SENSTAR

Physical Security Technologies for Correctional Facilities
Intelligent. Innovative. Integrated.

Agenda

About Senstar

Security Challenges

Application Solutions

Senstar Products

System Integration

Q&A

SENSTAR®

Overview

With intelligent video management, video analytics, access control, and innovative perimeter intrusion detection systems, Senstar offers a comprehensive suite of proven, integrated technologies.

PIDS Facts	VMS Facts
35+ years experience	18+ years experience
50,000+ km of installed sensors	25,000 VMS deployments
World-wide service and support	World-wide service and support
World's largest privately owned PIDS test facility (harsh environment)	Leader in intelligent video management solutions
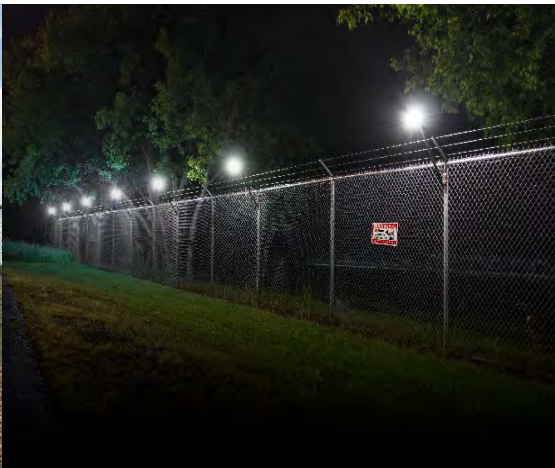
Global Reach, Local Support

Headquarters, manufacturing & sensor development:
Ottawa, Canada

Video and SMS development:
Waterloo, Canada

350+ employees worldwide,
150 technical staff

Strong balance sheet, cash on hand, no debt

Proven track record for long-term stability and support

SENSTAR

Industry Experience

Senstar has over 35 years of extensive experience in securing correctional facilities around the world. Our equipment is used at:

- All Canadian federal facilities
- Over 90% of all US federal facilities
- Numerous US state and private facilities (Florida, Tennessee, Nebraska, and Michigan)
- Other countries: Germany, Mexico, Brazil and UK

CORRECTIONAL FACILITIES

Security Challenges

SENSTAR

Corrections Unique Security Needs

- Physical security barriers such as fences are mostly to keep people in

- These physical security barriers also mitigate contraband ingress from the outside

- Dual physical barriers are used around the facility to create a sterile area between the fences

- Physical barriers up to 14' in height need to be monitored along its entire height

- Multi-layered security approach is always incorporated

- Correctional officers need immediate, precise information to quickly respond to security incidents in large facilities

Corrections Security Concerns

- Government regulations
- Budgetary concerns
- Riot prevention
- Overcrowding concerns
- Sites with differing security requirements such as Minimum, Low, Medium, Max and Super Max
- Contraband concerns
- Reliability and training concerns

CORRECTIONAL FACILITIES

Application Solutions

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Perimeter and Sterile Area

Requirement	• Regulatory compliance • Public safety • Protection against escape attempts • Protection against contraband smuggling
Site characteristics	• Fenced and double fenced (sterile area) • Extended height (12 to 14 feet), with razor wire on top, bottom, and/or sides • Heavy use of outdoor lighting • Multi-layered approach

FlexZone

Fence-mounted locating sensor:

• Scalable for any size of perimeter

FiberPatrol FP400 or FP1150

Fence-mounted fiber optic sensor:

• Non-conducting, lightning immune

OmniTrax

Buried locating volumetric sensor:

• Covert, low vulnerability to defeat

X-Field

Free-standing electromagnetic field sensor:

• Narrow detection zone, up to 7.3 m (24 ft)

UltraWave

Bi-static microwave volumetric sensor

Symphony VMS

Scalable, affordable video management with built-in analytics:

•Outdoor people and vehicle tracking

•PTZ auto-tracking

•Crowd Detection

•PIDs mapping & alarm

Sally Port

Requirement	• Regulatory compliance • Public safety • Protection against escape attempts • Protection against contraband smuggling
Site characteristics	• Mix of technologies required • Multi-layer approach • Swinging and/or sliding gate types

FlexZone
Fence-mounted locating sensor:

• Effective and affordable

• Easy to install on existing fence

UltraWave

• Bi-static microwave sensor

• Stackable

• Use multiple pairs for overlapping coverage

Wireless Gate Sensor (WGS)

• Effective and affordable

• Effective with all gate types

Symphony VMS
Scalable, affordable video management with built-in analytics:

• Outdoor people and vehicle tracking

• PTZ auto-tracking
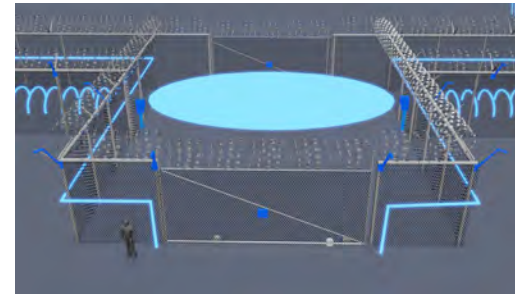
Gate Protection

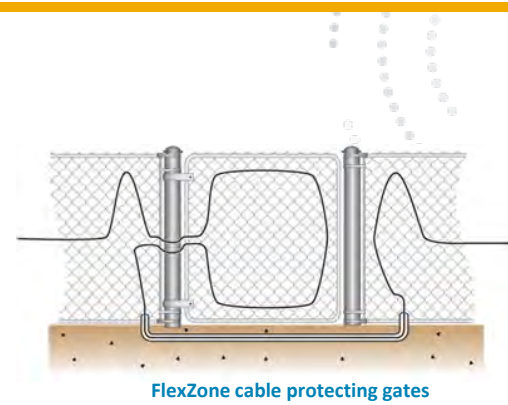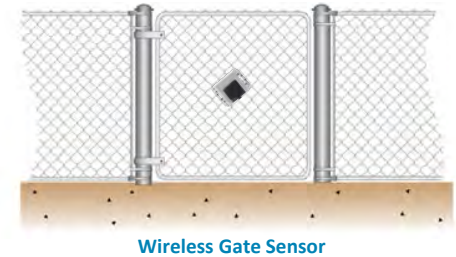| Requirement	• Regulatory compliance • Public safety • Protection against escape attempts
Site characteristics	• Mix of technologies required • Multi-layer potential • Swinging or sliding gate types

FlexZone

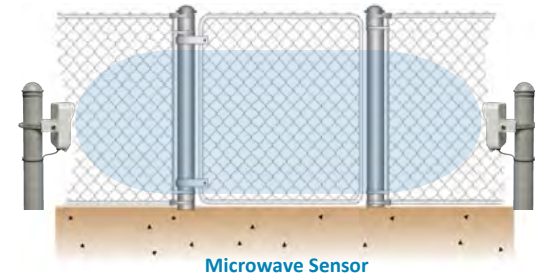Fence-mounted locating sensor:

- Most effective with swing gates

FlexZone cable protecting gates

Wireless Gate Sensor

- No infrastructure required at gate

- Effective with all gate types

- Easy to install, minimal maintenance

Wireless Gate Sensor

UltraWave

Bi-static microwave volumetric sensor

- Works in all weather conditions

Microwave Sensor

Guard/CO Duress

Requirement	• Regulatory compliance • Guard/Corrections Officer (CO) safety • Protection from CO attack from inmate • Protection for CO health distress issue
Site characteristics	• Distributed receivers • CO allocated transmitter • Computer/software monitors receivers • Duress event notifies response force

PAS

Personal Alarm System for Emergency Response

- Ultrasonic based system
- Location to nearest room

Flare

Real-Time Locating System

- RF-based system (protected RF bands)
- Location to within 6 m (20 ft)
- No interference with other RF electronics

CORRECTIONAL FACILITIES

Senstar Products

SENSTAR.

FlexZone

Description

- Sensor cable attaches directly to surface (fence, wall, or building structure)
- Alarms reported by zone and cable distance (±3 m)
- Cost-effective for small sites but scalable for all sites
- Up to 600 m (1968 ft) of coverage per processor
- Up to 60 reporting zones per processor

Key Benefits

- Low cost, easy to install
- Works with virtually all fence types
- Reduced infrastructure (power & comms over sensor)
- Software-defined zones
- Ranging minimizes weather-generated nuisance alarms, assists in locating problematic areas (e.g. loose fence fabric or sign)

FlexZone Technical Details

Main Features

- Detect and locate intrusions (600 m/1968 ft per processor)
- Pinpoint intrusions to within ±3 m (10 ft)
- Sensor cable in standard and armored versions
- Available in two models:
    - FlexZone-4: 4 software-defined zones, zone-reporting
   - FlexZone-60: 60 software-defined zones, location-reporting

Environment Specs

- Weather: –40 to 70 °C (–40 to 158 °F), 100% humidity
- Rugged all-weather hinged aluminum UL enclosure, NEMA Type 4X (IP66)

Electrical Specs

- Low power (<2.5W), PoE support via Ethernet card
- Up to 5 processors per power supply (power over sensor cables)

Networking Specs

- Communications over sensor cable reduces network infrastructure
- Ethernet, RS-422 and fiber communication card options
- Common integration interfaces (API, ASCII, or I/O)
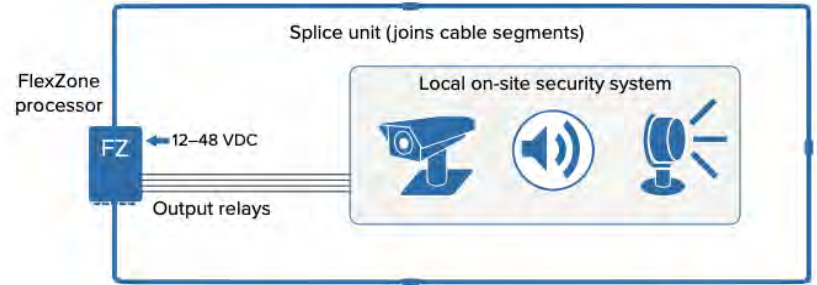
Output Relay Integration
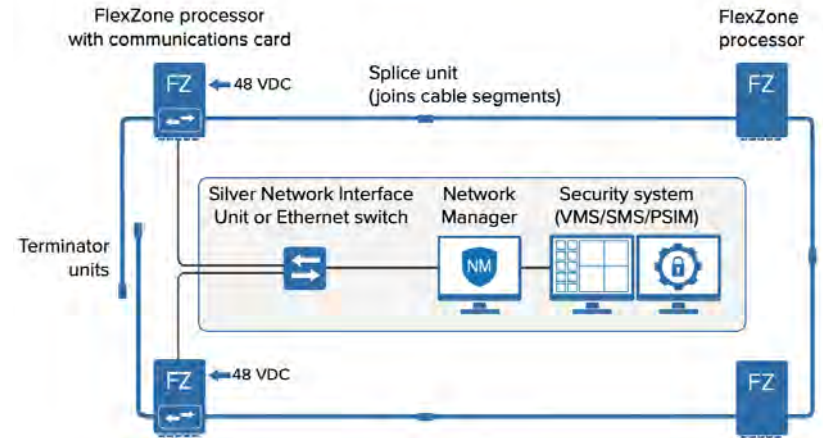
Networked Integration

FiberPatrol FP1150

Description

- Fiber optic sensor suitable for fence, wall, and buried applications
- Alarms reported by zone, cable distance or GPS (±4 m)
- Ideal for large sites, borders, and buried pipelines
- Up to 100 km (62.1 mi) of coverage per processor

Key Benefits

- No powered or conductive components in field
- EMI and lightning immune
- Unused fibers can be reused for other applications (e.g. communications), 25+ year cable service life
- Cut-immune configuration

FiberPatrol FP1150 Technical Details

Main Features

- Detect and locate intrusions:
    - Fence, wall, and buried perimeter applications: Up to 80 km (49.7 mi) per processor
    - TPI applications: Up to 100 km (62.1 mi) per processor
- Pinpoint intrusions to within ±4 m (15 ft)
- Up to 1440 software-defined detection zones
- Sensor cable in standard and armored versions
- Cut-immune configuration: locates up to point of cable cut
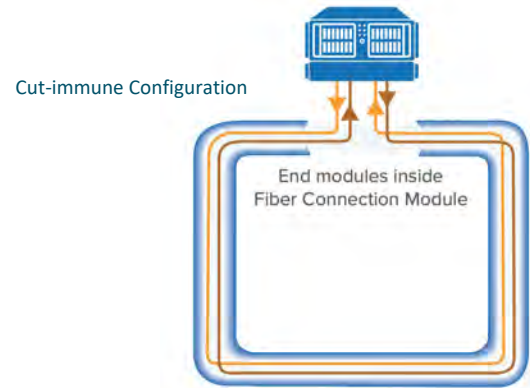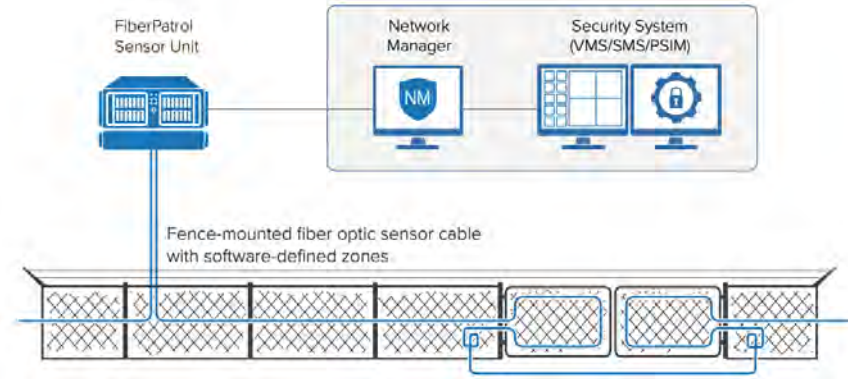- 4U height, 19-inch rack-mount Sensor Unit

Environment Specs

- All-weather sensor cable: –40 to 70 °C (–40 to 158 °F)
- Sensor unit: 0 to 50 °C (32 to 122 °F), humidity 20–80% non-condensing

Electrical Specs

- Dual redundant power supplies
- Consumption: 200W max

Networking Specs

- Dual Gigabit Ethernet
- Common integration interfaces (API, ASCII, or I/O)

Cut-immune Configuration

XField Technical Details

Main Features

- Fence or free-standing pole mounting
- Dual 4-wire or 5-wire zones (A&B)
- Zone lengths: Up to 150 m (500 ft)
- Detection height (fence-mounted): Up to 7.3 m (24 ft) (10-wire, A&B stack)
- Detection width: Less than 0.5 m (20 in) (walk-up detection of 35 kg (77 lb) person)
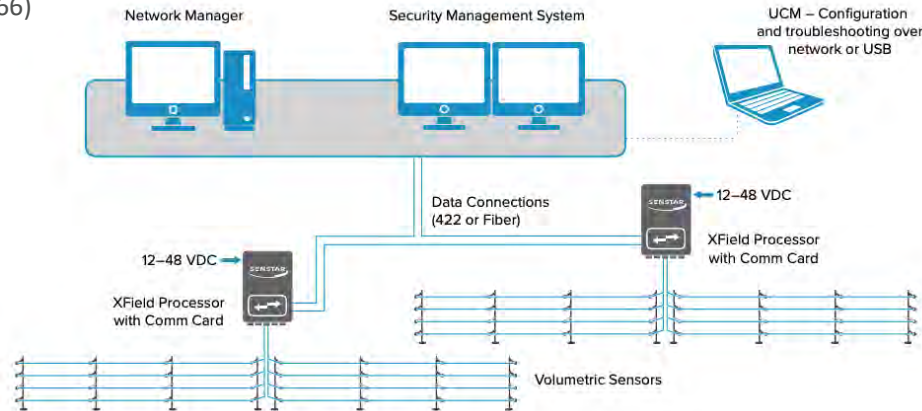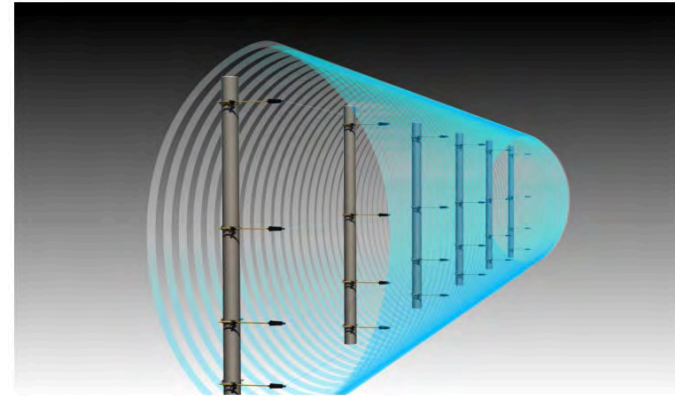
Environment Specs

- Weather: –40 to 70 °C (–40 to 158 °F), 100% humidity
- Rugged all-weather hinged aluminum UL enclosure, NEMA Type 4X (IP66)

Electrical Specs

- Low power (<6W)

Networking Specs

- RS-422 and fiber communication card options
- Common integration interfaces (API, ASCII, or I/O)

Gate and Gap-Fill Solutions

Wireless Gate Sensor

- Detects movement and/or vibration on gates and doors of all times
- Includes auxiliary input to monitor status of gate contact
- Available in solar powered and battery-only versions

UltraWave Microwave Sensor

- A fully digital bi-static microwave sensor that generates a cigar-shaped field between a Tx/Rx pair (up to 200 m or 656 ft)
- Ideal for gates, open areas and security backfill
- Reliable detection in all weather conditions, including rain, fog and snow

Wireless Gate Sensor Technical Details

Main Features

- Accelerometer analyzes vibration, motion, and position data
- Compatible with virtually all gate types (swinging, lifting, sliding (cantilever), garage etc)
- Compatible with FlexZone and Senstar LM100 (up to 4 WGS per processor)
- Solar panel and battery-only versions
- Reports intrusion, supervision, RF link, and auxiliary input alarms

Environment Specs

- Weather: –40 to 70 °C (–40 to 158 °F), 100% humidity
- Rugged all-weather acrylic casing, NEMA Type 4X (IP66)

Electrical Specs

- Solar panel version:
  - Eliminates need to replace batteries
  - Super capacitor design eliminates battery memory or cycle life limitations
  - On-board emergency power
- Battery version:
  - 1.5V "D" battery, approximately 1 year of operation

Networking Specs

- Encrypted 128-bit wireless link to receiver card
- Unlicensed operation in regional ISM band
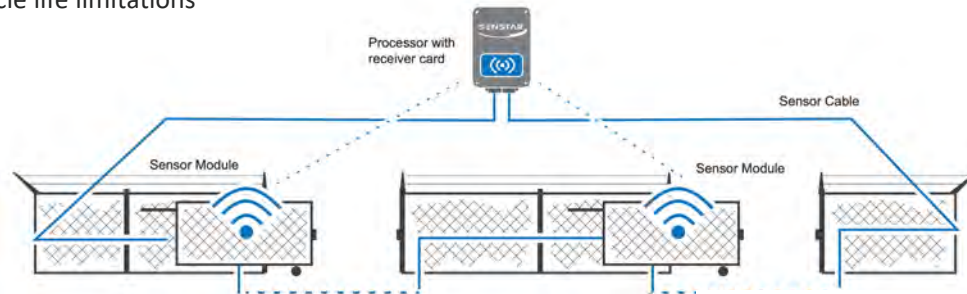
UltraWave Technical Details

Main Features

- Detection range:
    - Walking target: 5 to 200 m (16 to 656 ft)
    - Crawling target: 5 to 150 m (16 to 492 ft)
    - Commando roll: 5 to 100 m (16 to 328 ft)
- Clear zone with total width of 4% of the Tx-Rx separation distance required
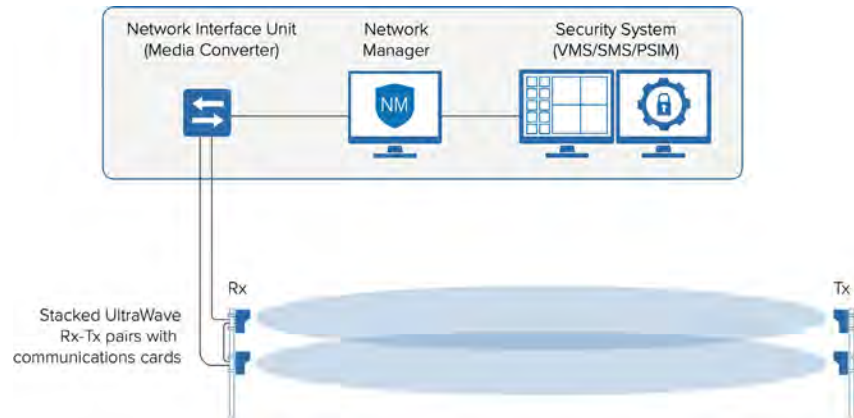
Environment Specs

- Weather: –40 to 70 °C (–40 to 158 °F), 100% humidity
- High-impact ABS plastic, marine white enclosures

Electrical Specs

- Low power: Transmitter 1.5W, Receiver 2.6W

Networking Specs

- Wireless link between Transmitter and Receiver reduces cabling
- Ethernet, RS-422 and fiber communication card options
- Common integration interfaces (API, ASCII, or I/O)

OmniTrax

Description

- Covert, buried sensor cable generates detection field
- Alarms reported by zone and cable distance (±1 m)
- Ideal for small and medium sites
- Up to 800 m (1/2 mile) of coverage per processor

Key Benefits

- Ranging capability
- Terrain-following and covert installation
- Works in virtually any type of material
- Active volumetric detection
- Reduced infrastructure (power & comms over sensor)
- Software-defined zones
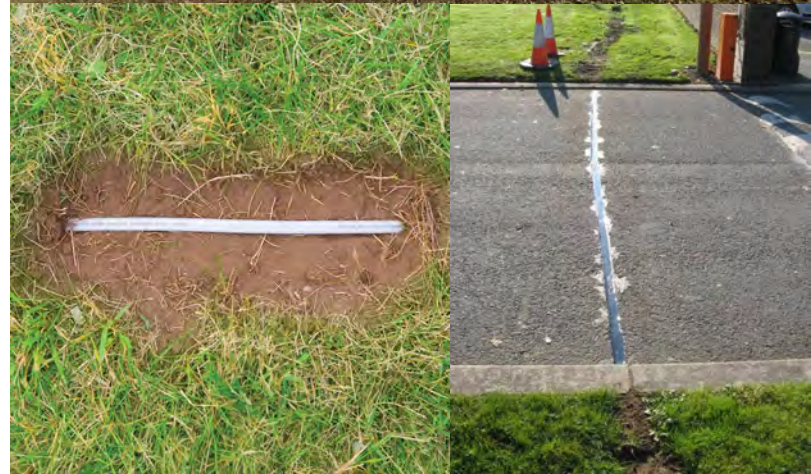
OmniTrax Technical Details

Main Features

- Detect and locate intrusions (800 m/ 0.5 mile per processor)
- Pinpoint intrusions to within ±1 m (3.3 ft)
- Sensor cable available in 3 versions

Environment Specs

- Weather: –40 to 70 °C (–40 to 158 °F)
- Rugged all-weather hinged aluminum CSA/UL enclosure, NEMA Type 4X (IP33)

Electrical Specs

- Power requirement per processor (9W)
- Up to 5 processors per power supply (power over sensor cables)

Networking Specs

- Communications over sensor cable reduces network infrastructure
- RS-422 and fiber communication card options
- Common integration interfaces (API, ASCII, or I/O)

Networked Integration
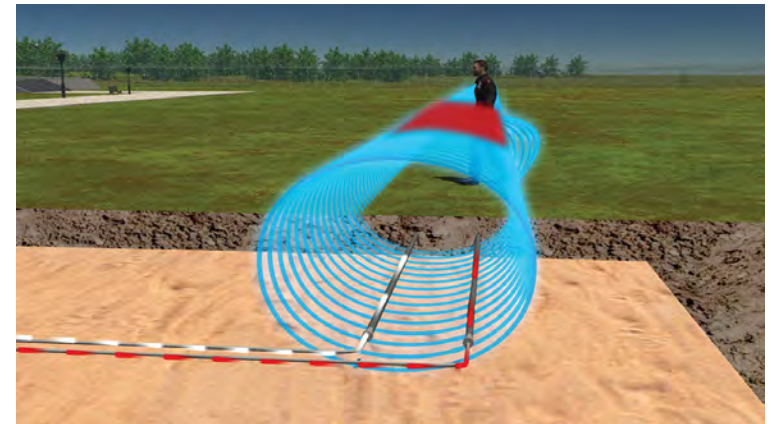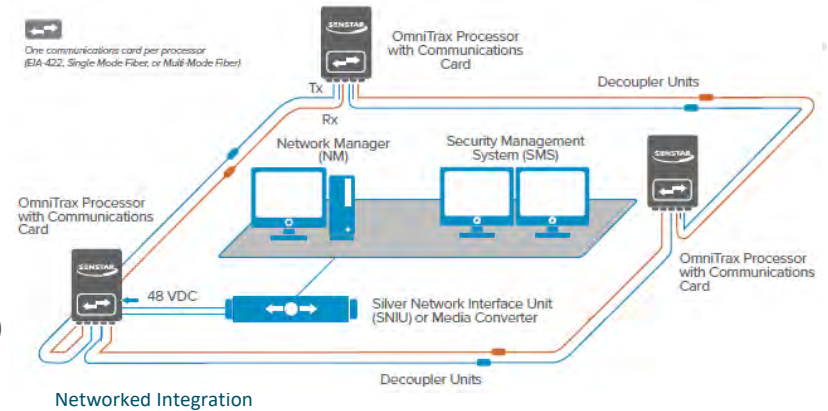
Example use case

Flare

Description

- Real-time RF locating system
- Uses protected frequencies
- Locates to within ±6 m (20 ft)
- Distributed RF receivers
- PoE based technology

Key Benefits

- High integrity system
- Optimized for reliability within correctional environments
- Lower total cost of ownership
- Easy to install and maintain
- Proven technology performance

Flare Technical Details

Main Features

- Detects and locates distress alarms to within ±6 m (20 ft)
- Protected RF bands (guaranteed delivery)
- Low sensor density requirement
- Maintenance free and self-testing
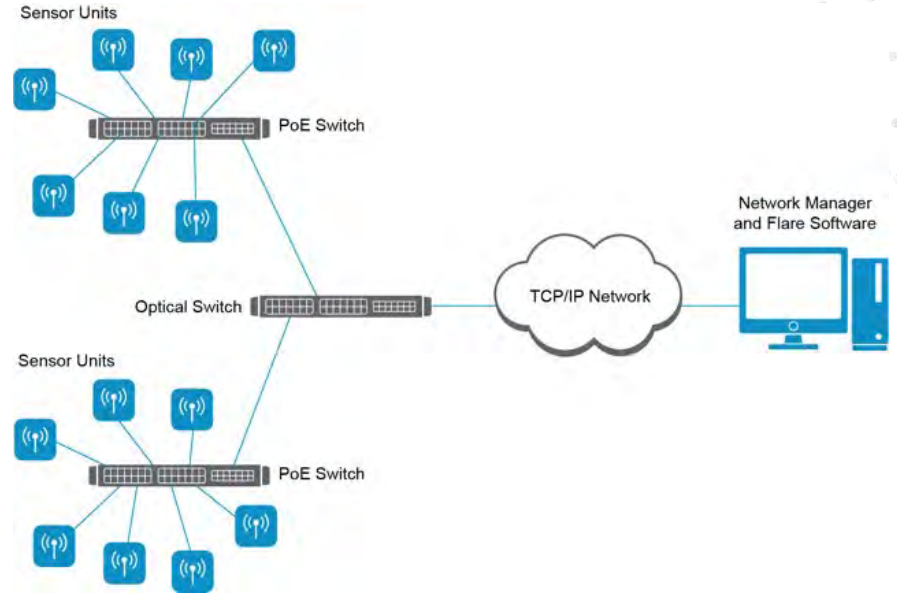- Flexible sensor unit placement

Environment Specs

- Weather: –20 to 60 °C (–4 to 140 °F)
- Rugged enclosure, NEMA Type 4X (IP65)

Electrical Specs

- Sensor Unit (SU)
    – Low power (<1.5W)
    – PoE support
- Personal Protection Device (PPD)
    – 9V alkaline battery (CR2025 compact version)
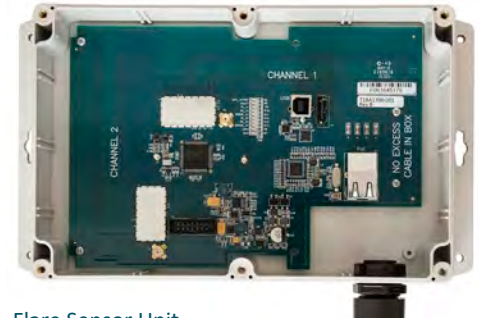
Networking Specs

- Communications over PoE
- Dedicated Ethernet infrastructure

Networked Integration

Flare PPD and PPD Compact


Flare Sensor Unit

StarNet 2

Description

- Feature-rich Security Management System (SMS) optimized for intrusion detection systems
- Map-based interface displays precise intrusion location
- Deployed in a wide variety of markets, including corrections, government, and utilities

Key Benefits

- Works out of the box with all Senstar sensors
- Easy to use, minimal operator training
- Granular controls
- Rules-based engine
- Integrates with Symphony and other video management software
- Runs on standard PC hardware
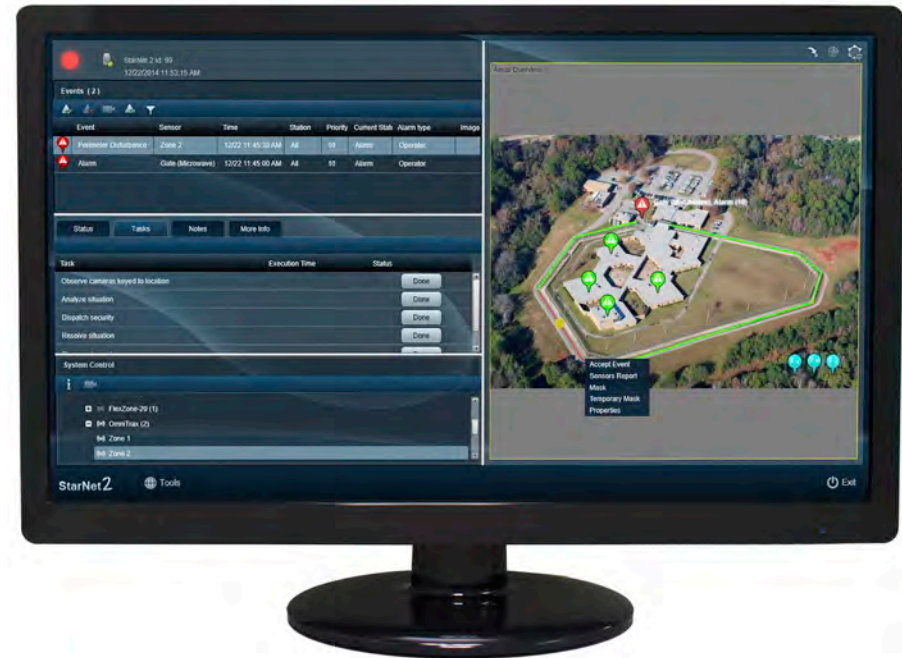
StarNet 2 Technical Details

Operator Features

- Graphical display of alarm event locations
- Alarm acknowledge, reset, mask and transfer functions
- Alarm escalation
- Event checklists and incident notes
- Full-screen, password-protected exit
- Up to 64 operator workstations per server
- Manual control of hardware commands

Security Management Features

- Bi-directional communication with all Senstar sensors
- Monitor/manage all sensor control points (zone alarms, diagnostic events, inputs, relay outputs etc)
- Support for Senstar Alarm Logic Engine

Site Configuration Features

- Point and click sensor placement
- Multi-point and icon sensor indicators
- Up to 128 picture-maps
- Alarm priorities, workflows, and procedu
- Customizable sensor labels and colors

Sensor Monitoring

- Display key sensor information
- Ranging sensor support

VMS Integration

- Integrates with Symphony/third-party VMS
- Link sensors to specific cameras

Administration Features

- User roles and access control
- Organization-specific customizations (priorities, routing, workflows)

Site Integration

- Email notifications
- Serial or TCP/IP-based ASCII messaging to third-party systems

Senstar perimeter sensors, third-party devices, and video systems

StarNet 2 Security Management System

Network Manager Software

Video Management System

# Symphony Common Operating Platform

- Scalable, high-performance open architecture
- Integrated alarm management and on-screen controls for cameras, two-way audio, perimeter intrusion, access control, and I/O devices
- Built-in video analytics
- Intelligent video search via metadata
- Intuitive Windows, web, mobile and thin client interfaces
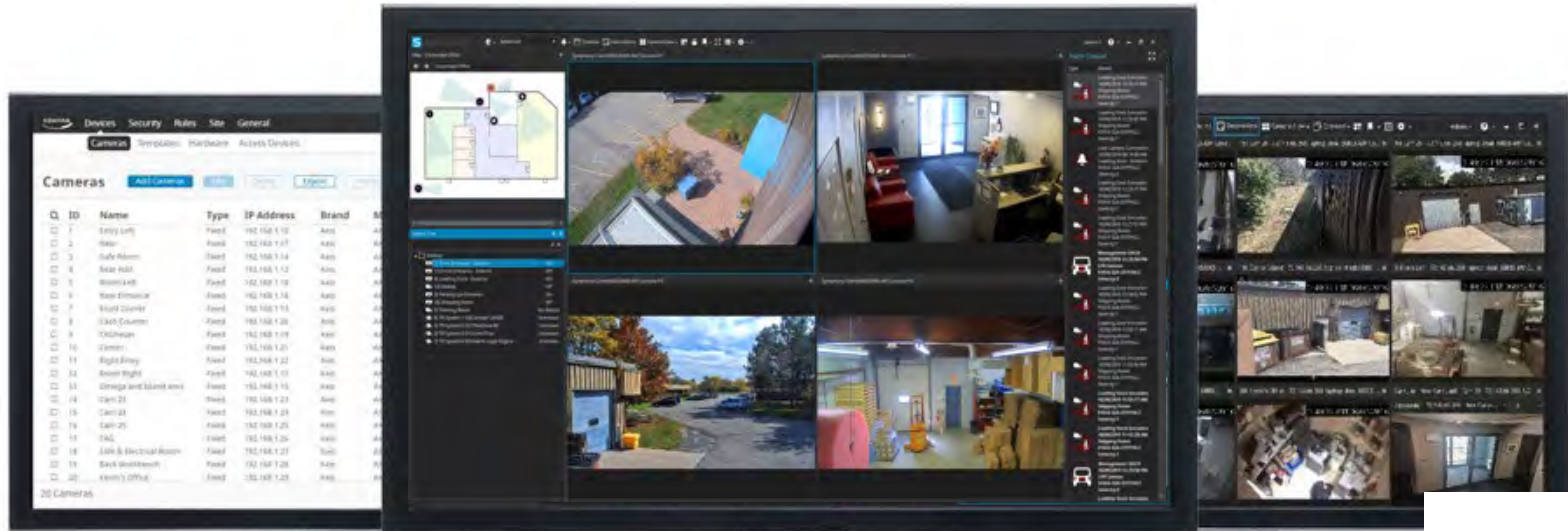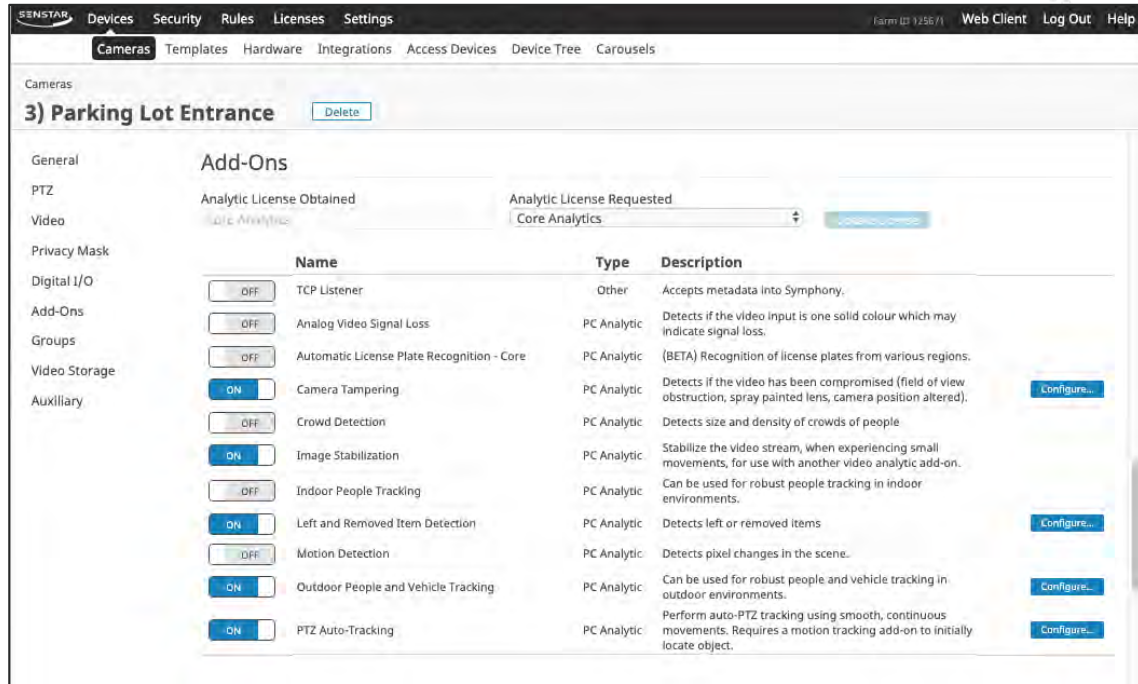
Symphony Architecture: Scalable and Open

Symphony installs on off-the-shelf hardware, supports thousands of network devices as well as industry standards (ONVIF profiles S and G), and is designed to have a low server footprint.

- Multi-server architecture (no separate management or analytic servers, one installation package)
- Embedded failover (no need for Windows Clustering)
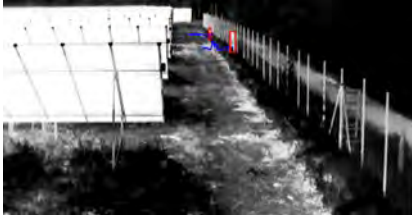- Licensed per-camera, not by individual servers or workstations
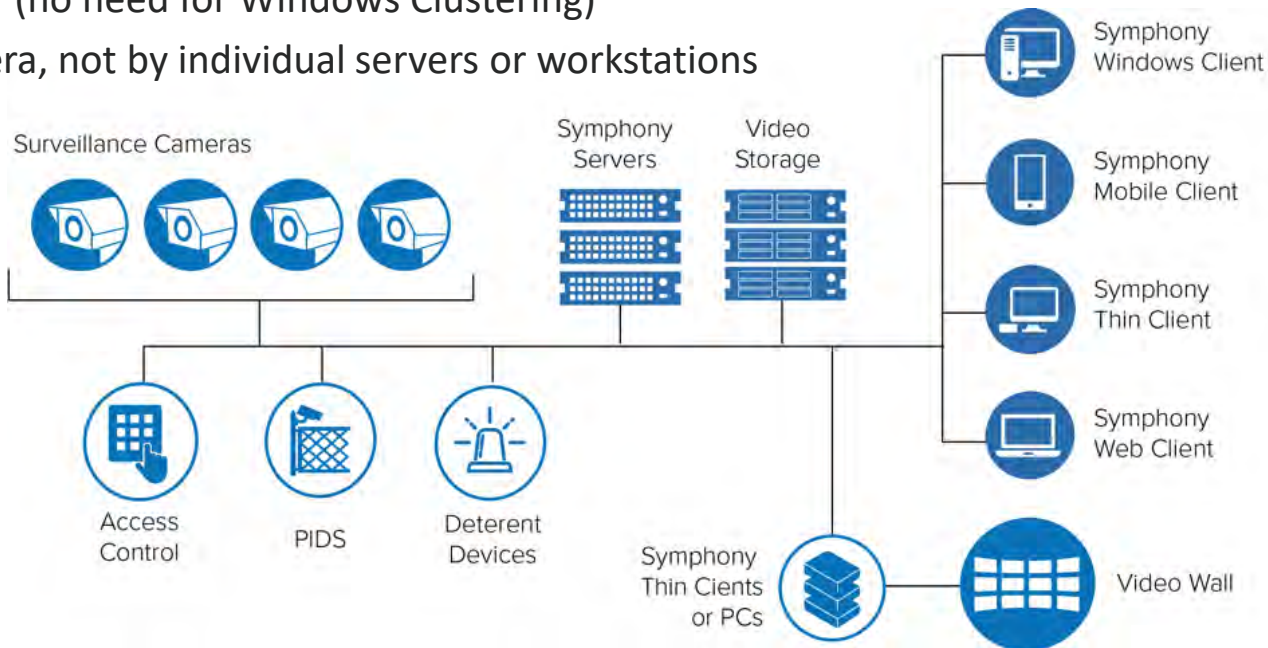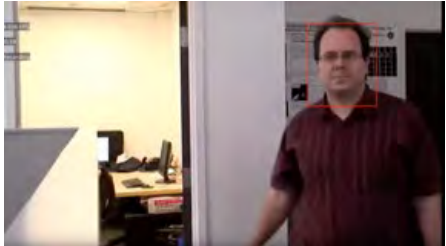
Video Analytics

- Video analytics can be enabled in real-time without additional servers

- Server or edge-based

- Licenses are movable from one camera to another

- Server-based analytics work with virtually all cameras, including low-light and thermal

Senstar Analytics (1 of 2)

Analytic	Description	Applications	Example
Camera Tampering	Detects if video has been compromised through view obstruction or position-altering	Detecting camera tampering	
Signal Loss	Detects if analog video input is one solid color, which may indicate signal loss	Detecting video loss with analog cameras/encoders	
Outdoor Tracking	Robust outdoor person and vehicle tracking for dynamic outdoor environments. Unlike simple motion detection, analytic compensates for weather, shadows, and small objects. Can be used a trigger for active deterrent devices, including the Senstar LM100 and 2-way intercoms	Tripwire, alarm zone, loitering, and people counting for outdoor environments	
Auto-PTZ	Performs auto-tracking. Requires event trigger for initial object detection (e.g. via Outdoor Tracking analytic). Enables operators to perform other tasks during security events Maximizes functionality of PTZ cameras	Alarm trigger	

Senstar Analytics (2 of 2)

Analytic	Description	Applications	Example
Left and Removed Item Detection	Detects left/removed items based on user-defined min/max object size	Detecting left or removed objects	
ALPR	Detects and captures license plates	License plate detection	
Face Recognition	Detects faces and compares against allow/disallow lists	Two-factor authentication processes for access control	

NVR Hardware

E-Series Description

- Compact, fanless server appliance
- Ideal for retail stores, gas stations, and restaurants

R-Series Description

- Dell enterprise-grade hardware
- Mini-tower, 1U and 2U form factor options
- Scalable solutions with high availability, hot-swappable components and server redundancy

Key Benefits

- Validated hardware for optimal performance with comprehensive 3-year warranty
- Simplifies ordering and support
- Different hardware options based on requirements
- Dell on-site support for R-series hardware

E-Series Physical Security Appliance

R-Series NVRs

Thin Client

Description

- Network video display appliance
- Decodes and displays up 16 live video streams
- Compatible with ONVIF Profile S and RTSP camera streams
- When paired with Symphony, provides playback, export, and video wall functions

Key Benefits

- Easy to install and use
- Compact, durable, fanless design
- Powered via PoE
- Manage locally or remotely
- Touchscreen, mouse and mobile app support (no keyboard required)
- Supports Symphony privacy controls

Thin Client Technical Details

Main Features

- Video output: HDMI 1080p (cable included)
- Supported layouts: 1: 1920 x 1080 @ 25 fps, 2: 960 x 1080 @ 25 fps, 4: 960 x 540 @ 25 fps, 6: 640 x 540 @ 20 fps, 9: 640x 360 @ 20 fps, 12: 480 x 360 @ 10 fps, 16: 480 x 270 @ 10 fps
- ONVIF Profile S and RTSP support
- One-way audio (from audio-capable cameras)
- Video playback, export, and video wall functions (via Symphony)

Interfaces

- 100 Mbps Ethernet (RJ-45) (additional interface via USB-Ethernet adapter)
- 2 USB ports (USB 2.0)
- Audio output (3.5 mm)
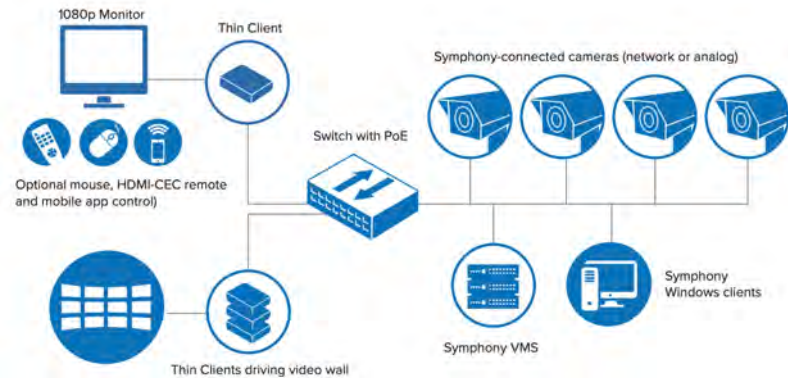
Control Options

- Mouse (USB), touch screen, TV remote control via HDMI-CEC, PTZ joystick
- Web interface
- Mobile app (iOS, Android)

Privacy Controls (via Symphony)

- Dynamic and static masks
- Password protection and restricted operator mode
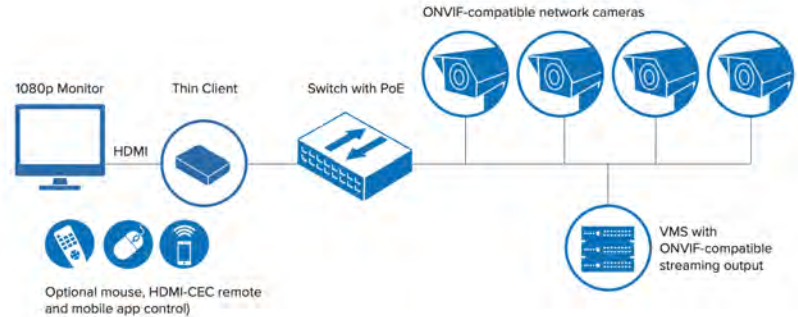
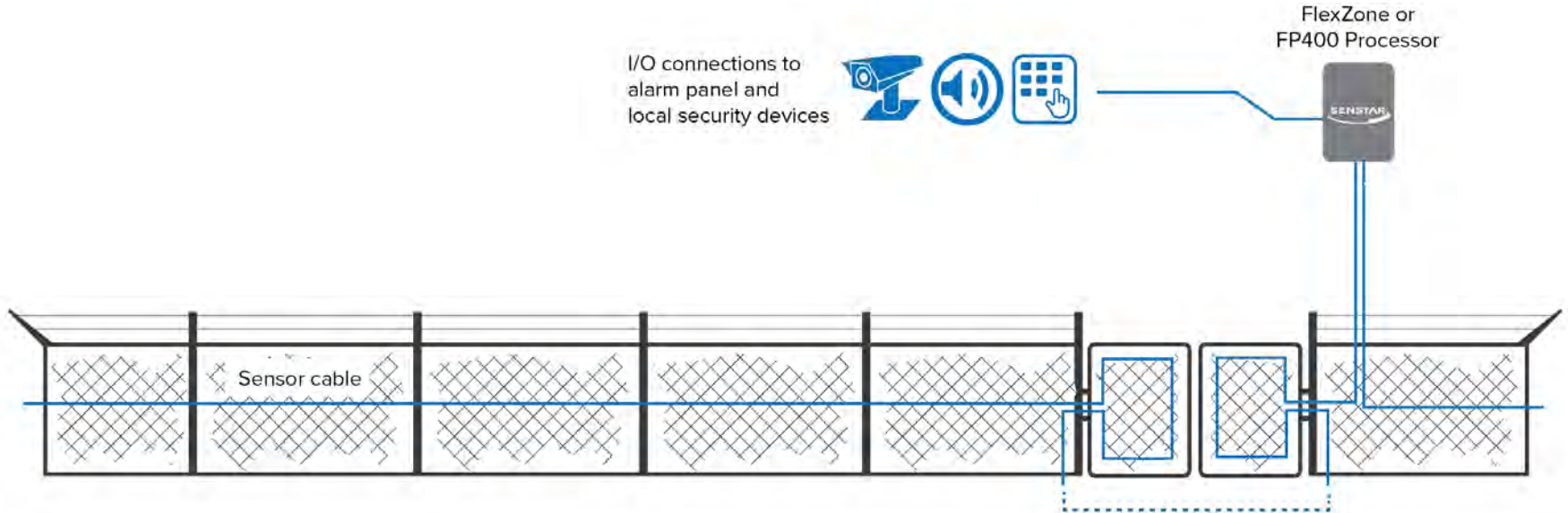Stand-alone Deployment (Direct Connect)
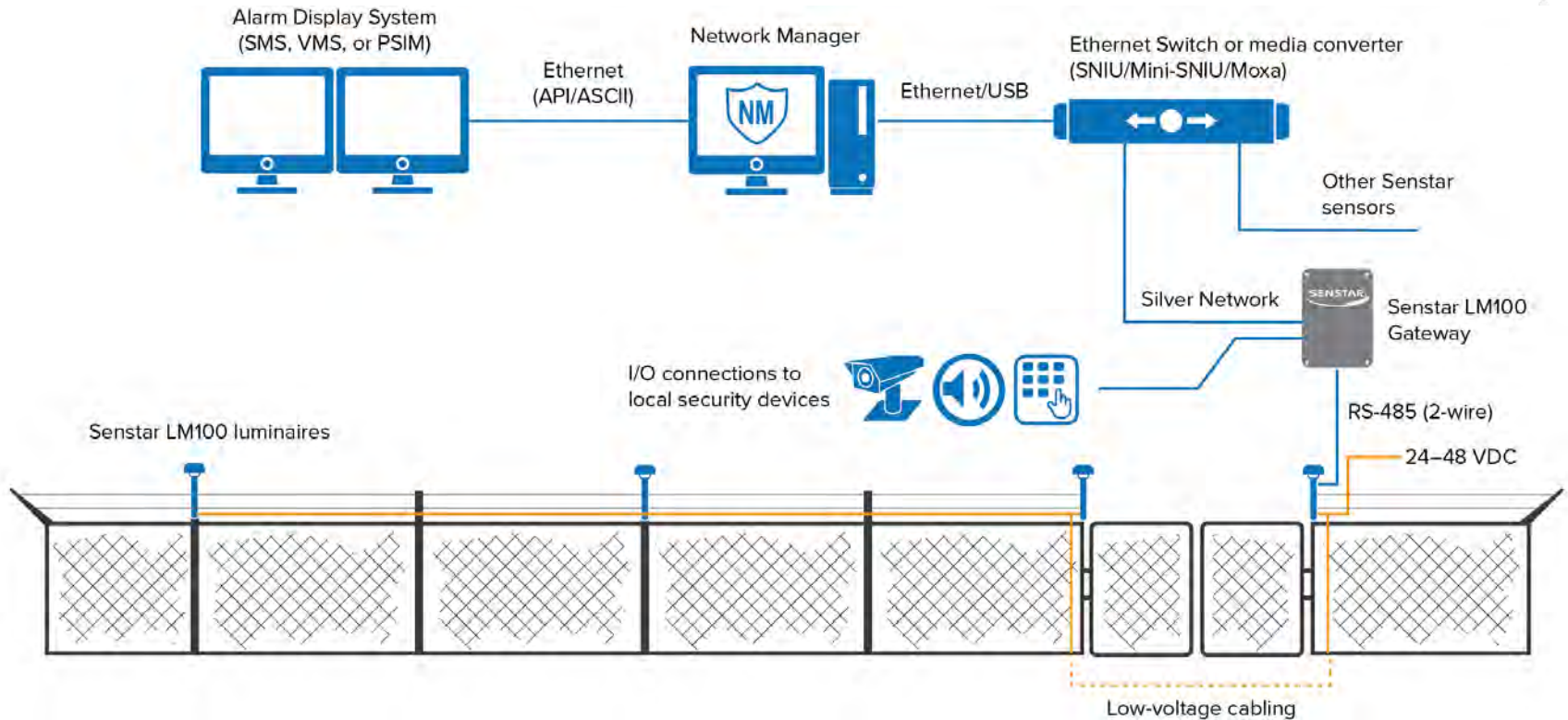

Symphony VMS Deployment

CORRECTIONAL FACILITIES

System Integration Options

SENSTAR

PIDS Example: Standalone System

PIDS Example: Networked System

Senstar Network Manager

The Senstar Network Manager software is an intelligent gateway that provides an interface between the perimeter sensors, other connected security devices, and Senstar/third-party security software (VMS, SMS, PSIM etc).

Sensor connectivity
- Ethernet, fiber and RS-422 networking
- Support for star and loop networks
- Communication over sensor cables (FlexZone, OmniTrax)
- Configuration via local (USB) and network connections

Network Manager software
- Runs on PC as a service
- Supports all Senstar sensors
- Built-in alarm logic engine
- Minimal system requirements
- Redundancy with failover support
- Alarm and event logging
- Diagnostic utilities

Integration options
- Senstar software:
  - Symphony VMS
  - StarNet 2 SMS
  - Senstar AIM
- API-based integration with third-party VMS, SMS, or PSIM software
- ASCII text over TCP/IP or serial
- Hardware I/O

PIDS + VMS + Senstar Access Control
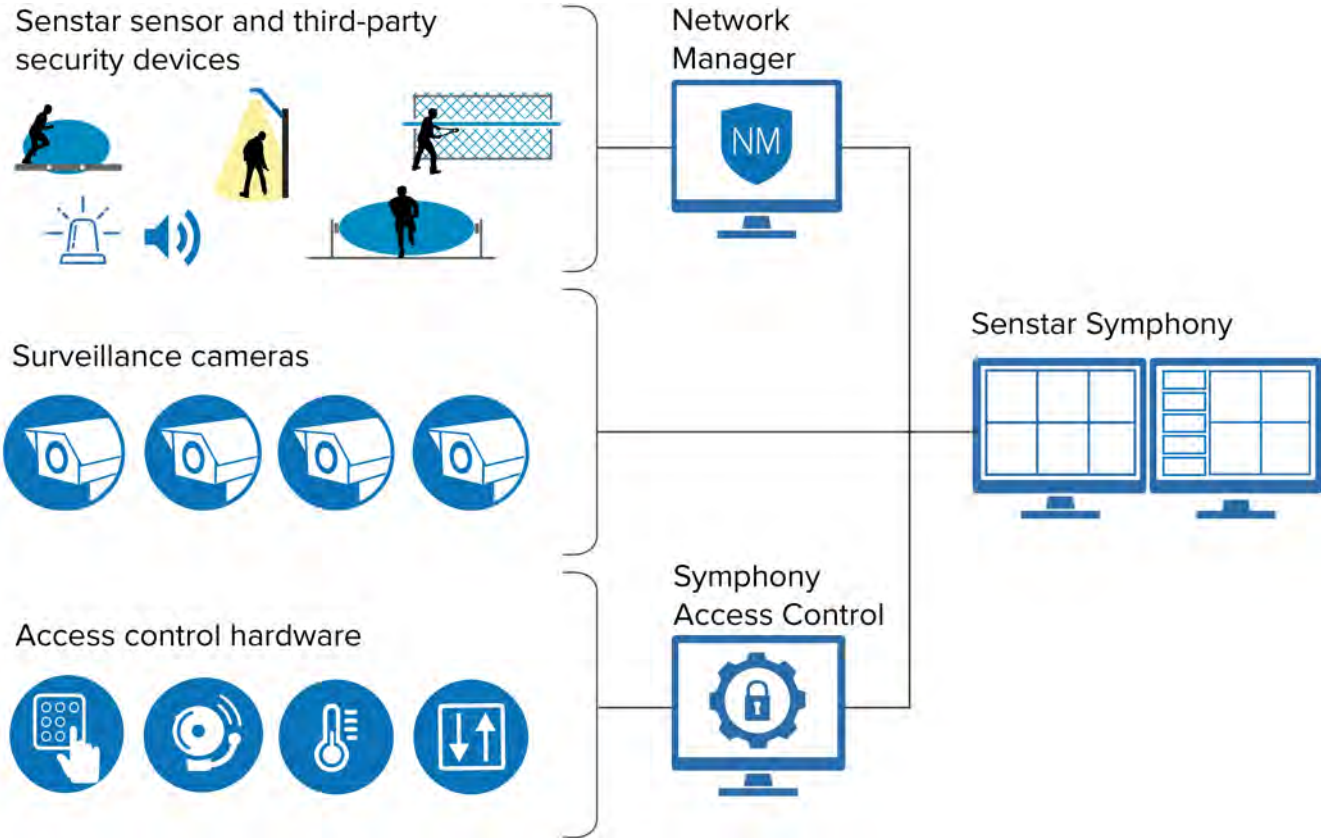
Symphony Integration – Alarm Console

- Sensor alarms in Symphony are displayed alongside video analytic and access control events.

- Each event may be linked to multiple cameras and graphically displayed on a site map, maximizing operator assessment capabilities.

- Bidirectional communications enable automated and manual control over sensor and camera I/O interfaces.
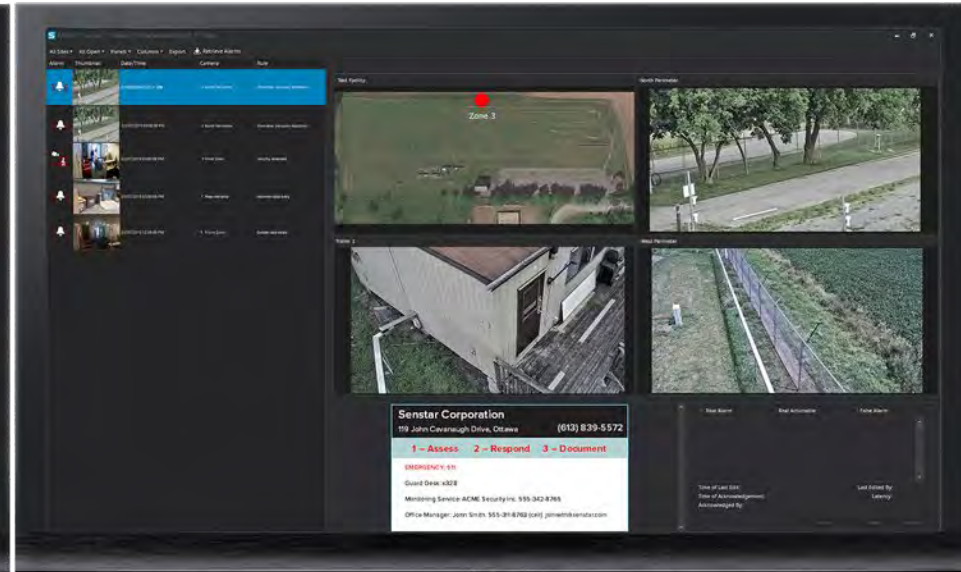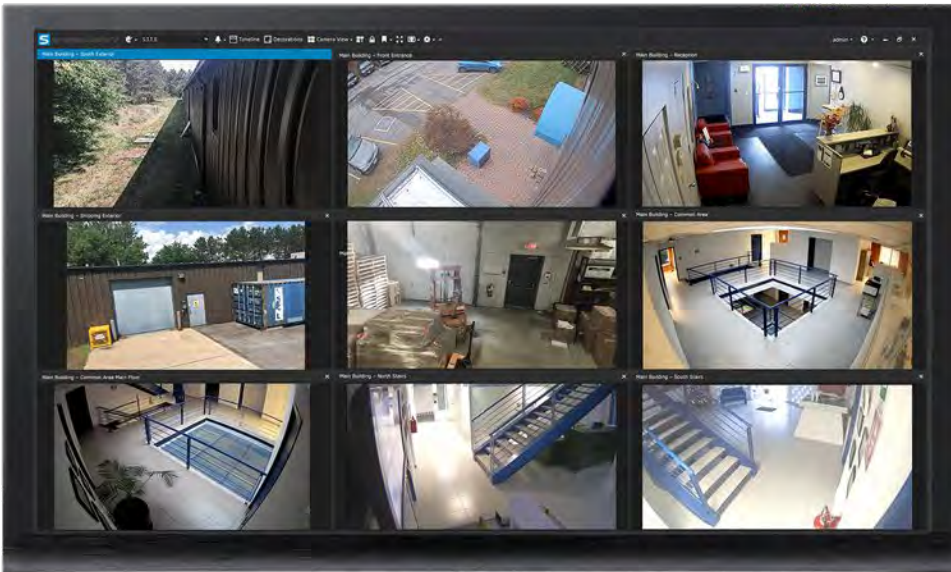
Benefits of Integrating PIDS with VMS and Video Analytics

Immediate assessment is critical for a fast, effective response. Integrating perimeter sensors with the VMS and analytics provides several benefits:

- Track persons and vehicles outside and inside the perimeter
- Use "pre-alarm" events to direct PTZ cameras before intrusion occurs
- Automatic camera call-up using zone/location information
- Combine perimeter sensor and video analytic events to reduce nuisance alarm rate
- Use perimeter sensors to improve post-incident analysis (fence data + intelligent video search)

Outdoor People and Vehicle Tracking analytic

Multiple technologies may be used together as part of a multilayered approach. In this example, a people tracking analytic is applied to a video stream from a thermal camera and works in combination with a fence-mounted sensor.

Third-Party Integrations

Senstar has extensive experience integrating with a wide range of third parties. For information on a specific integration, including the products supported (e.g. Senstar PIDS, Symphony VMS, video analytics) and the scope of features, contact Senstar.

Looking to the Future – A Deeper Integration

- "Sensor fusion" – integrating sensor technologies to receive the advantages of both while avoiding their disadvantages

- Goal: achieve a high probability of detection while maintaining a low nuisance alarm rate or low vulnerability to defeat

- Existing systems use Boolean or time-based logic, next-generation systems to process data via fusion engine:
  - Pattern recognition
 - Artificial intelligence
  - Multi-sensory approach
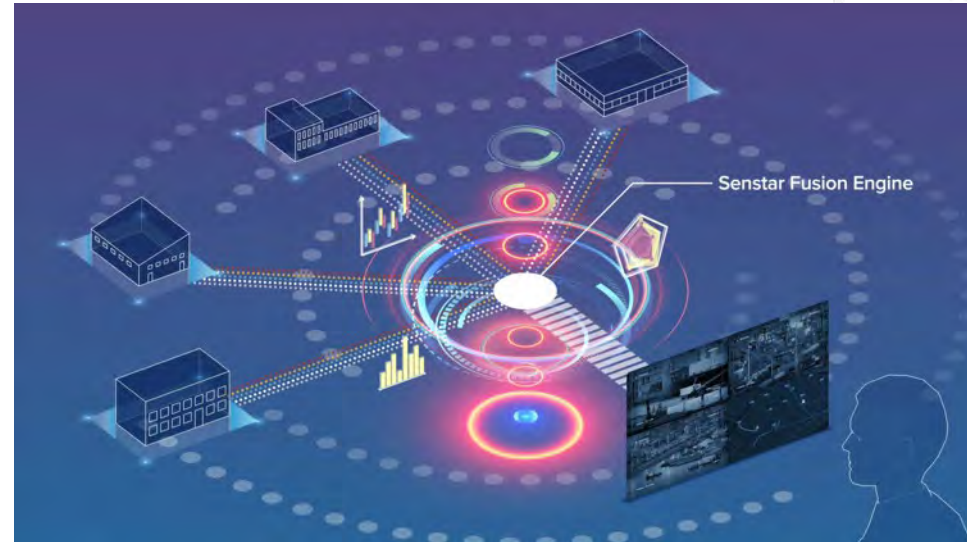
Senstar has the unique capability to fuse sensor and video analytic data over a common platform.

45

Senstar Common Operating Platform

Senstar is uniquely situated in the industry to provide a fully integrated common operating platform.

- Single vendor accountability
- Reduced training and IT costs
- Integration = situational awareness
- Fusion = intelligent data processing
- Centralized device management
- Common security infrastructure
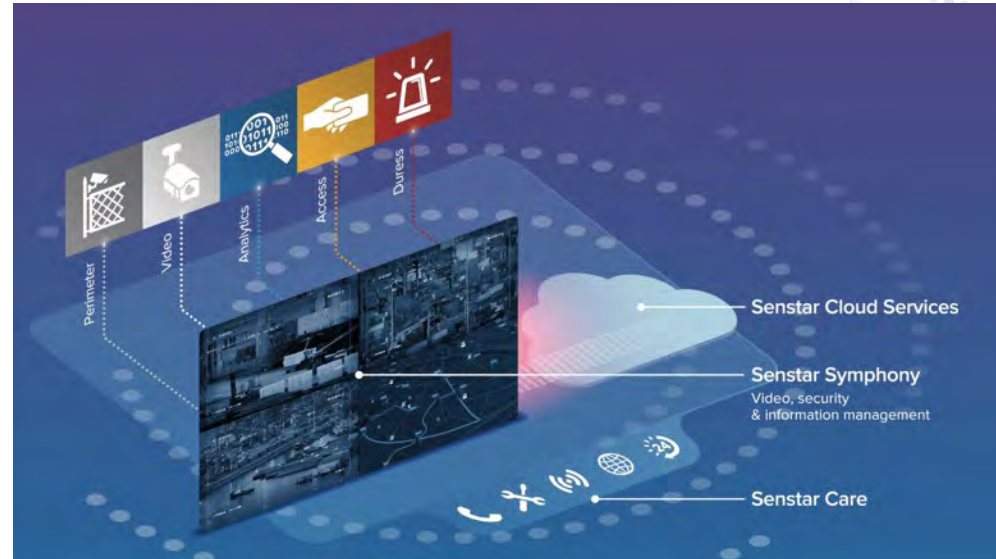
Senstar customers benefit from world-class hardware and software, including open interfaces and platforms, while avoiding risks and complexity

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Q&A

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Key Points

- Senstar has extensive experience in protecting correctional facilities
- Senstar's portfolio is unmatched in the industry
- Multiple technologies can be used together to improve capabilities
- Solid integrations improve time-critical event assessment and response capabilities