



NEUBREX COMPANY PROFILE

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EXECUTIVE SUMMARY

Neubrex, a worldwide leader and leading innovator for **D**istributed **F**iber **O**ptic **S**ensing (DFOS) solutions, providing cutting-edge monitoring systems for infrastructure and industrial applications. With an emphasis on innovation, reliability and sustainability. Neubrex delivers high-precision data insights that enhance operational efficiency, reduce maintenance costs, extend asset lifespans and ensure the safety of critical assets. The company serves a diverse global clientele, across all industries, including operators in the transportation, energy and industrial sectors.

Neubrex delivers unmatched performance, reliability, optical power delivery, measurement versatility, and technical scalability in distributed fiber optic sensor systems. Critical infrastructure and industrial process operators worldwide trust in Neubrex’s equipment, systems, and services. Our technology is applied on roads, bridges, tunnels, nuclear waste storage facilities, nuclear power plants, oil & gas fields, and geothermal system wells while meeting stringent requirements and objectives.

Industries Served



Key Applications

- **Structural Health Monitoring** and Pile Testing & Instrumentation
- **Geotechnical and Geophysical Investigation:** Surface, Borehole and Marine
- **Environmental Monitoring** and Chemical Testing
- **Materials, Technology:** Studies, Evaluation Testing
- **Quality Control** and Special Studies
- **Security & Intrusion Detection**

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COMPANY OVERVIEW

Neubrex was founded in 2002 in Osaka, Japan, as a spin-off from Osaka University.

The company specializes in developing measurement systems for infrastructure to increase efficiency, reduce maintenance costs, and ensure safe operations, including structural health monitoring. All Neubrex systems are based on distributed fiber optic sensing technology (DFOS).

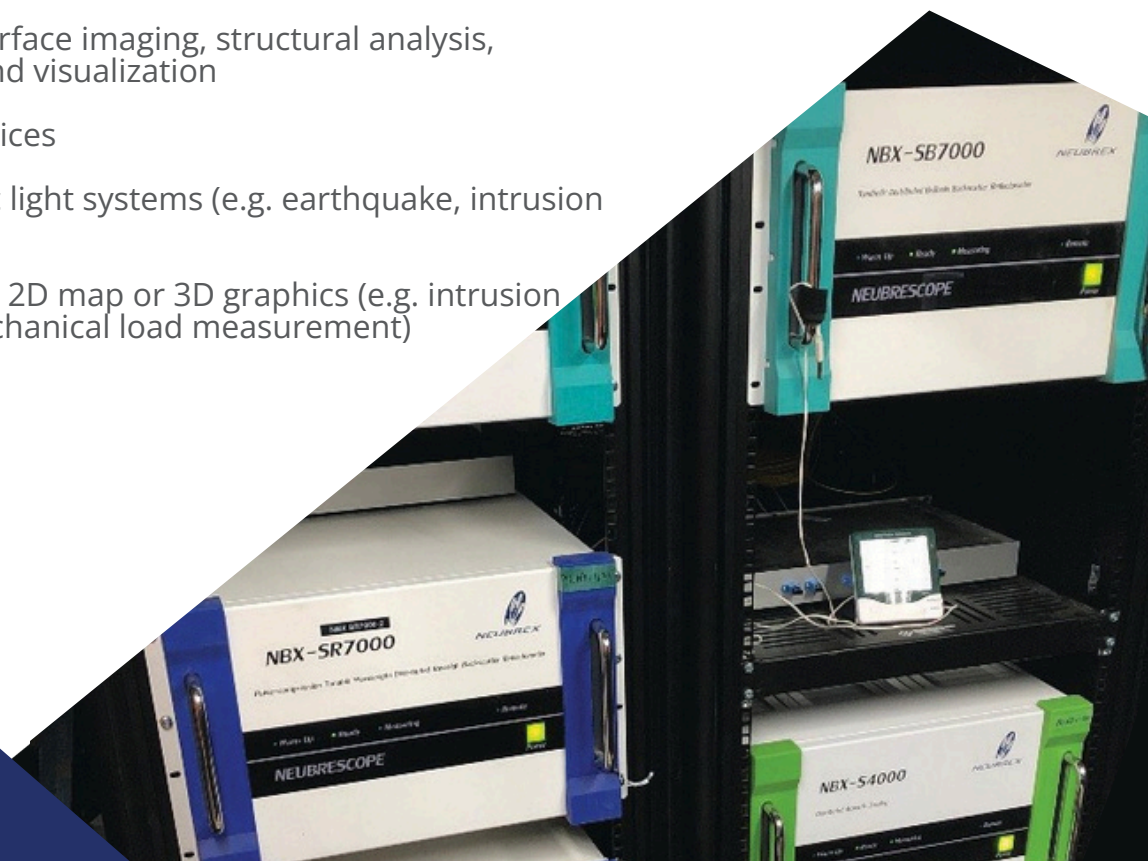
Neubrex stands at the forefront of innovation in product and systems manufacturing, seamlessly integrating internal research and development (R&D) into every facet of its operations.

Company Formation, Ownership and Management

Neubrex Co., Ltd (Japan), Neubrex Energy Services US LLC (USA), and Neubrex Infra AG (Switzerland) were all founded by Dr. Kinzo Kishida, who holds the majority ownership in each entity.

The Neubrex technology consists of

- Interrogator Units for distributed fiber optic measurement
- Fiber Optic sensing cables as sensors
- Specialized software for:
 - Intelligent subsurface imaging, structural analysis, interpretation and visualization
 - Information services
 - Alarm and traffic light systems (e.g. earthquake, intrusion detection...)
 - Visualization e.g. 2D map or 3D graphics (e.g. intrusion detection or mechanical load measurement)
 - Data processing



OUR VISION AND MISSION



Vision

Neubrex is a recognized technology leader, exceeding international standards for high-precision monitoring systems. Our expertise ensures exceptional advisory support throughout the entire implementation process of distributed fiber optic sensing (DFOS) solutions.



Corporate Values

At Neubrex, our values serve as the foundation of our operations, driving innovation and excellence in everything we do.

Innovation:

We continuously pioneer advancements in fiber optic sensing technology, setting new industry benchmarks.

Integrity:

We uphold the highest standards of honesty, transparency, and ethical business practices in all our engagements.

Prudence:

Every decision we make is guided by careful analysis, logical reasoning, and a commitment to sustainability and intelligent solutions.



Mission

Neubrex provides cutting-edge distributed fiber optic sensing (DFOS) solutions, delivering precise, real-time data of unparalleled quality. These solutions enable organizations to make fact-based decisions, optimizing efficiency, reducing maintenance costs, extending lifespans, and ensuring economic, long lasting and safe operations of their assets.

Reliability:

Our solutions are designed to deliver accuracy, consistency, and durability, ensuring long-term operational success.

Customer-Centricity:

Our approach is driven by the unique needs of our clients, providing tailored solutions that maximize value.

NEUBREX

HISTORY, MILESTONES & ACHIEVEMENTS



GLOBAL PRESENCE AND GEOMARKET OFFICE LOCATIONS

Delivering Excellence in DFOS Solutions Worldwide

Neubrex has established a strong global presence, with strategically located offices to ensure comprehensive market coverage and exceptional customer support. By maintaining a presence in key regions, we deliver worldwide industry-leading **D**istributed **F**iber **O**ptic **S**ensing (DFOS) solutions, equipment and services across diverse sectors, meeting the highest standards of quality and innovation.

Strategic Office Locations



Our offices are strategically situated in major cities around the world, enabling us to effectively serve a wide range of industries and applications. These locations are chosen based on market demand, proximity to key clients, and access to skilled talent. This strategic positioning allows us to respond swiftly to customer needs and leverage local expertise to deliver tailored solutions.

By maintaining a strong international presence, Neubrex ensures seamless service delivery, efficient project execution, and responsive support for clients worldwide. Our commitment to innovation and excellence drives us to expand our global reach and continue delivering high-quality, precision-driven monitoring solutions.

QUALITY STANDARDS & CERTIFICATIONS

Thanks to our Japanese heritage, we adhere strictly to the highest international quality and regulatory standards, ensuring full compliance with stringent industry regulations. Our dedication to excellence is evident in our thorough quality management system, which assures product reliability and operational efficiency.

Key Certifications

CE Certification:

Ensures product compliance with European safety, health, and environmental protection standards.

ISO Certification (In Progress):

Demonstrates our dedication to quality management and operational excellence through adherence to internationally recognized standards.

By continuously improving our processes and maintaining stringent quality control, Neubrex ensures that our solutions meet and exceed industry expectations.



CORE CAPABILITIES & COMPETENCIES

At Neubrex, we provide high-resolution distributed sensing solutions with a wide technical scalability that deliver precise, real-time data for infrastructure monitoring. Our advanced fiber optic technology enables operators to optimize efficiency, enhance structural safety, extend asset lifespans, and reduce operational risks.

With a strong focus on sustainability and resource optimization, our solutions minimize environmental impact while maximizing performance. In addition to cutting-edge sensor technology, we offer comprehensive engineering services and expert system integration, ensuring seamless implementation across a wide range of industries.

Our expertise-driven approach allows us to develop customized monitoring solutions tailored to the specific needs of construction, energy, oil & gas, and geothermal projects worldwide. By leveraging real-time insights and predictive analytics, we empower infrastructure owners to make data-driven decisions for long-term reliability and operational excellence.

Internal Neubrex Capabilities

- Development and manufacturing of interrogator units in Japan:
 - DAS (Distributed Acoustic Sensing)
 - RFS (Rayleigh Frequency Shift)
 - Brillouin temperature and strain sensing
- Development of operational software for interrogator units in Japan
- Development and design of fiber optic sensing cables and accessories in Japan and Switzerland:
 - Armored cables for distributed pressure, temperature, acoustic, and strain sensing
 - Shape sensing
 - Applications in nuclear radiation environments
- Development of software for intelligent structural analysis in Japan and Switzerland:
 - Pipeline thinning detection
 - Structural deformation monitoring
 - Crack detection
 - VSP (Vertical Seismic Profiling) and surface seismic analysis
- Information services in Japan, USA, and Switzerland:
 - Customized data processing and visualization software development
 - Data analysis and interpretation services
 - Hydraulic fracturing, cross-well strain, production allocation, and monitoring for unconventional oil and gas reservoirs

External Partner Capabilities

- 3D real-time micro-seismic data analysis with a traffic light alarm system in the USA and in Europe
- Fiber optic sensing cable installation in Japan, the USA and Europe
- Fiber optic sensing cable production in Japan and Europe

PRODUCTS & SOLUTIONS

Neubrex offers a comprehensive range of cutting-edge scalable fiber optic sensing solutions, designed to provide precise, real-time monitoring across various industries. Our portfolio includes advanced interrogator units, integrated monitoring systems, and high-performance sensing cables.

NEUBRESCOPE Interrogator Units

01. DTSS (Distributed Temperature Strain Sensing) Brillouin (5000 and 6000 series):

High-resolution monitoring for strain and temperature sensing.

02. DTSS Hybrid Brillouin-Rayleigh (7000 series):

Advanced separation of strain and temperature signals for enhanced analysis.

03. DAS (Distributed Acoustic Sensing) Real-Time Phase (4000 series):

Continuous acoustic sensing for structural and environmental monitoring.

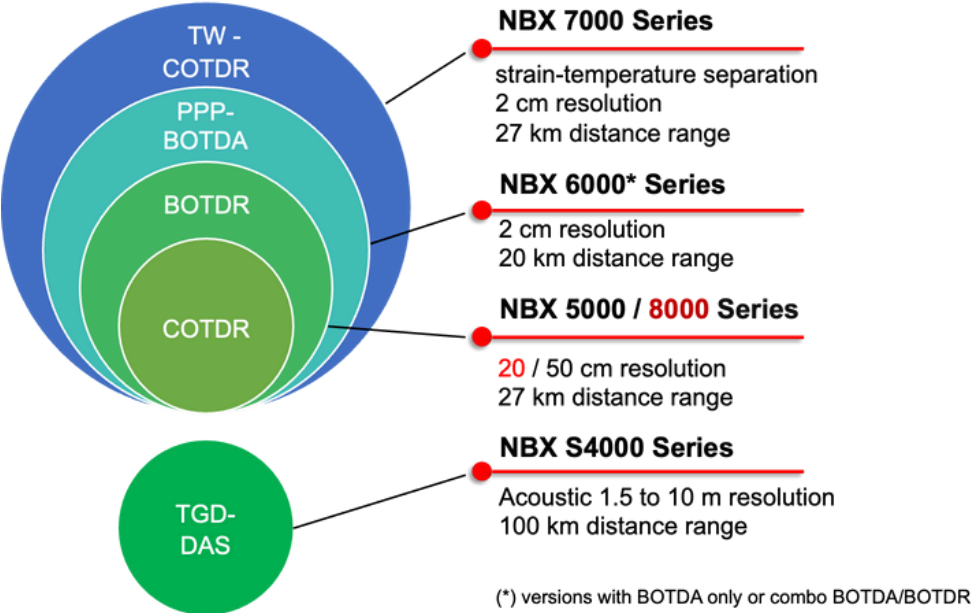
04. PON (Passive Optical Network) Monitoring System (9000 series):

Fiber optic network monitoring for telecommunications applications.

NEUBREX NEUBRESCOPE MODULARITY



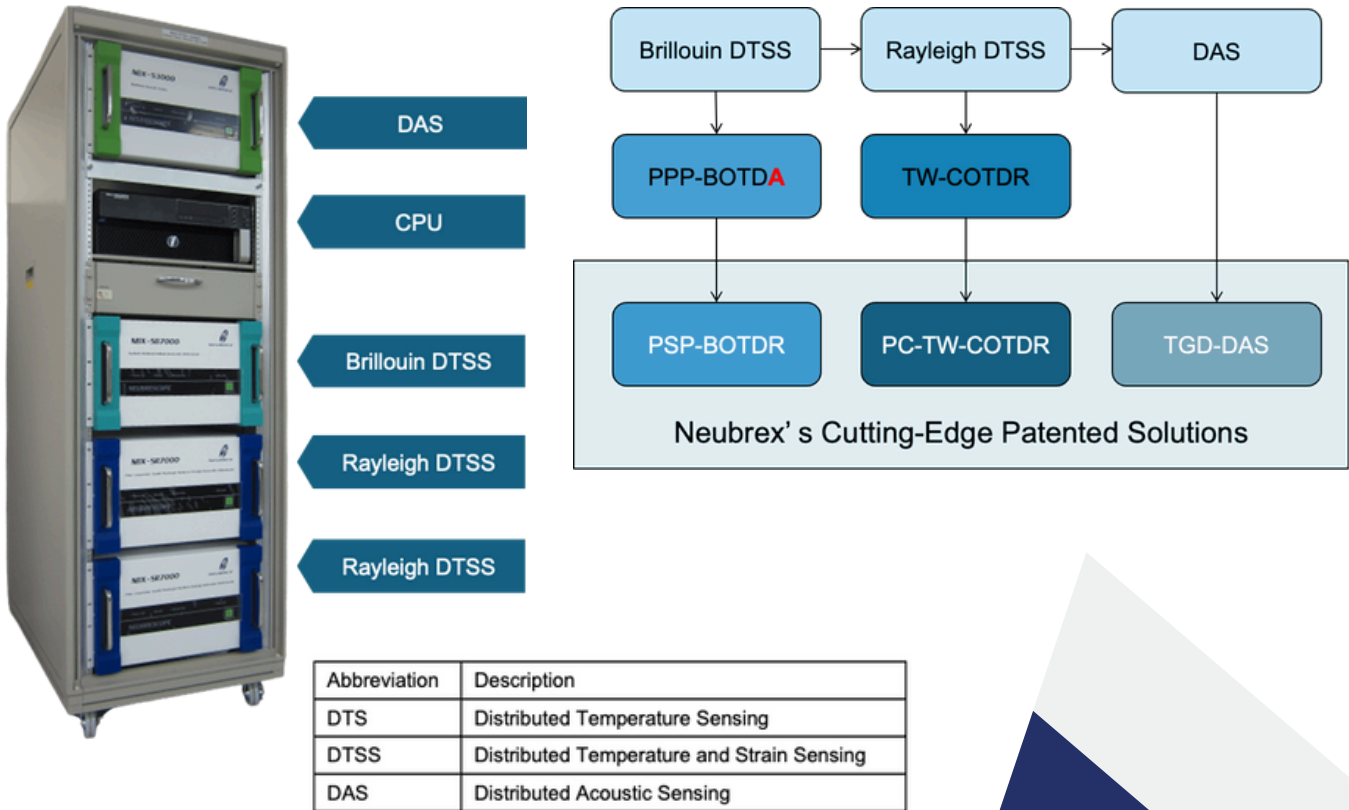
- High precision and speed:**
 Delivers high spatial resolution with fast temporal measurements over long distances.
- Broad fiber compatibility:**
 Works with both Single Mode and Multi-Mode fibers, with no special fiber type requirements (DTS).
- Proven reliability:**
 Successfully field-tested for over a decade in extreme environmental conditions worldwide.



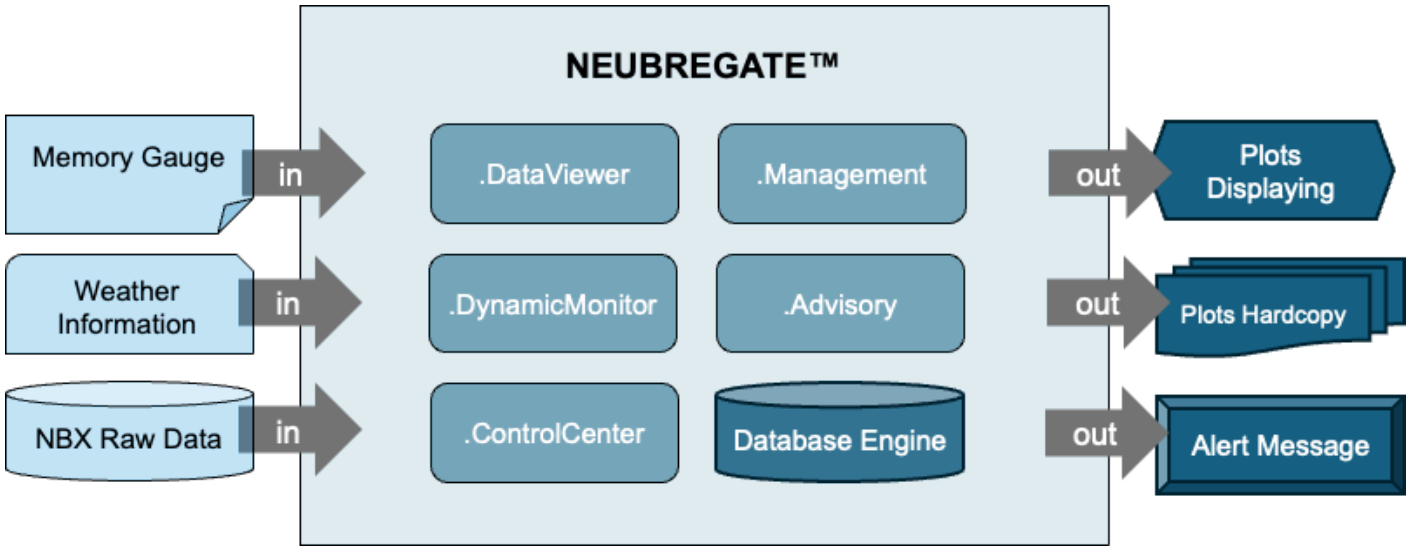
NEUBREGATE:
Robust back-end database system for efficient real-time Structural Health Monitoring (SHM) data management.

INSTRUMENTATION PLATFORM

The Brillouin DTSS and Rayleigh DTSS/DAS measurement systems can be used independently or integrated as a complete solution to meet the highest quality standards for all optical fiber distribution measurements.

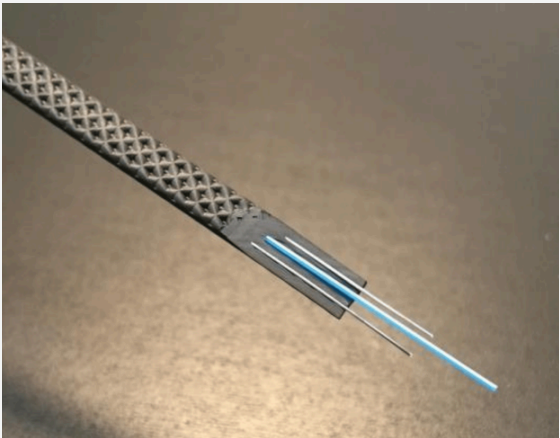


NEUBREGATE Data Flow Architecture



FUTURE NEURO FIBER OPTIC SENSING CABLE PRODUCTS:

- Versatile Sensing Solutions:** A wide range of fiber optic sensing modules and cables tailored for diverse industrial applications. *Neubrex continues to lead innovation in fiber optic sensing technology, ensuring reliability, precision, and adaptability across multiple industry sectors.*



COMPANY SERVICES

Neubrex provides a full spectrum of professional services designed to support the seamless deployment and maintenance of fiber optic sensing solutions. Our expertise ensures efficient installation, operation, and optimization of monitoring systems across industries.

Project Management:

End-to-end oversight ensuring successful execution of fiber optic sensing projects.

Installation Services:

Expert installation of fiber optic sensing cables tailored to site-specific requirements.

System Commissioning:

On-site and remote setup and calibration of monitoring systems for optimal performance.

Maintenance & Repair:

Regular upkeep and troubleshooting to ensure longevity and reliability of the system.

Training & Knowledge Transfer:

Hands-on training in instrument operation, optical fiber handling, and best practices.

Technical Support :

Remote and on-site assistance for system configuration, fault diagnostics, and troubleshooting.

Data Processing, Analysis, Interpretation and Visualization:

Advanced reporting of measurement data.

Customized Engineering Solutions:

Development of tailored hardware and software solutions to meet unique project demands.

By integrating cutting-edge technology with industry expertise, Neubrex ensures its clients receive world-class service and support, enabling efficient and reliable structural monitoring.

INDUSTRIES & APPLICATIONS

Neubrex provides high-precision scalable distributed fiber optic sensing (DFOS) solutions across various industries, enabling enhanced monitoring, safety, and operational efficiency. Our technology is utilized in:

Oil & Gas:

Conventional and unconventional oil and gas production, hydraulic fracture injection monitoring, in-well monitoring using Rayleigh strain change rate analysis.

CCS (Carbon Capture and Storage):

CO₂ migration and leakage detection to ensure environmental safety which could include passive / induced energy sensing

Nuclear Waste Management:

Monitoring structural integrity in nuclear waste repositories.

Geothermal Energy Production:

Thermal and acoustic monitoring for efficient energy extraction.

Civil Engineering & Construction:

Structural health monitoring (SHM) for bridges, tunnels, girders, and concrete structures.

Public Transport:

Railways and other transportation infrastructure monitoring.

Offshore Wind Farms:

Fiber optic sensing solutions for structural health and environmental monitoring.

Other Industrial Applications:

Environmental monitoring, perimeter security, seismic detection, and material science applications.

TYPICAL DEPLOYMENT & SUCCESSFUL COOPERATION

At Neubrex, we strictly follow the highest international quality and regulatory standards, ensuring full compliance with stringent industry regulations. Our dedication to excellence is evident in our thorough quality management system, which assures product reliability and operational efficiency.

Oil and Gas:

Unconventional reservoirs:

- Stimulation (DAS, RFS, DTS)
- Interference test (RFS, DAS)
- Production allocation (DAS, DTS)
- Logging (DAS, DTS)
- Seismic survey (VSP)

Customers & Industry Presence:

Neubrex serves a diverse range of global energy companies, including leading international oil and gas operators, national oil companies, and key service providers. Our expertise in fiber optic sensing solutions supports upstream and midstream operations, enabling advanced monitoring for enhanced efficiency and safety.

In the Middle East, Neubrex collaborates with industry leaders to deliver high-precision measurement services, including DAS-based monitoring for Oil & Gas, water wells and up-hole applications.

Government sponsored projects: US Department of Energy / Gas Technology Institute:

- HFTS-2 Parts 1,2,3.
- HFTS-1 Part. 3

CCS:



Typical deployment:

Industrial CO₂ capture facilities

- Carbon Management Canada (CMC)
- Research Institute of Innovative Technology for the Earth (RITE)

Nuclear waste storage:



Typical customers:

Nuclear waste companies/ facilities

- Structural health monitoring in tunnels (strain measurement in concrete)
- Deformation of nuclear waste containers (strain monitoring with radiation hardened fiber optic sensing cables)
- Soil humidity (active DTS)



Railways:



Typical deployment in Japan:

Railway Companies

- Structural health monitoring (bridges)
- Earthquake detection and alarm systems
- Train: location, speed, direction, length, wheel count

Construction:



Typical deployment:

Bridges & Tunnels

- Real-time surveillance to enhance safety during construction
- Permanent structural health monitoring
- Detection and measurement of vehicle count, speed, direction, and size for operational efficiency and safety

Geothermal:

FORGE project

Utah, USA

- 3D real time micro seismic measurement with Neubrex DAS
- Cementing
- Circulation tests

NEUBREX

OUR CORE VALUES



Culture

We at Neubrex believe that the fusion of local expertise with global perspectives fosters innovation and excellence in our work.

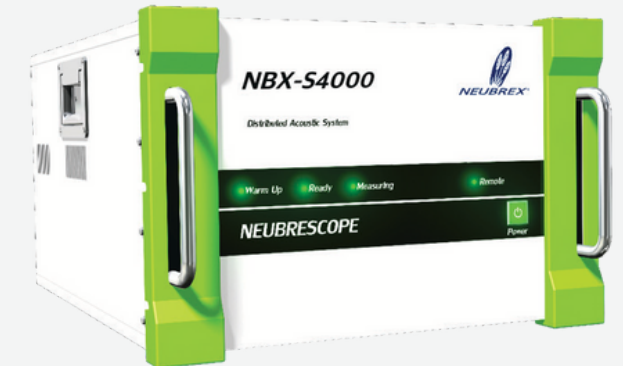
By leveraging the unique insights and abilities of our team members, we drive forward projects that meet and exceed the expectations of our clients.

OUR UNIQUE SELLING POINTS

Technology: 36 granted patents, including 22 international patents

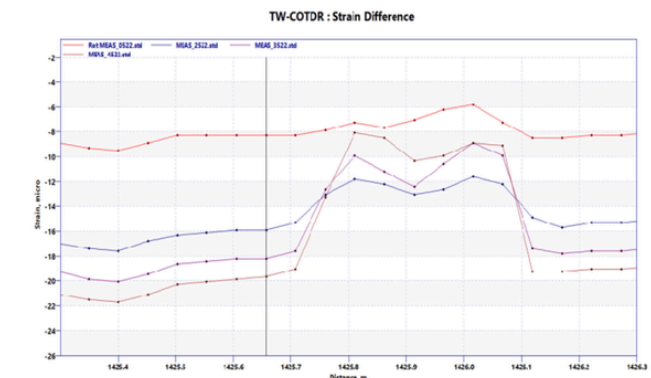
DAS Interrogator:

- Long distance range (e.g. today 120 km)
- High signal-to-noise ratio is achieved by utilizing chirp pulsed light signal
- Multi-band splitting suppresses Rayleigh interference fading noise
- Polarization diversity reception reduces polarization fading noise



RFS, BOTDA and BOTDR Interrogator:

- Long distance range (e.g. today up to 25 km at 20 cm resolution)
- High spatial resolution (e.g. today 2 cm for 0.5 km range)
- Strain Time lapse measurements (without need for continuous acquisition like with LF-DAS = low frequency distributed acoustic sensing)
- Temperature and strain separation with Rayleigh Frequency Shift (RFS) and Brillouin (BOTDA / BOTDR) measurement method



Fiber optic sensing cable:

- Optimized cables for strain, temperature and acoustic measurements
- Cables for 3D-displacement-monitoring (uniaxial strain/compression, cross-sectional deformation, torsion, bending and thermal expansion/contraction)
- Cables for surface seismic applications on-shore and off-shore

Micro seismic software:

- We have a strong partner for 3D real-time micro seismic (approved in the FORGE project in Utah USA).

Scalability:

All hardware and software solutions are scalable and designed to leverage technological advancements. Neubrex continuously integrates these advancements alongside internal innovations.

Contact Information



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