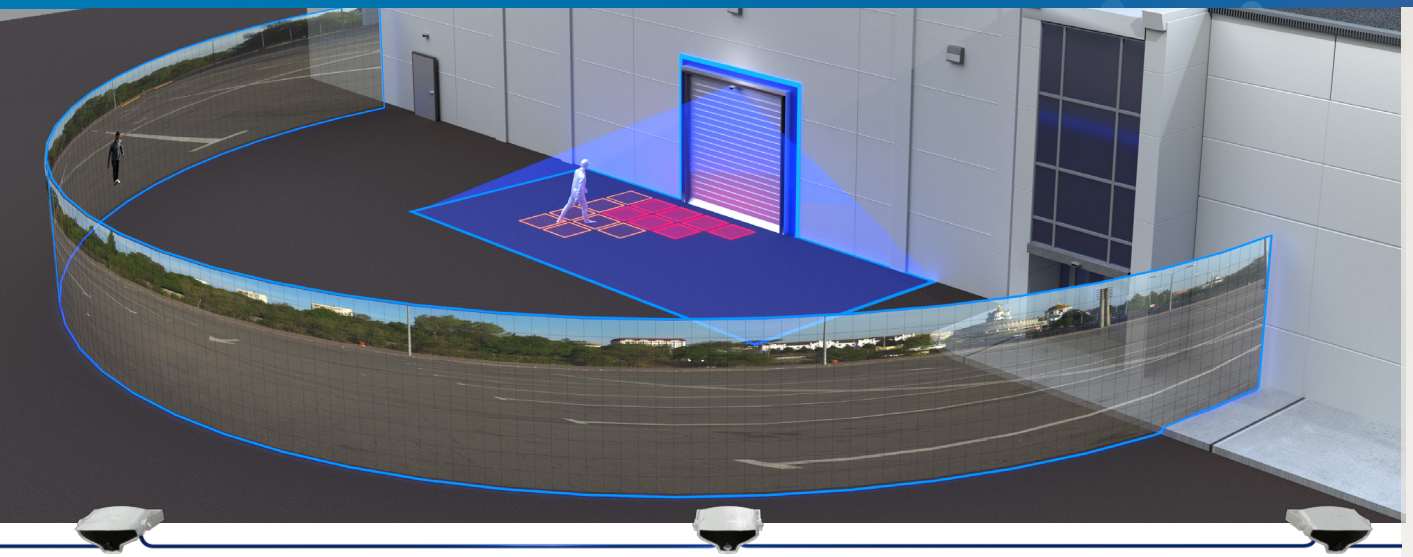


AI-Powered Multi-Sensing Detection System with Daisy Chaining and PoE Extension

Senstar MultiSensor™ Cascade Plus is a compact, AI-powered system that leverages the power of sensor fusion to intelligently detect and characterize intrusions while virtually eliminating nuisance alarms. Support for device daisy-chaining and third-party PoE devices reduces costs while enhancing site resiliency.

Detecting intruders at the perimeter, before they can enter buildings or sensitive areas, is a critical part of any security plan. However, conventional sensor technologies focus on detecting specific physical phenomena, and by themselves do not take into account the full context in which an event is occurring. This can lead to false positives (nuisance alarms) or worse, missed detections.

Senstar MultiSensor takes a revolutionary new approach. Its embedded Sensor Fusion Engine synthesizes data from multiple sensing technologies (short-range radar, PIR, accelerometer, high frequency vibration, and video) to understand the full context in which an event occurs, resulting in the highest probability of detection while virtually eliminating nuisance alarms.

This context-based approach assists security personnel with improved situational awareness by providing real-time location tracking, presence detection, and ground-level images of the event.

Features and Benefits

- Detect a range of intrusion threats via an embedded Sensor Fusion Engine that synthesizes data from multiple sources:
  - Short-range radar: Localized, volumetric radar coverage captures intruder distance, direction, and size
  - Image sensor: Track threats via embedded video analytics and generate 180 degree images at the intrusion location
  - Dual PIR: Left/right passive infrared sensors ensure detection of intruders in close proximity
  - Accelerometer: Detects physical interactions with the fence or mounting surface
  - High frequency vibration sensor: Provides additional data about perimeter activity
- AI-enabled algorithms provide a Probability of Detection (Pd) far exceeding that of traditional sensors while eliminating virtually all nuisance alarms (NAR), regardless of weather conditions
- Alarm/pre-alarm detection regions
- Daisy-chain up to 16 devices via a single PoE connection. Use two (redundant) Ethernet switches for enhanced network/power resiliency.
- Connect third-party devices like surveillance cameras, IP horns/speakers, and strobe lights
- Easily installed on virtually any hard surface, including fences, walls, posts, and gates

UNMATCHED PERFORMANCE VIA AI-POWERED SENSOR FUSION ENGINE

To maximize the strengths of its individual sensors, Senstar MultiSensor contains an AI-powered Sensor Fusion Engine. The engine intelligently performs a threat analysis based on the data obtained from each sensor, taking into account intrusion training data, pattern analysis, relevance, history, and background noise.

The result is a system that can reliably detect intrusions under difficult conditions and against skilled adversaries, including low light, high winds, rain, snow, fog and stealth attacks.

A high Probability of Detection (Pd) is only one consideration when measuring sensor performance. The Nuisance Alarm Rate (NAR) is another. A high NAR can lead to complacency or system mistrust, degrading the security readiness of a facility. Senstar MultiSensor Cascade Plus is designed to virtually eliminate nuisance alarms while maintaining the highest Pd.

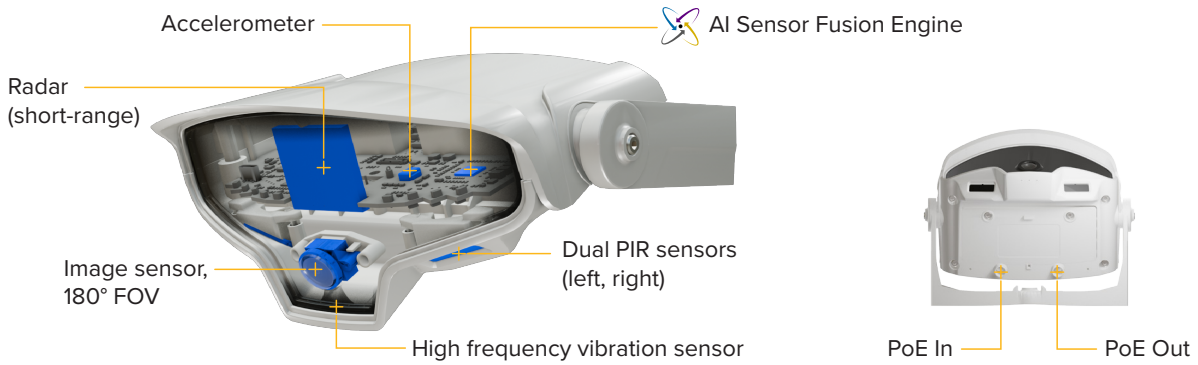
LOWER TOTAL COST OF OWNERSHIP (TCO)

Senstar MultiSensor lowers TCO by dramatically reducing infrastructure and installation costs. Its PoE In/Out ports enable multiple devices to share the same network connection, with up to 16 devices can be daisy-chained together.

The PoE ports can also be used to connect third-party devices, including surveillance cameras, IP speakers, two-way intercoms, and security lighting and strobes.

SIMPLIFY SITE UPGRADES

The PoE In/Out ports on Senstar MultiSensor enable site owners to easily upgrade the security posture of existing sites by re-purposing existing Ethernet cabling. The device can be connected anywhere that there is an existing PoE camera, reducing the need to drill additional holes or run additional cable through the building's structure.



NETWORK & POWER RESILIENCY

For network and power resiliency, dual Ethernet switches may be connected to each end of the daisy chain, ensuring continuity of protection in the event of a cable cut or device damage.

For sites without networking, or for unmanned/remote sites where sending emergency personnel is costly and/or unfeasible, the PoE Out and relay output ports can control local deterrence devices independently of the site's backhaul network connectivity.

INTEGRATED SECURITY NETWORK

Senstar MultiSensor can use the same network as other Senstar devices, including FlexZone®, FiberPatrol®, Senstar LM100™, and UltraWave™.

Senstar's Network Manager™ software conveys alarm and status information to a Senstar or third-party security/video management system (SMS/VMS). For information about integrating Senstar sensors within a security network, see the *Senstar Sensor Integration datasheet*.

EASY TO INSTALL AND MAINTAIN

Senstar MultiSensor Cascade Plus is easy to install and requires virtually no maintenance. Its mounting bracket supports a range of installation options, including fence posts, walls, light/camera posts, and tower structures.

A low-voltage device, Senstar MultiSensor Cascade Plus uses Ethernet for both communications and power. When retrofitting sites with existing IP camera networks, you can avoid having to install new, costly cable runs by reusing the existing wiring.

Senstar MultiSensor is installed tilting downwards at an approximate 20° angle, 2.4 to 3.7 m (8 to 12 ft) above the ground.

Enhanced Situational Awareness in Senstar Symphony™

When deployed at a site managed by the Senstar Symphony Common Operating Platform (licensed separately), Senstar MultiSensor becomes a powerful tool for enhancing a security operator's situational awareness. From within Senstar Symphony, operators can:

- View alarm location on site maps
- View live and recorded video captured by the Senstar MultiSensor's 180° image sensor, including Picture-in-Picture (PIP)
- View on-map thumbnails of the most-recent captured image
- View real-time device status
- Mask or unmask the device as required

Sensor data from Senstar MultiSensor can flag the presence of activity in Symphony's video timelines. Video segments flagged as containing relevant activity can be used to auto-generate summary videos as well as to quickly view or export video captured before and after an alarm event.

AUTOMATE ON-SITE SECURITY RESPONSE

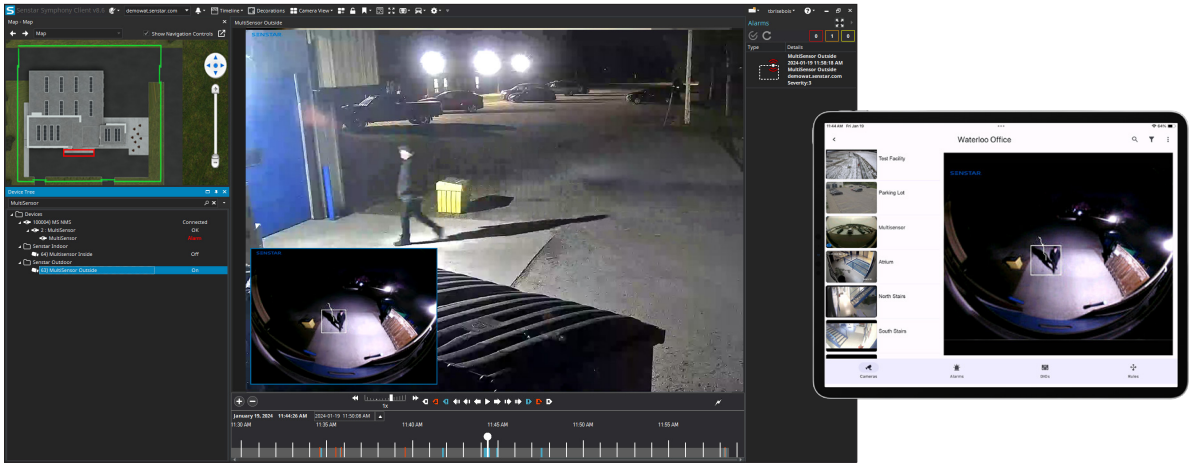
By virtually eliminating nuisance alarms, Senstar MultiSensor is an ideal device for intelligently automating on-site security. Senstar MultiSensor provides *a higher level of system confidence than other security devices,* enabling site owners to deploy automated deterrent mechanisms without the fear of creating additional operational burdens or nuisances.

Using the reliable information synthesized by its embedded Sensor Fusion Engine, Senstar MultiSensor device can be used to trigger Senstar Symphony events. For example:

- Enable/disable additional security lighting
- Playback automated messages over loudspeakers
- Send email or SMS alert messages with linked images
- Generate alarms on mobile devices

MOBILE APP SUPPORT

Senstar MultiSensor is fully supported in the Senstar Symphony Mobile app, available for iOS and Android devices. From the mobile app on their phone or tablet, users can view alarms as well as live and recorded video from multiple sites.



Senstar MultiSensor, connected to the Senstar Symphony Common Operating Platform, empowers users with real-time, critical information, including Picture-in-Picture (PIP) support.

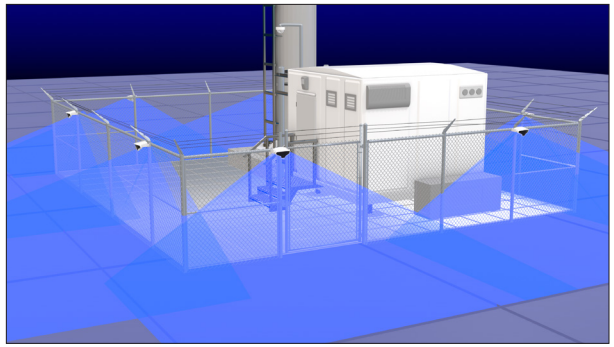
An example installation in which Senstar MultiSensor monitors a public entrance.

Applications

With its compact design multi-sensing capabilities, and network cable daisy-chaining, Senstar MultiSensor can detect activity in a wide variety of cost-effective applications, trigger cameras to document the event, and generate images of the covered area for improved situational awareness.

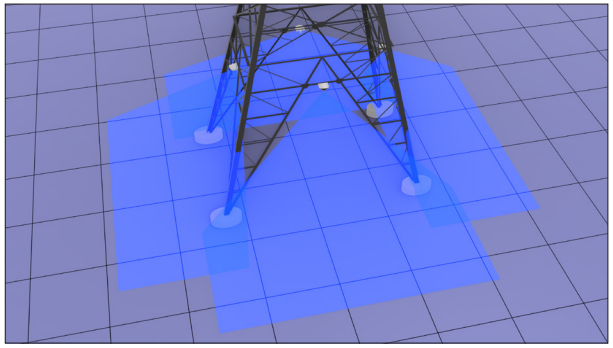
FENCE SENSOR

When mounted to a fence post, Senstar MultiSensor detects the approach of a potential threat as well as any attempt to breach the fence fabric.



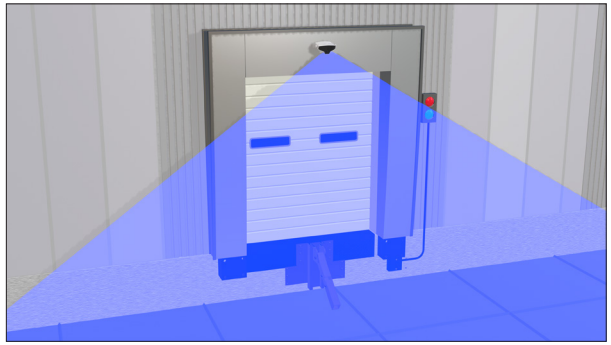
TOWER CLIMB DETECTION

When mounted on tower structures such as cellular masts or electrical towers, Senstar MultiSensor can detect activity at the base of the tower as well as attempts to climb the structure itself.



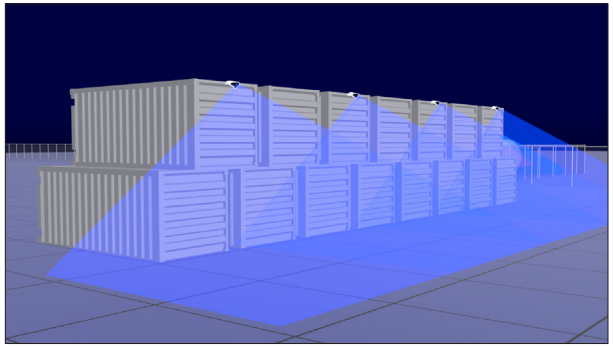
DOORS AND LOADING DOCKS

Installed above doors or loading docks, Senstar MultiSensor can detect the arrival and departure of vehicles and people, as well as the opening and closing of the doors themselves.



ASSET PROTECTION

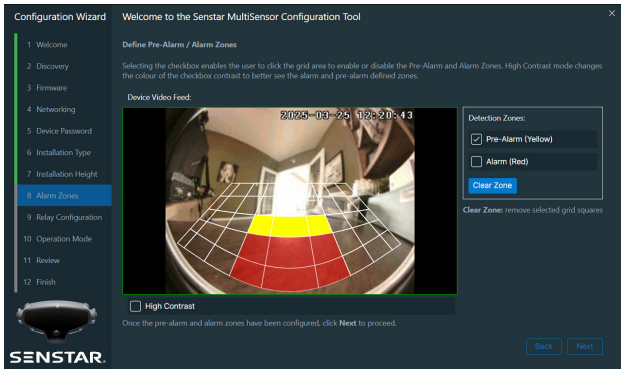
Support for both barrier and barrier-free (open area) applications make Senstar MultiSensor ideal for protecting a range of assets.



Configuration

Senstar MultiSensor is configured over the network via its Configuration Wizard or the Universal Configuration Module (UCM) software. The sofware communicates with Senstar devices via the Network Manager gateway software, and enables installers to visually view the detection performance and calibrate the system as required.

The easy-to-use Configuration Wizard that walks you through the configuration process, including application type, detection zones, daisy chain (cascade) support, and network configuration.

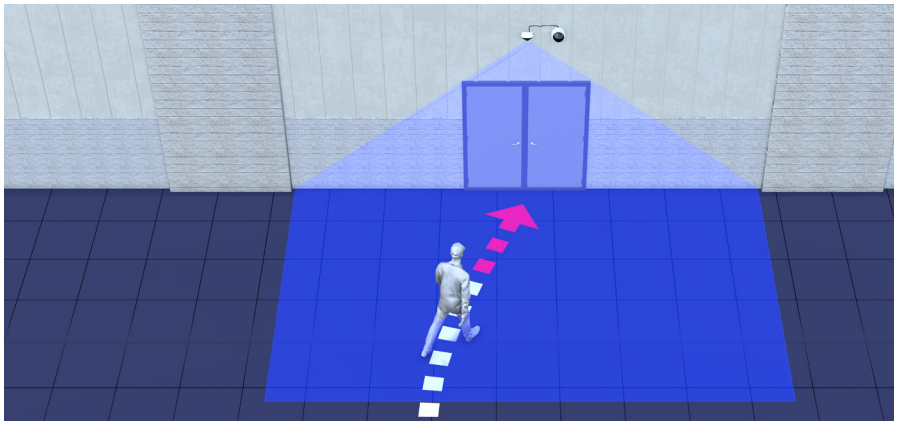


The Configuration Wizard walks you through the configuration process and provides information as needed to help you get the most from your Senstar MultiSensor Cascade Plus device.

Deployment Configurations

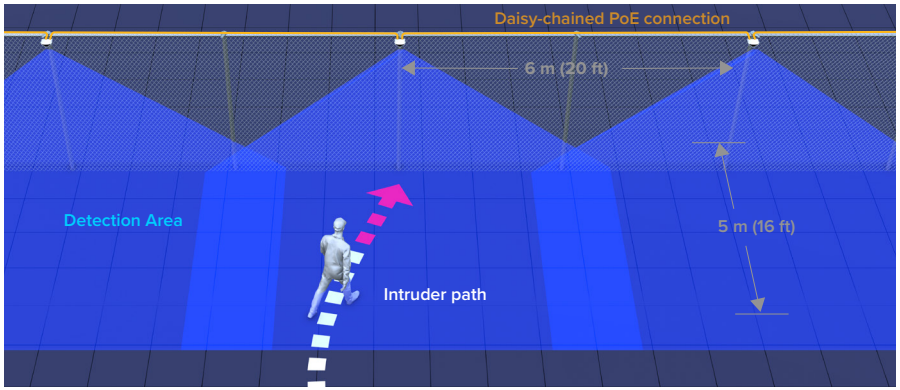
ENTRY/ASSET PROTECTION

The following diagram shows an example deployment in which Senstar MultiSensor monitors an entrance or a specific asset. In this configuration, Senstar MultiSensor can track and pre-alarm on intruders within an 8 x 5 m (26 x 16 ft) area. Alarms are generated when the intruder approaches the entrance or asset and reaches a distance of approximately 2 m (6.5 ft). This example also shows the ability for Senstar MultiSensor Cascade Plus to be used as a drop-in retrofit solution – it can share the same network connection as an existing PoE surveillance camera.



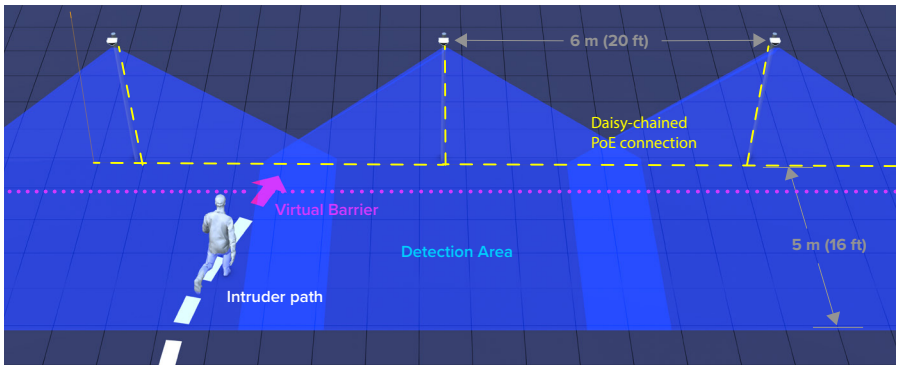
PERIMETER PROTECTION

The following diagram shows an example deployment in which a set of Senstar MultiSensor s monitor a perimeter fence or wall. In this configuration, each device tracks and pre-alarms on intruders as they approach the fence. Alarms are generated when the intruder disturbs the fabric in an attempt to breach the fence. The devices are daisy-chained together so that only one network connection is required.



AREA/OPEN GATE PROTECTION

The following diagram shows an example deployment in which Senstar MultiSensor monitors a non-barrier area or an open gate. In this configuration, each device tracks and pre-alarms when intruders approach the virtual barrier. Alarms are generated when the intruder loiters near or passes through. The devices are daisy-chained together (with the cabling being trenched between devices) so that only one network connection is required.



Daisy Chain and Accessory Power Considerations

The MultiSensor supports Power over Ethernet (PoE) daisy chain configurations using either a PoE switch or the MultiSensor PoE Injector accessory.

Senstar MultiSensor negotiates as a PoE Class 0 device, providing approximately 13W to the first device in standard PoE configurations. The number of allowed connected devices depends on which PoE device is used:

- PoE Switch: Up to 2 daisy-chained MultiSensors
- MultiSensor PoE Injector: Up to 16 daisy-chained MultiSensors, assuming 6-meter spacing between units (this creates a 100 m sensor segment consistent with industry-standard perimeter intrusion zoning practices).

The MultiSensor PoE Injector provides both PoE injection and lighting protection in a compact, outdoor-rated enclosure.

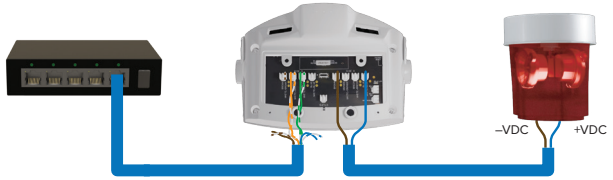
REDUNDANCY

For system resilience, the MultiSensor daisy chain supports dual-supply redundant configurations with DC power supplies and network switches positioned at both ends of the 16-unit segment,

The network switches must support Rapid Spanning Tree Protocol (RSTP) with proper port configuration to prevent data collisions and network loops inherent in dual-connection scenarios. This redundant architecture delivers automatic failover capabilities when a cable is severed or a unit fails, as RSTP intelligently manages the routing table to determine the active data path and maintains communication to all sensors via the alternative route.

ACCESSORY POWER

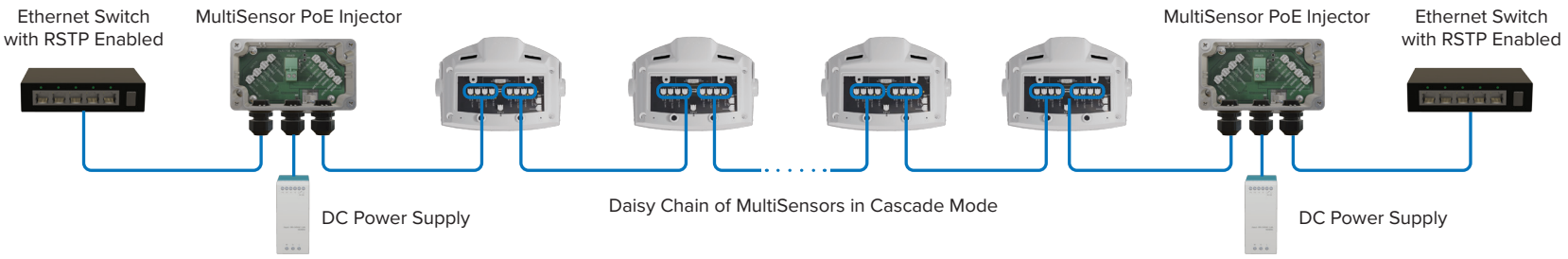
The MultiSensor's PoE Out port can function as a switched power output for attached devices in standalone configurations. This enables the direct powering of accessories such as security lighitng that operates at 48V DC (nominal) ranges.



The PoE Out port can provide switched +48VDC to a wide-range of deterrent devices.

The available power depends on the upstream power source—if powered by a standard PoE switch providing 13W, accessories are limited to that power budget, while higher-capacity injectors can support more demanding devices (up to 1.8A).

Accessory power is only available in standalone mode; when MultiSensors are configured in cascade mode, PoE Out functions exclusively as a network port for data transmission to downstream units; separate power supplies must be used for any connected external devices.



Daisy-chained Senstar MultiSensors can use redundant switches and power supplies to ensure continued operation in the event of a cable cut.

Technical Specifications

SENSTAR MULTISENSOR CASCADE PLUS

Performance

- AI-powered Sensor Fusion Engine
- Virtually eliminates nuisance alarms caused by wind, shadows, loose signs, overgrown brush, and background activity
- Calibration and operating parameters configured via UCM software
- Ideal Mounting Height: 2.4 to 3.7 m (8 to 12 ft)

Electrical

- Power consumption (single device): 3W (max)
- PoE device class: Class 0, 44–57 VDC, 13W
- PoE Out port: 48V, 1.8 A (maximum)
- Punch-down terminal connectors
- 1 Form A solid-state relay output (100 ma @ 60 V)

Mechanical

- Dimensions (width/height/depth): 18.4 x 19.4 x 10.2 cm (7.3 x 7.6 x 4.0 in)
- Weight: 0.6 kg (1.3 lbs)
- Rugged PVC enclosure
- Two cable entry points
- Mounting bracket (included)

Environmental

- Outdoor, all-weather
- Ingress protection: IP55
- Impact and shock resistant
- Operating temperature: –40 to 60 °C (–40 to 140 °F)

Networking

- 10/100 Mbit Ethernet
- PoE in/out ports
  - Up to 16 MultiSensor on one PoE connection (when using MultiSensor PoE Injector)
  - Support for third-party PoE device connection (use dedicated PoE injector if device draws more than 1.8 A)
- Communications: Proprietary
- Alarm queuing in the event of a network interruption

Note: specifications subject to change without notice

Regulatory Compliance

- FCC: 15.T-MS
- IC: 1454B-MS
- MIC R 218-250551
- ESER/25/0706

MULTISENSOR POE INJECTOR

Electrical

- Input voltage: 44 – 57 VDC
- PoE Out: 48V, 90W (max)

Mechanical

- Dimensions (width/height/depth): 11.5 x 6.5 x 5.5 cm (4.5 x 2.6.x 2.2 in) (not including cable glands)
- Weight: 0.4 kg (0.8 lbs)
- Rugged aluminum enclosure
- Three cable entry points (Ethernet, DC In, PoE Out)
- Mounting bracket

Environmental

- Outdoor, all-weather
- Enclosure ingress protection: IP68, NEMA 4X, 6, 6P, 12, 13
- Impact and shock resistant
- Operating temperature: –40 to 60 °C (–40 to 140 °F)

PART	DESCRIPTION
E9FG0100	MultiSensor Cascade Plus device (includes mounting bracket)
00FG0220	Network Manager software (service version) for Windows 8/10/11
00CD0100	Universal documentation package on USB, includes Universal Configuration Module (UCM)
E9EM0400	MultiSensor PoE Injector (injector-protector)