

VSD-8 SYSTEM OVERVIEW



All fire safety professionals constantly seek the benefits of early warning of potential fires. In the perfect world they imagine being able to place hundreds of smoke detectors millimetres above and around the items or areas at risk. This would certainly enable a fast response to a potential fire, saving valuable time even in voluminous areas or where a high airflow may be present. But of course such a dream is not possible from a practical or financial point of view - OR IS IT?

PRINCIPLE OF OPERATION

VSD is based on sophisticated computer analysis of the video image seen by the CCTV camera (sensor). Using advanced image-processing technology and extensive detection algorithms (and known false alarm phenomena); the VSD can automatically identify the distinct characteristics of smoke patterns. The fire detection industry has an abundance of known smoke signatures and all of these are built into the system to give an accurate decision on whether smoke is present. The VSD is so accurate in its analysis that it can even differentiate between steam and smoke.

The VSD system uses standard CCTV equipment linked to a self contained processing system which is capable of recognising small amounts of smoke within the video image and alerting the system operator both at the processor and by a variety of remote outputs.

The VSD system employs highly complex algorithms to process video information from up to eight cameras simultaneously. Under normal conditions with all eight cameras connected the system achieves a 5Hz-frame rate for each channel.

The video hardware is designed to allow simultaneous real time digitising of all eight images, which means that the system does not multiplex images and, therefore, no information is lost or delayed. All alarm condition images are logged, time & date stamped, and stored within the system's memory.

The VSD system detects smoke rapidly by looking for small areas of change within the image at the digitisation stage and only passing these pixel changes to the main processor for further filtering.

The video information is passed through a series of filters, which seek particular characteristics that can be associated with smoke behaviour. Further analysis is then carried out on the relationships between the filtered characteristics to determine whether all the conditions have been met for the system to confidently predict the presence of smoke.

The system installer has the ability to vary the amount of smoke signal, and the length of time that the smoke exists before an alarm condition is raised to cater for situations where there may be background smoke present. The installer may also divide the video image into zones and programme the system to alarm only if smoke is present in two or more zones.

SYSTEM ARCHITECTURE

The VSD system comprises of a high-grade industrial computer, mouse, keyboard and VGA monitor. Proprietary high performance video grabbers are housed within the computer. The VGA monitor will display the digitised video image from any one of the eight cameras in detection mode, all control and set-up graphics, zone layout information, pre-alarm and full alarm information, zone and camera identification in alarm.

SYSTEM OVERVIEW (cont.)

TECHNICAL SPECIFICATION

- Up to eight input cameras on one system
- Several systems can be networked to use a common monitor
- Up to eighty adjustable size detection zones per system. Full screen may be analysed if necessary
- Freely programmable and/or matrix between detection zones
- 16 opto-isolated relay outputs for connection to host system
- Pre-alarm available
- Alarm log with automatic storage of 5,000 time and date stamped images
- Supports time lapse video recorders
- Individual or grouped pixel elimination (dead zone) for highly reflective surfaces
- Camera shake compensation
- Adaptive sensor noise compensation for maximum sensitivity
- Three password protection levels (Engineer, Manager and User)
- PAL or NTSC video format
- Automatic checking for Video Signal Loss, Obscuration, Low Light Level and Low Contrast Level
- Automatic switching to camera in alarm with queuing
- Installer controllable sensitivity threshold and response times

FEATURES & BENEFITS

- Detects smoke particles before they are visible to the human eye
- Affords very early smoke detection at the incipient stages to increase the speed of response for intervention
- Detects all types of smoke so no fire will go unobserved
- Detects smoke at source
- Increased response as the detector is not waiting for the smoke to reach it
- Has no concern with high air flow movements taking the smoke away from any detector or causing excessive dilution
- Affords external smoke detection
- Can use existing CCTV cameras
- Can be retrofitted to an existing CCTV system
- The visual image of the area giving the alarm can be seen
- Affords the ultimate in false alarm rejection
- The extent of the problem can be seen to assess what action needs to be taken
- The area of alarm can be zoned on the monitor screen
- If a large area is being protected by one camera, the area can be split up into manageable zones to enhance response time to the problem area
- Each zone can be individually programmed to give uniform response throughout the area of detection
- Individual zones (in the same camera view or from different cameras) can be put into co-incidence (double knock)



APPLICATIONS

The VSD system is now in operation in a variety of applications throughout the world, either installed as a working system or on trial. Typical applications that can benefit from a VSD smoke detection system include: -

- Electrical Power Generating Stations (Nuclear, Fossil and Wood)
- Military and Merchant Ship's Engine Rooms
- Cement Works
- Paper Mills
- Tunnels (Road and Rail)
- Paper and Document Storage Facilities
- Aircraft Hangers
- On Board Aircraft
- Chemical and Petrochemical Works
- Toxic Waste Plants
- Water Treatment Facilities
- Historic Buildings and Museums
- Storage Facilities (Military and Commercial)
- Offshore Oil and Gas Installations
- Forest Fires

SELECTED PROJECT REFERENCE LIST

There follows a short list of selected installations only:-

Systems installed:

Nissan Motors UK	Plastics Moulding Area	4 Cameras
Heysham Nuclear Power Station	Main Turbine Hall	12 Cameras
Statoil Offshore Platform	Control Rooms and Generators	8 Cameras
Houses of Parliament, UK	Portcullis House	4 Cameras
UK Paper	Paper Storage Facility	28 Cameras
Cottam Power Station	Main Turbine Hall	8 Cameras
Stratford Market LUL	Main Station	24 Cameras
Fords Dagenham	Diesel Production	8 Cameras
BP/ Shell	Shah Deniz Oil Refinery	56 Cameras
Lafarge Cement	Fuel Storage Area	4 Cameras
Ferry Bridge Power Station	Turbine Hall	4 Cameras
Oldbury Power Station	Turbine Hall	8 Cameras
Fiddlers Ferry Power Station	Turbine Hall	6 Cameras
West Burton TXU Power Stations	Turbine Hall	16 Cameras
Iron Bridge	Turbine Hall	4 Cameras
Great Island Power Station	Turbine Hall	6 Cameras
High Marnam Power Station	Turbine Hall	10 Cameras
Radcliffe Power Station	Turbine Hall	6 Cameras
Rugely Power Station	Turbine Hall	8 Cameras
Drakelow Power Station	Turbine Hall	12 Cameras
Albright & Wilson	Phosphorous Storage	6 Cameras
Visy Industries Australia	Waste Paper Storage	6 Cameras
British Airways	Engine Store Hanger	20 Cameras

