



The use of Thermal Imaging in Security Applications

We live in a world where the growth of terrorism, violence and vandalism demands ever-increasing levels of security.

Thermal imaging is a technology which provides the ability to see whatever the prevailing lighting levels and weather conditions, and this unique ability to see in total darkness makes it an ideal tool for security and surveillance applications.

Although thermography is well established as an invaluable tool for diagnostic and preventive maintenance in manufacturing and process industries worldwide, thermal imaging has previously been limited by cost to a small number of specialist military and professional security applications. The latest generation of thermal imaging technologies however, is being applied to a comprehensive range of professional and commercial activities.

Security Application

As it requires no external lighting and can provide images of intruders even when obscured by fog or smoke, the thermal imager is ideal for the protection of a wide range of establishments and associated personnel. The deployment of the imagers may be within the plant, to monitor the perimeter of the plant or to protect specific high value assets. The imagers may be handheld or fixed (platform mounted).

Examples of the applications are:

- Government premises, embassies
- Public facilities, studio, schools
- Commercial complexes, retail outlets, utilities, warehouses
- Factories, hotels, private residences
- Infrastructure, airports, train stations, nuclear power plants, petrochemical facilities, pipelines, bridges
- Military establishments – barracks, airfields, fuel and ammunition depots.

Surveillance Applications

The cost of the equipment has meant that thermal imaging, as far as Law enforcement is concerned, has been restricted to Police helicopters with specialist teams. Thermal imaging is now available at a price, which means that a handheld camera can be provided for individual police units or even officers. Also used for border surveillance and a range of police applications:

Border surveillance

Handheld, fixed or vehicle-mounted systems can provide the immigration services with effective detection of potential illegal immigrants. This same technology can enable the coastguard to monitor large stretches of coastline and waterway; this is resulting in increased detection of illegal intrusion, smuggling and fishing etc.

Police Applications

The main applications for the police are concerned with covert surveillance and reconnaissance, pursuit of villains or searching for missing persons. Most of these

utilize the night vision capability of the instrument. Examples of the use of vehicle or handheld cameras for this purpose are:

- Suspects can be detected behind foliage in darkness and poor visibility.
- Suspects can be tracked in the open without being alerted.
- A scene can be swept quickly in total darkness to locate either a suspect or a missing person.
- The image storage capability of the instrument enables an officer to look round corners in safety.
- Search operations can be accelerated by detecting the heat signature of a footprint on a carpet or a handprint on a doorknob.
- Vehicle search operations can be accelerated by detecting the heat signature of a vehicle that has been recently operated.

There are a variety of other applications, which involve the temperature measurement capabilities of the imager. One example of this is the detection of cannabis factories – whereby the “giveaway” temperature profile of the building can be monitored by night or day – without the involvement of an expensive helicopter.

Thermography

Infrared thermography is one of the most important sensing technologies to be applied to the detection and monitoring of manufacturing and production equipment. Until recently this sophisticated technology was prohibitively expensive, being driven primarily by military applications; over the last few years, however, the technology has improved and it has been introduced to high volume commercial and professional applications by innovative companies such as Wahl. This has brought the price down to a level, which is opening up a host of new applications.

Thermal imagers measure the infrared energy emitted by surfaces remotely and are consequently extremely simple to operate, as no physical contact is necessary. Many facilities have employed thermographers to carry out inspections every 6 or 12 months; the cost of the equipment and its ease of use mean that these inspections can now be carried out as and when required by the organizations own maintenance staff. Appropriate thermal imagers no longer need to cost \$45,000 or more; for example the comprehensive range of imagers from Wahl starts from less than \$2,500 – less than the cost of a single survey from a thermographer. It is the affordability of the current generation of imagers that make them eminently suitable for the mainstream security and surveillance marketplace.