Smart Video Security Handbook

A Practical Guide for Catching Intruders Before They Act

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Table of Contents

Executive Summary

Thwarting Terror, Stopping Theft: The Future of Outdoor Smart Video Security

I n June 2002 one of the authors of this book, John Romanowich, toured the World Trade Center site in lower Manhattan along with several other leading video technology experts.

Not quite two years had passed since a terrorist attack had taken down the Twin Towers, killing nearly 3,000 people. The area was both a crime scene and an active construction zone. Romanowich and his colleagues had been invited by the Port Authority of New York and New Jersey to determine whether video surveillance could provide security for the work being done there.

Their answer was an unequivocal "No." The video technology of the day just wasn't up to the job. The visible-light cameras typically used in surveillance systems were useless in the dark, while the video from costly thermal night-vision cameras was blurry, indistinct, and difficult to interpret. Even the logistics didn't make sense: installing and maintaining the necessary wired infrastructure was too difficult and expensive.

Today their answer would be totally different. New thermal video technology has swept away barriers of cost, complexity, and compromised performance. It is already delivering comprehensive 24-hour protection at sites that are a lot more difficult to secure than the 2002 World Trade Center.

In fact the smart cameras described in this book now secure the National September 11 Memorial at the new World Trade Center.

Smart thermal video technology gives security professionals a tool for creating the outdoor equivalent of a burglar alarm. It can

- Detect and display unusual movement on a site at any time of day or night, in almost any weather
- Assess the threat potential of each incident
- Alert security personnel when a threat is credible
- Direct cameras with telephoto lenses to zoom in for a closer look
- Supply the geo-registered location of the threat so guards can reach it faster and stop intruders before they act

We are truly at the dawn of a new era in outdoor site security.

This advanced technology arrives when theft is rampant and the whole world is under threat of terrorist attack. Well-organized criminals carry out raids on poorly protected storage areas. Misguided fanatics driven by nationalism, ethnic hostility, or religious extremism are willing and able to travel across countries and across borders to commit acts of sabotage and terror. They regard buildings, public spaces, airports, and infrastructure as convenient targets of opportunity. And while less dramatic than terrorism, theft and vandalism at outdoor facilities are more common and lead to millions of dollars of lost revenue.

Smart thermal video security systems can thwart these plans. The reason: video is the ultimate human intrusion detector. Instead of a single point of information about an intrusion from a fence-mounted sensor, video covers the area with thousands of information sources, updated 30 times per second. No other security technology, including radar, can match its coverage, its detection reliability, or its accuracy in dismissing false alarms.

Unfortunately, very few outdoor sites are protected by such thermal video systems. Now that cost and complexity have both fallen, security professionals should move to implement the newer technology wherever security is a true concern.

It is our hope that this handbook will accelerate adoption of the newer technology. It contains detailed information and advice on all the steps necessary to create and implement a truly effective video security system, from strategic planning to equipment selection, site design, and installation.

Those topics will be covered in later chapters. Here we are concerned with presenting the basic goals and advantages of smart thermal video security. We will also point to new directions in smart visible-light video that promise to transform indoor security operations the way smart thermal technology has reshaped outdoor protection.

Security: Not Just How, But Who

We'll start with a fundamental truth: security is only as effective as the people who provide it. However smart the alarms, alerts, and video systems may be, they can't make the final judgment to call the police or otherwise intervene when there's an intrusion on a site. Only the on-site security staff or the staff in a central station monitoring office can do that.

Given this obvious fact, the primary goal of any security support system should be to make the staff more efficient and more effective. Unfortunately conventional video surveillance systems, the kind that millions of sites have used for decades, don't do much to achieve the goal. In some ways they even work against it by creating a false sense of security.

Conventional video systems put surveillance cameras at strategic locations around a site, and display their imagery on one or more video

screens in the security office. A video surveillance system may offer basic video analytics, allowing it to alert the guards when there is unusual movement in one of the covered areas, and it usually records the video for later review.

This helps security personnel the way a pair of binoculars helps a sentry in a tower. There's no question that the sentry is better off with binoculars. He doesn't have to patrol the site constantly to find out what's going on, and if he spots something out of the ordinary, he can focus on it. He can even record what he sees in a duty log.

But his field glasses are passive – and so is surveillance video. Both extend the user's view, but neither makes an active contribution to the security function. That is, they do not help staff detect and analyze potential threats more efficiently and effectively.

Smart video security systems, on the other hand, are active by design. They deploy cameras with built-in intelligence. These cameras optimize the video, detect unusual activity in the video stream, and bring it to the attention of humans to analyze its threat potential. And they do this with high accuracy over very large areas. They are the equivalent of having extra agents in the field, screening information and only alerting the main security staff when what they find is suspicious and actionable.

Essentially, then, a smart video security system is a force multiplier, taking the burden of monotonous surveillance off regular security staff. Instead of just watching endless video feeds, the staff gets information that lets them do their jobs better.

That in a nutshell is the crucial difference between video *surveillance* and video *security*. Video *surveillance* is passive. Its presence does not significantly impact the way a security staff works. Video *security*, on the other hand, is active. It helps the staff work smarter, which enhances the security function at every level.

Dependable Alerts, Assured Response

Effectiveness and efficiency involve more than just working smarter. We also want to help our security forces respond quickly and dependably when there is a serious perimeter breach. As recent widely publicized break-ins at high-profile sites prove, quick response is not a given, even when an elite force guards a facility.

In 2014, for example, one man got his 15 minutes of fame when his trespass into the White House made every network newscast and cable news channel. He had managed to bypass Secret Service patrols, cross the White House lawn, gain entrance to the building, and penetrate as far as the Green Room. His progress was relayed to Secret Service guards in live video feeds, but nobody moved to stop him.

In 2012 a group of three protesters, including an 82-year-old nun,

penetrated the heavily protected Y-12 National Security Complex. They spent two undisturbed hours inside the nation's largest nuclear materials storage facility before members of its 500-strong security force showed up.

There have been similarly troubling incidents at many government and military facilities over the past few years, and at airports, infrastructure installations, and other important and vulnerable locations. An Associated Press investigation found that intruders successfully evaded security at America's busiest airports at least 268 times between 2004 and 2014, getting on site, driving cars onto runways, even hopping onto jets.

Alert Fatigue

Who's at fault? In most cases the shortsighted response is to single out the security force as scapegoats. The guards were not alert. They did not respond to warning signs. They didn't take their job seriously. They and their bosses should be punished.

This rush to judgment ignores the real problem: alert fatigue. Security officers are charged with maintaining 24-hour vigilance about what is happening at their outdoor facility. After responding to hundreds of alerts about perimeter breaches that turn out to be nothing more than small animals or windblown branches, even the most conscientious security guards lose confidence in the system and start to ignore its warnings. That is simply human nature.

"Hundreds of alerts" is not an exaggeration. A recent study compared a conventional visible-light video surveillance system with analytics to a smart thermal video security system. The surveillance system posted 750 nuisance alerts during the study. At the same site and in the same time period, by contrast, the smart video security system registered only a handful of alerts, just enough to prove that it was on the job.

Clearly what we have called alert fatigue is a serious problem. You cannot protect an outdoor site if the security staff begins to ignore the intrusion warnings it receives. Systems that inundate guards with false alarms do not enhance their effectiveness – they diminish it.

> "After hundreds of alerts turn out to be small animals, it's simply human nature to start ignoring them."

More seriously, eventually one of the warnings will not be a nuisance alert. It will be a real breach. Will the guards respond?

They will if constant nuisance alerts have not undermined their confidence in the system's reliability. As this handbook will make clear, smart thermal video security systems promise to detect all intrusions, but ignore almost everything that isn't a threat. They don't flood the security staff with false alarms. They provide

only actionable information, and help the staff verify the nature and scope of every breach.

Smart thermal video security is the obvious choice for outdoor site security applications in our modern world.

Practical Matters

Our objective in this handbook is to describe today's best practices in site security, and to provide a practical guide for designing and using video-based outdoor systems. Topics will include

- Advantages and limits of smart thermal video security
- How to select the proper equipment and use it effectively
- Designing systems for effectiveness, easy implementation, and low cost
- Ensuring maximum site coverage and prompt response to events
- Sample site plans for security systems, with diagrams and explanations
- Using smart thermal video with a security operations center (SOC) or central station (CS) monitoring service

Part I of the book introduces smart thermal video technology and explores its potential to transform site security. Chapter 1 will be of particular interest to policy makers and facility managers for its summary of where we are today in video security technology, and its description of the tools available to protect outdoor assets. It is essentially a case statement for upgrading facilities to a newer, far more effective technology.

Chapter 2 explores the technology of smart thermal video and its benefits when used to protect an outdoor site, while Chapter 3 covers questions of cost from system and operational perspectives.

Part II covers the nuts-and-bolts of planning and designing an effective video security system to detect intruders and alert security staff to threats. Chapter 4 covers the selection of cameras and other equipment and shows how to implement their various functions. In Chapter 5 readers will find model site designs to give them a starting point in building their own systems.

Finally, Chapter 6 is our attempt to look ahead at what the future holds for the people responsible for maintaining the security of outdoor sites and their assets. It covers corporate and public security, and foresees the application of smart video technology to the monitoring and protection of indoor spaces and residential and personal property as well.

There can be no doubt that the threats we face will change and grow over time. Video technology must evolve to counter new methods of attack. The good news is that the technology is as flexible as it is powerful. There's a lot of room left to develop sophisticated new functions as countermeasures against those who would do us harm.
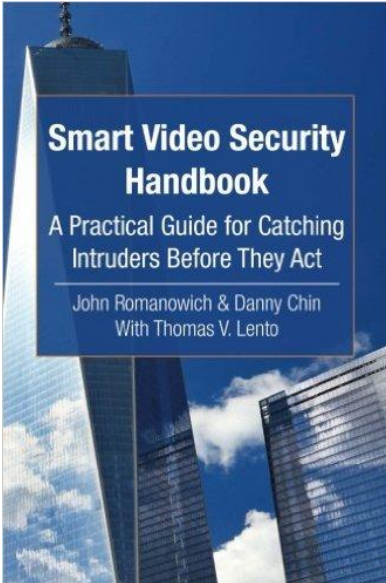
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For more information on SightLogix perimeter security and outdoor video security solutions, call (609) 951-0008, email info@sightlogix.com or visit www.sightlogix.com.

We're at the dawn of the next billion-dollar market within the security industry. Gone are the days of passive solutions that left us vulnerable to serious problems of theft, vandalism, and acts of sabotage. The Smart Video Security Handbook covers all major aspects of today's most advanced video security systems, helping you deploy a proactive tool for thwarting intruders before they act.

SightLogix was co-founded by CEO John Romanowich over a decade ago, in the aftermath of the 9/11 attacks on the World Trade Center. From the start, the team was dedicated to making the world's most accurate and reliable smart video security system. The Smart Video Security Handbook incorporates many of the lessons learned about video technology and its practical applications, and provides a vision about what to expect in the future.

Praise for the Smart Video Security Handbook

"The Smart Video Security Handbook is a well-written, no-nonsense guide that provides clear, thoughtful advice about the practical application of thermal technology to reduce risk and increase security effectiveness. It's a must read for anyone responsible for choosing or applying technology to protect people, property and assets."

- **Greg Olsen**, Entrepreneur, third Private Citizen in Space

"The issues addressed in The Smart Video Security Handbook are top-of-mind for the readers of Security Systems News. Romanowich believes smart video will be the next billion dollar market, and he makes a convincing case for its adoption today and predictions about how it may be used in the future."

- **Martha Entwistle**, Editor, Security Systems News

"The value of smart camera technology has been proven at critical outdoor locations. Their lower costs, higher performance and verification capabilities also make them a perfect fit for indoor security applications, which is of significant interest to CSAA membership. The Smart Video Security Handbook is ideal for security professionals who seek to gain from the next wave of security electronics innovation."

- **Jay Hauhn**, Executive Director, Central Station Alarm Association