



PROVIDING A PRACTICAL SOLUTION

Tony Holloway, Business Development Manager at 360 Vision Technology discusses how thermal imaging technology is supporting effective high-end security

The strength of thermal imaging lies in proactive surveillance where its deployment is used as an early warning mechanism for approaching people or objects, mechanical failure or process control issues.

Thermal cameras are an ideal first line of defence in terms of detection capability and, in the world of high security visual imaging and threat detection, the technology is playing an important role in protecting infrastructure and people.

For many years, there has been debate over the value of thermal imaging vs. cost. However, in recent times, things have changed significantly. Today, the technology is much more affordable, with some thermal imaging cameras available at comparable cost to quality professional video surveillance cameras. With affordable thermal imaging now available, the technology is on the agenda for a much larger number of sites and applications.

Thermal technology background

Operating in the lower infra-red part of the spectrum, at longer wavelengths than visible light, thermal images are produced by representing the differences in thermal radiation, or 'heat signatures', emitted or reflected by all objects within a field of view; using this differential information to produce high contrast images suitable for effective target detection, security personnel can detect a target of interest (such as a person or vehicle) and take early action for intervention.

Thermal imaging security cameras can operate in zero lighting conditions, offering situational awareness and enabling a surveillance system operator to 'see' what the human eye cannot, even in complete darkness.

Looking at the technology, we can group thermal imaging cameras into two main categories: cooled and uncooled. Cooled thermal cameras offer the ultimate performance

in terms of signal-to-noise ratio, delivering around three to four times the sensitivity of uncooled thermal cameras. Their higher sensitivity and longer focal length lenses enable detection and identification of objects over much greater target distances compared to that of uncooled devices. However, the cost of cooled thermal cameras far exceeds that of their uncooled counterparts and therefore rules them out of most enterprises' available budgets.

Uncooled thermal technology (9Hz)

For most high-end security and commercial applications, the deployment of professional quality uncooled thermal imaging cameras, available at an affordable cost, brings the benefit of useable long-range detection into the grasp and consideration for many organisations where the advantages and availability of 9Hz thermal camera technology can provide an effective solution.

Suitable for use within fixed fence line and large, wide-open spaces, thermal camera technology can be deployed in a diverse range of scenarios and applications; this provides a powerful situational awareness and detection tool for the vast majority of high-end security requirements to identify targets of interest at a distance.

Whether the need is for security, safety or equipment protection, critical infrastructure, borders, perimeters, utility sites, airports, bridges, ports and more can all be protected. In fact, anywhere where long-range open area detection is needed, uncooled 9Hz thermal cameras can provide a practical solution.

Detection, Recognition and Identification

The detection of a potential threat by a thermal imaging camera is the first step. Once an object of

interest is detected, it must be identified and its threat level assessed. Without clear, long-range visual analysis of detected threats (on land or water),

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surveillance system operators will not be able to distinguish between a false alarm or an alert that requires immediate intervention.

As already discussed, thermal imaging cameras detect people or objects by the differential heat signature for the Detection, Recognition and Identification (DRI) fulfilment of a target. However, it's desirable, from a systems perspective, to use a combination of camera types as thermal alone does not provide the type of evidential images we are familiar with within the visual surveillance spectrum.

As an example, a thermal camera could be used to detect long-range threats and activate an alarm trigger to a VMS. In response to the alarm event, an HD surveillance camera could be automatically directed to optically view the object detected as it continues to approach a site.

To fulfil the above surveillance detection and imaging scenario, 360 Vision Technology's range of Predator PTZ and Eclipse static uncooled thermal imaging cameras employ 'dual' camera technology,

within an 'all-in-one' housing. The camera combination of thermal and optical HD surveillance technology delivers high resolution images in all environments and is effective through smoke, dust, light fog, haze and complete darkness. ONVIF compatible, the cameras can be easily integrated into third-party VMS control platforms and advanced analytics.

With a thermal imaging range of up to 2.5kms (person detection), 360 Vision Technology's thermal technology can be used to easily detect vehicles, vessels and persons of interest. In addition to this, thermal imaging cameras can also be applied to applications such as process control, for example to detect excessive heat in pipelines, failing electrical insulators or elevated temperature exceptions, not to mention waste recycling/processing early combustion detection applications.

