



Intelligent Video Monitoring Solutions  
for Harsh Environments

## DVS2500 SUBSTATION HARDENED DIGITAL VIDEO SERVER

### FEATURES

- Designed for harsh substation environments (IEC61850-3, IEEE1613)
- Industrial rated power supply with dual power supply option
- Wide operating temperature (- 40°C to +85°C), no fans
- Integrated video analytics for automatic detection of events
- Alarm and event notification

### KEY BENEFITS

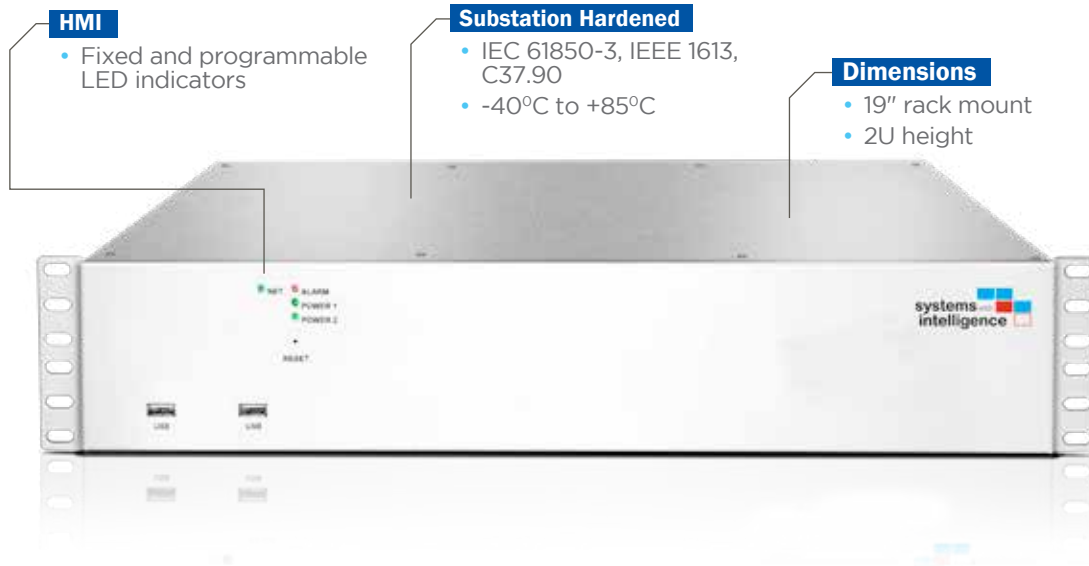
- Monitor critical infrastructure and remote sites
- Reduce theft and damage to physical assets
- Comply with regulatory requirements
- Easy integration with existing equipment
- Connects with existing SCADA systems

The Systems With Intelligence Digital Video Server (DVS2500) is the center piece of the monitoring solution. It is a powerful platform that records from multiple cameras and incorporates a suite of sophisticated video analytic algorithms for automated monitoring. The DVS features flexible networking capabilities and provides automated alarm and event notification to reduce the need for continuous monitoring. Local video archiving up to 2 Terabytes allows for over 30 days of local storage.

The DVS2500 is easy to use, with simple “plug-n-play” functionality that minimizes installation time and costs. It can be used in new or existing installations and connects directly to most IP video cameras. The DVS2500 is ideal for applications with remote sites that are managed from a central location.

The DVS2500 has been designed specifically for harsh environments found in electric utility applications, taking into account the presence of high levels of EMI, voltage fluctuations and wide temperature ranges.

## FRONT & REAR DIAGRAM



### HMI

- Fixed and programmable LED indicators

### Substation Hardened

- IEC 61850-3, IEEE 1613, C37.90
- -40°C to +85°C

### Dimensions

- 19" rack mount
- 2U height

### Expansion Ports

- Ethernet Ports for IP Camera support
- Serial interfaces
- Digital I/O
- Wireless LAN\*

### Dual Ethernet Ports

- Dual "switched" Ports available for redundant loops
- Multiple types of Interfaces & Connectors (Copper, Fiber)

### Standard Interfaces

- 10/100/1000 Base Tx Ethernet Port
- 4 USB Ports (2 front/2 back)
- VGA Interface
- 1 Audio Output



### Additional Features

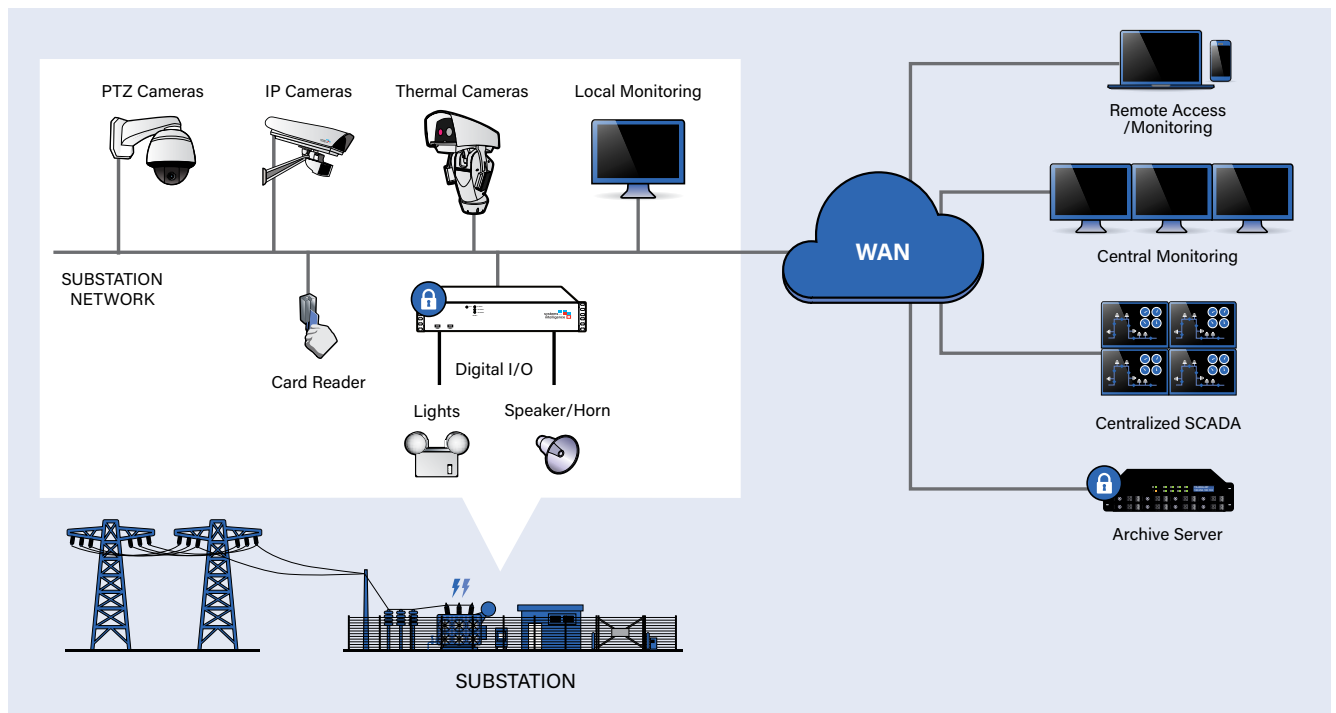
- Fail Safe Relay
- HDMI port

### Power Supply

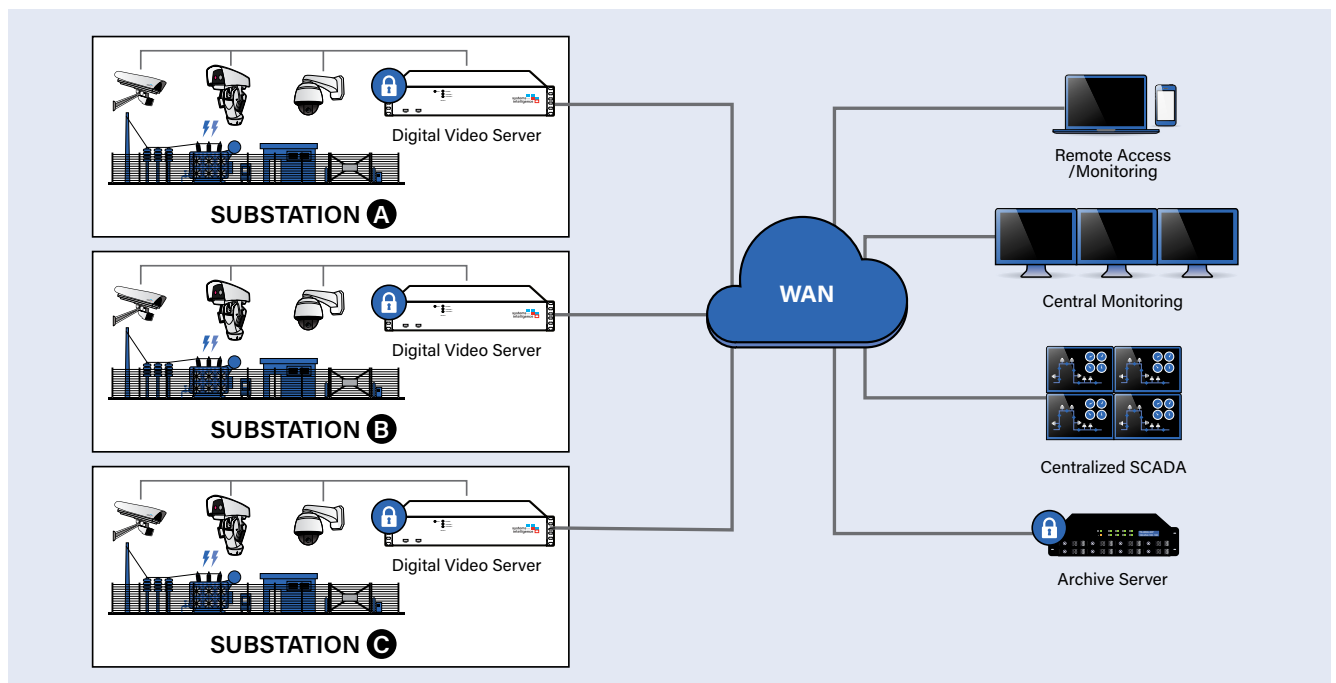
- Industrial rated for substations
- 24VDC, 48VDC, 105-300VDC or 85-250VAC
- Optional dual redundancy

\* Future option available soon.

# SUBSTATION MONITORING ARCHITECTURE



# DISTRIBUTED ARCHITECTURE



# SMARTVMS™ VMS2000 SERVER SOFTWARE

The VMS2000 Video Management System is the software behind the video surveillance solution that consists of Server software on the Digital Video Server and Client software on a remote Windows PC. VMS2000 Server software records video images, analyzes them using unique analytics, determines if a rule has been broken, then sends real-time alerts with an image to the operator. The video is also stored in the DVS for archiving and investigation. The VMS Server software is also responsible for streaming the video feeds to the VMS Client, providing PTZ control and managing serial and digital I/O interfaces to allow integration of physical security devices.

## KEY FEATURES INCLUDE:

**Real-time camera monitoring and remote control over network** • The VMS2000 can capture live video from up to 16 cameras that can be monitored over any IP network. Graphical web based management interface to remotely control and configure cameras.

**H.264 Compression Technology** • The VMS2000 supports H.264 AVC/SVC and JPEG encoding. H.264 compression provides the best image quality at the lowest possible bandwidth and storage requirement.

**Alarm and Event Notification** • The VMS2000 has a comprehensive set of configurable video analytic alarms and can be configured for up to ten rule sets per camera. An extensive set of system event and alarms are provided to help in the overall system management. When an alarm event occurs, the VMS2000 performs one or more of the following actions:



VMS2000 Client Main Screen.

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

**SCADA Integration** • A DNP interface is available to enable seamless integration of alarms into third party SCADA applications.

**Serial Interfaces** • Up to 16 serial interfaces (RS232/RS422/RS485 via DB9 or RJ45). Allows integration of physical security devices such as card readers or lights.

**Digital I/O** • Utilize up to 16 of the various types of digital I/O available on the DVS. The user can then incorporate control logic into the video surveillance system. Inputs from the video analytics can be included in the rule sets, while outputs can be used to control other devices (such as turning on lights or sounding a horn).

# VIDEO ANALYTICS

The VMS software incorporates a wide range of video analytics that are designed to work in outdoor environments.

The task of a security operator often includes repetitive tasks, analytics are designed to automate video monitoring. For example, an operator might be expected to:

- Monitor a fence line to make sure no one enters an area
- Make sure that no unauthorized personnel 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 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 process video on the fly, the same way as would a person

## AVAILABLE ANALYTICS FUNCTIONS

<b>Motion Detection</b>	Detect motion in a specified field of view	<b>Camera Tampering</b>	Determine if a camera has been compromised
<b>Directional Motion</b>	Monitor a perimeter for any intrusion (one direction)	<b>Arc Flash</b>	Determine if an Arc Flash has occurred
<b>Bidirectional Motion</b>	Monitor a perimeter for any intrusion (both directions)	<b>Switch Operation</b>	Determine if a switch has operated
<b>Loitering Detection</b>	Determine if people are loitering near a restricted area		

## 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 limited network connectivity available.

### Reduce Video Storage Requirements

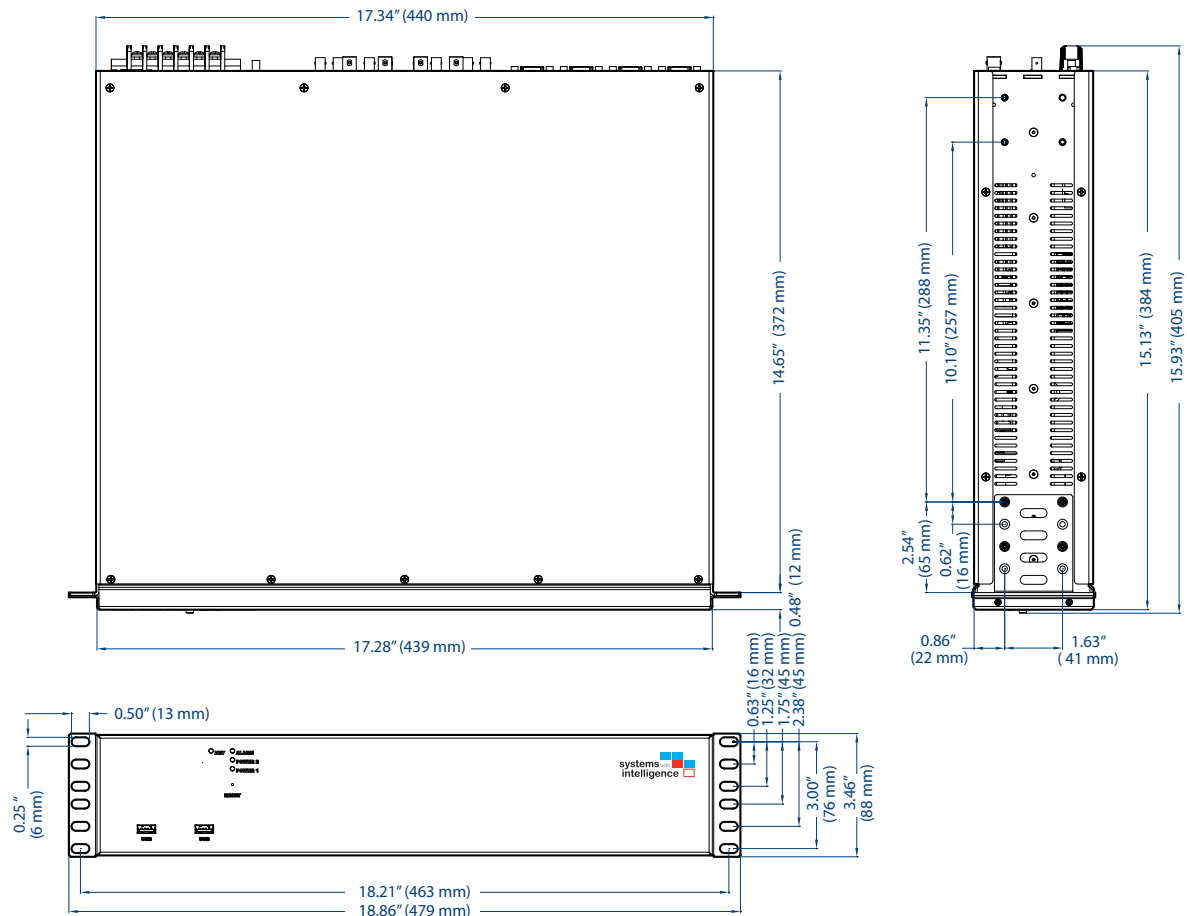
- Storage optimization is a common use for video analytics. In its simplest form, video analytics examine video feeds to identify changes in motion. Based on the presence or absence of motion, the video management system can decide not to store video or to store video at a lower frame rate or resolution. 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.

# TECHNICAL SPECIFICATIONS

SPECIFICATIONS	
IP Cameras	<ul style="list-style-type: none"> <li>Up to 16 IP cameras can be connected to the DVS</li> <li>IP Camera support for leading manufacturers (Contact Systems With Intelligence for the latest list of supported IP Cameras)</li> <li>H.264 video streaming</li> <li>Resolution and frame rate dependant on IP camera used</li> <li>HD and megapixel images supported</li> <li>ONVIF IP Camera Support</li> </ul>
Video Output	<ul style="list-style-type: none"> <li>1 VGA interface for computer monitor</li> </ul>
USB	<ul style="list-style-type: none"> <li>4 USB Ports</li> </ul>
Storage	<ul style="list-style-type: none"> <li>Up to 2TB using solid state drives</li> </ul>
LAN Interface	<ul style="list-style-type: none"> <li>Included: 1-port 10/100/1000TX RJ45 Interface</li> <li>Optional: 2-ports 10/100/1000TX RJ45 or 100FX Fiber Interface</li> </ul>
Optional Modules	<ul style="list-style-type: none"> <li>Serial Interfaces: 4 x RS232/RS422/RS485 DB9 modules</li> <li>Serial Interfaces: 8 x RS232/RS422/RS485 RJ45 modules</li> <li>Wireless: 802.11 b/g*, Cellular Modem*</li> </ul>
Power Supply	<ul style="list-style-type: none"> <li>24VDC, 48VDC, 105 -300VDC or 85-250VAC; Optional dual redundant power supplies</li> </ul>
Power Requirement	<ul style="list-style-type: none"> <li>100W(max)</li> </ul>
Operating Temperature	<ul style="list-style-type: none"> <li>-40 °C to +85 °C; no cooling fans</li> </ul>
EMC/EMI	<ul style="list-style-type: none"> <li>IEC 61850-3; IEEE 1613; IEC 61000-6-2; IEC 61800-3</li> </ul>
Mounting/Dimensions	<ul style="list-style-type: none"> <li>19" Rack Mount; 2U height</li> </ul>

\* Future option available soon.

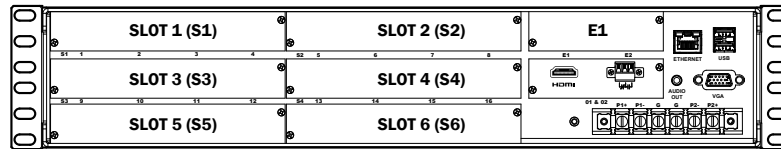
## DIMENSIONS Unit: inches (mm)





# CONFIGURATION

## SmartDVS™ DVS2500 DIGITAL VIDEO SERVER



### BASE UNIT

DVS2500 Base Unit - Intel i3 Dual Core, 1.7GHz Processor, 8GB Memory

### PS1, PS2 - Power Supply

HIS 105-300VDC or 85-250VAC, screw terminal block  
 24S 24VDC (18-36VDC), screw terminal block  
 48S 48VDC (36-60VDC), screw terminal block  
 XXX None

### E1 - Switched Ethernet Port

2C10 2 x 10/100/1000Tx, RJ45  
 2LC1 2 x 100FX - Multimode, 1310nm, LC  
 2LC2 2 x 100FX - Singlemode, 1310nm, LC  
 EXXX Empty

### HD - Flash Drive for Storage

HD001 500 GB SSD (approximate size)  
 HD002 1TB SSD (approximate size)  
 HD003 2x 1TB SSD (approximate size)  
 HDXXX Empty

### S1, S2 - Camera Input Module

8C01 8x 10/100TX Port IP Camera Input Card, RJ45 Interface  
 8LC1 8x 100FX Port IP Camera Input Card (LC, Multimode, 1300nm)  
 8LC2 8x 100FX Port IP Camera Input Card (LC, Singlemode, 1300nm)  
 8F00 8x 100FX Port IP Camera Input Card (SFP - Blank)  
 SXXX Empty

### S3, S4, S5, S6 - Expansion Slot

4S01 4x RS232/RS422/RS485 via DB9 Module  
 8S02 8x RS232/RS422/RS485 via RJ45 Module  
 8D01 8 transient/surge protected two-state, dry contact, current loop inputs  
 8D02 8 relay switch outputs (30VDC, 1 Amp / 50VAC, 5 Amp)  
 4D01 4 dry contact, current loop inputs + 4 relay switch output (30VDC, 1 Amp / 50VAC, 5 Amp)  
 SXXX Empty

### HDMI Port

HR00 Fail Safe Relay<sup>(1)</sup>

**\*Note:** SSD Flash Drive sizes are approximate and subject to change without notice. Contact factory for exact size.

### ORDER CODE EXAMPLE

DVS2500-HIS-HIS-2C10-HD002-8LC1-SXXX-SXXX-SXXX-8D01-8D02-HR00

## SmartVMS™ VMS2000 SERVER SOFTWARE

### VIDEO MANAGEMENT SOFTWARE

VMS2000S VMS2000 Server Software that resides on the DVS



Contact Systems With Intelligence for VMS2000 Server software camera licensing options.

#### <sup>(1)</sup> IP CAMERA NOTES:

- The IP Camera Input Modules in the S1, S2 option slots will provide direct connection from an IP camera directly to the DVS which will reduce overall network bandwidth requirements.
- Contact Systems With Intelligence for the latest list of supported IP cameras.



Systems With Intelligence Inc.  
6889 Rexwood Road, Unit #9  
Mississauga, Ontario, CANADA  
L4V 1R2

Tel: +1-289-562-0126  
Fax: +1-289-562-0152

**General Inquiries:**

[info@SystemsWithIntelligence.com](mailto:info@SystemsWithIntelligence.com)

**Sales Inquiries:**

[sales@SystemsWithIntelligence.com](mailto:sales@SystemsWithIntelligence.com)

**Product Support:**

[support@SystemsWithIntelligence.com](mailto:support@SystemsWithIntelligence.com)

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