Securing a border that traverses sparsely populated areas poses substantial law enforcement, budgetary, and deployment challenges.

To maximize the effectiveness of limited resources, border patrol organizations need technological solutions that reliably detect and locate the presence of people, vehicles and tunneling over extended distances that may include varied terrain and a range of urban, rural and wilderness areas.

To be economically viable (including capital and operational costs), any technological solution for border protection must:

- Require minimal in-field infrastructure (systems may need to cover distances ranging from tens to hundreds of miles)
- Be tamper and vandalism resistant
- Require no regular maintenance of in-field components
- Operate in extreme weather conditions (heat, cold, lightning, etc)
- Have a service life of 25+ years

**FiberPatrol: Long Range Detection + Target Classification**

Senstar’s FiberPatrol fiber optic sensor is the ideal solution for protecting long borders. The system provides covert detection and classification of intruders, tunneling, and vehicles over a distance of up to 100 km (62 miles) per processor. Multiple units can be used together to provide protection over extended distances.

The cable is buried in the ground and forms a virtual wall. Segments of the cable may also be installed above ground to provide intrusion detection on fences, walls, and other barriers.

FiberPatrol works by transmitting pulses of laser light into an optical fiber and measuring the minute light reflections that occur along its length. Vibrations change the amount of reflected light, indicating nearby activity, while advanced algorithms identify patterns that correspond to types of activity, including walking, running, tunneling and vehicle traffic.

FiberPatrol detects and classifies intruders, tunneling, and vehicle traffic.
FiberPatrol for Border Protection
Long-range fiber optic intrusion detection system

The FiberPatrol buried sensor creates a wide, covert "virtual wall" detection area that cannot be bypassed by ground-based movement, including tunneling. Detected targets are tracked by the system, enabling distance and direction information to be accessed by security personnel. FiberPatrol can be deployed as a standalone system (ideal for environmentally sensitive areas) as well as providing an additional layer of security alongside physical barriers or other detection technologies (for example, FiberPatrol can detect that a wall has been bypassed or supplement video-based people-tracking software).

FiberPatrol communicates with Command and Control centers via a standard IP-based network. Hundreds of FiberPatrol units can be centrally managed from a single location, with border activity information being automatically sent to local response forces.

DETECT AND LOCATE BORDER ACTIVITY
FiberPatrol locates intrusions with a ±4 m (±14 ft) accuracy, with the location being displayed on a map along with distance, zone, or GPS coordinates. The system maintains location accuracy even during simultaneous events at different locations and is able to report on each one individually. Precision ranging also enables sections of sensor to be calibrated for maximum performance within the immediate environment – for example, a segment can be calibrated specifically to reject the ambient noise generated by a nearby highway or airport.

CLASSIFY AND TRACK TARGETS
FiberPatrol can distinguish between humans, animals, manual and machine digging, engine noise, and moving vehicles. Intelligent target classification provides several benefits over that of non-classifying systems:

- Equip security personnel with additional information about a potential incident before visual confirmation is made.
- Track the movement of people and vehicles along the border.
- Maintain performance across soil types (system uses pattern recognition, not just signal strength)
- Lower the nuisance alarm rate by rejecting natural events.

<table>
<thead>
<tr>
<th>Intrusion Type</th>
<th>Typical detection distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human, walk</td>
<td>1 to 5 m (3 to 15 ft)</td>
</tr>
<tr>
<td>Human, running</td>
<td>5 to 10 m (16 to 33 ft)</td>
</tr>
<tr>
<td>Human, slow crawl</td>
<td>1 m (3 ft)</td>
</tr>
<tr>
<td>Light vehicle moving</td>
<td>3 to 10 m (10 to 33 ft)</td>
</tr>
<tr>
<td>Heavy vehicle moving</td>
<td>10 to 20 m (33 to 66 ft)</td>
</tr>
<tr>
<td>Heavy vehicle engine running</td>
<td>5 to 10 m (16 to 33 ft)</td>
</tr>
<tr>
<td>Manual digging (pickax)</td>
<td>10 to 20 m (33 to 66 ft)</td>
</tr>
<tr>
<td>Tunnel digging</td>
<td>20 m (66 ft)</td>
</tr>
</tbody>
</table>

Intrusion Type: Hand or machine digging and tunneling at distances of up to 20 m (66 ft) from the sensor cable in any direction. The sensor cable can be positioned further underground if necessary to extend coverage down to the required depth. Activities inside an existing tunnel such as movement of people, equipment, and vehicles can also be detected.

PROTECT AGAINST VANDALISM
FiberPatrol has no electronic components in the field, making it inherently resistant to vandalism and sabotage. The buried fiber optic sensor cable is highly covert and extremely difficult to detect (and bypass). If the sensor cable is cut, accidentally or in an attempt to defeat the sensor, FiberPatrol immediately reports the incident and its location. Moreover, the sensor retains the ability to detect and locate intrusions right up to the point of the cut (if deployed in a cut-immune configuration, the system retains the ability to detect and locate on each side of the cut).

MAXIMIZE YOUR INVESTMENT
Senstar has over 35 years of perimeter protection experience, with some of its earliest installed systems remaining in active use today. Senstar uses field-proven technologies and builds its products to last. For example, FiberPatrol uses standard telecommunications-grade fiber optic cable, which has a service life of at least 25 years. Not only does this guarantee the longevity of the system, the extra non-sensing fiber strands within the cable can be used as a high-speed communications network.

INTEGRATE WITH COMMAND AND CONTROL
FiberPatrol can report alarm locations by zone number, cable distance and/or GPS coordinates. An IP-based interface specification enables a wide range of integration options with industry-leading video and security management systems, as well as future-proofing the system by enabling it to be integrated with new software applications as they become available.
Senstar technology protects borders worldwide

Senstar along with its affiliate, Magal Security Systems, keeps borders safe around the world. Our products protect borders in diverse areas, including Eastern Europe, Israel, Kuwait, and Jordan.

Understanding that no two borders are alike, and that each faces unique challenges with regards to defense threats, terrorism, illegal immigration, and smuggling, Senstar offers a range of border solutions that maximize effectiveness while taking into account terrain, climate, available infrastructure, and operational realities:

- Buried sensors
- Fence-mounted sensors and intelligent lighting
- Intrusion detection video analytics
- Smart fence barrier systems

Global support, local presence

FiberPatrol technologies currently protect hundreds of civilian and military installations around the world.

Senstar maintains highly trained support organization and has support and training centers located at strategic locations world-wide, ensuring that expert technical support is available 24/7 and in a language you understand.

In addition, Senstar has extensive experience working with governments in a range of law enforcement, corrections, border security, defence, and transportation organizations. Senstar works closely with the customer, from initial planning to deployment to on-going support in order to ensure the project is a success.

About Senstar

Senstar has been safeguarding people, places and property for over 35 years. With intelligent video management, video analytics, access control, and innovative perimeter intrusion detection sensors, Senstar offers a comprehensive suite of proven, integrated technologies that reduce complexity, improve performance and unify support.

With corporate offices in strategic locations worldwide and products operating in more than 100 countries, Senstar has an extensive global presence that enables it to offer service excellence and comprehensive technical support.

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