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# Temperature Detection CCTV Technology

## White paper

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### **Introduction**

Using a CCTV camera with "**Temperature Detection**" it is possible to detect high body temperatures in people, giving a possible early warning someone has a fever and may have Covid-19.

Rapid identification of a fever is a great help to screening and protecting staff or visitors of any business, it's contactless so chances of spreading a virus are lowered and it is easy and fast to implement and manage too.

CCTV Cameras equipped with "**Temperature Detection**" are actually a "**2 in 1**" device, they have a standard IP CCTV camera and an additional Infrared detection module that can read the thermal temperature of a human by the Infrared they give off.

Temperature Detection cameras that help with the detection of fevers and Covid-19 are known as ITDCs and can be roughly split into two groups, long range and short range cameras.

# Temperature Screening with CCTV

## – the basics of Body Temperature Measurement

This is a basic article for CCTV installers and business owners on the human body's core temperature ranges and how it can be measured by CCTV equipment. This article isn't and does not claim to be a medical reference point for diagnosis of fever.

When a person has a fever and is unwell their core temperature rises. The human body is remarkable at maintaining a stable “core” operating temperature although this temperature can vary a small amount from person to person.

For a healthy adult the internal body temperature is typically 37 °C but this can vary throughout the day.

As people age their core temperature lowers slightly, with someone over 70 having a typical core body temperature of 36 °C as opposed to a 40 year old at 37 °C.

One of the most accurate ways to measure this core body temperature is through an oral thermometer or one that reads the temperature inside the ear canal. The ear canal has several arteries close to it that flow to the “hypothalamus” so it provides a good indication of internal body temperature as the hypothalamus role amongst other things is to help control body temperature.

The head itself is the body part that is closer than all other body parts to the core internal body temperature, in fact the feet can be as much as 8 degrees cooler than the head.

On the head itself, the forehead is the best possible place for distance temperature monitoring of body temperature as it is relatively easy to “see” and capture this temperature. It's also a relatively reliable indicator of the body temperature as arteries close to the inner corners of the eyes provide a good infra red source of the core body temperature that is then transmitted from the centre lower section of the forehead.

Most but not all temperature monitoring CCTV cameras will attempt to read the temperature from the forehead and low down in between the eyes.

### **So what is a normal body temperature and what should the CCTV camera be set on?**

Based on a normal body temperature of 37 °C we suggest the camera is configured to detect “abnormal temperatures” at 38 °C and above†. Although you may wish to lower this so that you have the ability to detect smaller abnormalities in temperature in a “better to be safe than sorry manner”.

#### **Human Body Temperature Guide -**

- ▶ Normal body temperature = 37 °C
- ▶ Low grade fever temperature = 37.2 – 38 °C
- ▶ Fever temperature = 38 °C or higher
- ▶ Dangerously high = 41 °C or higher
- ▶ Fatal = 43 °C or higher can be fatal

*Disclaimer: Please be aware the above is meant as a guide only and not a medical reference article. If you have any medical concerns please contact a doctor or specialist.*



† People's skin temperature can be affected by other factors. Typically temperature detection screening cameras have an accuracy of around 0.3 degrees so we would suggest setting the trigger point to between 37.7 – 38 °C.

# How to

*- Use CCTV Technology to Help Protect Staff & Customers*



**Automatic -**

*Captures temperatures as people walk past*

**HotHEAD™ "Crowd"**  
 Long range camera  
 Code: SEEK200



**Semi-Automatic -**

*Captures temperatures as people stand in front of it*

**HotHEAD™ "Selfie"**  
 Short range camera  
 Code: SEEK111

Temperature Detection cameras can be roughly split into two groups, long range and short range cameras.

### 1- HotHEAD™ "Crowd" Long Range Temperature Cameras (more than 1m)

These cameras can simultaneously read multiple people at a distance and therefore the subject's temperature can be read without any participation in the process. Great in a busy environment where you can capture people's temperature by strategic placing of the camera(s).

Long range temperature readers are a good choice for busy shops and buildings where people are coming and going without any appointments or other visitor control. These cameras can inform the visitor or staff of high temperature via audible warnings or software supplied with the cameras. The long distance temperature reading of these cameras makes them more expensive to buy than the short range readers.

Within the camera you can set it also to alert if someone is not wearing a mask. This is especially useful for retailers or on public transport or if you have a general policy that masks should be worn at all times.



Long range cameras are ideal for walk in buy and browse outlets



Built-in mask detection, useful for public transport uses

### 2- HotHEAD™ "Selfie" Short range temperature Cameras (less than 1m)

These cameras need the subject to be closer and pretty much standing in front of the camera. As the Infrared detection module can't read at a long distance, these cameras tend to be much lower in cost than the long distance readers.

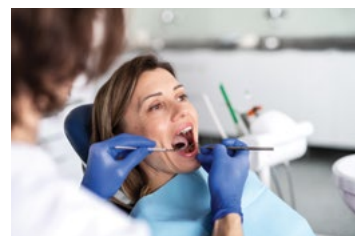
The short range readers often are manufactured with a small attached CCTV monitor so that the subject can stand in front of the camera and see what their own reading is. Is it high or low and do they have a temperature or not? This instant feedback to customers and staff is great for non-confrontational management after detection of a high temperature.

The short range readers tend to be a good choice for businesses that have people book appointments or have low volume "walk in and wait customers". The customer can be asked to check their temperature by standing in front of the camera. It's easy, safe and gives fast results.

Within the camera you can set it to alert if someone is not wearing a mask. This is useful if it is difficult to maintain a safe social distance in your premises or business and you have a policy that masks should be worn at all times.

With the short range option, the cameras get a good full facial shot and some like the HotHEAD™ "Selfie" have built-in facial recognition. This allows the cameras to be used to perform other functions like open doors\*.

*Note\* - this is only possible by integration into other systems.*



Short range cameras are ideal for business who have appointments or walk in and wait customers

### What Should you Buy for your Business?

#### **Business type 1- Appointments or have low volume "walk in and wait"**

If your business has few visitors and they tend to book in or you have a small amount of "walk ins" then the short range reader is a great choice. It's easy, low cost and user friendly. You will find staff and visitor will soon tend to "re-use" it throughout the day for self-reassurance that they don't have a fever. This solution is very good for any business that uses waiting rooms etc, such as doctors, dentists, showrooms, surgeries, vets, hairdressers, barbers, health clubs, council buildings and offices that deal with the public.



*Suits appointments or walk in and wait type businesses such as hairdressers*

#### **Business type 2 - Busy shops with browsers and buyers or public access such as libraries**

If your business has a lot of "walk in buy or browse" shoppers (or visitors) you are better having the long range detection system so that it can alert you when someone is in the store who is abnormally hot and may have a fever. The camera and software can save a picture of the person who has the high temperature so staff can take appropriate action (The short range system also takes snapshots). You may need more than one long range camera or have short range ones located at the tills or check out for added protection.





*Long range cameras suit businesses with walk in and browse shoppers*

The perfect technological solution for your business maybe a mixture of short and long range heat detection cameras but we trust the above helps in your conclusion of how best to protect your staff and customers.



***In Conclusion...***

Whilst the use of CCTV technology may seem expensive to protect your staff and customers, in reality by controlling the spread to keep your staff healthy and protected, the investment in this technology may actually save you money by keeping the business going with the least amount of problems in this difficult time.

Camera Style	✓ Pros	✗ Cons
 <p><b>HotHEAD™ "Crowd"</b> (Long range) Best for busy shops, public areas (libraries, cinemas etc).</p>	<p>Simultaneous multiple detection, longer range, no subject participation needed. Rapid scanning. Automatic reading (Captures as people walk past).</p>	<p>More expensive.</p>
 <p><b>HotHEAD™ "Selfie"</b> (Short range) Best for appointment type businesses, (dentist, hairdressers etc) or staff protection alone.</p>	<p>Built-in monitor, gives immediate feed back, self contained, low cost, built-in facial recognition. Semi-automatic reading (Captures from a pose).</p>	<p>Needs subject to participate and stand in front of the monitor.</p>

## The Data Protection Act & Temperature Detection CCTV

If you already have CCTV in your business you may have already taken steps to ensure that you comply with the Data Protection Act. If the temperature detection cameras are the first CCTV items in your building it would be wise for you to read up on how it affects your business on our dedicated website [www.WholWatchingMe.org](http://www.WholWatchingMe.org).

You can buy simple off the shelf products and kits to help your CCTV system to comply with the act such as these:



### DPA Compliance Kit

Includes 20x Evidence DVDs with unique ID stickers and seals, 1x A3 and 1x A4 warning signs, 20x warning stickers and date compliance log book.

Order code: **DPA100**



### CCTV Warning Signs & Stickers

With FREE registration to the "Who Is Watching Me" scheme

A3 Sign Order Code: **SIG650**

A4 Sign Order Code: **SIG550**

A5 Sticker Order Code: **SIG102**

## Technical Application Notes:

### **For Long range temperature detection cameras**

You need to have good positioning of the camera to get the best results.

**DON'T** Position the camera looking straight at an entrance to get customers walking in to the shop as this would get poor results.

Looking at an entrance from inside to outside can subject the camera to extreme changes in heat when the door is opened due to the infrared that is let in from sunshine so do not position the camera looking at the entrance. Similarly if it is looking out of a window it would create similar issues.

**DO** Position the camera so that the area of observation is **ENTIRELY** internal, walls, back drop etc. When people walk in on a very cold day their skin may be a little cooler and on a very hot sunny day it may be a little hotter being heated by the sun just before entering. Ideally get the cameras to read people's temperatures when they are in a stable temperature controlled section of your business. Perhaps use some kind of flow control so they will walk towards your camera(s) a few seconds after entering.

**DON'T** Position the cameras in direct sunlight or in front of direct heat or IR sources such as heaters.

**DO** Use the camera to inform the right people of a high temperature. Cameras such as the **HotHEAD™** range have a relay output and also built in audio so you can use this to alert someone they have a high temperature. However if you have multiple people in the shop this may be confusing so this feature is best switched off and software should be used to manage the detection.

The software is installed on a computer in the shop and an image of the staff or shopper with a high temperature is displayed as a pop up. The shop can then take the necessary actions based on their own procedure. To use the camera with the software the camera will need to be connected to the same local area network (LAN) as the computer.

**DO** Use the camera to uphold regulations. Within the camera you can set it also to alert if someone is not wearing a mask. This is useful if you have a policy that masks should be worn at all times.

**For Short range temperature detection cameras**

- DO** Position the camera so people can see them and the signage supplied with them. This encourages people to use them through their own volition.  
  
In reception areas, the receptionist would ask the visitor to stand in front of the camera and monitor. It would then display the visitor's temperature. If it is a high temperature then the business would take the necessary steps depending on their own H&S procedures.
- DON'T** Waste time with other over complicated systems. The short range temperature detection camera such as the **HotHEAD™ "Selfie"** is pretty much a plug and play solution and needs either installing on a wall or tripod (extra) as a mounting location. All it then needs is a power socket to plug it in to and use it. If you want to change any settings within the camera it would need a computer or laptop to connect to it to alter these. Typically a user may wish to alter the threshold for the high temperature etc.
- DO** Use the camera to uphold regulations. Within the camera you can set it also to alert if someone is not wearing a mask. This is useful if you have a policy that masks should be worn at all times.
- DO** Combine the camera with the software for a comprehensive system. If you connect the short range camera to a network you can use the software supplied to get notifications of high temperature detection.

**HotHEAD™ Temperature Detection CCTV Cameras - Shortform Specification**

**HotHEAD™ "Crowd" Long Range camera – SEEK200**



Temperature Range	30°C to 45°C	IR Range	Up to 15m
Temperature Accuracy	±0.5°C	Smart IR	Automatically Adjusts Intensity & Angle
Optical Resolution	2688 x 1520 (4MP)	Input Voltage	12V DC / PoE
Optical Lens Type	4mm Fixed	Consumption	12V: 500mA / PoE: 6.5W
Min. Illumination	Colour: 0.0089 Lux @ F1.6 / Black & White: 0.0018 Lux @ F1.6	Finish	White / Black
Day/Night Function	Mechanical (True Day/Night)	Build	Metal Body
Alarm Inputs	1	Use	Internal Use Only
Alarm Outputs	1	Dimensions	Ø140mm x (h) 125mm

**HotHEAD™ "Selfie" Short Range camera – SEEK111**



Monitor Screen Size	7"	Day/Night Function	Mechanical (True Day/Night)
Mount	Wall or Tripod (Sold Separately)	Alarm Outputs	1
Temperature Range	30°C to 45°C	Input Voltage	12V DC / PoE
Temperature Accuracy	±0.3°C	Consumption	12V: 2A / PoE: 20W (Max)
Optical Resolution	1920 x 1080 (2MP)	Finish	Silver / Black
Optical Lens Type	4.5mm Fixed	Build	Plastic Body
Min. Illumination	Colour: 0.01 Lux @ F1.2 / Black & White: 0.001 Lux @ F1.2	Use	Internal Use Only
		Dimensions	(h) 365 x (w) 125 x (d) 85mm

Further Information

For more information on the HotHEAD™ 'Crowd' Long Range camera, please visit:  
<http://robohothead.com/hothead-crowd.html>

For more information on the HotHEAD™ 'Selfie' Short Range camera, please visit:  
<http://robohothead.com/hothead-selfie.html>

Please see our easy comparison chart for a full list of HotHEAD™ camera features:  
<http://robohothead.com/compare.html>

## Watch the video



The video player thumbnail shows a man and a woman in a restaurant. A red box highlights the man's face with a red crosshair and a temperature reading of 38.5°C. A green box highlights the woman's face with a green crosshair and a temperature reading of 36.5°C. A blue play button is in the center. A blue box on the left contains the text: 'HOT HEAD' logo, 'Temperature Detection CCTV', and '...with mask detection function'.

just go to [www.RoboHotHead.com](http://www.RoboHotHead.com)  
or scan the QR code >>>



Scan here!