

INFINITY INNOVATION

ENITT

ENITT, a company that creates new value



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Chapter

01

About Company



We create a safe world beyond technology. ENITT, the place where infinite innovation begins

Established in February 2018, we are carrying out business in the field of AI-based disaster safety & energy efficiency, We are steadily growing with new technologies and constant challenges.

We actively reflect creative thoughts and opinions that are freely expressed, Also, we help our employees to work joyfully with challenges so that we can be the leader of creating the safe future with innovative technology through continuous challenges.

■ Core Value



Creative idea



Balance & Principle



Challenging spirit

■ Company Overview

Company name	ENITT Co., Ltd.	Management Ideology	INFINITY INNOVATION We will make a safe future through innovation.
CEO	Song-do Ki	Industry	Electromagnetic Measuring/Testing/Analysis Equipment Manufacturing Software Development and Supplies
Established date	February 7, 2018	Key products	AI solutions for disaster safety management AI solutions for energy efficiency
Capital	610 million won	Address	#303, Siheomsaengsan-dong, 333, Cheomdan Gwagi-ro, Buk-gu, Gwangju
Full-time employees	31	Seoul·R&D Center	371-28 Gasan-dong, Geumcheon-gu, Seoul (701, B)
Website	www.enitt.co.kr	Jeonnam Branch Office	#704, 679, Bitgaram-ro, Naju-si, Jeollanam-do

Strong teamwork with technical expertise and know-how

The highest level of education

Sunchon National University (Master's/Ph.D.)

Electrical Engineering

Major career history

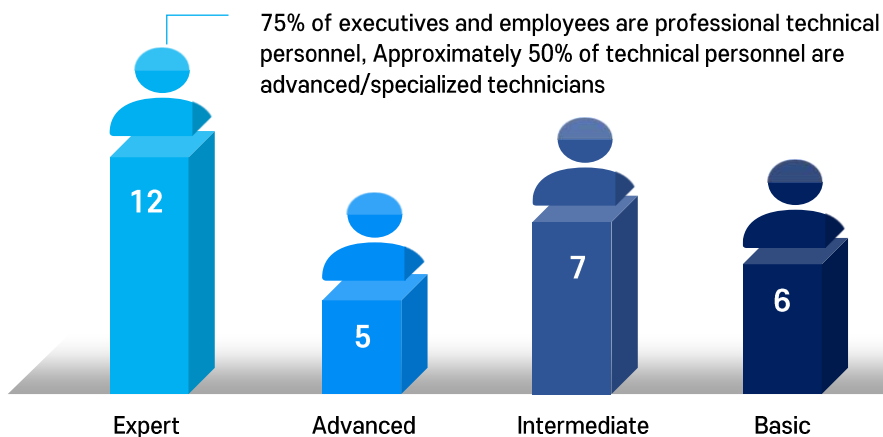
- Research Director of EI System Co., Ltd.
- Current KIAT Planning Advisory Committee member
- Currently an evaluation member of the Integrated R&D and Information System
- Current Planning Member, Korea Evaluation Institute of Industrial Technology
- Currently a member of the Technology and Information Promotion Agency for SMEs

CEO

Ki Song-do

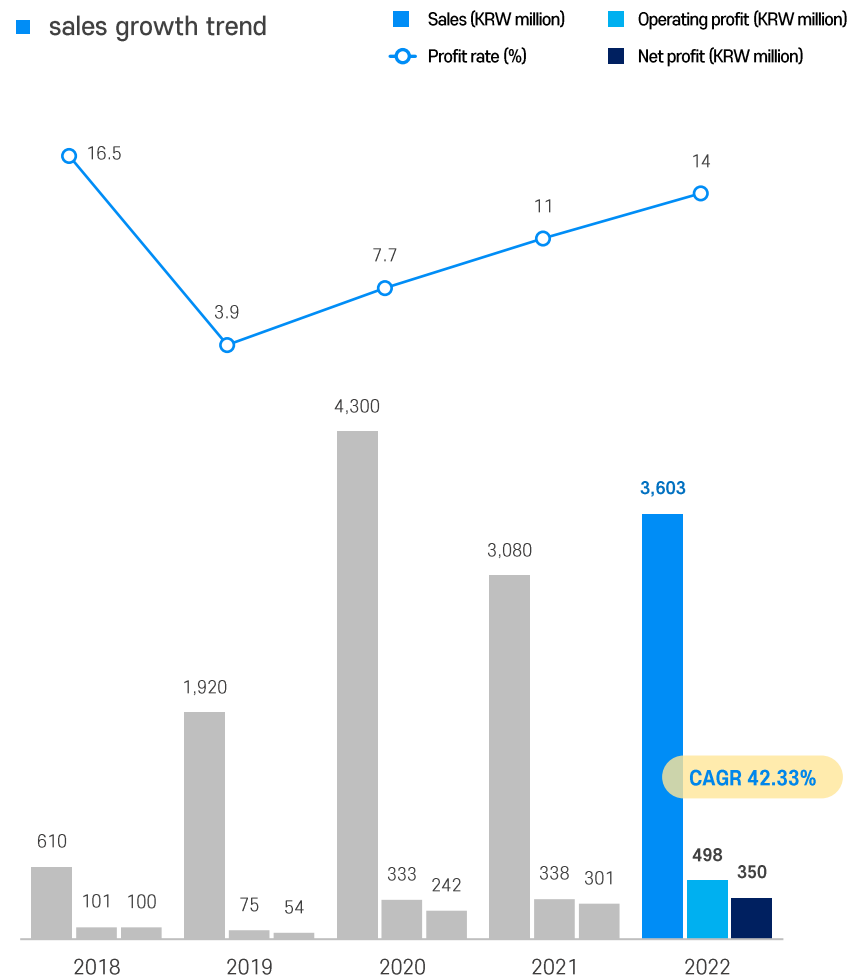


■ Status of professional manpower

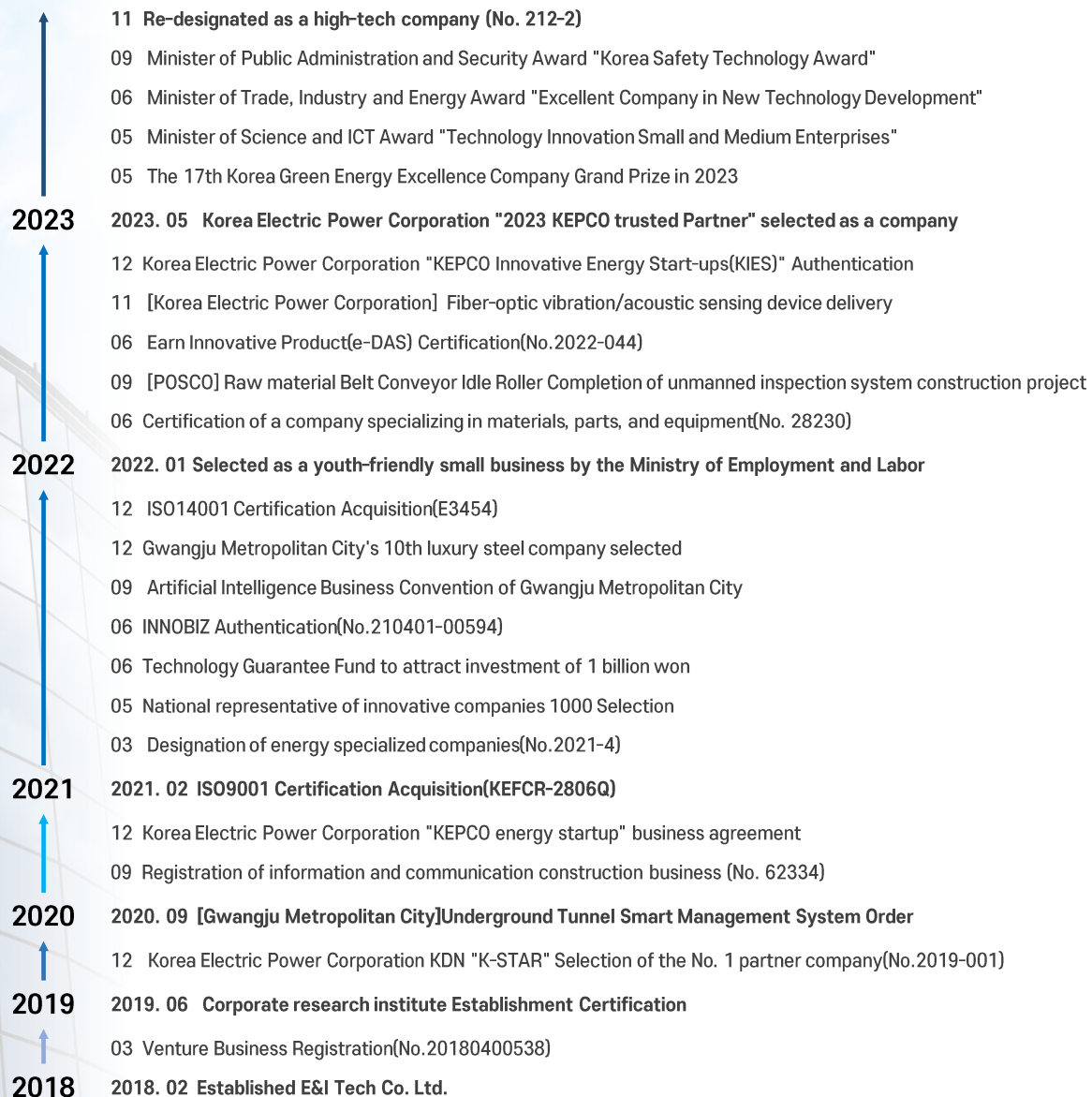


*Source: National Legislation Information Center
(Appendix 2 of the Enforcement Decree of the Engineering Industry Promotion Act)

■ sales growth trend



Brilliant growth built on superior technology



Securing product reliability by securing and verifying core technologies



public
technology
before

Twice of original technology transfer

“Distributed optical sensor” field

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KOPTI

- ✓ [10-1817295]
Power facility partial discharge measurement and railway monitoring system technology using temperature measurement-supported optical fiber acoustic sensor
- ✓ [10-1844031]
Optical frequency domain reflection measurement system for high-resolution strain distribution measurement

Patent
registration
and
applications

Leading company in technology development in new industries

6 patent registrations and 8 applications
related to distributed optical sensors



Patent Certificate

‘Power generation facility safety monitoring system using optical cables’ and 5 other items

Patent
trend
analysis

Securing monopoly advantage through patent portfolio

5 out of 10 distributed optical sensor core patents are held by Enitt
Commercialization of world-class technology

* Excluding technologies held by public research institutes

- ✓ Patent trend survey search formula/conditions
Distributed*Optical Fiber*! (Bragg+Grid+Manufacturing) / Registered Patent



Chapter

02

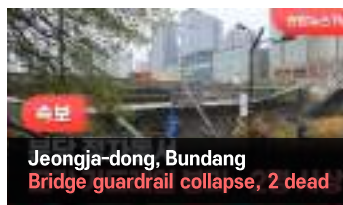
Disaster Safety AI Solution



■ Issue - Current status of continuous safety accidents on site



- **Urban time bomb, aging infrastructure** where even the slightest crack can lead to a major disaster
- **Casualties** and **economic losses** due to limitations of existing safety inspection technology and systems
- The aging of Seoul's infrastructure **rapidly increased** from 31% in 2018 to **61%** in **2028**.



■ Issue - Status of existing safety management laws and regulations

- Vulnerable to accidents due to unexpected events due to regular safety inspections conducted by personnel
- Failure to secure continuous detection system and standards for facilities with high accident risk
- Revision of underground fire safety performance standards in accordance with strengthened safety requirements

Case of law revision

「Fire safety performance standards for underground tunnels(NFPC 605)」

[enforcement 2022. 12. 01.] [fire department]

Article 6 (Automatic fire detection equipment) ① Paragraph 1

**Install a detector that can check the ignition point
(in 1m units) and temperature without being affected by dust, moisture, etc.**

Track maintenance guidelines

[enforcement 2023. 5. 11.] [National Railroad Corporation]

Article 170 (Inspection by track inspectors), Article 200 (Daily circuit inspection)

division	high speed rail	general railway
Track inspection	Once a month	Once a quarter
walking tour	More than once every 10 weeks	Once a week
train tour	Once every 15 days	Depending on the relevant department

Guidelines for safety and maintenance of facilities, etc.

[enforcement 2022. 9. 28.] [National Railroad Corporation]

Article 13 (Period of conducting safety inspections, etc.) Paragraphs ① and ②

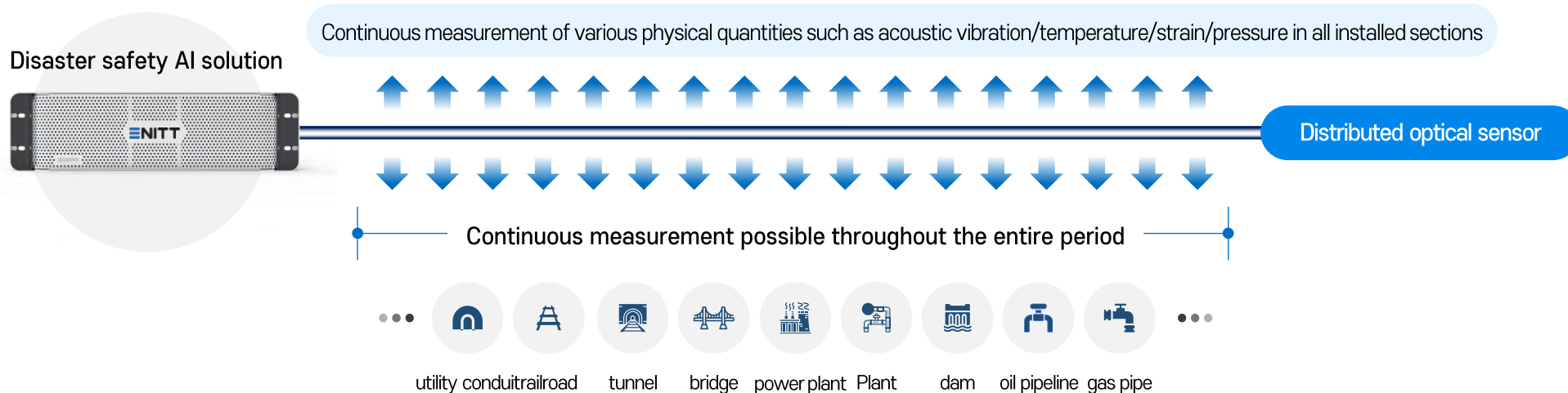
safety level	Regular safety inspection	Precise safety inspection
A	More than once per half year	More than once every 3 years
B, C	More than once per half year	More than once every 2 years
D, E	More than 3 times a year	More than once every 1 years

02 A third eye that predicts risks created with distributed optical sensors and AI technology

Solution Overview

A disaster safety AI solution that continuously measures acoustic vibration, temperature, etc. by installing distributed optical sensors (optical cables for communication) in measurement sections ranging from a few kilometers to tens of kilometers in length, and analyzes the collected data to monitor the presence of any abnormalities in real time.

Disaster safety AI solution



What is a distributed optical sensor?

The most advanced measurement technology among optical fiber sensor technologies, it is an innovative technology that can continuously measure physical quantities across the entire range without dead zones based on scattered signals, regardless of the sensor installation interval.



index	IoT sensors	CCTV
Blind Spot	○	○
Installation restrictions	○	○
Operating environment	Limit product installation and construction costs	Requires constant power supply
characteristic	Operation of multiple sensors	Installation in certain sections
Measuring distance	Up to 10m	Up to 50m

Distributed sensor

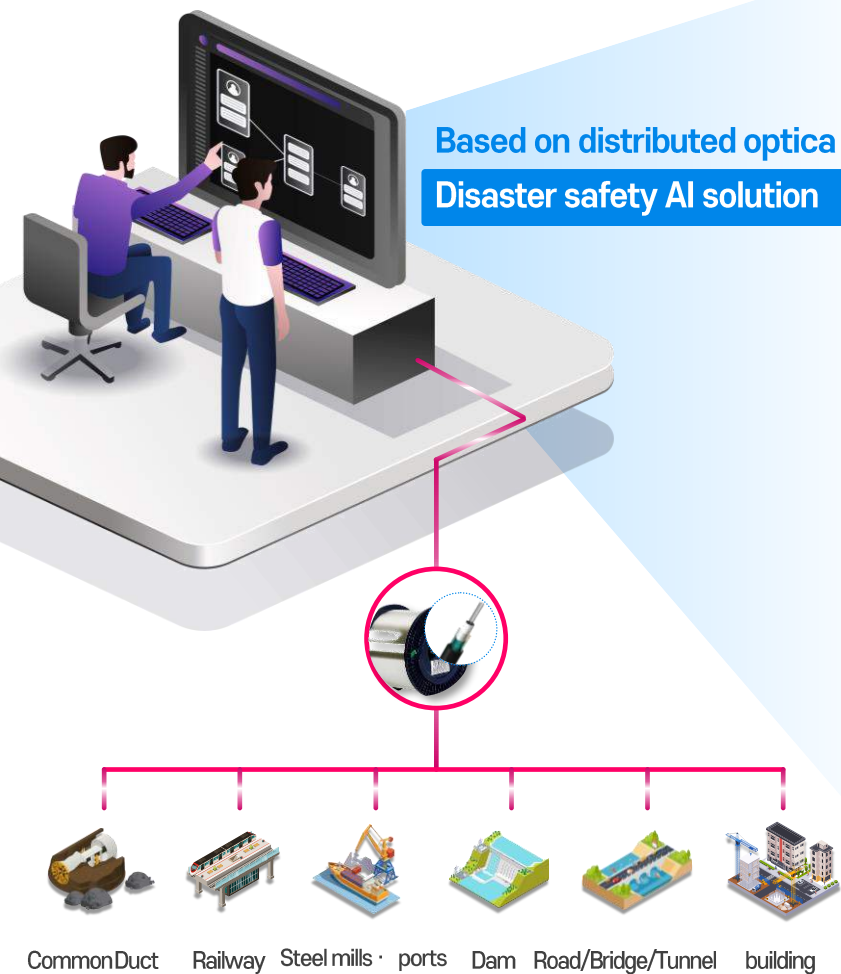
Continuous measurement throughout the entire period



Continuous measurement based on scattered signals

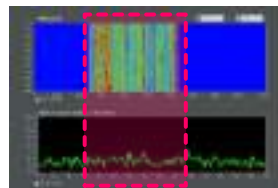
Up to 50km
(dramatic cost savings when applied to the same section)

Next-generation disaster safety AI solution that meets industrial needs



Distributed Optical Interrogator

HW



Acoustic, vibration event detection

- abnormal vibration
- external intrusion
- construction
- crack
- falling rock
- fire
- Rail abnormality
- Detect location

Integrated control monitoring

SW



Provides WEB-based real-time monitoring

- Abnormal symptom prediction/alarm
- Data analysis statistics provided

Big data-based AI analysis

SW

Large volume data collection/processing

- Large volume RAW Data save
- Risk level setting
- Save event information

Big data analysis and AI engine

- Sensing data pattern learning
- Event type classification algorithm



fiber optic cable

HW



Case 01

Utilize existing cables

* Can utilize existing installed/laid communication optical cables



Case 02

New cable installation

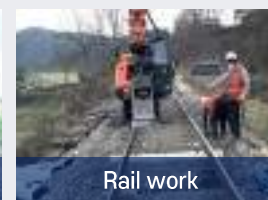
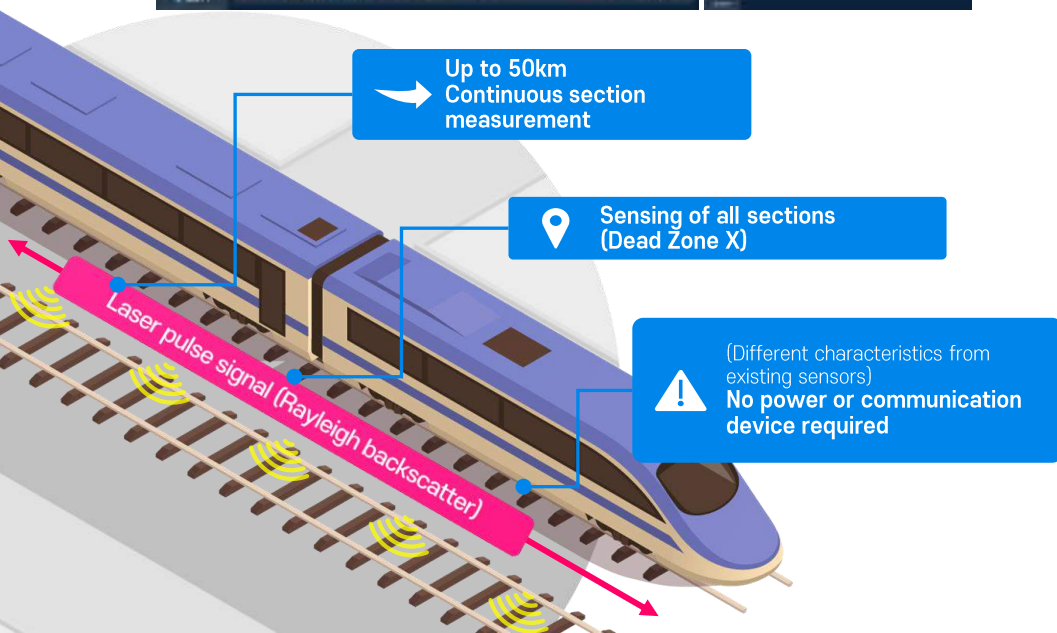
* Applying cables suitable for the installation environment, installing in hazardous sites such as high temperature and high voltage

100% performance in disaster situations verified by empirical testing

Empirical test _ #01 「Railway track safety monitoring verification」(21.12.)

- Support for operational safety through verification of the Osong-Gongju (47km) and Seodaejeon-Gyeryong (19km) sections
- Accident prevention and maintenance efficiency through track condition monitoring

KORAIL 한국철도



No	Evaluation Criteria	Evaluation Method	Certification criteria	Result
1	Phase/frequency based data reception	Check whether DAS Process module receives HMI	Dual data reception distance	50.425km

(syncopation)

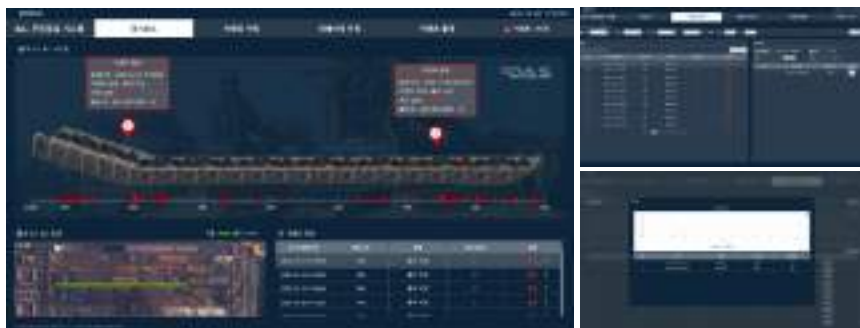
6	abnormal condition of track	Rail joint analysis at train passing points	Classification Accuracy	90.91%
7	Worker (intruder) detection	Repeated movement of sections around the track	Classification Accuracy	90%
8	Construction (human work) detection	Implementation of human work events on the ground around the tracks	Classification Accuracy	100%
9	Construction (mechanical work) detection	Implementation of mechanical work events on the ground around the tracks	Classification Accuracy	100%
10	Falling rock detection	Repeated rockfall test around the track	Classification Accuracy	100%

Verified Customized Technical Applicability through Various Extreme Environmental Tests

Demonstration test _ #02 「Unmanned Inspection Monitoring System」('22.06.)

- Real-time Monitoring of the Rotating Components (Roller) of Raw Material Transfer Belt Conveyors
- Optimal Maintenance Support through AI Analysis of Abnormal Vibration Occurrences

posco



Real-time Monitoring of Rotating Components

Substitution of Periodic Inspections to Prevent Human Accidents

Optimal Maintenance Support

belt conveyor
Roller

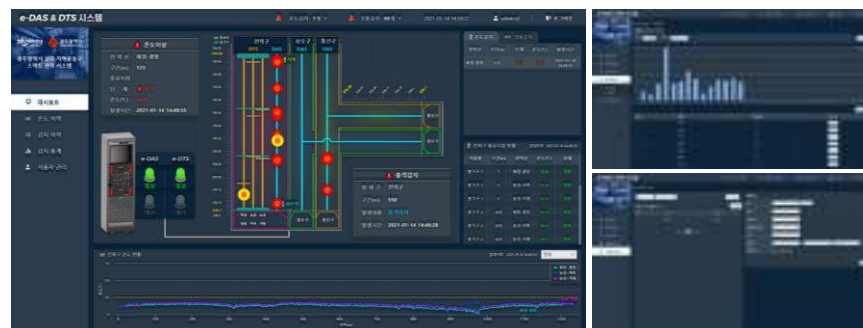
Laser pulse signal (Reilly rear scattering)



Demonstration test _ #03 「Underground Bunker Monitoring System」('20.12.)

- 24/7 Unmanned Continuous Safety Inspection of Urban Lifelines (Power Lines, Water Lines, Communication Lines)
- Simultaneous Measurement Support for Vibration and Temperature through e-DAS and e-DTS

GWANGJU CITY



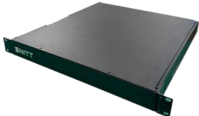





* DTS : Distributed Temperature Sensing,

Real-time Vibration and Temperature Detection

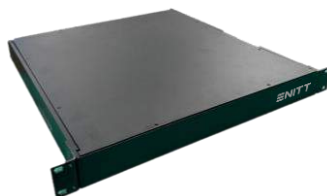
24-hour Simultaneous Measurement of the Entire Section

Initial Response Support in the Event of an Occurrence

Tailored Disaster Safety AI Solutions based on the characteristics of disaster management targets and structures

						
Model Name	EDAS	PORTABLE EDAS	HYBRID EDAS	EDTS	EDSS	FBGi
Detected Items	Acoustic vibration	Acoustic vibration	Acoustic vibration/ Temperature	Temperature	Strain	Strain
Measurement Method	Fixed Type	Moved Type	Fixed Type	Fixed Type	Fixed Type	Fixed Type
Size	1U	1U	3U	3U	3U	1U
Optical Properties	Distributed Sensor					Grid Sensor
	Rayleigh	Rayleigh	Rayleigh, Raman	Raman	Rayleigh, Brillouin	VCSEL

Get superior performance, including maximum detection range and spatial resolution compared to foreign products

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ADVANCED PHOTONIC SENSING

SILIXA
actionable insight

OptaSense®

terra15

NOTICE


Model	e-DAS	N-52 Series	iDAS	OptaSense	Treble+	DAS
Country of Manufacture	Republic of Korea	Germany	UK	UK	Australia	Republic of Korea
Reliability	< 95%	< 90%	Simple Vibration Detection			
Maximum Detection Range	100km	70km	45km	50km	40km	40km
Spatial Resolution	1m~10m	1m	10m	7.5m	1m	10m
Technical Support and Maintenance	Fast and easy	Impossible/Overcost				
Measurement Technique	Phase DAS	Amplitude DAS				

[Differences in measurement techniques]

1) Amplitude DAS : As only amplitude is measured and long-distance (25 km) sensing is limited, there is a weakness in that long-distance sensing is only possible by amplifying the pulse through an amplifier (EDFA) for long-distance sensing.

2) Phase DAS : This is a method of measuring vibration by extracting amplitude + phase change, enabling innovative noise filtering and vibration sensing in a specific frequency range compared to the Amp method. This makes it easy to detect specific abnormal events in work sites with a lot of noise and vibration.

* Advantages: improved measurement distance, detection of fine signals, miniaturization of product

* Construction costs vary depending on the site situation or construction distance

* Source: IEC 61757-3-2 Standard applicable, refer to each company's catalog

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 APSENSING
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 actionable insight


Bandweaver



TS3000



YOKOGAWA



Model	e-DTS	N-45-Series	XT-DTS	Bandweaver	TS3000	DTSX 3000
Country of Manufacture	Republic of Korea	Germany	UK	China	Republic of Korea	Japan
Maximum Detection Range	15km	50km	35km	40km	10km	50km
Spatial Resolution	1m	2m	0.5m	5m	2m	1m
Technical Support and Maintenance	Fast and easy	Impossible/Overcost				

* Construction costs vary depending on the site situation or construction distance

* Source: IEC 61757-3-2 Standard applicable, refer to each company's catalog

* exchange rate : 1,291.50(2023.11.29)

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Model	e-DSS(OFDR)	OBR 4600	FEBUS G1-R	iDSS	T-BERD/MTS-8000	BOCDA
Country of Manufacture	Republic of Korea	USA	France	UK	USA	Japan
Strain Measurement Range	3000 $\mu\epsilon$	2000 $\mu\epsilon$	2500 $\mu\epsilon$	2000 $\mu\epsilon$	-30,000~40,000 $\mu\epsilon$	1500 $\mu\epsilon$
Strain Resolution	5 $\mu\epsilon$	1 $\mu\epsilon$	5 $\mu\epsilon$	1 $\mu\epsilon$	5 $\mu\epsilon$	60 $\mu\epsilon$
Measurement Sensor Length	100m	70m	100m	50m	100m	500m
Technical Support and Maintenance	Fast and easy	Impossible/Overcost				

* Construction costs vary depending on the site situation or construction distance

* Source: IEC 61757-3-2 Standard applicable, refer to each company's catalog

* exchange rate : 1,291.50(2023.11.29)

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Model	e-FBGi	FI3300/FI3400	LCM-2700	GTR	FBG	si255
Country of Manufacture	Republic of Korea	Republic of Korea	USA	Netherlands	China	USA
Wavelength Accuracy	6pm	20pm	1pm	2pm	1pm	1pm
Wavelength Range	5nm	85nm	70nm	50nm	75nm	100nm
Measurement Speed	10kHz	10kHz	19.2kHz	19.23kHz	19.2kHz	10kHz
Technical Support and Maintenance	Fast and easy	Impossible/Overcost				

* Construction costs vary depending on the site situation or construction distance

* Source: IEC 61757-3-2 Standard applicable, refer to each company's catalog

* exchange rate : 1,291.50(2023.11.29)

Have customer performance references in different fields and build technical partnerships

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Domestic
Company



University



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Thank You!