FI-VISION

인공지능 기반 산업 현장 맞춤형 경고 장치
[AI-based industrial site customized alert device]

2021. 11. 09.

ETRI FISYS Future Innovation Systems
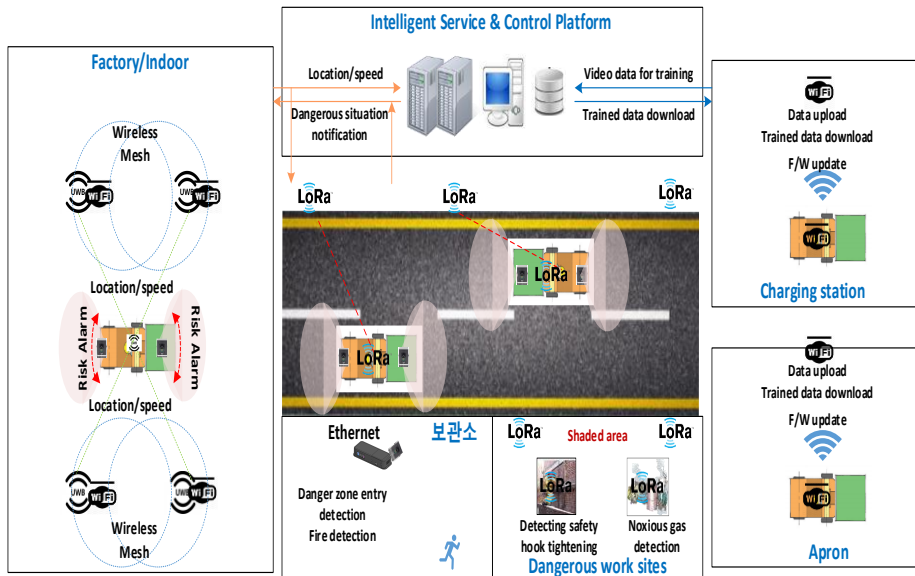(주)에프아이시스

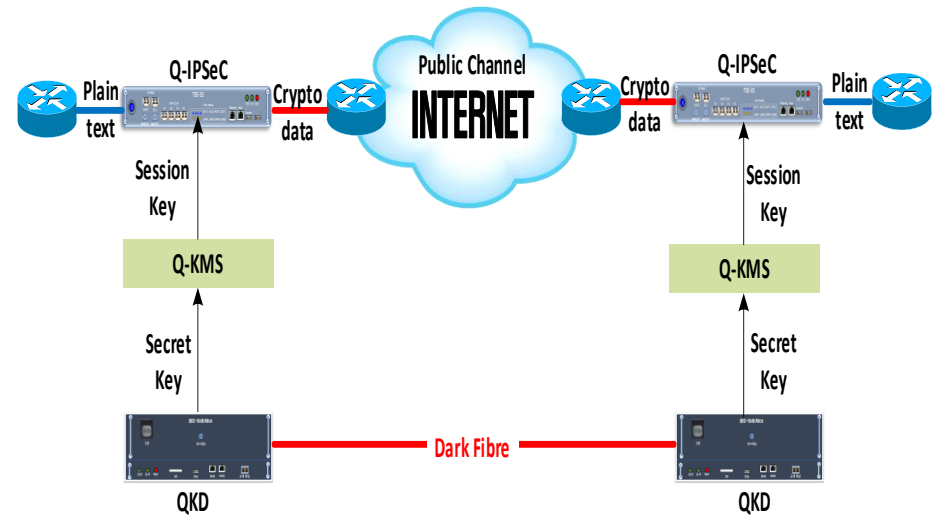# Company Introduction

FISYS[Future Innovation Systems]

A company that realizes a safe society as a priority value based on information protection between people and people, people and things since 2011

Intelligent safe IOT Infrastructure

AI-based safe interconnection and risk minimization for industry

Factory/Indoor

Wireless Mesh

Location/speed

Risk Alarm

Location/speed

Wireless Mesh

Intelligent Service & Control Platform

Location/speed
Dangerous situation notification
Video data for training
Trained data download

LoRa · LoRa · LoRa

LoRa

LoRa

Ethernet · 보관소 · LoRa · Shaded area · LoRa

Danger zone entry detection
Fire detection

Detecting safety hook tightening

Noxious gas detection

Dangerous work sites

Data upload
Trained data download
F/W update

Charging station

Data upload
Trained data download
F/W update

Apron

High Confidentiality Secure Networking

Plain text · Q-IPSeC · Crypto data · Public Channel INTERNET · Crypto data · Q-IPSeC · Plain text

Session Key

Q-KMS

Secret Key

QKD

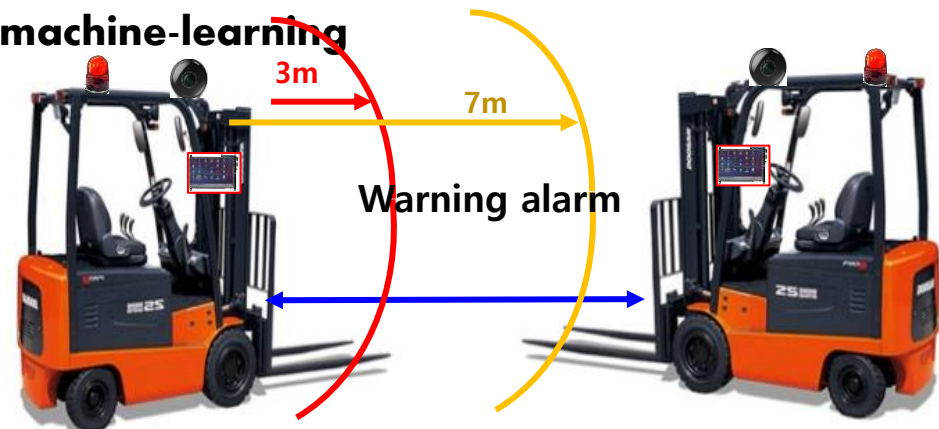Dark Fibre

QKD

Session Key

Q-KMS

Secret Key

High Confidentiality IPsec VPN combining QKD technology and high-speed IPsec technology
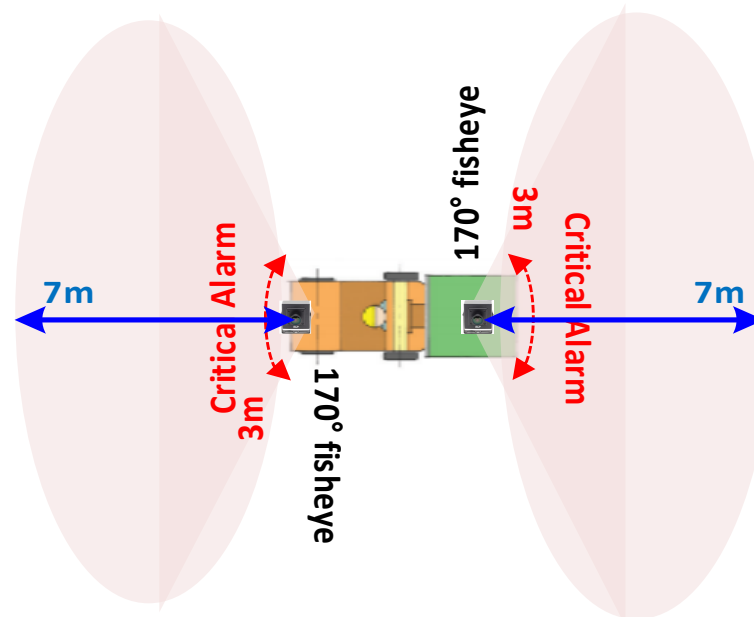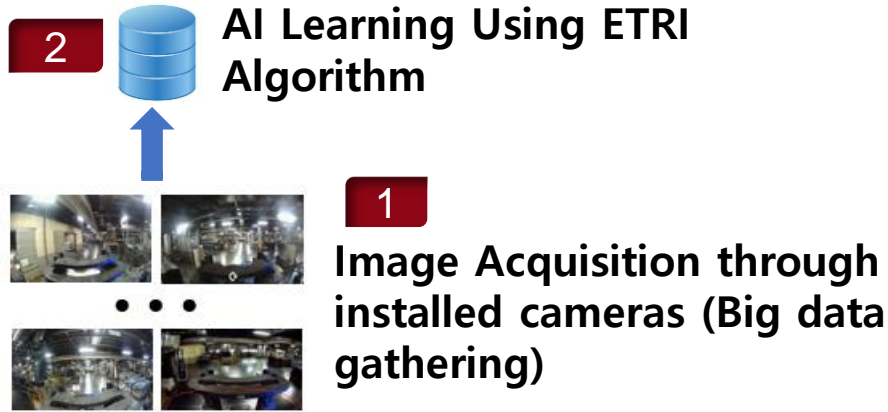
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A system that alerts the forklift drivers to the risk of collision between humans and forklifts, and between forklifts and forklifts using AI technology
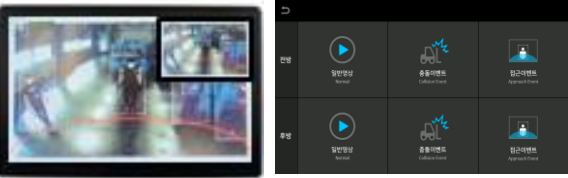
Features and benefits

- **Safety device to prevent accidents due to forklift driver's carelessness**

- **ETRI Machine-learning Algorithm optimized for industry safety**

- **System verified through 2 years of operation at the Hankook Tire plants**
  (A system that takes into account all the need of workers)

- **Easy to change object recognition target by machine-learning**

- **Simultaneous detection of multiple objects**

- **Alert forklift drivers using LCD monitor and LED bar**

- **UPS(Uninterrupted Power Supply)**

3m

7m

Warning alarm

2 AI Learning Using ETRI Algorithm

1 Image Acquisition through installed cameras (Big data gathering)

3 Loading the learning results into the device and store video periodically

5 Store video when crash is detected

170° fisheye

Critical Alarm
3m

7m

170° fisheye

Critical Alarm
3m

7m

4 Alert according to the settings when objects are detected within the pre-defined distance

Components	Specifications
AI controller	- GPU-based AI platform 　. Simultaneous detection of forklift and human body - Easy function extension and easy maintenance structure - UPS for stable power supply - Provides Blackbox functions
LCD Monitor	- Critical alarm within 3M(LCD boarder white) - 3M ~ 7M object recognition 　(human body : white box, forklift : red box) - Blackbox function selection 　. Approach detection and collision detection 　. Recording and playing driving video, Alarm event video
Fisheye camera	- 170-degree, Full HD, fisheye camera - Minimize blind spots - Dust and waterproof(IP67)
LED bar	- Additional alert for forklift drivers

Two-way Display

Front/Rear hazard detection
- · alert display
- · Store video

LED bar

- **Additional Alert**
  - · **Driver's attention for dangerous situations**

2CH Cameras

Full HD high Resolution Camera
- · 170° fisheye lens
- · waterproof

AI Controller

GPU based AI engine
- · Simultaneous recognition of human body and forklift

Stable power supply by UPS

Alert dangerous situations to the monitor and LED

Recognition dangerous situations by AI engine

On-site Video by cameras

	FISYS	Competitors
AI engine	GPU-based, field-customized AI-engine	NPU/VPU-based, limited detection
Detection capabilities	Both Human-body and forklift real-time detection	Only Human-body, time-delay
No. of cameras	Max 4 channel – front/rear/left/right	1 or 2 channel – front/rear
Camera performance	170-degree full HD fisheye lens	88~150 degree
Scalability	Easy to extend and add objects	Limited extension due to limited engine resources
Black box	Save video according to set interval(128GB) and crash video	No black box function or save still cut images or video
UPS	Yes	No

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1 HANKOOK TIRE

- Installed and operated at Shintanjin and Geumsan plants
- 2-ch(front/rear) AI system
- Recognize human-body and forklifts
- **Operating in extreme vibration and shock environment**

2 HYUNDAI HEAVY INDUSTRY SHIPYARD

- Installed on large forklifts
- 6-ch AI system [2xfront/2xrear/left/right]
- Recognize 4-objects human-body/forklifts/motorcycle/bicycle

THANK YOU

Any questions?
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