

FeverTIR – Fever detection System

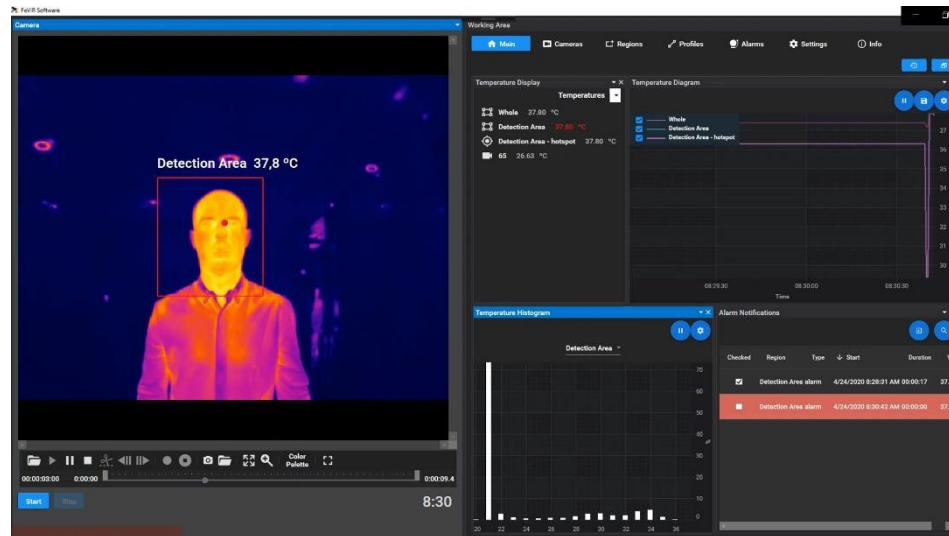
April 2020

How to measure body temperature accurately and avoid false alarms?

Measuring body temperature is a demanding application from the metrological point of view. In industry, thermal cameras have been used with a small error in temperature measurement ($\pm 2^{\circ}\text{C}$). This precision was considered more than acceptable. However, the uncertainty created by that precision is very high for this application. $\pm 2^{\circ}\text{C}$ at 35°C can mean the non-detection of a healthy or sick person.

Due to mass production and calibration standards, this measurement uncertainty is common to almost all thermal cameras manufacturers. To solve this problem, **we have defined a specific calibration process** that allows us to achieve **an accuracy of $\pm 0.5^{\circ}\text{C}$ with our thermal imaging cameras**. In addition, we have developed another specific thermal camera model that incorporates a **black body calibration source** and allows us **to offer a greater precision of $\pm 0.3^{\circ}\text{C}$** for the measurement of human temperature. Thanks to these specific developments we can face the detection of people with fever and help to identify and reduce people with diseases, such as COVID-19.

Another important factor when making a correct measurement of corporal temperature is the use of **high-resolution cameras**. For this application, it is necessary to use high resolution cameras (384x288 pixels or 640x480 pixels). Cameras with lower resolutions, obtain a very large pixel size that averages the human surface and supposes the non-detection of sick people in most cases.



FeverTIR – Thermal imaging system for body temperature measurement

EQUIPRO offers a reliable “**plug & play**” **detection system** designed to quickly and accurately measure contactless body temperature of people. The system **alerts people who exceed a regular body temperature**, detecting possible cases of fever, one of the most obvious symptoms of CoVID-19 infection, as well as similar diseases.

The system combines a **high resolution thermal imager (384x288 pixels)** with a **Full HD visible camera**, allowing body temperature and identification of people and rapid recording of the data obtained. With an **accuracy of $\pm 0.5^{\circ}\text{C}$** , a **traceable calibration certificate is included**.

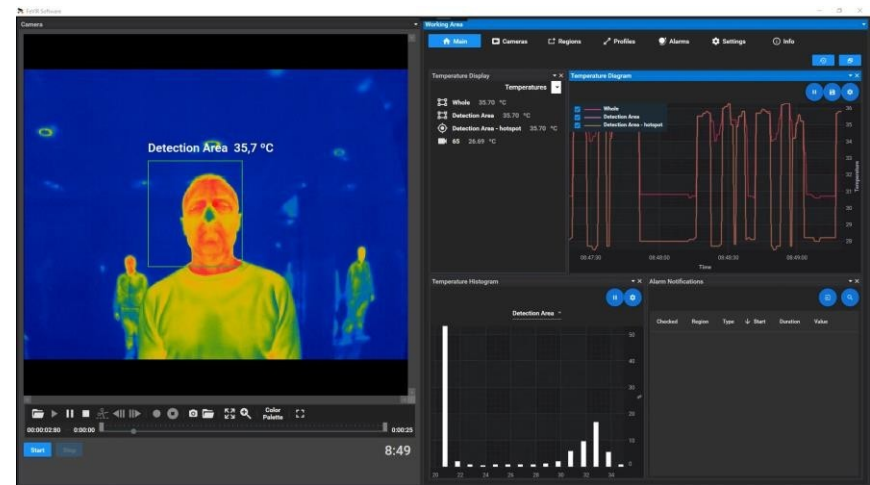
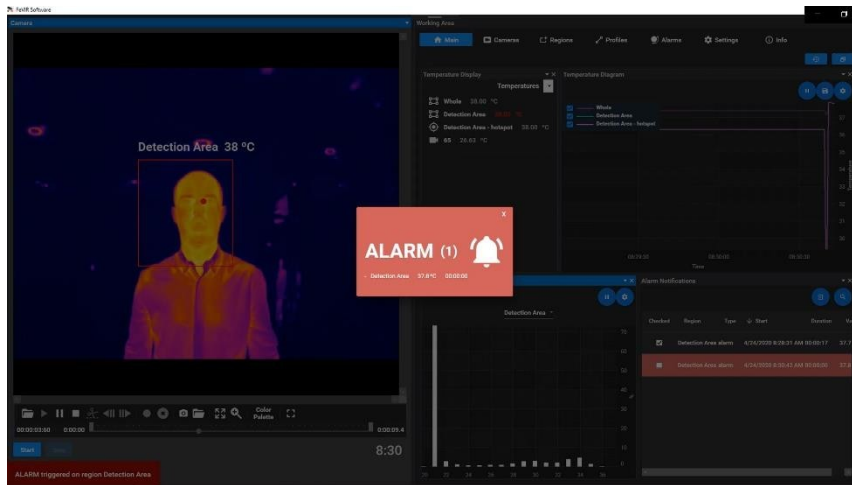
For greater accuracy, $\pm 0.3^{\circ}\text{C}$, we offer the option of including a **high accuracy black calibration body**. In this case, a traceable calibration certificate is also included.

In both cases the **software license is included with a very intuitive interface for the control and configuration of temperature, alarms and recording functions, as well as the analysis of measured data**. The system includes **output signals for integration with other systems**.



BENEFITS

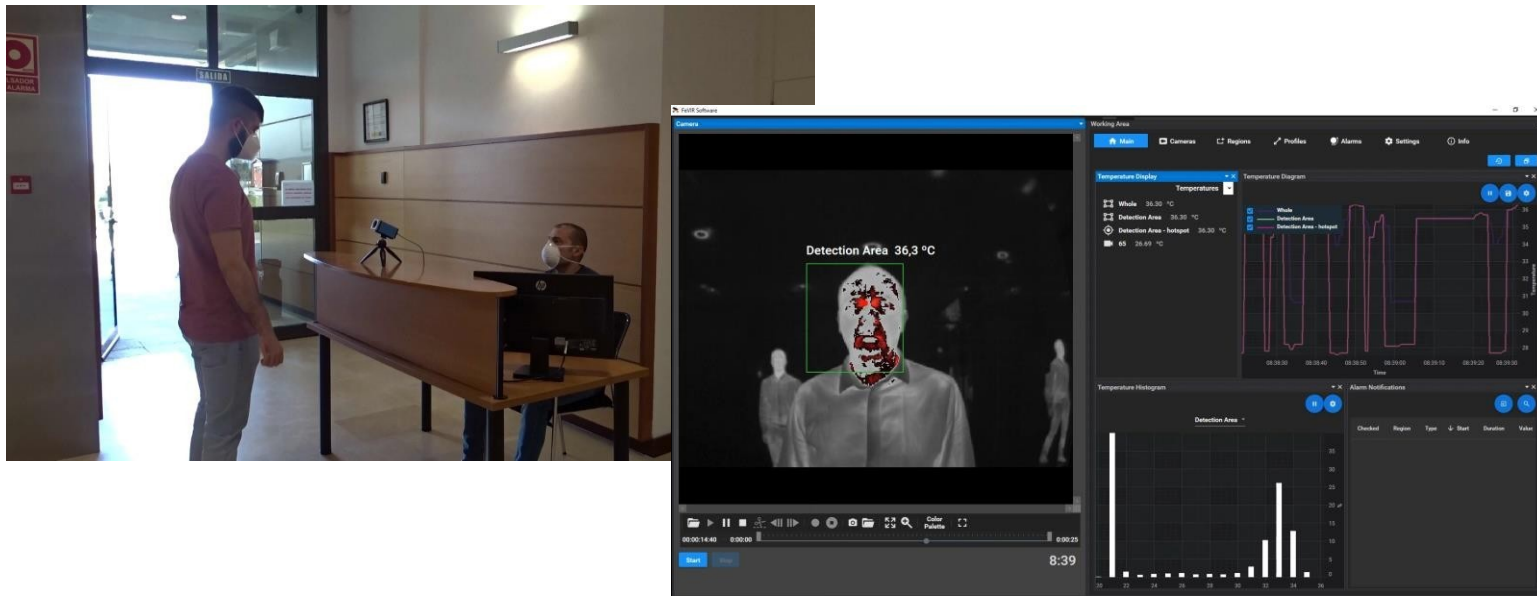
- Detection of employees and visitors with elevated skin temperatures.
- Easy installation and operation of the inspection system.
- Alarm signal when the skin temperature reaches a predefined alarm value.
- Thermal images of people suspected of having a fever can be automatically stored.
- Extensive software included, runs on a standard PC.



APPLICATIONS

Our system can be implemented for a **first screening or scanning in areas where there is traffic of people and crowds**. Also for **individual scans at a close distance, in order to detect even a few tenths of fever**.

Its fast data capture, high precision and resolution, make it ideal for installation at the entrance of hospitals, work centers, industrial centers, logistics centers, shopping centers, construction sites, hotels, companies that continue to operate, banks, etc. In short, in any establishment with an influx of people and a potential risk of contagion.



TECHNICAL CHARACTERISTICS

- High resolution thermal camera: 384 X 288px
- Focal length $f = 8,9\text{mm}$ / FOV $41^\circ \times 31^\circ$
- High sensitivity: $<60\text{mK}$
- High precision: $\pm 0,3^\circ\text{C}$ using correction and re-calibration with a black body in real time
- Integrated visible spectrum camera (RGB full HD)
- Simultaneous recording of video and images (RGB and thermal)
- Special calibration temperature range for measuring facial temperature ($30\text{-}45^\circ\text{C}$)
- Software license included. Two-level alarm detection, including on-screen notification
- Display of both cameras on the screen (thermal + visible)
- Ethernet communication
- POE and 24 VDC
- Exportable worldwide unit without license required
- 2 inputs and 2 outputs, support tripod and 220 adapter.

USE OF BLACK BODY

For a **correct and accurate measurement, the black body must be permanently placed in the field of view of the thermal imager.** This blackbody has very low measurement uncertainty. This guarantees the highest possible measurement precision, which cannot be achieved by any other measurement procedure.



HOW TO MAKE A CORRECT MEASUREMENT?

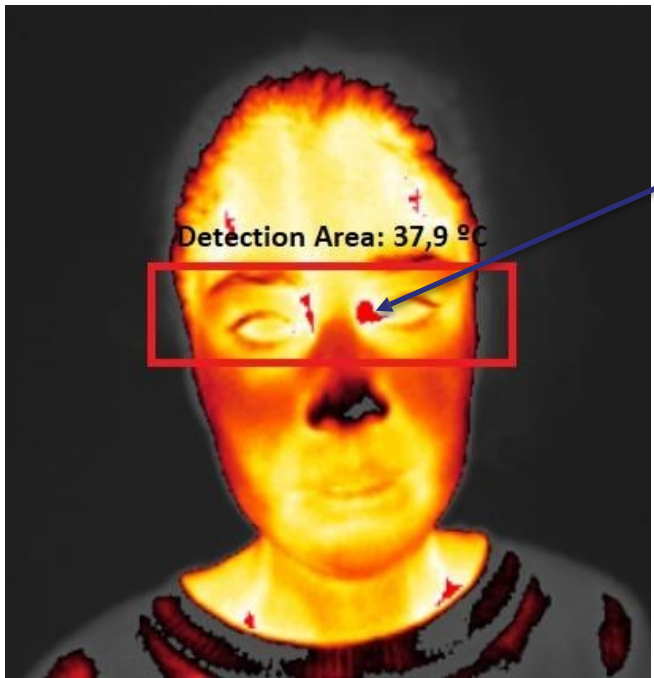
As previously mentioned, **the resolution (pixel size) and the measurement field of view are very important to be able to accurately measure body temperature.** Our cameras offer a resolution of **384x288 pixels** and a **field of view of 41° x 31°**. This allows us to perform a correct temperature measurement in the environment from two to five meters. This allows us to always respect the safety distance with people who are being analyzed.

Another important parameter when measuring is the emissivity value of human skin, which is approximately 0.96. In order to ensure a correct measurement of body temperature, the temperature of the lacrimal (canthus) as well as the tympanic membrane within the ear must be measured. It is in these areas where there is a greater correlation between the external temperature of the skin and the core body temperature.

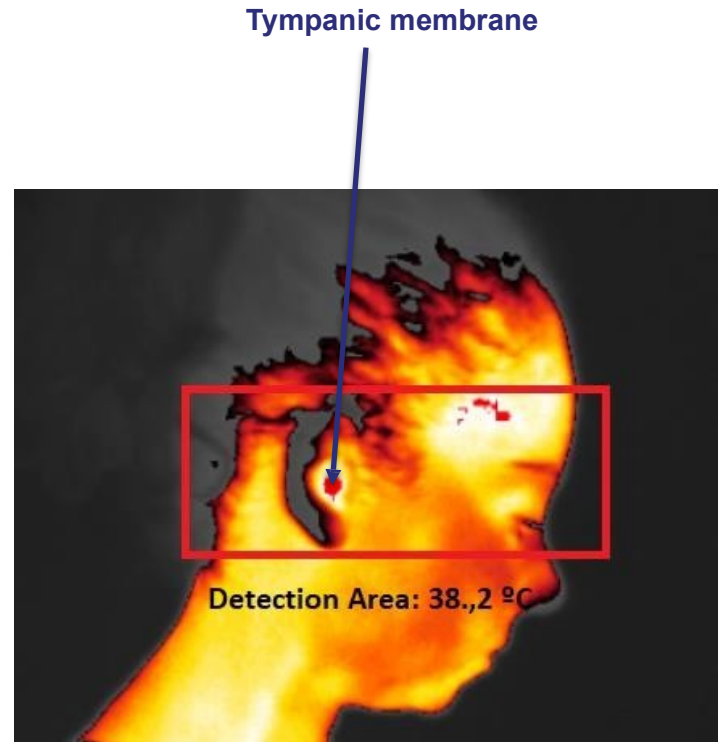
Other factors:

- Remove glasses or sunglasses in order to properly measure the tear area.

EXAMPLES FOR A GOOD MEASUREMENT WITH A THERMAL CAMERA



Medial Canthus



Tympanic membrane

**Thank you for
your attention**

EQUIPRO LTD

MilnWood House

**North Parade
Horsham
RH12 5FS**

www.equipro-worldwide.com

EQUIPRO

EQUIPMENT PROTECTION SOLUTIONS