PR 2025.12

Smart E&C

Smart Terra Sense: AI-based Debris Flow Monitoring System

Smart E&C

Through the development and supply of an advanced
and supply of an advanced IoT-based ICT convergence
disaster safety measurement system, we are growing
into a leader in SOC disaster safety solyutions.

Welcome Message

Smart E&C

Safe Korea
A leader in disaster safety solutions

Smart E&C Co., Ltd. is preparing for the future based on its boundless spirit of challenge and advanced technological capabilities in the era of the Fourth Industrial Revolution, which utilizes information and communication technology (ICT) and convergence technologies.

We are focusing all our capabilities on transforming modern life into a new and safer experience with cutting-edge IoT technologies, such as the Smart Early Warning System for Predicting Slope Failure.
We will actively research and develop advanced technologies utilizing cutting-edge IoT technologies and pioneer new business areas.

We promise to be a Smart E&C Co., Ltd. that constantly strives to improve the quality of life and realize value for our customers, always from the customer's perspective. Thank you.

Kim Yong Jin
CEO/Founder

Product

Smart Terra Sense

Introducing the new technology applied to product

To protect against large-scale debris flows in mountainous basins, measure debris flow magnitude, and issue real-time alerts.
Smart tensile sensors connected to the net detect impact forces in real time, immediately alerting managers when measured tensile forces exceed the net's allowable threshold. This system protects residents and infrastructure in mountainous downstream areas.

✦ Smart Terra Sense Application example

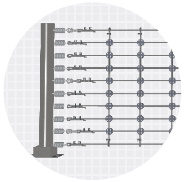
Rockfall Prevention fence

Flexible Rockfall Prevention fence

Rockfall Prevention net

✦ Smart Terra Sense Components

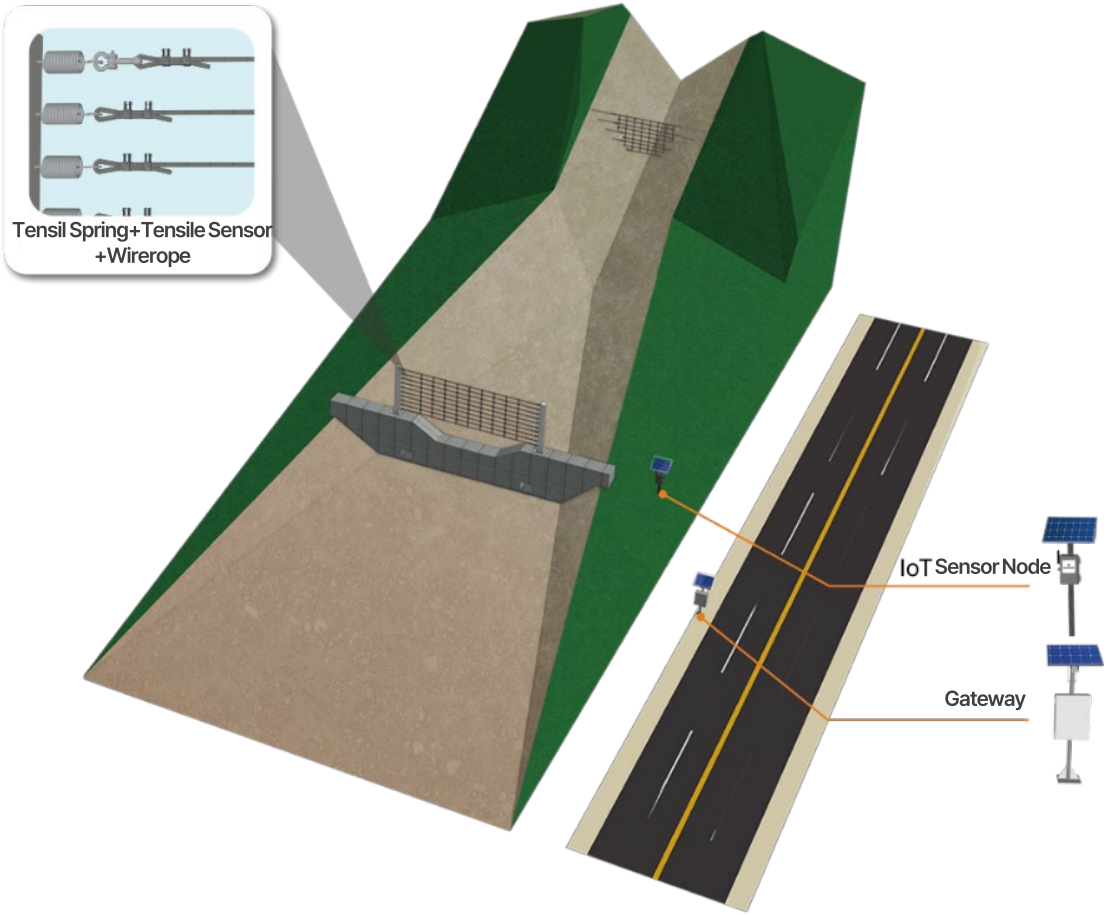
Tensile Sensor



Net

IoT Sensor Node

Gateway



Product

Smart Terra Sense

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✦ Smart Terra Sense Features

Large-scale debris flow protection

Large-scale debris flow protection is possible by utilizing a tensile net with maximized net stretch.

Effective water blocking

The permeable net structure effectively filters out only the crops while discharging water.

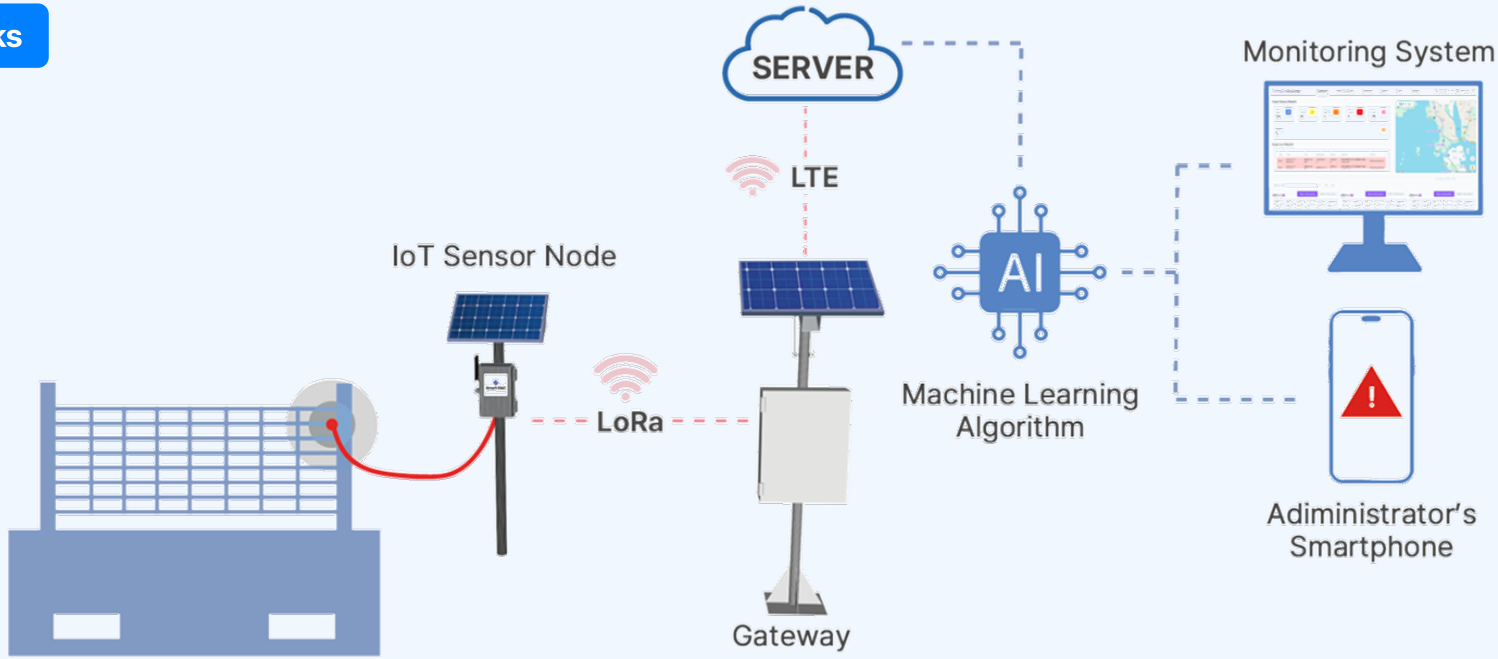
Application scalability

In addition to debris flow risk areas, construction is possible in areas such as rockfalls, valleys, slopes, and the top of tunnel shafts.

Excellent maintainabliy

Replace only damaged parts to ensure long-term stability of the structure and improve the convenience of sediment removal.

✦ How It Works



Product

Smart Terra Sense

Introducing the new technology applied to product

Product Comparison

Category	Conventional Check Dam	Smart Terra Sense
Function	Debris-flow protection	Debris-flow protection + Real-time monitoring And information provision
Construction Method	Mechanized construction	Simple installation (uses lightweight materials)
Installation Area	Lower sections of mountain slopes	Upper section of existing check dams; Adaptable to upstream and mid-slope areas
Maintenance	Difficult to remove accumulated debris	Replaceable damaged components; easier removal of accumulated debris

Reference (pilot construction at 1 location)

Product

Smart Terra Sense

Introducing the new technology applied to product

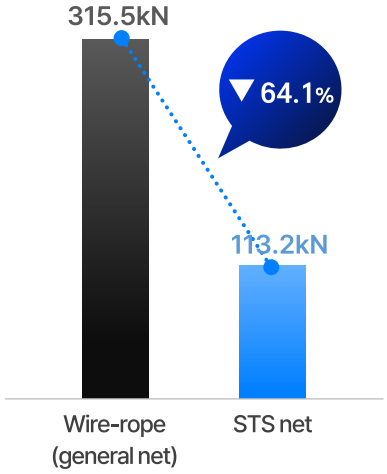
Debris- and rockfall-prevention technology using a permeable elastic-net structure Domestic patent for the *Check Dam Monitoring System*

✦ Improved impact resistance and energy absorption through the combination of springs and wire ropes

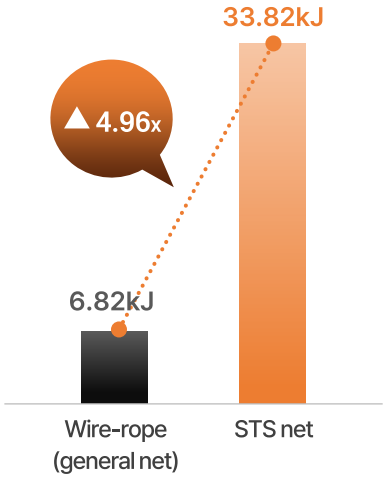
64.1% reduction in impact force compared to wire-rope

4.96x increase in impact-energy absorption compared to wire-rope

Impact-force reduction compared to standards nets

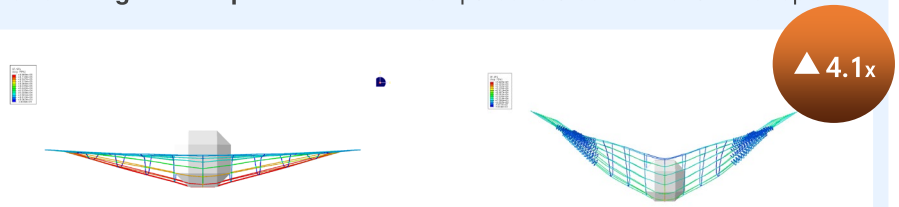


Impact-energy absorption compared to standard nets



✦ Enhanced impact-resistance performance through spring–wire rope integration

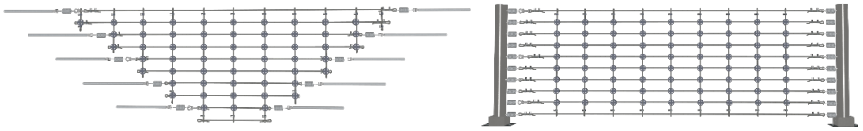
When subjected to a 100 kJ impact (6.3 m free fall), the spring–wire rope net shows **4.1× greater impact resistance** compared to a conventional wire rope net.



<Wire-rope net impact value 188.8kN> <spring-wire rope net impact valye 46.1kN>

✦ Two types of permeable net structures

Installable in upper areas of existing check dams and suitable for various terrains.



<Net type without ground anchors> <Net type with ground anchors>

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