service integrity
signal integrity
remote monitoring

DVStor/DVStor² – Recording, Playout & Archive

COMPLIANCE RECORDING

DVStor is the ultimate solution for government mandated compliance recording, logging and archival. Highly scalable, DVStor can record multi-channel TV from days to months to years.

In addition, the system features real time video transrating - further improving storage efficiency while leaving audio and other data in the transport stream untouched. Highly stable, the system can be configured with multi-level redundant standby sub-systems for maximum reliability and uninterrupted recording.
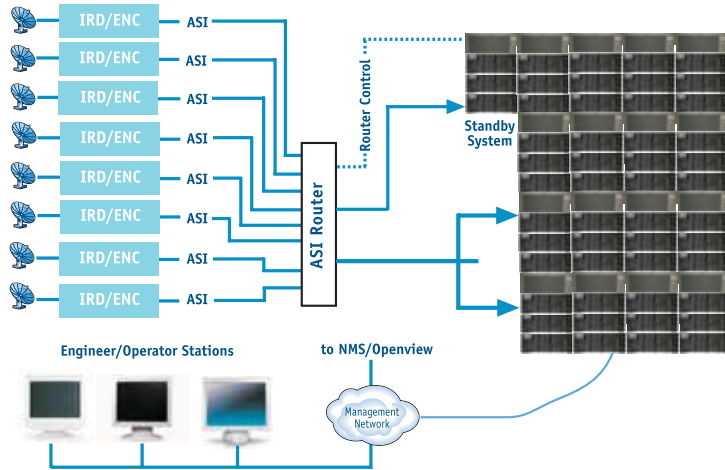
DISASTER RECOVERY PLAYOUT

DVStor provides vital business continuity for playout and retransmission operators by playing stored content when a live feed fails. DVStor continuously records live content from the "normal" broadcast.

When the input feed fails, the DVStor automatically plays out stored content in place of the missing "live" signal. The stored content can either be stored as "evergreen" material or previously recorded/time-shifted content (for example, rewind 24 hours and play yesterday's content) – keeping your system on-air in times of trouble.
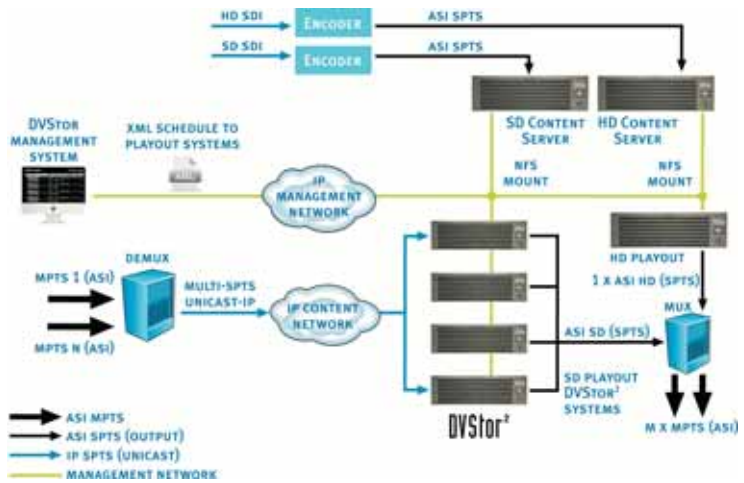
MONITOR & TROUBLESHOOT

DVStor can also be used in conjunction with the DVStation broadcast monitoring system for in-depth troubleshooting and analysis. Tightly coupled, the DVStor can either continuously record in a loop, or otherwise, record only time periods with errors.

The complete transport stream is recorded, including all audio, video and metadata, allowing engineering personnel to troubleshoot in detail even long after the error has occurred.

Pixelmetrix
corporation
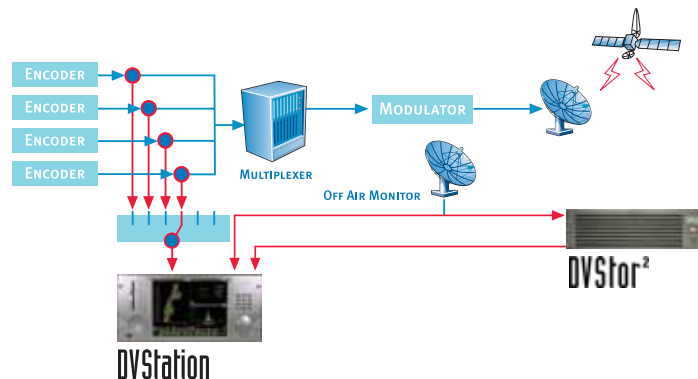
COMPLIANCE RECORDING APPLICATION OVERVIEW

DVStor uses in-place real time transrating of the video down to VHS quality, leaving audio and other data in the transport stream untouched. This allows for maximum compression, hence reducing the need for costly external storage.

Content is stored in a sliding window. This is in contrast with existing DTL solutions and the incumbent VHS tape stacks. When coupled with a DAS (Direct Attached Storage) option, DVStor can store media in excess of a year without the need for human intervention.

DVStor can be set up in N+1 redundant hot-standby mode for maximum reliability. With the DAS option, the dual-redundant DVStor can access a secure RAID-6 storage solution which is fail-safe with hot-swappable spare hard disks and dual-redundant power supplies.
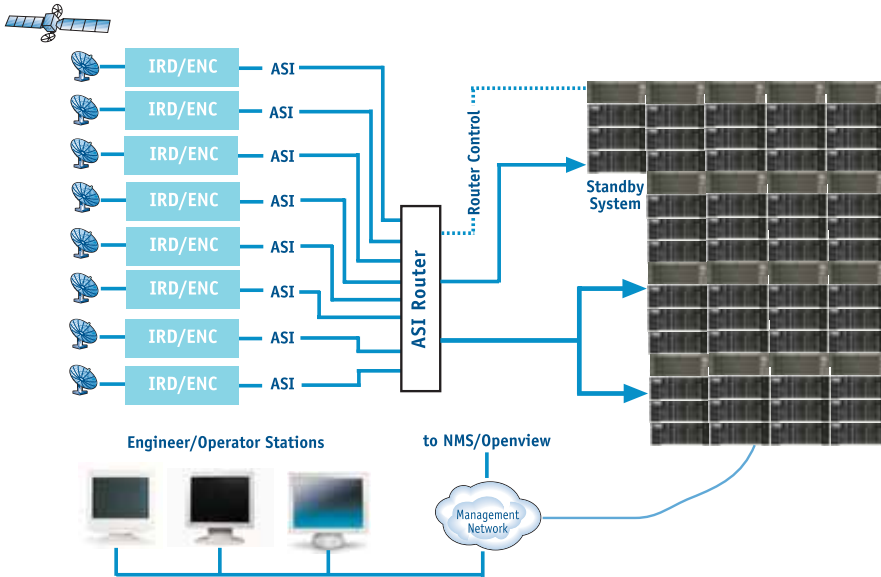
EPG AWARE

The DVStor is "EPG Aware". This allows operators to use the event information embedded in a transport stream to quickly identify desired content for visual verification. EPG content can be displayed on either concise or complete forms.

SCALABLE COMPLIANCE RECORDING

DVStor provides the ultimate in highly scalable, highly stable compliance recording with hot standby redundant switchover upon failure of signal input or active DVStor. On playback, the switchover between the main and standby DVStor is seamless.

VISUAL PRESENTATION

All stored content can be visually indexed by stream, channel and event sequence, making content location and identification fast and easy.

Double-click on any thumbnail for immediate full motion playback.

REDUNDANT FAIL-OVER OPTION

DVStor can be installed in redundant fail-over configuration with a one-to-one or N-to-one setup. One fail-over DVStor can monitor a number of other DVStors, and upon failure of any one of the monitored machines, the fail-over machine will take up archival duty. Playback of the content is equally seamless, regardless of whether there was a failure in the time segment.
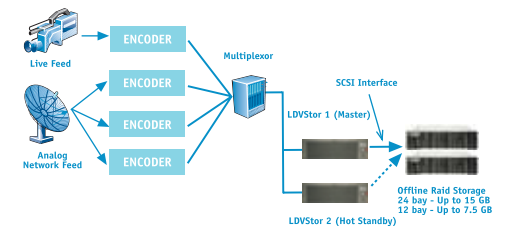
Playout System

Loss of input signal has disastrous consequences for playout and retransmission operators. The DVStor can be used to buffer content while the downlink signal is good, which can then be played out when the live feed fails. Upon failure, the DVStor can provide backup of live signal forever by playing out in loopback mode.

At the time of failure on the "live" signal, the DVStor can also trigger playout of the recorded transport stream over either the IP or the optional ASI port. The DVStor can automatically control an ASI switch to change from the live feed to the recorded signal at the time of failure.

DVStation Integration Overview

The DVStation monitoring system is the award-winning family of preventive monitoring probes from Pixelmetrix. The system continuously tracks both errors and performance information such as signal loss, problems with SI tables or missing content such as lost subtitles or incorrect language components.

DVStor is integrated with DVStation through the DVStation capture system. Each port on the DVStation is equipped with a capture buffer. Captured transport stream data can be uploaded to the DVStor for one-time or continuous playout.

If more transport stream data is to be captured, then DVStor can be set up to record in the event of an error - a standalone DVStor² can store up to three months of content off a satellite transponder (40 Mbps).

Downlink Processing
Recording
Live
Standby
Playout
ASI Switch control mechanism

3 PM   3 PM
Day 8 Day 7 Day 6 Day 5
Play pointer
Play pointer rewinds to start

ENCODER
ENCODER
ENCODER
ENCODER
MULTIPLEXER
MODULATOR
OFF AIR MONITOR
DVStation
DVStor²
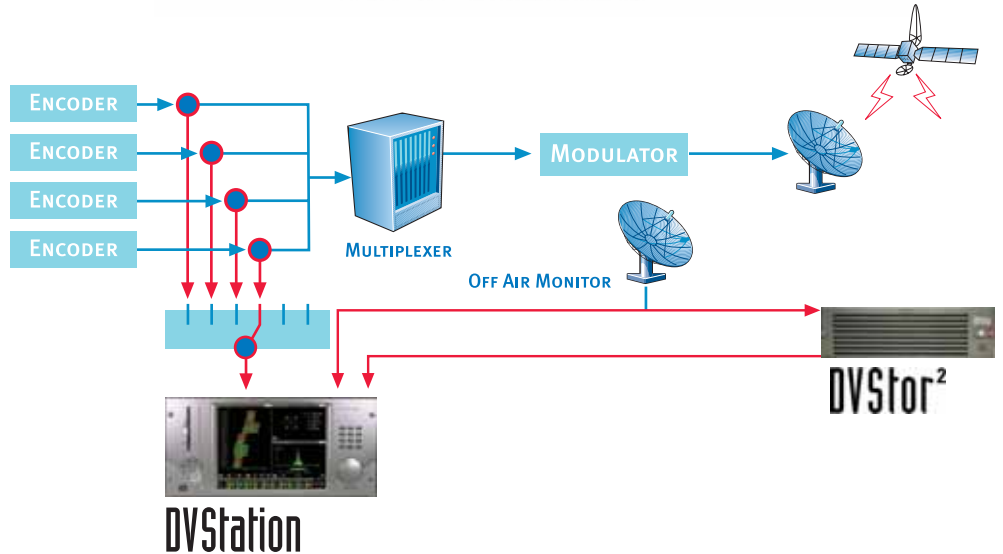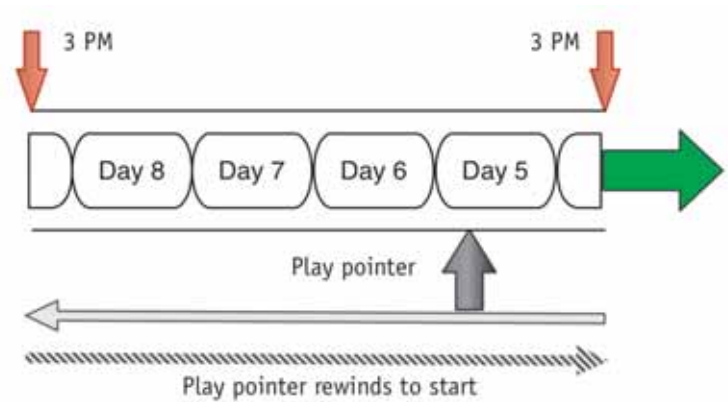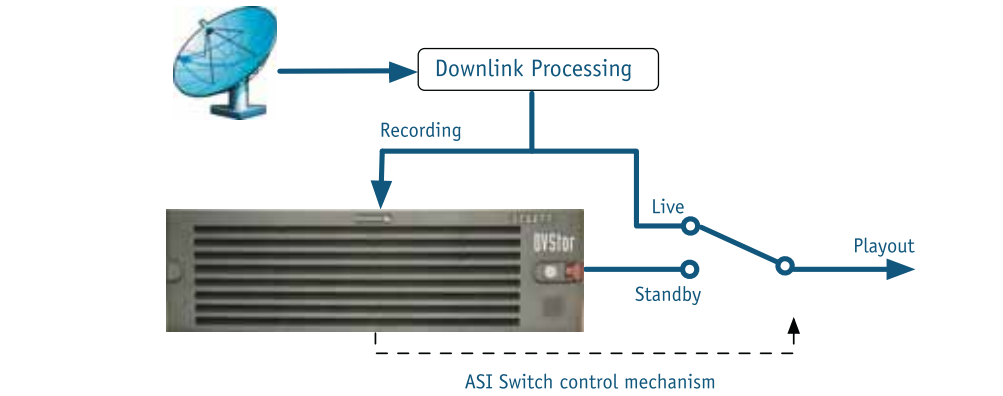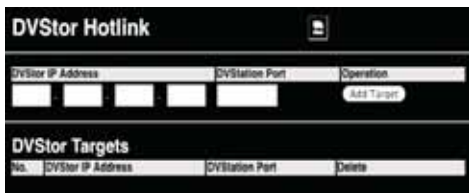
TRANSPORT STREAM GAP COMPRESSION

Should the input signal be interrupted due to transport stream sync loss or loss of signal, DVStor automatically suspends recording until normal signal condition is restored. Each recording segment is identified in the user interface by its corresponding start and stop time.

Original TS

Stored TS

Playback TS

■ Video	■ SI	■ Idle/Null Packets
■ Audio	■ Data Cast	
■ EPG	■ Audio	
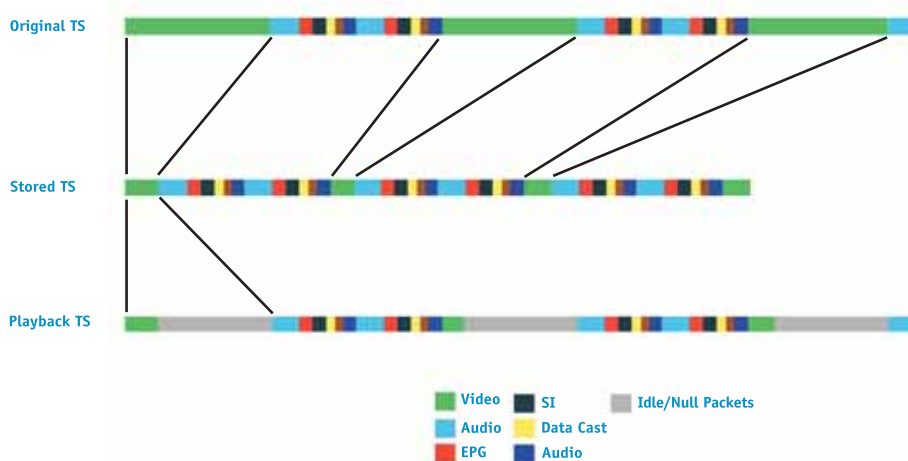
NULL PACKET REMOVAL

In MPEG transport systems, null packets are inserted to smoothen out the bandwidth used by the channel. The DVStor notes the presence of null packets in the stream and removes them when recording for efficient storage space. On playback, the null packets are reinserted seamlessly.

LIGHTWEIGHT STREAMING SERVER

DVStor is also a lightweight streaming server used to troubleshoot video equipment. Recorded transport streams can be played back remotely over any IP network directly to your desktop. Streaming playout can also be used for short feature playout, barker channels etc. With a loop function, the DVStor can provide a seamless, continuous video source over either ASI or IP.

Live Feed

Analog Network Feed
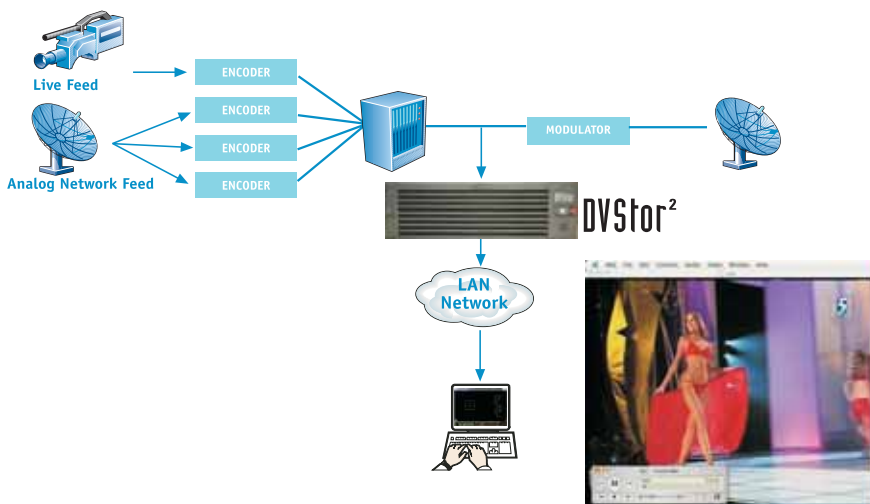
ENCODER
ENCODER
ENCODER
ENCODER

MODULATOR

DVStor²

LAN Network

TRANSRATING SUPPORT

Transrating support is standard on all DVStor platforms. Transrating changes the bit rate of the recorded video stream in real time to a user-configurable value ranging from 250 to 1000 kbps. Up to three SD services or one SD and HD service each, can be processed simultaneously. Audio streams and metadata are maintained as is.

SNMP SUPPORT

DVStor can be monitored using SNMP, with extensive support for SNMP v2. Recording status can be reported with SNMP traps.

NETWORK TIME SYNCHRONIZATION

DVStor can be synchronized with Network Time Protocol (NTP) servers in the network to allow for accurate time-stamping. Time synchronization also allows the DVStor to be controlled by other machines in the network using SNMP or other automation procedures.

SECURE MANAGEMENT INTERFACE

By default, DVStor constantly records all MPEG-2 transport stream traffic. Additionally, recorded segments or a subset of a recorded segment can be locked out to prevent data being inadvertently overwritten. Unauthorized access is protected by a user-password system.

DVStor also uses a multi-level authentication system that allows administrators unlimited access, while other users can access playback and retrieval functions.

DVStor Family

DVStor 1U – 1 TB
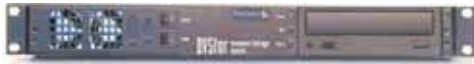
DVStor² 1U – 8 TB

DVStor² 2U – 12 TB

DVStor² 3U – 32 TB

DVStor² 4U – 48 TB

Expansion Storage

DVStor-DAS 48000

Rugged, Stable and Easy Set-Up

Built on a dual core Intel® Pentium®-based processing engine, the DVStor utilizes a Linux-based operating platform for maximum stability with a focus on performance. The rugged, industrial chassis of the DVStor² features two hot-swappable power supplies with automatic input voltage selection. RAID is deployed on the storage sub-system to ensure maximum redundancy and protection for archived data.

The installation and integration of the DVStor with an existing transmission monitoring system is easy. Simply connect the Ethernet and ASI cables, set the IP address and select an NTP source. Once operational, the recording and playback control is managed with the HTML interface on the DVStor.

Support for Extended Storage

Overall system storage can be expanded by daisy chaining or supplementing with an external Direct Attached Storage (DAS) unit. Daisy chaining can be enabled on all platforms with easy configuration settings. By specifying the recording duration and defining the IP address of the subsequent daisy-chained DVStor, recording is triggered when storage space fills up.

On the DVStor² 4U platform, optional DAS modules can be connected through a SCSI interface. The DVStor² can support three DAS modules of up to 48 TB each, for a maximum of 144 TB. With RAID-6 and redundant power supplies, the DVStor-DAS modules complement the fail-safe architecture of the DVStor² platforms.

DVStor Model Overview

	PRODUCTS				
FEATURES	DVSTOR 1U	DVSTOR² 1U	DVSTOR² 2U	DVSTOR² 3U	DVSTOR² 4U
Rack-mountable	Yes	Yes	Yes	Yes	Yes
ASI input	Optional	Optional	Optional	Optional	Optional
Rack-space required	1RU	1RU	2RU	3RU	4RU
RAID	Not Applicable	RAID-5	RAID-5	RAID-6	RAID-6
Redundant Power Supply	Not Applicable	Yes	Yes	Yes	Yes
Hot-swappable disks	Not Applicable	Yes	Yes	Yes	Yes
Gross Capacity	1,000 GB	8,000 GB	12,000 GB	32,000 GB	48,000 GB
Net Capacity	930 GB	5,400 GB	9,000 GB	25,200 GB	39,600 GB

Expansion System Overview

|	FEATURES					
MODELS	Rack Size	Gross Storage	Net Storage	HDD Used	Hot-Swappable Power Supplies	Raid-6 Redundancy
DVStor-DAS 24000	2U	24TB	18.6TB	HDD2000	Yes	Yes
DVStor-DAS 36000	3U	32TB	26TB	HDD2000	Yes	Yes
DVStor-DAS 48000	4U	48TB	40.9TB	HDD2000	Yes	Yes

Professional Services

The DVStor is a very flexible platform upon which customized solutions can be easily built. Operators throughout the world have recognized the advantages of its bullet-proof accurate recording engine and service-centric functions to solve their unique problems with playout, recording and archival.

Working closely with our partners, our professional services team is ready to help solve your problems today. Through close consultation, our suite of technology building blocks and extensive solution prototyping, we ensure that each solution perfectly meets even the most demanding requirements.

After delivery, your investment is protected with comprehensive support services tailored to your needs – from standard free-of-charge help desk support, to comprehensive Hardware/Software plans, to full 24x7 support.

Contact us at sales@pixelmetrix.com to learn more about how the DVStor can help your broadcast operations.
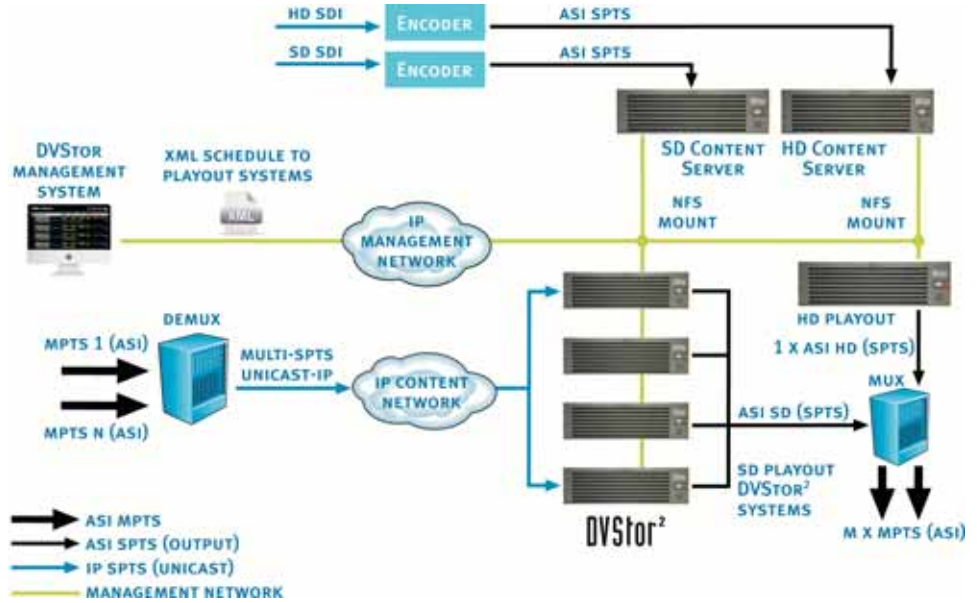
Specifications

DVStor 1U SYSTEM

Platform
- Core 2 Duo Intel® Pentium® based
- 2048 MB RAM
- 1000 GB gross storage

Auxiliary Interfaces
- VGA out, 1024 x 768 resolution
- 10/100/1000 Base T RJ-45 management port
- 1 serial, 1 USB 2.0
- 1 PS/2 (y-cable included for keyboard and mouse)
- CD-ROM drive

Recording and Playout Interfaces
- 10/100/1000 Base-T RJ-45 recording port
- Optional ASI input
  - DVB/ASI physical interface
  - 75Ω BNC input and output interfaces
  - 100 Mbps receive and transmit rate
  - 1 bps transmit rate resolution
  - 10 ppm transmit rate stability
  - 70 ns maximum transmit jitter
  - 17 dB input return loss

Chassis Specifications
- 1RU rack-mount
- Dimensions: 44mm(H) x 440mm(W) x 482.6mm(D)
- Weight: ~9kg

Electrical/Temperature
- 100 - 240 Vac, 50 - 60 Hz
- 80A maximum in-rush current
- 250W power supply
- 100W average power consumption
- Operating temperature: 10°C to 40°C
- Storage temperature: 0°C to 50°C

DVStor² 1U SYSTEM

Platform
- Core 2 Duo Intel® Pentium® based
- 2048 MB RAM
- 8000 GB gross storage
  - RAID-5 standard

Auxiliary Interfaces
- VGA out, 1024 x 768 resolution
- 10/100/1000 Base T RJ-45 management port
- 1 serial, 2 USB 2.0
- 1 PS/2 (y-cable included for keyboard and mouse)
- CD-ROM drive

Recording and Playout Interfaces
- 10/100/1000 Base-T RJ-45 recording port
- Optional ASI input
  - DVB/ASI physical interface
  - 75Ω BNC input and output interfaces
  - 100 Mbps receive and transmit rate
  - 1 bps transmit rate resolution
  - 10 ppm transmit rate stability
  - 70 ns maximum transmit jitter
  - 17 dB input return loss

Chassis Specifications
- 1RU rack-mount
- Dimensions: 43mm(H) x 437mm(W) x 650mm(D)
- Weight: ~18kg

Electrical/Temperature
- 100 - 240 Vac, 50 - 60 Hz
- 80A maximum in-rush current
- 450W (1+1) redundant AC-DC high efficiency with PFC
- 190W average power consumption
- Operating temperature: 10°C to 35°C
- Storage temperature: -40°C to 70°C

DVStor² 2U SYSTEM

Platform
- Core 2 Duo Intel® Pentium® based
- 2048 MB RAM
- 12000 GB gross storage
  - RAID-5 standard

Auxiliary Interfaces
- VGA out, 1024 x 768 resolution
- 10/100/1000 Base T RJ-45 management port
- 1 serial, 1 parallel, 4 USB 2.0
- 2 PS/2 (keyboard and mouse)
- CD-ROM drive

Recording and Playout Interfaces
- 10/100/1000 Base-T RJ-45 recording port
- Optional ASI input
  - DVB/ASI physical interface
  - 75Ω BNC input and output interfaces
  - 100 Mbps receive and transmit rate
  - 1 bps transmit rate resolution
  - 10 ppm transmit rate stability
  - 70 ns maximum transmit jitter
  - 17 dB input return loss

Chassis Specifications
- 2U rack-mount
- Dimensions: 89mm(H) x 426mm(W) x 650mm(D)
- Weight: ~30kg

Electrical/Temperature
- 100 – 240 Vac, 50 – 60 Hz
- 80A maximum in-rush current
- 500W (1+1) redundant AC-DC high efficiency with PFC
- 205W average power consumption
- Operating temperature: 10°C to 35°C
- Storage temperature: -40°C to 70°C

DVStor² 3U SYSTEM

Platform
- Core 2 Duo Intel® Pentium® based
- 2048 MB RAM
- 32000 GB gross storage
  - RAID-6 standard
  - RAID-5 factory option

Auxiliary Interfaces
- VGA out, 1024 x 768 resolution
- 10/100/1000 Base T RJ-45 management port
- 1 serial, 1 parallel, 4 USB 2.0
- 2 PS/2 (keyboard and mouse)
- CD-ROM drive

Recording and Playout Interfaces
- 10/100/1000 Base-T RJ-45 recording port
- Optional ASI input
  - DVB/ASI physical interface
  - 75Ω BNC input and output interfaces
  - 100 Mbps receive and transmit rate
  - 1 bps transmit rate resolution
  - 10 ppm transmit rate stability
  - 70 ns maximum transmit jitter
  - 17 dB input return loss

Chassis Specifications
- 3U rack-mount
- Dimensions: 132mm(H) x 440mm(W) x 648mm(D)
- Weight: ~47kg

Electrical/Temperature
- 100 – 240 Vac, 50 – 60 Hz
- 80A maximum in-rush current
- 800W (1+1) redundant AC-DC high efficiency with PFC
- 265W average power consumption
- Operating temperature: 10°C to 35°C
- Storage temperature: -40°C to 70°C

DVStor² 4U SYSTEM

Platform
- Core 2 Duo Intel® Pentium® based
- 2048 MB RAM
- 48000 GB gross storage
  - RAID-6 standard
  - RAID-5 factory option

Auxiliary Interfaces
- VGA out, 1024 x 768 resolution
- 10/100/1000 Base T RJ-45 management port
- 1 serial, 1 parallel, 4 USB 2.0
- 2 PS/2 (keyboard and mouse)
- CD-ROM drive

Recording and Playout Interfaces
- 10/100/1000 Base-T RJ-45 recording port
- Optional ASI input
  - DVB/ASI physical interface
  - 75Ω BNC input and output interfaces
  - 100 Mbps receive and transmit rate
  - 1 bps transmit rate resolution
  - 10 ppm transmit rate stability
  - 70 ns maximum transmit jitter
  - 17 dB input return loss

Chassis Specifications
- 4U rack-mount
- Dimensions: 178mm(H) x 440mm(W) x 666mm(D)
- Weight: ~56kg

Electrical/Temperature
- 100 – 240 Vac, 50 – 60 Hz
- 80A maximum in-rush current
- 1200W (1+1) redundant AC-DC high efficiency with PFC
- 320W average power consumption
- Operating temperature: 10°C to 35°C
- Storage temperature: -40°C to 70°C

Pixelmetrix Corporation

The Americas
10097 Cleary Boulevard
Suite 114 Fort Lauderdale
Florida 33324, USA
Tel: +1 954 472 5445

Asia Pacific
31 Kaki Bukit Road 3
#07-03 Techlink
Singapore 417818
Tel: +65 6547 4935

Europe
Montnegre 18-24
Local 2, Baixos
08029 Barcelona, Spain
Tel: +34 93 539 6819

Distributor Contact

www.pixelmetrix.com

Pixelmetrix
c o r p o r a t i o n