

The smart way to secure borders and facilities

# Intelligent Perimeter Intrusion Detection System (IPIDS)



## At a Glance

NEC's Intelligent Perimeter Intrusion Detection System (IPIDS) secures borders and facilities such as:

- National borders
- Military facilities
- Corporate campuses
- Oil and gas pipelines (leakage)
- Oil, gas, and chemical plants
- Nuclear, electric, wind, and solar power plants and infrastructure
- Airports and seaports
- Prisons, jails, and correctional facilities
- Data centers
- Transportation infrastructure
- Diplomatic outposts
- Municipal/public water resources

## Overview

A critical task for any government, agency or business is the protection of its people, property, and other assets. Whether it is physical intrusions at a national border, military installation, or private property, **NEC's Intelligent Perimeter Intrusion Detection System (IPIDS)** can detect physical intrusions and disturbances along land borders, property boundaries, and facility perimeters; above ground, underground, and under water.

Fiber-optic sensing and machine learning-based artificial intelligence provide covert, instant, and simultaneous classification and location of multiple physical intrusions or disturbances. Underground or on fences, NEC IPIDS detects a variety of activities at distances such as:

INTRUSION	RANGE
Human Walking	Up to 10 m/33 ft.
Human Running	Up to 15 m/50 ft.
Human Crawling	Up to 1 m/3 ft.
Fence climbing, cutting, lifting	Yes
Light vehicle moving	Up to 15 m/50 ft.
Heavy vehicle moving	Up to 30 m/100 ft.
Digging	Up to 30 m/100 ft.
Tunneling	Up to 30 m/100 ft.
Low flying aircraft	Yes

Immune to electromagnetic interference and with no electrical power required in the field, it actively monitors near and remote areas, delivering reliability and results, including:

Distance	Up to 100 km (62 mi)
Location Accuracy	Up to $\pm 1$ m ( $\pm 3$ ft.)
Cut Immunity	Yes
Bidirectional	Yes
Probability of Detection*	High
Nuisance Alarm Rate*	Low
False Alarm Rate	Low
Total Cost of Ownership	Low

\*Optimized using machine learning based Artificial Intelligence

NEC's IPIDS performance is invariant to seasons and remains consistent in a wide-range of field conditions such as strong wind, heavy rain and snow, dense fog, lightning and explosive atmospheres. Ability to withstand these elements provides a significant reduction of maintenance and security resources for low total cost of ownership.

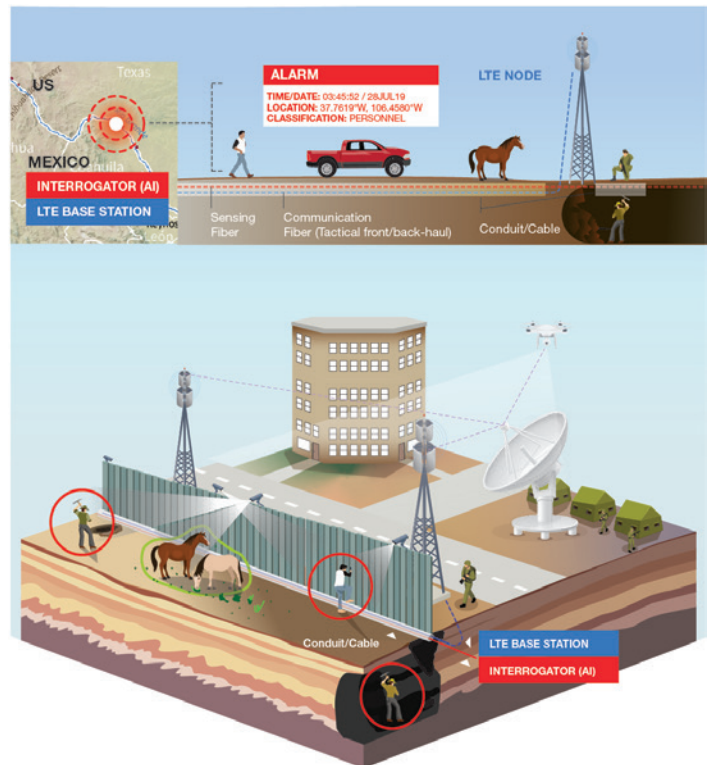
# Solution

NEC's Intelligent Perimeter Intrusion Detection System combines NEC's world-leading expertise in transoceanic optical fiber communication and machine learning-based artificial intelligence. A centrally located INTERROGATOR sends and receives light into and from optical fibers that are covertly buried and/or fence-mounted or wall-mounted along borders and facility perimeters. When physical intrusions create vibrations that reach the optical fibers, the interrogator discerns changes in the light. Then, machine learning-based AI instantly and simultaneously classifies and locates the multiple physical intrusions.

## USER-FRIENDLY AND CUSTOMIZABLE SOFTWARE AND INTEGRATION

In real-time, a user-friendly and customizable graphical user interface displays a border and/or facility perimeter map, denotes the location of detected physical intrusions, and provides actionable data. Detection and alarms can be integrated into NEC IPIDS to immediately trigger silent or audible alarms and/or activate security resources—such as personnel, cameras, or drones in the field—which can prompt the intruder's retreat or lead to apprehension. Actionable data, such as date, time, location, and classification, can be stored locally or remotely for future reference and data analytics. Additionally, for a single INTERROGATOR and over the length of a single optical fiber, the software can be customized for multiple types of borders and facility perimeters that have a wide range of field conditions.

HARDWARE SPECIFICATIONS - 160 Kilometers / 100 Miles	
Optical Fiber Connection	2 SC/APC
Optical Fiber*	2 standard single mode (0.2 db/km loss @ 1550 nm)
Data I/O & Communication	1000Base-T Ethernet (Gigabit)
Temperature (Operating)	0 to 45 °C (32 to 113 °F)
Temperature (Storage)	-40 to 70 °C (-40 to 158 °F)
Humidity (Operating)	20 to 85 % relative/no cond.
Humidity (Storage)	5 to 95 % relative/no cond.
Electrical power (input)	-39~+57 V DC
Electrical power (consumption)	Max:120 W, Typ100 W
Size	4U, 19" rack mountable



## CUSTOMER BENEFIT

NEC's Intelligent Perimeter Intrusion Detection System provides the best accuracy, highest probability of detection and lowest nuisance alarm rate over the longest distances and widest-range of field conditions. Being invariant to seasons, in concert with innate immunity to electromagnetic interference, and requiring no electrical power in the field, existing and/or previously non-securable borders and perimeters can be secured with unmatched reliability and significant reduction of maintenance and security resources for a low total cost of ownership.

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