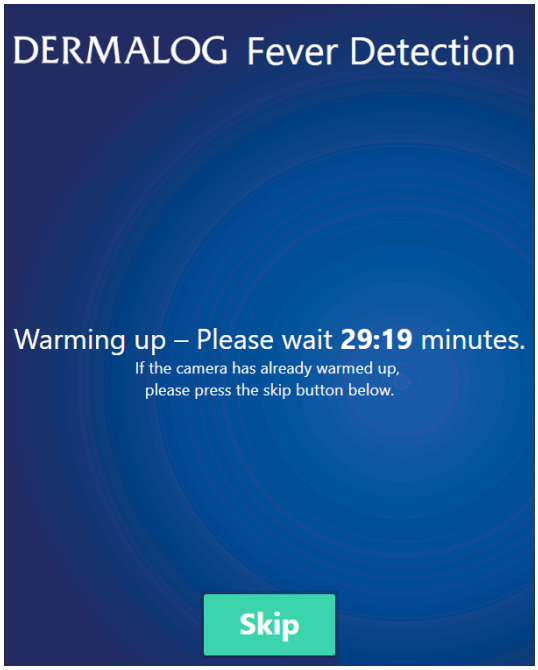
- The DERMALOG FLC1 Light Edition is connected to your computer.
- The DERMALOG Fever Detection Application has been installed (see chapter 4.1.3).

**START:**

**STEP 1** On the Windows Desktop, click the **DERMALOG Fever Detection App** icon.




- The **DERMALOG Fever Detection Application** starts.
- The **DERMALOG FLC1 Light Edition** starts.
- A message is shown.

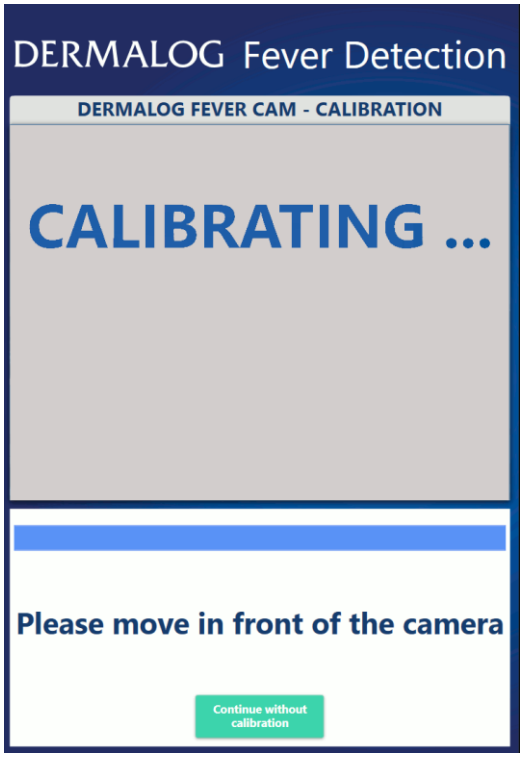



**STEP 2** Wait until the time shown on the screen has elapsed.

**If the warm up-process is skipped prematurely, the camera may not work properly. The waiting time is required to obtain reliable measuring results.**

The **DERMALOG Fever Detection Application** starts in full screen mode. To change to window mode, press the **F11** key on the keyboard. The application is displayed in an upright window in front of the desktop. To reactivate the full screen mode, press the **F11** again.

- The **DERMALOG FLC1 Light Edition** is warmed up.
- The **Calibration** screen for automatic calibration is shown.




**FINISH:** **You have warmed up the DERMALOG FLC1 Light Edition.**

## 5.2 Calibrate the DERMALOG FLC1 Light Edition

This chapter shows you how to calibrate the DERMALOG FLC1 Light Edition. Calibration is required:

- After the warm up phase has been completed or skipped
- Whenever the ambient temperature changes by more than 2 degrees

There are 2 different calibration modes:

- *Automatic one-time calibration with a person*: This calibration mode is preconfigured and it is generally used.
- *Manual calibration with a thermometer*: The manual calibration process uses a medical forehead thermometer to measure a reference temperature. The manual calibration overrules the automatic calibration modes.

To change the calibration mode, see chapter 5.3.1.

The standard calibration process starts automatically after the warm up phase of the application, see chapter 5.2.1.

For the manual calibration with a medical forehead thermometer, see chapter 5.2.2.

**The position of the DERMALOG FLC1 Light Edition must not be changed after the calibration. If the position of the DERMALOG FLC1 Light Edition is changed, restart the application to start a new calibration process.**

**The test persons must not wear a mask during the calibration process.**

### 5.2.1 Standard calibration

To change the calibration mode, see chapter 5.3.1.

**Prerequisites:**

- The DERMALOG FLC1 Light Edition is connected to your computer.
- The DERMALOG Fever Detection Application has been installed (see chapter 4.1.3).
- The DERMALOG FLC1 Light Edition has been warmed up (see chapter 5.1).
- The **Calibration** screen is shown.
- 1 test person with normal temperature is available (no fever!).

Figure 7: Calibration screen – message at bottom of screen

**Only if you want to perform a manual calibration, click the *Continue without calibration* button and continue with chapter 5.2.2. Otherwise, you must perform the automatic calibration in chapter 5.2.1 to obtain reliable measuring results.**

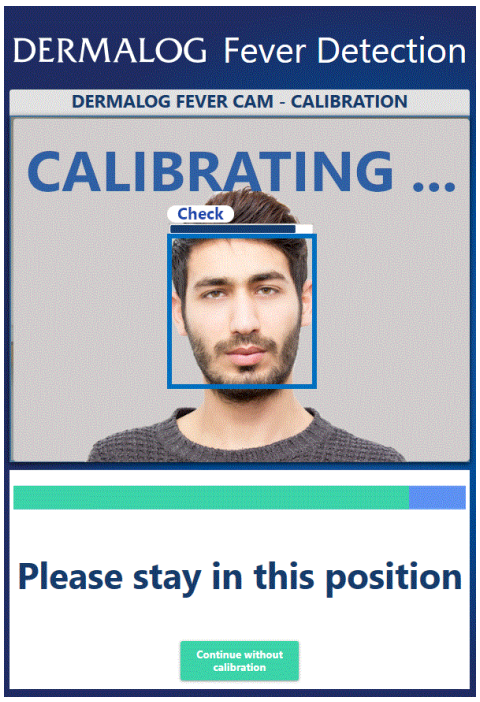
**START:**

**Only 1 person must be in the camera's view during the calibration process.**

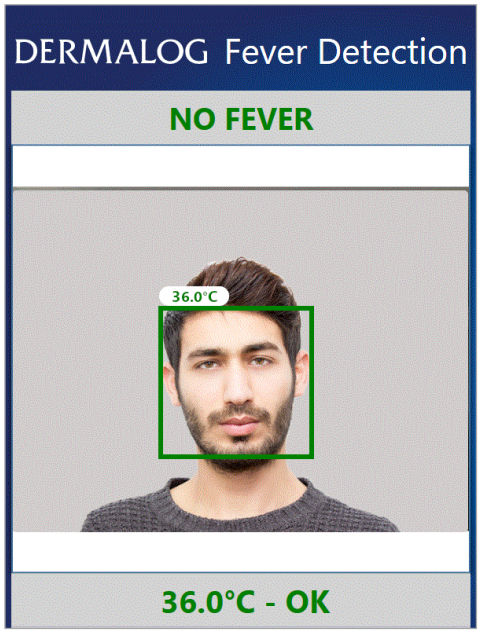
**To place the test person correctly in front of the DERMALOG FLC1 Light Edition, follow the recommendations in chapter 4.2.**

**Body and face must not be moved. The test person must keep the position till the calibration is finished.**

**STEP 1** Place the test person in front of the DERMALOG FLC1 Light Edition at a distance of 1 m. The person's face must be shown in the middle of the camera's view.




- The progress bar above the head indicates the calibration status for the test person.
- The progress bar below the live picture indicates the general calibration status.
- When the calibration has finished, the message *Calibration successful* is shown.
- The **Fever Detection** screen is shown.
- The test person is shown with a temperature indication.




If, despite the calibration, the measured temperatures are generally too high or too low press **Ctrl** + **R** simultaneously on the keyboard to reset the DERMALOG Fever Detection Application. Restart the calibration with **Step 1**.

**FINISH:** **You have performed an automatic calibration.**

### 5.2.2 Perform a manual calibration using a medical forehead thermometer

**Prerequisites:**

- The DERMALOG FLC1 Light Edition is connected to your computer.
- The DERMALOG Fever Detection Application has been installed (see chapter 4.1.3).
- The DERMALOG FLC1 Light Edition has been warmed up (see chapter 5.1).
- The **Calibration** screen is shown.
- A test person with normal temperature is available (no fever!).
- A medical forehead thermometer is available. (The thermometer can be purchased in any pharmacy).

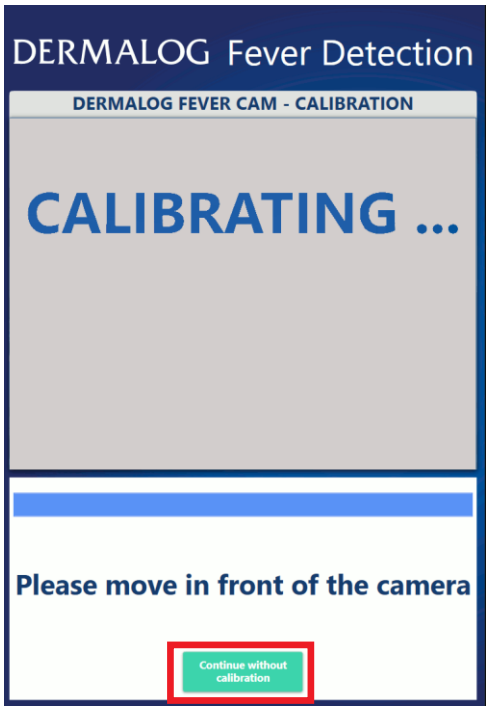



Figure 8: Calibration screen

**START:**

**STEP 1** On the **Calibration** screen, click the **Continue without calibration** button.

- ▶ The automatic calibration is skipped.
- ▶ The **Fever Detection** screen is shown.

**STEP 2** Measure the temperature of the test person from the forehead using the medical forehead thermometer. Take 5 temperature readings of the medical forehead thermometer and calculate the average.

**STEP 3** Place the test person in front of the **DERMALOG FLC1 Light Edition** at a distance of 1 m.

**To place the test person correctly in front of the DERMALOG FLC1 Light Edition, follow the recommendations in chapter 4.2.**

**In addition, please note:**

- **During the calibration, the test person must view directly into the DERMALOG FLC1 Light Edition.**
- **Body and face must not be moved.**
- **Keep the position till the calibration is finished.**

**STEP 4** On the keyboard, press **Ctrl** + **C** simultaneously.

▶ The **Fever Settings** tab is shown.

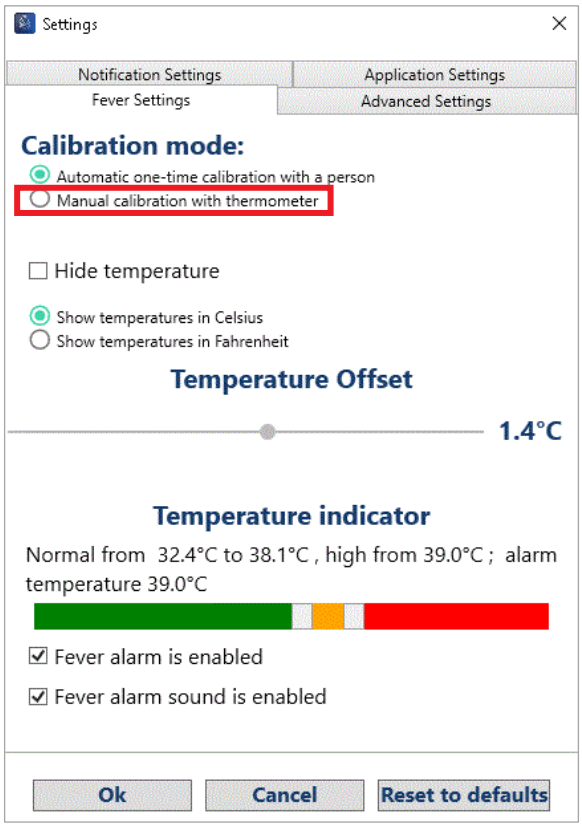



Figure 9: Fever Settings tab – Manual setting framed in red

**STEP 5** **Calibration mode** – Select *Manual calibration with thermometer*.

▶ The **Temperature Offset** slider is enabled.

**STEP 6** Select the **Hide temperature** check box.

▶ The measured temperature is shown.

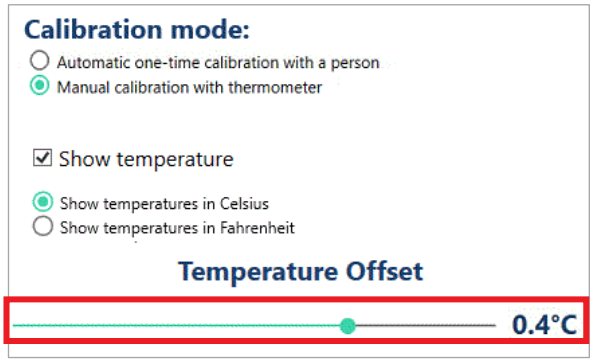



Figure 10: Fever Settings tab excerpt – Temperature Offset slider framed in red

**STEP 7** Drag the **Temperature Offset** slider with the mouse to the left or to the right until the shown value above the head of the test person corresponds to the temperature measured in **Step 2**.

**OPTIONS:**

- To change the value in small steps, click to the right or left of the slider. The slider moves 0.1°C in the selected direction.

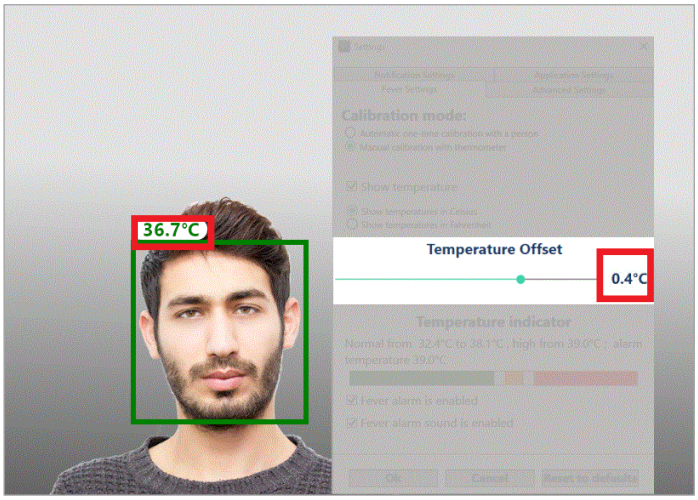



Figure 11: Fever Settings tab – Temperature Offset and displayed value framed in red

**STEP 8** To save the setting, click **OK**.

▶ The **Fever Detection** screen is shown.

**FINISH:** **You have performed a manual calibration using a medical forehead thermometer.**

## 5.3 Configure parameters

The DERMALOG Fever Detection Application has preconfigured parameters which can be changed in the Settings window. The parameters can be configured on 4 tabs:

**Fever Settings**

- Calibration mode — see chapter 5.3.1
- Show temperature — see chapter 5.3.2
- Unit for temperature — see chapter 5.3.3
- Colors for the temperature indicator — see chapter 5.3.4
- Display of the Health counter screen — see chapter 5.3.5
- Fever alarm sound — see chapter 5.3.6

**Advanced Settings**

- Face tracking — see chapter 5.3.7
- Face gamma correction — see chapter 6.2
- Distance compensation — see chapter 6.3
- Diminish temperature fluctuations — see chapter 6.4

**Application Settings**

- Change the user interface language — see chapter 4.5
- Camera operation time — see chapter 5.3.8

**Notification Settings**

- Configure DERMALOG Notification Service settings — see chapter 5.3.9

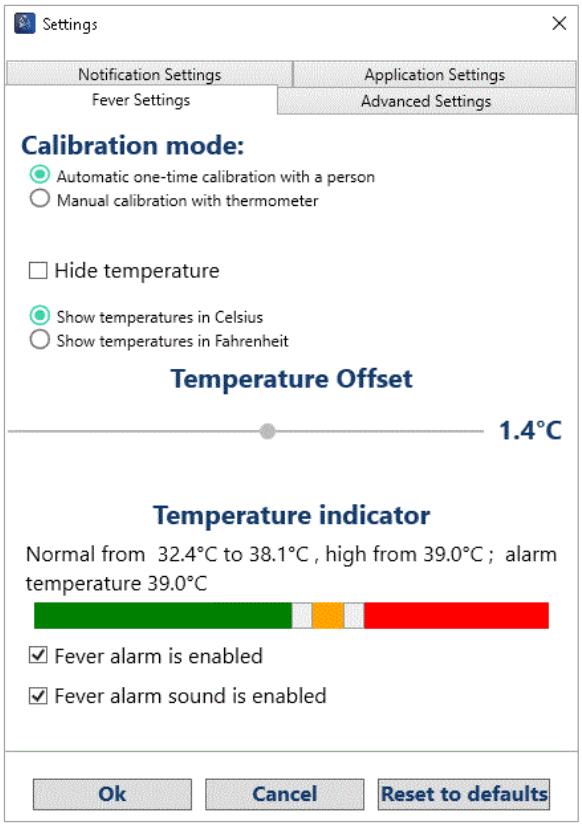



Figure 12: Settings window – Fever Settings tab

### 5.3.1 Configure the calibration mode

The DERMALOG Fever Detection Application must be calibrated before use. You can choose between the following calibration modes:

- Automatic one-time calibration with a person (recommended and preconfigured, see chapter 5.2.1)
- Manual calibration with a thermometer (see chapter 5.2.2)

This setting can be changed on the **Fever Settings** tab of the **Settings** window.

**Prerequisites:**

- The DERMALOG FLC1 Light Edition is connected to your computer.
- The DERMALOG Fever Detection Application has been installed (see chapter 4.1.3).
- The **Fever Detection** screen is shown.

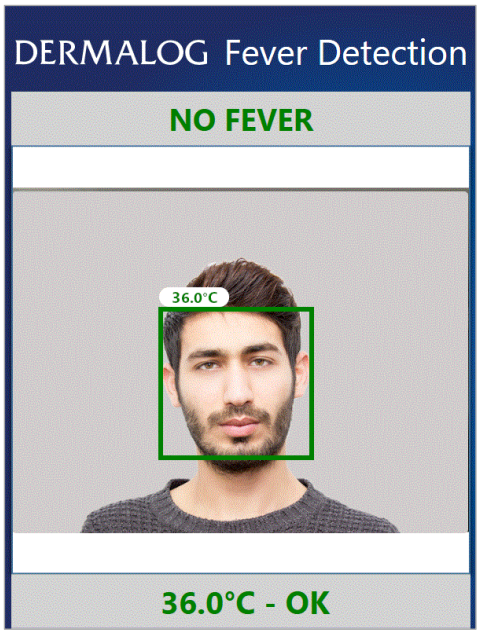



Figure 13: Fever Detection screen – 1 test person is shown (example)

You can press **Ctrl + C** to open the **Settings** window. Whilst the **Settings** window is open, no fever warning message will be shown.

**START:**

**STEP 1** On the keyboard, press **Ctrl** + **C** simultaneously.

▶ The **Fever Settings** tab is shown.

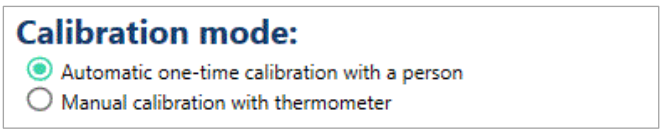



Figure 14: Fever Settings tab excerpt – Calibration mode section

**STEP 2** In the **Calibration mode** section, select one of the following options:

**Automatic one-time calibration with a person** – This option is preconfigured and recommended. The application is initially calibrated only once.

**Manual calibration with thermometer** – Select this option if you want to do a manual calibration as described in chapter 5.2.2.

**OPTIONS**

- To reset all parameters in the **Settings** window to default values, click the **Reset to defaults** button. This also resets the **Calibration mode** to *Automatic one-time calibration with a person*. The application is restarted. The **Calibration** screen is shown (continue with chapter 5.2).

**STEP 3** To save the setting, click **Ok**.

▶ The **Fever Detection** screen is shown.

If you change the calibration mode from manual calibration to automatic calibration, the application restarts. The **Calibration** screen is shown. Continue with chapter 5.2.1.

**FINISH: You have configured the calibration mode.**

### 5.3.2 Show temperature

The DERMALOG Fever Detection Application system is preconfigured with a temperature indicated by the words *Ok* and *Fever* shown above the head of the person. This chapter shows how to hide or show the temperature indication.

This setting can be changed on the **Fever Settings** tab of the **Settings** window.

**Prerequisites:**

- The DERMALOG FLC1 Light Edition is connected to your computer.
- The DERMALOG Fever Detection Application has been installed (see chapter 4.1.3).
- The **Fever Detection** screen is shown.

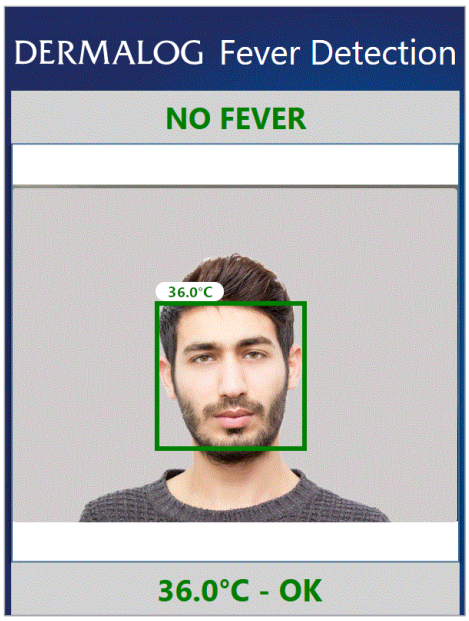


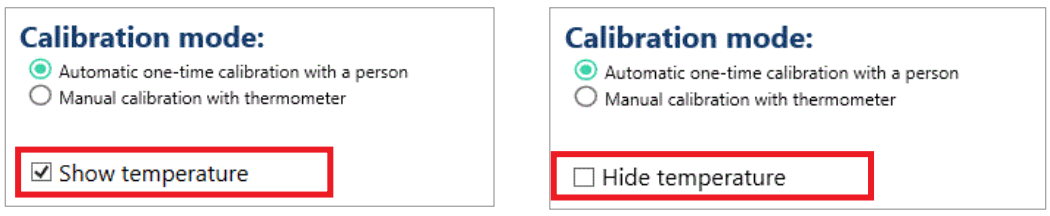

Figure 15: Fever Detection screen – 1 test person shown (example)

You can press **Ctrl + C** to open the **Settings** window. Whilst the **Settings** window is open, no fever warning message will be shown.

**START:**

**STEP 1** On the keyboard, press **Ctrl** + **C** simultaneously.

▶ The **Fever Settings** tab is shown.




**Temperature will be shown** **Temperature will not be shown**

Figure 16: Fever Settings tab excerpt – Configure temperature indication

**STEP 2** Configure the temperature indication according to Figure 16.

- If the check box is selected, the temperature will be shown above the person's head (see Figure 17).
- If the check box is blank, the status is indicated by the words *OK* or *Fever* (see Figure 18).

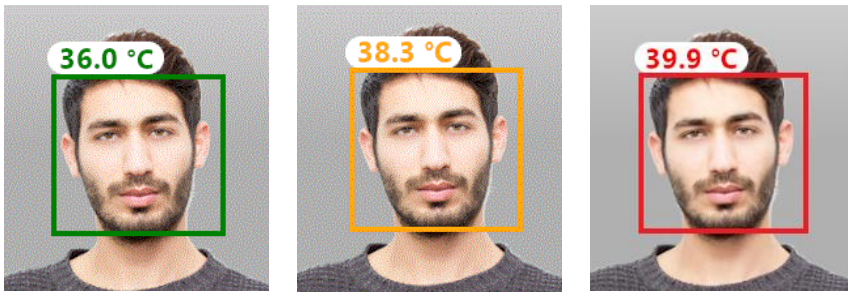



Figure 17: Temperature is shown

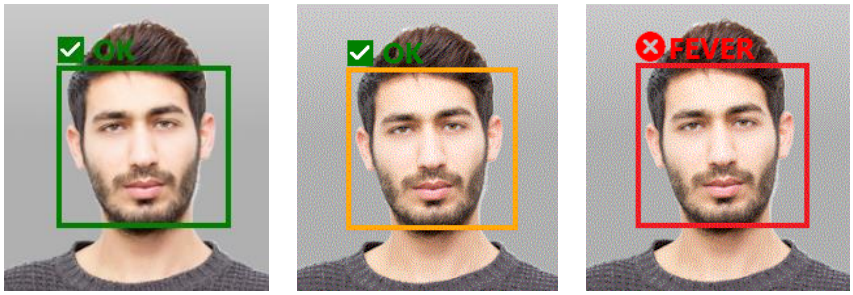



Figure 18: Temperature is hidden

**OPTIONS**

- To reset all parameters in the **Settings** window to default values, click the **Reset to defaults** button. This also resets the temperature indication to not shown temperature.

**STEP 3** To save the setting, click **Ok**.

- The **Fever Detection** screen is shown.

**FINISH:** **You have configured the temperature indication.**

### 5.3.3 Configure the unit for temperatures

Temperatures can be displayed in Celsius (°C) or Fahrenheit (F). This chapter shows how to change the unit.

This setting can be changed on the **Fever Settings** tab of the **Settings** window.

**Prerequisites:**

- The DERMALOG FLC1 Light Edition is connected to your computer.
- The DERMALOG Fever Detection Application has been installed (see chapter 4.1.3).
- The **Fever Detection** screen is shown.

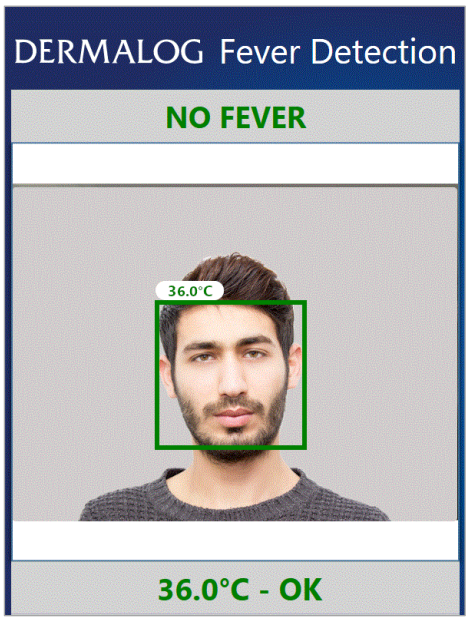



Figure 19: Fever Detection screen – 1 test person shown (example)

You can press **Ctrl + C** to open the **Settings** window. Whilst the **Settings** window is open, no fever warning message will be shown.

**START:**

**STEP 1** On the keyboard, press **Ctrl** + **C** simultaneously.

▶ The **Fever Settings** tab is shown.

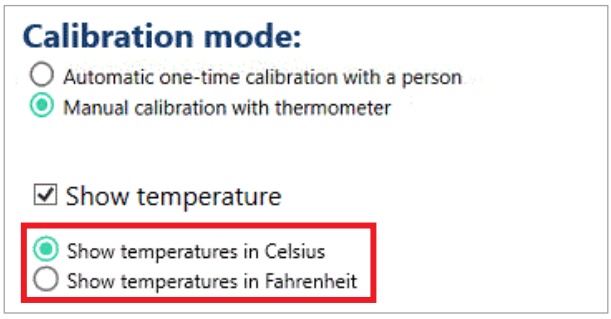



Figure 20: Fever Settings tab excerpt – Temperature unit selection framed in red

**STEP 2** Select the unit for displaying the temperatures.

**OPTIONS**

- To reset all parameters in the **Settings** window to default values, click the **Reset to defaults** button. This also resets the temperature unit to *Show temperature in Celsius*.

**STEP 3** To save the setting, click **Ok**.

▶ The **Fever Detection** screen is shown.

**FINISH: You have configured the unit for temperatures.**

### 5.3.4 Configure the colors of the temperature indicator

The temperature of persons can be shown in 3 colors. Each color includes a specific temperature range:

- green: normal temperature
- yellow: slightly elevated temperature
- red: fever

This chapter shows you how to configure the thresholds for the colors of the temperature indicator.

This setting can be changed on the **Fever Settings** tab of the **Settings** window.

**Prerequisites:**

- The DERMALOG FLC1 Light Edition is connected to your computer.
- The DERMALOG Fever Detection Application has been installed (see chapter 4.1.3).
- The **Fever Detection** screen is shown.

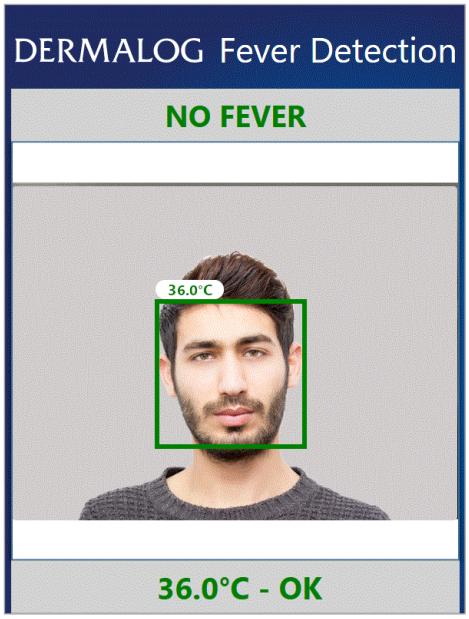



Figure 21: Fever Detection screen – 1 test person shown (example)

You can press **Ctrl + C** to open the **Settings** window. Whilst the **Settings** window is open, no fever warning message will be shown.

**START:**

**STEP 1** On the keyboard, press **Ctrl + C** simultaneously.

- The **Fever Settings** tab is shown.

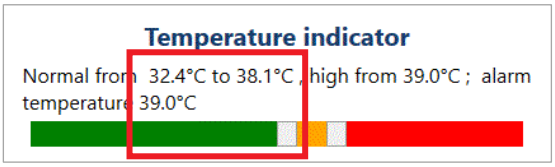



Figure 22: Fever Settings tab excerpt – Left slider and color threshold framed in red

**STEP 2** In the **Temperature indicator** section, move the white slider next to the green band to set the threshold for normal temperature.

- The **To** value shows the adjusted color threshold.
- The temperature range for normal temperature is indicated in green.

**STEP 3** Move the white slider next to the red band to set the threshold for high fever.

- The **High from** value shows the adjusted color threshold.
- The temperature range for high fever is indicated in red.

The value for the alarm temperature is identical to the set value for high fever.

The space between the green and red temperature ranges will be shown in yellow. The yellow temperature range depends on the set values for the green and red temperature ranges.

Temperatures below 35°C are not measured and will be shown as approximately 35°C – if the option *Show temperature* has been enabled (see chapter 5.3.2).

**OPTIONS**

- To reduce the color ranges to two, push the sliders together until the yellow temperature range disappears.
- To reset all parameters in the **Settings window** to default values, click the **Reset to defaults** button. This also resets the color setting to *Normal from 32.4 °C to 38.1 °C, high from 39.0 °C; alarm temperature 39.0 °C*.

**STEP 4** To save the setting, click **Ok**.

- The **Fever Detection** screen is shown.

**FINISH:** **You have configured the color of the temperature indicator.**

### 5.3.5 Configure the fever alarm setting

The DERMALOG Fever Detection Application is preconfigured with a Health counter screen. If a person with fever is detected, the Health counter screen is shown. This chapter shows you how to enable or disable the Health counter screen.

Figure 23: Health counter screen

This setting can be changed on the **Fever Settings** tab of the **Settings** window.

**Prerequisites:**

- The DERMALOG FLC1 Light Edition is connected to your computer.
- The DERMALOG Fever Detection Application has been installed (see chapter 4.1.3).
- The **Fever Detection** screen is shown.

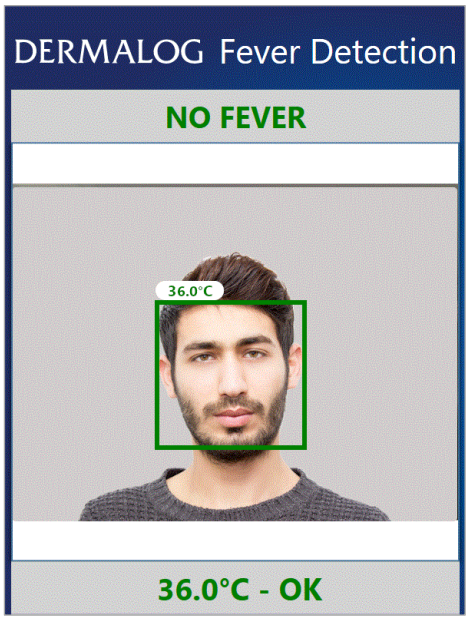


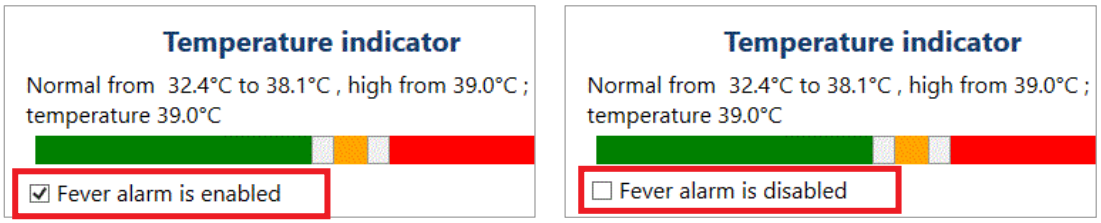

Figure 24: Fever Detection screen – One person shown (example)

You can press **Ctrl + C** to open the **Settings** window. Whilst the **Settings** window is open, no fever warning message will be shown.

**START:**

**STEP 1** On the keyboard, press **Ctrl** + **C** simultaneously.

▶ The **Settings** window is shown.




**Health Counter screen is enabled** **Health Counter screen is disabled**

Figure 25: Configure fever alarm setting

**STEP 2** Configure the fever alarm setting according to Figure 25.

▶ If the check box is selected, the **Health Counter** screen will be shown.

▶ If the check box is blank, the **Health Counter** screen will not be shown.

**OPTIONS**

- To reset all changed parameters in the **Settings** window to default values, click the **Reset to defaults** button. This also resets the **Health Counter** screen to enabled.

**STEP 3** To save the setting, click **Ok**.

▶ The **Fever Detection** screen is shown.

**FINISH:** **You have configured the fever alarm setting.**

### 5.3.6 Configure the fever alarm sound

This setting can changed on the **Fever Settings** tab of the **Settings** window.

**Prerequisites:**

- The DERMALOG FLC1 Light Edition is connected to your computer.
- The DERMALOG Fever Detection Application has been installed (see chapter 4.1.3).
- The **Fever Detection** screen is shown.

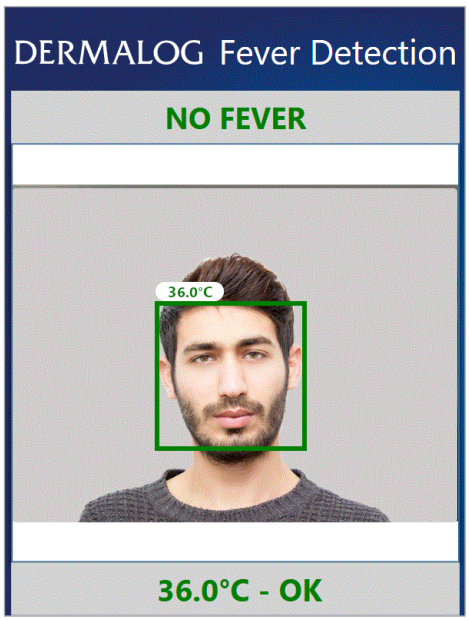


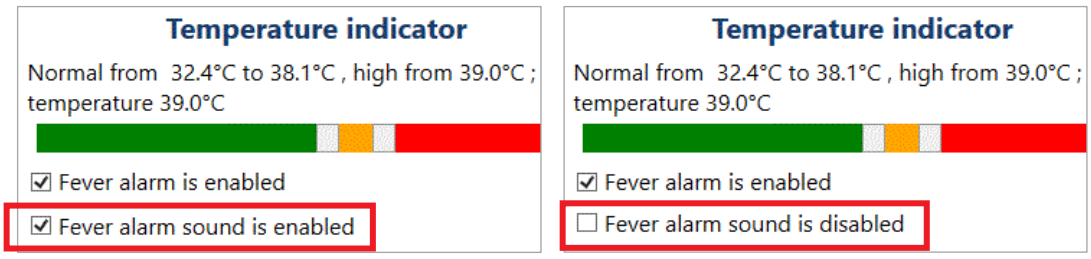

Figure 26: Fever Detection screen – 1 test person is shown (example)

You can press **Ctrl + C** to open the **Settings** window. Whilst the **Settings** window is open, no fever warning message will be shown.

**START:**

**STEP 1** On the keyboard, press **Ctrl** + **C** simultaneously.

▶ The **Fever Settings** tab is shown.




**Fever alarm sound is enabled** **Fever alarm sound is disabled**

Figure 27: Fever Settings tab excerpt – Configure fever alarm sound

**STEP 2** Configure the fever alarm setting according to Figure 27.

▶ If the check box is selected, a sound can be heard in case of a fever alarm.

▶ If the check box is blank, a fever alarm will not be indicated by a sound.

**OPTIONS**

- To reset all changed parameters in the **Settings** window to default values, click the **Reset to defaults** button. This also resets the fever alarm sound to enabled.

**STEP 3** To save the setting, click **Ok**.

▶ The **Fever Detection** screen is shown.

**FINISH: You have configured the fever alarm sound.**

### 5.3.7 Configure the face tracking

The DERMALOG Fever Detection Application works reliable for up to 2 persons within the captured area at the same time. This chapter shows you how to configure the maximal number of captured persons.

- The minimum is 1 person.
- The maximum are 2 persons.

This setting can be changed on the **Advanced Settings** tab of the **Settings** window.

**Prerequisites:**

- The DERMALOG FLC1 Light Edition is connected to your computer.
- The DERMALOG Fever Detection Application has been installed (see chapter 4.1.3).
- The **Fever Detection** screen is shown.

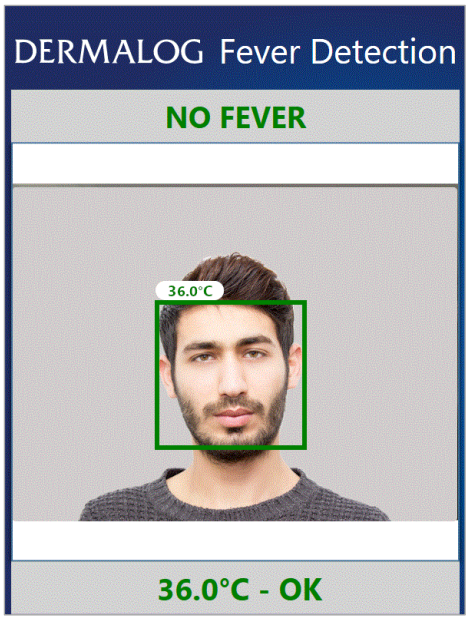



Figure 28: Fever Detection screen – 1 test person (example)

You can press **Ctrl + C** to open the **Settings** window. Whilst the **Settings** window is open, no fever warning message will be shown.

**START:**

**STEP 1** On the keyboard, press **Ctrl** + **C** simultaneously.

▶ The **Settings** window is shown.

**STEP 2** On the **Settings** window, open the **Advanced Settings** tab.

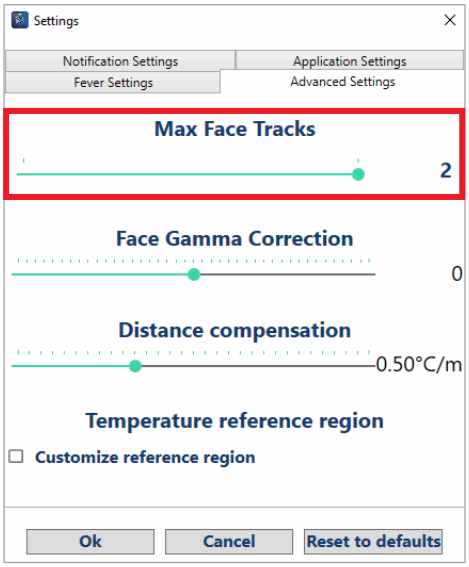



Figure 29: Advanced Settings tab– Max face tracks section framed in red

**Face Gamma Correction** must be changed only if faces are not recognized properly, see chapter 6.2.

**Distance compensation** must be changed only there are significant deviations from the temperatures measured at 1 m distance (calibration) and temperatures at different distances, see chapter 6.3.

The **Temperature reference** region is only visible after the camera has been calibrated.
The **Temperature reference** region is used to diminish temperature fluctuations (see chapter 6.4).

**STEP 3** In the **Max face tracks** section, drag the slider with the mouse to the left or right to set the maximal number of captured persons.

**OPTIONS**

- To reset all parameters in the **Settings** window to default values, click the **Reset to defaults** button. This also resets the **Max face tracks** to *2*. The application is restarted. The **Warm up** screen is shown (continue with chapter 5.1).

**STEP 4** To save the setting, click **Ok**.

The application must be restarted to apply changes to the face tracking.

**STEP 5** On the confirmation dialog, click **Yes**.

- ▶ The **DERMALOG Fever Detection Application** is restarted.
- ▶ The **Warm up** screen is shown.

**FINISH: You have configured the face tracking.**

### 5.3.8 Configure the camera operation time

The DERMALOG Fever Detection Application has a preconfigured operation time which defines an automatic start and switch off for the DERMALOG FLC1 Light Edition. This chapter shows you how to configure the operation time of the camera.

Depending on your settings, the DERMALOG FLC1 Light Edition is released out of sleep modus automatically. Hence, the DERMALOG FLC1 Light Edition can already warm up before operation without having to run unnecessarily (e.g. overnight). The warming up of the DERMALOG FLC1 Light Edition is done without manual intervention and the camera is ready at the right time.

**To use the sleep modus, the computer must remain switched on and the DERMALOG Fever Detection application must be running.**

Ensure that the operating system on the computer is set to the time and time zone of your country (see chapter 4.3).

This setting can be changed on the **Application Settings** tab of the **Settings** window.

**Prerequisites:**

- The DERMALOG FLC1 Light Edition is connected to your computer.
- The DERMALOG Fever Detection Application has been installed (see chapter 4.1.3).
- The time zone setting of the operating system on the computer matches the time zone of the country.
- The **Fever Detection** screen is shown.

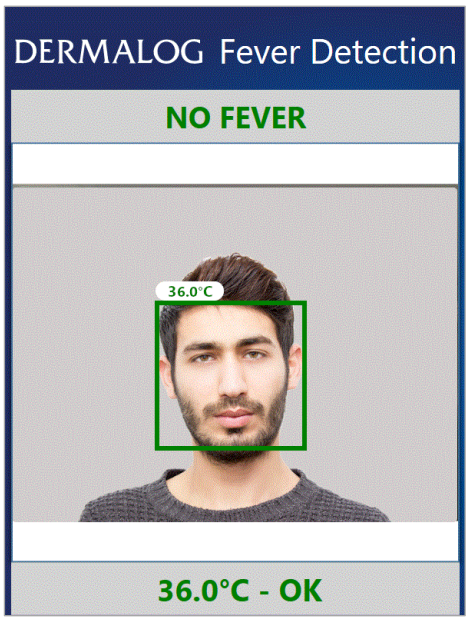



Figure 30: Fever Detection screen – 1 person shown (example)

You can press **Ctrl + C** to open the **Settings** window. Whilst the **Settings** window is open, no fever warning message will be shown.

**START:**

**STEP 1** On the keyboard, press **Ctrl** + **C** simultaneously.

▶ The **Settings** window is shown.

**STEP 2** On the **Settings** window, open the **Application Settings** tab.

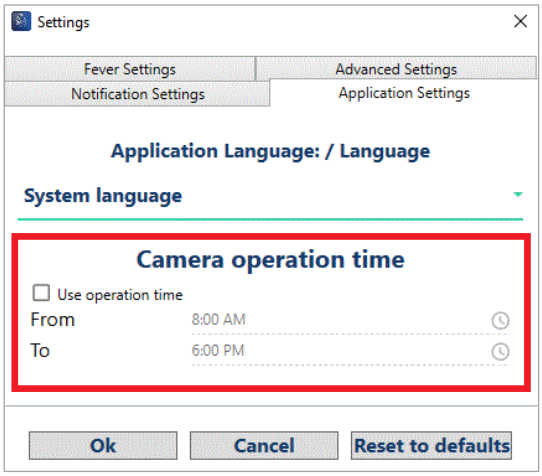



Figure 31: Application Settings tab

**STEP 3** Select whether you want to use an operation time for the camera:

**Use operation time** – ☐ : camera runs permanently (default setting)

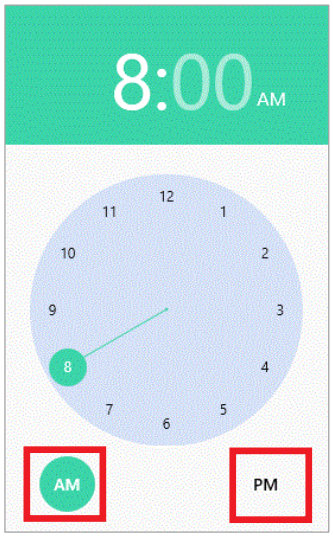
☑ : camera runs during set operation time

**STEP 4** If you want to use the *operation time* option and want to change the operation time, continue with **Step 5**.

Otherwise, click **Ok**.

**STEP 5** In the **Camera operation time** section, click the time in the **From** field.

▶ A clock is shown.




**STEP 6** If you want the camera to start in the morning, select *AM*.

If you want the camera to start in the afternoon, select *PM*.

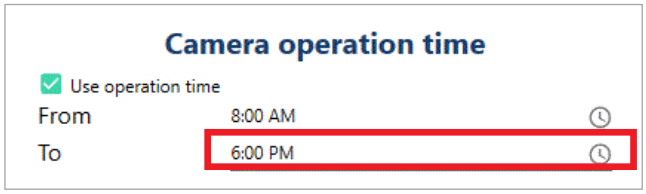
**STEP 7** In the green field above the clock, type the time when you want the camera to start.

▶ The start time is changed.

**OPTIONS**

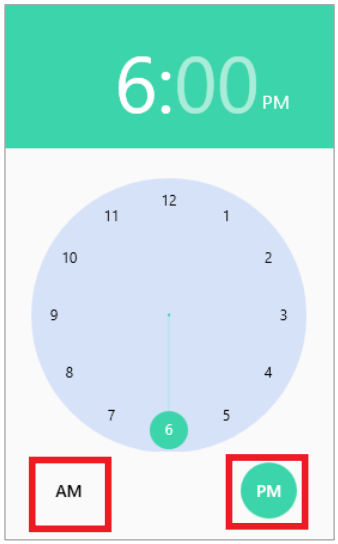
- Alternatively, move the clock's hand to the corresponding position.

**STEP 8** To return to the **Settings** window, click next to the **Clock** window.




**STEP 9** In the **Camera operation time** section, click the time in the **To** field.

▶ A clock is shown.




**STEP 10** If you want the camera to go into sleep mode in the morning, select *AM*.

If you want the camera to go into sleep mode in the afternoon, select *PM*.

**STEP 11** In the green field above the clock, type the time when you want the camera to go into sleep mode.

▶ The sleep time is changed.

**OPTIONS**

- Alternatively, move the clock's hand to the corresponding position.

**STEP 12** To return to the **Settings** window, click next to the **Clock** window.

**STEP 13** To save the setting, click **Ok**.

▶ The **Fever Detection** screen is shown.

**FINISH: You have configured the camera operation time.**

### 5.3.9 Configure DERMALOG Notification Service settings

The DERMALOG Notification Service is an interface for sending messages. These messages can be used, for instances, to trigger events in different software programs. The DERMALOG Notification Service is provided for developers and is available in the DERMALOG Support Center.

The DERMALOG ImageDataService is required to receive images via the DERMALOG Notification Service and is available in the DERMALOG Support Center.

This chapter shows how the DERMALOG Fever Detection Application can be configured to send information to the DERMALOG Notification Service.

This setting can be changed on the **Notification Settings** tab of the **Settings** window.

**Prerequisites:**

- The DERMALOG FLC1 Light Edition is connected to your computer.
- The DERMALOG Notification Service has been installed.
- The DERMALOG ImageDataService has been installed.
- The configuration file has been prepared to receive images via the DERMALOG Notification Service (see chapter 4.6).
- The DERMALOG Fever Detection Application has been installed (see chapter 4.1.3).
- The **Fever Detection** screen is shown.

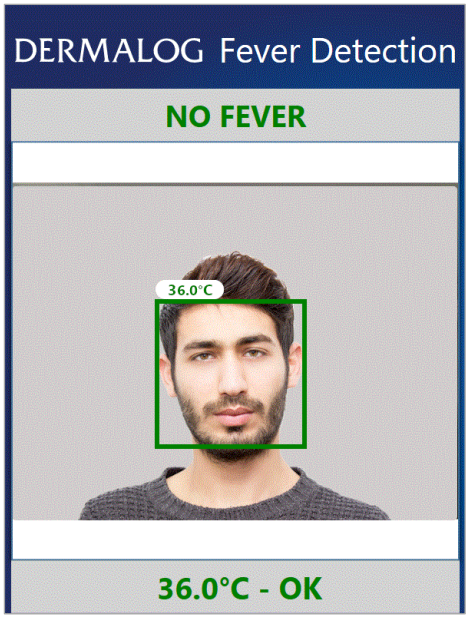



Figure 32: Fever Detection screen – 1 test person (example)

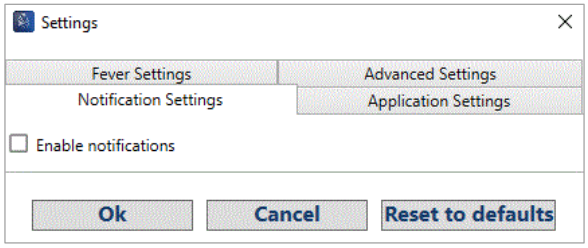
You can press **Ctrl + C** to open the **Settings** window. Whilst the **Settings** window is open, no fever warning message will be shown.

**START:**

**STEP 1** On the keyboard, press **Ctrl** + **C** simultaneously.

▶ The **Settings** window is shown.

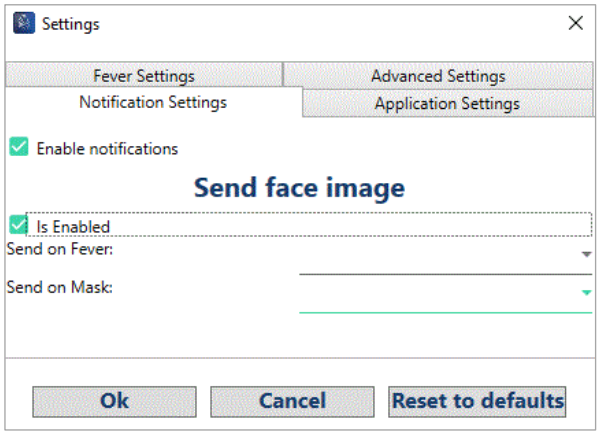
**STEP 2** On the **Settings** window, open the **Notification Settings** tab.




**STEP 3** If you do not want to send notifications to the **DERMALOG Notification Service**, leave the **Enable notifications** check box blank and click the **Cancel** button.

If you want to send notifications to the **DERMALOG Notification Service**, select the **Enable notifications** check box.

**STEP 4** If you want to send face images to the **DERMALOG Notification Service**, select the **Is Enabled** check box and select values from the dropdown lists according to Table 5.




| Dropdown list | Value in Dropdown list | Description |
|---|---|---|
| Send on Fever | Always | The facial image is always sent to the DERMALOG Notification Service, no matter, whether the person has fever or no fever. |
| | In case of fever | The facial image is sent to the DERMALOG Notification Service, if the person has fever. |
| | In case of no fever | The facial image is sent to the DERMALOG Notification Service, if the person has no fever. |
| Send on Mask | Always | The facial image is always sent to the DERMALOG Notification Service, no matter, whether the person wears a masks or not. |
| | In case of wearing no mask | The facial image is sent to the DERMALOG Notification Service, if the person wears no mask. |

Table 5: Possible notification settings for face images

**STEP 5** To save the settings, click **Ok**.

▶ The **Setting**s window closes.

**FINISH:** **You have configured the information sent to the DERMALOG Notification Service.**

## 5.4 Measure persons' temperatures using the DERMALOG FLC1 Light Edition

**The DERMALOG FLC1 Light Edition detects the temperature of a person in order to make a preselection. The temperature detection is no medical fever measurement. In suspected cases, a reference measurement with a medical thermometer is necessary.**

**Prerequisites:**

- The DERMALOG FLC1 Light Edition has been warmed up (see chapter 5.1).
- The DERMALOG Fever Detection Application has been calibrated (see chapter 5.2).
- The **Fever Detection** screen is shown.

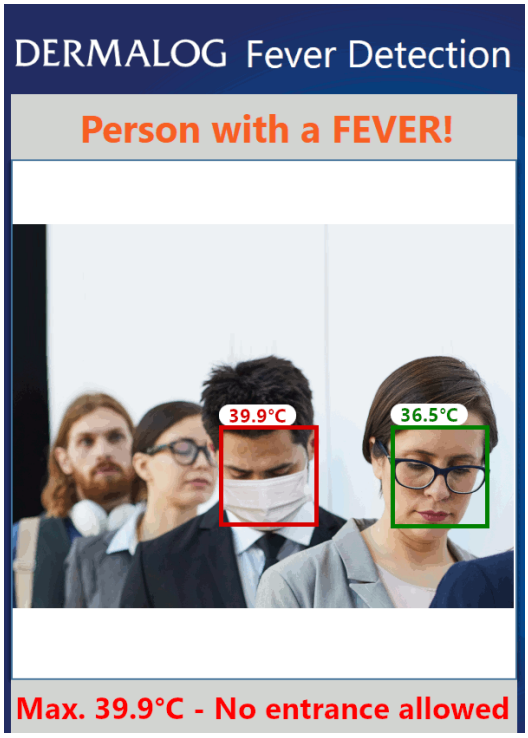



Figure 33: Fever Detection screen

**START:**

For positioning the person in front of the camera, note the recommendations in chapter 4.2 to get best results.

**STEP 1** Let the person to be measured stand in front of the **DERMALOG FLC1 Light Edition** at a distance of 0.5 m to 2 m.

▶ The screen shows each recognized person with a colored frame. The colored frame is an indication of the temperature.

- Blue: temperature cannot be measured
- Green: normal temperature
- Yellow: slightly increased temperature
- Red: fever

▶ The measured temperature is shown on top of the colored frame.

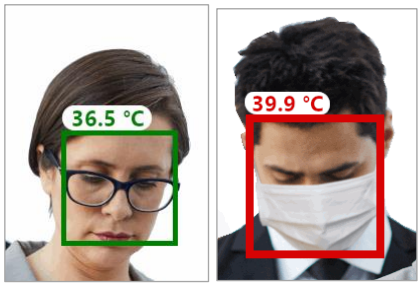



Figure 34: Temperature indication for normal temperature (left) and fever (right)

- **If the bounding boxes around the faces of the persons wearing masks jump quickly between from the complete face to the eye or mouth region, see chapter 6.2.**
- **If persons are measured at distances other than 1 m and are not measured correctly, see chapter 6.3.**

The temperature range attributed to the colors green, yellow and red can be configured as shown in chapter 5.3.5.

Temperatures below 35°C are not measured and will be shown as approximately 35°C – if the option *Show temperature* has been enabled (see chapter 5.3.2).

- ▶ In case of fever an alarm sounds.
- ▶ A message with further instructions will be shown.

**OPTIONS**

- To configure the temperature for a fever alarm, see chapter 5.3.4.
- To configure whether the measured temperature is shown, see chapter 5.3.2.
- To enable or disable the display of the **Health counter** screen, see chapter 5.3.5.
- To enable or disable the alarm sound, see chapter 5.3.6.

In rare cases, the application shows for a 10 second period too high temperature values. This is no malfunction but due to the need of the measuring unit to adjust its own temperature when cooled down. Just wait 10 seconds and repeat temperature measurement. There is no need for recalibration.

To close the **DERMALOG Fever Detection Application**, press **Alt** + **F4** on the keyboard.

**FINISH:** **You have measured a persons' temperatures.**

# 6 Troubleshooting

## 6.1 Error Messages

| Error Message | Possible Explanation | Proposed Solution |
|---|---|---|
| DERMALOG FLC1 Light Edition camera is not connected. | The cable connection between camera and computer has not been established. | Check if the USB 3.0 cable is connected to the camera and the computer. If so, unplug the cable from the computer interface and plug it in again. Then terminate the application (press **ALT** + **F4** on the keyboard) and restart it. |

Table 6: Error messages

## 6.2 Correct the face gamma correction

If the bounding boxes around the faces of the persons wearing masks jump quickly between from the complete face to the eye or mouth region, the gamma correction of the stream is not set correctly. This chapter shows how to correct the face gamma correction setting.

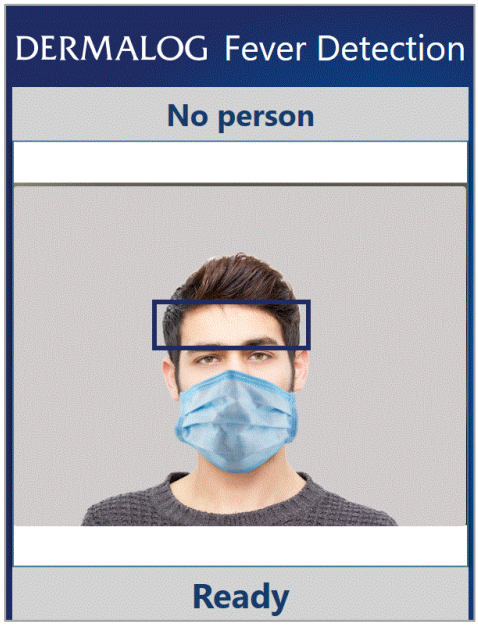



Figure 35: Fever Detection screen – 1 test person is shown

You can press **Ctrl + C** to open the **Settings** window. Whilst the **Settings** window is open, no fever warning message will be shown.

**START:**

**STEP 1** Place the test person where the problem occurs in the middle of the camera view in front of the **DERMALOG FLC1 Light Edition** at a distance of 1 m.

**To place the test person correctly in front of the DERMALOG FLC1 Light Edition, follow the recommendations in chapter 4.2.**

**STEP 2** On the keyboard, press **Ctrl** + **C** simultaneously.

▶ The **Settings** window is shown.

**STEP 3** On the **Settings** window, open the **Advanced Settings** tab.

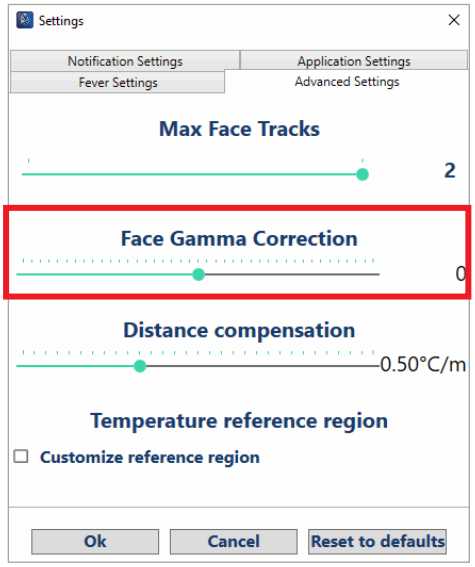



Figure 36: Advanced Settings tab – Face Gamma Correction section framed in red

**STEP 4** In the **Face Gamma Correction** section, drag the slider a step to the right.

▶ The gamma correction increases a step upwards.

**STEP 5** Repeat **Step 4** until the jumping behavior of the bounding box no longer occurs.

**OPTIONS**

- To reset all changed parameters in the **Settings** window to default values, click the **Reset to defaults** button. This also resets the **Face Gamma Correction** to *0*.

**STEP 6** To save the setting, click **Ok**.

▶ The **Fever Detection** screen is shown.

**FINISH: You have configured the face gamma correction.**

## 6.3 Adapt the distance compensation

During calibration, the test person is placed in front of the DERMALOG FLC1 Light Edition at a distance of 1 m. During operation, DERMALOG recommends also to place a person in front of the DERMALOG FLC1 Light Edition at a distance of 1 m.

However, if you measure at a distance other than 1 m and deviations from temperatures occur to temperatures measured at a distance of 1 m, you can use the distance compensation parameter.

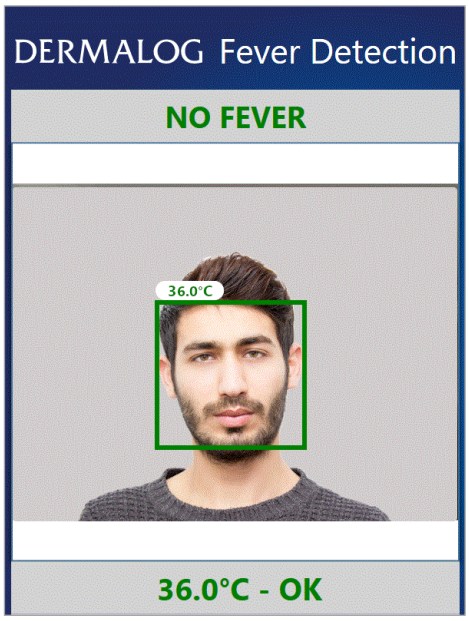



Figure 37: Fever Detection screen – One person shown (example)

You can press **Ctrl + C** to open the **Settings** window. Whilst the **Settings** window is open, no fever warning message will be shown.

**START:**

**STEP 1** Place a test person in the middle of the camera view in front of the **DERMALOG FLC1 Light Edition** at a distance of 1 m and measure the temperature.

**To place the test person correctly in front of the DERMALOG FLC1 Light Edition, follow the recommendations in chapter 4.2.**

If the temperature is not shown, make sure that the option *Show temperature* is enabled (see chapter 5.3.2).

**STEP 2** Place the test person in the middle of the camera view in front of the **DERMALOG FLC1 Light Edition** at the distance you usually perform the measurements and measure the temperature.

**STEP 3** On the keyboard, press **Ctrl** + **C** simultaneously.

▶ The **Settings** window is shown.

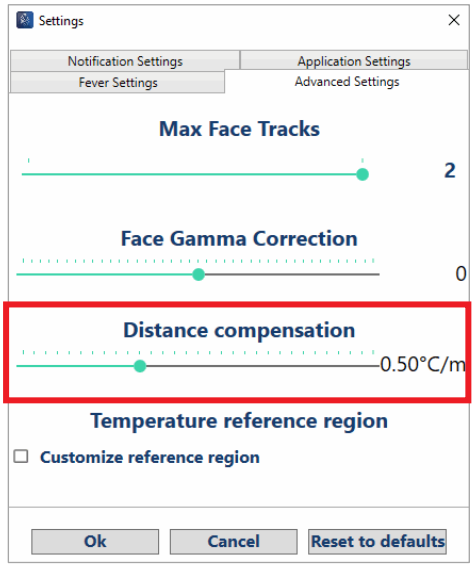



Figure 38: Advanced Settings tab – Distance compensation section framed in red

**STEP 4** In the **Distance compensation** section, drag the slider until the measured temperature corresponds to the temperature that you measured in **Step 1**.

**Example**

- If you measure in **Step 2** at a distance of 0.5 m and you observed a temperature increase of 0.3 °C in **Step 2** compared to **Step 1**, increase the distance compensation value by 0.15 °C/m.

**STEP 5** To save the setting, click **Ok**.

**FINISH: You have configured the distance compensation.**

## 6.4 Diminish temperature fluctuations

Temperature fluctuations in the measurements may be caused by temperature changes in the ambient environment. You can use the parameter *temperature reference region* to diminish temperature fluctuations as a selected background region is continuously measured and used as a reference.

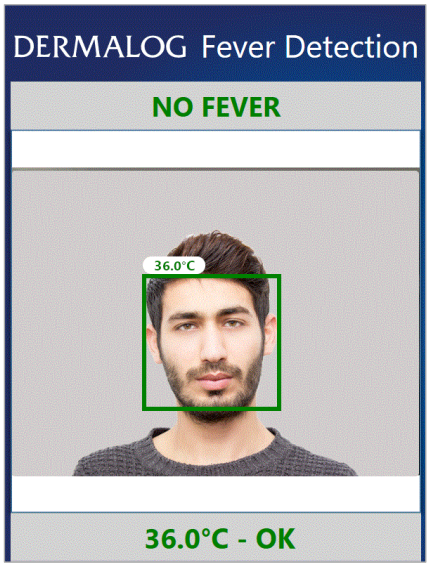



Figure 39: Fever Detection screen – One person shown (example)

You can press **Ctrl + C** to open the **Settings** window. Whilst the **Settings** window is open, no fever warning message will be shown.

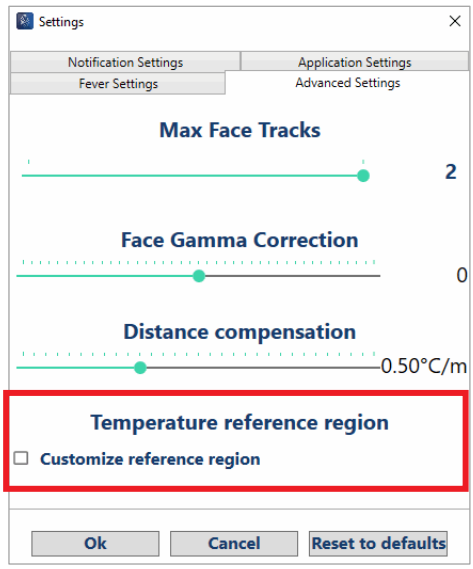
**START:**

**STEP 1** Place a test person in the middle of the camera view in front of the **DERMALOG FLC1 Light Edition** at the distance the measurements are usually performed (recommended distance: 1 m).

**STEP 2** On the keyboard, press **Ctrl** + **C** simultaneously.

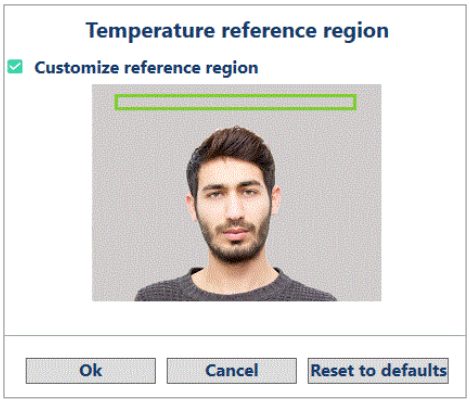
▶ The **Settings** window is shown.

**STEP 3** Open the **Advanced Settings** tab.



**STEP 4** Select the **Customize reference region** check box.

▶ The reference region is highlighted with a green frame.




If you leave the **Customize reference region** check box blank, the background is not measured continuously and not used as a reference.

**STEP 5** If you want to move the reference region, click into the camera picture and draw a rectangle from left to right. **Note:** The size of the rectangle is purposely restricted.

**Select a reference region in the background that has a stable temperature.**
**Ideally, the reference region is a non-reflecting surface (e.g. a black surface) in frontal position of the camera.**
**Ideally, the whole reference region is at a constant distance.**

**Make sure that:**

- **the reference region is NOT covered by the person(s) you want to measure.**
- **the reference region is NOT drawn where any of the following is located:**
  - **heat sources (e.g. lamps, radiators, people passing by in the background)**
  - **reflecting surfaces (e.g. windows, mirrors)**
  - **doors**

**STEP 6** To save the setting, click **Ok**.

▶ If the calibration mode is set to *Automatic one-time calibration with a person*, then the **Calibration** screen is shown. Continue with chapter 5.2.1.

▶ If the **Calibration** mode is set to *Manual calibration with thermometer*, open the **Fever Settings** tab. A test person with normal temperature and a medical forehead thermometer are needed. Continue with **Step 2** and **Step 3** of chapter 5.2.2 and then finish the manual calibration with the instructions of **Step 7** and **Step 8** in the same chapter.

**FINISH:** **You have used the parameter *Customize reference region*.**

# 7 Additional documentation

- *DERMALOG FLC1 Light Edition User Guide*

More information:

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