

# End of the Spectrum

## IR Technology Aids in the Battle against SARS

Six months ago the world had never heard of Severe Acute Respiratory Syndrome (SARS). However, by mid-July, more than 8000 probable cases of this potentially fatal disease had been reported in 32 areas around the world. More than 800 deaths resulted from those reported cases, and the World Health Organization (WHO) labeled SARS "the first severe and easily transmissible new disease to emerge in the 21st century."

As the SARS epidemic began to spread at a rapid rate, health officials acted quickly to try and contain the disease. With no known vaccine or treatment for SARS, measures used to stem the outbreak included tracking the patterns of transmission, rapid detec-

tion and isolation of individual cases, quarantine of those in contact with the disease, and travel restrictions. Infrared (IR) technology was quickly put to use as one method for rapid detection of potential SARS cases.

According to the Centers for Disease Control and Prevention, person-to-person contact is the primary way that SARS is contracted. The disease spread quickly to many different countries through international air travel. Therefore, many airports required a way to quickly and noninvasively screen passengers for disease. IR thermal imaging offered an efficient solution.

All objects with a temperature above absolute zero (0 K) emit IR

radiation. Cameras using IR imaging technology detect IR radiation and convert it into a monochrome or multicolored image wherein various shades or colors represent the thermal patterns of an object. The main symptoms of SARS include a high fever (greater than 38 °C) and a cough or difficulty breathing. Several companies quickly developed IR imaging technology specifically designed for SARS detection.

Indigo Systems (Goleta, CA) and WinSoft (Santa Ana, CA) developed a human skin temperature monitoring system with accuracy of  $\pm 0.5$  °C. The ThermoSTAT monitoring station can be set up at building entrances or in airports to screen people as they walk past or wait in lines. The system noninvasively images the facial area in real time and self-calibrates continuously for accurate skin temperature readings. When a subject registers a temperature reading outside a pre-set value, the system triggers an alarm and alerts the operator of the potentially abnormal condition. Once identified, the feverish person can be directed to medical personnel for examination, testing, treatment, and/or isolation.

Rudy Machuca, product manager at Indigo Systems, said that IR detection played a very large role during the SARS epidemic. "The key thing is that it doesn't necessarily stop the spread of the virus, but it acts as a system to monitor temperature levels," he said. In the case of SARS, fever detection is an important first step in the screening process.

Cantronic Systems (Coquitlam, British Columbia) also developed a SARS screening system. The FeverScanM3000 operates on a similar

principle as other IR imaging technology, but includes a software program specifically developed for mass screening of fever symptoms. The system is capable of evaluating hundreds of people per minute.

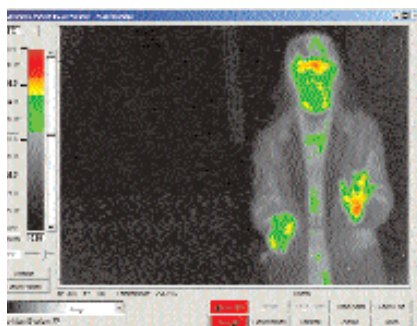
Mark Mandell, vice-president of sales and marketing at Cantronic Systems, said that IR detection played a role as one of many tools that were put to use during the SARS epidemic. "I think the most important role that it played was giving the general public a bit more peace of mind knowing that every step was being taken to help stop the spread of the virus," he said.

In his paper, "Thermal Imaging for Detecting Potential SARS Infection," R. James Seffrin, director of the Infrascpection Institute (Burlington, NJ), discusses the positives and negatives associated with IR screening systems. He states, "Although the use of infrared instruments to measure body surface temperatures has many advantages, there are human, environmental, and equipment variables that can affect the accuracy of collected data."

The SARS epidemic appears to have been contained, but WHO warns that the world must remain vigilant, as a resurgence of the disease is a possibility. Although it may have its limitations for SARS screening purposes, the use of IR imaging in medical applications is growing. IR technology also has applications in many other fields, including military, surveillance, process monitoring, and environmental studies. ■

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A sample IR scan from Cantronic Systems FeverScanM3000 system.

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