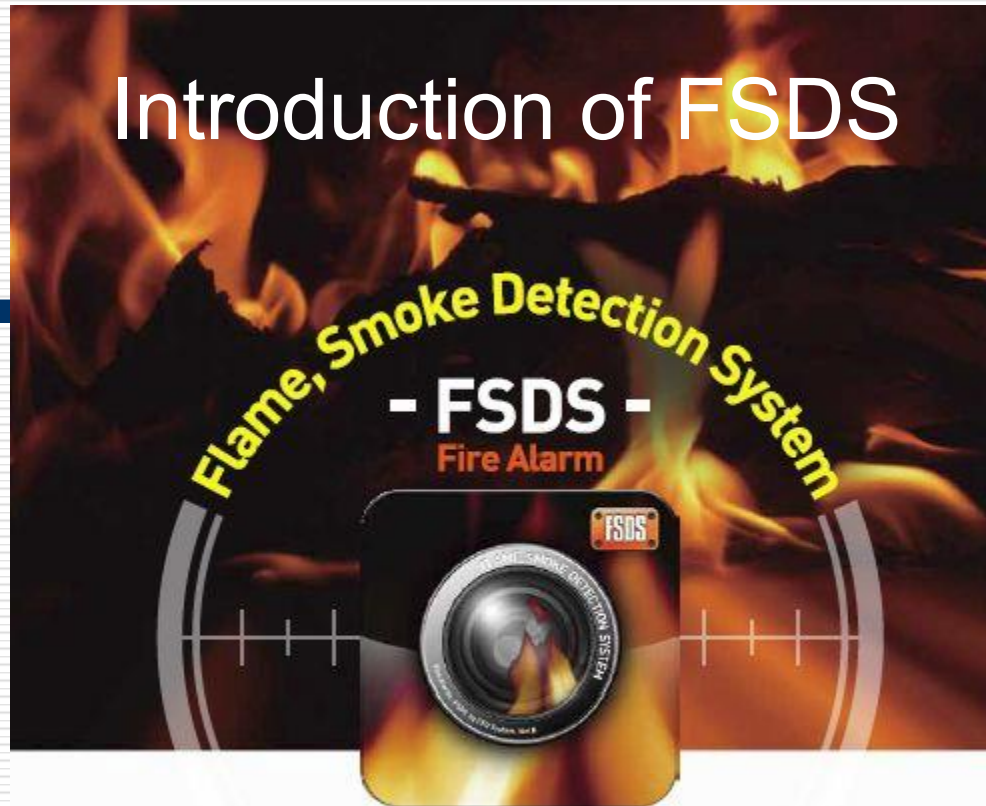


Video Image Fire Detectors for Automatic Fire Alarm

Introduction of FSDS

Ver1.0



映像火災警報システム

火災の甚大な被災を未然に防ぐ
監視カメラ活用による画像解析火災警報システム



FSDS and is ...

Video fire alarm system **FSDS (Flame, Smoke Detection System)** is a crime prevention use of the product to be alert to detect the fire that occurred in a wide area reflected in the surveillance camera at an early stage.

FSDS senses **smoke and flames** caused by the **indoor and outdoor and semi-outdoor**, **which could not be covered by conventional fire detector**, also the alarm earlier, is a device that is intended to be prevented serious disaster.

**FSDS**
Fire Alarm

The background of surveillance camera type of fire detector can be expected?

Why do you need fire sensing of the video analysis type? The significance of the Video Image Fire Detectors for Automatic Fire Alarm

Conventional smoke detectors, heat detectors, but you sensed by the smoke and heat to reach the sensor, the smoke and the heat may not be able to sense and diluted by a change in the flow of outside air and air-conditioning and ventilation.

Also flame sensor can't identify with the fire on the life and fire.

In a difficult place fire conventional sensors.

- ①The high ceiling of the building
- ②Place where there is a flow of air in the air conditioning and ventilation, etc.
- ③Place at all times there is the outside air flow
- ④Outdoor and semi-outdoor
- ⑤Place to deal with fire

And so on.

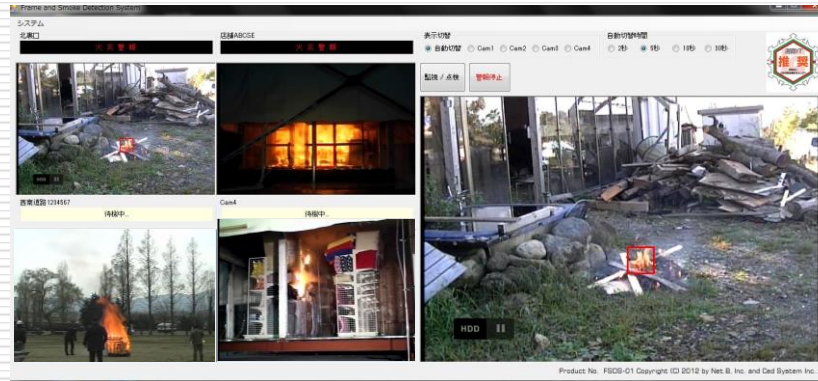
Fire detection of video analysis type to resolve the problem.

FSDS is possible fire monitoring
even in difficult places
be sensed by conventional fire sensor.



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FSDS recognizes a small flame and dilute the smoke of the early stages reflected in the video at the state-of-the-art algorithms.



FSDS will monitor the fire from four camera images at the same time.





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Feature of FSDS

- ◆ To detect small flames immediately after the fire (16 to 24 pixels or less)
- ◆ FSDS because to capture the features of the diffusion combustion of the fire, by identifying the lighter, candle, a stove of fire, to prevent non-fire alarm.
- ◆ To detect until the dark smoke from a dilute smoke (permeability smoke).
- ◆ Fire source does not appear on the imaging space, to detect the smoke flowing from any location.
- ◆ In addition to the smoke soar from the seat of the fire, and also detected the smoke of smoldering fire.
- ◆ FSDS detects fire source of fire and smoke at the same time.
- ◆ After detecting the right after the fire abnormal situation, by confirming that the trouble has continued during the accumulation time, and outputs a fire alarm.
(Suppression of non-fire alarm)
- ◆ From 5 minutes before the start of accumulation, to record a still image of the alarm after 5 minutes. FSDS is the analysis of the fire cause.
- ◆ FSDS the power outage will be running for 30 minutes by the secondary power supply is also happening.



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The video fire analysis of FSDS?

Fire analysis overview of the FSDS

- ① Analysis of flame-specific emission color and brightness
- ② Analysis of the flicker phenomenon of flame
- ③ Features of fire suppression and growth of the flame
- ④ Feature analysis of smoke soar from the fire source
- ⑤ Analysis of the smoke flow to fire source is not displayed
- ⑥ Analysis of the smoke flow rate and the flow direction due to heat
- ⑦ Analysis of the background hidden by smoke



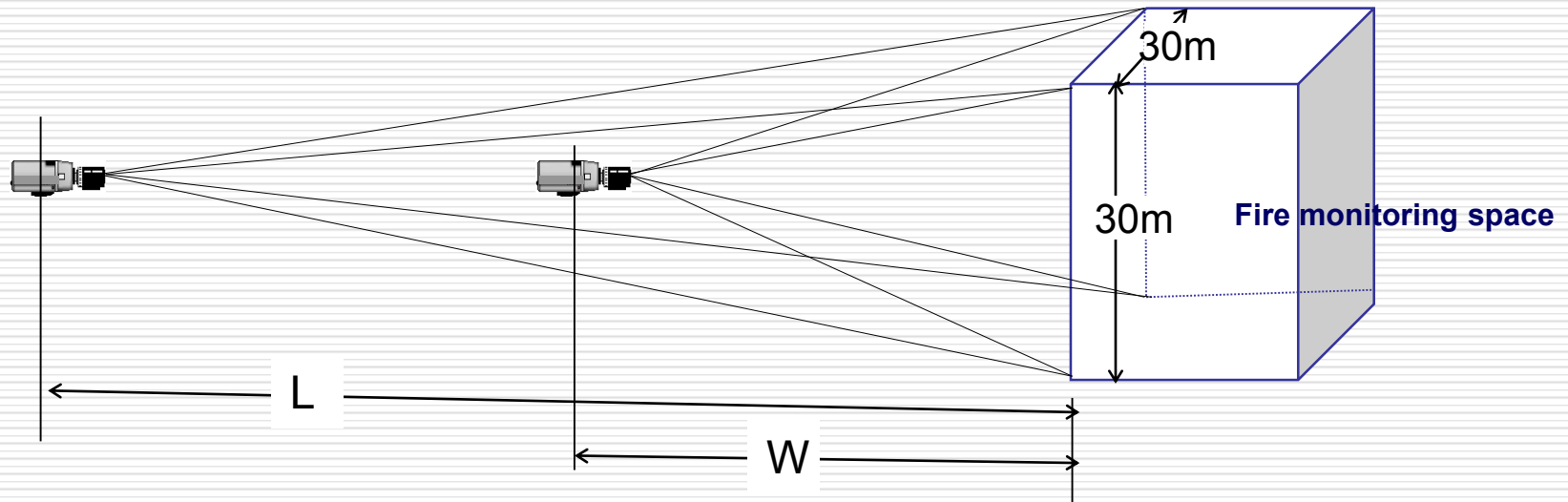
Alarm and display of fire analysis

- A Outline display of fire flames
- B Movement direction arrow display of fire flames
- C Circumscribed rectangle display of fire flames
- D Outline display of smoke
- E Movement direction arrow display of smoke
- F During the accumulation, alarm departure report display

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FSDS・・・

Superiority of video surveillance in the FSDS (wide range, remote monitor)



- It can be a wide area of the fire monitoring(W)
 - ・・・It can fire monitoring of **30m × 30m** range
- It can fire monitoring from afar
 - ・・・2/3 inch CCD camera, possible fire monitoring of **400m** destination focal length 40mm

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Examples of **high-risk of fire** buildings and facilities such as outdoor and semi-outdoor

- The outer periphery and the outer wall of the general building, indoor and outdoor, semi-outdoor
- High-rise building, atrium part of the station building, the outside air flows into place (Especially the first floor)
- High ceiling of architectural space, tunnel, domed stadium, airports and port facilities
- Common areas of the apartment building (garbage yard, bicycle parking, etc.)
- Retailers of bedding department, of compression display store
- Gas tank, gas production plants, thermal and nuclear power plants
- Data center, computer room
- Cultural heritage building, general building in the grounds of the Religious site
- Warehouse, aircraft hangar, vehicle base, refrigerated warehouse, timber depot
- Shopping street arcade, underground shopping center, atrium, subway station premises
- Garbage collection point, rubble yard, garbage incineration plant
- Petroleum refining plant, a petrochemical plant, manufacturing plant, gas station
- Oil reserve base, tank yard, combustible material reservoir
- Fermentation product reservoir
- Highways and general road tunnel, railway tunnel
- Ironworks, sawmill, large heavy equipment manufacturing plant, shipyard, building site
- Other

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It requires early detection of smoke + fire outside the indoor

- **Continuous monitoring system**, including an **outdoor and external structure** is required.
 - Although the flame sensor is available limited to, only it can not sense smoke
 - FSDS by, you will be able to sense the smoke and flames of the outdoors.

- It is essential to **early detection** of **the early stages of smoke and small flames**.
 - When the discovery of the initial fire is delayed, it increases the risk of burnt.

- Including **the monitoring of the re-combustion**, you need a high-precision "smart" monitoring (**no false alarm**).
 - Early detection of smoke, a small flame
 - In particular, surely capture visually difficult to smoke (thin smoke and white smoke) with the naked eye.
 - Such as lighters and candles, to correctly distinguish the fire is not a fire

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Installation case of FSDS (Illustration)

- Cultural Property (Religious site, shrines and temples)
- Factories and plants, combustible materials storage plant, warehouse
- Rubble dumps
- Data center
- Apartment shared facilities
- Tunnel, long facility



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What is the current state of the fire in the shrines and temples

- Fire of cultural heritage buildings, often by **arson or flying sparks** from the surroundings.
 - Such as arson and flying sparks can occur **outside structure or outdoors** rather than indoors.
 - Many of the cultural property in the wooden, vegetable roofing materials such as Hiwadabuki and Kayabuki is easy to burn, is also fire discovery difficult.
- ⇒ **Building all around, in the place that is out of the reach of a glance, requires **monitoring of smoke and fire****
- The discovery of the ignition of the spark is very difficult, in the case of a Hiwadabuki, even if the ignition on the surface of the roof, do not stand too much smoke.
 - Spark is smoldering over time inside the roof material, fire spread fell into the roof trusses, there is a risk of re-burning.
 - In the case of Kayabuki roof, even if once extinguished with water cannons, there is a need to continue monitoring vigilance of the order of the day.
- ⇒ **Roof, Exterior, outdoors requires **continuous monitoring****

(Case)

Factory fire, the plant fire early detection system



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- To detect smoke at an early stage.
- It can fire monitoring of the factory building and outdoor facilities.
 - Plant, such as petrochemical, refining
 - Combustible materials storage facility
 - Hazardous materials handling plant
 - And oil tank, oil reserve base
 - Power plant
- By the appropriate arrangement of surveillance cameras, it is possible to monitor the entire vast factory without blind spots
- You can prepare for all possible measures at a low cost.
- FSDS is preparing the function of the automatic report to the firefighting headquarters



(Case) Early detection system of spontaneous combustion fire of rubble dumps



FSDS
Fire Alarm

- To detect smoke in the initial stage.
- Immediately to find the fire source location of rubble fire
- By the appropriate arrangement of surveillance cameras, it is possible to monitor **the entire vast debris storage** without blind spots
- You can prepare for all possible measures at a low cost.
- FSDS is preparing the function of the automatic report to the firefighting headquarters



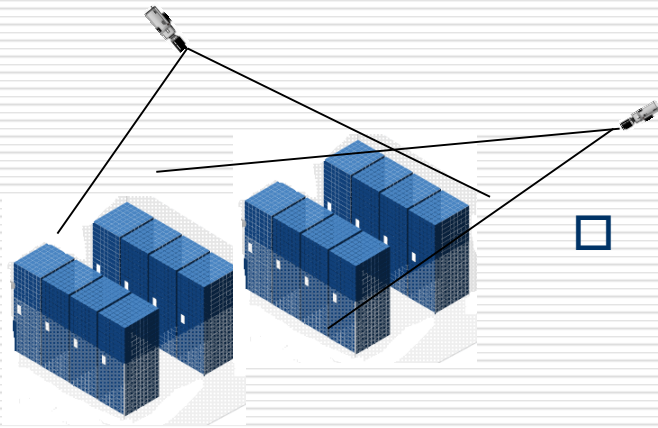
**FSDS**
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(Case)

Early detection system of data center electrical fires



- To detect smoke in the initial stage.
- FSDS compared to particle detection type smoke sensor, also detected immediately where you are away from the intake port.
- It turned out in the immediate fire source of rack of electrical fires
 - By the placement of appropriate surveillance camera, it can be monitored without any blind spot the entire server room



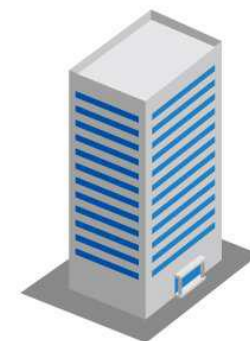
- You can prepare for all possible measures at a low cost.

(Case) Early detection system of the apartment common area fire



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- # 1 of the fire cause is arson.
- The arson mischief, shut out!
 - To detect a small flame and early smoke at an early stage.
- Garbage depot, bicycle parking, parking, etc., can be fire monitoring in semi-outdoor
 - By the placement of appropriate surveillance camera, it can be monitored without any blind spot the sharing unit
 - You can prepare for all possible measures at a low cost.
 - FSDS is, at the time of the fire detection, it can be linked emergency bell, and automatic broadcasting equipment



(Case)

Early detection system of tunnel vehicle fire



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- You sense the smoke and flames immediately after the vehicle fire at an early stage.
- By multiple units of CCTV cameras, fire source location will be found immediately.
- By the placement of the appropriate CCTV camera, it can be a tunnel entire fire monitoring
- You can prepare for all possible measures at a low cost.
- FSDS is available automatic Problem with fire to the Administration Center





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Processing screen configuration of FSDS

- At the same time to see four of the surveillance camera live video.
- A full-size (720 × 480) screen in fire monitoring, and displays four lines sequentially switched.

