VMS2000 VIDEO MANAGEMENT SOFTWARE

FEATURES

- Live real-time video viewing and playback
- Central monitoring and alarm management of multiple remote sites
- Video data archive management
- Automatic intrusion detection using advanced video analytics
- Manage and configure all local and remote SmartDVS™ Digital Video Servers
- Easy integration into existing systems

KEY BENEFITS

- Unattended surveillance
- Use as part of an overall physical security solution
- Architected for widely dispersed infrastructure
- Comply with regulatory requirements
- Protect critical infrastructure from a central location

The SmartVMS™ VMS2000 Video Management Software is the software component behind Systems With Intelligence's video surveillance solution. The VMS2000 allows for central and remote management of Systems With Intelligence's SmartDVS™ Digital Video Servers (DVS) and provides live video viewing, remote camera control, video data archive management, remote access services, video analytics algorithms for automated intrusion detection, and alarm and event notification through email.

The VMS2000 can connect to multiple DVSs at a single location or across multiple remote sites and is capable of managing and monitoring hundreds of video cameras. The VMS2000 manages remote video access to all DVSs which allows for the distribution and viewing of system events and alarms to any computer connected to the network. Additionally, alerts can be sent to handheld devices such as Blackberrys or Windows Mobile Smart Phones to ensure personnel are notified of incidents in a timely manner.

The VMS2000 software is available as a standalone application or can be integrated into an existing monitoring or SCADA system.

systems with **intelligence**

SOFTWARE OVERVIEW

The SmartVMS™ VMS2000 Video Management Software is a collection of software components behind Systems With Intelligence's video surveillance solution and performs the following major tasks:

1. Video Monitoring: shows operators real-time live video feed from the connected cameras.
2. Video Playback: operators can review recorded video.
3. Video Analytics: analyzes video images to determine if preset user-defined rules have been broken and decide if real-time alerts need to be generated.
4. Recording: 24 hours, based on scheduled events.
5. Real-time Alerts: sends a real-time event notification whenever an alarm is identified.
6. Data Archive Management: store and manage video and data on the local DVS and a centralized long term external storage device
7. System Configuration: configure all aspects of the system, including DVS hardware, cameras, video analytics, and other system parameters.
8. Auxillary Functions: integrates additional capabilities such as access control devices, thermal cameras for asset monitoring, SCADA integration, and general digital I/O control

The VMS2000 software components include the following:

VMS2000 Server: the software that resides in the SmartDVS™ Digital Video Server (DVS), and is responsible for all the functions operating on the DVS hardware.

VMS2000 Client: the software that resides remotely on a user's laptop or personal computer and is the main user interface for the video surveillance system. It is designed to connect to multiple DVS devices located locally or across multiple sites.

VMS2000 Analytics: the software algorithms that are used to automatically identify various types of security incidents such as motion detection, perimeter violation, and loitering.
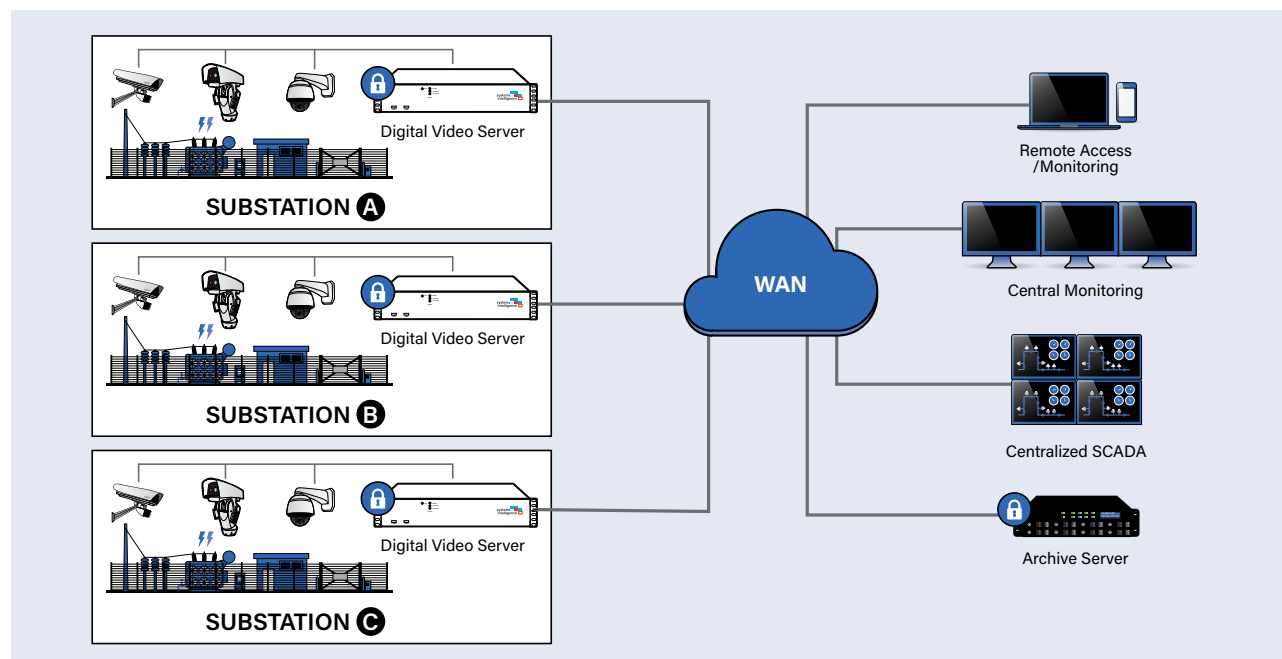
VMS2000 Archive Server: the software that resides on a central dedicated computer that manages the retrieval of all stored video and data from each DVS to an external storage device for the purposes of long-term data archiving.

TYPICAL SUBSTATION NETWORK ARCHITECTURE
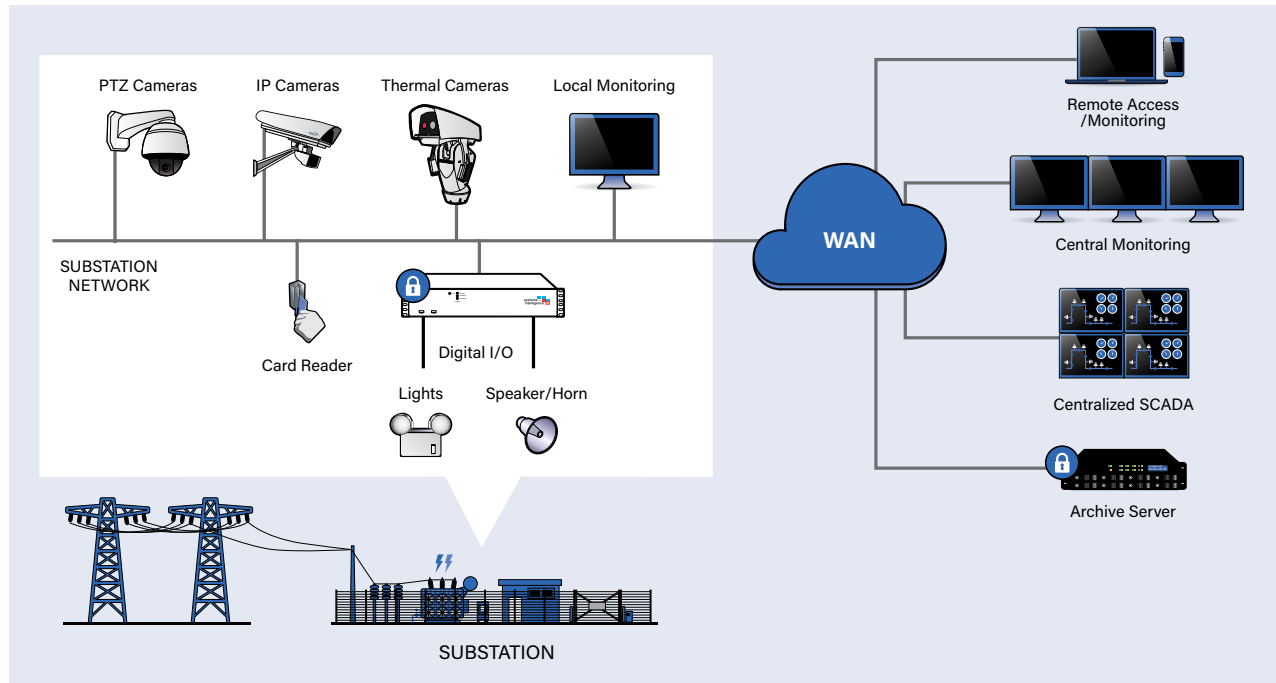
DISTRIBUTED ARCHITECTURE

* The VMS2000 Software is capable of running on any computing platform that has sufficient computing power for the specific application. However, Systems With Intelligence recommends using a dedicated computer and can provide the appropriate platform required.

SOFTWARE FEATURES

FUNCTIONS	
Manage Digital Video Server (DVSs)	• Manage and configure Digital Video Servers located locally or at remote sites
Monitoring	• Live video viewing: Simultaneously view multiple video feeds (Full screen, Split screen (4, 9, 16) • Event and Status display (Event Lists): event list, alarms, system status • Event Log display: Real time displaying of event list and automatic refresh of video event list
Video Analytics Rule Management	• GUI based wizard used to set up video analytics rules which perform real-time event detection on live surveillance video • Rules tell the system which security events to look for in the video • Rules specified for each camera
Alarm/Event Notification and Management	• Event list: History of all security and system alerts • Event Action Plan: Able to define multiple actions in response to an event • Email Notification: Send a notification response via email message to a contact or a distribution list • PTZ Activation: Supports setup of Alarm related with PTZ preset location.
Camera Control	• View camera configuration, rules and responses for each camera • PTZ camera: Pan & tilt, zoom control
Data Storage (Archive Server)	• Manage data storage and archiving from all Digital Video Servers • Export and store all data, including video and alerts, to a local storage device, server attached storage or network attached storage • Ability to schedule archiving of the system database, files, alert and system events and video files locally and/or to a network attached storage device • Backup: Automatic (schedulable) or Manual
Search and Playback	• Search a video archive and playback stored and live video • Ability to search for various events, including alerts and system events • Playback Speed: Single frame, 1/16x, 1/8x, 1/4x, 1/2x, 1x, 2x, 4x, 8x, 16x, Fast forward and rewind • Searching: Searching of images by date, time, camera, and event • Image Transfer: Able to save images as BMP, JPG and AVI format.
Video Resolution	• 1280p x 720p

VMS2000 CLIENT MAIN USER INTERFACE
The features of the VMS2000 Client software as shown below includes:

The SmartVMS™ VMS2000 Software Main User Interface Screen.

① Video Panel:
- Live camera feed from one or many digital video servers (DVS)

② Control Panel:
- Select cameras to manage & control
- Control the PTZ camera functions
- Access all features of the software

③ Alarm and Event Notification Panel:
- Displays a list of recent alarms & events
- Displays the camera connection status

④ TreeView Panel:
- Displays a list of available cameras in a tree structure
- User can define different pages and the cameras associated with each

SMARTVMS™ VMS2000 SERVER SOFTWARE

The SmartVMS™ VMS2000 Video Management System is the software component behind Systems With Intelligence's video surveillance solution. It consists of two parts, the VMS2000 Server software that is located in the SmartDVS™ Digital Video Server (DVS), and the VMS2000 Client software that can reside locally on the DVS or remotely on a user's laptop or personal comput er.

The VMS2000 Server software is responsible for all the Video Management Systems functions operating on the DVS hardware. Since it is operates on the DVS itself (on the edge), it reduced ongoing operating costs because it minimizes bandwidth, communications, power and back office IT infrastructure requirements.

The VMS2000 Server software records video images, analyzes them using unique video analytics, determines if a rule has been breached, then sends a real-time alert with an image to an operator. The video is also stored in the DVS for event review and investigation. The VMS Server software is also responsible to stream the video feeds to any connected VMS2000 Client, provide PTZ control, control all serial and digital I/O interfaces to allow integration of physical security devices and other control functionality to the overall video surveillance solution.

Key Features Include:

Real-time camera monitoring and remote control over network • The VMS2000 can capture live video from up to 16 cameras, which can be monitored locally or remotely over Local Area Networks (LAN) and Wide Area Networks (WAN). Users are able to locally or remotely change setting of system parameters including individual camera configuration.

H.264 Compression Technology • The VMS2000 supports H.264 AVC/SVC and JPEG encoding. H.264 compression provides the user with the best image quality at the lowest possible communication bandwidth and disk storage requirements. With D1/4CIF image resolution at 30 fps video with audio embedded recording, users can retain the highest possible quality of recorded events for future investigation.

VMS2000 Client Software Main Screen.

Alarm and Event Notification • The VMS2000 has a comprehensive set of user selectable video analytic alarm rules and can be configured up to 10 analytic rule sets per camera. Additional, an extensive set of system event and alarms are also provided to help in the overall system management and monitoring. When an alarm event occurs, the VMS2000 is able to perform one or more of the following actions:

1. Update the alarms database with a record of the time, alarm message and event image.
2. Send an alarm notification to the client viewers.
3. Send an email notification with JPEG attachment of the scene.

Additionally, a DNP interface is available to enable seamless integration of alarms into third party SCADA applications.

Serial Interfaces • The VMS2000 can be configured to incorporate up to 16 serial interfaces (RS232/RS422/RS485 via DB9 or RJ45) that may be available on the DVS. This will allow integration of physical security devices such as card readers.

Digital I/O • The VMS2000 can be configured to utilize the various types of digital I/O available on the DVS the user to incorporate control logic into the video surveillance system. Inputs from physical security devices (eg. motion sensors) can be included in the rule sets, while outputs can be used to control other devices (such as turning on a light or sounding a horn).

VMS2000 CLIENT SOFTWARE

The VMS2000 Client software is the main user interface for the video surveillance system. It is designed to connect to multiple digital video servers located locally or remotely across multiple sites. The VMS2000 can be run on any computer or laptop and boasts many features including:

- View live video (1 to 16 images per screen)
- Review recorded Aand archived video
- Video data management, archiving and summarizing
- Access multiple monitoring stations
- Video analytics configuration
- Real-time alarm and event management and email notifications
- Remote PTZ camera controls
- System configuration of all user-definable parameters

VMS2000 Client Software Main Screen.

Historical Video Screen Viewer.

Historic Alarm & Event View window.

Examples of Channel Analytics Configuration screen.

VIDEO ANALYTICS

The VMS2000 software can incorporate a wide range of video analytics that are designed to work in outdoor environments.

What are analytics? Essentially analytics are an automated operator. The task of a security operator often includes repetitive tasks. For example, an operator might be expected to:

• Monitor a fence line to make sure no one enters an area.

• Make sure that no one unauthorized crosses into the "employees only" zone in a building.

• Keep an eye on some of the items that can be stolen.

A lot of attention and time is required to keep track events 24/7. Systems With Intelligence analytics introduces a way to manage tasks and automate them to free up the operators' time and make security systems more efficient.

All the tasks mentioned above (and more) can be tracked by the VMS2000 software. The operator can set up rules that describe what they are trying to monitor. Rules are simple sets of specifications that say what to look for, where to look for it, and what to do if it happens. If, for example, the operator sets up a rule to watch for a person crossing a perimeter line, the VMS2000 software will analyze the video and notify the operator when someone crosses the line.

Analytics works by looking at video and analyzing it in real-time. This means that there is no delay between an event and the reaction to it. In other words, the analytics processes video on the fly, the same way as would a person looking at the camera feed.

Video Analytics detection example

| AVAILABLE ANALYTICS FUNCTIONS	
Motion Detection	Detect motion in a specified field of view
Directional Tripwire	Monitor a perimeter for any intrusion (one direction)
Bidirectional Tripwire	Monitor a perimeter for any intrusion (both directions)
Loitering Detection	Determine if people are loitering near a restricted area
Camera Tampering	Determine if a camera has been compromised

OTHER BENEFITS WITH VIDEO ANALYTICS

Reduce Network Bandwidth • Streaming video over a network gives rise to many bandwidth and network resource issues. In many cases, and in particular for remote locations, continuously streaming video over a wide area network is not practical. In this case, video analytics can be used to decide when to transmit video. For example, when a person enters a field of view where no one should be present, a small video clip can be transmitted to an operator for remote viewing. Bandwidth and network resources are preserved and only used when an event of interest occurs. Video analytics can provide effective monitoring of remote locations that may only have low speed network connectivity available, such as dial-up or cellular modems.

Reduce Video Storage Requirements • Storage optimization is a common use for video analytics. In its simplest form, video analytics examines video feeds to identify changes in motion. Based on the presence or absence of motion, the video management system can decide not to store video or to store video at a lower frame rate or resolution. Since surveillance video captures long periods of inactivity, like at unmanned substations, using video analytics can reduce storage consumption by 60% - 80% relative to continuous recording. Recording only when an event has occurred also results in the ability to quickly search and retrieve specific security events in post-event analysis.

AUXILLARY FUNCTIONS

Systems With Intelligence's VMS2000 and DVS2000 provides a flexible platform to seemlessly integrate many auxillary functions into the overall solution. The following provides some examples of possible integration. Contact Systems With Intelligence to discuss integration of other functions or systems.
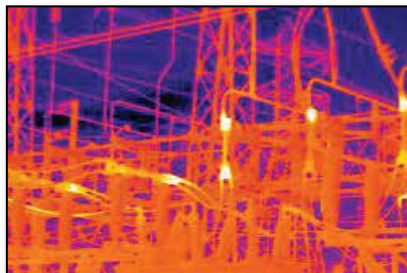
Hot Spot Monitoring Using Thermal Cameras

Thermal Camera Integration

- Asset monitoring
- Preventive maintenance
- Automated alarms and notification based on "thermal" rules

Integrate Various Types of Access Control Devices

Access Control Integration

- Tie in card readers and other physical security devices
- Video verification
- Event logging
- User policy management

Live Video Feed Directly in a SCADA System

SCADA Integration

- Integrate into existing HMI's (via API or system calls)
- Obtain alarm and event information through standard utility protocols such as DNP3

CONFIGURATION

The VMS2000 Server software must be ordered in conjunction with Systems With Intelligence's Digital Video Server. The number of IP cameras must be specified, in addition to how many channels of analytics are required.

The VMS2000 Client software can run on any Windows computer subject to sufficient available computing power. One software license is required for each computer running the Client software. Software licenses can be ordered in packages and can be added at a later date.

Contact Systems With Intelligence for VMS2000 Software ordering details to ensure the correct configuration and options are selected.

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