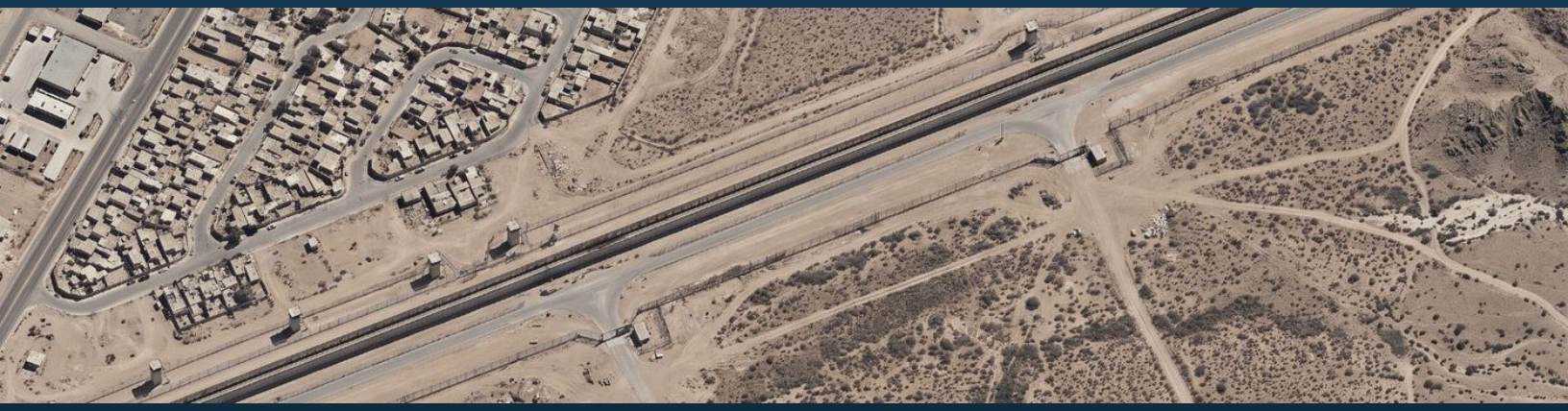
RBtec Perimeter Security Systems

CASE STUDY

Border Monitoring with RaySense Buried Fiber

How a national border security agency instrumented remote border sectors with buried RaySense fiber: tens of kilometers per sector on a single unit, fully covert underground, classifying foot traffic, vehicles and digging, with located alarms feeding the agency command center.



AERIAL VIEW OF A REMOTE BORDER CORRIDOR. ILLUSTRATIVE IMAGERY; CUSTOMER IDENTITY WITHHELD.

10s of km	100 km	100%	Meters	0
PER SECTOR, ONE UNIT	MAXIMUM PER UNIT	COVERT, BURIED	LOCATION PRECISION	ELECTRONICS IN THE FIELD

The Challenge

Thousands of miles of remote terrain, crossed by people and vehicles that do not want to be seen.

The agency monitors border sectors with no buildings, no power distribution and often no road alongside: hills, thick vegetation and deep valleys. A fence is a blunt instrument at this scale, expensive to maintain, quick to climb or cut, and an announcement of exactly where the defenses are.

Radar and cameras share one dependency: line of sight. In rolling terrain their coverage maps are archipelagos of blind spots, and experienced crossers learn where those blind spots are.

WHAT THE TERRAIN RULED OUT

- Line-of-sight sensors blinded by hills, vegetation and valleys.
- Towers needing power, communications and access roads that do not exist in these sectors.
- Anything visible enough to be mapped and planned around.

The Solution, RaySense Buried Fiber

A fiber optic cable is trenched into the ground along the line to be protected and becomes the sensor along its entire length, following the natural contour of the land meter by meter. The unit classifies ground-borne vibration into the signatures that matter at a border: footsteps, moving vehicles, and digging near the line.

- **Covert by construction:** after backfill there is nothing to see, no posts, no hardware, nothing to plan around.
- **Located alarms:** each event is placed on the line to within meters.
- **Sector scale:** one unit covers tens of kilometers, rated up to 50 km per direction and 100 km total.
- **Nothing to maintain in the field:** passive glass, with no power or electronics along the route.

The Results

Coverage that follows the ground, with nothing above it.

The design intent is that a crossing attempt in an instrumented sector, on foot, by vehicle, or by digging, raises a located alarm in the command center while it is in progress, including in terrain no camera or radar was covering.

- Patrols are dispatched to a point on the line, not to a sector.
- RBtec has not published measured before and after detection or interdiction counts for this agency.
- Civil contractors carried out the burial sector by sector under RBtec supervision, with the classifier tuned to each sector's real ground.
- The agency's command center gained a sensing layer, not another screen to watch: events hand off through standard interfaces.

> *"A buried line changes the psychology of a border. A fence announces where the detection is and invites a plan. Buried fiber gives an intruder nothing to plan against: the first sign that a sector is instrumented is a patrol arriving at your position."*
>
> **RBtec engineering team**

RaySense Buried at a Glance

System	RaySense buried fiber optic intrusion detection
Coverage model	One RaySense unit per sector, tens of kilometers each
Unit range	Up to 50 km in one direction, 100 km total per unit
Detects	Foot traffic, vehicles, and digging near the line
Location	Places an event on the line to within meters
Visibility	Buried, nothing above ground: 100% covert
Integration	Located alarms into the agency's command center
Installation	Civil contractor with RBtec design and commissioning, weeks per sector

LGDS SENSOR CABLE BEING LAID IN THE TRENCH DURING BURIAL. REPRESENTATIVE INSTALLATION IMAGERY.

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