24/7 SECURITY SURVEILLANCE TECHNOLOGY
OVERCOMING SECURITY BLIND SPOTS

DRS Technologies, Network and Imaging Systems Group

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Security surveillance systems are only as effective as their ability to see and warn of intrusions. While today's video technology has significantly extended the perimeters of detection, many blind spots remain, hindering its success.

Errors in human decision-making, equipment malfunctions and lack of timely data can cripple surveillance operations; and prompt detection can become uncertain in the dark of night or in adverse weather. Advanced technology however, is helping to close these gaps in surveillance systems. A fully integrated system will incorporate six building blocks that can transform video surveillance into a reliable, all-weather, 24/7, low-cost, automated, remotely operated network.

Building Blocks for Effective, Integrated Surveillance

1. **Passive thermal imaging:** While camera systems are effective for visual assessment over wide areas, at night their impact can drop dramatically. Active illumination systems operate only over limited areas, making detection at a distance unlikely. Thermal cameras, on the other hand, can be effective day and night because they produce sharp video images from infrared (heat) rays that are emitted by people, structures and objects, whatever the ambient temperature may be. As a result, they can detect potential security threats from great distances, day and night, in areas with no visible light and in conditions of dust, haze, light fog or smoke. The latest of these devices are built on an IP platform to allow for networking with other security and surveillance equipment. Due to advances in technology, passive thermal detection is becoming increasingly affordable and offers higher performance, such that it must be considered in the mix of affordable, reliable and practical technologies for surveillance imaging.

2. **Automatic detection:** Observing a potential threat on a monitor is an important capability, but it is effective only if an operator is watching the screen when the threat emerges. When several cameras are deployed and must be monitored, the chance of seeing the threat approach becomes even more difficult. The security industry has tried to meet this challenge with video analytic systems, but conventional analytics produce high false alarm rates and are limited to motion detection. New-generation video analytics, however, perform more complex image analysis, greatly reducing false alarms and detecting additional dangers, such as perimeter breach, loitering and suspicious objects.

3. **Remote camera operation and threat assessment:** Once video surveillance alerts an operator to a possible threat, many questions may arise. Where is the object? Where is the object in relation to other detected objects? Where did the object originate, and where is it going? How can the object be followed as it leaves the camera's field of view? The change is underway for video surveillance cameras to be designed to make intelligent video analytic decisions at the camera sensor itself, or what is referred to as "at the edge". Internet protocol (IP) cameras with intelligent video analytics at the edge provide answers to many of these questions. Adding tamper-proof capability to these "sensors at the edge" creates a powerful force multiplier for the ability of any system to remotely assess threats.

4. **Wide-area command and control:** A variety of cameras, with multiple fields of view, that are fully integrated into a surveillance solution are key to command and control, enabling users to roam seamlessly from one location in the site to the next. For large sites and sites distributed nationwide, however, operators must manage large numbers of alarms that are received from sensors of any type and coordinate rapid local responses. The response may include slaving one or more 3D immersive (allows imagery from multiple cameras to be stitched together) surveillance systems, with their operators, to perform visual

assessment of a particular alarm event. A wide-area command and control system can provide such a capability.

5. **Total cost of ownership:**
Analysis shows that the latest video and thermal imaging technology consistently offers a lower total cost of ownership. Low-maintenance thermal cameras now can be purchased at significantly lower prices than

active DVT, CCTV or image-intensified low-ight cameras, all of which— unlike thermal cameras— require illumination infrastructure and lighting maintenance.

6. Consideration of future trends: Certain trends are emerging in passive thermal security surveillance.

   These include:

   - IP connectivity and the associated standards,

bandwidth considerations and analytics

- Power over Ethernet (PoE), which allows an Ethernet cable to deliver both data and power to devices

- SWAP-C improvements—Size, weight, power and cost are being quickly reduced

- Embedded analytics with distributed "decision-making-at-the-edge"

Summary

For a fully integrated and consistently operational security system, organizations should incorporate networked/remote video surveillance with passive long-wave thermal cameras that offer embedded automated detection capability, remote tamper-proof camera operation for threat assessment and a wide selection of surveillance options at an affordable cost. Understanding both the limitations and advances of technology can help decision-makers invest in the right products and services with results that meet or exceed system performance expectations.