



## SmartDVS™ DVS1000

SUBSTATION HARDENED DIGITAL VIDEO SERVER

- Digital video recording (H.264)
- Integrated video analytics for automatic detection of events
- Alarm and event notification
- Aggregate multiple video sources at a remote location
- 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

### KEY BENEFITS

- Monitor critical infrastructure and remote sites
- Reduce theft and damage to physical assets
- Comply with regulatory requirements
- Easy integration with existing equipment
- ‘IP-enable’ legacy CCTV cameras

SWI's Digital Video Server (DVS1000) is the center piece to SWI's intelligent video surveillance solution. It is a powerful video server appliance that digitally records video from multiple cameras, incorporates a suite of sophisticated video analytics algorithms for “smart” surveillance, includes tools for video monitoring and analysis, features flexible networking capabilities, and provides automated alarm and event notification. Local video archiving of up to 512 Gigabytes allows for over 30 days of local video storage is also available.

The DVS1000 is easy to use, with simple “plug-n-play” functionality that minimizes installation time and costs. It can be used within new or existing installations and can connect directly to most types of IP and/or analog/CCTV video cameras. For legacy analog cameras, the DVS1000 can “IP-enable” these cameras for distribution of the video stream over an IP-based communications network, enabling users to leverage their existing surveillance infrastructure and reduce capital costs. The DVS1000 is ideal for applications with a widely dispersed infrastructure, as it can be used to aggregate multiple video sources at a remote location for efficient transmission to a central location.

The DVS1000 has been designed specifically for harsh environments found in electric utility applications, taking into account the presence of high EMI and wide temperature range present in a substation.

## FRONT & REAR DIAGRAM

### HMI

- Fixed and programmable LED indicators
- Digital I/O
- “Maintenance” serial interface

### Substation Hardened

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

### Dimensions

- 19” rack mount
- 2U height



### Expansion Ports

- Serial interfaces
- Digital I/O
- Additional Ethernet ports
- Wireless LAN

### Dual Ethernet Ports

- Copper or Fiber
- “Switched” ports for RSTP network redundancy

### Standard Interfaces

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



### Wide Area Network

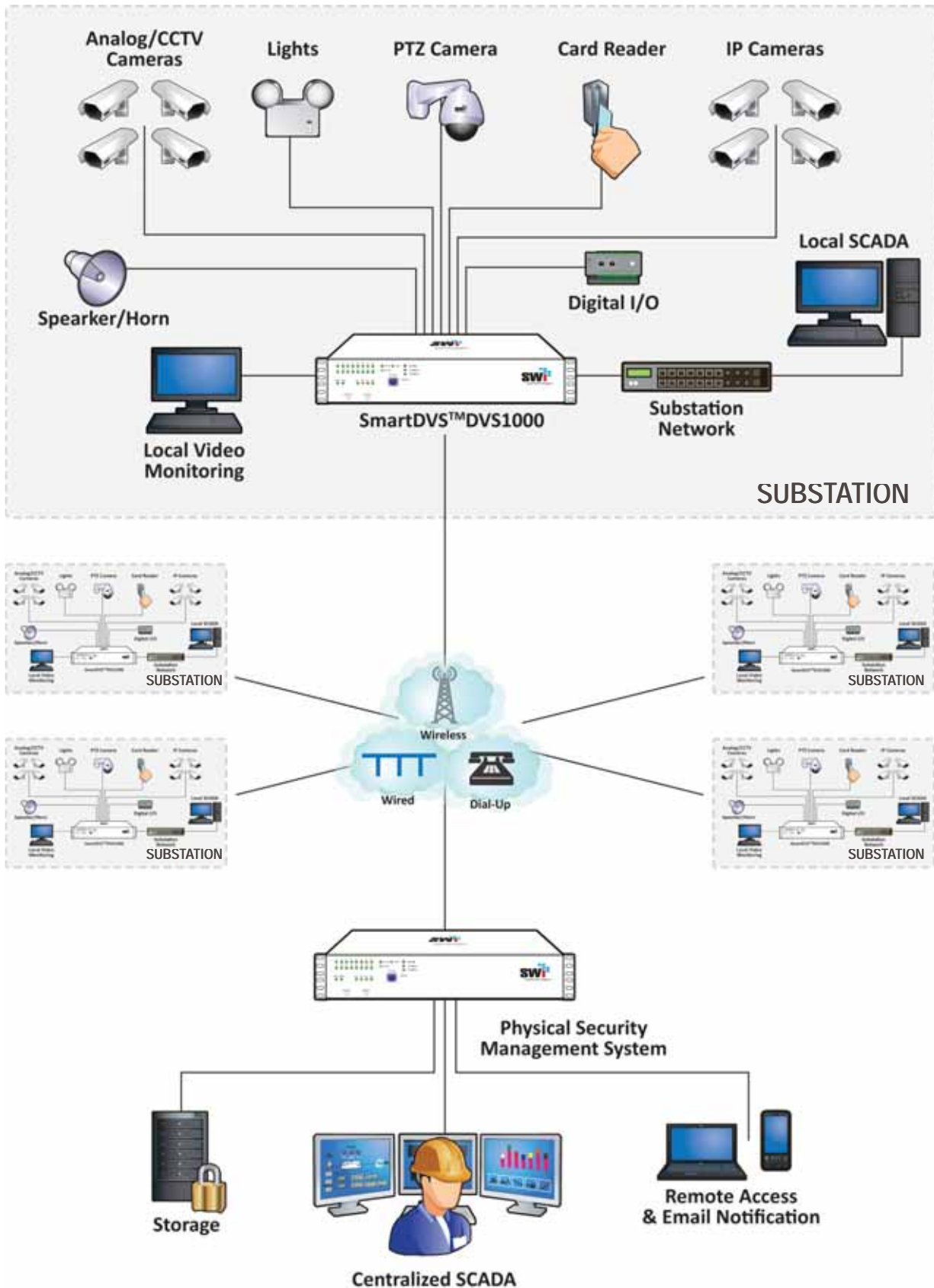
- Cellular interface\*
- V.90 modem\*
- T3/E3, DSL, DDS\*

### Power Supply

- Industrial rated for substations
- 24VDC\*, 48VDC\*, 88-300VDC or 85-264VAC
- Optional dual redundancy

\* Future option available soon.

## TYPICAL NETWORK DIAGRAM



## VIDEO MANAGEMENT SOFTWARE

The SmartDVS™ DVS1000 incorporates extensive video management software capabilities and sophisticated video analytics algorithms for automatic intrusion detection and event notification. The DVS1000 incorporates one-touch video playback, instant video tagging and alarm notification, built-in PTZ control, and serial and digital I/O interfaces to allow integration of physical security devices and other control functionality to the overall video surveillance solution.

**Real-time camera monitoring and remote control over network** • The DVS1000 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). User defined policies and rules can be established to allow automatic video tagging when events occur. Manual video tagging can also be attached to specific video segments. Users are able to locally or remotely change setting of system parameters including individual camera configuration.

**H.264 Compression Technology** • The DVS1000 supports H.264 AVC/SVC, MPEG-4, MJPEG 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.

**Network Security** • The DVS1000's recorded video is encrypted with on-demand AVI and DIVX export functions. The video stream is also encrypted for up to 10 simultaneously authenticated viewer client stations.

**Web Server Feature** • The system can send JPEG/AVI/H.264 images and videos to authenticated users upon query. A web based interface is also active through an optional web-server function running on the DVS1000. JPEG images can also be sent via email to multiple recipients when violations of user-defined policies occur.

**Analytics** • The DVS1000 can incorporate a wide range of video analytics that are designed to work in outdoor environments. The analytics are environmentally compensated in order to reduce nuisance false alarms.

**Alarm Function** • The DVS1000 has a comprehensive set of user selectable alarm rules and can be configured up to 10 analytic rule sets per camera. When a rule is violated, the DVS1000 is able to perform one or more of the following actions:

1. Display an on-video tag
2. Update the alarms database with a record of the time, alarm message and event image
3. Send an email with JPEG attachment of the scene
4. Send an alarm notification to the client viewers
5. Send an SMS text message

A policy or rule can be manually activated, deactivated, or scheduled automatically. Two-rule activation schedule are available to define different operating times for weekdays or weekends. The analytics engine in the DVS1000 allows the user to create lines, boxes or arbitrarily shaped areas for the definition of policy rules.

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

**Serial Interfaces** • The DVS1000 can be configured to incorporate up to 16 serial interfaces (RS232/RS422/RS485 via DB9 or RJ45) to allow integration of PTZ camera control and other physical security devices such as card readers.

**Digital I/O** • The DVS1000 can be configured with various types of digital I/O. Digital I/O allows the user to incorporate control logic into the video surveillance system. Inputs from physical security devices (eg. motion sensors) can included in the rule sets, while outputs can be used to control other devices (such as turning on a light or sounding a horn).

**Audio Function** • The DVS1000 can record simultaneous audio along with video. The number of input audio channels is equal to the number of video channels, plus an extra microphone input at the DVS1000 station. With this configuration, cameras with a built-in microphone or a separate microphone per video channel can be used. Using the extra microphone input and speaker output, the system can also be used for public address (PA) or for the addition of voice tags.

## OPTIONAL VIDEO ANALYTICS

FUNCTIONS	
Motion Detection	Protection of critical assets by automatically detecting motion in a specified field of view
Perimeter Violation (or “Virtual Tripwire”)	Automatically monitor the substation fence line for any intrusion
Loitering	Automatically determine if people are loitering near a restricted area
Abandoned Object	Automatically detect when an object, such as a bag, has been left behind, near or within a security perimeter
Foreign Object Detection and Classification	Automatically detect the type of object that has entered a field of view and determine if actions are needed (eg. ignore small animals entering a substation, notify personnel if a person enters)
Tracking	Automatically locate and track movement of persons using a Pan- Tilt- Zoom (PTZ) camera
Tailgating	Detect tailgating or double entry, such as when two persons enter a secure zone when only one is authorized
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

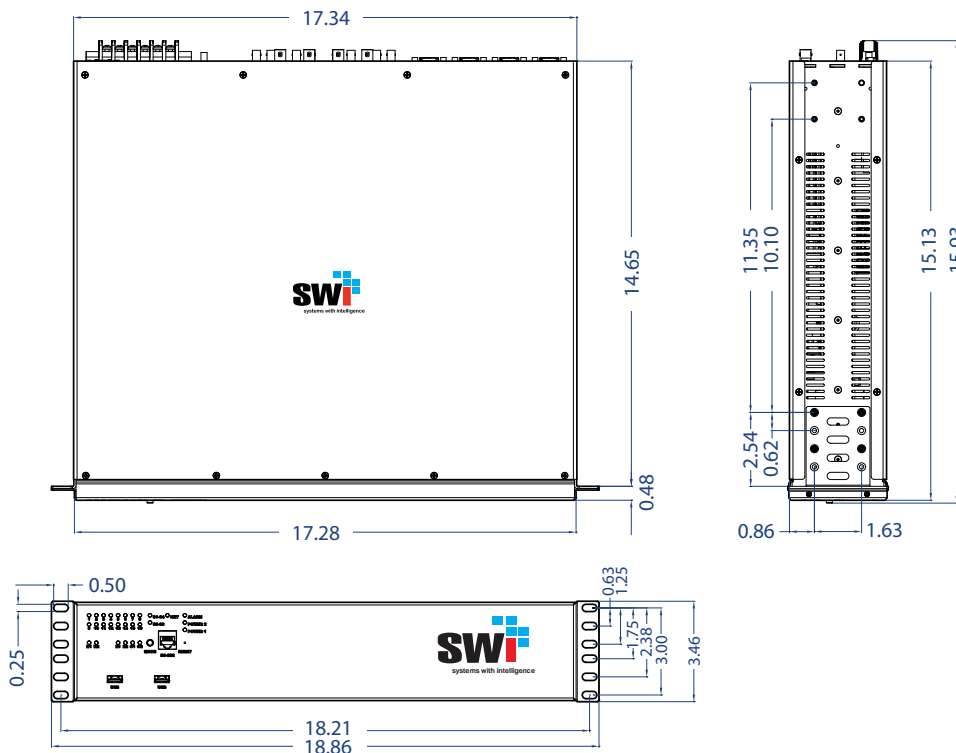
can decide not to store video or to store video at a lower frame rate or resolution. Since surveillance video captures long periods of inactivity, like at unmanned substations, using video analytics can reduce storage consumption by 60% - 80% relative to continuous recording. Recording only when an event has occurred also results in the ability to quickly search and retrieve specific security events in post-event analysis.

**Turn Legacy Analog CCTV Cameras into Smart Cameras** • By using SWI video analytics products, end users can leverage their existing legacy CCTV camera infrastructure. Doing so brings new security capabilities required to comply with new regulatory requirements, and does so with minimal capital costs. In addition to adding intelligent surveillance to an existing security system, SWI products IP enable analog cameras, thus allowing transmission of video over a standard IP-based network, which in-turn enables remote viewing.

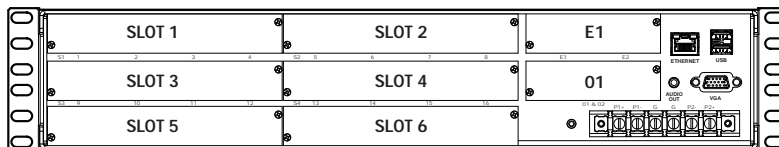
## TECHNICAL SPECIFICATIONS

SPECIFICATIONS	
Video Inputs	<ul style="list-style-type: none"> <li>Analog: 4, 8, 12, 16 analog BNC (PAL/NTSC) (4 port modules) PAL/NTSC analog camera automatically detected</li> <li>IP: IP camera support through network interfaces (Up to 16 IP cameras)</li> </ul>
Resolution	<ul style="list-style-type: none"> <li>Selectable recording resolutions per channel: CIF, 2CIF, D1</li> <li>PAL: CIF (352 x 288), 2CIF (704 x 288), D1 (720 x 576)</li> <li>NTSC: CIF (352 x 240), 2CIF (704 x 240), D1 (720 x 480)</li> </ul>
Compression	<ul style="list-style-type: none"> <li>H.264, 10 settings for video quality</li> </ul>
Frame Rate	<ul style="list-style-type: none"> <li>PAL: 1 - 25 fps; NTSC: 1 - 30 fps</li> </ul>
Video Output	<ul style="list-style-type: none"> <li>1 VGA interface for computer monitor</li> </ul>
Audio	<ul style="list-style-type: none"> <li>Inputs: 4, 8, 12, 16 (1 per channel); Outputs: 1</li> </ul>
USB	<ul style="list-style-type: none"> <li>4 USB Ports</li> </ul>
Storage	<ul style="list-style-type: none"> <li>32, 64, 128, 256 or 512GB flash drive</li> </ul>
LAN Interface	<ul style="list-style-type: none"> <li>Included: 1 Ethernet Ports (copper or fiber interface)</li> <li>Optional: 2 Ethernet Port modules (copper or fiber interface)</li> <li>Gigabit interfaces available</li> </ul>
Optional Modules	<ul style="list-style-type: none"> <li>Serial Interfaces: 4 x RS232/RS422/RS485 modules</li> <li>Wireless: 802.11 b/g, Cellular Modem</li> <li>Other: V90 Modem, Digital Input/Output modules</li> </ul>
Power Supply	<ul style="list-style-type: none"> <li>24VDC, 48VDC, 88-300VDC or 85-264VAC; Optional dual redundant power supplies</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>
Warranty	<ul style="list-style-type: none"> <li>2 Years</li> </ul>

## DIMENSIONS



## CONFIGURATION



### BASE UNIT

**DVS1000** Base Unit and all standard items (not listed in the options):

- 1 VGA interface for computer monitor
- 4 USB ports (2 front/2 back)
- 1 x 10/100/1000 BaseTx Ethernet Port
- 1 Audio Output

### PS1, PS2 - Power Supply

**HIS** 88-300VDC or 85-264VAC, screw terminal block  
**24S\*** 24VDC (9-36VDC), screw terminal block  
**48S\*** 48VDC (36-59VDC), screw terminal block  
**PXXX** None (PS2 only)

### E1 - Switched Ethernet Port

**EXXX** Empty  
**2C01** 2 x 10/100Tx RJ45  
**2F01** 2 x 100FX - Multimode, 1310nm, ST  
**2F02** 2 x 100FX - Multimode, 1310nm, SC  
**2F03** 2 x 100FX - Multimode, 1310nm, LC

### HD - Flash Drive for Storage

**HDXXX** Empty  
**HD032** 32GB SSD Flash Drive  
**HD064** 64GB SSD Flash Drive  
**HD128** 128GB SSD Flash Drive  
**HD256** 256GB SSD Flash Drive

### S1, S2, S3, S4 - Camera Input Module

**SXXX** None  
**4Z01** 4 Port Analog Camera Input Card  
**8Z02** 8 Port Analog Camera Input Card  
**4C01\*** 4 x 10/100Tx RJ45  
**4F01\*** 4 x 100FX - Multimode, 1300nm, ST  
**4F02\*** 4 x 100FX - Multimode, 1300nm, SC  
**4F03\*** 4 x 100FX - Multimode, 1300nm, LC

### S5, S6 - Expansion Slot

**SXXX** Empty  
**4S01** 4 x RS232/RS422/RS485 via DB9 module  
**8S02** 8 x 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)  
**8D03** 8 relay switch outputs (150VAC, 5 Amp)  
**4D01** 4 dry contact, current loop inputs + 4 relay switch output (30VDC, 1 Amp)  
**4D01** 4 dry contact, current loop inputs + 4 relay switch output (150VAC, 5 Amp)

### O1 - WAN Interface

**OXXX** None  
**1M01\*** V92/V90 Modem  
**1M02\*** Cellular Modem (GSM/EDGE/HSPA)

\* Future option available soon.

### IP CAMERA NOTES:

- When available, the IP Camera Input Modules in the S1, S2, S3, S4 option slots will provide direct connection from a networked/IP camera directly to the DVS which will reduce overall network bandwidth requirements.
- IP Cameras can be used today via the available network connections on the DVS (Base Unit Ethernet port and/or the E1 option) and using an external Ethernet switch when many IP cameras are required.
- Contact SWI for the latest list of supported IP cameras.



# Quasar

## Delivering Intelligent Data

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