

Engineering Specification

D-Tec

FireVu Video Smoke Detection System

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System



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Purpose and Scope

This document is to provide a specification for consultants to ascertain the requirements for the installation of a D-Tec Video Smoke Detection (VSD) system.

The document is generic and can be applied to any VSD platform to provide compliance to known standards

Version History

Issue Number	Date	Comments
Version 0.1	9/14/06	Author: Ricky Fuller
Version 0.2	9/14/06	Review & Edits Tim Maslen, Stuart Fuller and Jon East
Version 1.0	9/15/06	Accept change requests Ricky Fuller
Version 1.1	2/12/09	Review & Edits: Brian Carlson

General

Description of Work

Complete Video Smoke Detection (VSD) system including the following:

FireVu is an advanced digital Video Smoke Detection (VSD) system based on the NetVu Connected platform.

A Confirmation Unit, which is capable of receiving and analyzing video images from up to 4 cameras which provides a fully scalable solution to any number of cameras.

The VSD systems will have the capability of early warning of smoke and flame within the monitored risk area. The event confirmation will communicate an alarm via volt free contacts configured as per the user's requirements.

Distribution of all fire events over TCP/IP in either MJPEG or MPEG4. The ability to provide distributed video feeds in real-time with pre-alarm information and visual smoke overlay to identify the risk area for operator analysis.

Storage of all fire events with adjustable pre and post-alarm on the VSD unit. All event video storage shall meet evidential standards to provide evidence in a court of law. All footage must be stored in MJPEG with MD5 algorithm for watermarking.

The final detailed location of cameras will be decided by the VSD Specialist & CCTV supplier following agreement with the client.

The CCTV Supplier shall be required to enter into a design agreement between themselves and the client for the design, supply, installation, commissioning and acceptance of the video smoke detection system.

The CCTV Supplier must also be able to demonstrate the ability to provide ongoing maintenance, support, training and documentation.

The CCTV Supplier shall take full contractual responsibility for all VSD goods and services supplied. The supplier shall ensure that provision is made within the VSD system for interface provision between appropriate alarm manufacturers equipment.

The video smoke detection system can be linked directly to the in house fire detection system to relay fire (up to 16 alarm outputs).

The VSD standards require fixed cameras with auto-iris lenses, housings, mounting brackets, and terminal boxes.

Video cables, power cables and control cables with connectors, conduits and related accessories shall be supplied by others unless otherwise agreed.

This specification is for the design, supply, installation, commissioning and the acceptance of a VSD to the open floor areas such as Hangar/Tunnel/Power Station/Warehouse/Atria.

This specification also describes the provision of supporting services for maintenance, support, training and documentation.

Video Smoke Detection Central Equipment

Central Control Unit

The VSD FireVu unit shall be available in a 19" rack mounted version.

The proprietary software for detecting fire must be dedicated to its task and must be installed on a proprietary platform to remove the risk of virus attacks; or system crashes on generic Windows/Linux/MAC platforms. The VSD FireVu unit must have full watchdog capability to automatically restore the system without the need for any personnel intervention.

Connection shall be made by the incumbent provider of the Fire detection and alarm control panels, via input/output units to signal via volt free N/O dry contacts from the FireVu unit.

The VSD Specialist shall co-ordinate with the Fire Detection/Alarm System specialist with relation to physical and operational links between the systems.

Coded levels of access are required to operate the VSD unit for authorized personnel.

Standby power will be required for both cameras and VSD units in the event of power failure for a period, as recommended by NFPA72 or national standard.

The system must have the capability for multi adjustable sized zones with up to sixteen zones per camera. Initial setup of the zones and programming of all outputs must be done at site on the VSD unit.

System Features

The system shall automatically detect video signal loss, low light level and low contrast level.

The system shall have automatic switching for camera in alarm with queuing.

The video hardware will allow simultaneous real time digitizing of all eight images.

The system shall store a minimum of 5000 date and time stamped video files which contain full resolution MJPEG with MD5 watermarking for evidential purposes.

The system alarm log shall have the ability to allow per camera viewing of the alarms.

The system shall have the ability to report events through SMS or email messaging.

The system will have a front panel display indicating IP address and fault messages.

The system will have software firewalls to restrict access including log files recording all connections and illegal file access.

The system shall have identification text for all cameras connected to the system.

The system shall be adjustable on the amount of smoke required and the length of time that the smoke exists before an alarm condition is raised.

The system shall have the ability to divide the video image in to a maximum of 16 definable zones per camera image.

The system shall be programmable to alarm on one or more zones, and no size limit on the size of zones used.

The system shall have the ability to associate two camera images and the zones within the images to be associated, for greater system performance.

The system shall have sixteen alarm outputs that can be individually assigned to any combination of zones and sectors.

Operation

The principle of operation shall be based on a proprietary unit dedicated to the task of Video Fire Detection running no additional software which can compromise detection. The camera views can be monitored by any modern PC or MAC using viewing software. Camera viewing shall use a GUI with independent Video Codec's to providing continuous analysis of video images, i.e. the field of view covered by a number of standard CCTV cameras. The unit shall allow zones to be placed anywhere within a camera view to enable the source of a fire to be identified in the shortest time possible whilst alerting an operator to the presence of a fire, by means of the viewing software by a computer on a monitor screen.

The unit shall employ algorithms to process video information from up to four cameras simultaneously. The unit will monitor all four cameras connected; the unit shall achieve a 25Hz-frame rate for each of the four channels.

Smoke shall be detected by the monitoring of small areas of change within the image and passing these pixel changes to the processor for analysis. A series of filters within the algorithm shall be employed to seek particular characteristics associated with smoke. Further analysis shall then be carried out on the relationship between the filtered characteristics to determine whether all the conditions have been met for the system to confidently detect the presence of a fire.

To cater for situations where background smoke is present, the system shall provide the facility to vary the quantity of smoke and the duration the smoke needs to exist before an alarm condition is raised; this is typical within certain manufacturing facilities. The unit shall also have the facility to alarm only if smoke is present in one or more zones. To provide even greater system performance, the facility for two camera images to be associated together shall be provided. This allows smoke in one image to be treated as a pre-alarm and smoke in two associated camera images to be treated as a full alarm.

The VSD systems should be set up to provide single-stage alarm indication to the existing Fire Detection system by hard wired contacts to provide early warning of a possible alarm condition.

Outputs

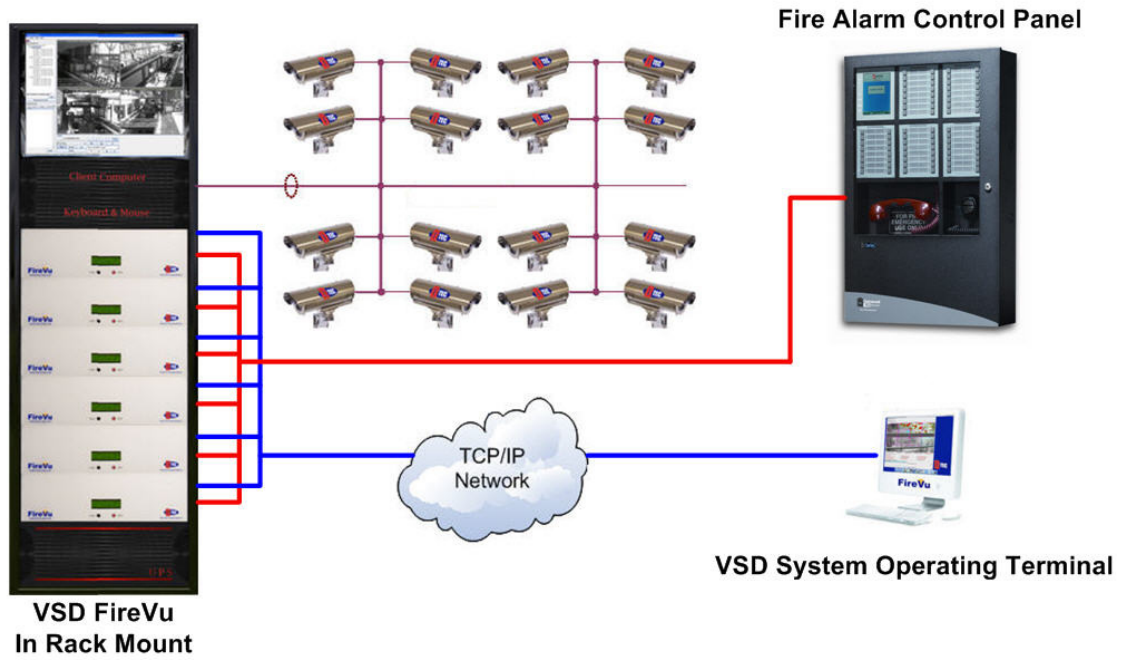
The system shall have a minimum of sixteen alarm outputs that may be individually assigned to any combination of zones or sectors.

These outputs shall not be linked to any particular camera so allowing for the zonal and image association described above. Through an output logic matrix, the operator shall have the ability to customize the systems output to alarm conditions and therefore allowing easy integration within the 'house' fire alarm system.

Camera and Cable Selection

Any cameras or cabling chosen for integration with the VSD unit shall be verified by the manufacturer. The system shall be capable of viewing with any standard camera which is capable of producing a clear image in the lighting conditions that are envisaged for the application.

Typical Network Diagram



Rear Panel Terminations

