

## Prevent North America from going dark

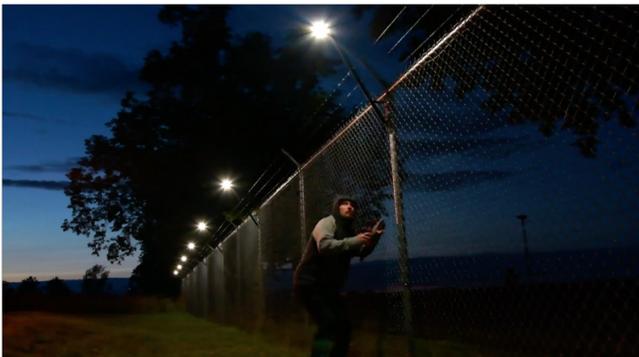
There are over 70,000 electrical substations in the United States<sup>1</sup>. A simultaneous attack on several of these could destabilize the grid and cause widespread blackouts. But even a non-targeted event like vandalism or copper theft could still cause substantial damages, easily reaching into the tens of thousands of dollars (if not much greater when potential liability and service outages are considered).

To prevent costly incidents and meet the National Electrical Reliability Commission's Critical Infrastructure Protection regulations (NERC CIP-014), electrical utilities need to assess the vulnerability of critical assets like substations, have an independent third-party review the results, and then implement the required physical security upgrades, typically via a phased-in approach<sup>2</sup>.

Perimeter Intrusion Detection Systems (PIDS) can be a key part of an overall physical security plan, offering highly effective, cost-effective protection. For the system to be a success, especially when deployed at remote and unmanned sites, it must meet the following requirements:

- Reliably detect and deter would-be intruders
- Avoid complacency by minimizing nuisance alarms
- Be cost-effective for smaller, remote sites
- Offer scalable integration options, with support for existing security, communications, and/or SCADA networks

This document looks at how Senstar (specifically FlexZone®, FiberPatrol®, Senstar LM100™ and Senstar Video Analytics) can directly address these requirements.



PIDS systems can trigger on-site devices to deter intruders



### DETECT INTRUDERS AT THE PERIMETER — BEFORE THEY GET INSIDE!

The first step of any security plan is to deter intruders. Fences provide a physical barrier but these can easily be bypassed. An effective security system communicates to intruders that their presence is known, they are being watched, and response forces may already be dispatched.

Senstar perimeter intrusion detection sensors turn existing fences into smart fences, detecting and locating attempts to cut, climb, or lift the fence fabric. They are field-proven, difficult to defeat, and work reliably in rain, snow, and wind. Senstar video analytics complement the sensors by providing the ability to detect and track people and vehicles both inside and outside the perimeter.

When an intruder is detected, the generated alarm (which includes intrusion zone or precise location) can be used to trigger other on-site security resources, including PTZ cameras and deterrent devices like sirens, loudspeakers, or security lights. The system can be monitored by centralized security personnel, enabling them to assess the situation remotely and dispatch a response if required.

Senstar's newest product, the Senstar LM100 Hybrid Perimeter Intrusion Detection and Intelligent Lighting System, includes built-in capabilities to deter intruders. Highly configurable, its perimeter lights can be set low (e.g. 30% intensity) during non-events in order to reduce light pollution and electrical usage. When an intruder is detected, the lights can instantly switch to full intensity as well as strobe the luminaire nearest the intruder. In addition to providing uniform illumination along the perimeter for on-site cameras, the intelligent lighting acts as a profound psychological deterrent.

### A COMPARISON OF SENSTAR PERIMETER INTRUSION DETECTION SYSTEMS

The following table provides a quick comparison of FlexZone, FiberPatrol, the Senstar LM100, and Senstar Video Analytics systems:

Product	Technology	Common Applications	Key Strengths
<p><b>FLEXZONE</b></p> 	Fence-mounted sensor cable	Small and medium sites	Low cost, easy to install.
<p><b>FIBERPATROL</b></p> 	Fence-mounted fiber optic sensor cable	Medium and large sites	Lighting and EMI-immune. No active electronics in field.
<p><b>SENSTAR LM100</b></p> 	Fence-mounted perimeter lighting with embedded accelerometers that detect intrusion attempts	Sites without existing security lighting or those using energy inefficient technologies	Combines intrusion detection and perimeter illumination into one product. Substantial cost savings (up to 95%) over non-LED-based lighting.
<p><b>SENSTAR VIDEO ANALYTICS</b></p> 	Embedded or server-based video analytics to track people and objects	Sites with existing surveillance infrastructure or to provide an additional layer of security	Flexible deployment options. Can monitor movement inside or near the perimeter.

## AVOID COMPLACENCY BY MINIMIZING NUISANCE ALARMS

Avoiding nuisance alarms generated by weather, animals, and lawful people is critical to the overall success of the system. Too many nuisance alarms and security personnel may ignore valid alarms or hesitate to initiate a response until it is too late.

Senstar designs its systems from the outset to minimize nuisance alarms:

- Ranging data from sensors is used to recognize and compensate for site-wide environmental disturbances like high winds or rain.
- Alarm algorithms are optimized so that alarms are generated only from realistic intrusion attempts (e.g. a ball hitting the fence doesn't trigger an alarm, nor do nearby grazing animals).
- Sensors are designed and tested for reliable operation in extreme environments (-40 to +70 °C/-40 to 158 °F).
- Maintenance staff can use the precision ranging to quickly find and resolve problematic areas (for example, an area with loose fence fabric).

## ENHANCE SECURITY WHILE MINIMIZING CAPITAL AND OPERATIONAL COSTS

The additional security provided by an intrusion detection system far exceeds that of its cost:

- Fence-mounted systems are only a small fraction of the cost of the fence itself.

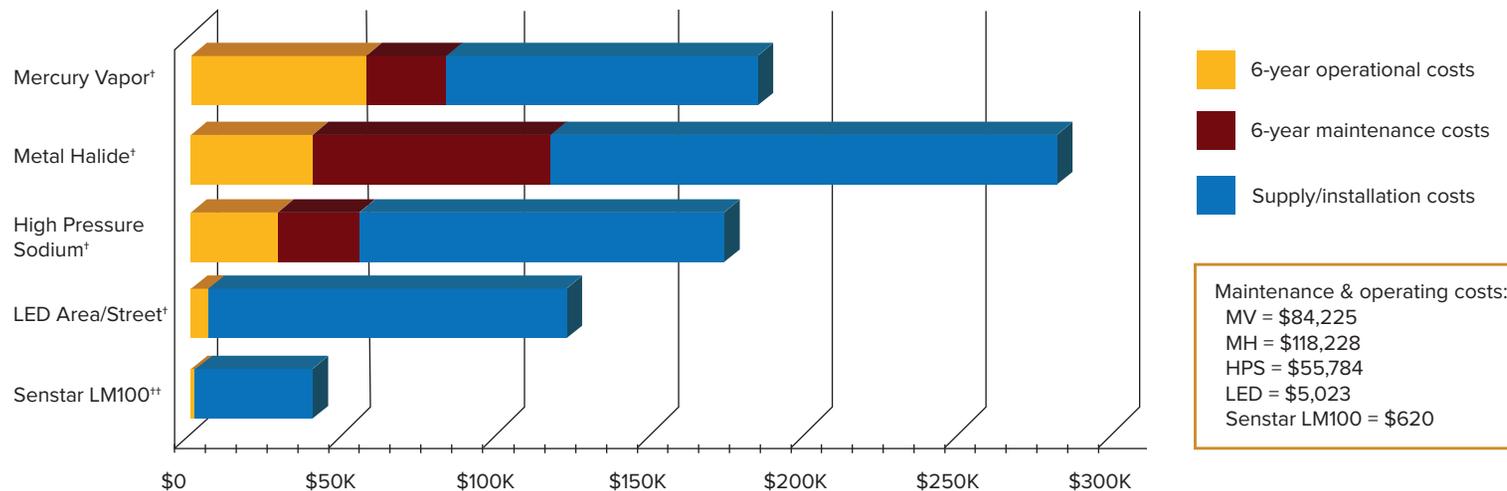
- The Senstar LM100 reduces electricity consumption and maintenance costs by as much as 95% when compared to perimeter lighting from traditional security lighting technologies.
- Fewer security incidents and/or insurance claims.
- Reduced nuisance alarms and precise ranging data leads to fewer and shorter on-site visits.

## SCALABLE SOLUTIONS THAT MAXIMIZE EXISTING INVESTMENTS

Depending on implementation and budgetary considerations, security directors may choose to implement security enhancements in stages. It is critical that security devices offer scalable, cost-effective solutions that maximize existing investments.

Senstar equipment uses common protocols and interfaces, so that additional sensors may be added while preserving existing investments. In addition, the equipment is designed to minimize infrastructure requirements:

- FiberPatrol offers an extended coverage distance with no in-field components.
- FlexZone can transmit power and communications over the sensor cables to simplify inter-device communications and wiring.
- The Senstar LM100 uses an encrypted wireless mesh network for communication between luminaires.



The maintenance and operating costs of the Senstar LM100 versus other perimeter lighting solutions. Electricity cost assumes 11¢/kWh.

† Based on 30-foot lighting standard used for HPS, MH, MV and LED area lighting.

†† Civil cost at \$20/hour for installation.

## INTEGRATE WITH ON-SITE AND REMOTE SECURITY MONITORING SYSTEMS

Senstar sensors can be integrated with a variety of security systems, including on-site alarm panels, a Security Management System (SMS), a Video Management System (VMS) and/or a SCADA control system:

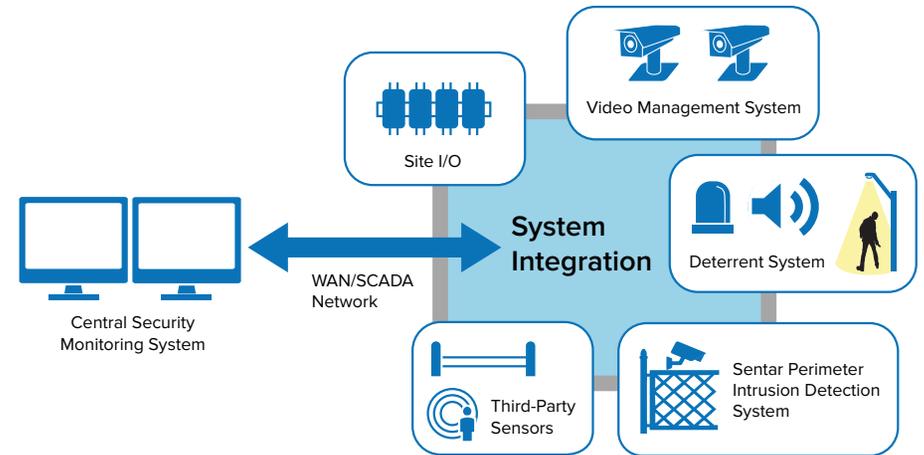
- Hardware I/O: Events and alarms are mapped to general purpose I/O collectors or alarm panels.
- Generic event interface: Events are summarized by Senstar Network Manager software and transmitted to the head-end via an open interface (e.g. ASCII text over serial, UDP, or TCP/IP).
- SDK with full API: All Senstar products include a robust, field-tested API that enable sensor integration with industry-leading Senstar and third-party security and video management systems.

## CONCLUSION

To protect remote and unmanned electrical substations, utility operators need solutions that are reliable, minimize nuisance alarms, are cost-effective, and easily integrate into their existing security systems and networks. Senstar products meet these requirements, providing field-proven detection and deterrent technology to help address NERC CIP-014 regulations.

## NEED ADDITIONAL INFORMATION?

For more than 35 years, Senstar has been protecting thousands of sites around the world. Senstar can look at your security requirements remotely by using Internet-based mapping tools like Google Earth and quickly provide a high-level assessment and quotation. Contact us at [info@senstar.com](mailto:info@senstar.com) to discuss your security requirements.



Senstar offers a wide range of integration options

1. [https://www.harriswilliams.com/sites/default/files/industry\\_reports/final%20TD.pdf](https://www.harriswilliams.com/sites/default/files/industry_reports/final%20TD.pdf)

2. <http://www.nerc.com/pa/Stand/Reliability%20Standards/CIP-014-2.pdf>