SENSTAR®

Sensor Integration
Flexible Sensor Management and Integration Options

Features and Benefits

- Common SMS/PSIM interface for all Senstar networked sensors, including OmniTrax®, FlexZone®, XField®, Senstar LM100, UltraWave™, FiberPatrol® FP1150, FiberPatrol® FP400, and Senstar MultiSensor™
- Remote access for sensor configuration, calibration and troubleshooting
- Centralized system monitoring, including sensor operation, performance, and event logging
- Combinational logic operations on multiple zone/sensor alarms to create virtual zones (Alarm Logic Engine)
- Optional redundant configuration for critical applications
- Software Development Kit (SDK) with API documentation, test software and simulator software
- Multiple integration options with Senstar and third-party Security Management Systems (SMS)
- Microsoft Windows® compatible
- Integrated sensor network reduces system installation and maintenance costs
- Monitoring and control of auxiliary perimeter security equipment
- Configurable per-alarm ASCII output messages (serial/TCP/IP)
- Hardening options for improved cybersecurity including authenticated and encrypted communications using TLS 2.0

Integrating a perimeter intrusion detection system with site security processes is critical to achieve situational awareness and fast response times. Senstar offers a suite of software and hardware components that provide a range of integration options:

- Network Manager
- Sensor network and communication cards
- Gateway media converters
- Configuration and calibration software
- Alarm display software
- Software development kit (SDK) with full sensor API

Network Manager

The Network Manager software communicates directly with the Senstar sensors and provides a common IP interface for use by Security Management Systems (SMS) or Physical Security Information Management (PSIM) systems. It also provides an access point through which sensor configuration tools can remotely access individual sensors.

Running on the Windows operating system, Network Manager can reside on the same PC as the SMS or on a dedicated PC. Network Manager connects to the networked sensors via gateway hardware (RS-422, fiber, or Ethernet) installed in the control room.

Key software components

Network Manager initiates and controls all communication over the sensor network and provides the interface for sensor status and system management.

The Network Manager software includes the following components:

- **Front Panel** – Displays the overall status of the sensors and network. It is also used to configure the sensor network and SMS interface.
- **Network Manager Service (NMS)** – The Network Manager software runs as a Windows service to maximize reliability, security, and remote accessibility.
- **Application Programming Interface (API)** – Provides an interface through which SMS software receives alarm and status information from the networked sensors. The SMS can also use the API to control networked relay outputs and initiate sensor self-tests.
- **System management tools** – A set of utilities for monitoring sensor status and performing troubleshooting (Plot tool, Event Log tool and Status tool).

📄 DATASHEET

Alarm Logic Engine (ALE)

The ALE performs custom combinational logic operations on sensor inputs and outputs, enabling operators to create custom behaviors and virtual sensors.

Scalability

Network Manager can scale to include multiple sensor networks, including remote sites and sensor networks of different types. Up to 10 instances of any combination of Network Manager (Silver or FiberPatrol) can be run on one PC.

Network Manager runs as a Windows service, rather than as a standard application. Running as a service increases operational integrity through the following features:

- Services can be configured to start up automatically at power-up without the need for user log-on
- A service can be configured to automatically restart if it crashes
- Services can be monitored and managed from a remote machine

Network Manager and the SMS can be co-hosted on the same computer or run on separate computers communicating over an IP network.

High availability

To support the requirement for high system availability, Network Manager can run in a redundant configuration whereby two instances run on two separate computers. One Network Manager is active while the other is in standby. A heart-beat protocol operates between the two so that the standby takes over in the event the active one fails.

Direct output control

The Network Manager's direct output control enables any input alarm state to be configured to control the state of any output point. "Alarm state" includes any sensor alarm along with supervision, tamper, diagnostic, and auxiliary input alarms. "Output point" includes any physical output (relay, open-collector output) and virtual outputs — self-test, audio control.

A typical use is to have sensor alarms and/or fault indications control third-party security equipment via an UltraLink™ I/O module's relay outputs.

ASCII text input/output

The Network Manager's ASCII text input/output capability allows integration with any security management system that processes test strings over serial or IP connections.

Sensor network and communication cards

Senstar sensors communicate alarm, status and configuration information to and from a centralized control location using their integrated networking capability.

For Senstar's latest generation sensors, the primary network type is Senstar's Silver Network™. The Silver Network includes error detection with automatic retries to provide a reliable and high integrity communications path.

The Silver Network allows a wealth of information to be communicated, including:

- Intrusion alarm status
- Operational status including alarm location, device tamper status and diagnostic alarms
- Configuration data, such as thresholds, gain settings and zone lengths
- Alarm and supervision status of auxiliary inputs
- Control messages for auxiliary relay outputs
- Sensor response data for calibration and troubleshooting
- Firmware updates
- Internal sensor event logs
- Sensor diagnostic information such as operating temperature, input voltage, battery voltage and power consumption
- Commands to initiate sensor self-test (device-dependent)

Network topologies

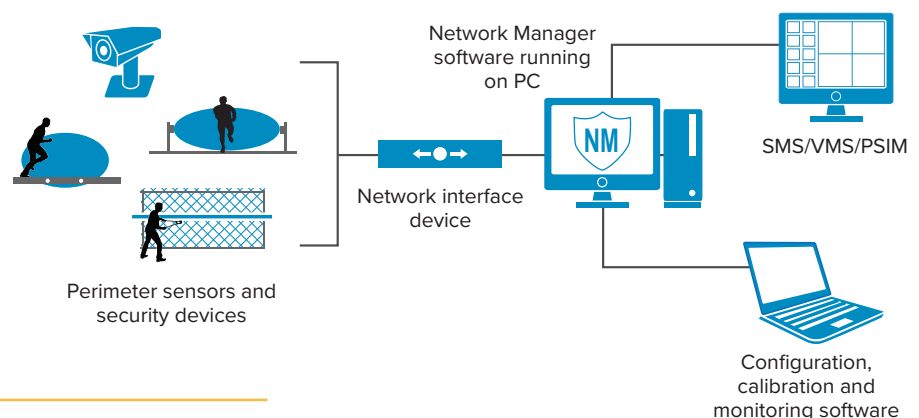The Silver Network protocol supports both loop and star network topologies.

The Silver Network supports loop topologies with separate Transmit (Tx) and Receive (Rx) point-to-point links. It is designed to be polled from both ends of the communications loop, thus providing redundant data paths to the field equipment. The links can be RS-422, single-mode or multi-mode fiber, or in the case of OmniTrax and FlexZone, over the sensor cables themselves.

Depending on the sensor, star topologies over Ethernet links are also supported. This enables operators to reuse their existing network infrastructure, such as that already in place for IP cameras and other security devices.

Communications cards

Sensor network communication is enabled through the addition of communications cards. Different communication cards are required depending on the processor and/or network interface.

Type	Products	Interfaces
Gen 1	OmniTrax XField	RS-422 Single-mode fiber Multi-mode fiber
Gen 2	FlexZone FP400 LM100™ UltraWave UltraLink I/O	RS-422 Single-mode fiber Multi-mode fiber
Ethernet	FlexZone LM100 UltraWave UltraLink I/O	10/100Base-TX with PoE

Network Manager software running on PC

Network interface device

Perimeter sensors and security devices

SMS/VMS/PSIM

Configuration, calibration and monitoring software

Site integration architecture

Configuration, calibration and monitoring software

Senstar includes a set of software tools that enable system maintainers to configure, calibrate, and monitor networked sensors from a centralized location. Each tool communicates with the Network Manager over TCP/IP and can run on separate PCs – a real time-saver when access to the Network Manager PC is restricted or inconvenient.

- **Universal Configuration Module (UCM)** Configures and calibrates Senstar sensors and performs firmware updates
- **Plot Tool** – Records the response of a specific sensor and displays up to 8 channels of recorded or live data
- **Status Tool** – Displays the status of all sensors on the network
- **Event Log Tool** – Provides remote access to the Network Manager log files and daily event information
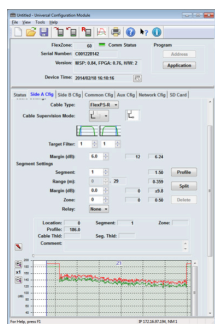
Universal Configuration Module (UCM)
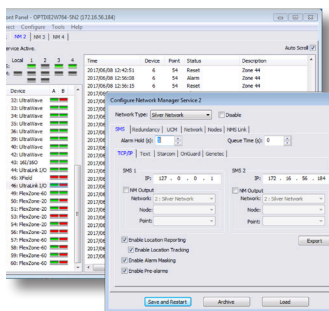
Network Manager Front Panel
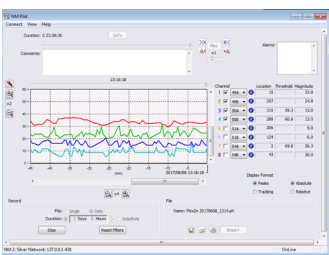
Plot tool

Software Development Kit (SDK) with full sensor API

Senstar provides an SDK to enable third-party SMS providers to communicate with the Network Manager and integrate Senstar sensors into their systems.

The SDK includes:

- API documentation
- Sample code for interfacing with API (C++, MFC)
- A simulator for mimicking a Network Manager connected to an array of Senstar sensors (enabling developers to test their software without having access to sensor hardware)

API Functionality
The API provided by the Network Manager provides the alarm display head-end or SMS access to all sensor data, including:

- Intrusion alarm status
- Tamper status
- Communications status
- Diagnostic alarm status
- Dry contact input status
- Control of relay outputs
- Sensor self-test initiation

The head-end/SMS communicates with the Network Manager over TCP/IP. During normal operation, unsolicited status changes are sent to the SMS. The API also includes query commands so that the SMS can request the complete operational status of the networked sensors.

Network Manager minimum computer requirements
- Operating system: All currently supported Windows desktop and server versions
- Intel i3- or AMD Ryzen 3-class processor
- 250GB HDD
- 4GB RAM
- Ethernet NIC
- Integrated graphics
- 4 USB ports

Cybersecurity
Network Manager is designed with cybersecurity in mind. Allow lists limit access while communications between the Network Manager and the SMS/PSIM can be authenticated and encrypted with Transport Layer Security (TLS) 2.0

Gateway media converter

If the sensor network runs over fiber or RS-422, a gateway media converter is required to interface the sensors with the PC running the Network Manager software.

Silver Network Interface Unit (SNIU)
The SNIU is a rack-mount unit designed for loop networks running fiber or RS-422:

- Two pairs of sensor network connections (one for each end of the sensor network loop):
  - Two RS-422 connectors (with integrated lightning protection)
  - Two fiber optic connections (multi-mode or single-mode)
- PC interfaces (same type must be used for each end of the loop):
  - Two USB ports (Type B)
  - Two Ethernet ports (RJ-45)
  - Two EIA-232 serial ports (DSUB)
- USB port for device configuration
- Redundancy: Includes a pass-through with fail-over mode
- Dimensions: 19-inch rack, 1U height, 23 cm (9 in) deep
- Power: 3W, 12 to 48 VDC
- Indoor-rated

Silver Network Interface Unit (SNIU)

Mini-SNIU
The Mini-SNIU is a DIN-rail mountable USB to fiber/RS-422 converter:

- Interfaces:
  - RS-422
  - Fiber optic connections (multi-mode or single-mode)
  - USB port (Type B)
- Dimensions (H/W/D): 11.5 x 3.2 x 12 cm (4.5 x 1.25 x 4.75 in)
- Power: USB powered
- Indoor-rated

Mini-SNIU DIN-rail module

Moxa Ethernet-to-serial converter

The Moxa converter is a panel or DIN-rail mountable converter for loop networks running RS-422:

- Interfaces:
  - One Ethernet connection (RJ-45)
  - Two RS-422/485 interfaces (screw-terminal connectors)
- Dimensions (H/W/D): 11.6 x 10 x 2.6 cm (4.6 x 4 x 1.02 in)
- Power: 3.2W, 12 to 48 VDC
- Temperature:
  - Standard version: 0 to 60°C (32 to 140°F)
  - Extended, outdoor version: –40 to 75°C (–40 to 167 °F)
- Humidity: 5 to 95% (non-condensing)

Moxa Ethernet-to-serial converter

Alarm display software

The Senstar Symphony Common Operating Platform includes a full-featured Security Management System (SMS) module optimized for the management and operation of perimeter protection and intrusion detection systems.

Symphony provides seamless integration with any sensor managed by Senstar's Network Manager software. It displays all the key information obtained from the sensor. If the sensor supports ranging, for example, the system will display the precise location of alarm events on the map. If part of a sensor goes offline (such as in the case of a fence sensor cable cut), the system visually indicates that the sensor is offline. The real-time state of each sensor and its components (i.e. each zone, output relay, or auxiliary input) is displayed in the Device Tree.

Customers may also integrate their own SMS or alarm display head-end.

Part Numbers

SOFTWARE

Part	Number
00FG0220-XXY	Network Manager sofware (service version) for Windows 7/8/10. Includes Silver, Crossfire, CCC, Sennet, and FiberPatrol versions, management tools, and AIM software (requires hardware key)
00SW0261-XXY	Genetec software gateway
00SW0280-XXY	Milestone XProtect gateway
00CD0100-001	Universal documentation package on USB, includes Universal Configuration Module (UCM)

NETWORK INTERFACE DEVICES

Part	Number
00EM0200-002	SNIU (RS-422 and multi-mode fiber-optic Silver Network connections)
00EM0201-002	SNIU (RS-422 and single-mode fiber optic Silver Network connections)
00EM1301-001	Mini-SNIU (USB to RS-422 and multi-mode fiber-optic interfaces). DIN-rail mount.
00EM1302-001	Mini-SNIU. USB to RS-422 and single-mode fiber-optic interfaces. DIN-rail mount.
GB0360-ST	Ethernet to dual RS-422/485 converter (standard temperature)
GB0360-ET	Ethernet to dual RS-422/485 converter (extended temperature)

COMMUNICATION CARDS

Part	Description
00BA0301-001	G1 Silver Network comm card – multi-mode fiber optic connections
00BA0302-001	G1 Silver Network comm card – RS-422 connections
00BA0303-002	G1 Silver Network comm card – single-mode fiber optic connections
00BA0304-001	G1 Silver Network comm card – one multi-mode fiber optic and one RS-422 connection
00BA0305-002	Gen 1 Silver Network comm card – one single-mode fiber optic and one RS-422 connection
00BA1901-001	G2 Silver Network comm card – multi-mode fiber optic connections
00BA2000-001	G2 Silver Network comm card – RS-422 connections
00BA2101-001	G2 Silver Network comm card – single-mode fiber optic connections
00BA2200-001	Ethernet card for G2 sensors, 10/100Base-TX, PoE

Note: G1 cards are compatible with XField and OmniTrax. G2 cards are compatible with FlexZone, FP400, LM100, UltraLink, and UltraWave.

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