

24-hour detection with thermal cameras



Table of contents

1. All-day surveillance	3
2. All weather conditions	4
3. Detection, Recognition and Identification	4
4. Thermal data	5
5. When is a thermal camera the correct option?	5

Introduction

When it comes to thermal cameras and their field of application, a general question usually comes to mind: "When is a thermal camera a good option?"

The most common answer to that question is: "When we need to see in the dark".

But is that all? Or can we consider a thermal camera as one of the best possible surveillance solutions?

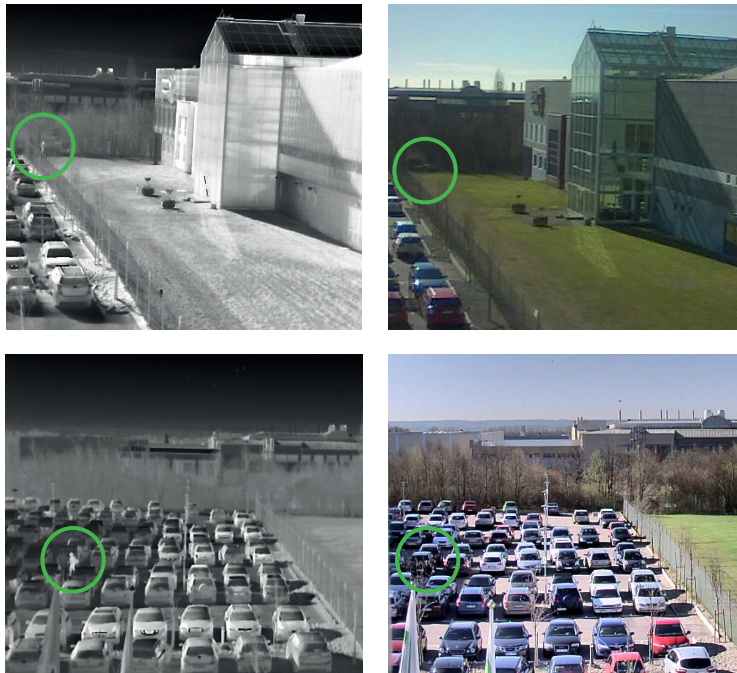
The goal of this article is to answer these questions, and to provide a better understanding of thermal imaging technology and when it can be used.

We have summarized this journey in five steps:

- > All-day surveillance
- > All weather conditions and fewer false alarms
- > Detection, Recognition and Identification
- > Thermal data
- > When is a thermal camera the only correct option?

1. All-day surveillance

Thermal cameras not only outperform a visual camera in dark scenes – they are a great tool for detecting people and objects in 24/7 surveillance, from pitch dark areas to a sunlit parking lot:



A thermal camera is less sensitive to problems with light conditions, such as shadows, backlight, darkness and even camouflaged objects; the thermal camera just keeps on performing.

In the images shown above, taken during a sunny day, a 640x480 thermal camera (images on the left) is compared to a 1280x800 visual camera (images on the right). In this situation, a person is detected by the thermal camera, but is hardly visible in the visual camera image.

2. All weather conditions

We have often heard that thermal cameras are sensitive to weather conditions. This is true. The image quality of a thermal camera is strongly dependent on weather conditions such as rain, fog and air pollution, but that does not mean that the visual camera provides better detection performance in such situations.



These images compare a 384x288 thermal camera to a 1280x800 visual camera. As you can see, despite the resolution difference, the detection capability of the thermal camera outperforms the visual camera – again.

Fewer false alarms

Visual cameras are often subject to false alarms caused for example by branches moving in the wind, headlights from cars, or simply a plastic bag flying by. Thermal cameras, on the other hand, can provide more reliable detection and recognition by adding image intensity to motion detection. This results in fewer false alarms and reduces unnecessary responses and actions by personnel.

3. Detection, Recognition and Identification

As shown in Chapter 2, the thermal camera is outstanding in detection situations. In recognition situations, thermal cameras also perform really well. In the images shown in Chapter 2, though the resolution of the thermal image is only 384x288, there is no problem at all in determining that a human is walking among the cars; when looking at the live video the thermal camera image gives us this information long before the visual camera has detected the movement at all.

When it comes to identification, we need to distinguish a typical identification performed by a visual camera (colors and faces) from an identification performed by a thermal camera. With the latter, an observer can distinguish and identify an object and the object's characteristics – for example, a person holding a crowbar. In general, at time of writing, resolution prohibits the use of thermal imaging as evidence in court. This means that whenever definitive proof of colors, faces or texts is required, the thermal camera needs assistance from visual cameras. However, the advantage here is that it is possible to use thermal cameras in situations where privacy is an issue, such as in schools.

To learn more about thermal imaging, see www.axis.com/technologies/thermal-imaging

4. Thermal data

In addition, thermal cameras also add thermal information to the image. They make it possible to monitor processes and detect abnormal behavior when temperatures change. Thermal cameras can be used to find heat leaks in buildings, and for example determine whether a car has been driven within a recent period. In the thermal images below, can you identify which cars have been driven recently?



5. When is a thermal camera the correct option?

Thermal cameras are the right option whenever any of the following is true:

- > Detection of intruders would be a key success factor for you
- > You need a surveillance solution that works in all conditions
- > You want to reduce false alarms
- > Thermal data can be used to your advantage
- > The object you are protecting is worth the price

To learn more about the range of thermal cameras available from Axis, please visit:
www.axis.com/products/thermal-cameras

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