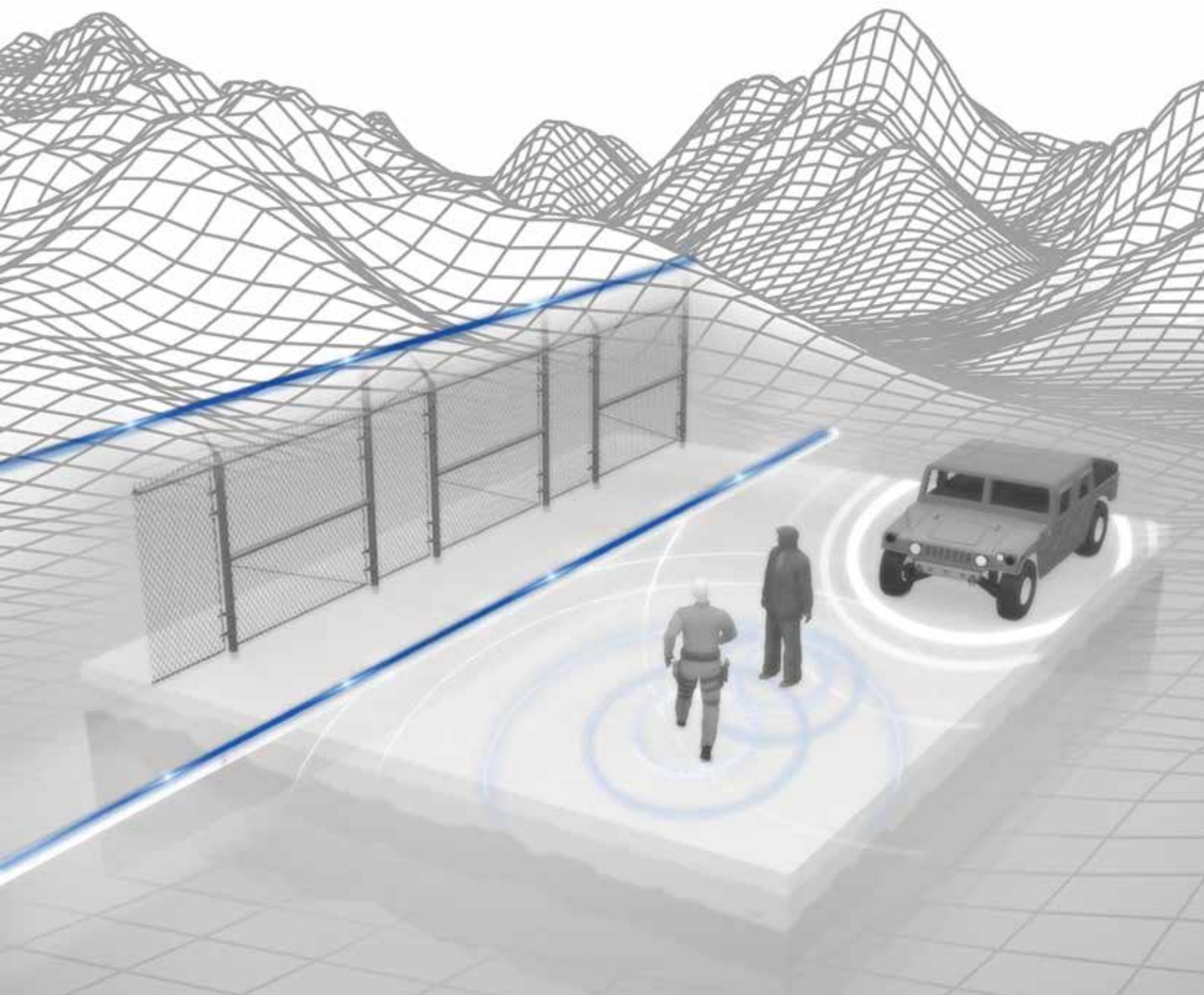# OptaSense®

a QinetiQ company

Border Security and Surveillance

Optimizing safety, efficiency and overhead

Protecting borders from illegal entry of people, weapons, drugs, and contraband is vital to a nation's security, as are boots on the ground.

Strengthening security efforts

Safeguarding borders and military with a surveillance system that identifies threats quickly and effectively is your first line of defense.

However, technical limitations and environmental factors can impact the performance of many surveillance systems—leaving them vulnerable to infiltration.

Strengthen security efforts with OptaSense® Border Security and Surveillance, a fiber optic monitoring system that
- Detects, tracks, and classifies a wide range of threats
- Delivers real-time, actionable intelligence
- Endures challenging environments and remote locations

Using advanced Distributed Acoustic Sensing (DAS) technology, the OptaSense Border Security and Surveillance system provides agents and field patrols a complete picture of the location, scale and type of threat detected—enabling rapid, more informed decisions that result in fast and efficient response mechanisms.

Get MORE from a single system

Multi-threat detection

The OptaSense Border Security and Surveillance system converts a standard telecoms fiber optic cable into an array of distributed sensors capable of detecting changes in pressure, temperature, stress and acoustics. Advanced algorithms are used to classify and locate activities such as people, vehicle movement, low flying aircrafts, digging, gunfire and many other events.

Unlike conventional sensors, this DAS-based system significantly reduces nuisance alarms using reliable algorithms that decipher and classify the type of intrusion in real time. Users can be notified of alarms via text or email, and by leveraging GPS coordinates, the system can pinpoint the location of a security breach and/or confirm zero activity within seconds.
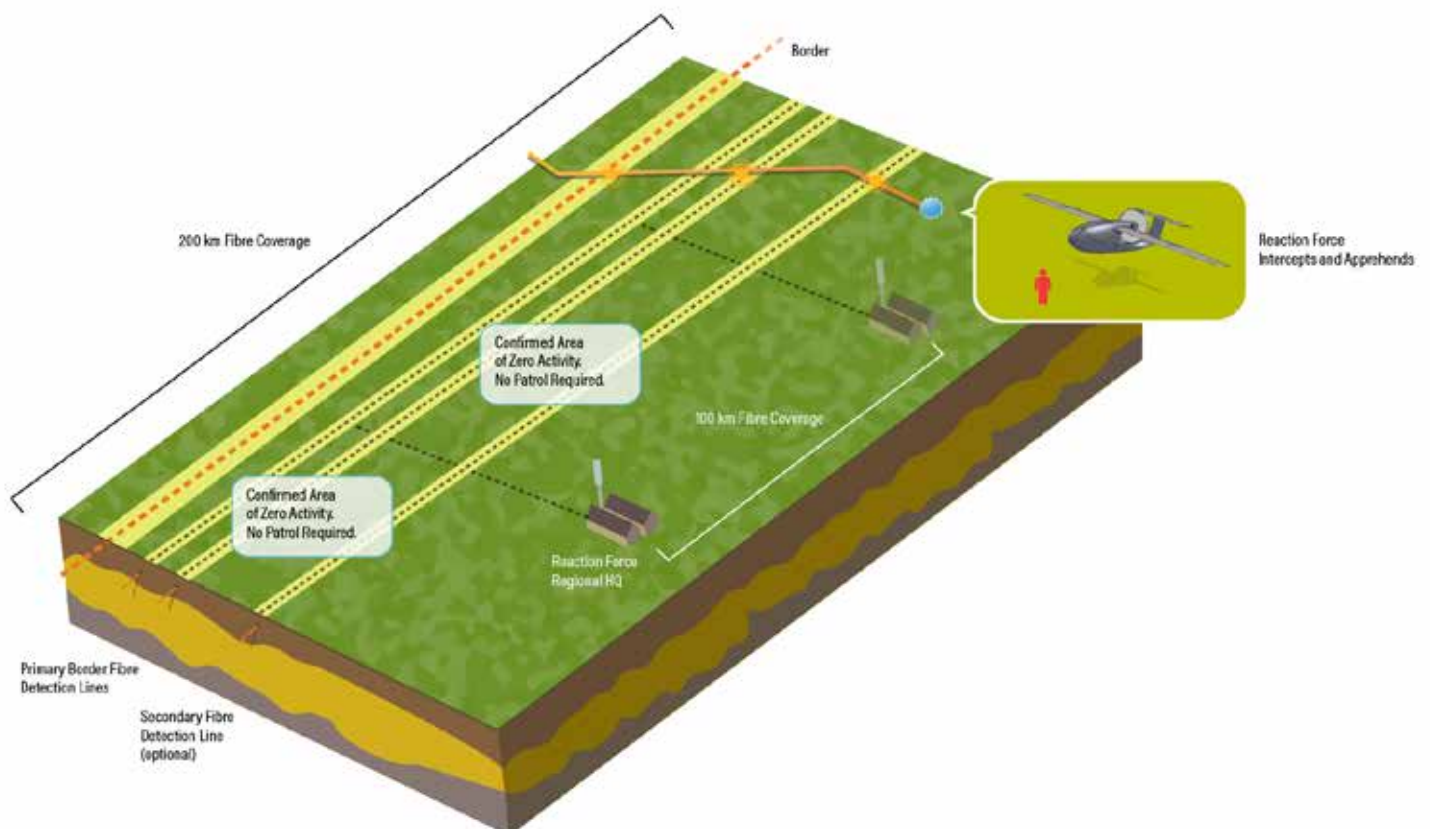
With this information, asset owners can increase the effectiveness of response mechanisms, such as patrols and helicopter reconnaissance, by ensuring manual inspection is focused on areas of real activity.

HOW IT WORKS

The Border Security and Surveillance system utilizes one strand of a single mode standard telecommunications fiber, installed along the perimeter of an asset, to monitor and detect unwanted activity.

For measurement, the system utilizes a Coherent Optical Time Domain Reflectometer, or Interrogator Unit (IU), located alongside the processing unit. After injecting laser pulses down the length of the fiber, the IU reconstructs acoustic signals detected from the backscattered light along the cable. Signal processing software is used to analyze these signals in real time, with 10m location accuracy.

The systems user interface presents real-time data in a clear and intuitive manner, displaying classified alerts on a map with location coordinates. And, by networking IU's together the system allows an operator to monitor over 5,000km from one location.

Border

200 km Fibre Coverage

Confirmed Area of Zero Activity. No Patrol Required.

Confirmed Area of Zero Activity. No Patrol Required.

100 km Fibre Coverage

Reaction Force Regional HQ

Reaction Force Intercepts and Apprehends

Primary Border Fibre Detection Lines

Secondary Fibre Detection Line (optional)

OptaSense Border Security and Surveillance can be customized to meet the demands of the perimeter it is protecting.

Fit-for-purpose protection

The system offers three types of installation: fence, buried or hybrid. A hybrid installation provides additional design flexibility and added security on fence and buried systems, as well as some water applications. The system can also be run in stealth mode for high security areas.

For a more robust security management solution, OptaSense Border Security and Surveillance can be easily integrated with other systems and sensors, such as CCTV cameras and VMSS.

The system is software based, allowing easy alterations to perimeter adjustments and/or changes to the number of zones being monitored.

To facilitate dynamic thresholds, this system offers smart zones that provide the flexibility to customize alert settings for specific regional needs, such as terrains, roadways and rivers, at different times of the day. With this insight, you can distinguish normal pedestrians and roadway traffic from an unexpected vehicle unloading several people.
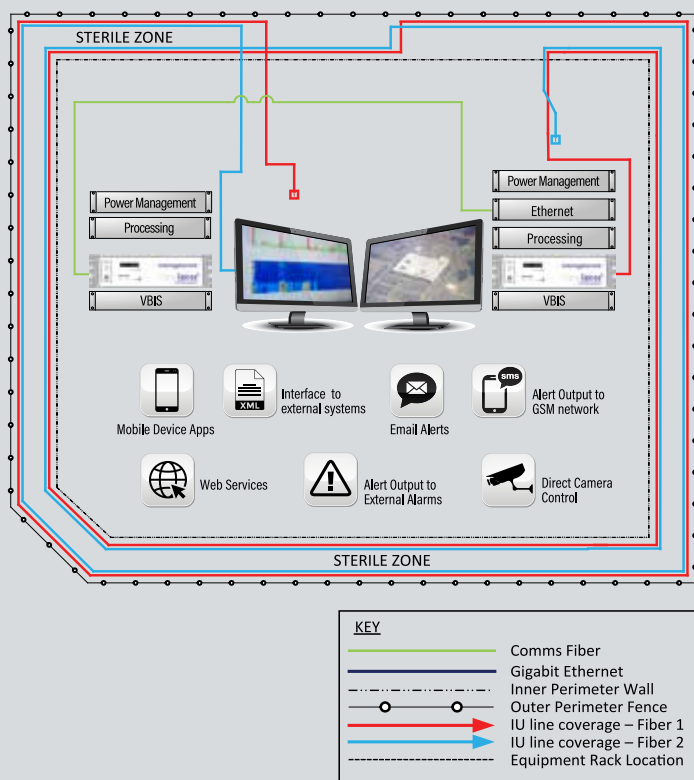
Seamless, affordable installation

The OptaSense Border Security and Surveillance system is typically installed 80km-100km apart, providing a sensor every 10m that can detect activity up to 100km from a single location.

This system seamlessly integrates with legacy systems, while offering auto-cueing capabilities for a wide range of perimeter security platforms, such as CTTV. By leveraging an existing fiber optic cable, such as SCADA control lines for pipelines or telecoms networks used to connect CCTV cameras or border posts, this system provides reliable security at an affordable cost.

With OptaSense Border Security and Surveillance, all electronics are located in a controlled environment—protecting equipment from EMI, RFI, and other hazardous environmental conditions.

The system also eliminates the need for in-field hardware, power and maintenance, which reduces the overall cost of ownership compared to conventional sensors in remote environments.
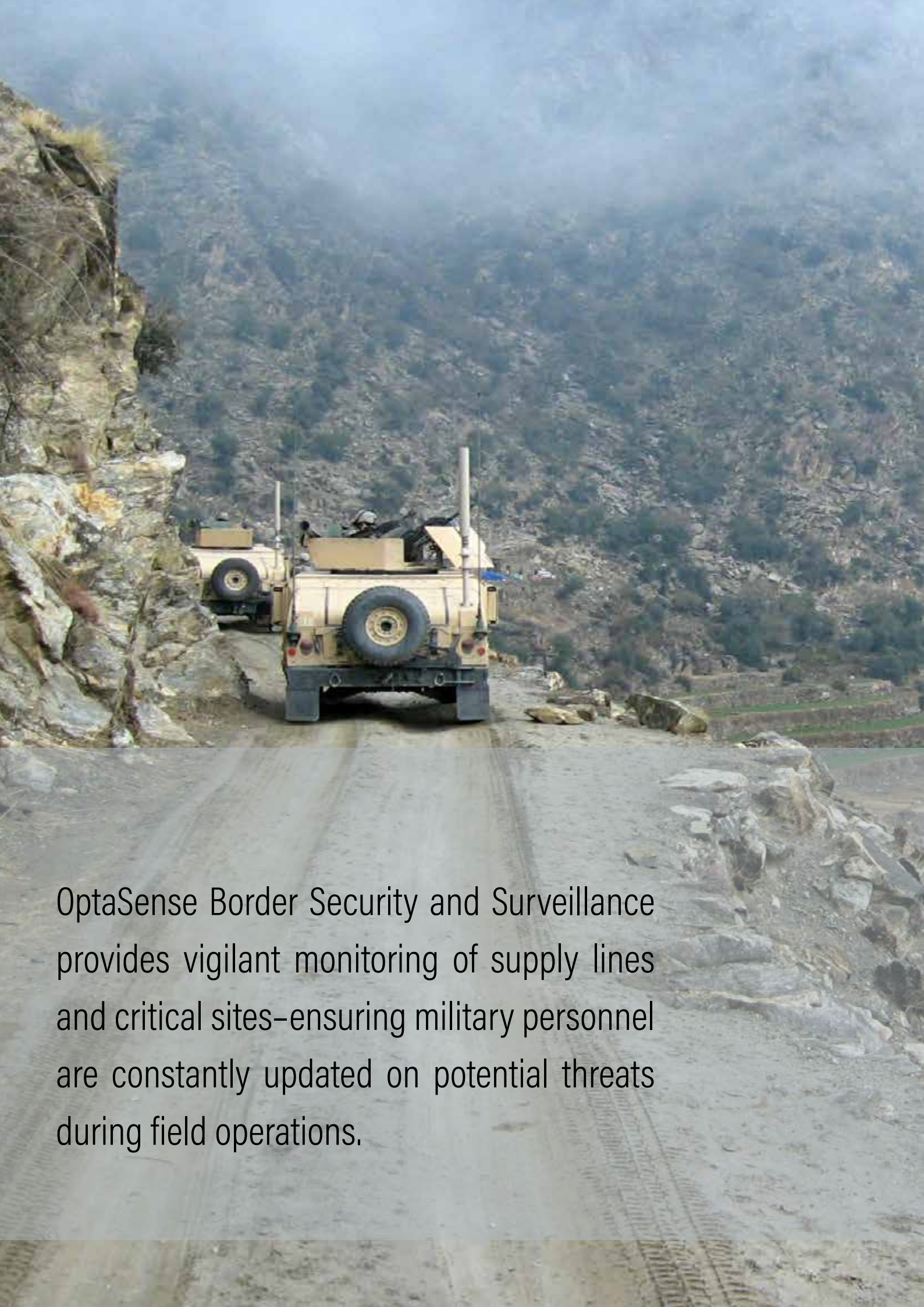
A layered system approach

In addition to providing maximum coverage potential, our technology can be configured in a dual redundant architecture which provides added protection against system failures.

In the configuration pictured, dual IU's are installed pointing opposite directions. Each IU leverages a single strand of an optical fiber, which is wrapped twice around the perimeter (inner and outer). One strand operates clockwise, while the other operates counter-clockwise, offering bi-directional redundancy from a single fiber optic cable.

In the event the fiber is cut or disconnected, this layered approach activates alerts from both IU's. One IU operates clockwise up to the cable cut, while the other operates counter-clockwise, resulting in no loss of coverage. If a single IU fails, alerts are immediately diverted to the secondary IU, also resulting in no loss of coverage.

STERILE ZONE

Power Management
Processing
VBIS

Power Management
Ethernet
Processing
VBIS

Mobile Device Apps

Interface to external systems

Email Alerts

Alert Output to GSM network

Web Services

Alert Output to External Alarms

Direct Camera Control

STERILE ZONE

KEY

	Comms Fiber
	Gigabit Ethernet
	Inner Perimeter Wall
	Outer Perimeter Fence
	IU line coverage – Fiber 1
	IU line coverage – Fiber 2
	Equipment Rack Location

OptaSense Border Security and Surveillance provides vigilant monitoring of supply lines and critical sites–ensuring military personnel are constantly updated on potential threats during field operations.

Protecting Boots on the Ground

Along any fiber optic cable, OptaSense Border Security and Surveillance acts as a single sensing system that provides valuable intelligence to protect your most valuable assets, your soldiers.

Supply Route Security
OptaSense Border Security and Surveillance provides continuous remote monitoring of supply lines, enabling soldiers to mitigate threats and keep supplies flowing.

Base Protection
Bases protect soldiers, but are under constant threat of attack. OptaSense Border Security and Surveillance provides reliable, real-time intelligence to secure a base perimeter.

At one extreme, it can detect and classify a single person attempting to infiltrate a perimeter. At the other extreme, it can detect and localize a blast, gunfire or a low-flying, radar-evading aircraft hidden by terrain.

Robust Performance
Regardless of weather, terrain, foliage, and other environmental factors, the OptaSense Border Security and Surveillance system delivers steadfast performance and life-saving intelligence.

Reducing Unnecessary Risk
Until now, there were few, if any, intelligence surveillance systems that could provide long duration, sustained, remote monitoring without requiring regular maintenance and/or resupply, which puts soldiers at risk of ambush.

The OptaSense Border Security and Surveillance system requires no in-field maintenance, eliminating the need routine system maintenance.

Safeguard borders and military operations with a surveillance system that
- Detects, tracks, and classifies a wide range of threats
- Delivers real-time, actionable intelligence
- Endures challenging environments and remote locations

For more information about the OptaSense Border Security and Surveillance system, contact your local representative or visit us online at www.optasense.com.

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