



National Security Systems
An NEC Company

Fiber Optic Sensing for Smart Cities, Smart Buildings, Smart Infrastructures

Intelligent Optical Fiber Sensing Solution



NEC's Intelligent Optical Fiber Sensing (iOFS) technologies identify people, objects, and events in a wide range of environments. NEC combines world-class expertise in transoceanic fiber optic transmission and machine learning-based artificial intelligence (AI) with advanced distributed fiber optic sensing technologies to create a solution that provides unobtrusive, low maintenance detection capabilities.

Applications:

- Fiber cable cut prevention
- Cable localization
- Traffic and road condition monitoring
- Utility pole health monitoring
- Environment temperature monitoring
- Perimeter intrusion detection

Key Features:

- Long sensing range
- Fine spatial resolution
- Accurate event identification
- No new cable installation required
- Customizable software interface
- Real-time and offline analysis
- Portable options

Overview

NEC's iOFS solution uses a toolset of distributed vibration and acoustic- temperature- and strain-sensing technologies. Applied to existing fiber optic network infrastructures or a dedicated fiber optic sensing network, NEC's iOFS solution monitors various types of environmental conditions and events. A user-friendly and customizable graphical user interface denotes the location of events-of-interest and provides actionable data in real-time.

When an environmental disturbance such as physical movement, temperature variation, or acoustic noise reach the optical fibers, the sensor interrogator instantly detects and locates the signal. The solution's machine learning-based AI analytic engine simultaneously analyzes and classifies the multiple physical events. Integrated, user-defined detection parameters immediately trigger silent or audible alarms and/or send actionable alerts. Actionable data, such as date, time, location, and event classification, can be stored locally or remotely for future reference and data analysis.

The solution allows the users to continuously monitor conditions on their networks and to detect threats and prevent disruption, hence reducing the effort and costs associated with infrastructure surveillance, repair, and operation.

Best Technology, Most Accurate

NEC's NeoFace® biometric technologies are consistently proven to have the fastest and most accurate face recognition algorithms available, based on independent benchmark testing conducted by the National Institute of Standards and Technology (NIST).^{*} NIST's independent tests also conclude that NEC's face recognition technologies are the most resilient to low-resolution images and viewing angles, as well as poor image quality. Of critical importance are NIST results that show NEC's algorithms provide the highest accuracy in age, gender, and race—results dramatically superior to our competitors.^{**} A rapid-capture biometric technology designed to operate with readily available commercial hardware and software, NeoFace solutions deliver superior performance at a competitive price.

NIST

**NEC's NeoFace® Technology
Consistently Ranked As #1 Provider
of Face Recognition Algorithms by
NIST***

Innovative Force in Identification

NEC pioneered biometric research, and has been a world leader in integrated, high-availability biometric identification systems for over 30 years. The unparalleled identity matching accuracy and speed of NEC's face recognition technologies have been independently verified by NIST. NEC's other top-ranked biometric identification modalities include fingerprint, palmprint, voice, and iris. Under the company's corporate ethos, "Orchestrating a Brighter World," NEC aims to help solve challenging issues and to create new social value for the world of today and tomorrow.

Key Product Features

Technical Specifications: SpectralWave™ LS3200

Sensing range	Up to 125 km each direction
Support optical fiber	Standard single mode fiber
Optical wave length	1550 nm
Laser class	Class 3B
Number of sensing ports	16 (LC/APC connector)
Number of management ports	1 (RJ-45, 100/1000 BASE-T)
Power consumption	60 W typical
Input voltage range and frequency	90VAC to 264VAC, 47 to 63Hz; with AC adaptor
Dimensions (H X W X D)	87 x 270 x 436mm
Weight	12Kg
Certifications	UL62368-1, FCC Class A, VCCI Class A

(*<https://www.necam.com/AdvancedRecognitionSystems/NISTValidation/FingerprintFacial/>)

(**<https://nvlpubs.nist.gov/nistpubs/ir/2019/NIST.IR.8280.pdf>)

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NEC National Security Solutions, Inc. (NSS), is a leading provider of biometric identity and AI technology for federal government agencies in defense, intelligence, law enforcement, and homeland security agencies. Based in Arlington, Va., NSS deploys proven groundbreaking technology for access control, identity verification, scene processing, advanced analytics, fiber optic sensing, border control and transportation security, among other applications. The company was launched in 2020 as a wholly owned subsidiary of NEC Corporation of America and will operate under a Special Security Agreement (SSA) with the US Government as a FOCI-mitigated entity, free of foreign ownership, control, and influence. It provides full-service solutions for large agencies using the intellectual property and resources of the global NEC brand. The NEC Corporation invests an estimated \$1.01 billion annually in R&D, holds 47,000 patents, and has more than 110,000 employees in 160+ countries. For more information, please visit www.necns.com.

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