

Distributed Acoustic Sensing



The e-DAS (Distributed Acoustic Sensing) system is a fiber-optic-based sensing technology that uses Rayleigh backscattered light to collect real-time acoustic and vibration data.

Its key features are as follows

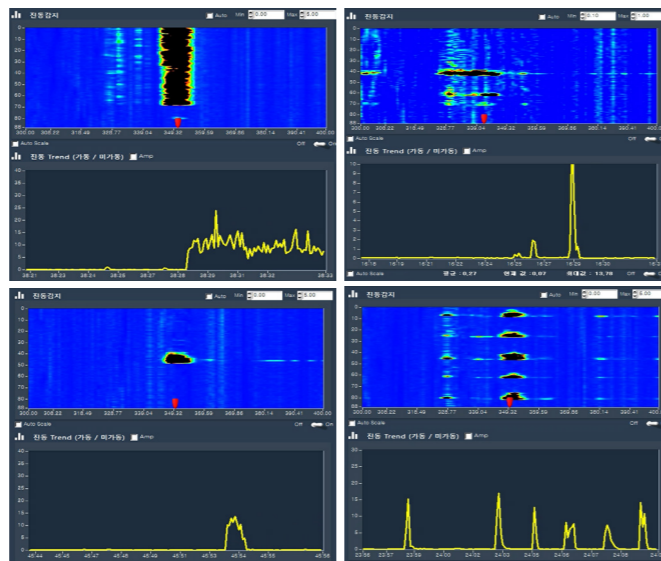
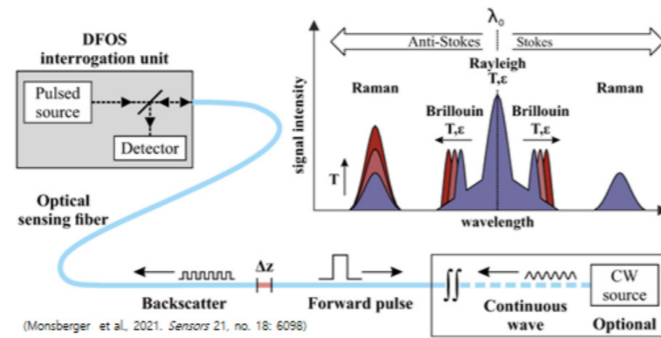
Rayleigh Scattering : This system detects scattered light generated by physical deformation or vibration when laser light is injected into the fiber. It analyzes the scattered light to gather acoustic and vibration data.

Distributed Sensing : The optical fiber itself serves as a sensor, allowing continuous collection of acoustic and vibration information from multiple points over a wide area, up to a range of 62mile(100km). This enables simultaneous monitoring of vibrations and acoustic data across large areas.

Real-time Data Collection : The e-DAS system processes Rayleigh scattered light data in real-time, enabling immediate detection of vibration and acoustic events occurring in various environments. This feature is highly useful in fields such as structural monitoring, earthquake detection, and pipeline leakage detection.

High-resolution Analysis : By analyzing the collected data at high resolution, the system can detect subtle vibrations and acoustic changes, quickly identifying abnormal signs.

The e-DAS system maximizes the advantages of fiber-optic sensing technology to accurately and reliably collect acoustic and vibration data over a wide area. It plays a crucial role in industries such as bridges, tunnels, and geological and structural monitoring.



Application



Product Features

Phase method capable of micro-vibration sensing

Distributed photoacoustic vibration measurement system using phase method that enables long-distance/micro vibration sensing compared to amplitude method

Measuring physical quantities by changes in scattered light

Measuring changes in physical quantities by changing the backscattered light (Rayleigh scattering) generated by irradiating a pulsed laser onto an optical fiber

Detecting structural abnormalities through acoustic vibration changes

Real-time structural abnormality monitoring by distance/section using acoustic vibration change data

The only long-distance section measurement in Korea

The only product in Korea capable of continuous measurement over long distances (approximately 100 km) without blind spots

Supports up to 4ch

Supports up to 4 channels per instrument (e-DAS standard)

Reduce initial construction costs by using existing optical cables

Reduce initial construction costs by using optical fiber cables for communications as sensors (can be changed according to field conditions)

Product Specifications

Maximum measurement distance	25km to 100km(15.5 to 62.1mile)	Spatial resolution	1m ~ 10m
Location accuracy	1m to 10m	Line width	<15KHz
Channels	1ch, 4ch	Pulse repetition rate	1 to 20KHz
Data transfer speed	>1Gbps	Pulse width	50 to 200ns
Optical amplification ratio	>20dB	Frequency measurement range	more than 1KHz
Optical power range	10 to 20dBm	Central wavelength	1550 ±1nm (check Seed Laser)

Input/output connection

Optical cable terminal	FC/APC
Ethernet	-
USB	-
RS232(DB9)	Config setting
Display	2.4inch OLED

Device and operating environment

Size	435 × 41.6 × 456.4mm
weight	4.21Kg(9.28lb)
Operating temperature	-10 to 40°C
Operating humidity	10 to 90%, Non-condensing
Storage temperature	-40 to 80°C

Standards and Safety

Laser Safety Classification	Class 1
Product Certification	KC, FCC
-	-

Electrical characteristics

Operating voltage	100 to 230 VAC
Operating voltage frequency	50 to 60 Hz
Power consumption	30.8W (typical)

Operating System Configuration

Rack	19" Rack 42U	Visualization Server	Visualizing DAS Analysis Information
DAQ Unit	DAS signal data collection, analysis and processing	UPS	Uninterruptible power supply
Storage	DAS signal data storage	L2 Switch	L2 network switch
Analysis Server	DAS signal data deep learning analysis	KVM	KVM for Servers

* System configuration may vary depending on purpose and environment.