Viz Engine
Administrator's Guide

Product Version 3.5

December 10, 2013

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Contents

1 Introduction

This guide will guide you through the setup and installation of Viz Engine. It will also explain settings available through its configuration user interface.

This section contains information on the following topics:

1.1 Document Structure

Section 1 gives an introduction to the guide, and summarizes the document content.

Section 2 describes general requirements for Viz and key software components that either integrate with Viz or is a part of the Vizrt workflow.

Section 3 describes the basic setup procedures, installation options, the Viz license dongle and how to activate Viz.

Section 4 describes how to start Viz using shortcut keys and command line options.

Sections 5 and 6 describe the Viz Engine On Air user interface, and Viz Config user interface, respectively.

Sections 7 and 8 gives an overview of the supported graphics and video cards, how to install them, what driver versions are supported and so on.

Section 9 gives an overview of the Viz Engine audio system. It also provides some information and procedures on how to enable and configure it.

Section 10 gives an overview of legacy cards, and describes additional hardware installation procedures that are not part of the default Viz setup.

Section 11 gives an extensive glossary with simple and to the point explanations of keywords and acronyms referenced throughout the document.

1.2 Related Documents

1. Viz Artist User's Guide: Contains information on how to install Viz Engine and create graphics scenes in Viz Artist.
2. Viz Artist Script reference: Contains information on how to create scripts for a scene.
3. Viz Engine Plug-in SDK reference: Contains information on how to create a customized Viz plug-in.

1.3 Contact Vizrt

We encourage your suggestions and feedback regarding the product and this documentation. Our support E-mail address is support@vizrt.com. You are also welcome to use the web-based support at www.vizrt.com, or to contact your local Vizrt support person by telephone.

2 Requirements

This chapter describes general requirements, such as hardware, software, access rights and policies for a number of software components in your Viz work flow.

For more in-depth system information, see the relevant sections in your respective user and/or administrator guides.

IMPORTANT! Always check release notes for information on supported versions.

This chapter contains information on the following topics:

2.1 General Requirements

There are some general requirements for any Vizrt system to run. These requirements apply when setting up a complete system with integration to other Vizrt and third party software products:

- All machines should be part of the same domain.
- Users of the Vizrt machines should ideally be separated in at least two groups, administrators and designers/operators.
- Most machines running desktop applications must be logged in with sufficient privileges to run Vizrt programs, while services by default do not require users to be logged in.
- Vizrt servers must have static IP addresses.

CAUTION! Third party systems that provide Vizrt systems with files must only use Microsoft Windows operating system compatible characters as the file name.

- Vizrt has license restrictions on all Viz Engine and Viz Artist instances. To have an output of Vizrt generated graphics (preview and program channels), either an USB or a parallel port dongle on the renderer machine is required.

2.2 Hardware Requirements

Hardware requirements vary depending on the system purchased; however, every system delivered by Vizrt has an accompanying hardware specification sheet that, for a new system, matches the Software Requirements.

For older hardware that are used with newer versions of Vizrt software, such as Viz Engine, it is always recommended to check against the current hardware specifications for the new software version to make sure that the latest software can run on the old hardware specification.

Additional hardware must always be checked to see if it is compatible with existing hardware. For example, the GPI cards supported by Vizrt must fit in the Media Sequencer servers.

For more information on hardware specifications, please contact your local Vizrt customer support team.

2.3 Software Requirements

The following sections describe software requirements for the product described in this manual and a range of components that may be integrated with it. For more information see the following topics:

- Viz Anchor
- Viz Artist
- Viz Content Pilot System
- Viz Engine
- Preview Server
- Viz Gateway
- Viz Graphic Hub
- Viz One
- Media Sequencer
- Viz Multichannel
- Viz Trio
- Vizrt Maps
- EVS Video Server Control

2.3.1 Viz Anchor

Viz Anchor is a Vizrt application targeted at the presenter in the studio. The application runs natively on Apple's iPad and allows users to control playlists with video and graphics directly from the handheld device.

Table 1: Viz Anchor specifications

Software	Viz Anchor 1.0 or later, Media Sequencer 1.22 or later
Operating system	Apple iOS 3.2 or later
Network access	Uses the Bonjour protocol to automatically discover the Media Sequencer and Preview Server if the wireless router/switch allows it.
Hardware	Apple iPad 1, 2 or 3

2.3.2 Viz Artist

Viz Artist is an advanced real-time motion graphics authoring system for the creation of stunning real-time graphics. Built with an elegant and easy to use drag-and-drop user interface and sophisticated 3D animation and modeling tools, Viz Artist enables the digital artist to produce complex and engaging visual content for broadcast, virtual sets, and visualization in less time and with greater creative freedom.

Table 2: Viz Artist specifications

Software	Viz Engine 3.5.1 or later, or Viz Engine 2.8 PL5 HotFix3 Viz World Client 12.0 or later (see Vizrt Maps) Viz DataPool 2.10 or later Extra Viz 2 plug-ins (for Viz 2.x) *Optional*: Mediaftp and Fsmon are used for the Viz One integration. Installers are bundled with Viz One. *Optional:* Viz Content Pilot with Viz Template Wizard, Media Sequencer, Viz Multiplexer and Thumbnail Generator. *Note*: Viz Engine 2.8 is not compatible with Viz One.
Executable(s)	viz.exe VizGui.exe vizSend.exe
Ports and Connections	TCP: 6100 (preview and playout) 14300 (Viz Multiplexer) 50007-50009 (multiplexing).
Local drive access	Read and write access to Windows 7: `C:\%LOCALAPPDATA%\VirtualStore\Program Files\vizrt\viz3\` Windows XP: `C:\Program Files\vizrt\viz3\`

Table 2: Viz Artist specifications

Network access	Mapped drive to VOS still store folder and Viz Engine data root (see Shared Data)
Operating system	Windows XP SP2/SP3 (32-bit) and Windows 7 (64-bit)

The Viz Artist design machine should preferably have the same specifications as the Viz Engine playout renderers, especially if the designers need to test performance issues on demanding scenes.

If designers are creating templates for Viz Content Pilot System (VCP), it is recommended that VCP is installed on a separate machine for more accurate playout emulation on Viz Engine.

2.3.3 Viz Content Pilot System

Viz Content Pilot (VCP) is built on a client-server software model where the VCP client connects to the Viz Content Pilot Database (Oracle database server) for templates and content, and the Media Sequencer for playout.

- VCP requires an Oracle database as the back-end server.
- VCP requires a Media Sequencer for communication with Viz Engine and other systems.

On the server side, the database serves all clients storing and retrieving content data for the control, delivery and playout of videos, maps, audio, graphics and so on, on the Viz Engine.

This section contains information on the following topics:

- Viz Content Pilot Client
- Viz Content Pilot Database
- Viz Content Pilot Database Administrator
- Viz Content Pilot Newsroom Component
- Viz Content Pilot Thumbnail Generator
- Viz Template Wizard
- Vizrt Pilot Data Server
- Script Runner Service

Viz Content Pilot Client

The VCP specifications shown below are machine specifications for a typical newsroom system setup, where VCP is the control application receiving the playlist.

Table 3: VCP specifications

Software	Viz Content Pilot 5.7 Media Sequencer 1.23 or later Oracle 10g Instant Client 32-bit Microsoft .NET Framework 4.0 (Full) *Optional*: Oracle 11g Instant Client 32-bit *Optional*: Oracle 11g or 10 g Runtime Client 32-bit *Optional*: Viz World Client, VCP TimeCode Monitor, Viz PreCut. *Optional:* If you are using a local Viz Engine to preview video clips from Viz One, Viz Engine must be installed with video codecs (e.g. MPEG-4 codec and Haali Media Splitter). *Optional:* Windows Media Player 11 for video clip preview in Viz Object Store.
Executable(s)	VizContentPilot.exe vizPreviewEngine.exe (local preview)
Local drive access	Access to Oracle client files and folders Read and write access to Windows 7: `C:\%LOCALAPPDATA%\VirtualStore\Program Files\vizrt\` Windows XP: `C:\Program Files\vizrt\`
Network access	Mapped drive to Viz Object Store still store folder *Optional:* If local preview using Viz Engine 2 is chosen, a mapped drive to Viz Engine's data root is needed Also see Shared Data
Operating system	Windows 7 Professional 64-bit (recommended) Windows 7 Enterprise 64-bit Windows 7 Ultimate 64-bit Windows XP Professional 32-bit

The Viz Content Pilot client gets its Viz One connection parameters from the VCP database.

Vizrt recommends the use of remote preview that has no need for a local Viz Engine or graphics cards on the client machine.

Viz Content Pilot Database

The VCP database is an Oracle database server. Usually two database servers are installed where one is used for manual failover and to hold the Viz Engine 2.x data root. Viz Engine 3.x graphics data is stored on the Viz Graphic Hub.

Table 4: VCP database specifications

Software	Oracle 11g Database 64-bit Oracle 11g Administrator Client 64-bit (standard edition) *Optional*: Oracle 10g Database and Administrator Client 64-bit
Executable(s)	Please refer to official Oracle documentation.
Ports and Connections	1521 (queries)
Service(s)	Oracle database service TNS listener service
Local drive access	A shared folder on the second server (failover) has to be accessible for all machines showing the rendered graphics.
Operating System	Windows 2008 R2 Server 64-bit (with 8GB RAM or more)
Oracle Documentation	Oracle Database Documentation Library: 11g: http://www.oracle.com/pls/db112/homepage 10g: http://www.oracle.com/pls/db102/homepage

Viz Content Pilot Database Administrator

The Viz Content Pilot Database Administrator tool (VCP DBA) is a small application used for installing, upgrading, exporting, importing, and setting various parameters for the Viz Content Pilot Database. It is purely a DBA tool, and should therefore only be used by database administrators.

Table 5: VCP DBA specifications

Software	Viz Content Pilot DBA tool Oracle 10g Administrator Client 32-bit *Optional*: Oracle 11g Administrator Client 32-bit
Executable(s)	VCPDBA.exe
Service(s)	Oracle database service TNS listener service
Operating system	Windows Server 2003 32-bit Windows XP 32-bit Windows 7 32-bit or 64-bit

Viz Content Pilot Newsroom Component

The newsroom client machine specification describes a basic setup for journalists and editors. For a more detailed view on available software options, see the Viz Content Pilot and other administrator guides for descriptions on different types of setup.

Table 6: Newsroom Component specifications

Software	VCP's Newsroom Component 5.7 Viz Object Store 5.7 Viz World Client 12.0 or later (see Vizrt Maps) Oracle 10g Instant Client 32-bit Microsoft .NET Framework 4 Newsroom system client *Optional*: Oracle 11g Instant Client 32-bit *Optional*: Oracle 11g or 10 g Runtime Client 32-bit *Optional:* If you are using a local Viz Engine to preview video clips from Viz One, Viz Engine must be installed with video codecs (e.g. MPEG-4 codec and Haali Media Splitter) *Optional:* Viz EasyCut or Viz PreCut for video clip editing.
Executable(s)	VCPAxFiller.ocx VCPAxNle.exe (NLE) viz.exe VizObjectStore.exe
Local drive access	Read access to Oracle client files and folders All users of machines installed with Viz Engine must have read and write access to: Windows 7: `C:\%LOCALAPPDATA%\VirtualStore\Program Files\vizrt\` Windows XP: `C:\Program Files\vizrt\`
Network access	Mapped drive to VOS still store folder. *Optional:* If local preview using Viz Engine 2 is chosen, a mapped drive to Viz Engine's data root is needed. Also see Shared Data.
Other	Registry settings for preview Registry settings for the MOS ID
Operating system	Windows 7 Professional 64-bit (recommended) Windows 7 Enterprise 64-bit Windows 7 Ultimate 64-bit Windows XP Professional 32-bit

Vizrt recommends the use of remote preview that has no need for a local Viz Engine on the client machine; hence, local preview is not recommended.

The Newsroom Component gets its Viz One connection parameters from the VCP database.

Note: Newsroom Component's timeline editor does not work on *virtual machines*.

Viz Content Pilot Thumbnail Generator

VCP's Thumbnail Generator is an optional addition to a VCP setup that generates data element snapshots used as thumbnails to visualize graphics and video elements in the VCP client's playlist.

It is recommended to install Thumbnail Generator on the Viz Graphic Hub or Viz Content Pilot Database machine.

It is also recommended to configure Viz Thumbnail Generator to fetch scene snapshots from one of the newsroom Viz Engine preview machines. If installed on a local Viz Engine, see also Viz Engine.

CAUTION! Do not use an on-air Viz Engine to generate thumbnails.

Table 7: Viz Thumbnail Generator specifications

Software	Oracle 10g Instant Client 32-bit Viz Content Pilot's Thumbnail Generator 5.7 *Optional*: Oracle 11g Instant Client 32-bit *Optional*: Oracle 11g or 10g Runtime Client 32-bit
Executable(s)	ThumbnailGenerator.exe
Operating system	Windows 7 Professional 64-bit (recommended) Windows 7 Enterprise 64-bit Windows 7 Ultimate 64-bit Windows XP Professional 32-bit Windows 2003 32-bit.

Viz Template Wizard

Viz Template Wizard (TW) is an easy-to-use software wizard, visual template editor, design and scripting tool. It is used to create, manage and categorize templates for graphics, with images, maps and video. Viz Template Wizard can also be used to create control templates for Viz Trio and Viz Ticker3D.

TW can be installed as a stand-alone product for editing and running VCP templates without a Viz Content Pilot DB server, for example for use with Viz Trio or Viz Ticker3D. In this case no Oracle Client is required, and the `use_database` setting in the ContentPilot.ini file (under the [TEMPLATE_WIZARD] section) must be set to 'n'.

It is possible to install Viz Template Wizard on the same machine as Viz Artist; however, it is recommended to install it on a separate design client for template designers.

Table 8: Viz Template Wizard specifications

Software	Oracle 10g Instant Client 32-bit Media Sequencer 1.23 Viz Template Wizard 5.7 Microsoft .NET Framework 4 *Optional:* Oracle 11g Instant Client 32-bit *Optional:* Oracle 11g or 10g Runtime Client 32-bit *Optional:* Windows Media Player 11 for video clip preview in Viz Object Store.
Executable(s)	scheduler.exe (when running in Console mode) VizTemplateWizard.exe
Operating system	Windows 7 Professional 64-bit (recommended) Windows 7 Enterprise 64-bit Windows 7 Ultimate 64-bit Windows XP Professional 32-bit.

Viz Template Wizard connects to the Media Sequencer for testing and previewing of template graphics. The Media Sequencer connection defaults to *localhost*. To use a different host set the command line option *-mse <host>* in Viz Template Wizard's target path.

Vizrt Pilot Data Server

The Data Server is installed as an application layer on top of the Viz Content Pilot database. It acts as an application server for accessing VCP's database and other services. The Data Server may be asked to handle requests from scripts to provide information on data elements, or to provide preview servers the information needed to resolve which scene and data is to be rendered by the preview server.

Table 9: Data Server specifications

Software	Data Server 1.3 or later Oracle 11g Instant Client 32-bit (bundled with Data Server) *Optional:* Oracle 11g Instant Client 64-bit Microsoft .NET Framework 4
Executable(s)	C:\Program Files (x86)\Vizrt\Vizrt Pilot Data Server\PilotAppServerHostService.exe
Service(s)	Vizrt Pilot Data Server
Ports and Connections	8177

Table 9: Data Server specifications

Operating system	Windows 7 Professional 64-bit (recommended) Windows 7 Enterprise 64-bit Windows 7 Ultimate 64-bit Windows XP Professional 32-bit Windows 2008 server 32-bit Windows 2008 R2 Server 64-bit

Script Runner Service

The Script Runner Service provides users with a simple way to use the Update Service without needing to create their own service.

For more information on the Update Service, see the *Viz Template Wizard User's Guide*.

Table 10: Script Runner specifications

Software	Comes packaged with the Vizrt Pilot Data Server software
Executable(s)	C:\Program Files (x86)\Vizrt\Vizrt Pilot Data Server\VCPScriptRunnerHostService.exe
Service(s)	Vizrt VCPScriptRunner
Ports and Connections	1981
Operating system	Same as Vizrt Pilot Data Server

2.3.4 Viz Engine

Viz Engine is an extremely powerful rendering engine and at the core of Vizrt's real-time graphics solutions. 2D and 3D animated scenes designed in Viz Artist are rendered in real-time as high-end animations, and the output can be SD or HD video. Viz Engine systems work with all other Vizrt products to provide users with the total solution for producing on-air graphics content.

This section also contains information on the Preview Server options for Viz Engine.

Note: Viz3.x is the standard and recommended Viz Engine to be used with VCP5.7 and later. Information specifically for Viz2.x users is listed in the Appendix of the *Viz Content Pilot User's Guide*.

To run Viz Engine as a program or preview (optional) machine, the following software and configuration is needed:

Table 11: Viz Engine specifications

Software	Viz Engine 3.5.1 or later (or Viz Engine 2.8 PL5 HotFix3) Viz DataPool 2.10 or later Viz World Client 12.0 or later (see Vizrt Maps) Extra Viz 2 or 3 Plug-ins (only for Viz 2.x) *Optional*: When used for local preview of video clips from Viz One, Viz Engine must be installed with video codecs (e.g. MPEG-4 codec and Haali Media Splitter)
Hardware	Licensed dongle
Executable(s)	viz.exe
Ports and Connections	6100 (program and/or preview) 6800 (program when running two instances of Viz Engine on the same machine. Requires two graphics cards) 14300 (Viz Multiplexer) 50007-50010 (multiplexing)
Local drive access	*Local preview:* Read and write access to folder: Windows 7: `C:\%LOCALAPPDATA%\VirtualStore\Program Files\vizrt\` Windows XP: `C:\Program Files\vizrt\`
Network access	Mapped drive to VOS still store folder *Local preview:* Mapped drive to Viz Engine data root Also see, Shared Data
Operating system	Windows XP SP2/SP3 (32-bit) and Windows 7 (64-bit)

Machines setup for local preview need an OpenGL compatible graphics card and at least 512MB of memory (RAM) in addition to a reasonably new processor. Some graphics features on a preview machine will not be shown exactly as on a Viz Engine renderer. This is limitations in the OpenGL features on the graphics cards, and not related to Vizrt's software.

2.3.5 Preview Server

The Preview Server option is used in situations where one or more Viz Engines provide frames for snapshot/thumbnail generation. A typical use case is where the Preview Server is used by Viz Trio or the Newsroom Component to fetch previews of overlay graphics for the Timeline Editor. The Preview Server can run on the same machine as a Viz Engine, but it is also possible to specify additional

Viz Engines in order to spread the load. The pool of Viz Engines is configured on the Preview Server Web Interface

Table 12: Viz Engine Preview Server specifications

Software	Preview Server 3.0 or later Microsoft .NET Framework 4 Viz Engine 2.8 or Viz 3.2 and later
Hardware	Licensed dongle
Executable(s)	Preview Server-<version>.msi
Ports and Connections	54000 is used when connecting over http using the REST interface.
Network access	Uses the Bonjour protocol to announce available services.
Operating system	Windows XP 32-bit Windows 7 32-bit or 64-bit

2.3.6 Viz Gateway

Viz Gateway (GW) is Vizrt's implementation of the MOS Protocol. It enables users of a Newsroom Computer System (NCS) to perform instant updates on playlists in Vizrt's control applications (Viz Trio and VCP).

The Viz Gateway is a framework built to help in newsroom integration tasks. Currently GW support NCSs based on the MOS Protocol that is supported by the leading NCS vendors.

Via Gateway 2.0 is in principle an extension to the Media Sequencer; hence, any GW supported version of the Media Sequencer may be configured to run as a GW server using the Viz Gateway configuration tool.

Table 13: Viz Gateway specifications

Software	Oracle 10g Runtime Client 32-bit Viz Gateway 2.0 Version 1.0.10 (beta) *Optional*: Oracle 11g Runtime Client 32-bit
Executable(s)	scheduler.exe (if running in Console mode) (GW 2.0)
Ports and Connections	10540 - 10541 (MOS lower and upper port) 10640 (DB event port) 10002 (Viz Gateway Controller Client)
Service(s)	vizgwservice.exe (GW 2.0)
Local drive access	Access to Oracle client files and folders. Read and write access to folder: Windows 7: `C:\%LOCALAPPDATA%\VirtualStore\Program Files\vizrt\` Windows XP: `C:\Program Files\vizrt\`

Table 13: Viz Gateway specifications

Operating system	Windows 2003 32-bit (recommended) Windows XP 32-bit

2.3.7 Viz Graphic Hub

Viz Graphic Hub is delivered as a pre-installed system with recommended hardware and software. Viz Graphic Hub must be installed as a separate server; hence, it is not recommended to install anything else on the server that will cause the system to lose performance.

Note: The database directory cannot reside on a remote machine.

Table 14: Viz Graphic Hub specifications

Software	Viz Graphic Hub 2.3 or later
Executable(s)	VizDbNamingService.exe VizDbTerminal.exe
Ports and Connections	19392-19396 (in most cases the ports are configurable).
Local drive access	Read and write access to database folders (configurable).
Operating system	Windows XP 32-bit

IMPORTANT! Do not run firewall or antivirus scanning software on the server.

2.3.8 Viz One

Viz One allows users to ingest images and video clips for use in graphics and as full screen video, supporting both SD and HD output.

Viz One can be used for finding and adding images and video to graphics using a range of different control applications for both preview and playout on Viz Engine.

IMPORTANT! Before Viz One is used the first time, it is important to decide upon the playout format. Ingesting and storing other formats on Viz One may lead to an undefined behavior if they are different from what is configured on Viz Engine.

Table 15: Viz One specifications

Software	Viz One 5.2 or later

2.3.9 Media Sequencer

The Media Sequencer is middleware software primarily used by control applications to connect to for example render engines, newsroom systems and video server (e.g. Viz One) systems.

More concrete the Media Sequencer is a framework for defining and executing media elements. The media elements are defined in a tree-based schedule that the sequencer interprets. The schedule is saved as an XML file (named **default.xml**). The XML file, in short, contains the configuration settings and the playlists saved to it by the control application.

The Media Sequencer's scheduler has a high-resolution timer that manages a Virtual Document Object Model (VDOM) that contains the schedule. The scheduler also performs the actual execution of the schedule by interpreting elements describing actions from the VDOM. The communication between end user products and the Media Sequencer mostly goes through a protocol named TreeTalk.

Table 16: Media Sequencer specifications

Software	Oracle 10g Runtime Client 32-bit Media Sequencer 1.23 *Optional*: Oracle 11g Runtime Client 32-bit
Executable(s)	scheduler.exe (if running in Console mode)
Ports and Connections	8580 (REST), 8594 (Media Sequencer TreeTalk)
Service(s)	scheduler.exe
Local drive access	Access to Oracle client files and folders. Read and write access to the following folders: Windows 7: `C:\%LOCALAPPDATA%\VirtualStore\Program Files\vizrt\` Windows XP: `C:\Program Files\vizrt\` `C:\Documents and Settings\All Users\Application Data\Vizrt\Media Sequencer`
Network access	Uses the Bonjour protocol to announce available services.
Operating system	Windows 2003 32-bit (recommended) Windows XP 32-bit

2.3.10 Viz Multichannel

The Viz Multichannel client is used by the traffic department to schedule programs that are controlled by automation systems in the master control room.

It has a TCP connection to a Media Sequencer. The client gives the user access to creation, editing and playout of pages with graphics and video clips.

Table 17: Viz Multichannel specifications

Software	Microsoft .NET Framework 4.0 or higher Windows XP Service Pack 1 or higher, or Microsoft Windows 7 (recommended) Viz Engine 3.5.1 or higher (lower versions do not support the Viz One integration). If you are using a local Viz Engine to preview video clips from Viz One, Viz Engine must be installed with video codecs (e.g. MPEG-4 codec and Haali Media Splitter) Viz One 5.4 or higher Media Sequencer 1.23 or higher Viz Multichannel 2.7 client Extra Viz 2 or 3 Plug-ins (only for Viz 2.x)
Executable(s)	PlaylistImporter.exe viz.exe VizRundown.exe
Service(s)	Viz Multichannel Schedule Collector
Operating system	Windows XP SP3 32-bit Windows 7 32-bit or 64-bit

2.3.11 Viz Trio

The Viz Trio client is the CG operator's user interface. It has a TCP connection to a Media Sequencer. The client gives the user access to creation, editing and playout of pages with graphics. A Viz Engine for local preview renders the graphics within the Viz Trio client.

Table 18: Viz Trio specifications

Software	Microsoft .NET Framework 4.0 or higher Windows XP Service Pack 1 or higher, or Microsoft Windows 7 (recommended) Viz Engine 3.5.1 or higher (lower versions do not support the Viz One integration). If you are using a local Viz Engine to preview video clips from Viz One, Viz Engine must be installed with video codecs (e.g. MPEG-4 codec and Haali Media Splitter) Viz One 5.2 or higher Media Sequencer 1.23 or higher Viz Trio 2.11 client Viz World Client 12.0 or later (see Vizrt Maps) Extra Viz 2 or 3 Plug-ins (only for Viz 2.x) *Optional*: Local Media Sequencer and Oracle 11g or 10g Runtime Client for connecting to the Viz Content Pilot Database.

Table 18: Viz Trio specifications

Executable(s)	trio.exe trionle.exe viz.exe
Operating system	Windows XP SP3 32-bit Windows 7 32-bit or 64-bit

2.3.12 Vizrt Maps

Vizrt provides map solutions that offer branded maps and geographic animations using Viz World Classic and Viz World Client and Server.

Viz World Classic

Viz World Classic (previously known as Viz Curious Maps) is ideal for designers, program researchers, and producers who need to create high-quality map animations for news, documentary, promotional videos, and online. It is designed to be simple and intuitive to use, so that users with no specific training in computer graphics, or video editing, can create professional maps on demand and at short notice.

Table 19: Viz Curious Maps specifications

Software	Viz Curious Maps 13.0 or later
Executable(s)	WorldMaps.exe
Ports and Connections	80, 8080 (Microsoft Bing and Imagery on Demand) 1947 Sentinel HASP Run-time Environment
Operating system	Windows XP 32-bit

It is possible to run the server and design machine at the same time on the same machine, but it is likely that this will impact the server performance.

Note: Requires a minimum screen resolution of 1280x1024, and display size of 96 DPI.

Viz World Client and Server

Viz World Client and Server integrates Viz World Classic mapping ability and database into Viz Artist and Viz Engine graphics. By utilizing a set of geographic referencing plug-ins and the maps produced by WoC, the creation of location based graphics using maps, 3D objects, texts, and so on, is seamless.

Table 20: Viz World Client and Server specifications

Software	Viz World Client 12.0 or later Viz World Server 12.0 or later

Table 20: Viz World Client and Server specifications

Executable(s)	AxMapsClient.ocx (embedded editor) MapBuilder.exe MapConfigClient.exe ServerAllocator.exe ServerLauncher.exe
Ports and Connections	101, 102, 103 80, 8080 (Microsoft Bing and Imagery on Demand).
Operating system	Windows XP 32-bit (client and server) Windows Server 2003 32-bit (server)

See Also

- Viz World Client and Server documentation

2.3.13 EVS Video Server Control

An EVS Control Plug-in lets the Viz Engine control an EVS video server (like a tape deck over RS422). This gives Viz Engine the ability to load and control playback of EVS video server clips.

This section contains information on the following topics:

- Set Up Requirements
- RS422 and XtenDD35 Setup
- RS422 Controller Set Up Examples

Set Up Requirements

- The computer which runs the Viz Engine must be equipped with an RS422 controller that maps the controller ports to the Windows COM ports.
- The RS422 port must be connected to an RS422 remote controller port of the EVS video server.
- The EVS player, controlled by the RS422 port, must be set up to use the protocol *XtenDD35* (No other protocol is currently supported).

RS422 and XtenDD35 Setup

1. You need a RS422 controller that installs the RS422 port as a new COM port in Windows.
2. Set up the *XtenDD35* protocol on the used remote port of the EVS video server.

IMPORTANT! This must be done before an attempt to connect.

3. Manually set the Windows COM port settings to:
   - *38400 baud*
   - *8 bytes*

- *one stop bit*
- *odd parity*

IMPORTANT! This must be set before Viz Artist is started.

4. Usually, a special RS422 cable is required to connect the controller to the EVS video server. It is recommended to use a connector cable to connect the RS422/DB9 connector to a standard RS422 cable. The RS422 cable should work with a normal EVS video server controller.
5. Every RS422 controller has a different pin-out setting and requires a different connector cable. The table below shows which signal of the RS422 controller must be connected to which pin on the EVS side:

Table 21: RS422 pin-out for the connector cable

Signal type of RS422 controller	Cable pin on EVS side
RxD B+ (in)	7
TxD B+ (out)	3
TxD A- (out)	8
RxD A- (in)	2
Sig Ref / Gnd	1

RS422 Controller Set Up Examples

The connection of a RS422 controller to the EVS is always different for each controller. Here are just two examples:

Bluestorm LP

Table 22: Setup for a Bluestorm LP RS422 PCI card

Viz Engine side (Bluestorm LP card)		EVS side	
Signal type	Pin	Pin	Signal type
TxD+	2	3	RxD+
TxD-	3	8	RxD-
RxD-	4	2	TxD-
RxD+	1	7	TxD+
Sig Ref	5	1	Sig Ref

ExSys EX-1303 USB to RS422

Table 23: Setup for a ExSys EX-1303 USB to RS422 connector

Viz Engine side (ExSys EX-1303)		EVS side	
Signal type	**Pin**	**Pin**	**Signal type**
TxD+	2	3	RxD+
TxD-	1	8	RxD-
RxD-	4	2	TxD-
RxD+	3	7	TxD+
Sig Ref	5	1	Sig Ref

2.4 Shared Data

Vizrt recommends that customers who use remote shares for storing data use UNC (Universal Naming Convention) paths directly in the configuration, instead of mapped drives.

Example: \\vosstore\images

2.5 Ports and Connections

This section contains information on the following topics:

- Port Numbers
- Multiplexing Port

2.5.1 Port Numbers

The table below lists all default server and listening port numbers that are used. It is, if possible, recommended to run the system on a network without a firewall.

Table 24: Listening port numbers

Listener	Port(s)	Descriptions and Comments

Table 24: Listening port numbers

Viz World Server	102–103	102 (TCP) is a Viz World Server listener port for Viz World Client connections when Server Allocator is not in use or only has one Viz World Server running. 103 (TCP) is a Viz World Server listener port for configuration tool connections to the first Viz World Server instance (as configurations are controlled by the first server instance). See also Vizrt Maps.
Microsoft Bing and Imagery on Demand	80, 8080	Web interface and client software. For download of Microsoft Bing and Imagery on Demand images. (service: HTTP)
Viz One Delivery	554	Real Time Streaming Protocol (service: TCP).
Oracle database	1521	For clients that connect to the Viz Content Pilot Database.
Sentinel HASP Run-time Environment	1947	Used to communicate with local and remote components. This relates to hardlock dongles used with Viz Curious Maps.
VCP Script Runner	1981	Used to communicate with the Update Service.
Video servers	5250	MVCP and Xlator control port for video servers. Note: this port is only necessary in combination with the video server extension (service: AVCP).
Viz Engine	6100 6700 6800	Ports are used by Media Sequencers that connect to a Viz Engine program and/or preview channel. Viz Engine's default program and preview port is 6100. In a single channel setup where both program and preview output is on the same machine, the default preview port is set to 6800 to separate the program and preview channels. In a dual channel setup, the default program ports are 6100 and 6800 for channel 1 and channel 2, respectively. In a dual channel setup, when used for stereo production, the default program ports are 6700 and 6800 for channel 1 (left eye) and channel 2 (right eye), respectively.
Viz Trio	6200 6210	6200 is used for controlling the Viz Trio client over a socket connection. 6210 is used by the Viz NLE plugin to establish a connection to Viz Trio.

Table 24: Listening port numbers

Newsroom Component	6220	Used by the Viz NLE Plugin to establish a connection to Viz Content Pilot's Newsroom Component.
Viz NLE Editor	6230	Used by the Viz NLE Plugin to establish a connection to the Viz NLE Editor (on Mac).
Viz NLE Config	6240	Used by the Viz NLE plugin to establish a connection to the Viz NLE Configuration tool (on Mac).
Ticker Service	6300 6301	Ticker handler in Media Sequencer connects to port 6300 for feedback from Ticker Service. Ticker handler in Media Sequencer connect to port 6301 when controlling the ticker via a socket connection.
Viz Content Pilot	6484	Socket connection used for controlling Viz Content Pilot using macro commands.
Viz Preview License server	7452	For the Newsroom Component using an unlicensed Viz Engine for local preview with a connection to the Viz Preview License server (is not the same as the Preview Server).
Viz Content Pilot Data Server	8177	Used when connecting over http using the REST interface.
Media Sequencer	8580 8594	For clients connecting to the Media Sequencer. 8580 is specifically used when connecting over http using the REST interface.
Viz Gateway	10001	For DB notification events.
	10002	For Viz Gateway controller clients.
	10540	For MOS object updates.
	10541	For MOS playlist updates.

Table 24: Listening port numbers

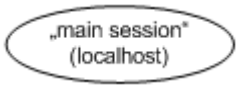
Viz World Server	10100 10200	10100 (TCP) is a Server Allocator listener port for Viz World Client connections, and is only used for clients to get connection details about Viz World Server(s). The first client connection will always be diverted to port 102. In case of multiple server instances port numbers are assigned according to a predefined schema (i.e. 10101, 10102 for server instance 2 and 3 and so on). In case there is no Server Allocator, Viz World Server will itself switch to port 102. 10100 (UDP) is a Viz World Server listener port for Server Allocator communication. 10200 (UDP) is a Server Allocator listener port for Viz World Server communication. Both UDP ports are internal ports used between the servers. For more information, please see the Viz World Client and Server 11.1 User's Guide and later. See also Vizrt Maps.
Viz Content Pilot	10640	Used by Viz Gateway to establish a connection to Viz Content Pilot to send and receive updates on MOS messages (e.g. elements and playlists).
Viz Engine	14300	Alternative port used to avoid conflicts with port 6100 (e.g. when using Viz Multiplexer). Port 6100 is normally used by renderers that are on air, hence, it is (e.g. when running Viz Content Pilot version 4 or Viz NLE Plugin towards Viz 2.x) recommended to use another port. Port 14300 is an optional port. The default 6100 may also be used if the renderer is not used on air.
Viz Graphics Hub	19392–19396	Ports in use when connecting to different Viz Graphics Hub components.
Viz Connection Broker	21098	Connection to the Viz Connection Broker configuration interface (e.g. http://localhost:21098/)

Table 24: Listening port numbers

Viz Engine		Ports 50007 - 50009 are all Multiplexing Port that enable Viz Engine to work on other scenes in sessions that are used for preview purposes:
	50007	**MUX Isolated port:** All connections to this port get its own session.
	50008	**MUX Shared port:** All connections from one single host shares one session.
	50009	**MUX Fixed port:** Same as shared port except that allocated resources are never cleared from memory.
	50010	**Still Preview port:** Enables a user to request a preview of the next scene to be put on air while another scene is on air.
Preview Server	54000	Used when connecting over http using the REST interface.

2.5.2 Multiplexing Port

Table 25: Multiplexing Ports

Ports	Viz Engine
All other ports	
Still Preview Port	
MUX Isolated Port MUX Shared Port MUX Fixed Port	

The multiplexer functionality is an integral part of Viz Engine. When using Viz Engine a session management takes place internally, with one default session for the GUI and internal/external commands, and additional sessions created on-demand for the multiplexing ports or the preview port.

With multiplex ports, other than the MUX Still Preview port, the Viz Engine state is only switched when a command is received, which means a new session is created; hence, ten consecutive commands from a client will only result in one state switch on the first command.

With the MUX Still Preview port the state is switched when a command is received and immediately switched back to the main session such that on air rendering will not be hindered in any way.

The MUX Fixed port is traditionally used by Viz Content Pilot 4's Newsroom Component, and is the same as the MUX Shared Port, except that allocated resources are never cleared from memory. To avoid memory overload, it is recommended to clean up the Viz Engine regularly when this port is used.

The MUX Shared Port is a shared port where all connections from one single host shares one session. It is most often used by Viz Trio and the Newsroom Component to display preview frames.

The MUX Isolated Port is an isolated port where all connections get their own session. It is used, for example in an NLE setup, to deliver frames to the host NLE-system when rendering or scrubbing video clips with graphics. Using this port will also suppress bounding box commands.

Note: The MUX Isolated Port cannot be used by the Newsroom Component.

Note: All multiplexing ports are supported by all Viz Engine versions

3 Software Setup

This chapter covers the Prerequisites and supported hardware options for Vizbefore installing Viz, the procedures on how and.

This section contains information on the following topics:

3.1 Prerequisites

All Viz Engine or Viz Artist installations run on a **Windows XP** SP2 and SP3 (32-bit), ans **Windows 7** (64-bit) platform.

For **Windows 7** the following applies:

- The user must have administrator rights
- User Account Control must be set to Lowest
- Windows 7 theme Aero must be disabled
- There must only be one active network card
- Depending on the User Account Control settings, the configuration and log files may be created under `C:\Users\<user name>\AppData\Local\VirtualStore\Program Files (x86)\vizrt\Viz3` instead of the Viz Engine installation folder.
- Power management and hibernation mode must be turned off. Execute "`powercfg -h off`" to remove hiberfil.sys from the hard disk.

For each machine a default user is defined that has administrator rights on the machine. The Admin account is as follows:

Table 26: Computer Users

Username	Password	Account Type
Admin	vizrt	Computer Administrator

IMPORTANT! It is highly recommended that these passwords are changed!

To learn more about the different account types, please refer to the Windows operating system manual, or visit www.microsoft.com.

See Also

- Requirements

3.2 Supported Hardware Options

Viz can be installed and configured to use different video and graphics cards. During the installation three hardware options can be selected.

The supported platform options are:

- **VGA –** Installs the Viz Engine VGA version (standard-PC). This option does not support video output, and is therefore normally used for Viz Artist design machines.
- **Video –** Installs the Viz Engine video version. This version supports the Targa, Matrox X.mio, NVIDIA SDI, DVS and Voodoo cards.
- **Trio Box CG –** Installs the Viz Engine version that enables the machine to run the Viz Trio setup using two graphics cards.
- **Dual channel –** Installs the Viz Engine version that enables the machine to run dual channel (e.g. two program channels) using two graphics cards.

See Also

- Installing the Viz Engine
- Video Cards
- Graphics Cards
- Audio in Viz
- Ports and Connections

3.3 Installing the Viz Engine

The Viz software can be installed to run with more than one hardware configuration. Depending on the hardware installed, for example video or audio hardware, Viz will make related features available to the user.

Viz Engine (not the Viz Artist design interface) is basically designed to operate in two modes; with or without video handling. To enable handling of video a video card is needed. The Viz installer auto-detects whether a supported video card is installed or not, and if it is supported by Viz.

Used without a video card Viz is often referred to as a VGA or standard-PC installation, which is commonly used by designers using the Viz Artist interface.

Note: There is only one version of the Viz software in use at any given time.

This section contains the following procedures:

- To install Viz
- To silent install Viz

To install Viz

1. Login to the computer as an Computer Administrator.
2. Double-click and run the installer.
3. Click Next.

4. Check the “I accept the terms in the License Agreement” option, and click Next.
5. Choose platform type (see Supported Hardware Options).
6. Optional: Select a different installation directory and/or select the components to install.
7. Click Next.
8. Click Install.
9. When the installation is done, click Finish.

IMPORTANT! Firewall ports configurations must be manually specified to allow Viz communicate over a network.

To silent install Viz

Run the following from a command line prompt, or save it to a batch file for execution:

1. On Windows XP:
   ```
   a.@rem silent installation
   b.@rem platformtype: standardpc, video, trioboxcg, dualchannel
   c.msiexec.exe /i <msi_package> /quiet
     PLATFORMTYPE=<platformtype> REINSTALL=ALL REINSTALLMODE=vomus
   ```
2. On Windows 7:
   ```
   a.@rem silent installation
   b.@rem platformtype: standardpc, video, trioboxcg, dualchannel
   c.msiexec.exe /i <msi_package> /quiet
     PLATFORMTYPE=<platformtype>
   ```
3. To prevent hardlock driver installation you can add the following parameter: `HARDLOCK=no`.
4. To see other options enter `msiexec` on the command line and press enter. Common options are:
   - **/i** : Installs or configures a product. Package: Specifies the name of the Windows Installer package file. ProductCode: Specifies the globally unique identifier (GUID) of the Windows Installer package.
   - **/x** : uninstalls a product. Package: Name of the Windows Installer package file. ProductCode: Globally unique identifier (GUID) of the Windows Installer package.

See Also

- Msiexec on Microsoft.com

3.4 Adding a License

All Viz machines must have a license in order to run. A license is normally acquired when purchasing the product. For acquiring additional or updated licenses contact your local Vizrt representative (support@vizrt.com).

It is also important to note that some of the plug-ins used with Viz is also licensed in addition to Viz itself.

The following procedures can be used on how To license a new Vizrt dongle and how To re-license a Vizrt dongle.

To license a new Vizrt dongle

1. Start Viz
2. Once Viz has started a license window will pop up
3. Before pasting in the license string, do the following:
   - Check that the dongle ID from the text file is identical to both what is written on the dongle and in the window that opens in Viz.
   - Check that the date and time on the computer the dongle is attached to is set correct as the license is only valid for a certain time frame.
   - Check that there are 32 pairs of characters and that they are divided by a single space. Also check the characters and any spaces at the end.
4. Paste in the license string, and do the following:
   - Check that the license key has not been entered twice.
   - Check that the whole string is pasted. It should be 32 pairs of characters.
5. Restart Viz for the changes to take effect.

To re-license a Vizrt dongle

1. Start Viz and click on the 'i' button in the top right corner of the program
2. Paste in the license string
3. Click OK
4. Restart Viz for the changes to take effect

3.5 Integrating with Viz One

The first step of a Viz One integration process is to setup Viz Engine in order for Viz One to make the correct connections, thus enabling Viz One to transfer clips for playout.

Note: A running Viz One system must be present prior to installation and configuration of the services.

The following sections describe how to install the transfer and monitoring services on Viz Engine and also how to enable clip play out.

For more information see the following sections:

- Installing Transfer and Monitoring Services on Viz Engine
- Configuring Local Preview of Video Files

See Also

- *Viz One Administrator's Guide*

3.5.1 Installing Transfer and Monitoring Services on Viz Engine

Both **Mediaftp** (file transfer) and **Fsmon** (file system monitor) are services that Viz One utilizes to transfer files and to know when files are added and removed from Viz Engine's video disk (i.e. the V:\ drive).

Both services are required for Viz One to successfully connect to Viz Engine, and can be downloaded from the Viz One shared folder, named **software**.

For *Mediaftp* it is important that you install the service with the user you set when adding Viz Engine as a video server to Viz One. Note that after the service is installed it will list, in the command shell, the username it is setup to use.

For *Fsmon* it is important that the Viz Engine hostname is the same string that was entered in Viz One as hostname for the Viz Engine. In other words, it must be the exact same string as seen beside Host on the Servers page.

To install transfer and monitoring services

1. Open Windows Explorer and enter the following address: `\\<vizone-hostname>\software\`
2. Locate and download the Mediaftp (exe) and Fsmon (zip) files
3. Unpack Fsmon
4. Open a command shell, and change to your download directory
5. Run the following commands in order to install the transfer service:

```
mediaftp-x_y-z.exe --install -a --root=V:\ --log="C:\Program Files
(x86)\Vizrt\mediaftp\mediaftp" --bandwidth=300000

fsmon.exe --install --mqserver=<vizone-hostname> --
hostname=<vizengine-hostname> --root=V:\ --log="C:\Program Files
(x86)\Vizrt\fsmon\fsmon" --debug
```

The *-a* flag used for the Mediaftp installation will automatically install the transfer service with the following user and password: *vtrsync*/*vtrsync*.

If you want to use a different user and password you can omit the *-a* flag, and the service will use your logged in Windows user. Hence, you will have to make sure it has read and write access to your V:\ drive (which is the location video clips are transferred to).

3.5.2 Configuring Local Preview of Video Files

If you are using Viz Engine for local preview (e.g. Viz Engine installed on a control client machine) you will have to install video codecs that are, for Viz Engine 3.5, not part of the Viz Engine installation.

Note that the following setup procedures are only relevant for Viz Engine 3.5 when previewing low resolution versions of video clips on Viz One. In most cases this happens when you are using a control application, such as Viz Trio, to for example preview a full screen clip. The high resolution versions do not need this codec installation.

The following procedures will guide you through the necessary installation steps:

- To install codecs for local preview
- To set a preferred decoder

- To register the Matroska Splitter
- To unregister the Matroska Splitter
- To configure preview of clips stored on Viz One

To install codecs for local preview

The following procedure makes use of the FFDShow codec package and the Matroska splitter.

After installing the FFDShow codec package make sure that Viz Engine or generally no applications are excluded (there is an inclusion and exclusion list in FFDShow).

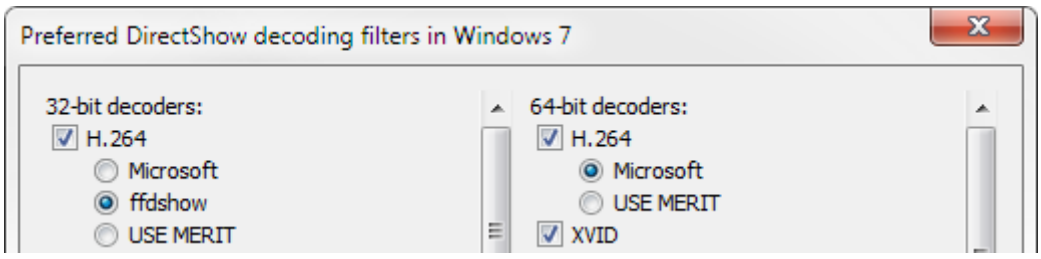
Also make sure you do not have any other codec packages installed on the machine that interfere with FFDShow or the Matroska splitter.

Note: You need to have your own license for clip playback as FFDShow does not come with a decoding license.

1. Start your browser
2. Search for and download the FFDShow MPEG-4 Video Decoder
   - Make sure you have a license to use the codec
   - Make sure you download a 32-bit version of the codec
3. Search for and download the Matroska Splitter
4. Search for and download the Windows 7 DirectShow Filter Tweaker
5. **Uninstall** older **64-bit** versions of the **MPEG-4 codec**
6. **Extract** the **Matroska Splitter** and the **Windows 7 DirectShow Filter Tweaker**
7. **Install** the **MPEG-4 codec**
8. Set your **MPEG-4** 32-bit decoder to **FFDShow** (see how To set a preferred decoder)
9. **Register** the **Matroska Splitter** (see how To register the Matroska Splitter)
   - You should now be able to preview video clips from Viz One

To set a preferred decoder

1. **Run** the **Windows 7 DirectShow Filter Tweaker**
2. In the appearing dialog box click **Preferred decoders**



3. Set your **MPEG-4/H.264** 32-bit decoder to **FFDShow** and click **Apply & Close**
4. Click **Exit**

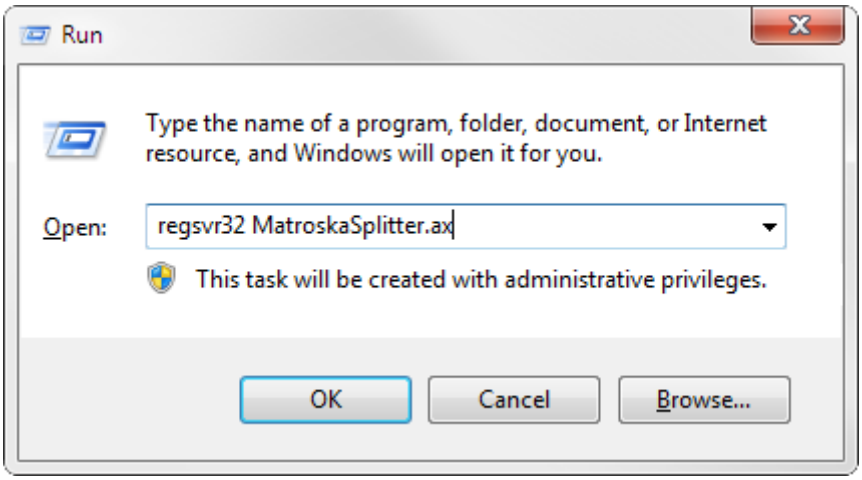
To register the Matroska Splitter

1. **Extract** the **Matroska Splitter**

2. **Copy** the **ax file** to your `C:\Windows\System32` folder

Note: There are two files available, one in the root folder that is used for 32-bit systems, and one in the x64 folder used for 64-bit systems.

3. Click on **Start** > **Run**



4. Enter **regsvr32 MatroskaSplitter.ax** and click **OK**
   - A message box appears confirming your registration
5. Click **OK**

To unregister the Matroska Splitter

1. Click on **Start** > **Run**
2. Enter **regsvr32 -u MatroskaSplitter.ax** and click **OK**
   - A message box appears confirming that it is unregistered

To configure preview of clips stored on Viz One

If you installed the Viz Engine **VGA version**, please perform the following steps:

1. Open Windows Explorer
2. Open the Viz Engine configuration file
   `C:\Program Files (x86)\vizrt\Viz3`
3. Locate `SECTION TARGA3200`
4. Set `vizlink_mode = 1`
5. Save the file

If you installed the Viz Engine **Video version**, please perform the following steps:

1. Start Viz Config
2. Select the **Video Board** section and enable (*On*) the **Viz Link** option
3. Click **Save**

4 Getting Started

This chapter describes how To start Viz Engine, the Viz Command Line Options that are available and how To start Viz with command line option(s).

Viz is mainly configured using Viz Config; however, all configuration settings are stored in a file found in the program folder. The configuration file uniquely identifies the machine Viz is installed on by using its hostname (e.g. *Viz-<hostname>-0-0.cfg*).

Any changes to the hostname will affect the configuration of Viz. If a hostname is changed, a new configuration file is created with a default setup. The old configuration file is not deleted, but left unused. It is possible to reassign the old configuration file using the Viz command -g <config file>.

This section contains information on the following topics:

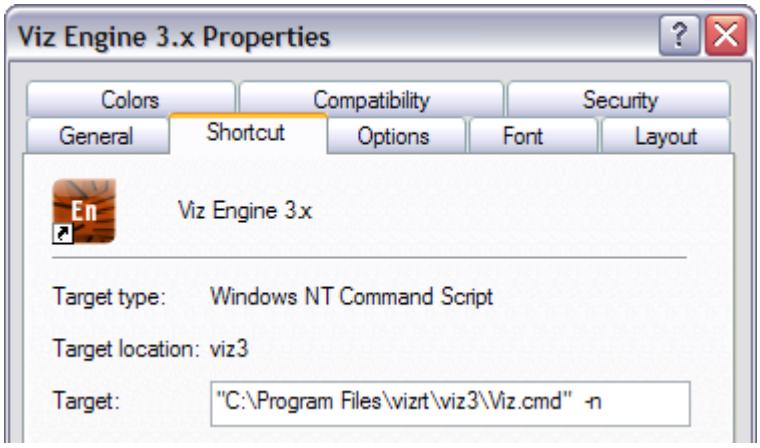
To start Viz Engine

1. Double-click the icon on the desktop, or
2. Select the program from the Start menu (All Programs > Vizrt > Viz3 > Viz Engine 3.x)

Note: The software is by default installed at C:\Program Files\vizrt\viz3

To start Viz with command line option(s)

Figure 1: Command line options, Viz Engine



1. Navigate to the Viz 3.x program icon.
2. Right-click the icon and select Properties on the appearing context menu.
3. In the Properties window, and set the Viz Command Line Options (and parameters) in the *Target* field.
4. Click OK to close the Properties window.

See Also

- Installing the Viz Engine
- Configuring Viz

4.1 Viz Command Line Options

The table below describes all the available Viz command line options

Table 27: Viz command line options

Command	Description
-3D	If you want to playout 3D Stereo Clips, you need to start Viz Engine with the `-3D` parameter. This sets Viz Engine in a special mode where a side by side clip will be split and played out on channel A and B on the Matrox board.Note that this is for clips only!
-c	Starts Viz in Viz Config mode.
-C	Starts Viz without a console.
-g <config file>	Starts Viz with a predefined configuration file. This allows the user to have more than one startup option.
-i	Enables pre-initialization of textures.
-l	Specifies a console title to distinguish the Viz Engines in a dual channel setup (example: `-l <title>`).
-n	Starts Viz in Viz Engine mode.

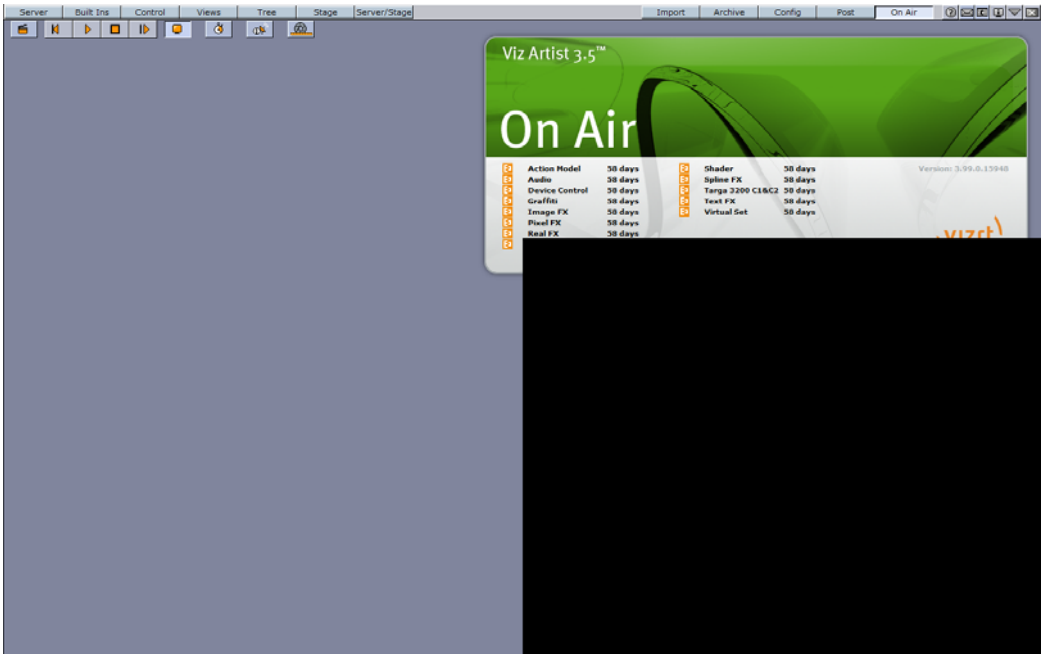
Table 27: Viz command line options

Command	Description
-o <scene>	Starts Viz in Viz Engine mode with an optional auto load scene (example: `-o SCENE*<path>`).
-T	Keeps console always on top.
-v	Enables verbose mode.
-V	Shows the last rendered frame on video output (only Digital Voodoo cards).

5 On Air Mode

The On Air interface may vary, depending on the software and hardware configuration used. In Viz Artist, designers can click the On Air button on the main menu to switch Viz Artist from a modeling tool to a render engine. The application will then wait for control commands; however, scene animations can also be rendered by the use of the Control Buttons (top-left corner).

Figure 2: On Air, Viz Engine VGA



The top left of the On Air screen shows a set of Control Buttons, On Air Editor Buttons, as well as a Performance Bar button. All License Information is displayed at the top right of the screen.

Depending on the software and hardware settings, additional buttons and information is available. For example in design mode, the scene will be shown in an output window (lower right).

Note: Be sure to keep Viz Artist running in the foreground as not to disturb the broadcast. Furthermore make sure no window is displayed to overlap the render output as this would interfere with the broadcast.

All script events that are added to a scene or to single containers will be executed in On Air mode. To learn more about scripting see the script documentation.

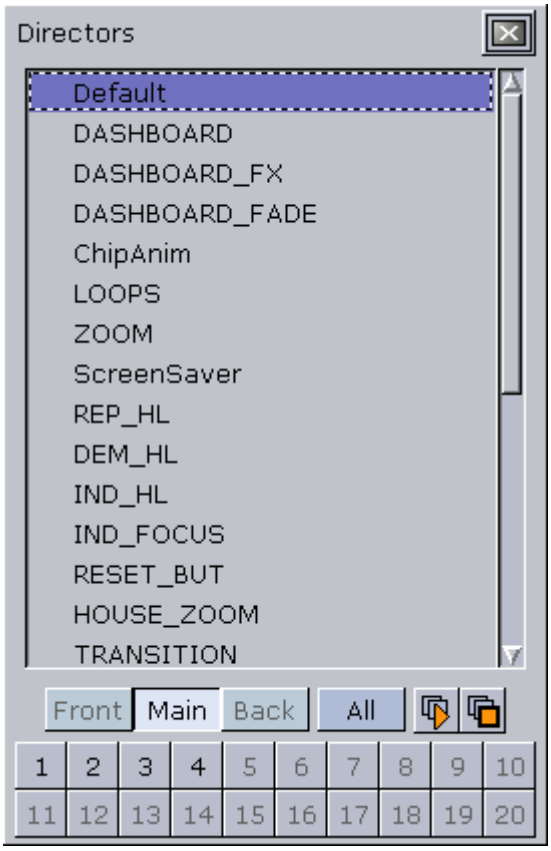
This section contains information on the following topics:

- Director Control Panel
- Control Buttons
- On Air Editor Buttons

- Performance Bar
- System Information
- License Information

5.1 Director Control Panel

Figure 3: Director Control Panel



The Standard-PC version of Viz displays a clapper board button when in On Air mode. This button opens the Director Control Panel window.

The Director Control Panel window can be used to select and animate one, multiple or all directors. In addition it can be used To set slots and to animate a combination of director(s).

This section contains information on the following topic and procedure:

- Properties and Parameters
- To set slots and to animate a combination of director(s)

Properties and Parameters

- **Front** – Shows all directors in the Front layer.
- **Main** – Shows all directors in the Main layer.
- **Back** – Shows all directors in the Back layer.
- **All** – Shows and selects all directors.

- **Play** – Plays the animation for the selected director(s).
- **Stop** – Stops the animation for all layers. Right-clicking stops only the selected director.
- **1-20** – Selects the selected director(s) configured for the slot. To set slots and to animate a combination of director(s).

To set slots and to animate a combination of director(s)

1. Select one, multiple or all directors
2. Drag and drop the director(s) onto a slot (1-20)
3. Click to select the newly configured slot
4. Click the Play button to animate the selected director(s)

5.2 Control Buttons

- **Back**: Jumps to beginning of your scene.
- **Play**: Will start to play your scene.
- **Stop**: Stops the scene.
- **Forward**: Continues to play after stopping.

5.3 On Air Editor Buttons

- **Clapper Board**: Opens the Director Control Panel window.
- **Screen**: Displays the VGA Preview window. VGA Preview must be activated in the Video Output section, and is only available on machines with video cards.

Note: VGA Preview is always enabled for the Standard-PC version of Viz Artist.

- **Clock**: Opens the Performance Bar.
- **System Information**: Opens the System Information screens.
- **Lense File**: Used for adjusting lens files for virtual sets. You can adjust field of view, lense deformation, mobile point and centership. It is useful in combination with lense calibration.

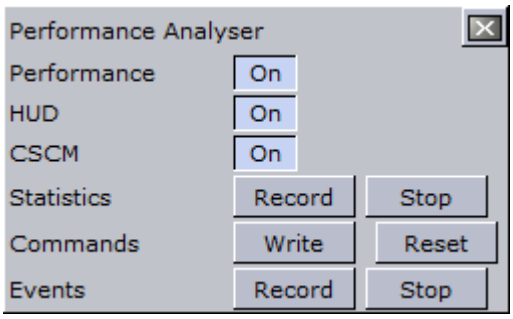
5.4 Performance

Analyzing the performance of Viz can be done using two tools; one is the Performance Bar that allows you to closely monitor a range of parameters for analyzing real-time performance of Viz, the other is the Performance Analyzer tool that allows you to monitor key performance and camera parameters as a head-up display in the renderer window and initiate logging of statistic, command and event information to the log file(s).

This section contains information on the following topics:

- Performance Analyzer
- Performance Bar

5.4.1 Performance Analyzer



The performance analyzer enables key performance and camera information to be displayed in the renderer view as a head-up display. Additionally the performance analyzer can be used to initiate writing of statistic, command and event information to the log files.

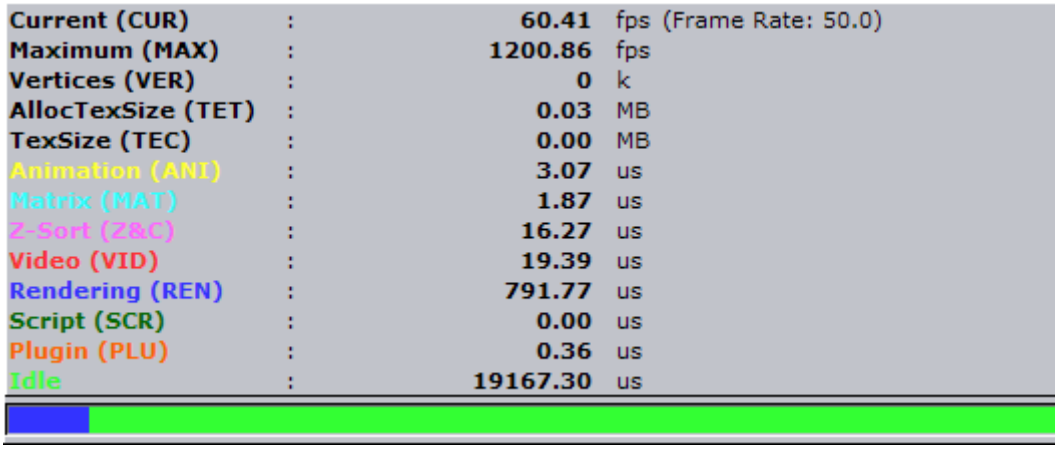
- **Performance**: Displays the current (CUR) and (MAX) parameters (see Performance Bar).
- **HUD**: Enables the head-up display (HUD) showing the following parameters in the renderer view:
  - **Camera 1-n**: Displays the currently selected camera.
  - **Position**: Displays the camera's X, Y and Z position.
  - **Pan/Tilt/Twist**: Displays the camera's pan, tilt and twist parameters.
  - **FovX/FovY**: Displays the camera's field of view (fov) for the horizontal (X) and vertical (Y) plane.
  - **Center Shift**: Displays the X and Y position of the camera's center shift.
- **CSCM**: Displays the center shift as a cross hair in the renderer.

Log files reside under the Viz program folder: `C:\Program Files\Vizrt\Viz3\`.

To open the performance analyzer

- Hold CTRL while clicking the right mouse button on the X (close) button in Viz.

5.4.2 Performance Bar



The performance bar gives an idea of the current scene rendering performance (frames per second).

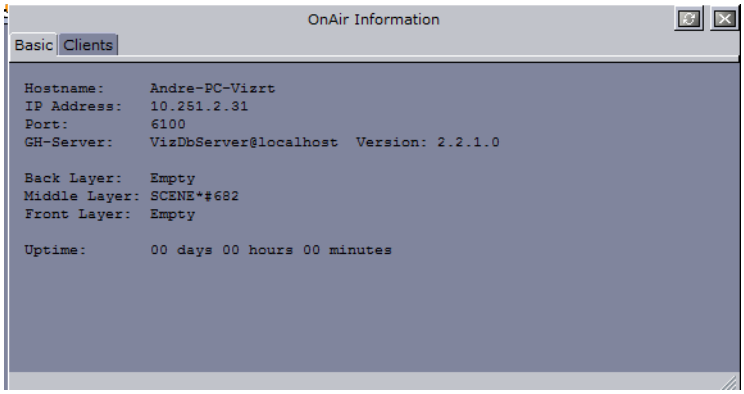
- **Current (CUR)**: Shows how many frames per second the scene will render at in On Air mode. The number should be above 50 (PAL) or 60 (NTSC), according to the rate that has been specified in the Output Format section.
- **Maximum (MAX)**: Shows how many frames per second the scene can render at without waiting for vertical retrace. The higher the maximum value, the more performance is left. If the maximum value is reduced to below 50 or 60, the scene is not rendering in real-time.
- **Vertices (VER)**: Shows the number of vectors in the scene.
- **AllocTexSize (TET)**: Shows the total allocated size of texture memory.
- **TexSize (TEC)**: Shows the size of the currently used texture memory.
- **Animation (ANI)**: Shows how many microseconds all active directors and animation channels take. This indicator is linked to the yellow bar.
- **Matrix (MAT)**: Transforms each container in the scene into world coordinate space. This indicator is linked to the cyan bar.
- **Z-Sort (Z&C)**: Refers to Z-sort and Culling, and sorts all containers for correct transparency drawing and determines if containers are visible in the current camera view. This indicator is linked to the pink bar.
- **Video (VID)**: Shows how many microseconds video input (live video texture) and video output take. De-interlaced video inputs take longer time than progressive and interlaced. The only way to improve this value is to use a faster system. This indicator is linked to the red bar.
- **Rendering (REN)**: Shows how many microseconds it takes to render all objects on the screen. A faster graphics card will improve this value. This indicator is linked to the blue bar.
- **Script (SCR)**: Shows the consumed time in microseconds from all active scripts. This indicator is linked to the dark green bar.
- **Plugin (PLU)**: Indicates how much time in microseconds all active plug-ins spend in each render cycle. This indicator is linked to the orange bar.
- **Idle**: Shows available resources in microseconds the renderer has available. This indicator is linked to the light green bar.

To open the performance bar

1. Click the performance bar button (timer icon).
2. To see all parameters, extend the view by clicking the Eject button.

5.5 System Information

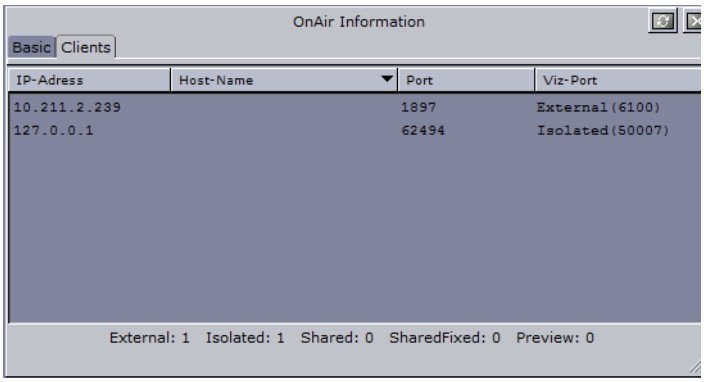
Figure 4: System information – Basic tab



In the Basic tab, the parameters you need to know for sending external control commands are displayed.

- **Refresh button**: Refreshes the status information.
- **Hostname**: Shows the name external control programs can use to communicate with Viz Artist.
- **IP Address**: Shows the IP address external control commands can communicate with Viz Artist.
- **Port**: Shows the port Viz Artist is using. Default port is 6100, but may be changed in Viz Config's Communication section.
- **GH-Server**: Shows the Viz Graphics Hub server Viz Artist is connected to.
- **Back Layer**: Shows the name of the scene that is defined to run in the background of the middle and front layer scene(s).
- **Middle Layer**: Shows the name of the scene that is defined to run in the middle between the back and front layer scene(s).
- **Front Layer**: Shows the name of the scene that is defined to run in the foreground of the back and middle layer scene(s).
- **Uptime**: Shows the time elapsed since Viz was started.

Figure 5: System information – Clients tab



In the clients tab, all connected clients are displayed with the IP address, host name and Viz Port.

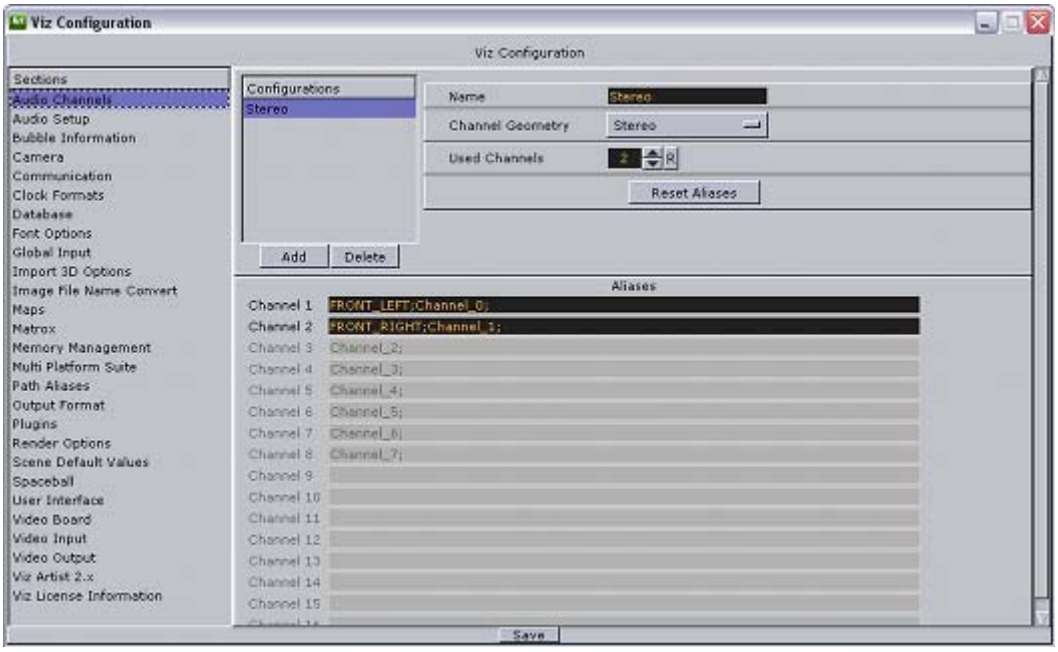
5.6 License Information

Figure 6: Licensed features

The license information listing displays the licensing information such as licensed features and how many days the license has left before it must be renewed.

6 Configuring Viz

Figure 7: Viz Configuration Interface, Video



Viz Config is the configuration interface for Viz Engine and other applications that integrate with Viz Engine.

Basically the user interface is divided in two; sections on the left and settings on the right. Various parameters regarding the program functionality can be set in the configuration; however, additional and more advanced settings can be set using the configuration file (not recommended).

Viz is mainly configured using Viz Config; however, all configuration settings are stored in a file found under the install directory. The configuration file uniquely identifies the machine Viz is installed on by using its hostname (e.g. *Viz-<hostname>-0-0.cfg*).

Any changes to the hostname will affect the configuration of Viz. If a hostname is changed, a new configuration file is created with a default setup. The old configuration file is not deleted, but left unused. It is possible to reassign the old configuration file using the Viz command -g <config file>.

CAUTION! Make sure to save any changes before closing Viz Config or else they might be discarded. Hence, it is recommended to restart the software to make sure that the changes take effect.

This section contains information on the following topics:

- Communication
- Clock Formats
- Database
- Font Options
- Global Input
- Import 3D Options
- Image File Name Convert
- Maps
- Matrox
- Memory Management
- Multi Platform Suite
- Path Aliases
- Output Format
- Plugins
- Render Options
- Scene Default Values
- Spaceball
- User Interface
- Video Board
- Video Clip
- Video Input
- Video Output
- Viz Artist 2.x
- Viz License Information

To start Viz Config

1. Start Viz Config from *Start* > *All Programs* > *Vizrt* > *Viz 3* > *Viz Config 3*, or
2. if Viz Artist 3 is running, click *Config* on the main menu.

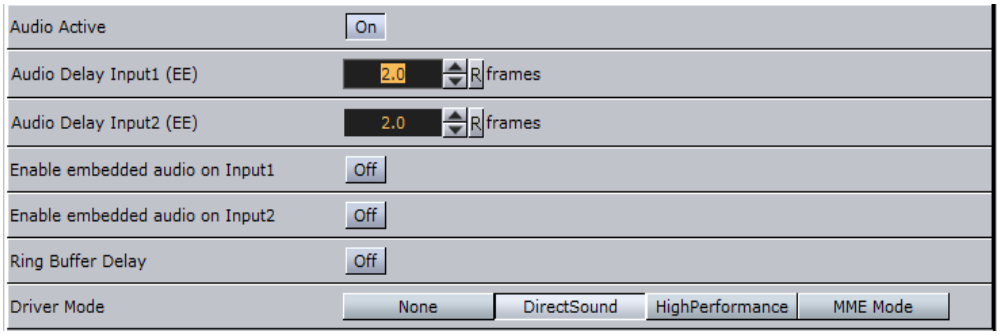
6.1 Audio Settings

This section contains information on the following topics:

- Properties and Parameters
- Dual Channel Configuration
- To add new audio channels
- To add multi-language audio channels
- To add multiple audio channel configurations
- To map audio output for a dual channel setup
- To delete audio channels
- To manually activate an audio device

Properties and Parameters

Figure 8: Various tab



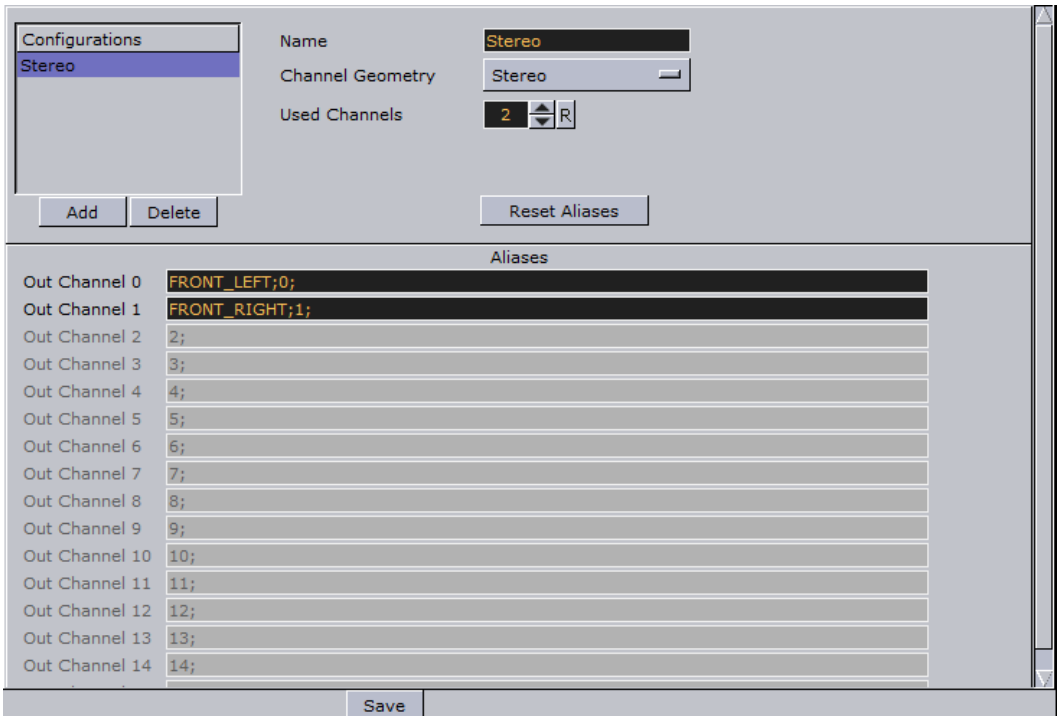
- **Audio Active**: Makes audio active or inactive.
- **Audio Delay Input1 (EE):** Delay can be adjusted to synchronize the inputs at the output. This only affects Targa boards.
  - For Matrox, see the configuration file and SECTION MATROX_CONFIG's *Matrox0.AudioIn1.AudioDelayDVE* setting.
- **Audio Delay Input2 (EE):** Delay can be adjusted to synchronize the inputs at the output. This only affects Targa boards.

Note: To enable audio mixing on the video board, these two settings must be turned on. Otherwise the audio data from Input 1 to Input 4 are not mixed with the values for the stage and played out.

Note: Targa boards do not distinguish between DVE and texture delays.

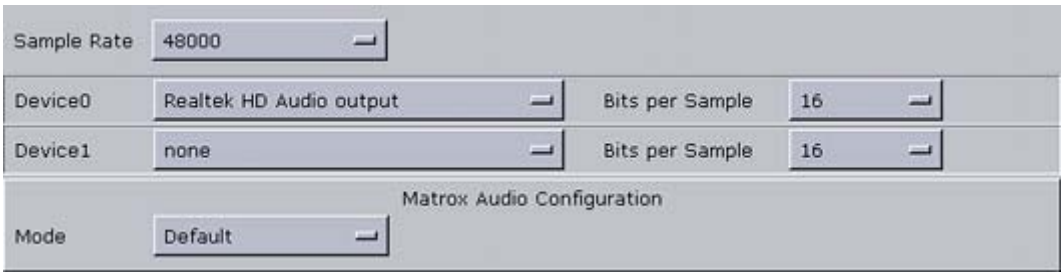
- **Enable embedded audio on Input1**: Enables embedded audio for use with video as texture or DVE. Input 1 in the Video Input section must be enabled in order to use embedded audio output.
- **Enable embedded audio on Input2**: Enables embedded audio for use with video as texture or DVE. Input 2 in the Video Input section must be enabled in order to use embedded audio output.
- **Ring buffer delay**: Turn **On** to enable the audio system to compensate for the ring buffer delay automatically.
- **Driver mode**: Select **None** for no sound card output. Select **DirectSound** for direct sound. Select **High Performance** for high performance MME mode (this only works for Wave driver cards. Select **MME** mode for that mode only.

Figure 9: Channels tab



- **Configurations:** Displays a list of channel configuration(s).
- **Add:** Adds a new channel configuration to the Configurations list.
- **Delete:** Deletes the selected channel configuration from the Configurations list.
- **Name:** Sets the name of the selected channel configuration.
- **Channel Geometry:** Sets the channel geometry. Available options are: Mono, Stereo, 5.1, 7.1 and Quad.
- **Used Channels:** Sets the number of configurable channel alias fields that can be mixed by the internal channels in Viz Engine (software). On a Matrox system this number must be equal to the number of configured input channels (hardware). This setting is independent of the Channel Geometry setting.
- **Reset Aliases:** Sets the channel aliases to the default option; however, the custom entry is not removed.
- **Out Channel 0–15:** The Out Channels represent the internal Viz audio channels, which are mixed to the output device one by one. Alias names are not only useful for creating multilingual systems, but also define the channel geometry for the Default and FX audio clip mix modes. Aliases are separated by a semicolon. The Audio plug-in only uses the channel aliases to find the correct speakers for Pan and 3D sound effects in FX mode. With this functionality you are able to use any of the 16 internal audio channels to play any audio geometry.

Figure 10: Setup tab



In this section all installed DirectSound audio cards are listed displaying the available audio inputs that can be mixed to one audio output by Viz Engine. It is currently only possible To manually activate an audio device by editing the configuration file.

Note: The Matrox audio-extension board is not configurable through this user interface.

- **Sample Rate:** *Reserved for later use*. Displays the sample rate. Default sample rate is 48kHz (48000) which is the maximum allowed.
- **Device** *n*: Displays the name of the audio card.
- **Bits per Sample**: *Reserved for later use*. Displays the number of bits used per sample. Default value is 16 Bit per sample rate.
- **Mode**: Refers to the audio mode of the Matrox card. Available modes are Embedded, AES, Embedded AES, Loop and Default.
  - **Embedded**: Forces the Matrox card to capture audio from the video signal and outputting embedded audio.
  - **AES**: Forces the Matrox card to capture and output audio through the AES/EBU connectors.
  - **Embedded AES**: Forces the Matrox card to capture audio from the video signal and outputting it to the AES/EBU connectors.
  - **AES Embedded**: Forces the Matrox card to capture audio from the AES connectors and outputting the audio as streams in the video signal.
  - **Loop**: Moves the audio from the inputs to the outputs without being down-mixed by Viz Engine.
  - **Default**: The default device(s) are used (usually the built-in sound board).

Note: Matrox X.mio1 only supports balanced audio through XLR connectors. X.mio2 only supports unbalanced audio through BNC connectors.

Dual Channel Configuration

In a dual channel setup AES channels can be configured to use up to 4 channels per Viz Engine for an X.mio1 and up to 8 channels per engine for an X.mio2. If 8/16 channels are set for one Viz Engine the other Viz Engine will overwrite these settings as the maximum of AES channels is 8/16 for X.mio1/X.mio2.

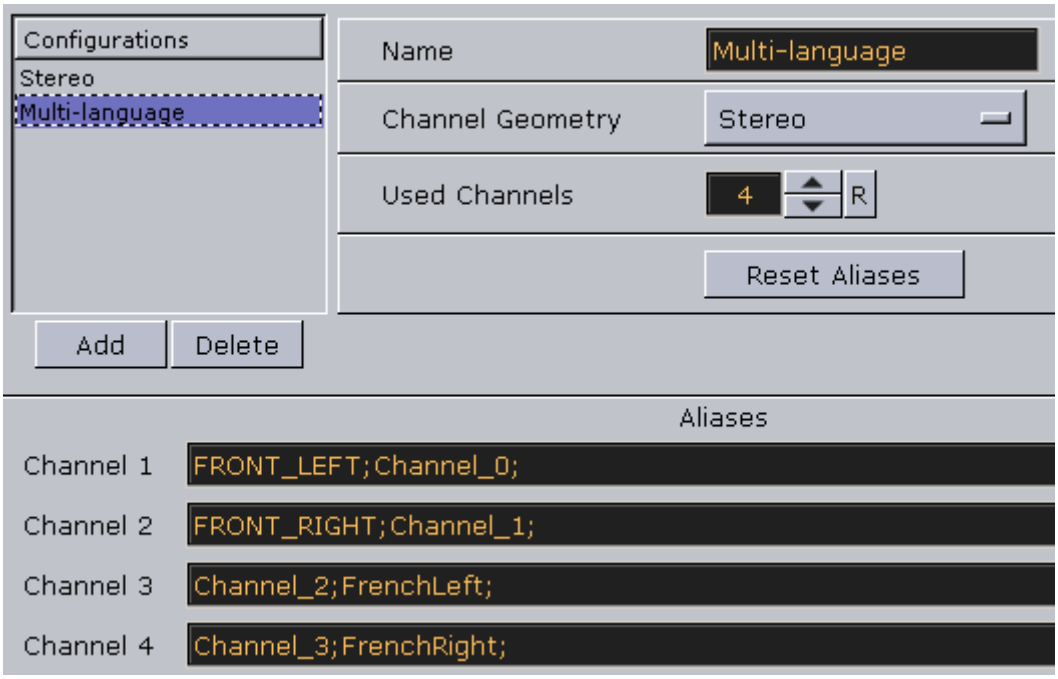
For correct mapping both Viz Engines should be set to an equal number of used AES channels.

To add new audio channels

1. Click the **Add** button.
2. Select the new entry from the **Configurations** list, and enter the new name in the **Name** field.
3. Set the **Channel Geometry**, and the number of **Used Channels**.
4. Click **Save**.

To add multi-language audio channels

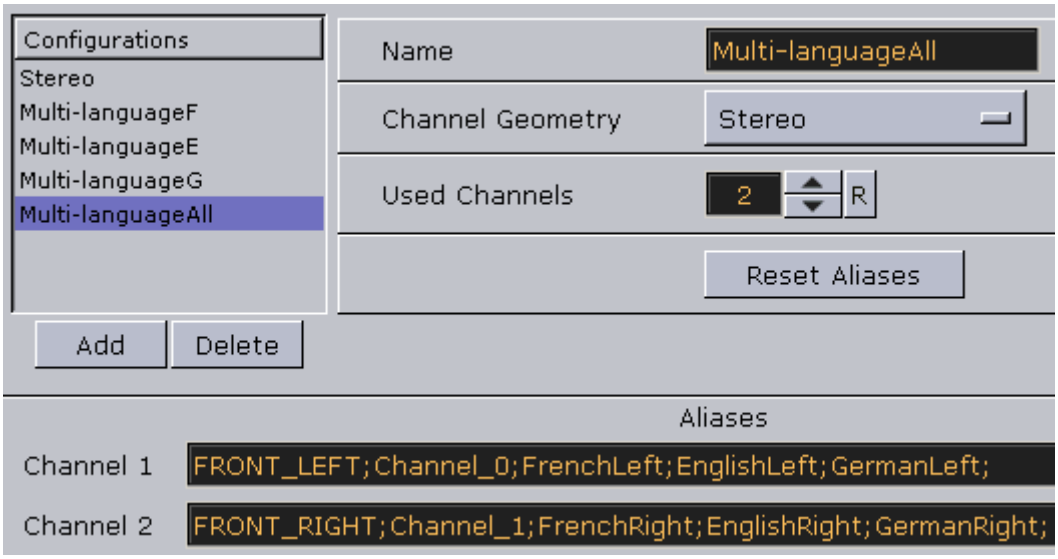
Figure 11: Multi-language audio setup



1. Click the **Add** button.
2. Select the new entry from the **Configurations** list, and enter the new name in the **Name** field.
3. Set the Channel Geometry to **Stereo**, and then click **Reset Aliases**.
4. Increase the number of **Used Channels** to 4
   - This will improve the performance.
5. In the **Channel 3** field add the alias **FrenchLeft**.
6. In the **Channel 4** field add the alias **FrenchRight**.
   - Add the same configuration for English (EnglishLeft, EnglishRight) and German (GermanLeft, GermanRight) on the other machines.
7. Click **Save**.

To add multiple audio channel configurations

Figure 12: Multi-languageAll setup



1. See how To add multi-language audio channels, and repeat the process such that the Audio Settings configuration has 3 setups for the three languages.
2. Name the configurations the following way;
   - Multi-languageF
   - Multi-languageE
   - Multi-languageG
3. Add a Multi-languageAll configuration (see Figure 12: Multi-languageAll setup).
4. In the **Channel 1** field add the alias **FrenchLeft**, **EnglishLeft** and **GermanLeft**., and do the same for **Channel 2**.

   ```
   FRONT_LEFT;Channel_0;FrenchLeft;EnglishLeft;GermanLeft;
   FRONT_RIGHT;Channel_0;FrenchRight;EnglishRight;GermanRight;
   ```

5. Click **Save**.

To map audio output for a dual channel setup

1. In a dual channel environment there are two configuration files, one for each Viz Engine.
2. For the first Viz Engine (1) the configuration of the audio output channel mappings should look like this:

   ```
   Matrox0.AudioOut1.MapToVizChannel = 0
   Matrox0.AudioOut2.MapToVizChannel = -1
   ```

3. Note that the audio output for the first Viz Engine (1) should be according to the video output channel:

   ```
   Matrox0.VideoOut1.MapToVizChannel = 0
   Matrox0.VideoOut2.MapToVizChannel = -1
   ```

4. For the second Viz Engine (2) the configuration should look like this:

   ```
   Matrox0.AudioOut1.MapToVizChannel = -1
   Matrox0.AudioOut2.MapToVizChannel = -1
   ```

5. Mind the difference to the video output settings:

   ```
   Matrox0.VideoOut1.MapToVizChannel = -1
   Matrox0.VideoOut2.MapToVizChannel = 0
   ```

6. All other audio output channels should be turned off:

```
Matrox0.AudioOut3.MapToVizChannel = -1
Matrox0.AudioOut4.MapToVizChannel = -1
```

To delete audio channels

1. Select a configuration entry from the **Configurations** list, and click the **Delete** button.
2. Click **Save**.

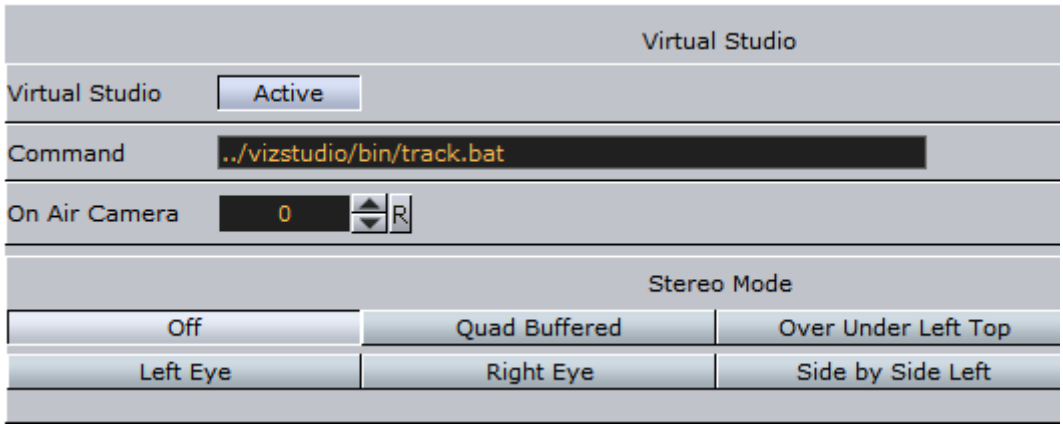
To manually activate an audio device

1. Open the configuration file.
2. Go to **SECTION AUDIO_CONFIG** and locate the **Available0** setting.
3. Activate the identified audio device (**Available0**) by adding its name to the **AudioDevice0** setting.
   - For multiple outputs, more than one device can be added as AudioDevice1, AudioDevice2 and so on; however, this is not very common.
4. Save the configuration file.

Example: AudioDevice0 = Realtek HD Audio output

6.2 Camera

Figure 13: Camera



In this section, special camera behavior settings that are used for virtual studio setups, can be defined. Viz IO is used as the studio configuration and calibration tool for enabling connectivity and control between all required studio devices such as cameras, routers, VTRs, video servers, audio mixers and other studio equipment.

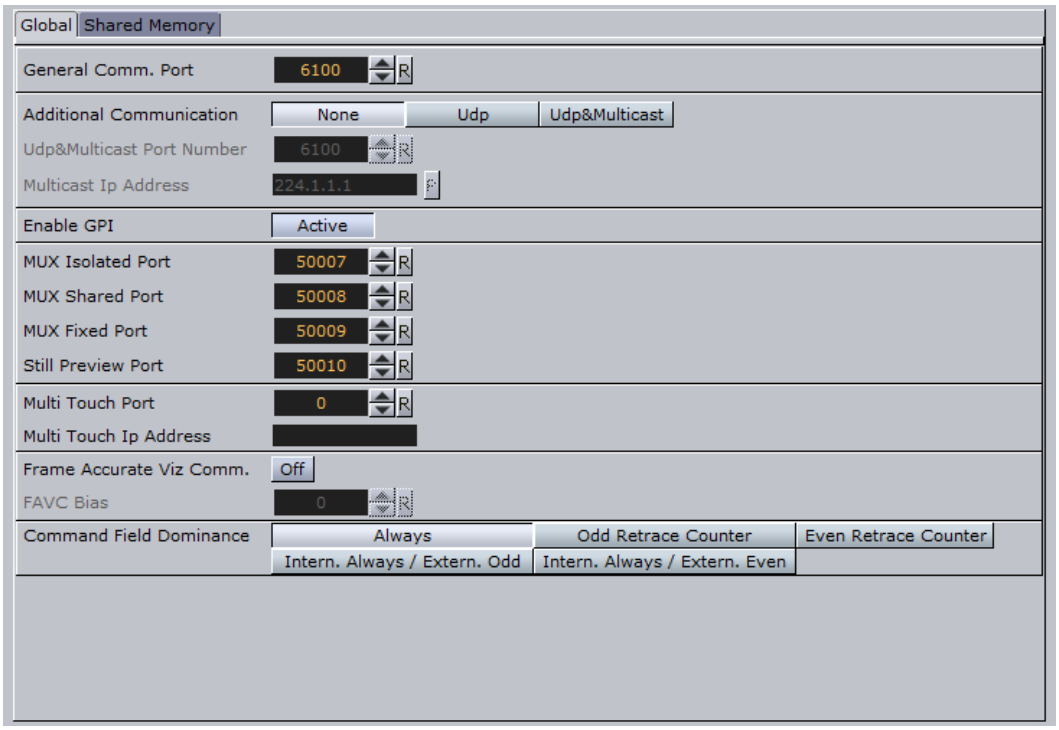
- **Virtual Studio:** When set to *Active* the tracking process will be started when Viz Engine is started.
- **Command:** Sets the path to the .bat file that will start the tracking process. If a valid path is given, Viz Engine will start Viz IO during startup.
- **On-air camera:** Activates the selected camera that should be used when setting the scene in on air mode. The camera is controlled by an external tracking device.

Stereo Mode settings will only take effect on air, during artist you won't see this rendering behavior!

- **Quad Buffered**: When using nVisio glasses together with a monitor with a frequency >100Hz the image for the left/right eye will be shown alternately and the glasses will darken the other eye. This configuration provides the full resolution.
- **Over Under Left Top/Right Top**: Both images will be drawn beneath each. Either side can be drawn first. The image height will be halved, providing half resolution
- **Left/Right Eye**: Either the left or the right eye image will be rendered for dual-channel setups in combination with a Video Wall / Stereo Distributor. Full resolution.
- **Side by Side Left/Right**: Both images will be rendered side by side, either left or right first. The image width will be halved, providing half resolution.

IMPORTANT! If you want to playout 3D Stereo Clips, you need to start Viz Engine with the -3D parameter. This sets Viz Engine in a special mode where a side by side clip will be split and played out on channel A and B on the Matrox board. Note that this is for clips only!

6.3 Communication



In this section, network connections can be set. Any external control software, for example Viz Content Pilot, uses TCP/IP network connections to send commands to the Viz Engine renderer engine. Viz Artist expects the commands at the port that is defined here. For a single pipe (one display) system, the default value (6100) should normally not be changed.

Global

- **General Communication Port:** Sets a general communication port for receiving external commands when in On Air mode. Changes to this setting must be reflected on the client side. Default is port 6100.
- **Additional Communication:** Enables commands to be sent to Viz Engine on UDP and Multicast or a combination of the two. This is used by Viz Video Wall.
- **Udp&multicast Port Number**: Sets the port number for the computers that share the same virtual IP address.
- **Multicast IP Address:** Sets the shared virtual IP address.

IMPORTANT! Viz 3.2 and later allows up to 255 connections; however, the number of connections is also limited to the available main memory and texture memory on the graphics card (see how To limit the number of TCP connections).

- **Enable GPI**: GPIO device control. Enables frame accurate triggering of commands via GPI (general purpose interface). We support Sealevel GPI devices for GPI input.
- **MUX Isolated Port**: Port number for isolated sessions - no data shared (NLE).
- **MUX Shared Port**: Port number for shared sessions - shared data (NLE).
- **MUX Fixed Port**: Port number for fixed sessions - shared data, no reference counting (NLE).
- **Still Preview Port**: Port number for still preview.
- **Multi Touch Port**: Port number for listening to multi touch server.
- **Multi Touch IP Address**: IP address for listening to multi touch server.
- **Frame Accurate Viz Comm.**: Frame accurate commands via TCP (commands delayed by ring buffer and specified FAVC bias). Enable only for external control that supports special frame accurate command execution.
- **FAVC Bias**: Delay fields (in addition to ring buffer size) for frame accurate commands via TCP or GPI. This is the bias in frames for the commands if Frame Accurate Viz Command is turned on. Could be negative as well.
- **FAVC Field Dominance**: States when to handle the commands sent to the engine. E.g when set to “Odd retrace counter” all commands will be handled on odd fields. Not valid in progressive modes. Options are:
  - Always
  - Odd Retrace Counter: Execute commands at an odd retrace counter.
  - Even Retrace Counter: Execute commands at an even retrace counter.
  - Intern. Always/Extern. Odd: Execute commands internally always and externally at an odd retrace counter.
  - Intern. Always/Extern. Even: Execute commands internally always and externally at an even retrace counter.

Shared Memory

- **Multicast IP Address**: Sets the address for synchronizing distributed shared memory map without Viz Graphics Hub.
- **Multicast Port**: Synchronizes shared memory between all Viz Engines listening to the multicast.
- **UDP Port**: Sets the UDP listening port for shared memory input.
- **TCP Port**: Sets the TCP listening port for shared memory input.

- **Master Engine IP Address**: Sets the IP address of the master Viz Engine which holds the complete shared memory map (i.e. loaded during startup of Viz Engine).
- **Master Engine Port**: Sets the initializing port for the shared memory on startup (i.e. command port of the master Viz Engine).
- **Enable Master Poll**: When enabled Viz Engine will load the shared memory map from the defined master Viz Engine.

To limit the number of TCP connections

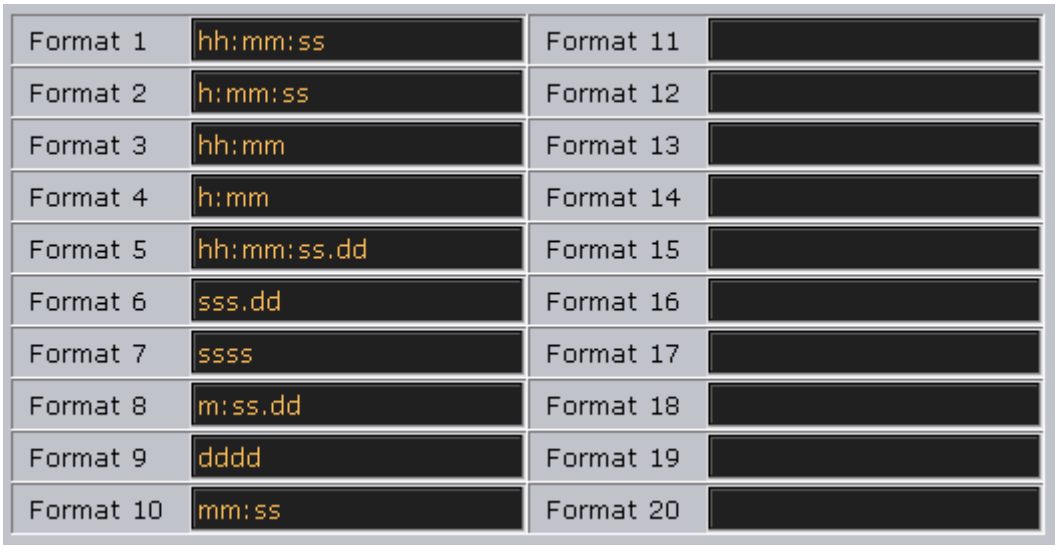
Viz 3.3 and later allows you to limit the number of TCP connections to Viz.

1. Open the Viz configuration file (i.e. *Viz-<hostname>-0-0.cfg*) found in the Viz3 program folder.
2. Under **SECTION COMMUNICATION** set `max_tcp_connections` to the number of TCP connections required.
   - If the number is set to 1 the first control application connecting to Viz will get exclusive control over Viz.

Note: This setting applies to the default port (6100) and the Multiplexing Ports.

6.4 Clock Formats

Figure 14: Clock Formats



In this section, twenty (20) various digital date and time formats can be set.

- **Format 1-20**: Sets and enables the clock formats that may be selected in Viz Artist during scene design.

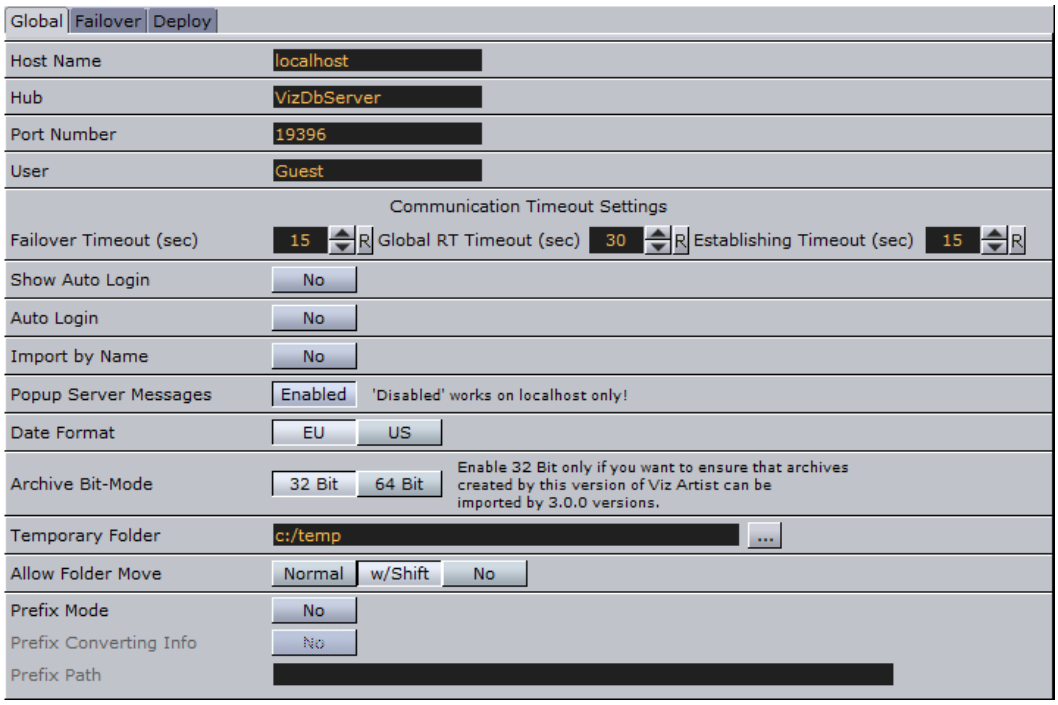
Tip: Add a font GEOM in Viz Artist to see how the clock formats can be used.

6.5 Database

The Database section has the following tabs for setting connections to e.g. Viz Graphics Hub, failover servers and deploy server.

- Global
- Failover
- Deploy

Global



In this section, the Viz Graphics Hub database connection settings are configured.

- **Host Name:** Sets the name of the Viz Graphics Hub naming service. The naming service will always be a one to one map to the hostname of the machine running Viz Graphics Hub.
- **Hub:** Sets Viz Graphics Hub server name.
- **Port Number:** Sets the listener port number for Viz Graphics Hub. The default port number is 19396, and should normally not be changed..
- **User:** Sets the default user.
- **Communication Timeout Settings:**
  - **Failover Timeout (sec)**: Sets the maximum waiting time before a fail over is initiated from the main to the replication Viz Graphics Hub.
  - **Global RT Timeout (sec)**: Sets the maximum response time for any request to Viz Graphics Hub.
  - **Establishing Timeout (sec)**: Sets the maximum waiting time to establish a connection to Viz Graphics Hub.
- **Show Auto Login:** Enables (Yes) the user to check the Auto login check-box in the Viz Graphics Hub login window. When disabled (No), the Auto login check-box is hidden.

- **Auto Login:** Enables or disables automatic login to Viz Graphics Hub. This will effectively disable the login screen for Viz Engine and Viz Artist.
- **Import by Name**: Set to **Yes** to check for existing objects by name rather than by UUID. Set to **No** to check by UUID.
- **Popup Server Messages:** Enables or disables popup server messages. Disabled only works on local host.
- **Date Format:** Sets the date format to EU (DD.MM.YYYY 13:54) or US (MM/DD/YY 01:54).
- **Archive Bit-Mode:** Sets the bit-mode in which the archive will be saved.

Note: For compatibility, 32-bit should be enabled if scenes will be imported to Viz Artist 3 versions prior to build 2310.

- **Temporary Folder:** Sets the location of the temporary folder that is used to save temporary plug-in data. The folder can be a local drive, mapped drive or a Universal Naming Convention (UNC) path.

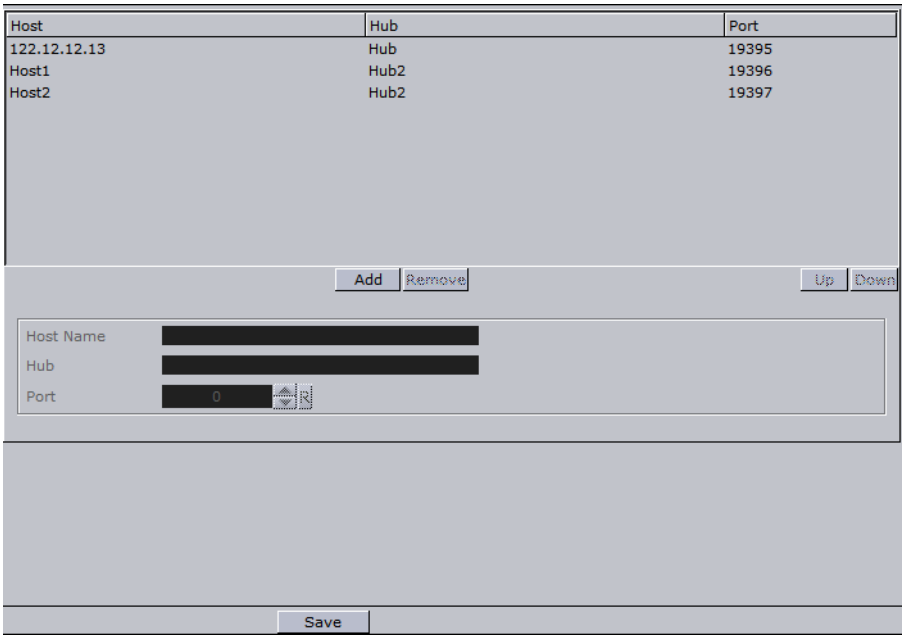
IMPORTANT! Make sure the Temporary Folder is configured with read and write access rights.

- **Allow Folder Move**: Allows or restricts the users ability to move/organize projects and folders in Viz Graphics Hub. Options are Normal, with Shift or No. Default is Normal which allows the user to freely move projects and folder.

The following prefix settings are needed if you are using an external control application that sends commands containing certain path locations, but where the path of your files is a different one on your Viz Graphics Hub (e.g. because you deployed them to a specific location).

- **Prefix Mode**: Activates the prefix mode.
- **Prefix Converting Info**: Shows the prefixed (final) paths in the console (this behaves like the Viz Artist 2.x debug mode).
- **Prefix Path**: Contains the prefix path string that is used for incoming commands containing path parameters.

Failover



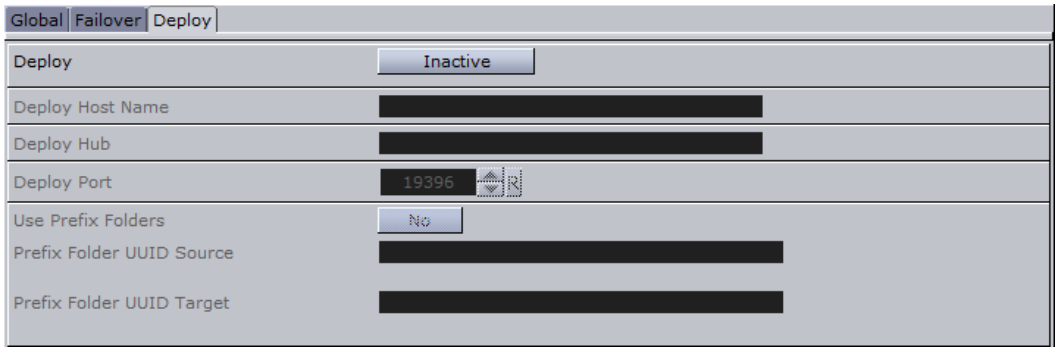
To add redundant servers to the failover list

1. Enter the host name.
2. Enter the Graphics Hub.
3. Enter the port number.
4. Click **Add**.

Tip: You can raise and/or lower a database's priority in the event of failover using the **Up** and **Down** buttons in the database failover list.

5. When finished all modifications, click **Save**.

Deploy



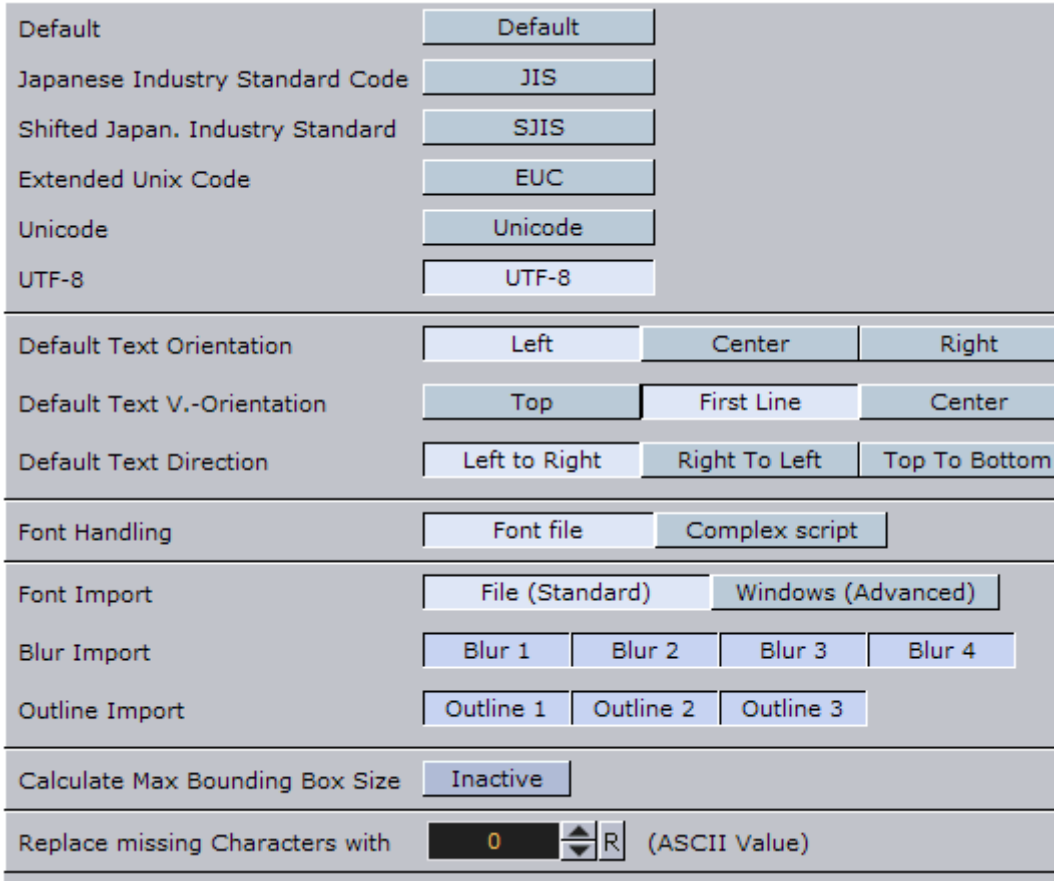
- **Deploy**: Enable or disable deployment of graphics data. When activated you will get a Deploy tab/button in the Viz Artist user interface.
- **Deploy Host Name**: Sets the hostname of the Viz Graphics Hub machine you deploy your files to.
- **Deploy Hub**: Sets the name of the Viz Graphics Hub instance you deploy your files to.

- **Deploy Port**: Sets your Viz Graphics Hub's listener port number.
- **Use Prefix Folders**: Enables you to define a prefix source and target.
- **Prefix Folder Uuid Source**: Sets the source folder's Uuid of the Viz Graphics Hub you deploy from.
- **Prefix Folder Uuid Target**: Sets the target folder's Uuid of the Viz Graphics Hub you deploy to.

Note: To use correct Uuids you must have both Viz Graphics Hub systems running.

6.6 Font Options

Figure 15: Font Options



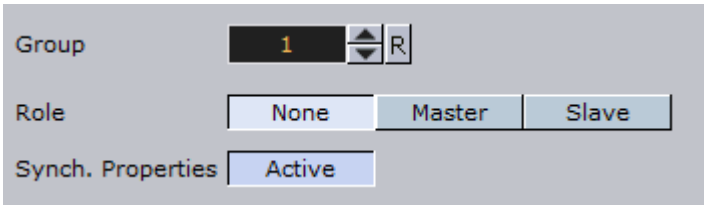
In this section, the font encoding can be configured.

- **Font Options: Sets the font encoding. Available options are:**
  - **Default:** Sets the font encoding to single character interpretation (limited to 255).
  - **Japanese Industry Standard Code (JIS):** Sets Japanese industry standard code character encoding.
  - **Shifted Japanese Industry Standard Code (SJIS):** Sets the newer Shift JIS character encoding standard which sets aside certain character codes to signal the start of a two-character sequence.

    - **Extended Unix Code (EUC)**: Sets Extended Unix Code (EUC) character encoding that is a multi byte character encoding system used primarily for Japanese, Korean, and simplified Chinese.
    - **Unicode**: Sets the Unicode character encoding where every two characters are interoperated as one (not widely used).
    - **UTF-8**: Sets UTF-8 (8-bit UCS/Unicode Transformation Format) character encoding that is a variable-length character encoding for Unicode.
- **Default Text Orientation**: Sets the default horizontal text orientation. Available options are; Left, Center and Right.
- **Default Text V. Orientation**: Sets the default vertical text orientation. Available options are; Top, First Line, Center and Bottom.
- **Default Text Direction**: Sets the default text direction. Available options are; Left to Right, Right to Left and Top to Bottom.
- **Font Handling**: Sets the font handling. Available options are Font file or Complex script.
    - **Font file**: Sets the font kerning to Font file that is mainly used for languages written from left to right.
    - **Complex script**: Sets the font kerning to Complex script. Complex script is mainly used for languages written from right to left and/or that one character can be are composed of one or several Glyphs.
- **Font Import**: Sets the Font import. Available options are; File (Standard) and Windows (Advanced).
    - **File (Standard)**: Imports and stores fonts on the database.
    - **Windows (Advanced)**: Stores only the font name on the database. For this to work the font must be installed on the Windows system where Viz Engine resides.
- **Blur Import**: Enables blur levels for fonts used in Viz 2.x scenes. These options will make sure that fonts that are imported to Viz 3.x will be recreated with all blur levels used in Viz 2.x. Available options are; Blur 1-4.
- **Outline Import**: Enables outline levels for fonts used in Viz 2.x scenes. These options will make sure that fonts that are imported to Viz 3.x will be recreated with all outline levels used in Viz 2.x. Available options are; Outline 1-3.
- **Calculate Max Bounding Box Size**: Enables Viz 3.x to calculate the bounding boxes as they were calculated in Viz 2.x. In Viz 3.x a text object's bounding box height will increase if a capital character is entered (e.g. an umlaut (double dots)). In viz 2.x the bounding box height was always the same and independent of the characters in the text object. Available options are Active and Inactive. Default is Inactive (false).
- **Replace missing Characters with**: Replaces a missing font character in a font file with a default font character. The Unicode value refers to the decimal value of the replacement character in the Unicode table (valid values are 0-65553). Normal usage would select a * (42) or _ (95).

6.7 Global Input

Figure 16: Global Input



The Global Input settings influence the generation and handling of *Six Degrees of Freedom* (6DoF) messages that can be distributed to several Viz Engines.

6DoF is used when working in 3D space in combination with special input devices such as a mouse. A mouse uses two coordinates (xy) which Viz is able to translate into three coordinates (xyz) based on a grid.

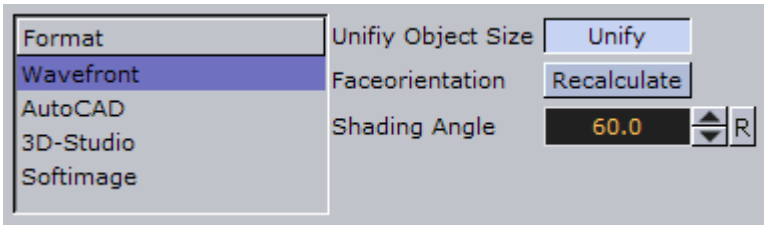
- **Group**: Defines which multicast group the generated or received messages belong to. If more than one group is to be defined, a unique Group number must be set for each group.
- **Role**: Defines how messages are generated and processed. Alternatives are; None, Master and Slave.
  - **None**: Messages are only generated and processed on the local Viz Engine.
  - **Master**: A Master creates messages for himself and the defined group.
  - **Slave**: A Slave reads and processes 6DOF messages but is not allowed creating them.
- **Synch. Properties**: Activates/deactivates synchronization of Viz Engine scene properties.

To synchronize multiple Viz Engines

1. Start Viz Config on all involved render machines.
2. Set the same Group ID for all engines, and set Synch. Properties to Active.
3. Save and close all Viz Configs.
4. Open the Control Panel on all render machines, and make sure that you deactivate all unused network connections.
   - Viz Engine always uses the first network connection setup by the Windows operating system.
   - Synchronized engines work within the same network segment only because it is using multicasts, hence, it is important to use the right connection.
   - You can also determine the first connection by setting a manual metric in Windows: http://support.microsoft.com/kb/299540.
5. Start all Viz Engines again.
6. Create a simple test scene with a geometry and the Synchronized Properties plug-in (Built Ins > Container > Global) on the same container.
7. Save the scene and open it on all involved engines.
8. Move the geometry on one engine.
   - All the other engines will show the same object movement.

6.8 Import 3D Options

Figure 17: Import 3D Options



In this section, parameters influencing the import of 3D objects can be configured. There are four different formats; Wavefront, AutoCAD, 3D-Studio, and Softimage.

The Wavefront, AutoCAD, and 3D-Studio formats have three available controls:

- **Unify Object Size:** If enabled, all vertices are recalculated during import in a way that the object centre is moved to the origin (0,0,0), and the size of the object is 100 cm in its largest extent. If disabled, all vertices retain their values as defined in the original file. An object could appear invisible in a Viz Artist 3 scene because the object is translated a lot from the origin or is scaled up or down a lot. It could be necessary to deactivate the unification to be able to recombine several separately imported objects that must keep their size and relative position.
- **Face Orientation:** Polygonal 3D models often do not have a consistent face orientation, but for performance reasons, the Viz Artist 3 renderer expects that all faces of an object point to the same direction. If enabling this function, Viz Artist 3 tries to rearrange the orientation of the object faces during import.
- **Shading Angle:** If the 3D object has no normal vector information, Viz Artist automatically recalculates the normal's from the geometry to make lighting possible. This recalculation is influenced by the shading angle, which acts as a threshold between sharp and soft edges.

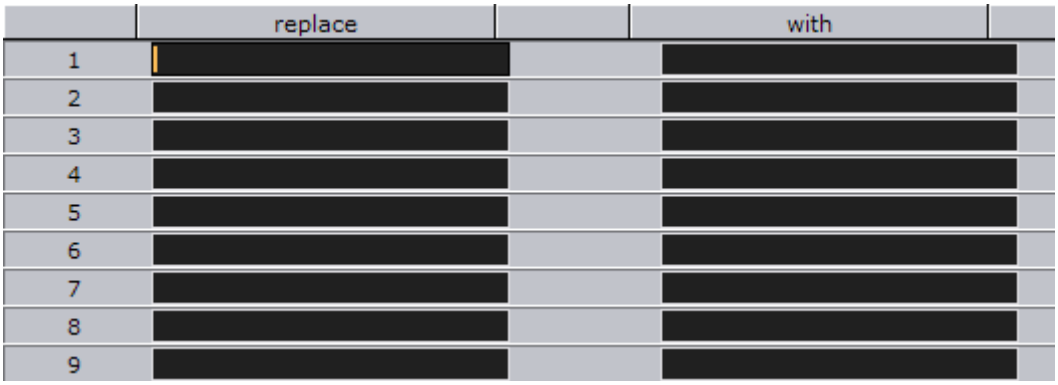
Note: A shading angle value of 60 means that an edge between two faces is considered to be a soft edge for angles below 60 and a sharp edge above this level. 60 is the default shading angle.

The Softimage format has two available controls:

- **Classic Scaling:** Changes Softimage rotation order to conform to the internal rotation order of Viz.
- **Enable Animations:** Allows import of saved Softimage animations.

6.9 Image File Name Convert

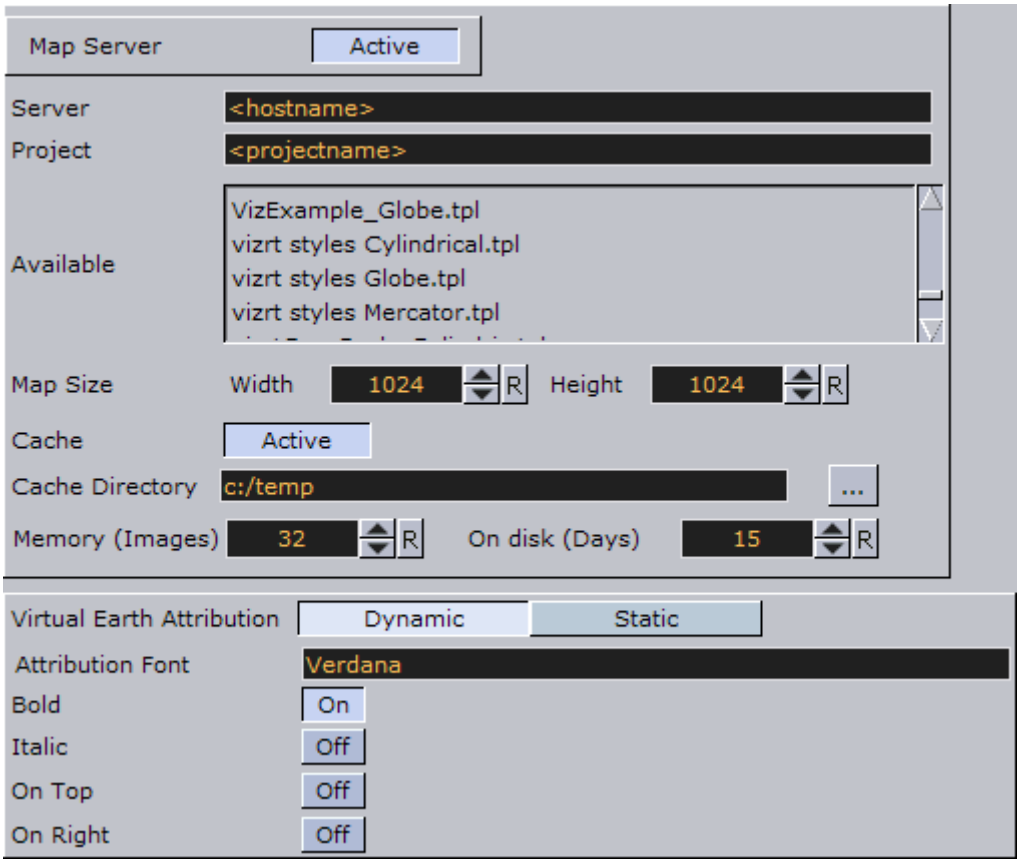
Figure 18: Image File Name Convert



In this section, nine (9) different replacement configurations can be set for image file names. For example; If an image file name starts with the string *Replace* this part of the file name can be replaced by the string *With*.

- **Replace:** Defines the string that will be replaced.
- **With:** Defines the replacement string.

6.10 Maps



- **Map Server**: Enables or disables Viz World Server (WoS) connection for Viz World Client (WoC).
- **Server**: Sets the Viz World Server host.
- **Project**: Sets the default map project that will be opened with the client application.
- **Available**: Lists all available Viz World Server projects.
- **Map size**: Sets the default map size that will be used with the client application.
- **Cache**: Enables caching of maps for faster preview and fetching of maps. Especially useful for journalists and operators using Newsroom Component and Viz Trio respectively.
- **Cache Directory**: Sets the cache directory for cached maps which can be a local drive, mapped drive or a Universal Naming Convention (UNC) path.

IMPORTANT! Make sure the Cache Directory folder is configured with read and write access rights.

- **Memory (Images)**: Sets the number of images to keep in memory.
- **On disk (Days)**: Sets the number of days to save images on disk.
- **Virtual Earth Attribution**: Adds an attribution to the map. Alternatives are; Static and Dynamic.
  - **Dynamic**: Displays the attribution when a Microsoft Virtual Earth image is in view and disappears when the image is out of view.

- **Static**: Displays the attribution as long as there is a Microsoft Virtual Earth image in the scene.
- **Attribution Font**: Sets the font for the Virtual Earth attribution.
- **Bold**: Sets the Virtual Earth attribution font to **bold**.
- **Italic**: Sets the Virtual Earth attribution font to *italic*.
- **On Top**: Places the Virtual Earth attribution image to the top in the screen. Default is bottom.
- **On Right**: Places the Virtual Earth attribution image to the right in the screen. Default is left.

6.11 Matrox

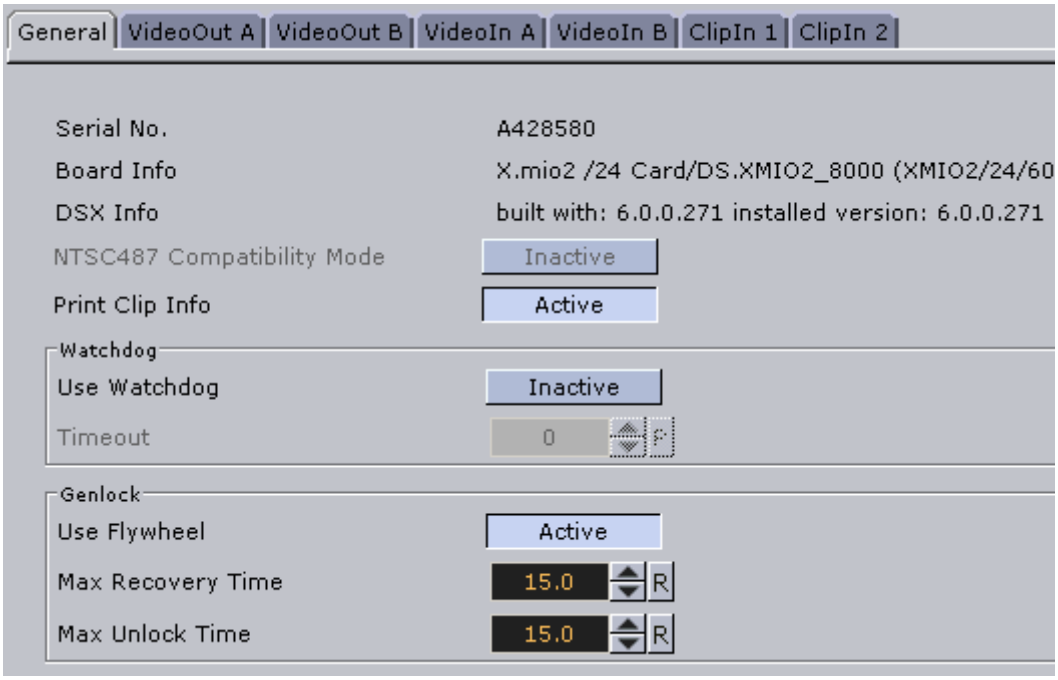
In Viz Artist 3.3 it is possible to assign Matrox' in and out channels to Viz Artist's in and out channels.

The GUI shows a tab for General and, according to the installed hardware, tabs for VideoOut, VideoIn, and ClipIn. Depending on your installed hardware there might be different tabs available.

This section contains information on the following topics:

6.11.1 General

Figure 19: General Matrox configuration

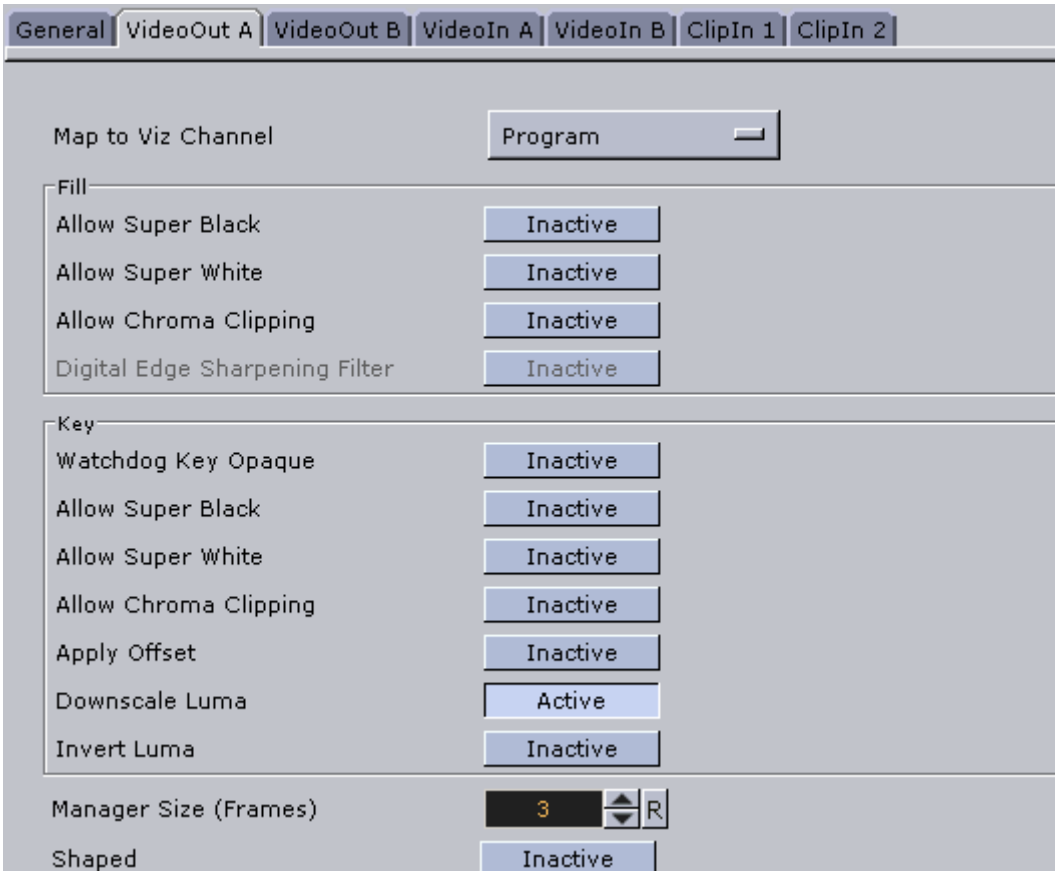


The General tab shows information about the installed hardware.

- **Serial No.**: Shows the serial number of the installed Matrox board.
- **Board Info**: Shows the model and type of the Matrox board.
- **DSX Info**: Shows the software version and driver version.
- **NTSC487 Compatibility Mode**: *For future use*. Enables the NTSC 487 compatibility mode. Default mode is Inactive.
- **Print Clip Info**: When activated this setting enables printing of clip information to the console; however, such information may cause the render loop to stall. Default mode is Inactive.
- **Use Watchdog**: When activated this setting enables the Matrox X.mio watchdog feature. It defines what kind of key is produced when the watchdog takes over control. Default mode is Inactive. When the watchdog is enabled, turning off the video out will activate the hardware bypass after a given timeout (see next setting).
- **Timeout**: Defines the time in milliseconds until the watchdog takes over control. This value should not be smaller than the time of two fields/frames. Default value is 999 milliseconds.
- **Use Flywheel**: When activated the Matrox card adopts a tracking mode if the genlock signal is interrupted or lost that maintains the signal frequency until the source genlock signal is regained. Default mode is Active.
- **Max Recovery Time**: Represents the time in milliseconds (ms) provided to the flywheel to attempt to regain the genlock before an abrupt jump to the locked state is performed. Default value is 15.
- **Max Unclock Time**: Represents the time in milliseconds (ms) provided to the flywheel to remain in the unlocked state before switching to the free running state. Default value is 15.

6.11.2 VideoOut

Figure 20: VideoOut configuration



The VideoOut tab displays a simple and an Advanced Properties and Parameters view. The simple view shows the mapped Viz Artist channel. In the advanced view every setting of the output channel can be controlled. The switch between the simple and the advanced view is done with the small black triangle on the right hand side.

- **Map to Viz Channel:** Decides which Viz Artist video out channel is mapped onto this Matrox video out channel. The drop-down gives a choice between the available channels. Only the channels not already taken are shown.
  - **Unused:** Do not use this Matrox channel for output.
  - **Program:** Plays out the Program signal of Viz Artist.
  - **Preview:** Plays out the Preview signal of Viz Artist.

On a single channel configuration VideoOutA is usually mapped to Program and VideoOutB to Preview, whereas on a dual channel configuration usually the first channel maps VideoOutA to Program and the second channel VideoOutB to Program.

This section also contains information on the following topics:

- Advanced Properties and Parameters
  - VideoOut fill settings
  - VideoOut key settings

- Manager size, shaped and repeat mode settings
- VideoOut VBI settings

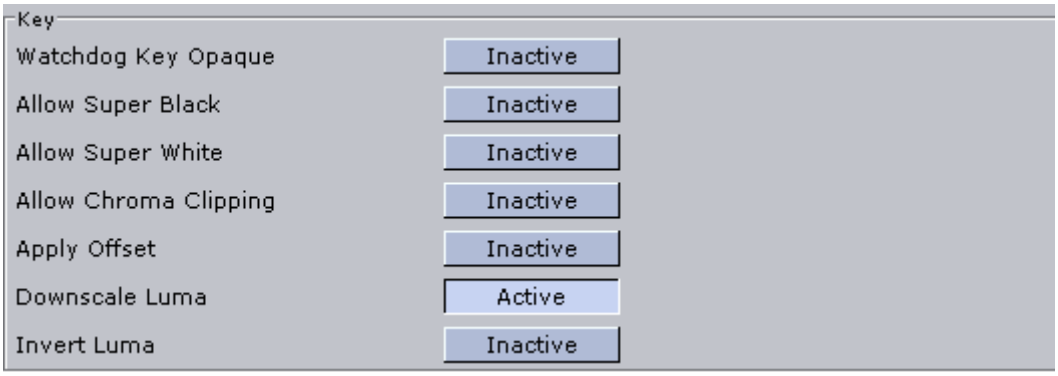
Advanced Properties and Parameters

Figure 21: VideoOut fill settings

Group for fill component of the video output.

- **Allow Super Black**: Determines whether or not to clip an output video signal that is under 7.5 IRE units. Default mode is Inactive.
- **Allow Super White**: Determines whether or not to clip an output video signal that is over 100 IRE units. Default mode is Inactive.
- **Allow Chroma Clipping**: Determines whether or not to clip over-saturated chroma levels in the active portion of the output video signal. Default mode is Inactive.
- **Digital Edge Sharpening Filter**: Applies an edge sharpening filter to digital output video. Default mode is Inactive. SD configurations only.

Figure 22: VideoOut key settings



Group for key component of the video output.

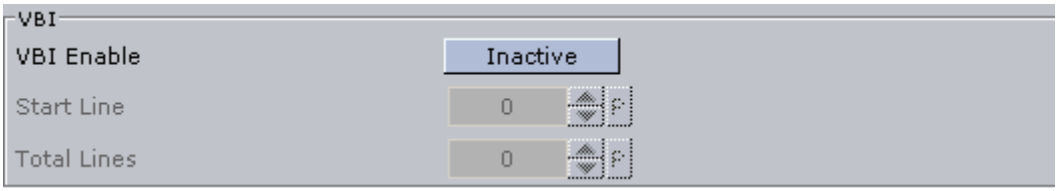
- **Watchdog Key Opaque**: Specifies if the output key must be opaque or transparent when the watchdog unit activates. Default mode is Inactive.
- **Allow Super Black**: Determines whether or not to clip an output video signal that is under 7.5 IRE units. Default mode is Inactive.
- **Allow Super White**: Determines whether or not to clip an output video signal that is over 100 IRE units. Default mode is Inactive.
- **Allow Chroma Clipping**: Determines whether or not to clip over-saturated chroma levels in the active portion of the output video signal. Default mode is Inactive.
- **Apply Offset**: Applies an offset to the luminance values such that the inverted result still falls within the 16-235 range. Default mode is Inactive.
- **Downscale Luma**: Compresses the luminance range of the output key signal from 0-255 to 16-235. Default mode is Active.

- **Invert Luma**: Inverts the luminance part of the output key signal (inverts the key). Default mode is Inactive.

Figure 23: Manager size, shaped and repeat mode settings

- **Manager Size (frames):** Sets the number of frames available in the on-board memory for output. A too high value may cause memory problems on the Matrox card. Default value is 3.
- **Repeat Mode:** Defines the way the output should be repeated if Viz Engine is stalled and does not update the output. Default mode is Field. Available modes are:
  - **None:** Does not repeat. Output goes black.
  - **Field:** Repeats the last played field.
  - **Frame:** Repeats the last played frame.
- **3G Level B**: Activates Level B for 3G mode in 1080p 50/60/60M (default mode is Level A).

Figure 24: VideoOut VBI settings

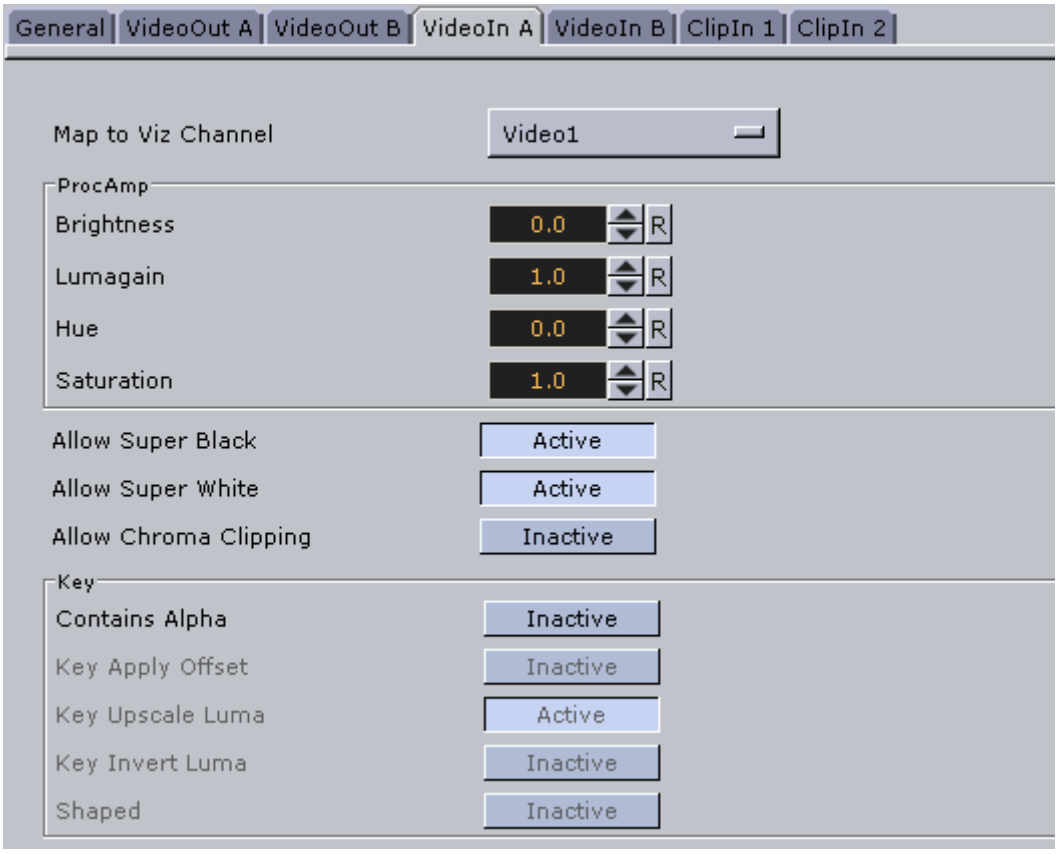


Group for Vertical Blanking Interval (VBI) related settings.

- **VBI Enable:** Enable/disable VBI output.
- **Start Line:** Defines at which line on the output the VBI section should start. Default value is 0 (Off). The minimum VBI values are:
  - NTSC: 7
  - PAL: 6
  - 720p: 7
  - 1080i: 6
- **Total Lines:** Defines how many lines the VBI section in the output should have in total. Default value is 0 (Off). The maximum VBI values are:
  - NTSC: 32
  - PAL: 34
  - 720p: 19
  - 1080i: 30

6.11.3 VideoIn

Figure 25: VideoIn configuration



The VideoIn tab comes with a simple and an Advanced Properties and Parameters view. The simple view shows only the mapped Viz Artist channel. In the advanced view every setting of the input channel can be controlled. The switch between the simple and the advanced view is done with the small black triangle on the right hand side.

- **Map to Viz Channel:** decides which Viz Artist video in channel is mapped onto this Matrox video in channel. The drop-down gives a choice between the available channels. Only the channels not already taken are shown.
  - **Unused:** Do not use this Matrox channel for video input
  - **Video1:** Captured input is available in Viz Artist Video1.

On a single channel configuration VideoInA is usually mapped to Video1 and VideoInB to Video2 and so on whereas on dual channel configuration usually the first channel maps VideoInA to Video1 and the second channel maps VideoInB to Video1. In this case both, the first and the second channel, have one video input configured, namely Video1.

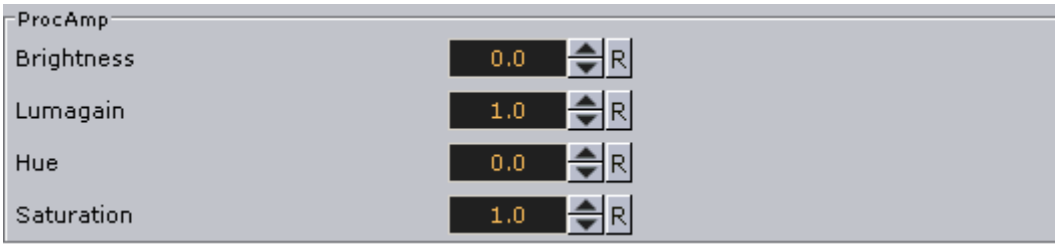
This section also contains information on the following topics:

- Advanced Properties and Parameters
  - VideoIn ProcAmp settings
  - VideoIn super black, white and chroma clipping settings
  - VideoIn key settings

- VideoIn video settings
- VideoIn VBI settings
- VideoIn audio settings

Advanced Properties and Parameters

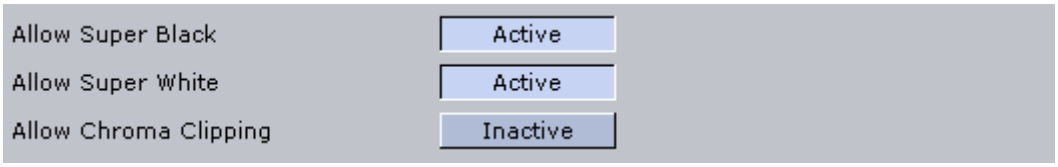
Figure 26: VideoIn ProcAmp settings



Group for signal related settings.

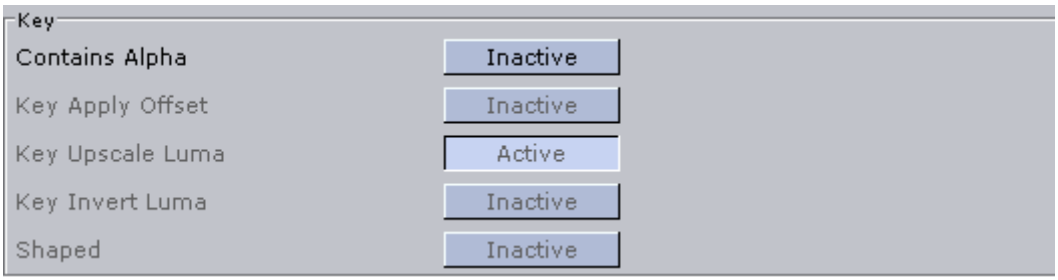
- **Brightness**: Sets the relative offset on the luminance component of the incoming video (min./max. values are dynamic and determined by the hardware). Default value is 0 (Off).
- **Lumagain**: Sets the gain on the luminance component of the incoming video (min./max. values are dynamic and determined by the hardware). Default value is 0 (Off).
- **Hue**: Sets the color shift on the chrominance component of the incoming video (min./max. values are dynamic and determined by the hardware). Default value is 0 (Off).
- **Saturation**: Sets the gain on the chrominance component of the incoming video (min./max. values are dynamic and determined by the hardware). Default value is 1 (On).

Figure 27: VideoIn super black, white and chroma clipping settings



- **Allow Super Black**: Determines whether or not to clip an input video signal that is under 7.5 IRE units. Default mode is Active.
- **Allow Super White**: Determines whether or not to clip an input video signal that is over 100 IRE units. Default mode is Active.
- **Allow Chroma Clipping**: Determines whether or not to clip over-saturated chroma levels in the active portion of the input video signal. Default mode is Inactive.

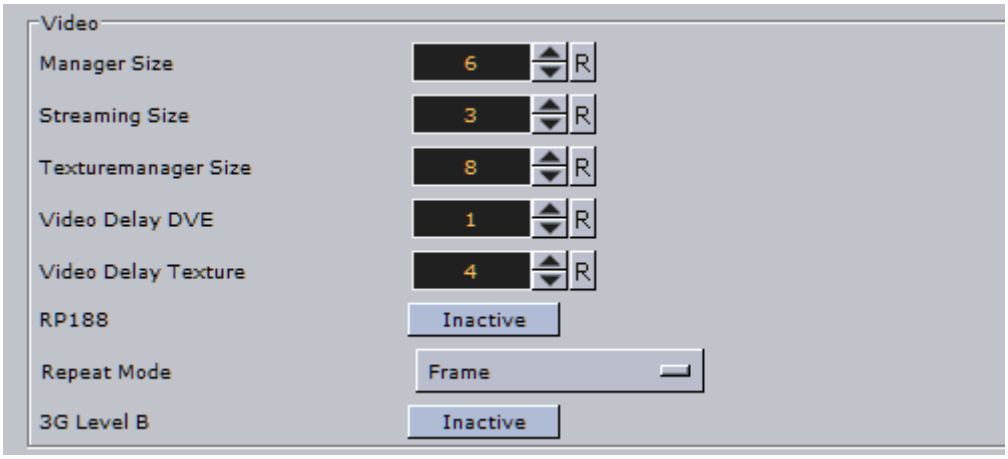
Figure 28: VideoIn key settings



Group for key component of the video input.

- **Contains Alpha:** Enables/Disables use of alpha component. This switch is only enabled on input channels where capture with alpha is supported.
- **Key Apply Offset:** Enables/Disables key offset.
- **Key Upscale Luma:** Enables/Disables key upscale luma.
- **Key Invert Luma:** Enables/Disables key invert luma.
- **Shaped:** Enables/Disables capture in shaped format.

Figure 29: VideoIn video settings



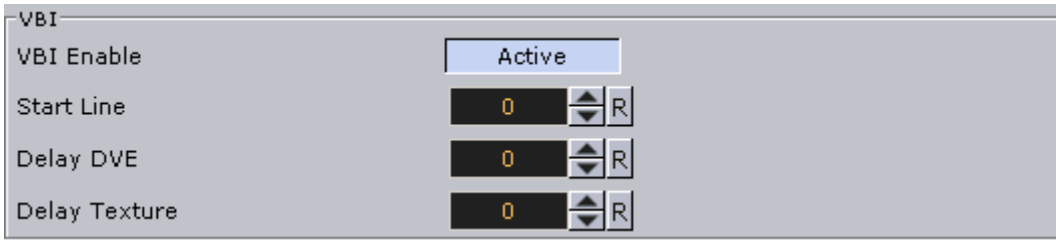
Group for fill component of the video input.

- **Manager Size:** Sets the number of frames available in the on-board memory for capturing. This value is influenced by the input delays specified in the parameters below and will automatically be adjusted if it is too low. A too high value may cause memory problems on the Matrox card. Default value is 6.
- **Streaming Size**: *Not in use*.
- **Texturemanager Size:** Defines the size of the texture buffer in frames. Default value is 8.
- **Video Delay DVE:** Sets the number of frames the live input should be delayed before it can be used as a DVE layer. Similar to the *LoopthroughDelay* for Targa boards. Default value is 0 (Off).
- **Video Delay Texture**: Sets the number of frames the live input should be delayed before it can be used as a texture in the scene. Default value is 4.
- **RP188 Enable**: Enables capturing of SMPTE RP 188 extra information such as LTC and VITC. Default is Inactive.
- **Repeat Mode**: Determines the behavior of the video input in case of capture drops. The drop-down gives a choice between
  - **None**: Does not repeat. Input goes black.

- **Field**: Repeats the last field.
- **Frame**: Repeats the last frame.

- **3G Level B**: Activates Level B for 3G mode in 1080p 50/60/60M (default mode is Level A).

Figure 30: VideoIn VBI settings



Group for Vertical Blanking Interval (VBI) related settings.

- **VBI Enable**: When set to Active this setting will enable VBI for this channel. Default is Inactive. Note that if the input resolution is different from the output resolution it is impossible to activate VBI since VBI can only be inserted if the resolutions are the same.
- **Start Line**: Defines at which line on the input the VBI section will start. Default value is 0 (Off). The minimum VBI values are (as for VideoOut):
  - NTSC: 7
  - PAL: 6
  - 720p: 7
  - 1080i: 6
- **Delay DVE**: Sets the number of frames the VBI should be delayed before the clip can be used in DVE mode. Default for Viz 3.3 is 0 (Off). For Viz 3.2 the value is 1.
- **Delay Texture**: Sets the number of frames the VBI should be delayed before the clip can be used in texture mode. Default is 0 (Off).

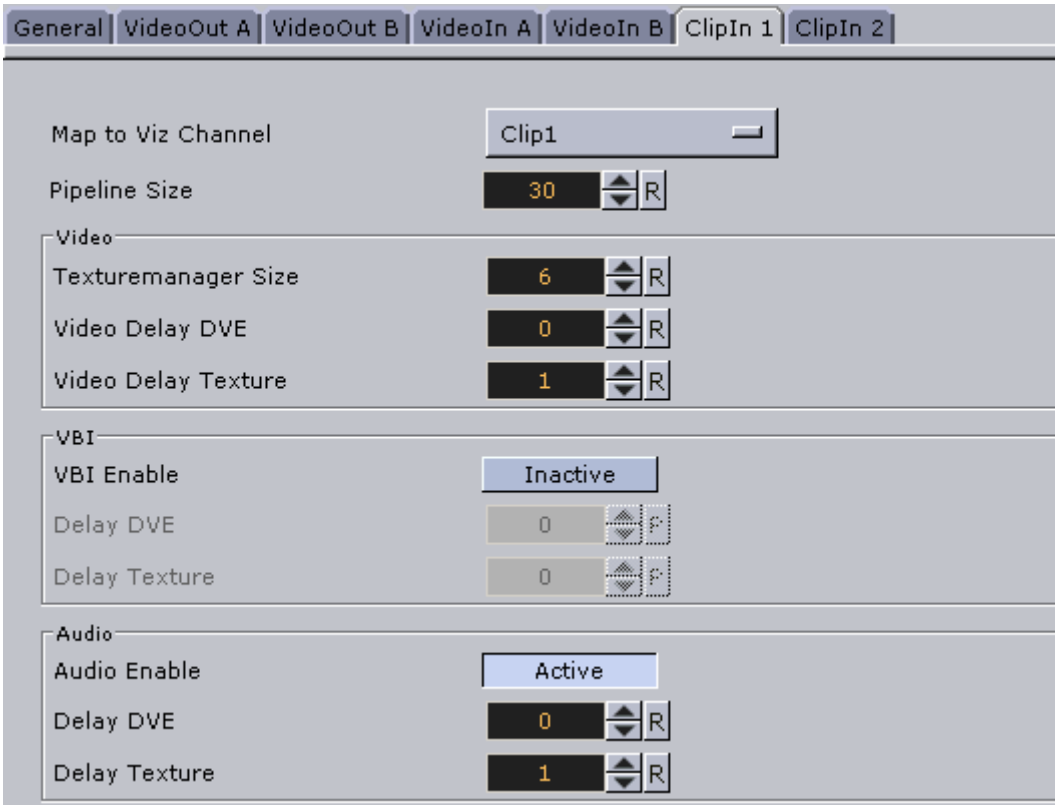
Figure 31: VideoIn audio settings

Group for audio related settings.

- **Audio**: When set to Active this setting enables audio capturing on this channel. Default mode is Active.
- **Channels**: Sets the number of audio channels to capture. Default number of channels are 2. Available channel options for AES on X.mio are None, 1, 2, and 4. For AES on X.mio2 and for Embedded the channel options are None, 1, 2, 4, 8, and 16.
- **Delay DVE**: Sets the number of frames the audio should be delayed in DVE mode before it can be mixed to the output. Default value is 4.
- **Delay Texture**: Sets the number of frames the audio should be delayed in texture mode before it can be mixed to the output. Default value is 4.

6.11.4 ClipIn

Figure 32: ClipIn configuration



The ClipIn tab comes with a simple and an advanced view. The simple view shows only the mapped Viz Artist channel. In the advanced view every setting of the input channel can be controlled. The switch between the simple and the advanced view is done with the small black triangle on the right hand side.

- **Map to Viz Channel:** Decides which Viz Artist clip in channel is mapped onto this Matrox clip in channel. The drop-down gives a choice between the available channels. Only the channels not already taken are shown.
  - **Unused:** Do not use this Matrox channel for clip input.
  - **Clip1:** Clip playback is available in Viz Artist Clip1.

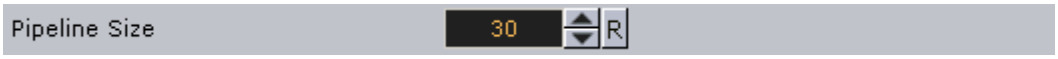
Usually Matrox' ClipIn1 is mapped to Viz' Clip1 and ClipIn2 to Clip2 and so on.

This section also contains information on the following topics:

- Advanced Properties and Parameters
  - ClipIn pipeline size setting
  - ClipIn video settings
  - ClipIn VBI settings
  - ClipIn audio settings
  - ClipIn key settings

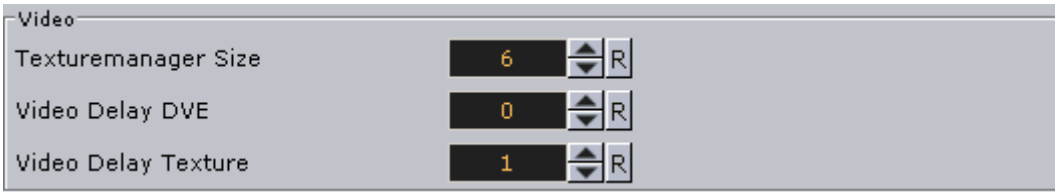
Advanced Properties and Parameters

Figure 33: ClipIn pipeline size setting



- **Pipeline Size:** Defines the number of frames Matrox' internal clip reader buffer should buffer in advance. Default value is 30.

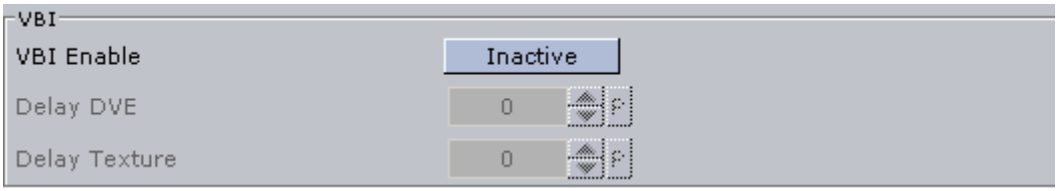
Figure 34: ClipIn video settings



Group for fill component of the clip in channel

- **Texuremanager Size:** Texture download buffer size.
- **Video Delay DVE:** DVE Delay of video when used as DVE.
- **Video Delay Texture:** Texture Delay of video when used as Texture.

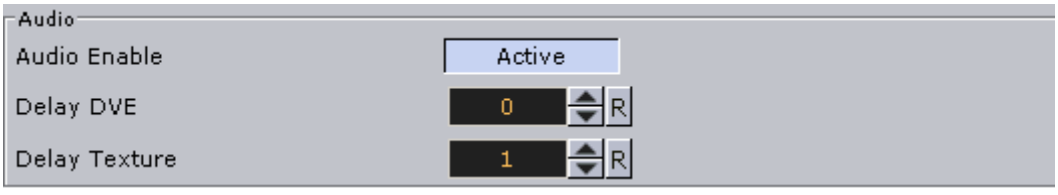
Figure 35: ClipIn VBI settings



Group for Vertical Blanking Interval (VBI) related settings.

- **VBI Enable:** Defines whether VBI should be used for this channel. Default mode is Inactive.
- **Delay DVE:** Sets the number of frames the VBI should be delayed before the clip can be used in DVE mode. Default value is 0 (Off).
- **Delay Texture:** Sets the number of frames the VBI should be delayed before the clip can be used in texture mode. Default value for Viz 3.3 is 1. For Viz 3.2 the value is 2.

Figure 36: ClipIn audio settings



Group for audio related settings.

- **Audio Enable:** When activated, this setting enables audio for this channel. When inactive audio is disabled. Default value is Activated.

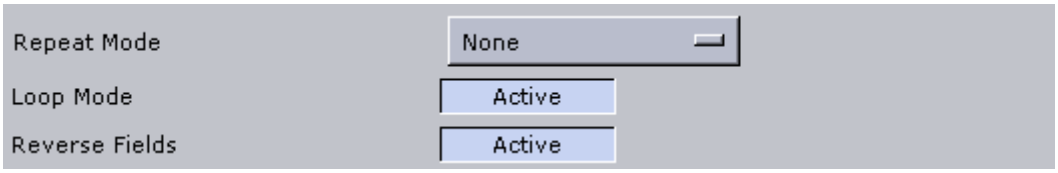
- **Delay DVE**: Sets the number of frames the audio clip should be delayed in DVE mode before it can be mixed to the output. Default value is 4.
- **Delay Texture**: Sets the number of frames the audio clip should be delayed in texture mode before it can be mixed to the output. Default value is 4.

Figure 37: ClipIn key settings

Group for key component of the clip in channel

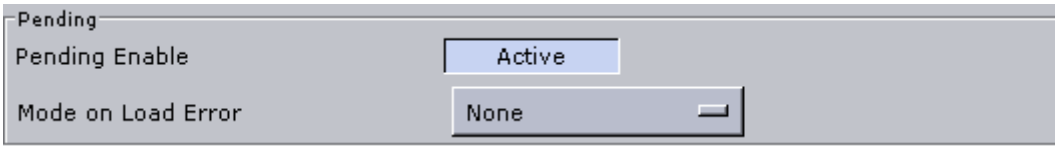
- **Contains Alpha**: Enables/disables playback of clips with alpha.
- **Upscale Luma**: Enables/disables the default for upscale luma. Per scene setting of this value is set per clip channel under Scene Settings and Video clip options.
- **Shaped**: Defines whether the fill from this channel, when the channel is used in DVE mode, should be interpreted as shaped video during DVE compositing. Default value is Inactive.

Figure 38: Repeat and loop mode and reverse fields



- **Repeat Mode**: Determines the behavior of the video input in case of capture drops. Available options are None, Field and Frame.
  - **None**: Does not repeat. Input goes black.
  - **Field**: Repeats the last field.
  - **Frame**: Repeats the last frame.
- **Loop Mode**: Enables/disables default for loop mode. Per scene setting of this value is set per clip channel under Scene Settings and Video clip options.
- **Reverse Fields**: Swaps fields when playing interlaced clips with negative playback speed (default setting). Per scene setting of this value is set per clip channel under Scene Settings and Video clip options.

Figure 39: ClipIn pending settings



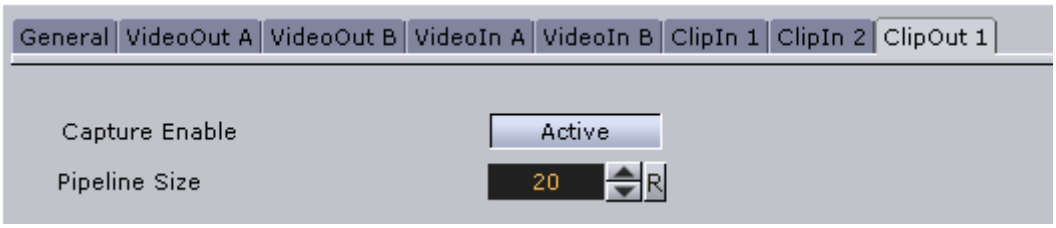
Group for pending support.

- **Pending Enable**: Enables/disables pending clip player for this channel. The pending clip player allows clip loading of another clip while the clip channel is still using the current clip.
- **Mode on Load Error**: Determines the behavior of the current clip when loading of the pending clip fails.

- **None:** Current clip mode is not changed.
- **Stop:** Performs a Stop command on the current clip.
- **Pause:** Current clip enters pause mode.
- **Flush:** Unloads the current clip.

6.11.5 ClipOut

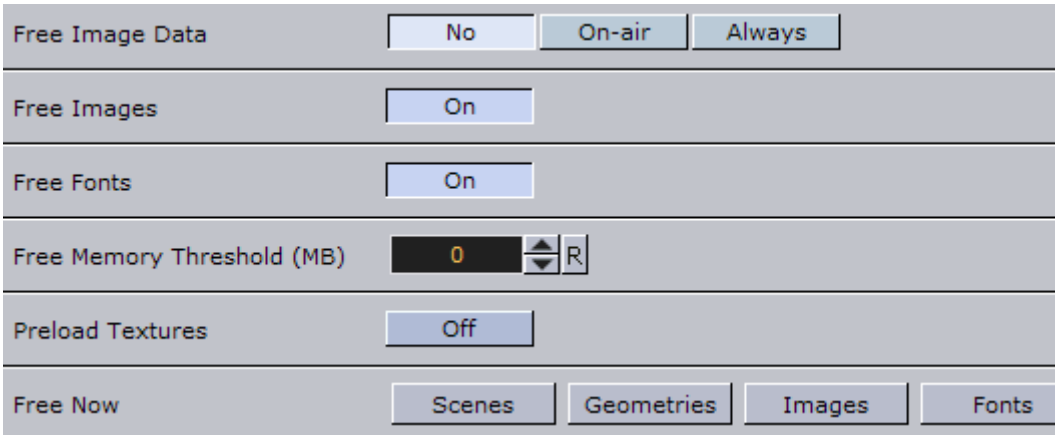
Figure 40: Clipout settings



- **Capture Enable**: Enables or disables the clip writer functionality. The main use is to give you control over host memory resources. When the clip writer functionality is not needed then the clip out channel does not need to be allocated.
- **Pipeline Size**: Gives control over the number of frames that the clip writer uses for file handling, similar to the setting in the ClipIn channels.

6.12 Memory Management

Figure 41: Memory Management



- **Free Image Data:** Loads images into the main memory, and if those images are rendered too, they will be loaded as texture to the graphics card memory as well. Free Image Data gives the possibility to free the image data from the main memory after texture creation. Available options are No, On-air and Always.

Note: If there are modifications done to an image then its texture will be rebuild a lot faster if the data already lies in the main memory (instead of re-loading it from the database).

    - **No**: Disables the Free Image Data option. This option is faster, but needs a lot of memory.
    - **On-air**: Frees image data when in On Air mode, but not in Viz Artist. mode.
    - **Always**: Frees image data every time after the texture was created. This option saves a lot of memory but is slower in case of texture rebuilds.
- **Free Images**: Removes unused images (not referenced in a loaded scene) from the Image Pool (main memory and graphics card memory).
- **Free Fonts**: Removes unused fonts from the Font Pool.
- **Free Memory Threshold (MB)**: If set to greater than zero (>0) then Viz Engine tries to automatically unload unused Pool objects until the specified amount of main memory is free again.
- **Preload Textures**: When enabled (On), then all images which will be loaded with a scene (they do not need to be rendered) are loaded as textures to the graphics card too. This eliminates the texture creation time during rendering afterwards (e.g. useful when initializing a show or a playlist). Default is disabled (Off).
- **Free Now**: Frees the selected unused Pool objects (Scenes, Geometries, Images, Fonts or all) from the memory.
- **Preload Textures**: If this option is active, then all Images which will be loaded with a scene (they do not have to be rendered) are loaded as texture to the graphics card too. This eliminates the texture creation time during rendering afterwards (useful when initializing Viz Trio shows).

6.13 Multi Platform Suite

Figure 42: Multi Platform Suite

In this section, Viz Multi Platform Suite (MPS) is enabled before MPS scenes are published. Enabling MPS for Viz Artist will display an MPS button (upper right) for publishing MPS files. For more information on how to enable MPS and create MPS files in Viz Artist, see the *Viz Multi Platform Suite user's guide*.

- **MPS Active**: Enables and disables MPS from publishing MPS scenes.
- **Default Export Folder**: Sets the default export folder for MPS scenes which can be a local drive, mapped drive or a Universal Naming Convention (UNC) path.
- **Zip Exported File**: Packages the MPS files to a compressed ZIP file.

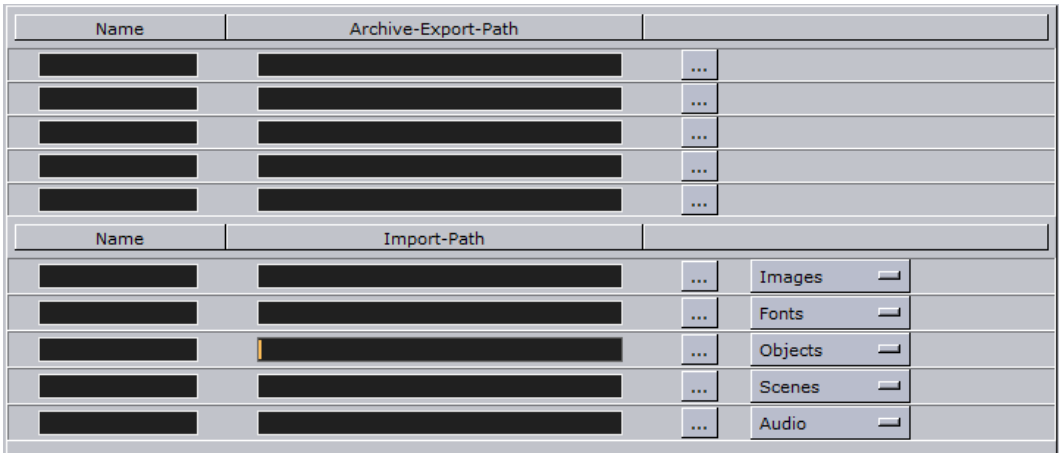
IMPORTANT! Make sure the Default Export Folder is configured with read and write access rights.

To enable Viz Multi Platform Suite in Viz Artist

1. **Enable** the MPS Active button (*On*).
2. Set the **Default Export Folder** field.
3. Click **Save**.

6.14 Path Aliases

Figure 43: Path aliases



In this section, five favorite archive and import paths can be set.

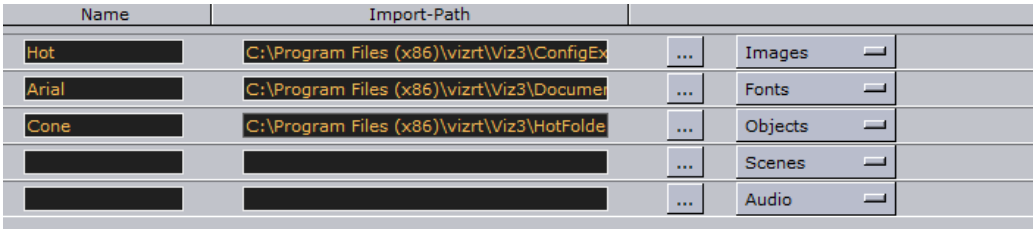
- **Name:** Sets the path alias name for the archive or import path.
- **Path:** Sets the archive or import path which can be a local drive, mapped drive or a Universal Naming Convention (UNC) path.

IMPORTANT! Make sure the archive folder is configured with read and write access rights.

Tip: Path aliases are available in the Viz Artist's Archive and Import panes.

To add a path

1. Enter a descriptive name in the **Name** field
2. Enter a path in the **path** field, or click the **Browse** button to navigate and select a path.
3. Assign a type. Your options are:
   - Images
   - Fonts
   - Objects
   - Scenes
   - Audio



   In this way, when you click on an alias before Importing Files, it automatically takes you to the designated folder and switches to the assigned type.
4. Click **Save**.

6.15 Output Format

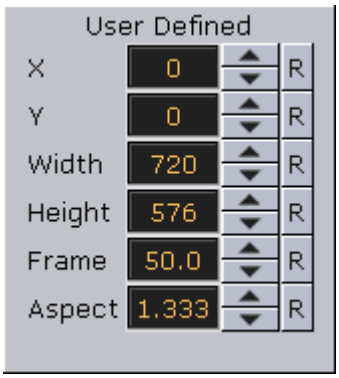
Figure 44: Output Format

Name	Specification	Dimension	Frequency
NTSC	480I_5994_SMPTE259_NTSC	720 x 486	59.94 Hz
NTSC	480I_5994_SMPTE259_NTSC	720 x 486	59.94 Hz
PAL	576I_5000_SMPTE259_PAL	720 x 576	50.00 Hz
PAL	576I_5000_SMPTE259_PAL	720 x 576	50.00 Hz
720p HD Progressive	720P_5000_SMPTE296	1280 x 720	50.00 Hz
720p HD Progressive	720P_5994_SMPTE296	1280 x 720	59.94 Hz
720p HD Progressive	720P_6000_SMPTE296	1280 x 720	60.00 Hz
1080i HD Interlaced	1080I_5000_SMPTE274	1920 x 1080	50.00 Hz
1080i HD Interlaced	1080I_5994_SMPTE274	1920 x 1080	59.94 Hz
1080i HD Interlaced	1080I_6000_SMPTE274	1920 x 1080	60.00 Hz
Fullscreen	FULLSCREEN	1280 x 1024	50.00 Hz
User Defined	USER_DEFINED		

In this section, the output format of the rendering engine can be set. All video hardware configurations are hooked to the video standard set as output format. This setting defines the frequency (frame rate) at which Viz Engine is running.

For PAL and NTSC, the aspect ratio of the format can be set to 4:3 (standard TV) and 16:9 (wide screen TV).

Clicking **Fullscreen** sets the output format to the screen size of the current machine. Note that Fullscreen only allows you to customize the *frame rate* and *aspect ratio* setting.



Clicking the **User Defined** sets the user defined output format. It can be used to fit the requirements of multi-pipe systems (for example video walls or visionariums). The multi-pipe settings can be configured in the right part of the editor.

Setup of multi-pipe systems should be performed by experienced system engineers. For more information, please contact your local Vizrt representative.

- **X**: Sets the horizontal alignment in pixels on the screen. Value is calculated from top left of the screen.
- **Y**: Sets the vertical alignment in pixels on the screen. Value is calculated from top left of the screen.
- **Width**: Sets the width in pixels.

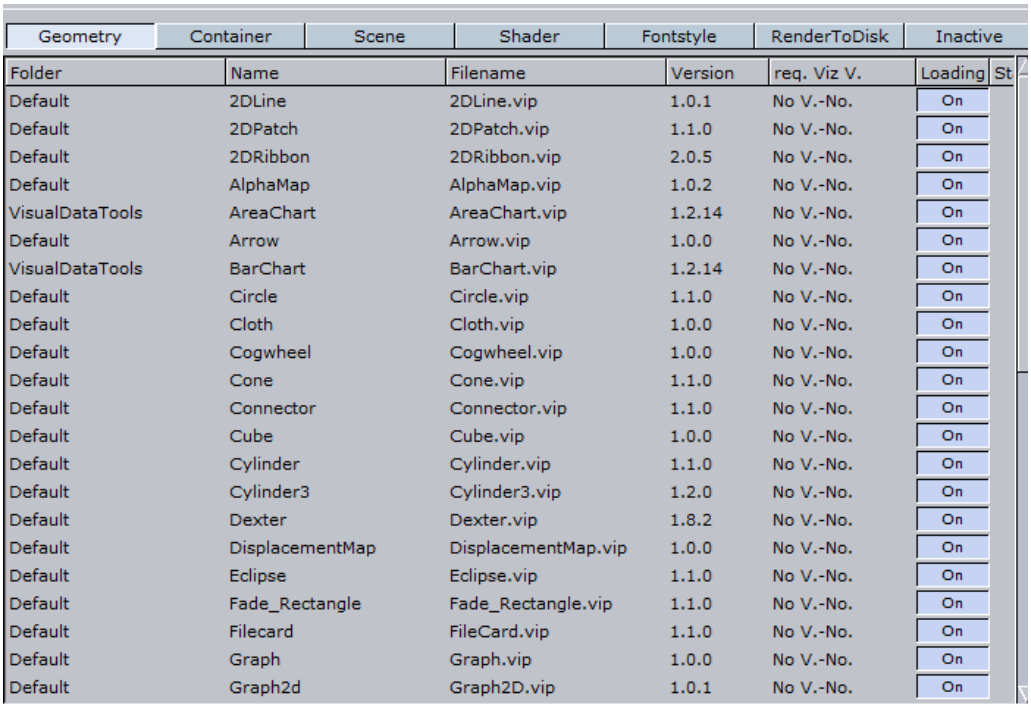
- **Height:** Sets the height in pixels.
- **Frame:** Sets the refresh rate/frequency per frame in hertz (Hz).
- **Aspect:** Sets the aspect ratio. For example 1.778:1 which is 16:9 or 1.333:1 which is 4:3.

Note: Make sure that the physical refresh rate of the graphics hardware and the video hardware is configured correspondingly.

There are 3 frequency groups/families; 50, 59,94 and 60 Hz. This defines the output format, and how fast Viz Engine operates. The frequency is the same as frames per second. This will also define the input format that is allowed; hence, an NTSC SD input cannot produce a PAL SD output, but an HD input with the same frequency as the SD output would work.

6.16 Plugins

Figure 45: Plug-ins



Folder	Name	Filename	Version	req. Viz V.	Loading	St
Default	2DLine	2DLine.vip	1.0.1	No V.-No.	On	
Default	2DPatch	2DPatch.vip	1.1.0	No V.-No.	On	
Default	2DRibbon	2DRibbon.vip	2.0.5	No V.-No.	On	
Default	AlphaMap	AlphaMap.vip	1.0.2	No V.-No.	On	
VisualDataTools	AreaChart	AreaChart.vip	1.2.14	No V.-No.	On	
Default	Arrow	Arrow.vip	1.0.0	No V.-No.	On	
VisualDataTools	BarChart	BarChart.vip	1.2.14	No V.-No.	On	
Default	Circle	Circle.vip	1.1.0	No V.-No.	On	
Default	Cloth	Cloth.vip	1.0.0	No V.-No.	On	
Default	Cogwheel	Cogwheel.vip	1.0.0	No V.-No.	On	
Default	Cone	Cone.vip	1.1.0	No V.-No.	On	
Default	Connector	Connector.vip	1.1.0	No V.-No.	On	
Default	Cube	Cube.vip	1.0.0	No V.-No.	On	
Default	Cylinder	Cylinder.vip	1.1.0	No V.-No.	On	
Default	Cylinder3	Cylinder3.vip	1.2.0	No V.-No.	On	
Default	Dexter	Dexter.vip	1.8.2	No V.-No.	On	
Default	DisplacementMap	DisplacementMap.vip	1.0.0	No V.-No.	On	
Default	Eclipse	Eclipse.vip	1.1.0	No V.-No.	On	
Default	Fade_Rectangle	Fade_Rectangle.vip	1.1.0	No V.-No.	On	
Default	Filecard	FileCard.vip	1.1.0	No V.-No.	On	
Default	Graph	Graph.vip	1.0.0	No V.-No.	On	
Default	Graph2d	Graph2D.vip	1.0.1	No V.-No.	On	

In this section, all installed plug-ins that are identified by Viz as valid plug-ins are listed. Click the Geometry, Container, Scene, Shader, Fontstyle, RenderToDisk or Inactive buttons to view plug-ins per category.

All plug-ins can individually be activated or deactivated. If a plug-in is inactive it will not be loaded during startup. All inactive plug-ins are listed under the Inactive pane.

Note: Some unlicensed plugins will not be loaded while others will; however, in the latter case a watermark will be shown.

Note: You must open the Config section in Viz Artist itself to display all information. In the Viz Config standalone application, the plugins are not actually loaded. However you can still enable or disable the loading state.

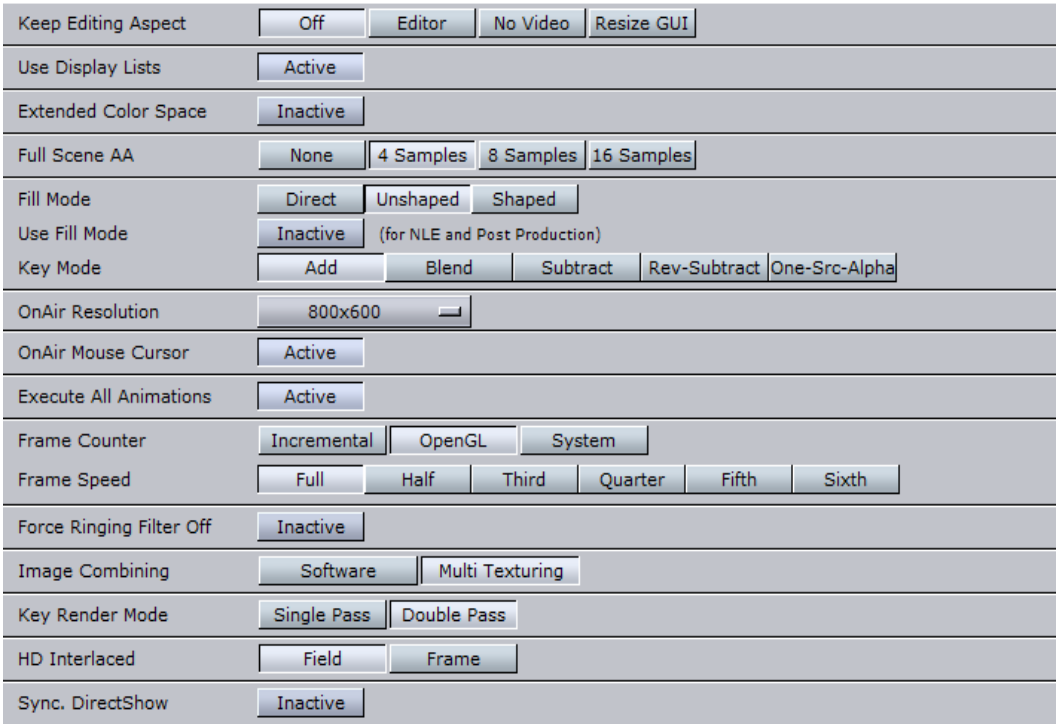
WARNING! Viz does not load inactive plugins during run-time; hence, if a scene uses a plug-in that is deactivated Viz is unable to activate it.

See Also

- Viz License Information.

6.17 Render Options

Figure 46: Render Options



In this section, the following render options can be set:

- **Force Sleep:** Enables Viz Engine to sleep on low performance renderer machines (for example a laptop) when Viz Engine is running inside another application such as Viz Trio.
- **Keep Editing Aspect:** Influences scene designs in Viz Artist mode. Alternatives are; Off, Editor, No Video and Resize GUI.
  - **Off:** Scenes are only shown in Anamorphic widescreen in the 4:3 VGA render window.
  - **Editor:** Scenes are displayed using a letter-box format during scene editing giving designers the option to set a user defined **camera aspect** ratio (under Scene Settings -> Rendering). On-Air and Viz Engine modes are not affected.

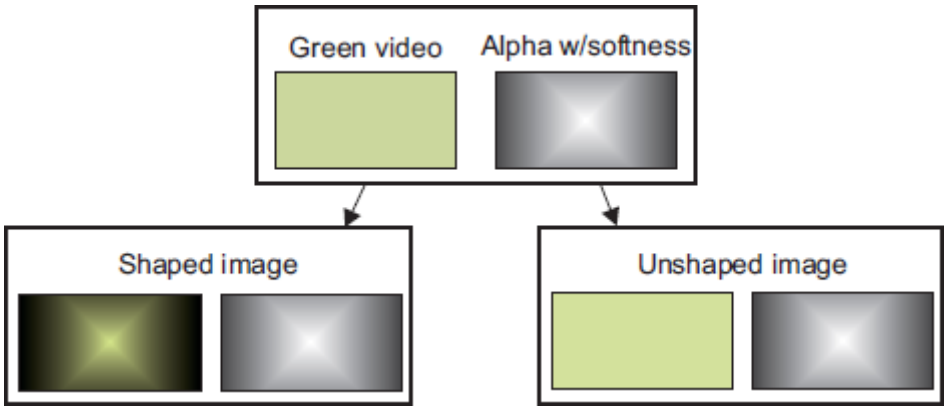
    - **No Video:** Scenes are shown using a letter-box format as long as the video out is inactive. If video out is active scenes are shown in Anamorphic widescreen in Viz Artist mode.
    - **Resize GUI:** Increases the renderer window when editing 16:9 scenes to 16:9 format. On-Air and Viz Engine modes are not affected.
- **Use Display Lists:** Activates or deactivates the use of display lists in the Open GL engine.
- **Extended Color Space:** *Not in use*.
- **Full Scene AA:** Sets the hardware Anti aliasing (provided by the graphics card). Alternatives are; None, 4, 8, and 16 Samples.
- **Fill Mode: Direct**: Unmodified fill output. **Unshaped**: Brightened fill when AutoKey is enabled. **Shaped**: Fill is premultipled with key. Shaped video versus unshaped video.
- **Use Fill Mode:** Determines whether the *Fill Mode* setting should also be applied to post rendering and NLE. If *Fill Mode* is inactive, and *Shaped* setting is active, then the output looks brighter, as it is required for keyers. This option will remove inconsistencies between full frames and fields with post rendering and NLE.
- **Key Mode**: *Not in use*.
- **RGB to YUV:** Enables color conversion either in the Shader or on the Matrox card.
- **On Air Resolution:** Sets the DVI output resolution for Viz Video Wall. Viz Video Wall must activate DVI Output in the Video Output section for the On Air Resolution to take effect. Alternatives are; Desktop Resolution, 800x600, 1024x768, 1280x1024, 1600x900, and 1600x1200.
- **On Air Mouse Cursor:** Enables a mouse cursor when in On Air mode and using interactive applications. Should be disabled for Viz Video Wall and when DVI out is enabled.
- **Execute All Animations:** When deactivated this setting will enable Viz Engine to only animate visible objects. Default is Active.
- **Use NVIDIA Frame Counter**: When activated this settings takes effect for Standard-PC versions that use NVIDIA cards and drivers that do not return valid frame counter values. When deactivated, an internal timer is used as a timing trigger.
- **Frame Speed**: Enables Viz to run at a slower rate than the actual refresh rate (determined by the screen speed with the use of a g-sync card). This is relevant for video wall applications when the scene (e.g. interactive scenes) cannot run real time (resource intensive), hence, all participating computers are synched to a lower speed. Running at 30Hz (screen speed 60Hz divided by 2) can be acceptable, however, this will affect the animation quality (i.e. will not be as smooth).

- **Image Combining:** In a texture editor (see Viz Artist) it is possible to set a second texture which will be used for the image combining. The texture editor offers two possible modes: The first mode uses the second image as an alpha channel, whereas the second mode defines a blend between the two textures. Configuring Image Combining to **Software** enables the combination to be calculated entirely on the CPU. Configuring Image Combining to **Multi Texturing** enables the combination to be calculated on the graphics card for

combining or blending the two images. In this case the texture creation is faster and memory will be saved as well. Default is Software. If there are performance or memory issues, especially with scenes imported from Viz 2.x, it is recommended to change this setting to Multi Texturing.

- **Key Render Mode:** This configuration is used when the Key Render Mode under Scene Settings in Viz Artist is set to Config, and determines how the key should be rendered:
  - **Double Pass:** Uses two rendering steps as in older 3.x versions. Double Pass should be used for old 3.x scenes for not breaking compatibility, for new scenes Single Pass should be used as it is faster.
  - **Single Pass:** Uses one rendering step as in 2.8 versions.

Figure 47: Shaped video versus unshaped video



A shaped video image has its video data multiplied by its alpha component while the video data of an unshaped image remains untouched. Shaped images are also referred to as *pre-multiplied alpha images*.

- **HD Interlaced**: Specifies if Viz Engine should render frames or fields for interlaced HD formats (i.e. 1080i). Rendering frames improves the rendered output but has a higher performance cost. Available options are: Field and Frame.
- **Sync. DirectShow**: Synchronize DirectShow clip playback with renderer (may cause video jumps and audio cracks).
- **NLE Antialiasing**: Antialiasing for small images snapshots and NLE frames.
- **Image Load Error**: If an image load error occurs you may configure Viz to keep the old image or clear the image (i.e. not showing anything).

6.18 Scene Default Values

Figure 48: Scene Default Values

This section configures the default values for new scenes.

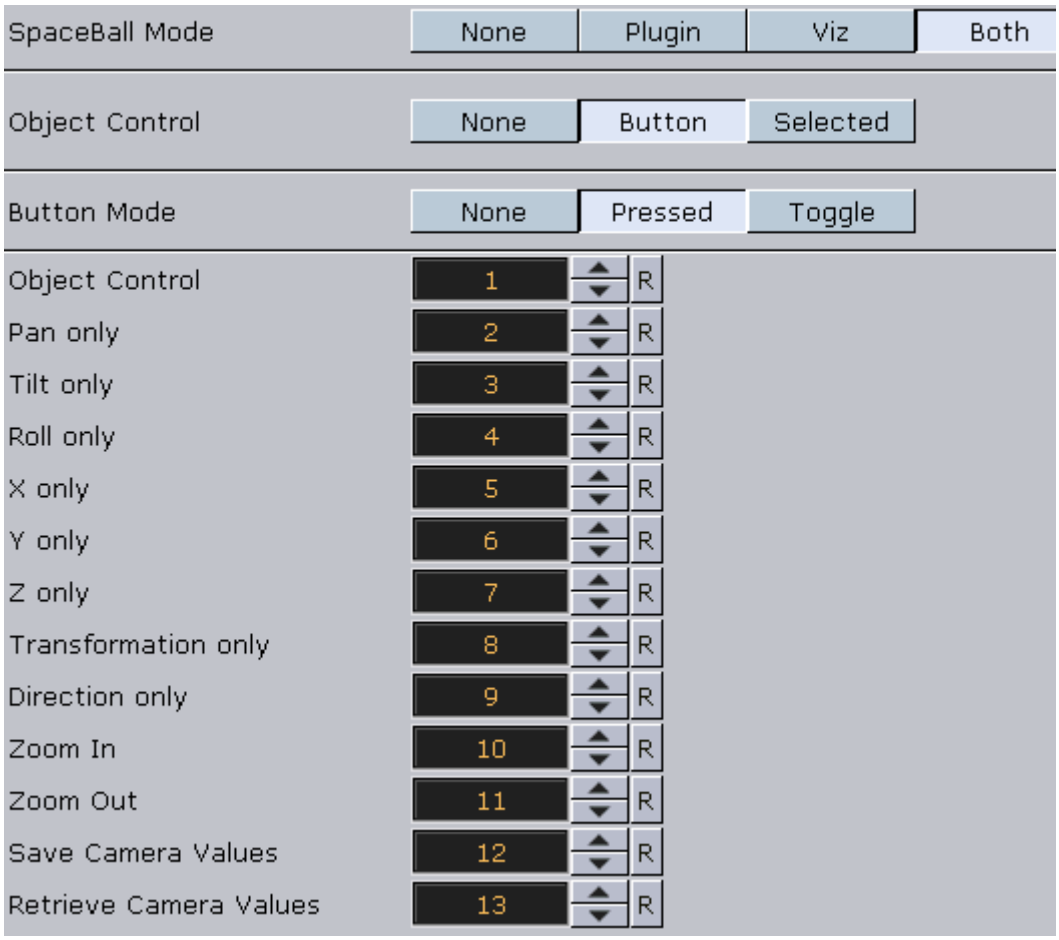
- **Key:** Sets the key mode. Alternatives are; Virtual Set, Full Screen, Overlay, and Auto Key.
- **Animation Motion Path:** Sets the default setting for all new position keyframes. When set to Smooth all handles in the scene output enables a smooth motion path. When set to Linear no handles are available; hence the motion path is not smooth. This setting corresponds with the Path Control setting in the keyframe editor. When set to manual handles are made available in the spline view that enables speed to be manually handled between keyframes. When set to Linear no handles are available.
- Animation Motion Speed: Sets the default setting for all new position keyframes.
- **Flicker Filter:** When enabled it will reduce interlaced flicker on high contrast objects. For example small lines and hard objects. Alternatives are; Off, and Level 1-3.
- **Gamma:** Sets the gamma radiation/emission for textures.
- **Camera Clipping Plane:** Sets the range of the virtual camera. Near sets the close range while far defines the far range. Only objects within this range will be rendered.
  - **Near:** Sets the Near value to clip unwanted objects from the foreground. Default value is 50.
  - **Far:** Sets the Far value to clip unwanted objects from the background. Default value is 20000.

Note: The camera range is where the Z-buffer is within. So if Z-buffer problems arise, they may be solved by editing the camera clipping plane settings.

- **Ringing Filter:** Sets the default value for the Ringing Filter. A ringing filter reduces high frequency values in the video signal created by high contrast and color changes in horizontal directions.
- **Show Merge Style Dialog:** Enables the user, when opening a scene in Viz Artist, to open old-style merged objects and expose containers within it.
  - This feature relates to scenes using old-style ordering of containers within merged objects, and solves the problem with auto-follow. When loading such scenes the dialog lets the user decide how to deal with them.
  - Users that are aware of this and decide to keep the old style can deactivate this dialog.
- **Output Region:** Shows which region of the screen Viz is licensed to render.
- **Half Edition:** Allows Viz to render half screen. Available options are; left, right, top, bottom, bottom left, bottom right and bottom top.
- **Quarter Edition:** Allows Viz to render quarter screen. Available options are; left, right, top, bottom, middle left, middle right, middle top and middle bottom.
- **Show Black After End**: Shows black after a clip has finished playing.
- **Texture Sharpen Default**: Sets the default sharpen value for textures.

6.19 Spaceball

Figure 49: Spaceball



The Spaceball section is used to configure a 3D navigation device.

- **SpaceBall Mode:** Sets special setups where the spaceball should only control specific plug-ins without influencing the scene (objects/camera). Alternatives are; None, Plugin, Viz, and Both.
  - **None:** No setup.
  - **Plugin:** Controls plug-ins.
  - **Viz:** Controls Viz objects.
  - **Both:** Controls both plug-ins and Viz objects.
- **Object Control:** Alternatives are; None, Button, and Selected.
  - **None:** No setup.
  - **Selected:** Modifies only the selected object.
- **Button Mode:** Alternatives are; None, Pressed, and Toggle.
  - **None:** No setup.
  - **Pressed:** When set to Pressed, this mode will trigger an action like a button in a user interface.
  - **Toggle:** When set to Toggle, this mode will set a state. For example when a button is pressed only the dominant axis will be considered in a move, whereas when the button is released all movements are applied.

The numeric fields are used to map the various buttons on the 3D navigation device. This varies by the vendor and the vendors model; hence, the button numbers need to be looked up in the user manual for the respective device.

Button options are: Object Control, Pan Only, Tilt Only, Roll Only, X Only, Y Only, Z Only, Transformation Only, Direction Only, Zoom In, Zoom Out, Save Camera Values, and Retrieve Camera Values.

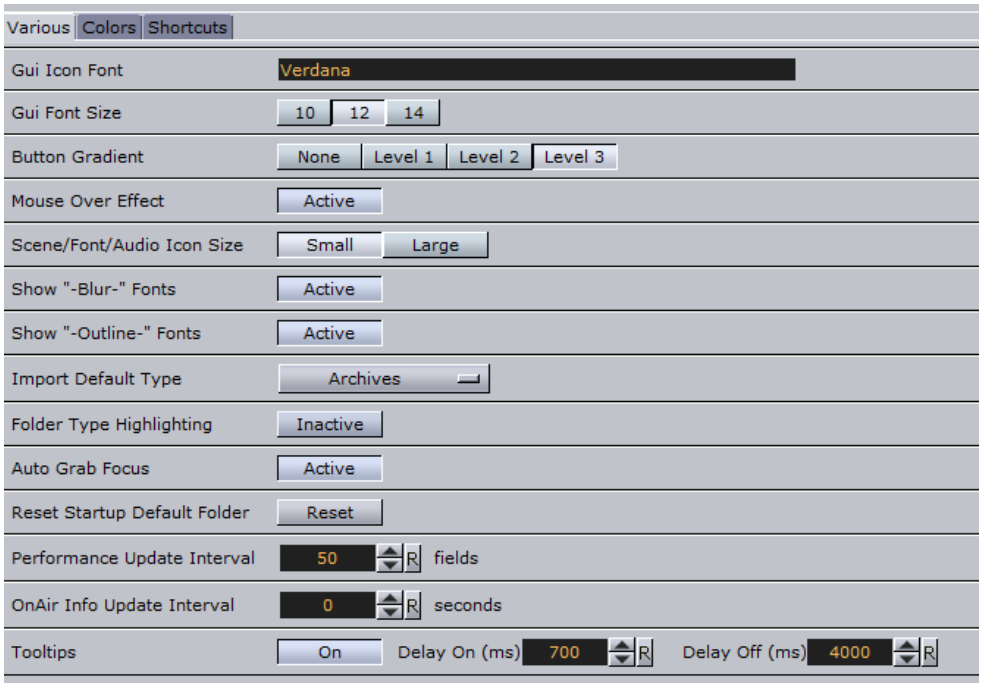
6.20 User Interface

This section describes the user interface settings. Some of these settings are also available in Viz Artist.

This section contains information on the following topics:

6.20.1 Various

Figure 50: Various user interface settings



- **GUI Icon Font:** Sets the Font type for all icons of elements such as scenes, objects, materials, images, fonts, and audio clips. Complex character sets such as Arabic, Hebrew and Chinese must change the default font type in order to display proper names for the icons.
- **GUI Font Size:** Sets a global font size for the Viz GUI. Alternatives are; 10, 12, and 14 pixels.
- **Button Gradient**: Sets the gradient level of the buttons in the Viz Artist user interface.

- **Mouse Over Effect**: Mouse over effect for buttons in the Viz Artist user interface. Set to Active or Inactive.
- **Scene/font/Audio Icon size:** Sets a size preference for scene, font and audio icons. Icon size can also be switched using the context menu in the server view in Viz Artist; however, a switch in Viz Artist will not be saved as a preference for later sessions.
- **Show "Blur" fonts**: Sets the default for showing or hiding the blur fonts in the Server area. The option can then be toggled using the Server File Context Menu.
- **Show "Outline" fonts**: Sets the default for showing or hiding the outline fonts in the Server area. The option can then be toggled using the Server File Context Menu.
- **Import Default Type**: Selects the default type for imports. This will then be pre-selected in the Import Menu. Options are:
  - Fonts
  - Images
  - Objects
  - Scenes
  - Audio
  - Archives
- **Folder Type Highlighting:** When enabled this will highlight the folders that contain content matching the current Viz Artist's Server view (for example Scene, Object, Material, Image, Font, Audio and so on).

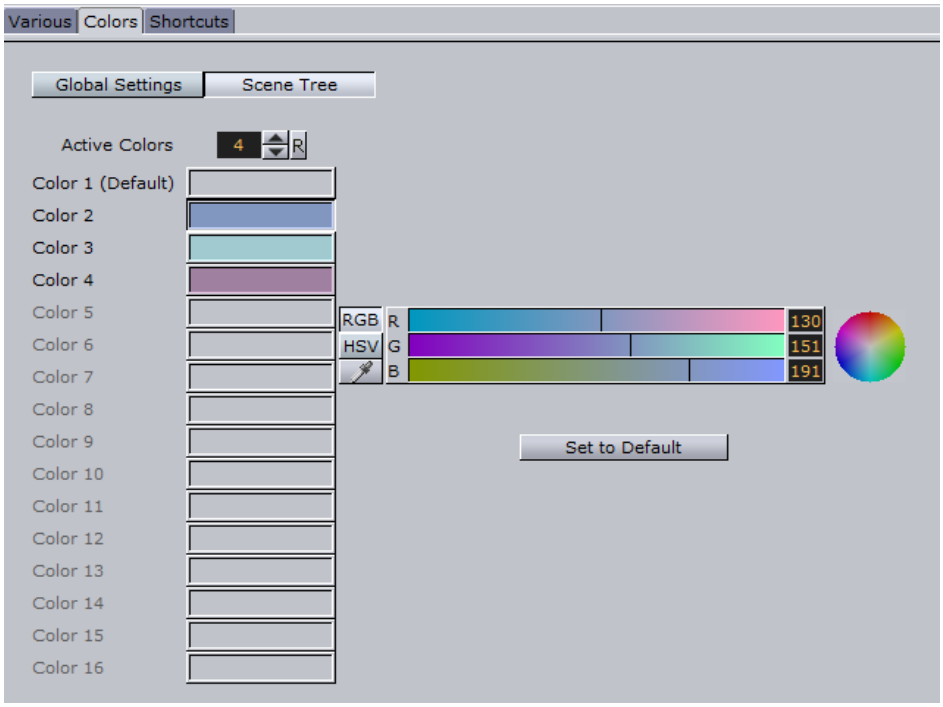
Note: This can cause some performance overhead, when switching to different types and/or with opening sub folders (but only first time, as the information is cached).

- **Auto Grab Focus**: When Inactive, a middle mouse click grabs the focus, as a left and right click do. When audio grab focus is Active, the focus is grabbed as soon as you move the mouse over a widget.
- **Reset Startup Default Folder**: Resets the startup folder. If Viz Artist is unable to start due to problems with the last saved server view, clicking the Reset button will reset the Server view to its top node.
- **Performance Update Interval:** Sets how often Viz Engine should update the Performance Bar when it is opened.
- **OnAir Update Interval**: Update interval for the OnAir Info Window. Note that a shorter interval decreases render performance. Seting to 0 means that no update occurs.
- **Tooltips:** Enables or disables the tool tip information (pop-ups) in the Viz Artist 3 user interface.
  - **Delay On (ms):** Sets the amount of time in milliseconds before the tool tip appears. Default is 1500 ms.
  - **Delay Off (ms):** Sets the amount of time before the tool tip disappears. Default is 4000 ms.

Note: A millisecond is one thousandth of a second.

6.20.2 Colors

Figure 51: User Interface colors - Scene Tree



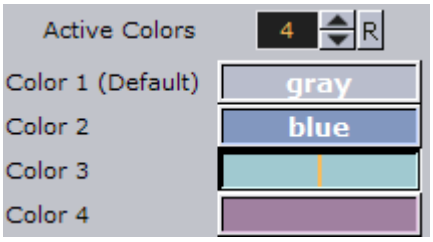
In the Scene Tree color configuration section, you can set up the tree's color coding in such a way as to sort elements by colors, search for colors within a tree, and restrict the scene tree to certain colors, so as not to require the handling the whole tree for certain simple transactions.

For example, all text containers can be colored gray and tagged Text, while all containers that hold images can be colored green and tagged Image and so on. Four active colors are configured by default with no text descriptions.

The text is scene specific and saved with the scene on Viz Graphics Hub; hence, the colors might change if the scene is edited using another editor with a different color setting.

The color options are available in the Scene Settings pane as the Tree Color Text setting, and available for use in the Scene Tree pane.

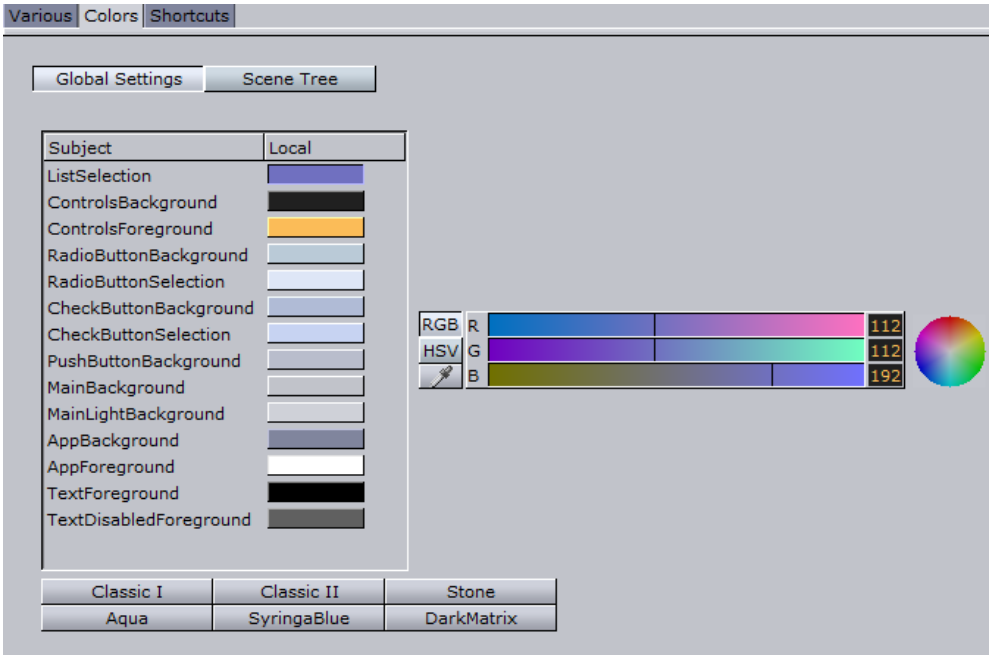
To create a new color



1. Select an unused scene tree Color container
2. *Optional*: Add a descriptive text

3. Set the color values
4. Optional: Click the color box and enter a name for it.
5. Click **Save** and restart Viz Artist.

Figure 52: User Interface colors - Global Settings



The Global Settings change the entire look of the Viz Artist user interface. You can customize each element in the left-pane list, using the color slider/picker. You can click and drag one of the current element colors and drop it onto another category as well.

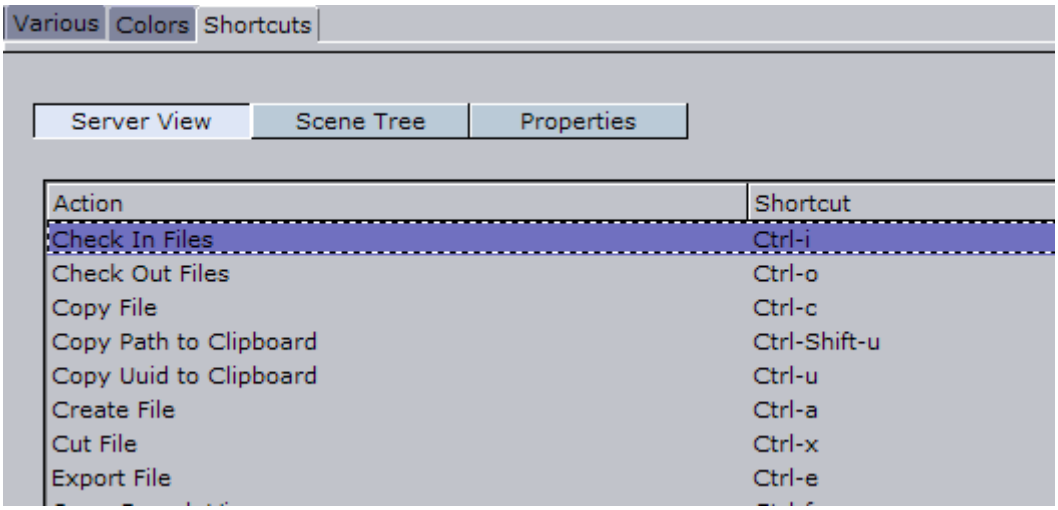
Alternatively you can choose one of the pre-defined color schemes for the user interface. **Classic 1** is the traditional Viz Artist look.

Note: All the changes made to the user interface are local on your machine. You need to restart Viz Artist for the changes to take effect.

6.20.3 Shortcuts

The shortcuts view displays all available server, scene tree and property actions and the currently assigned shortcuts. All shortcut configurations are saved to the database into the user table for personalization.

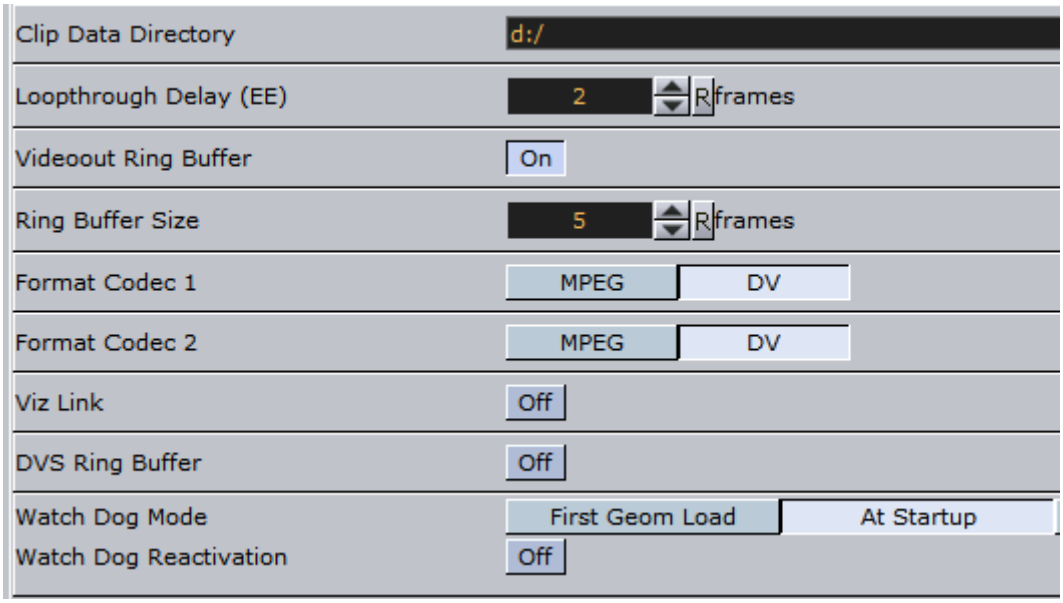
Figure 53: User interface shortcut settings



- **Server, Scene Tree and Properties:** Displays all server actions and their currently assigned shortcuts.
- **Shortcuts:** When clicked, displays a list of available shortcut key-combinations that can be assigned to the selected action.
- **Reset All:** Resets all shortcuts to the default setup.

6.21 Video Board

Figure 54: Video Board



This section is used to configure video input, output and clip playback related settings.

- **Clip Data Directory:** Sets the clip directory for clip transfer in a Viz Link environment. Default directory is V:\ drive.

Note: The directory has to match the directory set when installing the Mediaftp FTP service for video transfer from Viz Video Hub.

- **Loopthrough Delay (EE):** Sets delay for live video input in DVE mode. This setting is only used for Targa boards. This setting applies for all input channels. For Matrox, see (Matrox0.VideoIn1.VideoDelayDVE) ... Configuration File.
- **Videoout Ringbuffer:** Sets the render buffer for video output. Helps to prevent frame drops on the video output during execution of commands or loading of objects. When enabled the engine will render a number of graphics frames in advance and provide it to the video hardware. The number of frames rendered forwardly is defined by the Ringbuffer Size. Large buffer sizes will delay the output and increase the input to output delay for video textures.
- **Ringbuffer size:** Sets the size of the Ringbuffer in frames.
- **Format Codec 1**: Enables the codec matching the codec of the Targa board. Alternatives are MPEG and DV. This only applies to video clips.
- **Format Codec 2**: Enables the codec matching the codec of the Targa board. Alternatives are MPEG and DV. This only applies to video clips.
- **Viz Link**: Turning Viz Link on has the following effects:
  - In the VGA version, setting the clip takes immediate effect instead of the command travelling through the ring buffer.
  - In the VGA version a clip channel set to DVE will play the clip in texture mode.
  - Activates the asynchronous Command feedback when setting a clip. The first answer in this case is a `ANSWER DELAYED` message to the client and after that, either an error message or a success message is sent back to the client.
  - A clip which is currently playing in the active player will not be loaded back to back.
- **DVS Ring Buffer**: To have a separate ring buffer setting for DVS (especially for combinations with Matrox DSXLE2), turn this setting on.
- **Watch Dog Mode**: The following options are available:
  - **First Geom Load**: Video Out is activated when the first geometry is loaded.
  - **At Startup**: Video Out is activated at start up.
  - **First Geom Load/DVE**: Video Out is activated when the first geometry is loaded or an input or clip channel is set to DVE.
- **Watch Dog Reactivation**: Turn On to activate the watch dog again if scenes are unloaded from renderer.

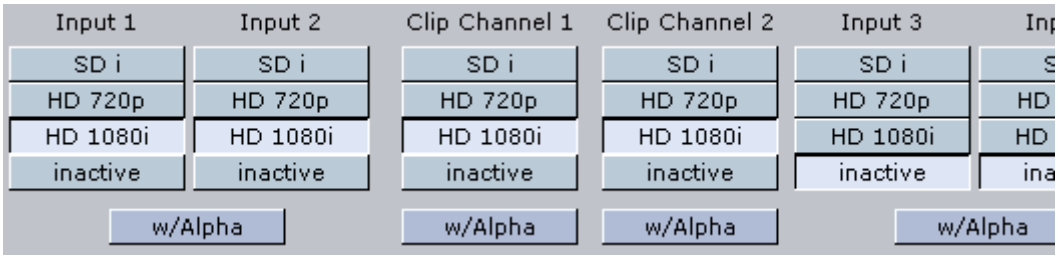
6.22 Video Clip

Figure 55: Video clip settings

- **Clip Data Directory:** Sets the clip directory for clip transfer in a Viz Link environment. Default directory is D:\ drive.

6.23 Video Input

Figure 56: Video input settings



Input channels are enabled in this section. To be able to use a channel – no matter if it is a live input channel or a clip channel – it first has to be enabled.

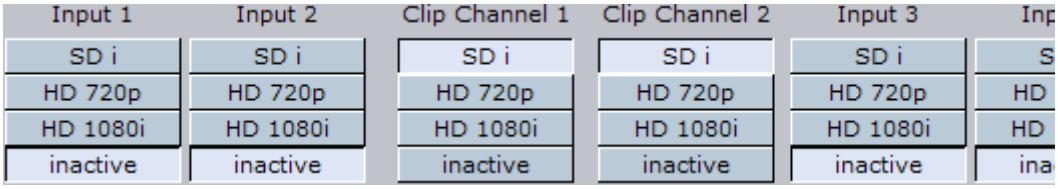
This dialog not only activates the channel, it also defines the video standard the channel should be configured to. It is possible to mix video standards – for example a Viz Engine configured to play out 1080i50 can have inputs configured to SD. In this dialog Input 1 and Input 2 refer to live input channel 1 and live input channel 2. Clip channels are for video clips. The frequency of the channels will be defined by the configurations in the Output Format section.

Clip Channel 1 and Clip Channel 2 must be configured to the same video standard.

- **Input w/Alpha**: For the Input this will combine the two (Input 1 and Input 2) channels to one channel carrying fill and key. Meaning the Y (luminance) from Input 2 in YUV will be used as the key signal.
- **Clip w/Alpha**: When enabled the clip file must either contain key information or a key clip must be provided. The key clip must have the string "_key" appended to the filename. For a clip named *i422_50M.avi* this would be *i422_50M_key.avi*.

Note: Video input format may be limited by hardware capabilities on the video board (for example Targa boards only support SD, and Matrox 6000 series boards does not support HD clips).

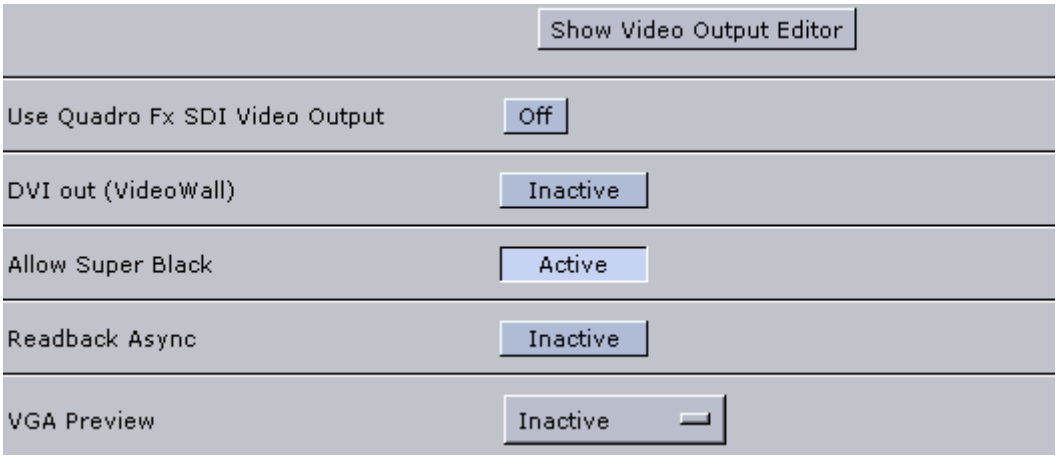
Figure 57: Video input settings without video board



When there is no onboard video board (standard-PC) the video input section no longer displays the video with alpha options. Video input for standard-PC versions enable clip playback via scene setup.

6.24 Video Output

Figure 58: Video Output



This section is used to configure special settings for video output such as SPG settings and so on.

- **Show Video Output Editor (ALT+V):** Opens the Video Output Editor.
- **Use Quadro FX 4000 SDI Video Output:** Enables NVIDIA's SDI module to output video. This will shorten the output delay when outputting graphics and video through the video board. However, this requires that audio to be handled externally since NVIDIA's SDI module does not support embedded audio output.
- **DVI Out (Viz Video Wall):** Sets the main output to DVI.
- **Allow Super Black**: Controls whether the key output uses the video range (Inactive) or the full signal range (Active). If set to Active it will then determine whether or not to clip the key output video signal that is under 7.5 IRE units or over 100 IRE units. Default mode is *Inactive*. Inactive (using older drivers) is only valid in conjunction with NVIDIA SDI and driver versions older than 259.12.
- **VGA Preview:** Sets the default value for the Preview button (see Control Buttons) when Viz Engine is in On Air mode.
  - When inactive, rendering will only be done for video out signals. This will increase performance as the renderer does not have to render into an editor on screen and into pixel buffer.
  - When active, rendering will be done for both video out signals and on screen; however, this will decrease the performance.
  - Standard-PC versions do not have a video out option; hence, the button is not visible in On Air mode and VGA Preview is always active.

Figure 59: Video Output Editor

The Video Output Editor defines the synchronization standard and the output signal phases.

- **Freerun:** Locks Viz Engine to a clock signal on the video board.
- **Blackburst and Tri-level:** Locks Viz Engine to a GenLock signal.
- **Digital Input 1 and 2:** Locks Viz Engine to the signal on Input 1 or 2.
- **H-Phase and V-Phase:** Shifts the output signal with respect to the sync signal.

To make the V- and H-phase values coincide

1. Set the **V-phase value**
   - The *V-granularity* is taken from the genlock
   - The *V-delay* is calculated from *V-phase * V-granularity*
   - The genlock is set with this *V-delay*

2. Set the **H-phase value**. Note that there is a distinction whether the H-phase is a positive or a negative value.
   a. If the **H-phase > 0**
   - The genlock *H-delay* is set to 0
   - The *H-granularity* is taken from the video out channel
   - The *H-delay* is calculated from *H-phase * H-granularity*
   - The fill and key channels are set with this *H-delay*

   b. If the **H-phase <=0**
   - The fill and key channel *H-delay* is set to 0
   - The *H-granularity* is taken from the genlock
   - The *H-delay* is calculated from *- H-phase * H-granularity*
   - The genlock is set with this *H-delay*

Note: The granularity and possible min/max values are printed to the Viz console during startup.

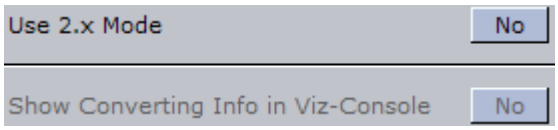
It should be taken into account that when the genlock video format is different from the fill/key video format the value of the *V-delay* matches the genlock lines and not the video output lines. The same applies to *negative H-phase* values.

See Also

- Output Format
- Video Input

6.25 Viz Artist 2.x

Figure 60: Viz Artist 2.x



In this section, Viz Artist 3 can be switched to Viz Artist 2 mode for compatibility issues.

In Viz Artist versions prior to 3.0, assets were stored in specific subdirectories (Scene, Object, Material, Font, and Image). As Viz Artist 3 stores assets anywhere in the directory, older control applications may not find these assets. If enabling

2.x mode, the assets will be looked for in the subdirectories, and calls for scenes will be represented by green lines in the console window.

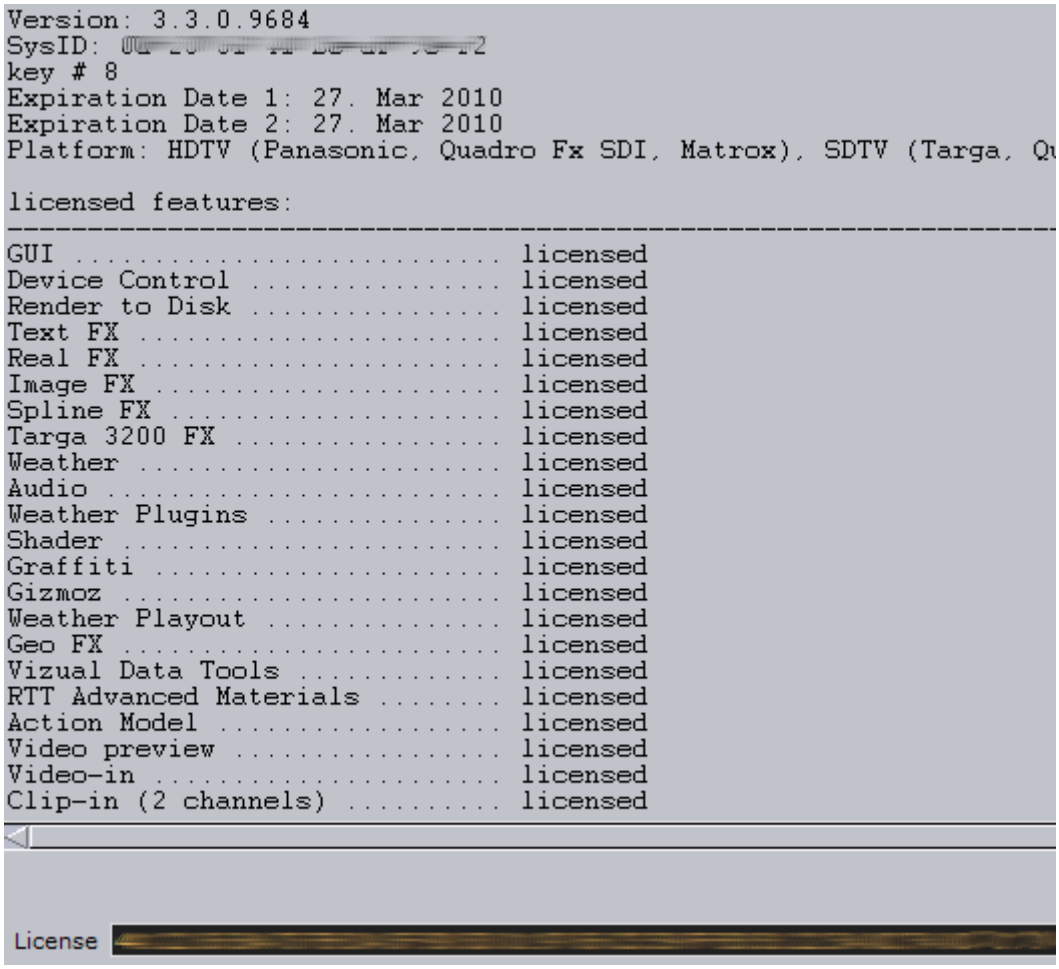
When working in 2.x mode, *Viz_2x* will automatically be added before the default messaging path. Furthermore, the paths sent by the external control applications will be converted to lower case (as the names of the data will be converted to lower case when importing). So, external control programs must not be re-written when migrating from Viz Artist 2 to 3.

- **Use 2.x mode**: Enables Viz Engine to run in 2.x mode.
- **Show converting Info in Viz-Console**: Enables the calls for scenes to be shown as green text.

Note: It is only recommended to use 2.x mode if new scenes are organized according to the old 2.x data structure.

6.26 Viz License Information

Figure 61: Viz License Information



In this section, information about the current Viz license is displayed. The section lists the various licensed features, for example the available plug-in packages.

- **License**: Enter a new license key into the License field, and click Save. Restart Viz in order for the new license key to take effect.

See Also

- Plugins

7 Graphics Cards

This chapter describes the NVIDIA graphics cards and drivers supported by Viz Engine. It also provides a procedure on how To configure NVIDIA driver settings.

IMPORTANT! Any other setup than those described is not guaranteed to be supported by Viz and may cause problems during operation.

Note: Vizrt may make changes to specifications and product descriptions at any time, without notice.

This section contains information on the following topics:

- Two Graphics Cards
- Driver Installation
- Driver Recommendations

See Also

- Video, Audio and Graphics Card Installation

7.1 Two Graphics Cards

A machine with two graphics cards is, with Viz Engine 3.3 and later, able to run two instances of Viz simultanously. Currently there are two options; Viz Engine dual channel or a Viz Trio OneBox setup.

In a Viz Engine dual channel setup the two instances could be used to run two program channels. For example; SD and HD output, for compositing a stereoscopic output. A dual channel solution will also save rack unit space as all hardware is fitted into one machine.

In a Viz Trio OneBox setup the two instances are used to obtain program and preview output from one single machine where both channels have video.

Note: The limitations to such systems, in general and not limited to Vizrt alone, is memory usage and access, and also lack of power redundancy.

This section contains information on the following topics:

- Dual Channel Setup for Synchronous Output
- Viz Video Wall Distributor
- To configure a machine with two graphics cards

Dual Channel Setup for Synchronous Output

With a dual channel setup, it is easy to create two fill/key pairs for the left and right eye/camera during a stereo production. A special version of the Viz Video

Wall Distributor synchronously distributes one command to the two instances of the Viz Engine. For Viz Engine version 3.3, it includes a built-in locking mechanism that ensures that both engines stay in sync, even if one of them drops a frame. This feature can be switched on or off by a simple command sent through the distributor.

Hardware requirements:
- HP Z800 machine
- 2 x NVIDIA Quadro FX 3800 or 2x NVIDIA Quadro FX 4800 (GPUs must be identical)
- Matrox X.mio 2 video in- and output card

Software requirements:
- Viz Artist / Viz Engine v3.3

The installer for Viz Engine v3.3 includes an option for dual channel support. Choosing this option generates desktop icons to start the configuration and the Viz Engine for channel 1 as well as for channel2. Note that Viz Artist will only be available for channel 1.

The configurations use one video input per channel and embedded audio on the channel. The table below shows the main differences in the configurations.

Table 28: Synchronous output

	Viz Engine 1	Viz Engine 2
Stereo Mode	LEFT_EYE	RIGHT_EYE
Video In A	Video1	Unused
Video In B	Unused	Video 1
Video In C+D	Unused	Unused
Clip A	Clip 1	Clip 1
Clip B	Clip 2	Clip 2
Video Out A	Fill	Unused
Video Out B	Unused	Fill
Video Out C	Key	Unused
Video Out D	Unused	Key
Communication Port	6700	6800

Since this configuration puts an extra load on the Matrox card, it is important to use the available resources with care.
- In the video section of the scene switch off all unused layers
- Let the GPU do the color conversion.

The Matrox card itself is synced through the Viz Engine 1 instance.

It is important that only **one** display is active in the NVIDIA control panel. If you span the desktop across multiple GPUs, the affinity mask has no effect and both engines will render on GPU.

Viz Video Wall Distributor

The Viz Video Wall distributor listens to port 6100 as if it was a regular Viz Engine. The engines are connected via ports 6700 and 6800 respectively.

During startup the engines are not in sync; hence, you need to send the Viz command `RENDERER SET_VSYNC 1` for them to listen to each other. If one Viz Engine fails, `RENDERER SET_VSYNC 0` should be sent to the other renderer to allow it to run freely.

- `RENDERER*CURRENT_CAMERA*ZERO_PARALLAX_DIST SET` will set the distance of the zero parallax plane to the camera origin.
- `RENDERER*CURRENT_CAMERA*EYE_SEPARATION SET` sets the eye separation of the current camera.

These properties are also available for the individual cameras in all three layers.

To configure a machine with two graphics cards

1. Install Viz Engine 3.3 or later and choose **Dual Channel** or **Viz Trio One Box** setup.
   - *Viz Trio One Box:* Requires Viz Trio 2.9 or later and Media Sequencer 1.19 or later.
   - Viz Trio One Box is a single channel setup where you have a program channel on the client machine.
2. From the Viz3 sub folder **ConfigExample/TrioOneBox** or **ConfigExample/DualChannel**, select the example configuration file that suits your desired video output format.
3. Create two copies of the selected configuration file and place them in your Viz3 directory and rename one to **VIZ-YOURHOSTNAME-0-0.cfg** and the other **VIZ-YOURHOSTNAME-1-0.cfg**.
4. Start Viz Config for both instances (channel 1and channel 2) and enter settings for the Viz Graphics Hub (see Database) and enable Auto Login.
   - The latter is needed as dual channel engines start without a UI.
   - For Viz Trio it is more a convenience factor, and not needed as such.
5. Start Viz Engine for channel 1 and then Viz Engine for channel 2.
   - Channel 1 signals are available on Matrox OutA (fill) and OutC (key).
   - Channel 2 signals are available on Matrox OutB (fill) and Out D (key).

See Also

- Viz Command Line Options
- HP z800 Installations
- Viz Artist manual on Stereo Settings and Stereoscopy best practices.
- Viz Trio manual on OneBox setup of the output channels.

7.2 Driver Installation

This section contains information on the following procedures:

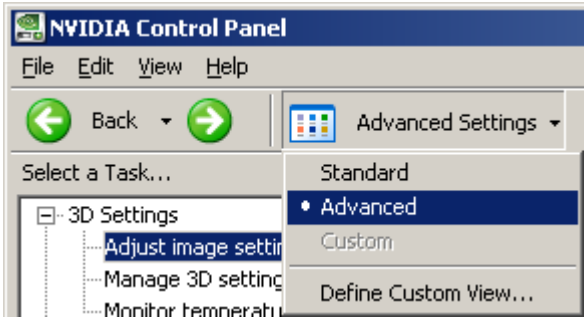
- To configure NVIDIA driver settings
- To configure the v-phase settings when synchronizing the card

To configure NVIDIA driver settings

Figure 62: NVIDIA Control Panel, Desktop context menu

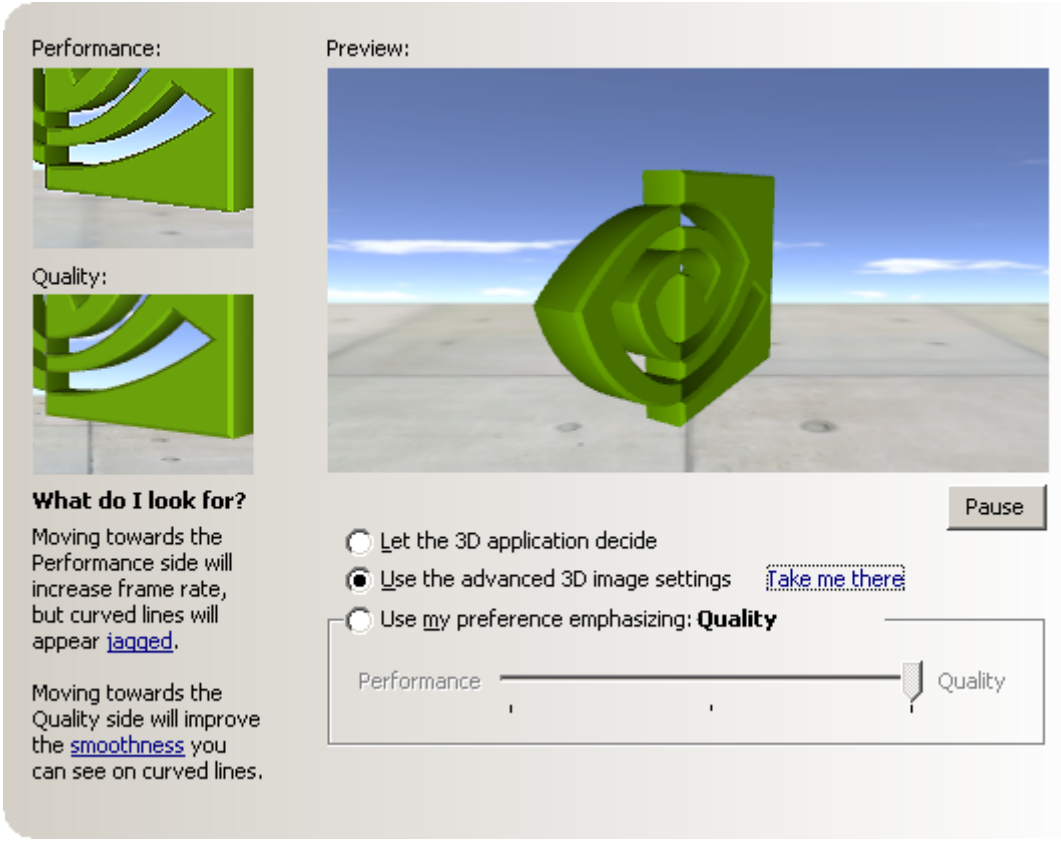
1. Right-click the desktop and select the **NVIDIA Control Panel** option on the appearing context menu

Figure 63: Advanced Settings, NVIDIA Control Panel



2. Set the NVIDIA Control Panel view option to **Advanced**
3. From the **Select a Task ...** tree view select **Adjust image settings with preview** to display the **Adjust Image Settings with Preview** in the right-hand pane

Figure 64: Adjust Image Settings with Preview, NVIDIA Control Panel



4. Select the **Use the advanced 3D image settings** option and click the **Take me there** link
5. Under **Global Settings** select the global preset option **Base profile**, and set the following parameters:
   - **Anisotropic filtering** – Application controlled
   - **Antialiasing–Gamma correction** – Off
   - **Antialiasing–Mode** – Override any application settings
   - **Antialiasing–Setting** – 4x (4xMS)
   - **Antialiasing–Transparency** – Off
   - **Vertical Sync** – Force off (see below for more)
6. Under **Global Settings** select the Global presets option **3D App – SDI Application**.
7. Click on **Apply**.

Regarding *Vertical Sync*:

- **Use the 3D application setting** for Viz installations (running in Standard PC (VGA) mode) and for Viz Video Wall setups where video is in use.
- **Force Off** is used for Viz installations where video is in use (unless used for video walls).
- **Unified Back Buffer** must be disabled (Off) in any case. Note that this depends on the driver version used. Most recent drivers from NVIDIA already have this setting disabled.

For Quadro FX 4000 SDI, FX 4500 SDI, and FX 5500 SDI you may need to set `use_old_nvsdk` to `1` in the Viz configuration file if you encounter stability issues on unsupported systems.

To configure the v-phase settings when synchronizing the card

1. Start Viz Config, or open the configuration from Viz Artist (Config button in the upper right corner)
2. Select the Video Output section
3. When using an NVIDIA SDI output option and synchronize on blackburst, use the following v-phase settings:
   - PAL: 606
   - NTSC: 509
   - 720p50: 743
   - 720p60: *not supported*
   - 720p60M: 736
   - 1080i50: 1113
   - 1080i60M: 1113
4. When synchronizing with SDI, leave the v-phase to 0

7.3 Driver Recommendations

For NVIDIA cards used in an **SDI** workflow, **firmware version 3.09** is required.

This section contains information on the following topics:

See Also

- Driver Installation
- Release notes for supported hardware and software

7.3.1 Workstation and Laptop Recommendations

When installing Viz Artist 3.5.4 or later on a workstation or laptop (aka VGA mode) with VGA or DVI output only, it is recommended to use NVIDIA driver version 311.50.

Configuration History

- Viz 3.5.4 and later, driver version 311.50
- Viz 3.5.2 and later, driver version 296.70

- Viz 3.1.0 - 3.5.1, driver version 275.36 (workstation) and 176.87 (laptop)

7.3.2 Viz Video Wall Recommendations

In a Viz Video Wall setup NVIDIA's G-Sync boards (genlock) are used to synchronize the graphics cards of all engines for the video wall with the house clock.

The NVIDIA driver 91.36 is recommended for Viz Video Wall setups with G-Sync boards and graphics cards FX5500, FX4500 or earlier, to enable a stable clock on all machines.

7.3.3 NVIDIA Quadro 2000

Typically used on control client machines running Viz Trio, Viz Content Pilot, Viz Multichannel or Viz Weather on a HP Z400 or Z420.

- **Interface** - PCIe
- **Operating System** - Microsoft Windows XP SP3 (32-bit) and Windows 7 (64-bit)

Configuration History

- Viz 3.5.4 and later, driver version 311.50
- Viz 3.5.2 - 3.5.3, driver version 296.70
- Viz 3.1.0 - 3.5.1, driver version 275.36

See Also

- To configure NVIDIA driver settings
- Release notes for recommended and supported hardware versions

7.3.4 NVIDIA Quadro 4000

Typically used with HD Viz systems based on a HP Z800, Z820 or Z420.

- **Interface** - PCIe
- **Operating System** - Microsoft Windows XP SP3 (32-bit) and Windows 7 (64-bit)

Configuration History

- Viz 3.5.4 and later, driver version 311.50
- Viz 3.5.2 - 3.5.3, driver version 296.70
- Viz 3.1.0 - 3.5.1, driver version 275.36

See Also

- To configure NVIDIA driver settings
- Release notes for recommended and supported hardware versions

7.3.5 NVIDIA Quadro 5000

Typically used with HD Viz systems based on HP Z800.

- **Interface** – PCIe
- **Operating System** – Microsoft Windows XP SP3 (32-bit) and Windows 7 (64-bit)
- **Support**
  - SDI output with Matrox X.mio2
  - SDI capture with NVIDIA Quadro SDI Outlet card
  - G-Sync II

Configuration History

- Viz 3.5.4 and later, driver version 311.50
- Viz 3.5.2 – 3.5.3, driver version 296.70
- Viz 3.1.0 – 3.5.1, driver version 275.36

See Also

- To configure NVIDIA driver settings
- NVIDIA Quadro SDI Capture
- Release notes for recommended and supported hardware versions

7.3.6 NVIDIA Quadro 6000

Typically used with HD Viz systems based on HP Z800.

- **Interface** – PCIe
- **Operating System** – Microsoft Windows XP SP3 (32-bit) and Windows 7 (64-bit)
- **Support**
  - SDI output with Matrox X.mio2
  - SDI capture with NVIDIA Quadro SDI Output card
  - G-Sync II

Configuration History

- Viz 3.5.4 and later, driver version 311.50
- Viz 3.5.2 – 3.5.3, driver version 296.70
- Viz 3.1.0 – 3.5.1, driver version 275.36

See Also

- To configure NVIDIA driver settings
- NVIDIA Quadro SDI Capture
- Release notes for recommended and supported hardware versions

7.3.7 NVIDIA Quadro FX 1400

Typically used with Viz Trio or Viz Weather clients on HP xw4200 and xw4300.

- **Interface** – PCIe
- **Operating System** – Microsoft Windows XP SP2

Configuration History

- Viz 3.5.2 and later, driver version 296.70
- Viz 3.1.0 – 3.5.1, driver version 275.36
- Viz 3.0, driver version 81.67

See Also

- To configure NVIDIA driver settings
- Release notes for recommended and supported hardware versions

7.3.8 NVIDIA Quadro FX 1500

Typically used with Viz Trio or Viz Weather clients on HP xw4400.

- **Interface** – PCIe
- **Operating System** – Microsoft Windows XP SP2

Configuration History

- Viz 3.5.2 and later, driver version 296.70
- Viz 3.1.0 – 3.5.1, driver version 275.36
- Viz 3.0, driver version 162.62

See Also

- To configure NVIDIA driver settings
- Release notes for recommended and supported hardware versions

7.3.9 NVIDIA Quadro FX 1700

Typically used with Viz Trio, Viz Content Pilot or Viz Weather clients on HP xw4600.

- **Interface** – PCIe
- **Operating System** – Microsoft Windows XP SP2

Configuration History

- Viz 3.5.4 and later, driver version 311.50
- Viz 3.5.2 – 3.5.3, driver version 296.70
- Viz 3.1.0 – 3.5.1, driver version 275.36
- Viz 3.0, driver version 162.62

See Also

- To configure NVIDIA driver settings
- Release notes for recommended and supported hardware versions

7.3.10 NVIDIA Quadro FX 1800

Typically used with Viz Trio, Viz Content Pilot or Viz Weather clients on HP Z400.

- **Interface** – PCIe
- **Operating System** – Microsoft Windows XP SP3 (32-bit) and Windows 7 (64-bit)

Configuration History

- Viz 3.5.4 and later, driver version 311.50
- Viz 3.5.2 – 3.5.3, driver version 296.70
- Viz 3.1.0 – 3.5.1, driver version 275.36

See Also

- To configure NVIDIA driver settings
- Release notes for recommended and supported hardware versions

7.3.11 NVIDIA Quadro FX 3400

Typically used with *older* Viz systems based on HP xw8200.

- **Interface** – PCIe
- **Operating System** – Microsoft Windows XP SP2

Configuration History

- Viz 3.5.2 and later, driver version 296.70
- Viz 3.1.0 – 3.5.1, driver version 275.36
- Viz 3.0, driver version 81.67

See Also

- To configure NVIDIA driver settings
- Release notes for recommended and supported hardware versions

7.3.12 NVIDIA Quadro FX 3450

Typically used with HD Viz systems based on HP xw8600.

- **Interface** – PCIe
- **Operating System** – Microsoft Windows XP SP2

Configuration History

- Viz 3.5.2 and later, driver version 296.70
- Viz 3.1.0 – 3.5.1, driver version 275.36

See Also

- To configure NVIDIA driver settings

- Release notes for recommended and supported hardware versions

7.3.13 NVIDIA Quadro FX 3500

Typically used with *older* Viz systems based on HP xw8200.

- **Interface** – PCIe
- **Operating System** – Microsoft Windows XP SP2

Configuration History

- Viz 3.5.2 and later, driver version 296.70
- Viz 3.1.0 – 3.5.1, driver version 275.36
- Viz 3.0, driver version 81.67

See Also

- To configure NVIDIA driver settings
- Release notes for recommended and supported hardware versions

7.3.14 NVIDIA Quadro FX 3700

Typically used with HD Viz systems based on HP xw8400, xw8600 or IBM Z-Pro 9228.

- **Interface** – PCIe
- **Operating System** – Microsoft Windows XP SP2
- **Support**
  - SDI output with Matrox X.mio2

Configuration History

- Viz 3.5.4 and later, driver version 311.50
- Viz 3.5.2 – 3.5.3, driver version 296.70
- Viz 3.1.0 – 3.5.1, driver version 275.36
- Viz 3.0, driver version 162.62

See Also

- To configure NVIDIA driver settings
- Release notes for recommended and supported hardware versions

7.3.15 NVIDIA Quadro FX 3800

Typically used with HD Viz systems based on HP Z800.

- **Interface** – PCIe
- **Operating System** – Microsoft Windows XP SP3 (32-bit) and Windows 7 (64-bit)

Configuration History

- Viz 3.5.4 and later, driver version 311.50
- Viz 3.5.2 – 3.5.3, driver version 296.70
- Viz 3.1.0 – 3.5.1, driver version 275.36

See Also

- To configure NVIDIA driver settings
- Release notes for recommended and supported hardware versions

7.3.16 NVIDIA Quadro FX 4000

Typically used with *older* HD Viz systems based on IBM Z-Pro 6221.

- **Interface** – AGPx8
- **Operating System** – Microsoft Windows 2000 Professional SP4 and XP SP2
- **Support**
  - SDI output with Matrox X.mio2

Configuration History

- Viz 3.5.2 and later, driver version 296.70
- Viz 3.1.0 – 3.5.1, driver version 275.36 or driver version 91.36 when used with Viz Video Wall (SDI only).

CAUTION! Application crashes or blue screens with NVIDIA Quadro FX 4000 SDI, FX 4500 SDI, or FX 5500 SDI in conjunction with a later NVIDIA driver than 162.62 due to a driver bug. Install NVIDIA driver 162.62 for these cards, or use the current driver and set **use_old_nvsdk** to 1 in the configuration file.

- Viz 3.0, driver version 83.62

See Also

- To configure NVIDIA driver settings
- Release notes for recommended and supported hardware versions

7.3.17 NVIDIA Quadro FX 4400

Typically used with HD Viz systems based on HP Z800.

- **Interface** – PCIe
- **Operating System** – Microsoft Windows XP SP3 (32-bit) and Windows 7 (64-bit)
- **Support**
  - SDI output with Matrox X.mio2

Configuration History

- Viz 3.5.2 and later, driver version 296.70
- Viz 3.1.0 – 3.5.1, driver version 275.36

See Also

- To configure NVIDIA driver settings
- Release notes for recommended and supported hardware versions

7.3.18 NVIDIA Quadro FX 4500

Typically used with Viz systems based on HP xw8200, xw8400 or IBM Z-Pro 6223.

- **Interface** – PCIe
- **Operating System** – Microsoft Windows XP SP2
- **Support**
  - SDI output with Matrox X.mio2
  - G-Sync

Configuration History

- Viz 3.5.2 and later, driver version 296.70
- Viz 3.1.0 – 3.5.1, driver version 275.36
- Viz 3.0, driver version 83.62

See Also

- To configure NVIDIA driver settings
- Release notes for recommended and supported hardware versions

7.3.19 NVIDIA Quadro FX 4600

Typically used with HD Viz systems based on HP xw8400, xw8600 or IBM Z-Pro 9228.

- **Interface** – PCIe
- **Operating System** – Microsoft Windows XP SP2
- **Support**
  - SDI output with Matrox X.mio2

Configuration History

- Viz 3.5.4 and later, driver version 311.50
- Viz 3.5.2 – 3.5.3, driver version 296.70
- Viz 3.1.0 – 3.5.1, driver version 275.36
- Viz 3.0, driver version 162.62

See Also

- To configure NVIDIA driver settings
- Release notes for recommended and supported hardware versions

7.3.20 NVIDIA Quadro FX 4800

Typically used with HD Viz systems based on HP Z800.

- **Interface** – PCIe
- **Operating System** – Microsoft Windows XP SP3 (32-bit) and Windows 7 (64-bit)
- **Support**
  - SDI output with Matrox X.mio2
  - G-Sync II

Configuration History

- Viz 3.5.4 and later, driver version 311.50
- Viz 3.5.2 – 3.5.3, driver version 296.70
- Viz 3.1.0 – 3.5.1, driver version 275.36

See Also

- To configure NVIDIA driver settings
- Release notes for recommended and supported hardware versions

7.3.21 NVIDIA Quadro FX 5500

Typically used with HD Viz systems based on HP xw8400 or IBM Z-Pro 9228.

- **Interface** – PCIe
- **Operating System** – Microsoft Windows XP SP2
- **Support**
  - SDI output with Matrox X.mio2
  - G-Sync

Configuration History

- Viz 3.5.2 and later, driver version 296.70
- Viz 3.1.0 – 3.5.1, driver version 275.36 or driver version 91.36 when used with Viz Video Wall (SDI only).
- Viz 3.0, driver version 162.62

CAUTION! Application crashes or blue screens with NVIDIA Quadro FX 4000 SDI, FX 4500 SDI, or FX 5500 SDI in conjunction with a later NVIDIA driver than 162.62 due to a driver bug. Install NVIDIA driver 162.62 for these cards, or use the current driver and set **use_old_nvsdk** to 1 in the configuration file.

See Also

- To configure NVIDIA driver settings
- Release notes for recommended and supported hardware versions

7.3.22 NVIDIA Quadro FX 5600

Typically used with HD Viz systems based on HP xw8400 and xw8600.

- **Interface** – PCIe
- **Operating System** – Microsoft Windows XP SP2

- **Support**
  - SDI output with Matrox X.mio2

Configuration History

- Viz 3.5.4 and later, driver version 311.50
- Viz 3.5.2 - 3.5.3, driver version 296.70
- Viz 3.1.0 - 3.5.1, driver version 275.36
- Viz 3.0, driver version 162.62

See Also

- To configure NVIDIA driver settings
- Release notes for recommended and supported hardware versions

7.3.23 NVIDIA Quadro FX 5800

Typically used with HD Viz systems based on HP Z800.

- **Interface** - PCIe
- **Operating System** - Microsoft Windows XP SP3 (32-bit) and Windows 7 (64-bit)
- **Support**
  - SDI output with Matrox X.mio2
  - G-Sync II

Configuration History

- Viz 3.5.4 and later, driver version 311.50
- Viz 3.5.2 -3.5.3, driver version 296.70
- Viz 3.1.0 - 3.5.1, driver version 275.36

See Also

- To configure NVIDIA driver settings
- NVIDIA Quadro SDI Capture
- Release notes for recommended and supported hardware versions

7.3.24 NVIDIA Quadro K600

Typically used with HD Viz systems based on HP Z420.

- **Interface** - PCIe
- **Operating System** - Microsoft Windows XP SP3 (32-bit) and Windows 7 (64-bit)

Configuration History

- Viz 3.5.4 and later, driver version is 311.50

See Also

- To configure NVIDIA driver settings
- Release notes for recommended and supported hardware versions

7.3.25 NVIDIA Quadro K2000

Typically used with HD Viz systems based on HP Z420.

- **Interface** – PCIe
- **Operating System** – Microsoft Windows XP SP3 (32-bit) and Windows 7 (64-bit)

Configuration History

- Viz 3.5.4 and later, driver version is 311.50

See Also

- To configure NVIDIA driver settings
- Release notes for recommended and supported hardware versions

7.3.26 NVIDIA Quadro K4000

Typically used with HD Viz systems based on HP Z820.

- **Interface** – PCIe
- **Operating System** – Microsoft Windows XP SP3 (32-bit) and Windows 7 (64-bit)
- **Support**
  - SDI output with Matrox X.mio2

Configuration History

- Viz 3.5.4 and later, driver version is 311.50

See Also

- To configure NVIDIA driver settings
- Release notes for recommended and supported hardware versions

7.3.27 NVIDIA Quadro K5000

Typically used with HD Viz systems based on HP Z820.

- **Interface** – PCIe
- **Operating System** – Microsoft Windows XP SP3 (32-bit) and Windows 7 (64-bit)
- **Support**
  - SDI output with Matrox X.mio2
  - SDI capture with NVIDIA Quadro SDI Output card
  - G-Sync III

Configuration History

- Viz 3.5.4 and later, driver version is 311.50

See Also

- To configure NVIDIA driver settings
- NVIDIA Quadro SDI Capture
- Release notes for recommended and supported hardware versions

8 Video Cards

This section describes the video cards supported by Viz 3.x. Some cards are considered legacy cards with the latest version of Viz 3.x, and are consequently moved to the Legacy Cards section.

This section contains information on the following topics:

See Also

- Video, Audio and Graphics Card Installation

8.1 BlueFish444 Epoch

Figure 65: BlueFish444 Epoch|4K SuperNova and Epoch|2K Horizon

Viz 3.5 and later supports the BlueFish444 Epoch 4K|SuperNova and Epoch|2K Horizon cards. These cards replace the SD Lite Pro Express, which for Viz 3.5 installations will work, but is considered a legacy card.

Note: Other BlueFish444 and Digital Voodoo cards are no longer officially supported (see the Legacy Cards section).

The cards are intended for character generetors such as Viz Trio, but can also be used as a cheap alternative where only two inputs and outputs are required. The card is typically seen on HP z800.

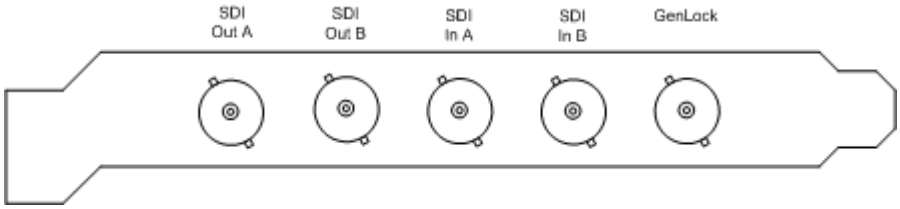
Some of the main supported features are:

- Embedded audio input and output. Note that all 16 channels are used; however, there are currently no configuration options available for these channels (e.g. routing of channels, enable/disable channels etc)
- ANC data (HANC and VANC), such as VITC and RP188 timecodes is supported. Data from the input is overlayed on the output. Ingestion of timecodes from time code reader cards are supported as well
- Two video inputs and outputs and one genlock
- Automatic Bypass of video if the Viz Engine crashes
- Constant delay of 4 frames from input to output

This section contains information on the following topics:

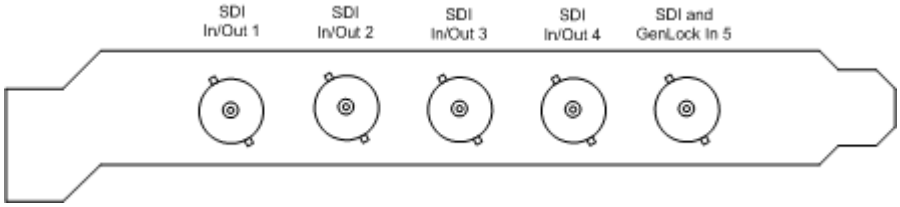
8.1.1 Connectors

Figure 66: BlueFish444 Epoch|2K Horizon adaptor board's BNC connectors



The Epoch|2K Horizon comes with five MMCX connectors which can be connected to an adaptor board providing 5 BNC connections;- two inputs, two outputs and one GenLock.

Figure 67: BlueFish444 Epoch|4K SuperNova BNC connectors

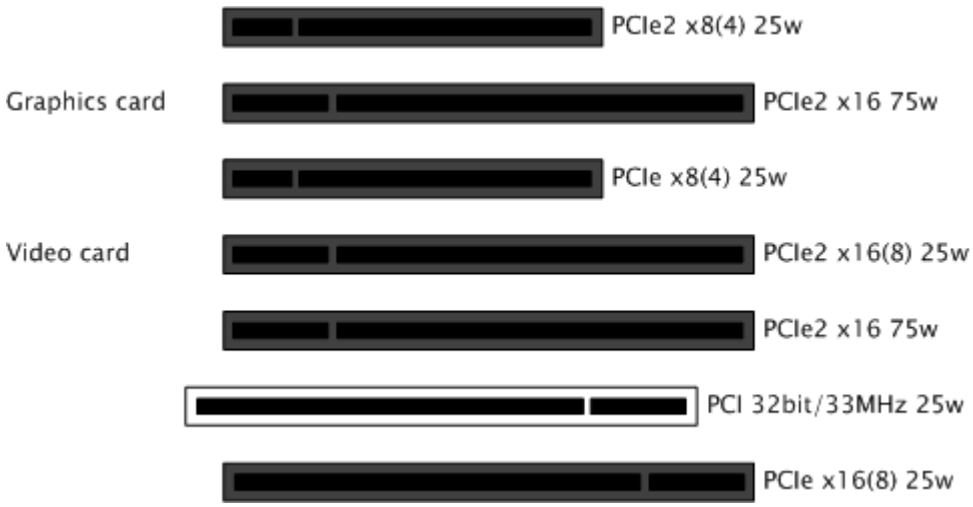


The Epoch|4K SuperNova comes with 5 bidirectional BNC connectors. With 5 BNC connectors, each of the first four do SD, HD, 3G, ASI, AES and LTC as either input or output. The fifth is the designated GenLock or SD, HD, 3G, ASI or AES (no LTC).

8.1.2 Video Card Installation

To install the BlueFish444 Epoch in an HP z800

Figure 68: PCI-X, PCI and AGP slots, HP z800



1. Disconnect the power and all other peripherals.
2. Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.
3. Insert the graphics card in the PCIe slot number 2 from the top.
4. Insert the BlueFish444 video card in the PCIe slot number 4 from the top.

Note: If you are using the BNC adaptor with the Epoch|2K Horizon card it can be placed directly adjacent the video card on either side.

8.1.3 Driver Installation

Use the driver version available on Vizrt's FTP server in order to ensure proper functionality and ring buffer support.

- **Viz 3.x**: 3.5.1 - 3.5.4
  - **Driver**: Bluefish444 v5.10.1.11
- **Viz 3.x**: 3.5
  - **Driver**: Bluefish444 v5.9.0.78

8.1.4 Automatic Bypass

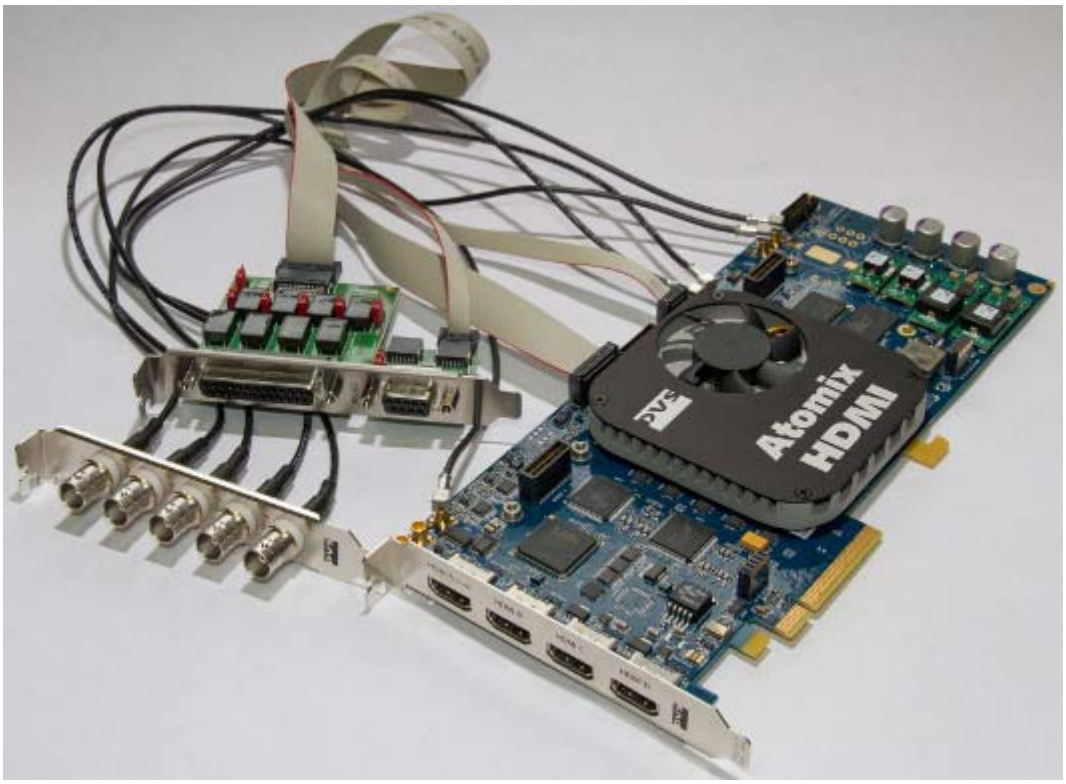
Viz Engine supports automatic mechanical bypass (copper-to-copper) of video for both BlueFish444 Epoch cards. In order to enable this feature you have to enable Viz Engine's Watchdog feature. This is commonly used for the Matrox cards, but works the same way for the BlueFish444 cards.

To enable automatic bypass for BlueFish444 Epoch cards

1. Stop Viz Engine

2. Open your Viz configuration file (e.g. *VIZ-<hostname>-0-0.cfg*)
   - The file is located in the Viz3 program folder
3. Locate the `SECTION MATROX_CONFIG` and enable the Matrox watchdog setting:
   `Matrox0.WatchDogUseHardwareBypass = 0`
4. Save the file
5. Start Viz Engine

8.2 DVS Atomix HDMI



This section contains a description of the Digital Video Systems' (DVS) Atomix HDMI video board.

Atomix HDMI is designed for HD TV broadcast and film post production up to 2K. Atomix HDMI features two video channels that can be used independently or in 3D/stereo mode up to 2K. Moreover, it has an up/downscaler, a 1D LUT and multi-rate SDI ports with 3.0 Gbps which can be used in various single- and dual-link configurations.

The DVS Atomix HDMI is mainly used with Viz Virtual Set and Viz Arena, and is the successor of the DVS Centaurus II. The DVS Atomix HDMI is, as with the Centaurus II, able to output SD, HD and 2K.

The DVS Atomix HDMI is typically mounted in HP Z420 machines.

This chapter contains information on the following topics:

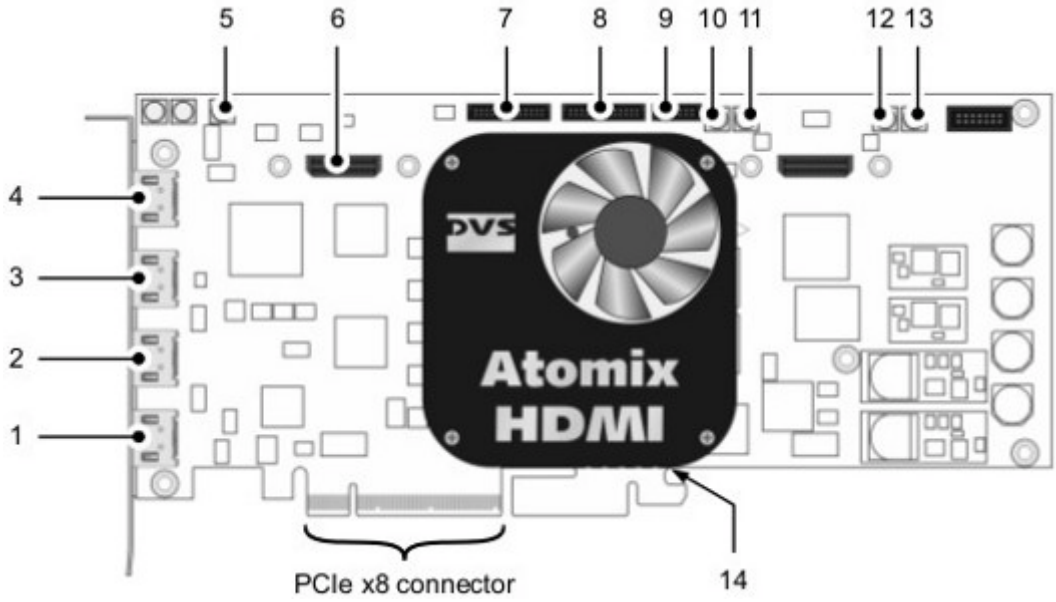
- Connectors
- Supported Codecs
- Configuration History
- Licensing

See Also

- Video, Audio and Graphics Card Installation
- DVS support

8.2.1 Connectors

Component Side



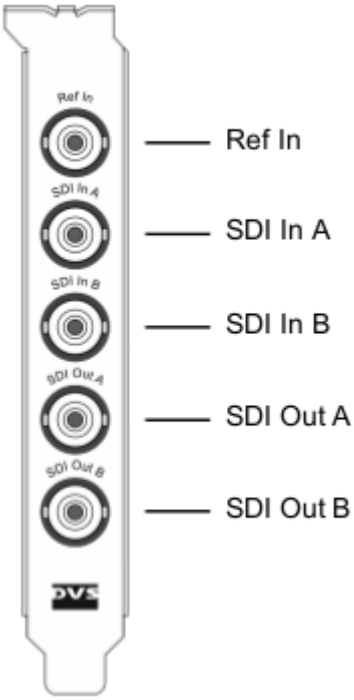
This section is an excerpt from the DVS Atomix HDMI Installation Guide (version 2), section 2.2.2: *Overview of the Component Side* and section 2.3.3: *Audio and RS-422 Panel*. For complete information, see the DVS Installation Guide available for download on their website.

No.	Item	Description
1	HDMI D	HDMI 1.3 connector for an output of digital audio and video signals; will be used for the first video channel in special rasters (e.g. for quad-display applications)
2	HDMI C	HDMI 1.3 connector for an output of digital audio and video signals (main port of the assigned video channel); usually used for the second video channel; can also be used for the first video channel in special rasters (e.g. for quaddisplay applications)

No.	Item	Description
3	HDMI B	HDMI 1.3 connector for an output of digital audio and video signals; will be used for the first video channel in special rasters (e.g. for quad-display applications)
4	HDMI A (1.4a)	HDMI 1.4a connector for an output of digital audio and video signals up to 4K (main port of the assigned video channel); usually used for the first video channel
5	Ref In	MXC connector for the reference input
6	Expansion	Connection for an expansion module or slot panel
7	AUDIO 1-8/ LTC	Flat cable connector for analog audio, the digital audio channels 1 to 8 and LTC
8	AUDIO 9-16	Flat cable connector for the digital audio channels 9 to 16
9	RS-422 A/B	Flat cable connector for an in- and output of RS-422 signals (main remote ports)
10	SDI OUT A	MCX connector for an output of digital video signals (serial digital interface, port A); usually used for an output of the first video channel in single-link (YUV) or dual-link modes (either 3-Gbit/s SDI or first dual-link stream of YUVA or RGB[A])
11	SDI IN A	MCX connector for an input of digital video signals (serial digital interface, port A); usually used for an input of the first video channel in single-link (YUV) or dual-link modes (either 3-Gbit/s SDI or first dual-link stream of YUVA or RGB[A])
12		SDI IN B MCX connector for an input of digital video signals (serial digital interface, port B); usually used for an input of the second video channel in single-link (YUV) or dual-link modes (3-Gbit/s SDI); can also be used for the first video channel for the second dual-link stream of YUVA or RGB[A]
13	SDI Out B	MCX connector for an output of digital video signals (serial digital interface, port B); usually used for an output of the second video channel in single-link (YUV) or dual-link modes (3-Gbit/s SDI); can also be used for the first video channel for the second dual-link stream of YUVA or RGB[A]
14	breaking line	The printed circuit board provides at its bottom an extension void of any electrical parts; it may serve to stabilize the installation of the board in a computer system; when not needed or interfering, you can carefully break it off the circuit board at the breaking line

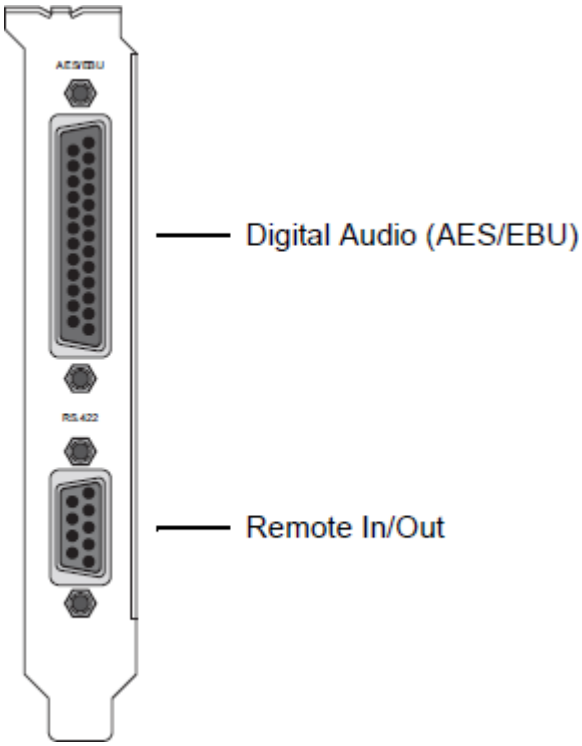
SDI Panel

The SDI panel provides the serial digital interface connectors for Atomix HDMI:



Item	Description
Ref In	BNC connector for the reference input
SDI In A	BNC connector for an input of digital video signals (serial digital interface, port A); usually used for an input of the first video channel in single-link (YUV) or dual-link modes (either 3-Gbit/s SDI or first dual-link stream of YUVA or RGB[A])
SDI In B	BNC connector for an input of digital video signals (serial digital interface, port B); usually used for an input of the second video channel in single-link (YUV) or dual-link modes (3-Gbit/s SDI); can also be used for the first video channel for the second dual-link stream of YUVA or RGB[A]
SDI Out A	BNC connector for an output of digital video signals (serial digital interface, port A); usually used for an output of the first video channel in single-link (YUV) or dual-link modes (either 3-Gbit/s SDI or first dual-link stream of YUVA or RGB[A])
SDI Out B	BNC connector for an output of digital video signals (serial digital interface, port B); usually used for an output of the second video channel n single-link (YUV) or dual-link modes (3-Gbit/s SDI); can also be used for the first video channel for the second dual-link stream of YUVA or RGB[A]

Audio and RS-422 panel



The board has the breakout cable, a RS-422 panel and cable. On the RS-422 panel there are two connectors:

Item	Description
Digital Audio (AES/EBU):	DB-25 connector (female) for audio and LTC in- and output; provides either four stereo channels digital audio (channels 1 to 8) or three channels audio plus LTC. It can also be used to provide the digital audio channels 9 to 16.
Remote In/Out:	DB-9 connector (female), serial RS-422 interface for master or slave control.

The breakout cable has 4 XLR male and 4 XLR female connectors to interface directly with audio devices. The RS-422 panel's cable is mounted on the back of the RS-422 panel's board and connected to the Atomix HDMI board.

8.2.2 Supported Codecs

Currently, the DVS Atomix HDMI implementation only supports the **Microsoft DirectShow Filtergraph** framework to render video clips. This enables play, for example, of MPEG files or streams from a server.

For more information on how to use video clips in Viz Artist, see the Viz Artist User Guide and, in particular, the SoftClip and MoViz plugins.

Basically the DVS Atomix HDMI board can play everything that can be played out by the Windows Media Player, so it depends on what codecs/DirectShow filters that are installed on the machine.

8.2.3 Configuration History

Use the driver version available on Vizrt's FTP server to make sure of correct functionality and ring buffer support.

The following driver versions are supported:

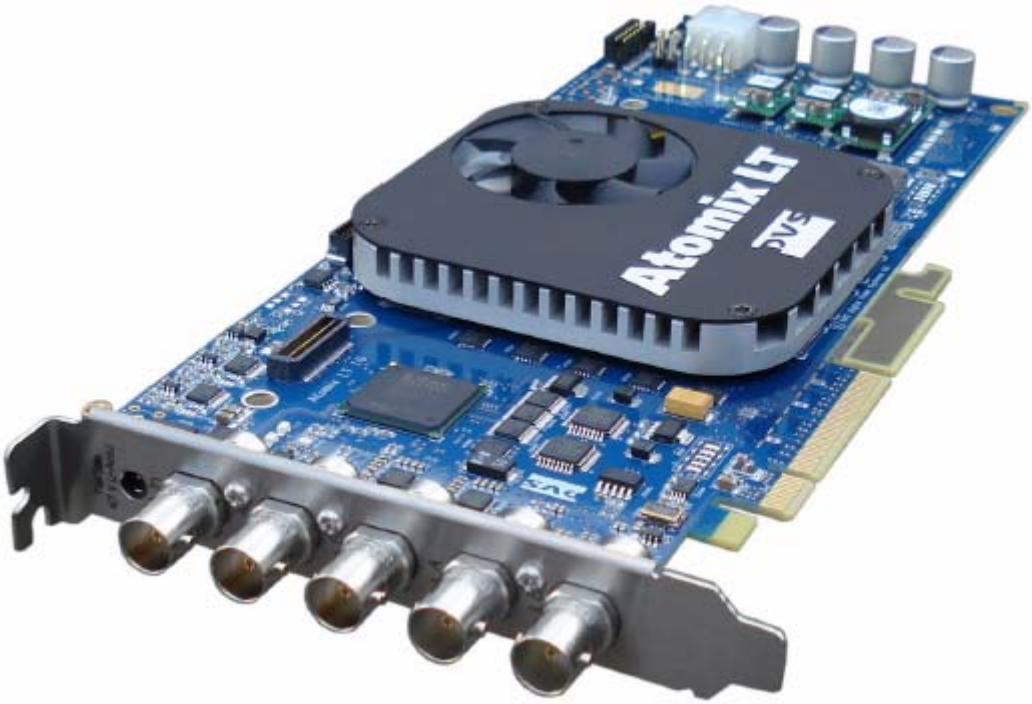
Viz Release	Driver Version
3.5.4 and later	SDK 4.3.5.10 (firmware7.4.0.20_7.0.10)
3.5.2 - 3.5.3	SDK 4.2.9.8 (firmware 7.4.0.6_7.0.10)

For information on how to install or update the driver, see the DVS SDK 2.7 User Guide (version 2.0) sections 3.2 and 3.3: *Installation under Windows* and *Updating an Existing SDK*.

8.2.4 Licensing

For information on how to set the license key for the DVS Atomix HDMI board, see the DVS Atomix HDMI installation guide, section 3.3: *Setting the License Key*.

8.3 DVS Atomix LT



This section contains a description of the Digital Video Systems' (DVS) Atomix LT video card.

Atomix LT is designed for HD TV broadcast and film post production up to 2K. Atomix LT features two video channels that can be used independently or in 3D/stereo mode up to 2K. Moreover, it has an up/downscaler, a 1D LUT and multi-rate SDI ports with 3.0 Gbps which can be used in various single- and dual-link configurations.

Vizrt's use of the DVS is mainly used with Viz Virtual Set and Viz Arena, and is Vizrt's successor of the DVS Centaurus II. The DVS Atomix LT is as with the Centaurus II able to output SD, HD and 2K. The DVS Atomix is typically mounted in HP z800 machines.

This section contains information on the following topics:

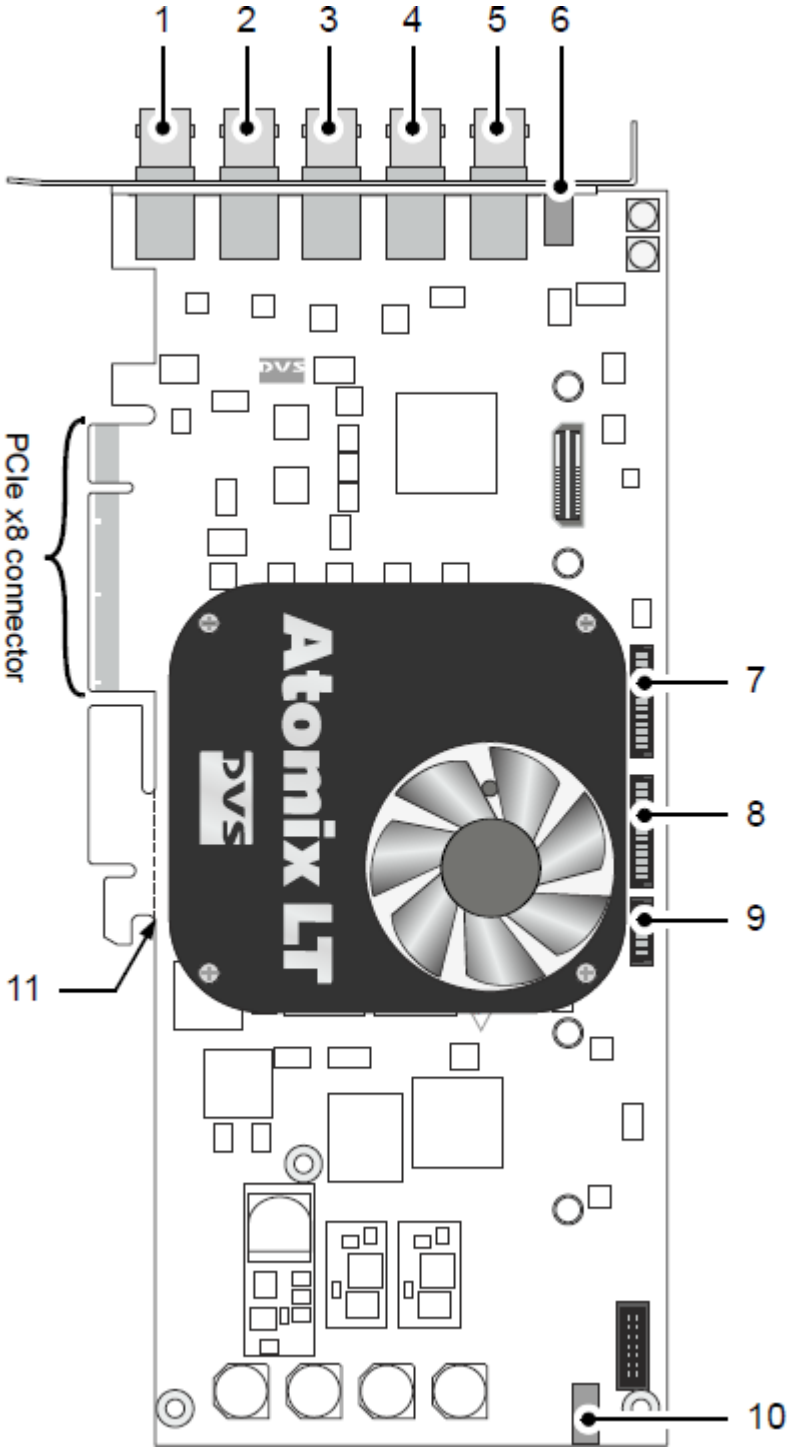
- Connectors
- Supported Codecs
- Driver Installation
- Licensing

See Also

- Video, Audio and Graphics Card Installation
- DVS support

8.3.1 Connectors

Figure 69: Overview of the items and connectors on the DVS Atomix LT board



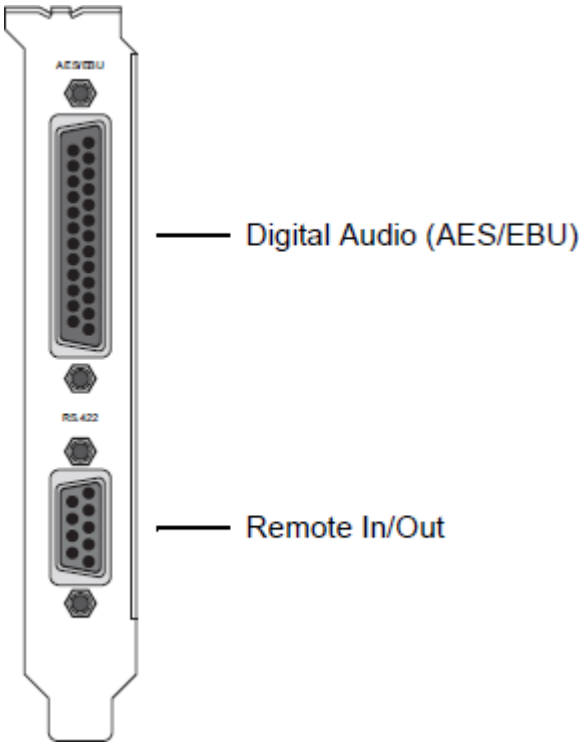
This section is an excerpt from the **DVS Atomix LT installation guide** (version 1.0) section 2.2.1 and 2.3.2: *Overview of the Component Side and Audio* and *RS-422*

Panel. For complete information, please refer to DVS' installation guide available for download on their website.

Table 29:

No.	Item	Explanation
1	SDI Out B	BNC connector for an output of digital video signals (serial digital interface, port B); usually used for an output of the second video channel in single-link (YUV) or dual-link modes (3-Gbit/s SDI); can also be used for the first video channel for the second dual-link stream of YUVA or RGB[A]
2	SDI Out A	BNC connector for an output of digital video signals (serial digital interface, port A); usually used for an output of the first video channel in single-link (YUV) or dual-link modes (either 3-Gbit/s SDI or first dual-link stream of YUVA or RGB[A])
3	SDI In B	BNC connector for an input of digital video signals (serial digital interface, port B); usually used for an input of the second video channel in single-link (YUV) or dual-link modes (3-Gbit/s SDI); can also be used for the first video channel for the second dual-link stream of YUVA or RGB[A]
4	SDI In A	BNC connector for an input of digital video signals (serial digital interface, port A); usually used for an input of the first video channel in single-link (YUV) or dual-link modes (either 3-Gbit/s SDI or first dual-link stream of YUVA or RGB[A])
5	Ref In	BNC connector for the reference input
6	Fail Safe 0	See Fail Safe 1
7	AUDIO 1-8/ LTC	Flat cable connector for analog audio, the digital audio channels 1 to 8 and LTC
8	AUDIO 9-16	Flat cable connector for the digital audio channels 9 to 16
9	RS-422 A/B	Flat cable connector for an in- and output of RS-422 signals (main remote ports)
10	Fail Safe 1	For a bypass of the SDI input signals to the SDI outputs in case of power loss connect to either this connector or Fail Safe 0 a rechargeable battery (accu, see section "Technical Data" on page A-1)
11	Breaking line	The printed circuit board provides at its bottom an extension void of any electrical parts; it may serve to stabilize the installation of the board in a computer system; when not needed or interfering, you can carefully break it off the circuit board at the breaking line

Figure 70: Panel with audio and remote control connections



With the card you also have the breakout cable, RS-422 panel and cable. On the RS-422 panel there are two connectors, one DB-25 connector for digital audio (AES/EBU) and one DB-9 connector for remote in/out.

Table 30:

Item	Explanation
Digital Audio (AES/EBU)	DB-25 connector (female) for audio and LTC in- and output; provides either four stereo channels digital audio (channels 1 to 8) or three channels audio plus LTC; alternatively it can be used to provide the digital audio channels 9 to 16.
Remote In/Out	DB-9 connector (female), serial RS-422 interface for master or slave control.

The breakout cable has 4 XLR male and 4 XLR female connectors to interface directly with audio devices. The RS-422 panel's cable is mounted on the back of the RS-422 panel's board and connected to the Atomix LT board.

8.3.2 Supported Codecs

Currently, the DVS implementation only supports the Microsoft DirectShow Filtergraph framework to render video clips. Therefore it is possible to play for example MPEG files or streams from a server. For more information on how to use video clips in Viz, see the Viz Artist manual and in particular the SoftClip and MoViz plugins.

Basically, it can play everything that can be played out by the Windows Media Player, so it depends on what codecs/DirectShow filters that are installed on the machine.

8.3.3 Driver Installation

The following driver version is supported by Vizrt:

- **Viz 3.x**: Viz 3.5.4 and later
  - **Driver**: SDK 4.3.5.10
- **Viz 3.x**: Viz 3.5.2 - 3.5.3
  - **Driver**: SDK 4.2.9.8
- **Viz 3.x**: Viz 3.3.0 - 3.5.1
  - **Driver**: SDK 4.0.1.15

For information on how to install or update the driver, please refer to DVS' SDK 2.7 user guide (version 2.0) sections 3.2 and 3.3: *Installation under Windows* and *Updating an Existing SDK*.

8.3.4 Licensing

For information on how to set the license key for your DVS Atomix LT card, please refer to the DVS Atomix LT installation guide (version 1.0) section 3.3: *Setting the License Key*.

8.4 Matrox X.mio 1 and X.mio 2

Figure 71: Matrox X.mio 2 card

The Matrox X.mio cards are used as Vizrt's HD and SD multi-channel video- and audio I/O solution, replacing the Pinnacle Targa 3200.

This section contains information on the following topics:

- Connectors
- Supported Codecs
- Mixed Mode Video Support
- Driver Installation
- Watchdog
- Licensing

See Also

- Matrox DSX LE2/CG
- Video, Audio and Graphics Card Installation

8.4.1 Connectors

The connectors for X.mio 1 are:

- 133 MHz PCI-X card compliant to PCI-X standards 1.0b and 2.0
- x2 SDI Video Inputs in SD and HD
- x4 SDI Video Outputs in SD and HD
- x8 In / x16 Out, balanced XLR AES/EBU audio
- x16 Embedded Audio I/O Channels per SDI Stream

The connectors for X.mio 2 are:

- PCIe card compliant to PCIe 2.0 in x8 or x16 slot
- x2 or x4 SDI Video Inputs in SD and HD
- x4 SDI Video Outputs in SD and HD
- x16 In / x32 Out, unbalanced AES/EBU audio

Because of the large number of I/O connections the card is equipped with Sub-D connectors. A breakout-cable translating the Sub-D connectors to regular connectors/plugs is included for every machine.

This section contains information on the following topics:

- Breakout Box
- Cable Wiring
- Audio Configuration
- Audio-extension Card

Breakout Box

Figure 72: X.mio 1 breakout box

Figure 73: X.mio 2 breakout box

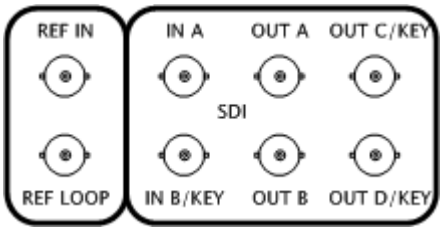
The breakout box is the often used for Viz Engine solutions that needs to be rewired in regular intervals. The 1U Rack unit chassis is designed to fit into a standard 19" rack.

Note: The parts and tools required to mount the box into a rack are not included.

Figure 74: Video signal connector

The above image depicts the connector responsible for transmitting any video related signals to and from the X.mio card.

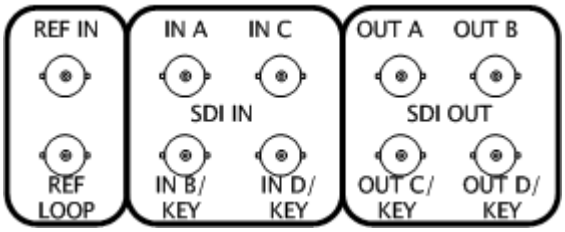
Figure 75: Video connectors for X.mio 1 and X.mio 2



The front panel of the X.mio 1 breakout box provides the user with 8 standard BNC connectors.

- x2 HD/SD SDI In
- x4 HD/SD SDI Out
- x1 Analogue Ref In
- x1 Analogue Ref Loop

Figure 76: Video connectors for X.mio 2



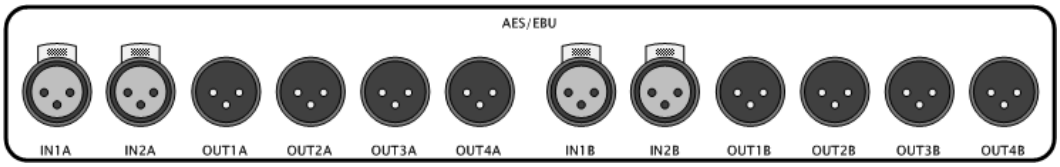
The front panel of the X.mio 2 breakout box provides the user with 8 or 10 standard BNC connectors.

- x2 or x4 HD/SD SDI In
- x4 HD/SD SDI Out
- x1 Analogue Ref In
- x1 Analogue Ref Loop

IMPORTANT! When using the Ref. In connector on the Matrox card for synchronization, the Ref. Out Loop connector must be terminated with a 75 Ohm resistor unless it is being used to loop an incoming GenLock signal.

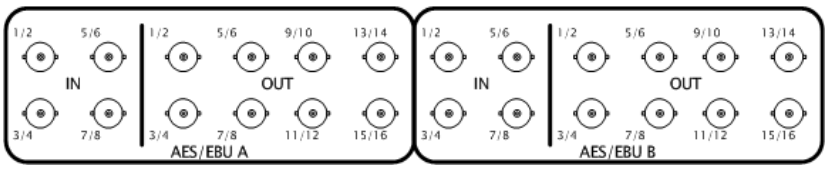
The front side of the breakout box also hosts the various audio in- and outputs offered by Matrox X.mio.

Figure 77: Audio connectors for X.mio 1



On the X.mio 1 breakout box, each of the two audio bays, A and B, consists of two female AES/EBU audio input channels and of four male AES/EBU audio output channels.

Figure 78: Audio connectors for X.mio 2



On the X.mio 2 breakout box, each of the two audio bays, A and B, consists of four female BNC audio input channels and of eight female BNC audio output channels.

Note: Bay cables are not included.

On the backside of each breakout box there are two connectors labeled AUDIO-A and AUDIO-B. The included cables are used to connect the corresponding plugs of the X.mio Audio-extension Card to the computer.

Cable Wiring

The Viz Engine can either be High Definition (HD) or Standard Definition (SD). Connect the relevant video input(s) and output(s), and the reference signal(s).

SDI Out connections are only relevant when the Matrox card is used for SDI In and Out.

A reference signal can be attached to the reference input connector (Analog Ref. In) which can be fed with any analogue GenLock signal such as a Blackburst signal or a Tri-level sync as required.

If you are relaying the reference signal (for synchronization) from Matrox to a graphics card (e.g. NVIDIA) you must verify that all internal connections between the graphics card and its SDI extension are OK and that the extension is properly supplied with power.

IMPORTANT! When using the Ref. In connector on the Matrox card for synchronization, the Ref. Out Loop connector must be terminated with a 75 Ohm resistor unless it is being used to loop an incoming GenLock signal.

Audio Configuration

This section contains information on the following topics:

- AES Input Cable Assignment
- AES Output Cable Assignment
- Embedded input

- Embedded output

Table 31: AES Input Cable Assignment

Card	Viz audio config	AES Cable	Matrox Video Channel
DSX.LE2/CG	2 tracks	Not supported	
	4 tracks	Not supported	
	8 tracks	Not supported	
	16 tracks	Not supported	
X.mio 1	2 tracks	A IN 1	Video IN A
		B IN 1	Video IN B
	4 tracks	A IN 1+2	Video IN A
		B IN 1+2	Video IN B
	8 tracks	A IN 1+2 B IN 1+2	Video IN A
		N/A	
	16 tracks	Not supported	
X.mio 2	2 tracks	A IN 1/2	Video IN A
		A IN 3/4	Video IN B
		A IN 5/6	Video IN C
		A IN 7/8	Video IN D
	4 tracks	A IN 1/2+3/4	Video IN A
		A IN 5/6+7/8	Video IN B
		B IN 1/2+3/4	Video IN C
		B IN 5/6+7/8	Video IN D
	8 tracks	A IN 1/2+3/4+5/6+7/8	Video IN A or Video IN C
		B IN 1/2+3/4+5/6+7/8	Video IN B or Video IN D
	16 tracks	A IN 1/2+3/4+5/6+7/8 B IN 1/2+3/4+5/6+7/8	Video IN A or Video IN B or Video IN C or Video IN D

Table 32: AES Output Cable Assignment

Card	Viz audio config	AES Cable	Matrox Audio Channel
DSX.LE2/CG	2 tracks	AES OUT 1/2	Audio OUT 0
	4 tracks	AES OUT 1/2+3/4	Audio OUT 0
	8 tracks	Not supported	
	16 tracks	Not supported	
X.mio 1	2 tracks	A OUT 1	Audio OUT 0
		A OUT 3	Audio OUT 1
	4 tracks	A OUT 1+2	Audio OUT 0
		A OUT 3+4	Audio OUT 1
	8 tracks	A OUT 1+2 B OUT 1+2	Audio OUT 0
		A OUT 3+4 B OUT 3+4	Audio OUT 1
	16 tracks	A OUT 1+2+3+4 B OUT 1+2+3+4	Audio OUT 0
X.mio 2	2 tracks	A OUT 1/2	Audio OUT 0
		B OUT 1/2	Audio OUT 1
	4 tracks	A OUT 1/2+3/4	Audio OUT 0
		B OUT 1/2+3/4	Audio OUT 1
	8 tracks	A OUT 1/2+3/4+5/6+7/8	Audio OUT 0
		B OUT 1/2+3/4+5/6+7/8	Audio OUT 1
	16 tracks	A OUT 1/2+3/4+5/6+7/8+9/10+11/12+13/+14+15/16	Audio OUT 0
		B OUT 1/2+3/4+5/6+7/8+9/10+11/12+13/+14+15/16	Audio OUT 1

Table 33: Embedded input

Card/ Viz audio config	2 tracks	4 tracks	8 tracks	16 tracks
DSX.LE2/CG	–	–	–	–
X.mio 1	yes	yes	yes	yes
X.mio 2	yes	yes	yes	yes

Table 34: Embedded output

Card / Viz audio config	2 tracks	4 tracks	8 tracks	16 tracks
DSX.LE2/CG	yes	yes	yes	no
X.mio 1	yes	yes	yes	yes
X.mio 2	yes	yes	yes	yes

Audio-extension Card

Figure 79: Matrox audio-extension card

The audio-extension card and audio cables are part of the X.mio break-out box or the X.mio cable kit (that comes with the X.mio card), and needs to be installed when AES/EBU audio support is required. The card is an extension for the connectors, and does not provide any extra functionality. For installations that require embedded audio, or no audio at all, this extension is not required.

IMPORTANT! The Matrox audio-extension card only supports digital audio.

By default the audio-extension card will consume one additional free slot on the motherboard. The card is supplied by the Matrox X.mio card in terms of power and data.

In some cases the design of the audio-extension card (see Figure 79: Matrox audio-extension card) makes it hard to mount it at a location with an underlying PCIe slot. Therefore it is an option To remove the audio-extension card back-end instead of using another PCI or PCI-X slot. However, it is in most cases possible to

mount the extension card in any slot in the machine, unrelated to the underlying slot's design, without removing its back-end.

Removing the back-end of the extension card will free any connection to the motherboard. As a result it may react more sensitively to transportation and tension introduced by the external audio cables connected to it. Therefore, the above-mentioned procedure should only be applied to machines residing in stable environment like a dedicated machine room. Do not apply these instructions to machines intended to be used for OB or equipment that will be moved around a lot.

See Also

- Audio Settings
- Audio Configuration
- Matrox configuration interface
- Supported Codecs

8.4.2 Supported Codecs

Similar to the Pinnacle Targa 3200, the Matrox X.mio and X.mio2 supports a selection of different codecs for both SD and HD.

All codecs are implemented in software. Matrox uses the card itself as a kind of dongle for the software codecs, therefore certain codecs require certain card classes as follows:

- 6000 class = SD codecs only. No D10
- 8000 class = same as 6000 + HD codecs and D10, D12

The Matrox X.mio 24/6000 card, including all SD codecs, except D10/D12, is Vizrt's standard card. This model can be upgraded to any higher model-class by performing a license upgrade.

The following codec types are supported:

- PAL Codecs
- NTSC Codecs
- 720P50 Codecs
- 720P60M Codecs
- 1080i25 Codecs
- 1080i30M Codecs

PAL Codecs

Table 35:

Name	Container	Codec / Resolution		Audio
Generic Interleaved	.avi	MPEG2-IFrame422 720x576	alpha: no bitrate: 10-50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG2-IFrame4224 720x576	alpha: yes bitrate: 10-50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP SD 4:2:0, Elemetary 720x576	alpha: no bitrate: 1-15 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP SD 4:2:0, Programm 720x576	alpha: no bitrate: 1-15 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP SD 4:2:0, Transport 720x576	alpha: no bitrate: 1-15 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP SD 4:2:2, Elemetary 720x576	alpha: no bitrate: 5-50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP SD 4:2:2, Programm 720x576	alpha: no bitrate: 5-50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz

Table 35:

Name	Container	Codec / Resolution		Audio
Generic Interleaved	.avi	MPEG-2 IBP SD 4:2:2, Transport 720x576	alpha: no bitrate: 5-50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	DV/DVCAM 4:2:0 720x576	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	DVCPRO 4:1:1 720x576	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	DVCPRO 50 4:2:2 720x576	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	Uncompressed YUVU 4:2:2 720x576	alpha: no bitrate: 160 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	Uncompressed YUAVUA 4:2:2:4 720x576	alpha: no bitrate: 240 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MJpeg Lossless 720x576	alpha: no bitrate: VBR bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz

Table 35:

Name	Container	Codec / Resolution		Audio
XDCAM (OP1a)	.mxf	DVCAM 4:2:0 720x576	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 4 ch: 16 in 16bit; 48kHz
XDCAM (OP1a)	.mxf	D10 (IMX) 4:2:2 720x608	alpha: no bitrate: 30, 40, 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 4 ch: 24 in 32bit; 48kHz 8 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2 IBP SD 4:2:0, Elemetary 720x576	alpha: no bitrate: 1-15 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2 IBP SD 4:2:0, Programm 720x576	alpha: no bitrate: 1-15 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2 IBP SD 4:2:0, Transport 720x576	alpha: no bitrate: 1-15 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2 IBP SD 4:2:2, Elemetary 720x576	alpha: no bitrate: 5-50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2 IBP SD 4:2:2, Programm 720x576	alpha: no bitrate: 5-50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2 IBP SD 4:2:2, Transport 720x576	alpha: no bitrate: 5-50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz

Table 35:

Name	Container	Codec / Resolution		Audio
DVCPRO	.mxf	DVCPRO 4:1:1 720x576	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
DVCPRO	.mxf	DVCPRO 50 4:2:2 720x576	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Panasonic P2	.mxf	DVCAM 4:2:0 720x576	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Panasonic P2	.mxf	DVCPRO 4:1:1 720x576	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Panasonic P2	.mxf	DVCPRO 50 4:2:2 720x576	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
XDCAM	.mov	DVCAM 4:2:0 720x576	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
DVCPRO	.mov	DVCPRO 4:1:1 720x576	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
DVCPRO	.mov	DVCPRO 50 4:2:2 720x576	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz

Table 35:

Name	Container	Codec / Resolution		Audio
H.246	.mov	H.264/AVC 720x576	alpha: no bitrate: VBR bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
H.246	.mp4	H.264/AVC 720x576	alpha: no bitrate: VBR bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
DV	.dv	DVCAM 4:2:0 720x576	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz
DV	.dv	DVCPRO 4:1:1 720x576	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz
DV	.dv	DVCPRO 50 4:2:2 720x576	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz
Generic Separate	.avi	MPEG2-IFrame422 720x576	alpha: no bitrate: 10-50 bitdepth: 8 VBI: N/A timecode: N/A	
Generic Separate	.avi	MPEG2-IFrame4224 720x576	alpha: yes bitrate: 10-50 bitdepth: 8 VBI: N/A timecode: N/A	
Generic Separate	.avi	MPEG-2 IBP SD 4:2:0, Elemetary 720x576	alpha: no bitrate: 1-15 bitdepth: 8 VBI: N/A timecode: N/A	

Table 35:

Name	Container	Codec / Resolution	Audio
Generic Separate	.avi	MPEG-2 IBP SD 4:2:0, Programm 720x576	alpha: no bitrate: 1-15 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP SD 4:2:0, Transport 720x576	alpha: no bitrate: 1-15 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP SD 4:2:2, Elemetary 720x576	alpha: no bitrate: 5-50 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP SD 4:2:2, Programm 720x576	alpha: no bitrate: 5-50 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP SD 4:2:2, Transport 720x576	alpha: no bitrate: 5-50 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	DV/DVCAM 4:2:0 720x576	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	DVCPRO 4:1:1 720x576	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	DVCPRO 50 4:2:2 720x576	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A

Table 35:

Name	Container	Codec / Resolution		Audio
Generic Separate	.avi	Uncompressed YUVU 4:2:2 720x576	alpha: no bitrate: 160 bitdepth: 8 VBI: N/A timecode: N/A	
Generic Separate	.avi	Uncompressed YUAVUA 4:2:2:4 720x576	alpha: no bitrate: 240 bitdepth: 8 VBI: N/A timecode: N/A	
Generic Separate	.avi	MJpeg Lossless 720x576	alpha: no bitrate: VBR bitdepth: 8 VBI: N/A timecode: N/A	
XDCAM	.mov	DVCAM 4:2:0 720x576	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	
DVCPRO	.mov	DVCPRO 4:1:1 720x576	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	
DVCPRO	.mov	DVCPRO 50 4:2:2 720x576	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	
H.246	.mov	H.264/AVC 720x576	alpha: no bitrate: VBR bitdepth: 8 VBI: N/A timecode: N/A	
Generic Separate	.wav			PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Separate	_vbi.avi	vbi 720x1-17 Start Line: 6	bitdepth: 10 VBI: YUYV422	

NTSC Codecs

Table 36:

Name	Container	Codec / Resolution		Audio
Generic Interleaved	.avi	MPEG2-IFrame422 720x480	alpha: no bitrate: 10-50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG2-IFrame4224 720x480	alpha: yes bitrate: 10-50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP SD 4:2:0, Elemetary 720x480	alpha: no bitrate: 1-15 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP SD 4:2:0, Programm 720x480	alpha: no bitrate: 1-15 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP SD 4:2:0, Transport 720x480	alpha: no bitrate: 1-15 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP SD 4:2:2, Elemetary 720x480	alpha: no bitrate: 5-50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP SD 4:2:2, Programm 720x480	alpha: no bitrate: 5-50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz

Table 36:

Name	Container	Codec / Resolution		Audio
Generic Interleaved	.avi	MPEG-2 IBP SD 4:2:2, Transport 720x480	alpha: no bitrate: 5-50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	DV/DVCAM 4:1:1 720x480	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	DVCPRO 4:1:1 720x480	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	DVCPRO 50 4:2:2 720x480	alpha: no bitrate: 1-15 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	Uncompressed YUVU 4:2:2 720x480	alpha: no bitrate: 160 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	Uncompressed YUAVUA 4:2:2:4 720x480	alpha: no bitrate: 240 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MJpeg Lossless 720x480	alpha: no bitrate: VBR bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz

Table 36:

Name	Container	Codec / Resolution		Audio
XDCAM (OP1a)	.mxf	DVCAM 4:1:1 720x480	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 4 ch: 16 in 16bit; 48kHz
XDCAM (OP1a)	.mxf	D10 (IMX) 4:2:2 720x512	alpha: no bitrate: 30, 40, 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 4 ch: 24 in 32bit; 48kHz 8 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2 IBP SD 4:2:0, Elemetary 720x480	alpha: no bitrate: 1-15 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2 IBP SD 4:2:0, Programm 720x480	alpha: no bitrate: 1-15 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2 IBP SD 4:2:0, Transport 720x480	alpha: no bitrate: 1-15 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2 IBP SD 4:2:2, Elemetary 720x480	alpha: no bitrate: 5-50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2 IBP SD 4:2:2, Programm 720x480	alpha: no bitrate: 5-50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2 IBP SD 4:2:2, Transport 720x480	alpha: no bitrate: 5-50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz

Table 36:

Name	Container	Codec / Resolution		Audio
DVCPRO	.mxf	DVCPRO 4:1:1 720x480	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
DVCPRO	.mxf	DVCPRO 50 4:2:2 720x480	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Panasonic P2	.mxf	DV/DVCAM 4:1:1 720x480	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Panasonic P2	.mxf	DVCPRO 4:1:1 720x480	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Panasonic P2	.mxf	DVCPRO 50 4:2:2 720x480	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
XDCAM (OP1a)	.mov	DVCAM 4:1:1 720x480	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
DVCPRO	.mov	DVCPRO 4:1:1 720x480	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
DVCPRO	.mov	DVCPRO 50 4:2:2 720x480	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz

Table 36:

Name	Container	Codec / Resolution		Audio
H.246	.mov	H.264/AVC 720x480	alpha: no bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
H.246	.mp4	H.264/AVC 720x480	alpha: no bitrate: VBR bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
DV	.dv	DV/DVCAM 4:1:1 720x480	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz
DV	.dv	DVCPRO 4:1:1 720x480	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz
DV	.dv	DVCPRO 50 4:2:2 720x480	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz
Generic Separate	.avi	MPEG2-IFrame422 720x480	alpha: no bitrate: 10-50 bitdepth: 8 VBI: N/A timecode: N/A	
Generic Separate	.avi	MPEG2-IFrame4224 720x480	alpha: yes bitrate: 10-50 bitdepth: 8 VBI: N/A timecode: N/A	
Generic Separate	.avi	MPEG-2 IBP SD 4:2:0, Elemetary 720x480	alpha: no bitrate: 1-15 bitdepth: 8 VBI: N/A timecode: N/A	

Table 36:

Name	Container	Codec / Resolution	Audio
Generic Separate	.avi	MPEG-2 IBP SD 4:2:0, Programm 720x480	alpha: no bitrate: 1-15 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP SD 4:2:0, Transport 720x480	alpha: no bitrate: 1-15 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP SD 4:2:2, Elemetary 720x480	alpha: no bitrate: 5-50 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP SD 4:2:2, Programm 720x480	alpha: no bitrate: 5-50 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP SD 4:2:2, Transport 720x480	alpha: no bitrate: 5-50 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	DV/DVCAM 4:1:1 720x480	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	DVCPRO 4:1:1 720x480	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	DVCPRO 50 4:2:2 720x480	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A

Table 36:

Name	Container	Codec / Resolution		Audio
Generic Separate	.avi	Uncompressed YUVU 4:2:2 720x480	alpha: no bitrate: 160 bitdepth: 8 VBI: N/A timecode: N/A	
Generic Separate	.avi	Uncompressed YUAVUA 4:2:2:4 720x480	alpha: no bitrate: 240 bitdepth: 8 VBI: N/A timecode: N/A	
Generic Separate	.avi	MJpeg Lossless 720x480	alpha: no bitrate: VBR bitdepth: 8 VBI: N/A timecode: N/A	
XDCAM (OP1a)	.mov	DVCAM 4:1:1 720x480	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	
DVCPRO	.mov	DVCPRO 4:1:1 720x480	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	
DVCPRO	.mov	DVCPRO 50 4:2:2 720x480	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	
H.246	.mov	H.264/AVC 720x486	alpha: no bitrate: VBR bitdepth: 8 VBI: N/A timecode: N/A	
Generic Separate	.wav			PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Separate	_vbi.avi	vbi 720x1-16 Start Line: 7	bitdepth: 10 VBI: YUYV422	

720P50 Codecs

Table 37:

Name	Container	Codec / Resolution		Audio
Generic Interleaved	.avi	MPEG2-IFrame422 1280x720	alpha: no bitrate: 50-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG2-IFrame4224 1280x720	alpha: yes bitrate: 50-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP HD 4:2:0, Elemetary 1280x720	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP HD 4:2:0, Program 1280x720	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP HD 4:2:0, Transport 1280x720	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP HD 4:2:2, Elemetary 1280x720	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP HD 4:2:2, Program 1280x720	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz

Table 37:

Name	Container	Codec / Resolution		Audio
Generic Interleaved	.avi	MPEG-2 IBP HD 4:2:2, Transport 1280x720	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
DVCPRO	.avi	DVCPRO HD 1280x720	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	Uncompressed YUVU 4:2:2 1280x720	alpha: no bitrate: 700 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	Uncompressed YUAVUA 4:2:2:4 1280x720	alpha: no bitrate: 1050 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
XDCAM (OP1a)	.mxf	XDCAM HD, IBP HD 4:2:0,Elementary 1280x720	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
XDCAM (OP1a)	.mxf	XDCAM HD, IBP HD 4:2:0, Program 1280x720	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
XDCAM (OP1a)	.mxf	XDCAM HD, IBP HD 4:2:0, Transport 1280x720	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
XDCAM (OP1a)	.mxf	XDCAM HD422, IBP HD 4:2:2, Elementary 1280x720	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz

Table 37:

Name	Container	Codec / Resolution		Audio
XDCAM (OP1a)	.mxf	XDCAM HD422, IBP HD 4:2:2, Program 1280x720	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
XDCAM (OP1a)	.mxf	XDCAM HD422, IBP HD 4:2:2, Transport 1280x720	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2, IBP HD 4:2:0, Elementary 1280x720	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2, IBP HD 4:2:0, Program 1280x720	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2, IBP HD 4:2:0, Transport 1280x720	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2, IBP HD 4:2:2, Elementary 1280x720	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2, IBP HD 4:2:2, Program 1280x720	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2, IBP HD 4:2:2, Transport 1280x720	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz

Table 37:

Name	Container	Codec / Resolution		Audio
DVCPRO	.mxf	DVCPRO HD 1280x720	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Panasonic P2	.mxf	AVCIntra Class 50 1280x720	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
Panasonic P2	.mxf	AVCIntra Class 100 1280x720	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
Panasonic P2	.mxf	DVCPRO HD 1280x720	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
DVCPRO Quicktime	.mov	DVCPRO HD 1280x720	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
HDV	.mov	HDV 1280x720	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
XDCAM (OP1a)	.mov	XDCam EX 1280x720	alpha: no bitrate: 25CBR, 35VBR bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
XDCAM (OP1a)	.mov	XDCam HD 422 1280x720	alpha: no bitrate: 18-35 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz

Table 37:

Name	Container	Codec / Resolution		Audio
DNxHD	.mov	DNxHD 4:2:2 1280x720	alpha: no bitrate: 36, 145, 220 bitdepth: 8; 10 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
H.264	.mov	H.264/AVC 1280x720	alpha: no bitrate: VBR bitdepth: 8; 10 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
H.264	.mp4	H.264/AVC 1280x720	alpha: no bitrate: VBR bitdepth: 8; 10 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
DV	.dv	DVCPRO HD 1280x720	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz
ProRes 422	.mov	I-Frame 4:2:2 1280x720	alpha: no bitrate: 147, 220 bitdepth: 10 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
Generic Separate	.avi	MPEG2-IFrame422 1280x720	alpha: no bitrate: 50-300 bitdepth: 8 VBI: N/A timecode: N/A	
Generic Separate	.avi	MPEG2-IFrame4224 1280x720	alpha: yes bitrate: 50-300 bitdepth: 8 VBI: N/A timecode: N/A	
Generic Separate	.avi	MPEG-2 IBP HD 4:2:0, Elemetary 1280x720	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	

Table 37:

Name	Container	Codec / Resolution	Audio
Generic Separate	.avi	MPEG-2 IBP HD 4:2:0, Program 1280x720	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP HD 4:2:0, Transport 1280x720	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP HD 4:2:2, Elemetary 1280x720	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP HD 4:2:2, Program 1280x720	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP HD 4:2:2, Transport 1280x720	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A
DVCPRO	.avi	DVCPRO HD 1280x720	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	Uncompressed YUVU 4:2:2 1280x720	alpha: no bitrate: 700 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	Uncompressed YUAVUA 4:2:2:4 1280x720	alpha: no bitrate: 1050 bitdepth: 8 VBI: N/A timecode: N/A

Table 37:

Name	Container	Codec / Resolution		Audio
DVCPRO Quicktime	.mov	DVCPRO HD 1280x720	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	
HDV	.mov	HDV 1280x720	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	
XDCAM (OP1a)	.mov	XDCam EX 1280x720	alpha: no bitrate: 25CBR, 35VBR bitdepth: 8 VBI: N/A timecode: N/A	
XDCAM (OP1a)	.mov	XDCam HD 422 1280x720	alpha: no bitrate: 18-35 bitdepth: 8 VBI: N/A timecode: N/A	
DNxHD	.mov	DNxHD YUVU 4:2:2 1280x720	alpha: no bitrate: 36, 145, 220 bitdepth: 8; 10 VBI: N/A timecode: N/A	
H.264	.mov	H.264 YUVU 4:2:2 1280x720	alpha: no bitrate: VBR bitdepth: 8; 10 VBI: N/A timecode: N/A	
Generic Separate	.wav			PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Separate	_vbi.avi	vbi 1280x1-19 Start Line: 7	bitdepth: 10 VBI: YUYV422	

720P60M Codecs

Table 38:

Name	Container	Codec / Resolution		Audio
Name	Container	Codec / Resolution		Audio
Generic Interleaved	.avi	MPEG2-IFrame422 1280x720	alpha: no bitrate: 50-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG2-IFrame4224 1280x720	alpha: yes bitrate: 50-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP HD 4:2:0, Elemetary 1280x720	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP HD 4:2:0, Program 1280x720	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP HD 4:2:0, Transport 1280x720	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP HD 4:2:2, Elemetary 1280x720	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz

Table 38:

Name	Container	Codec / Resolution		Audio
Generic Interleaved	.avi	MPEG-2 IBP HD 4:2:2, Program 1280x720	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP HD 4:2:2, Transport 1280x720	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
DVCPRO	.avi	DVCPRO HD 1280x720	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	Uncompressed YUVU 4:2:2 1280x720	alpha: no bitrate: 850 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	Uncompressed YUAVUA 4:2:2:4 1280x720	alpha: no bitrate: 1275 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
XDCAM (OP1a)	.mxf	XDCAM HD, IBP HD 4:2:0,Elementary 1280x720	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
XDCAM (OP1a)	.mxf	XDCAM HD, IBP HD 4:2:0, Program 1280x720	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
XDCAM (OP1a)	.mxf	XDCAM HD, IBP HD 4:2:0, Transport 1280x720	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz

Table 38:

Name	Container	Codec / Resolution		Audio
XDCAM (OP1a)	.mxf	XDCAM HD422, IBP HD 4:2:2, Elementary 1280x720	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
XDCAM (OP1a)	.mxf	XDCAM HD422, IBP HD 4:2:2, Program 1280x720	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
XDCAM (OP1a)	.mxf	XDCAM HD422, IBP HD 4:2:2, Transport 1280x720	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2, IBP HD 4:2:0, Elementary 1280x720	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2, IBP HD 4:2:0, Program 1280x720	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2, IBP HD 4:2:0, Transport 1280x720	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2, IBP HD 4:2:2, Elementary 1280x720	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2, IBP HD 4:2:2, Program 1280x720	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz

Table 38:

Name	Container	Codec / Resolution		Audio
Generic MPEG-2	.mxf	MPEG-2, IBP HD 4:2:2, Transport 1280x720	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
DVCPRO	.mxf	DVCPRO HD 1280x720	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Panasonic P2	.mxf	AVCIntra Class 50 1280x720	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
Panasonic P2	.mxf	AVCIntra Class 100 1280x720	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
Panasonic P2	.mxf	DVCPRO HD 1280x720	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
DVCPRO Quicktime	.mov	DVCPRO HD 1280x720	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
HDV	.mov	HDV 1280x720	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
XDCAM (OP1a)	.mov	XDCam EX 1280x720	alpha: no bitrate: 25CBR, 35VBR bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz

Table 38:

Name	Container	Codec / Resolution		Audio
XDCAM (OP1a)	.mov	XDCam HD 422 1280x720	alpha: no bitrate: 18-35 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
DNxHD	.mov	DNxHD 4:2:2 1280x720	alpha: no bitrate: 36, 145, 220 bitdepth: 8; 10 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
H.264	.mov	H.264/AVC 1280x720	alpha: no bitrate: VBR bitdepth: 8; 10 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
H.264	.mp4	H.264/AVC 1280x720	alpha: no bitrate: VBR bitdepth: 8; 10 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
DV	.dv	DVCPRO HD 1280x720	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz
ProRes 422	.mov	I-Frame 4:2:2 1280x720	alpha: no bitrate: 147, 220 bitdepth: 10 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
Generic Separate	.avi	MPEG2-IFrame422 1280x720	alpha: no bitrate: 50-300 bitdepth: 8 VBI: N/A timecode: N/A	
Generic Separate	.avi	MPEG2-IFrame4224 1280x720	alpha: yes bitrate: 50-300 bitdepth: 8 VBI: N/A timecode: N/A	

Table 38:

Name	Container	Codec / Resolution	Audio
Generic Separate	.avi	MPEG-2 IBP HD 4:2:0, Elemetary 1280x720	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP HD 4:2:0, Program 1280x720	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP HD 4:2:0, Transport 1280x720	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP HD 4:2:2, Elemetary 1280x720	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP HD 4:2:2, Program 1280x720	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP HD 4:2:2, Transport 1280x720	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A
DVCPRO	.avi	DVCPRO HD 1280x720	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	Uncompressed YUVU 4:2:2 1280x720	alpha: no bitrate: 850 bitdepth: 8 VBI: N/A timecode: N/A

Table 38:

Name	Container	Codec / Resolution		Audio
Generic Separate	.avi	Uncompressed YUAVUA 4:2:2:4 1280x720	alpha: no bitrate: 1275 bitdepth: 8 VBI: N/A timecode: N/A	
DVCPRO Quicktime	.mov	DVCPRO HD 1280x720	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	
HDV	.mov	HDV 1280x720	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	
XDCAM (OP1a)	.mov	XDCam EX 1280x720	alpha: no bitrate: 25CBR, 35VBR bitdepth: 8 VBI: N/A timecode: N/A	
XDCAM (OP1a)	.mov	XDCam HD 422 1280x720	alpha: no bitrate: 18-35 bitdepth: 8 VBI: N/A timecode: N/A	
DNxHD	.mov	DNxHD YUVU 4:2:2 1280x720	alpha: no bitrate: 36, 145, 220 bitdepth: 8; 10 VBI: N/A timecode: N/A	
H.264	.mov	H.264 YUVU 4:2:2 1280x720	alpha: no bitrate: VBR bitdepth: 8; 10 VBI: N/A timecode: N/A	
Generic Separate	.wav			PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz

Table 38:

Name	Container	Codec / Resolution	Audio
Generic Separate	_vbi.avi	vbi 1280x1-19 Start Line: 7	bitdepth: 10 VBI: YUYV422

1080i25 Codecs

Table 39:

Name	Container	Codec / Resolution		Audio
Generic Interleaved	.avi	MPEG2-IFrame422 1920x1080	alpha: no bitrate: 50-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG2-IFrame4224 1920x1080	alpha: yes bitrate: 50-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP HD 4:2:0, Elemetary 1920x1080	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP HD 4:2:0, Program 1920x1080	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP HD 4:2:0, Transport 1920x1080	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP HD 4:2:2, Elemetary 1920x1080	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP HD 4:2:2, Program 1920x1080	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz

Table 39:

Name	Container	Codec / Resolution		Audio
Generic Interleaved	.avi	MPEG-2 IBP HD 4:2:2, Transport 1920x1080	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
DVCPRO	.avi	DVCPRO HD 1920x1080	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	Uncompressed YUVU 4:2:2 1920x1080	alpha: no bitrate: 800 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	Uncompressed YUAVUA 4:2:2:4 1920x1080	alpha: no bitrate: 1200 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
XDCAM (OP1a)	.mxf	XDCAM HD, IBP HD 4:2:0,Elementary 1440x1080	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
XDCAM (OP1a)	.mxf	XDCAM HD, IBP HD 4:2:0, Program 1440x1080	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
XDCAM (OP1a)	.mxf	XDCAM HD, IBP HD 4:2:0, Transport 1440x1080	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
XDCAM (OP1a)	.mxf	XDCAM HD422, IBP HD 4:2:2, Elementary 1920x1080	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz

Table 39:

Name	Container	Codec / Resolution		Audio
XDCAM (OP1a)	.mxf	XDCAM HD422, IBP HD 4:2:2, Program 1920x1080	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
XDCAM (OP1a)	.mxf	XDCAM HD422, IBP HD 4:2:2, Transport 1920x1080	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2, IBP HD 4:2:0, Elementary 1920x1080	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2, IBP HD 4:2:0, Program 1920x1080	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2, IBP HD 4:2:0, Transport 1920x1080	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2, IBP HD 4:2:2, Elementary 1920x1080	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2, IBP HD 4:2:2, Program 1920x1080	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2, IBP HD 4:2:2, Transport 1920x1080	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz

Table 39:

Name	Container	Codec / Resolution		Audio
DVCPRO	.mxf	DVCPRO HD 1920x1080	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Panasonic P2	.mxf	AVCIntra Class 50 1920x1080	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
Panasonic P2	.mxf	AVCIntra Class 100 1920x1080	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
Panasonic P2	.mxf	DVCPRO HD 1920x1080	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
DVCPRO Quicktime	.mov	DVCPRO HD 1920x1080	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
HDV	.mov	HDV 1440x1080	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
XDCAM (OP1a)	.mov	XDCam EX 1920x1080	alpha: no bitrate: 25CBR, 35VBR bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
XDCAM (OP1a)	.mov	XDCam HD 1440x1080	alpha: no bitrate: 35 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz

Table 39:

Name	Container	Codec / Resolution		Audio
XDCAM (OP1a)	.mov	XDCam HD 422 1920x1080	alpha: no bitrate: 18-35 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
DNxHD	.mov	DNxHD 4:2:2 1920x1080	alpha: no bitrate: 36, 145, 220 bitdepth: 8; 10 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
H.264	.mov	H.264/AVC 1920x1080	alpha: no bitrate: VBR bitdepth: 8; 10 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
H.264	.mp4	H.264/AVC 1920x1080	alpha: no bitrate: VBR bitdepth: 8; 10 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
DV	.dv	DVCPRO HD 1920x1080	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz
ProRes 422	.mov	I-Frame 4:2:2 1920x1080	alpha: no bitrate: 42, 63 bitdepth: 10 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
Generic Separate	.avi	MPEG2-IFrame422 1920x1080	alpha: no bitrate: 50-300 bitdepth: 8 VBI: N/A timecode: N/A	
Generic Separate	.avi	MPEG2-IFrame4224 1920x1080	alpha: yes bitrate: 50-300 bitdepth: 8 VBI: N/A timecode: N/A	

Table 39:

Name	Container	Codec / Resolution	Audio
Generic Separate	.avi	MPEG-2 IBP HD 4:2:0, Elemetary 1920x1080	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP HD 4:2:0, Program 1920x1080	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP HD 4:2:0, Transport 1920x1080	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP HD 4:2:2, Elemetary 1920x1080	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP HD 4:2:2, Program 1920x1080	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP HD 4:2:2, Transport 1920x1080	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A
DVCPRO	.avi	DVCPRO HD 1920x1080	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	Uncompressed YUVU 4:2:2 1920x1080	alpha: no bitrate: 800 bitdepth: 8 VBI: N/A timecode: N/A

Table 39:

Name	Container	Codec / Resolution	Audio
Generic Separate	.avi	Uncompressed YUAVUA 4:2:2:4 1920x1080	alpha: no bitrate: 1200 bitdepth: 8 VBI: N/A timecode: N/A
DVCPRO Quicktime	.mov	DVCPRO HD 1920x1080	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A
HDV	.mov	HDV 1440x1080	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A
XDCAM (OP1a)	.mov	XDCam EX 1920x1080	alpha: no bitrate: 25CBR, 35VBR bitdepth: 8 VBI: N/A timecode: N/A
XDCAM (OP1a)	.mov	XDCam HD 1440x1080	alpha: no bitrate: 35 bitdepth: 8 VBI: N/A timecode: N/A
XDCAM (OP1a)	.mov	XDCam HD 422 1920x1080	alpha: no bitrate: 18-35 bitdepth: 8 VBI: N/A timecode: N/A
DNxHD	.mov	DNxHD YUVU 4:2:2 1920x1080	alpha: no bitrate: 36, 145, 220 bitdepth: 8; 10 VBI: N/A timecode: N/A
H.264	.mov	H.264 YUVU 4:2:2 1920x1080	alpha: no bitrate: VBR bitdepth: 8; 10 VBI: N/A timecode: N/A

Table 39:

Name	Container	Codec / Resolution		Audio
Generic Separate	.wav			PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Separate	_vbi.avi	vbi 1920x1-15 Start Line: 6	bitdepth: 10 VBI: YUYV422	

1080i30M Codecs

Table 40:

Name	Container	Codec / Resolution		Audio
Generic Interleaved	.avi	MPEG2-IFrame422 1920x1080	alpha: no bitrate: 50-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG2-IFrame4224 1920x1080	alpha: yes bitrate: 50-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP HD 4:2:0, Elemetary 1920x1080	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP HD 4:2:0, Program 1920x1080	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP HD 4:2:0, Transport 1920x1080	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP HD 4:2:2, Elemetary 1920x1080	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	MPEG-2 IBP HD 4:2:2, Program 1920x1080	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz

Table 40:

Name	Container	Codec / Resolution		Audio
Generic Interleaved	.avi	MPEG-2 IBP HD 4:2:2, Transport 1920x1080	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
DVCPRO	.avi	DVCPRO HD 1920x1080	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	Uncompressed YUVU 4:2:2 1920x1080	alpha: no bitrate: 950 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Interleaved	.avi	Uncompressed YUAVUA 4:2:2:4 1920x1080	alpha: no bitrate: 1425 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
XDCAM (OP1a)	.mxf	XDCAM HD, IBP HD 4:2:0,Elementary 1440x1080	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
XDCAM (OP1a)	.mxf	XDCAM HD, IBP HD 4:2:0, Program 1440x1080	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
XDCAM (OP1a)	.mxf	XDCAM HD, IBP HD 4:2:0, Transport 1440x1080	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
XDCAM (OP1a)	.mxf	XDCAM HD422, IBP HD 4:2:2, Elementary 1920x1080	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz

Table 40:

Name	Container	Codec / Resolution		Audio
XDCAM (OP1a)	.mxf	XDCAM HD422, IBP HD 4:2:2, Program 1920x1080	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
XDCAM (OP1a)	.mxf	XDCAM HD422, IBP HD 4:2:2, Transport 1920x1080	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2, IBP HD 4:2:0, Elementary 1920x1080	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2, IBP HD 4:2:0, Program 1920x1080	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2, IBP HD 4:2:0, Transport 1920x1080	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2, IBP HD 4:2:2, Elementary 1920x1080	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2, IBP HD 4:2:2, Program 1920x1080	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Generic MPEG-2	.mxf	MPEG-2, IBP HD 4:2:2, Transport 1920x1080	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz

Table 40:

Name	Container	Codec / Resolution		Audio
DVCPRO	.mxf	DVCPRO HD 1920x1080	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz
Panasonic P2	.mxf	AVCIntra Class 50 1920x1080	alpha: no bitrate: 50 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
Panasonic P2	.mxf	AVCIntra Class 100 1920x1080	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
Panasonic P2	.mxf	DVCPRO HD 1920x1080	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
DVCPRO Quicktime	.mov	DVCPRO HD 1920x1080	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz
HDV	.mov	HDV 1440x1080	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
XDCAM (OP1a)	.mov	XDCam EX 1920x1080	alpha: no bitrate: 25CBR, 35VBR bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
XDCAM (OP1a)	.mov	XDCam HD 1440x1080	alpha: no bitrate: 35 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz

Table 40:

Name	Container	Codec / Resolution		Audio
XDCAM (OP1a)	.mov	XDCam HD 422 1920x1080	alpha: no bitrate: 18-35 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
DNxHD	.mov	DNxHD 4:2:2 1920x1080	alpha: no bitrate: 36, 145, 220 bitdepth: 8; 10 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
H.264	.mov	H.264/AVC 1920x1080	alpha: no bitrate: VBR bitdepth: 8; 10 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
H.264	.mp4	H.264/AVC 1920x1080	alpha: no bitrate: VBR bitdepth: 8; 10 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
DV	.dv	DVCPRO HD 1920x1080	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz
ProRes 422	.mov	I-Frame 4:2:2 1920x1080	alpha: no bitrate: 42, 63 bitdepth: 10 VBI: N/A timecode: N/A	PCM 2 ch: 16 in 16bit; 48kHz 4 ch: 16 in 16bit; 48kHz 8 ch: 16 in 16bit; 48kHz
Generic Separate	.avi	MPEG2-IFrame422 1920x1080	alpha: no bitrate: 50-300 bitdepth: 8 VBI: N/A timecode: N/A	
Generic Separate	.avi	MPEG2-IFrame4224 1920x1080	alpha: yes bitrate: 50-300 bitdepth: 8 VBI: N/A timecode: N/A	

Table 40:

Name	Container	Codec / Resolution	Audio
Generic Separate	.avi	MPEG-2 IBP HD 4:2:0, Elemetary 1920x1080	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP HD 4:2:0, Program 1920x1080	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP HD 4:2:0, Transport 1920x1080	alpha: no bitrate: 5-80 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP HD 4:2:2, Elemetary 1920x1080	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP HD 4:2:2, Program 1920x1080	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	MPEG-2 IBP HD 4:2:2, Transport 1920x1080	alpha: no bitrate: 5-300 bitdepth: 8 VBI: N/A timecode: N/A
DVCPRO	.avi	DVCPRO HD 1920x1080	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A
Generic Separate	.avi	Uncompressed YUVU 4:2:2 1920x1080	alpha: no bitrate: 950 bitdepth: 8 VBI: N/A timecode: N/A

Table 40:

Name	Container	Codec / Resolution	Audio
Generic Separate	.avi	Uncompressed YUAVUA 4:2:2:4 1920x1080	alpha: no bitrate: 1425 bitdepth: 8 VBI: N/A timecode: N/A
DVCPRO Quicktime	.mov	DVCPRO HD 1920x1080	alpha: no bitrate: 100 bitdepth: 8 VBI: N/A timecode: N/A
HDV	.mov	HDV 1440x1080	alpha: no bitrate: 25 bitdepth: 8 VBI: N/A timecode: N/A
XDCAM (OP1a)	.mov	XDCam EX 1920x1080	alpha: no bitrate: 25CBR, 35VBR bitdepth: 8 VBI: N/A timecode: N/A
XDCAM (OP1a)	.mov	XDCam HD 1440x1080	alpha: no bitrate: 35 bitdepth: 8 VBI: N/A timecode: N/A
XDCAM (OP1a)	.mov	XDCam HD 422 1920x1080	alpha: no bitrate: 18-35 bitdepth: 8 VBI: N/A timecode: N/A
DNxHD	.mov	DNxHD YUVU 4:2:2 1920x1080	alpha: no bitrate: 36, 145, 220 bitdepth: 8; 10 VBI: N/A timecode: N/A
H.264	.mov	H.264 YUVU 4:2:2 1920x1080	alpha: no bitrate: VBR bitdepth: 8; 10 VBI: N/A timecode: N/A

Table 40:

Name	Container	Codec / Resolution		Audio
Generic Separate	.wav			PCM 2 ch: 24 in 32bit; 48kHz 4 ch: 24 in 32bit; 48kHz 8 ch: 24 in 32bit; 48kHz 16 ch: 24 in 32bit; 48kHz
Generic Separate	_vbi.avi	vbi 1920x1-15 Start Line: 6	bitdepth: 10 VBI: YUYV422	

See Also

- Licensing

8.4.3 Mixed Mode Video Support

This section gives an overview of the Matrox' mixed mode video support. The tables are valid for both genlock families in Viz. One is 25/50 (e.g. PAL/720p50/1080i25/1080i50) and the other is 30M/60M (e.g. NTSC/720p60M/1080i30M/1080i60M).

The genlock family refers to the used house signal (e.g. Blackburst) frequency - typically PAL for the first and NTSC for the latter. Note that you cannot mix the two.

The following tables contain information on the following topics:

- Source: PAL or NTSC
- Source: 720p
- Source: 1080i

Source: PAL or NTSC

The first two tables show *video in* to DVE and texture output capabilities, while the next two tables show the *clip in* to DVE and texture output capabilities. Note that you cannot mix the genlock families (e.g. NTSC and 1080i50).

Table 41: PAL or NTSC sources

Output DVE	VideoIn		
	PAL/NTSC	720p	1080i
PAL/NTSC	OK	-	-
720p	-	-	-
1080i	OK	-	-

Table 42:

Output Texture	VideoIn		
	PAL/NTSC	720p	1080i
PAL/NTSC	OK	–	–
720p	OK	–	–
1080i	OK	–	–

Table 43:

Output DVE	ClipIn		
	PAL/NTSC	720p	1080i
PAL/NTSC	OK	–	–
720p	–	OK	–
1080i	OK	OK	–

Table 44:

Output Texture	ClipIn		
	PAL/NTSC	720p	1080i
PAL/NTSC	OK	–	–
720p	OK	OK	–
1080i	OK	OK	OK

Source: 720p

The first two tables show *video in* to DVE and texture output capabilities, while the next two tables show the *clip in* to DVE and texture output capabilities. Note that you cannot mix the genlock families (e.g. NTSC and 1080i50).

Table 45: 720p sources

Output DVE	VideoIn		
	PAL/NTSC	720p	1080i
PAL/NTSC	–	–	–
720p	–	OK	–
1080i	–	OK	–

Table 46:

Output Texture	VideoIn		
	PAL/NTSC	720p	1080i

Table 46:

Output Texture	VideoIn		
PAL/NTSC	–	OK	–
720p	–	OK	–
1080i	–	OK	–

Table 47:

Output DVE	ClipIn		
	PAL/NTSC	720p	1080i
PAL/NTSC	OK	–	–
720p	–	OK	–
1080i	OK	OK	OK

Table 48:

Output Texture	ClipIn		
	PAL/NTSC	720p	1080i
PAL/NTSC	OK	OK	–
720p	OK	OK	–
1080i	OK	OK	OK

Source: 1080i

The first two tables show *video in* to DVE and texture output capabilities, while the next two tables show the *clip in* to DVE and texture output capabilities. Note that you cannot mix the genlock families (e.g. NTSC and 1080i50).

Table 49: 1080i sources

Output DVE	VideoIn		
	PAL/NTSC	720p	1080i
PAL/NTSC	–	–	–
720p	–	–	–
1080i	–	–	OK

Table 50:

Output Texture	VideoIn		
	PAL/NTSC	720p	1080i
PAL/NTSC	–	–	OK

Table 50:

Output Texture	VideoIn		
720p	–	–	OK
1080i	–	–	OK

Table 51:

Output DVE	ClipIn		
	PAL/NTSC	720p	1080i
PAL/NTSC	OK	–	–
720p	–	OK	–
1080i	OK	OK	OK

Table 52:

Output Texture	ClipIn		
	PAL/NTSC	720p	1080i
PAL/NTSC	OK	–	OK
720p	OK	OK	OK
1080i	OK	OK	OK

8.4.4 Driver Installation

The first time the machine is started with the Matrox X.mio card installed, the operating system (OS) will query the user To install the Matrox X.mio driver. It is not recommended to use the OS installation procedure, but to use the supplied driver installer application.

It is required To remove the Matrox X.mio driver on existing systems before a new driver is installed; however, there are some considerations to note:

- A new driver should not be installed before the new hardware is installed.
- It is recommended **not to use a different driver version** than what was shipped with the video card.
- Using a non-recommended driver version will in most cases cause the system to be **irresponsive**.

IMPORTANT! As there are several driver versions available, it is always recommended to contact your local Vizrt representative or Vizrt support (support@vizrt.com) for updates.

Figure 80: Matrox system tray icon

After the driver has been installed, a Matrox system tray icon should be visible. It is possible To verify the installation using Matrox X.info and/or To verify the installation using Windows Device Manager.

As there are many driver versions available, it is important to compare the versions of those reported by the Matrox X.info utility in order to verify that the Driver and firmware versions match.

This section contains information on the following topics and procedures:

- Matrox X.mio 2 Configuration History
- Matrox X.mio 1 Configuration History
- Driver and firmware versions
- To install the Matrox X.mio driver
- To remove the Matrox X.mio driver
- To verify the installation using Matrox X.info
- To verify the installation using Windows Device Manager

Matrox X.mio 2 Configuration History

- Viz 3.5.3 and later, driver version DSX.utils 7.5.2.1448

Note: As the VfW codecs are included in the 7.5.2.1448 driver you need to uninstall previous versions of the Matrox VfW codecs. Do not install any Matrox VfW codecs in addition to the already installed drivers.

- Viz 3.5.0 – 3.5.2, driver version DSX.utils 7.5.2.447 SP2
- Viz 3.3.x, driver version DSX.utils 7.5.2.443
- Viz 3.2.2, driver version: DSX.utils 5.0.3.171

Note: DSX.utils 5.0.3.171 is required on Windows XP SP3.

- Viz 3.1.0 – 3.2.1, driver version DSX.utils 5.0.3.166

Matrox X.mio 1 Configuration History

- Viz 3.5.3 and later, driver version DSX.utils 7.5.2.1448

Note: As the VfW codecs are included in the 7.5.2.1448 driver you need to uninstall previous versions of the Matrox VfW codecs. Do not install any Matrox VfW codecs in addition to the already installed drivers.

- Viz 3.5.0 – 3.5.2, driver version DSX.utils 7.5.2.447 SP2
- Viz 3.3.x, driver version DSX.utils 7.5.2.443
- Viz 3.2.2, driver version DSX.utils 5.0.3.171

Note: DSX.utils 5.0.3.171 is required on Windows XP SP3.

- Viz 3.1.0 - 3.2.1, driver version DSX.utils 5.0.3.166
- Viz 3.1.0 - 3.2.1, driver version DSX.utils 4.0.0.132(sp1) or driver version DSX.utils 4.0.0.136(sp3)
- Viz 3.1.0 - 3.2.1, driver version DSX.utils 2.5.0.673

Driver and firmware versions

Table 53: Driver and firmware versions

Driver version	Primary device firmware	Secondary device firmware
2.5.0-667	165.0	166.0
2.5.0-673 (sp1)	165.0	167.0
4.0.0-126	177.2	178.0
4.0.0-132 (sp1)	177.2	179.0
4.0.0-136 (sp3)	177.2	180.0
5.0.3-166	192.0	195.0
5.0.3-171	192.0	197.0
7.5.2-443 (X.mio 1)	194.1	198.0
7.5.2-443 (X.mio 2)	6.34.0	6.33.0
7.5.2-447 SP2 (X.mio 1)	194.1	198.0
7.5.2-443 SP2 (X.mio 2)	6.34.0	6.33.0
7.5.2.1448 (X.mio 1)	194.1	198.0
7.5.2.1448 (X.mio 2)	6.40.2	6.40.0

To install the Matrox X.mio driver

Note: This procedure will use the supplied driver installer application.

1. Start the machine.
2. Cancel any *Found New Hardware Wizard* dialog boxes.
3. Locate the Mio Tools setup executable (*setup.exe*), and start the installation.

Figure 81: Example dialog box, Matrox Firmware Updater.

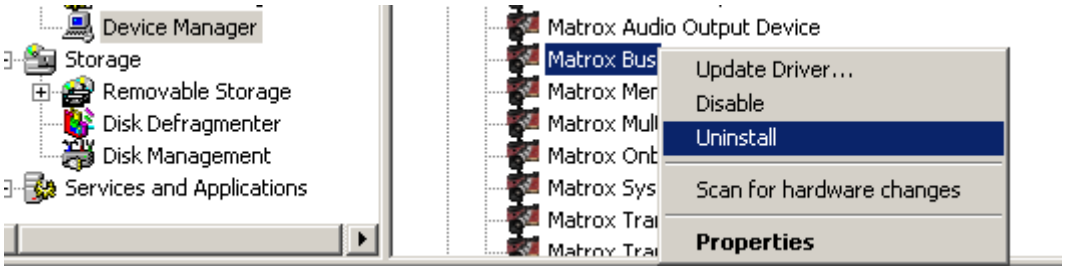
4. In the Matrox Firmware Updater dialog box, select the *Onboard compositor firmware* option, and click OK.
   - The firmware upgrade may take several minutes.

Note: X.mio, not X.mio2

5. Once the upgrade is complete, click OK to close the *Setup* dialog box and to restart the system.
   - After the restart the firmware settings will take effect and the setup will continue.
6. Cancel any *Found New Hardware Wizard* dialog boxes.
7. In the *Welcome to Matrox Setup* dialog box, click Next to continue the setup.
8. Click Yes to acknowledge the license agreement.
9. In the *Select Program Folder* dialog box, click *Next* or select another program folder and click *Next*.
10. In the *Choose Destination Folder* dialog box, click *Next* or select a different destination folder.
    - The installation of driver files may take several minutes.
11. Once the installation is complete, click *OK* to close the *Install Complete* dialog box and to restart the system.

To remove the Matrox X.mio driver

Figure 82: Removing video card drivers, Device Manager

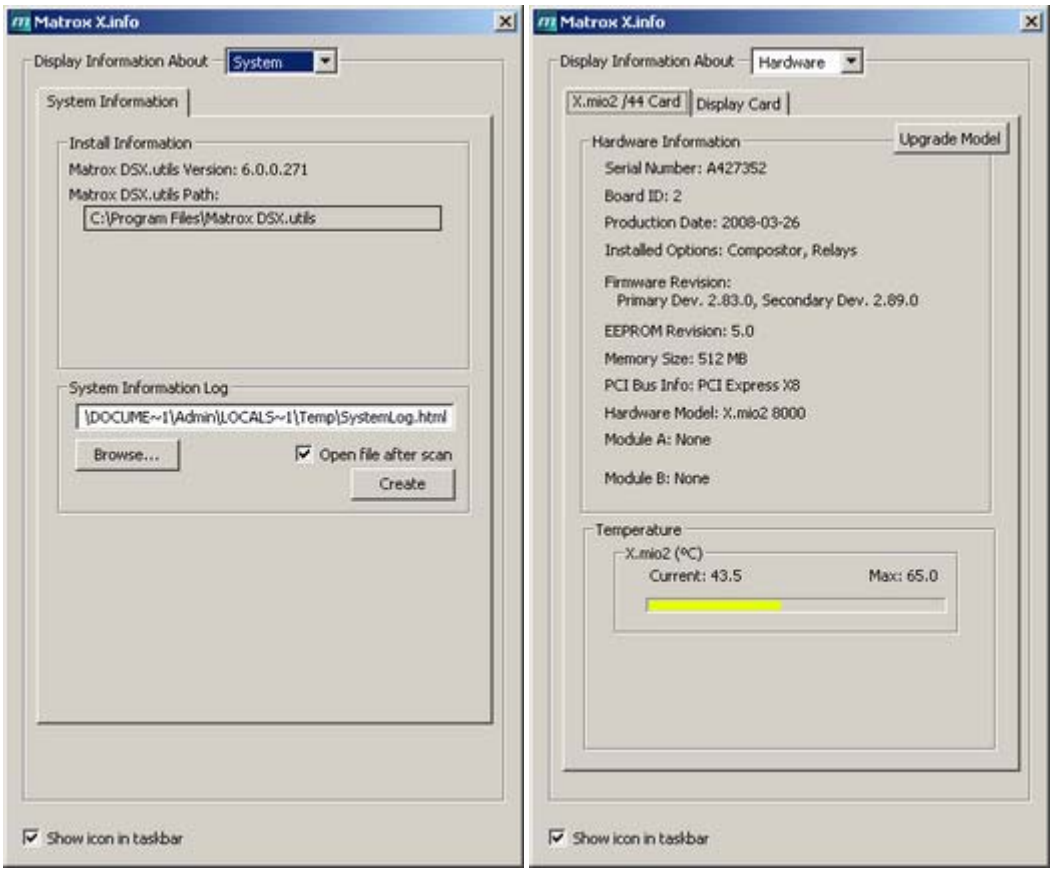


1. Open the Device Manager (see also To verify the installation using Windows Device Manager)
2. Expand the *Matrox Audio/Video devices* node, and select the *Matrox Bus device*.
3. Right-click the *Matrox Bus* device and select Uninstall.
4. Click OK to confirm the device removal.

5. When the removal is done restart the machine for the changes to take effect.

To verify the installation using Matrox X.info

Figure 83: Matrox X.info.



1. Right-click the Matrox system tray icon, and select *Open X.info*.
2. From the *Display Information About* drop-list, select *System* to verify that the correct driver version was installed.

IMPORTANT! Always disable the *Allow hibernation when available* option.

3. From the *Display Information About* drop-list, select *Hardware* , and then the *X.mio/24 Card* tab to verify the following:
   - See *Installed Options* and verify that the card is taking advantage of the *On Board Compositor*
   - See *PCI Bus Info* and verify that the card was put into a PCI-X slot operating at the right frequency.
   - See *Hardware Model* (e.g. X.mio2 8000) to check for Supported Codecs.

To verify the installation using Windows Device Manager

Figure 84: Microsoft Device Manager.

1. Start the Device Manager. Alternatives are:
   - Click *Start*, click *Run*, and then type *devmgmt.msc*, or
   - Right-click *My Computer*, click *Manage*, and then click *Device Manager*, or
   - Right-click *My Computer*, click *Properties*, click the *Hardware* tab, and then click *Device Manager*, or
   - Type the following command at a command prompt: *start devmgmt.msc*
2. Expand the *Matrox Audio/Video devices* node to see the devices installed.

8.4.5 Watchdog

A watchdog is essentially a timer that allows a system to continue video pass-through during an application crash or system failure. The X.mio has a built-in watchdog capability; however, the bypass only works for video (including optional embedded audio), while AES audio is not bypassed.

The watchdog is implemented as a mechanical (copper-to-copper) and a hardware bypass. The mechanical bypass is basically a relay (input to output) that works in case of a power loss while a hardware bypass is performed in a powered machine state (input to the board's output). In hardware bypass mode the incoming video and reference signals must be compliant in order to provide proper watchdog functionality.

Transition from Watchdog to video

When watchdog is deactivated (with `video_loopthrough_mode=2`) and a scene with DVE input is loaded, a few black frames are shown. The watchdog should be activated after the input channel is ready. In order to provide a glitch free transition from watchdog to video you may configure the watchdog's deactivation delay by setting the delay in fields for the watchdog to wait before deactivation.

Under normal circumstances the watchdog is deactivated as soon as the first object is present in the scene or an input is active (depending on the flag `video_loopthrough_mode`). With the `Matrox0.WatchDogDeactivationDelay` flag you can compensate a delay occurring while loading the scene completely and thus preventing black frames from being played out.

8.4.6 Licensing

The Matrox X.mio2 includes all SD codecs except D10/D12. This model can be upgraded to any higher class model by performing a license upgrade using the Matrox X.info utility. To upgrade a video card to a higher class model it is necessary to To generate a Matrox Dongle Information File (.MDIF), and then to perform an To upgrade with a Matrox Dongle Upgrade File (.MDUF). It is also possible To reset to factory settings at any time.

Note: Driver versions prior to 4.0.0-126 do not support the upgrade and revert features.

This section contains the information on the following topics:

- To generate a Matrox Dongle Information File (.MDIF)
- To upgrade with a Matrox Dongle Upgrade File (.MDUF)
- To reset to factory settings

To generate a Matrox Dongle Information File (.MDIF)

1. Open the Matrox X.info utility on the Windows taskbar.
2. Select *Hardware*, and click the *Upgrade Model* button on the right.
3. From the appearing menu, choose *Generate Matrox Dongle Information File* (.MDIF).
4. Select to save the file to a specified location.
   - Once the file is created a confirmation dialog box will appear.
5. Click OK to dismiss the confirmation dialog box.
6. Locate the file and send it to your local Vizrt representative or to Vizrt support (support@vizrt.com).
   - Once the request to purchase an upgrade has been sent, an MDUF file will be sent in return from Vizrt.

To upgrade with a Matrox Dongle Upgrade File (.MDUF)

1. Open the Matrox X.info utility on the Windows taskbar.
2. Select *Hardware*, and click the *Upgrade Model* button on the right.
3. From the appearing menu, choose *Upgrade Board from Matrox Dongle Upgrade File* (.MDUF).
4. Click *Browse* to locate and select the .MDUF file to start the upgrade process.
5. Restart the machine for the changes to take effect.

To reset to factory settings

1. Open the Matrox X.info utility on the Windows taskbar.
2. Select *Hardware*, and click the *Upgrade Model* button on the right.
3. From the appearing menu, choose *Reset to Factory Settings*.
4. Restart the machine for the changes to take effect.

8.5 Matrox DSX LE2/CG

Figure 85: Matrox DSX LE2 card

Matrox DSX LE2/CG is HD ready, has 2 video outputs, but no video input. It is used for outputting fill and key signals, and is a useful card in systems that do not need live video input or codec support.

The card comes with a set of breakout and power cables (no break-out box required). The power cables must be connected or else the card will not work. The breakout cable is used for the reference signal (GenLock) and AES audio. Fill and key have their own BNC connectors. The card should be installed in the same slot as the X.mio 2 card, and use the same driver versions as Matrox X.mio2.

See Also

- Video, Audio and Graphics Card Installation
- Driver Installation
  - Matrox X.mio 2 Configuration History

8.6 Matrox X.RIO

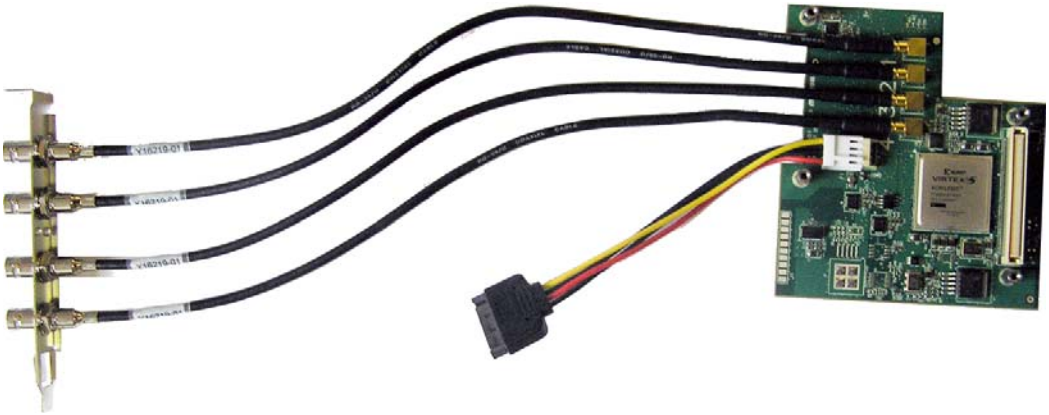
Viz Engine supports up to 8 video inputs with the Matrox X.Mio2 and X.RIO combined. The X.RIO module expands the capabilities of the Matrox X.Mio2-based systems by providing four inputs and outputs that can be configured by the user as 4 inputs and 4 outputs, or 2 inputs and 2 outputs; however, Viz Engine can only be configured to use it as 4 extra inputs (not as extra outputs).

With an HP Z800 machine, Matrox X.Mio2 and X.RIO, provides eight SD inputs as DVE or Texture. In HD only six inputs are working as DVE at 65% or Texture. Note that the actual number of working inputs depends on the bandwidth of the system, resource usage, and how many clips are played at the same time and if they are played as DVE or Texture.

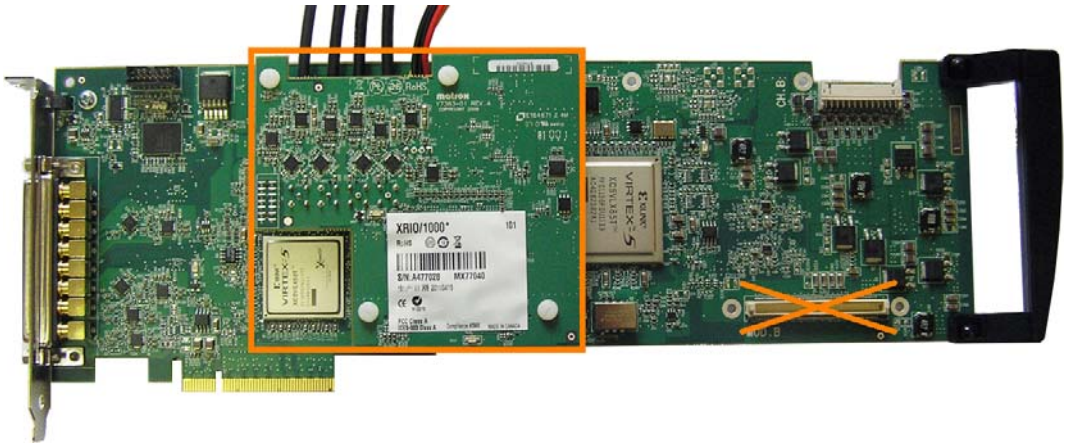
This section contains information on the following topics:

- To install the Matrox X.RIO card
- To install the Matrox X.RIO driver

To install the Matrox X.RIO card



1. First connect the power cable to the X.RIO card
2. The slot panel has numbers from 1-4 as well as the X.RIO card, just connect them carefully, because the mini BNC's are easily broken



3. Mount the X.RIO on the XMio2 card "Mod A" connector. The Mod B connector will not work
4. Use the screws to fix the X.RIO card
5. When building the XMio2 with X.RIO into the Z800 be careful that the mini BNC's do not get disconnected as they are very hard to connect while the X.RIO card is mounted on the XMio2

6. Mount the slot panel with the 4 additional inputs in any free slot and connect the power for the X.RIO. Also, make sure the cables do not touch any fans

To install the Matrox X.RIO driver

1. Install Matrox driver version 7.5.2.1448
2. Start **Matrox X.Info**
3. Under the **X.mio2 /24 Card** tab select the **Hardware** option
   - This should enable the X.RIO **Configure** button
4. In the X.RIO Module Configuration dialog-box check that the configuration for next restart is set to **4 Inputs 0 Outputs**
5. Restart your computer
6. Start Viz Config

7. Select the Matrox section to see the new VideoIn tabs (i.e. E, F, G and H). Note that the X.RIO inputs are mapped to Viz Engine's channels 5-8 by default.
   - This means when you use an X.Mio2/24 Viz Engine's channels 3 and 4 are not in use

8.7 NVIDIA Quadro SDI Capture Card

Currently the NVIDIA® Quadro® SDI Capture card can only be used with the NVIDIA SDI option. Vizrt's application of this card is mainly in time critical environments like virtual studios and sports applications as it has a stable latency from input to output (of 4 frames).

The time used for video transfer from input to the GPU and back to video output is a lot less than any other solution Vizrt currently offers. Hence, scenes with 4 video inputs as texture still have a lot of rendering time left per field/frame.

Embedded audio is supported; however, audio input is currently not.

This section contains information on the following topics:

- Connectors
- Driver Installation

See Also

- Compatible and recommended NVIDIA SDI out cards supported by Vizrt:
  - NVIDIA Quadro FX 4000
  - NVIDIA Quadro FX 5500
  - NVIDIA Quadro K600
- Available machine configurations:
  - HP z800 Installations
  - HP DL370 Installations

8.7.1 Connectors

The card has five (5) BNC connectors, four connectors are used for input, whereas the fifth (5) connector serves as a loopthrough of input one (1).

8.7.2 Driver Installation

Use the latest NVIDIA GPU driver and WDM (Windows Driver Model) driver for the capture card. Currently Vizrt do not recommend any driver version except the latest version available from NVIDIA.

9 Video, Audio and Graphics Card Installation

Installing a video, audio or graphics card is under normal circumstances not necessary as all components are pre-installed on all new systems with the latest driver versions; however, for maintenance or upgrade issues it is important to know how to do the installation for the different models.

This section mainly describes how to install Matrox and DVS video cards with NVIDIA graphics cards, and contains information on the following topics:

- HP z800 Installations
- HP DL370 Installations
- HP xw8600 Installations
- HP xw8400 Installations
- HP xw8200 Installations
- Verifying the Matrox X.Mio Installation
- Replacing the Matrox X.Mio Card
- Connecting the Matrox X.Mio Audio-extension Card

See Also

- Graphics Cards
- Video Cards

9.1 HP z800 Installations

This section describes how to setup the HP z800 machine with the different cards provided by Vizrt:

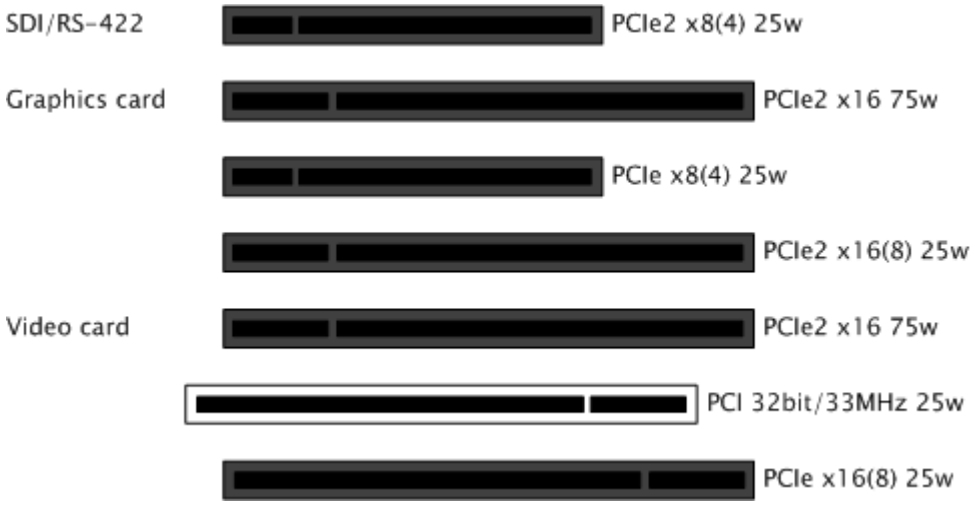
- To setup an HP z800 with a DVS card
- To setup an HP z800 with a Matrox card
- To setup an HP z800 with two graphics cards
- To setup an HP z800 with a capture card

See Also

- Graphics Cards
- Video Cards

To setup an HP z800 with a DVS card

Figure 86: PCI-X, PCI and AGP slots, HP z800

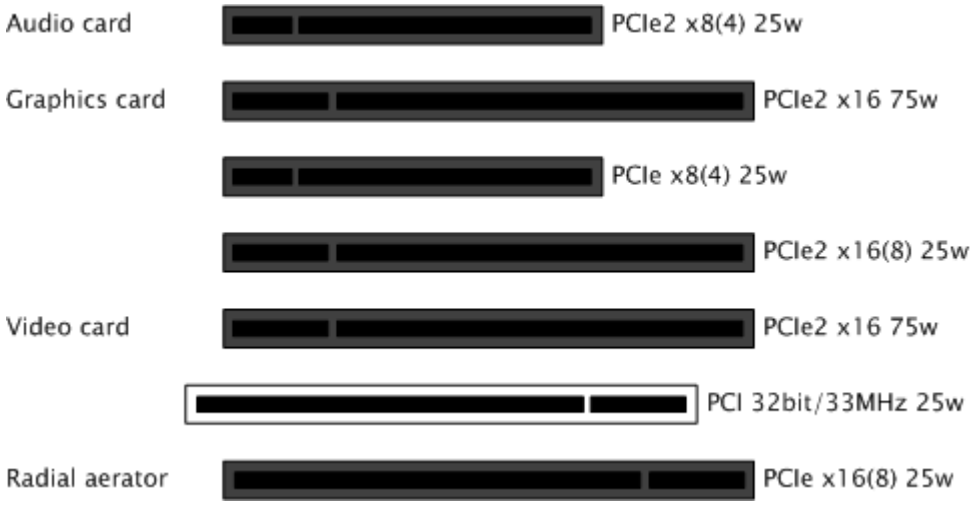


1. Disconnect the power and all other peripherals.
2. Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.
3. Mount the video card in slot number 5 from the top.
4. Mount the graphics card in slot number 2 from the top.
5. Mount the separate SDI/RS-422 panel in slot number 1 from the top.
   - Make sure that the cable connections are properly mounted and that it stays clear of any supplemental aerators or the aerator of the graphics device.
6. Tidy up all cables and close the computer's casing.

Note: Placement of cards are the same for both DVS Atomix LT and DVS Centaurus II

To setup an HP z800 with a Matrox card

Figure 87: PCI and PCIe slots, HP z800

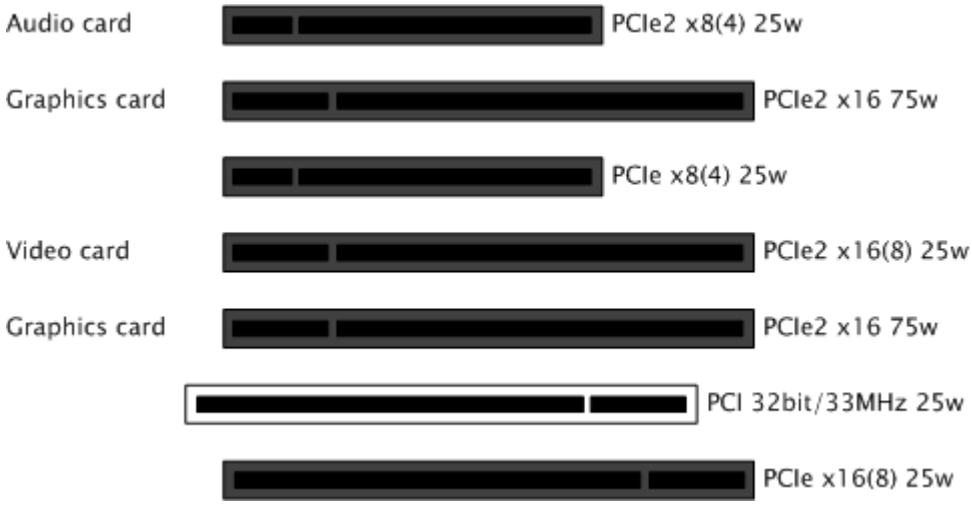


1. Disconnect the power and all other peripherals.
2. Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.
3. Insert the graphics card in PCIe2 slot number 2 from the top.
4. Insert the Matrox video card into the PCIe2 slot number 5 from the top.
5. Insert the radial-aerator into the PCIe slot number 7 from the top.
   - A radial-aerator is mandatory as the video card reaches high temperatures during operation.
6. *Optional:* Insert the Audio-extension Card into the PCIe2 slot number 1 from the top.
7. *Optional*: Insert the extra slot panel for the X.mio 2/44 card in any of the vacant slots, and connect it to the X.mio 2 card.
8. Tidy up all cables and close the computer's casing.

Note: A radial-aerator is mandatory as the video card reaches high temperatures during operation.

To setup an HP z800 with two graphics cards

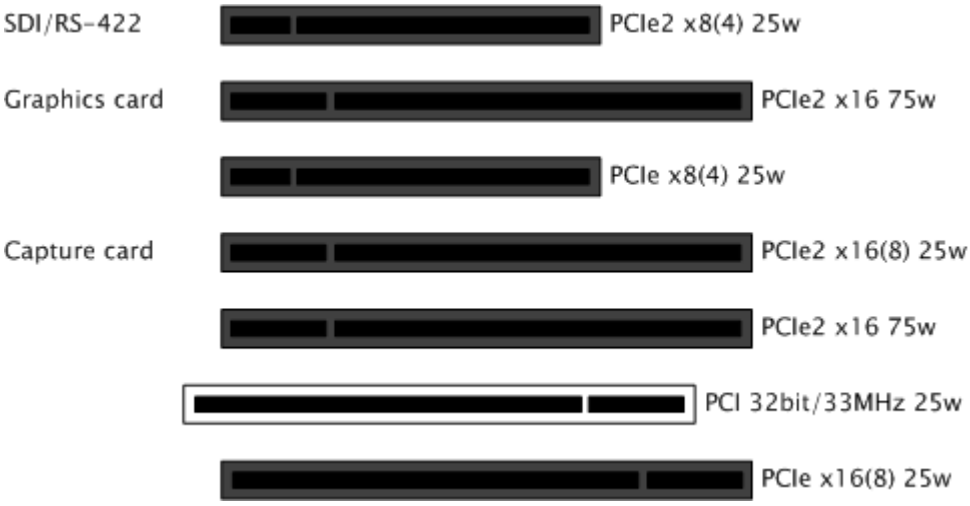
Figure 88: PCI and PCIe slots, HP z800



1. Disconnect the power and all other peripherals.
2. Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.
3. Insert the weaker graphics card in PCIe2 slot number 2 from the top.
4. Insert the stronger graphics card in PCIe2 slot number 5 from the top.
5. Insert the Matrox video card in the PCIe2 slot number 4 from the top.
6. Insert the radial-aerator into the PCIe slot number 3 from the top.
   - A radial-aerator is mandatory as the video card reaches high temperatures during operation.
7. *Optional:* Insert the Audio-extension Card into the PCIe2 slot number 1 from the top.
8. Tidy up all cables and close the computer's casing.
9. Connect the computer's monitor to the graphics card in slot 2 from the top.
10. Start the machine and in the BIOS (Advanced: Thermal – Full Fan speed) set all fans to run at full speed.
11. Boot and log on to the machine.
12. Install NVIDIA and Matrox drivers.
13. Open the NVIDIA Control Panel, and click on System Information in the bottom left corner and check that both graphics cards are installed and run at PCIe x16 speed.
14. Open Matrox X.info from the system tray and check that the video card runs at PCIe x8 speed.

To setup an HP z800 with a capture card

Figure 89: PCI and PCIe slots, HP z800



1. Disconnect the power and all other peripherals.
2. Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.
3. Insert the graphics card in PCIe2 slot number 2 from the top.
4. Insert the NVIDIA capture board into the PCIe2 slot number 4 from the top.
5. Tidy up all cables and close the computer's casing.

9.2 HP DL370 Installations

This section describes how to setup the HP DL370 G6 machine with the different cards provided by Vizrt:

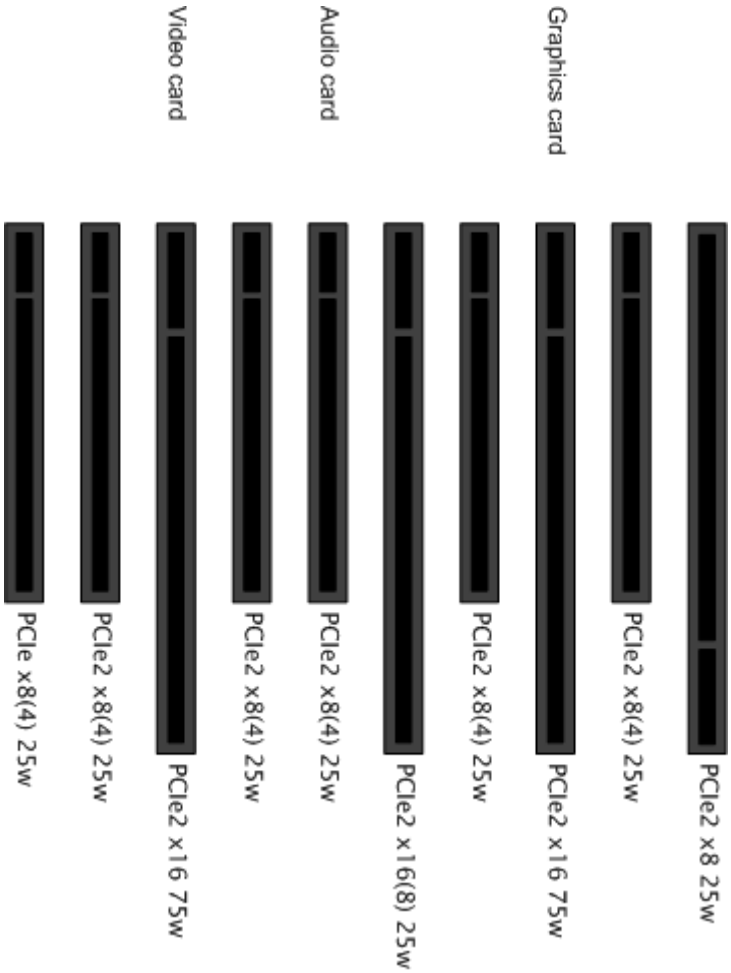
- To setup an HP DL370 G6 with one graphics card
- To setup an HP DL370 G6 with two graphics cards
- To setup an HP DL370 G6 with a capture card
- To configure the BIOS

See Also

- Graphics Cards
- Video Cards

To setup an HP DL370 G6 with one graphics card

Figure 90: PCI and PCIe slots, HP DL370 G6

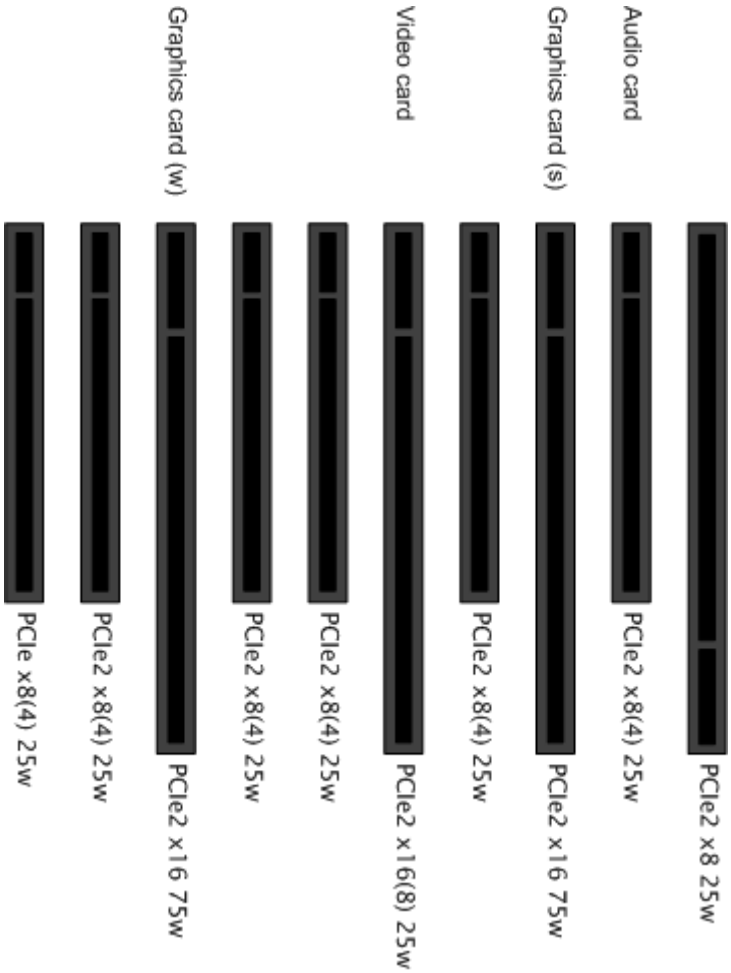


1. Disconnect the power and all other peripherals.
2. Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.
3. Insert the graphics card in PCIe2 slot number 8 from the left.
4. Insert the video card (i.e. Matrox X.mio2) into the PCIe2 slot number 3 from the left.
5. If you have a Matrox card, insert the radial-aerator into the PCIe slot number 2 from the left.
   - A radial-aerator is mandatory as the video card reaches high temperatures during operation.
6. *Optional:* Insert the Audio-extension Card into the PCIe2 slot number 5 from the left.
7. *Optional*: Insert the extra slot panel for the X.mio 2/44 card in any of the vacant slots, and connect it to the X.mio 2 card.
8. Tidy up all cables and close the computer's casing.

Note: Matrox DSX.LE cannot be mounted in the DL370 G6

To setup an HP DL370 G6 with two graphics cards

Figure 91: PCI and PCIe slots, HP DL370 G6



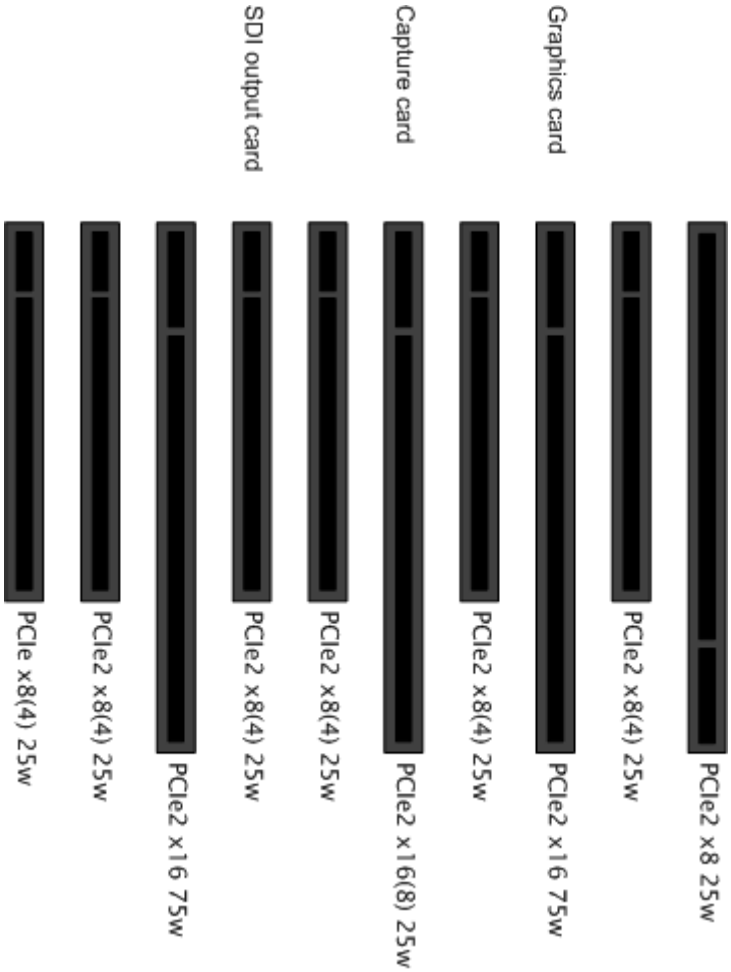
1. Disconnect the power and all other peripherals.
2. Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.
3. Insert the weaker graphics card in PCIe2 slot number 3 from the left.
4. Insert the stronger graphics card in PCIe2 slot number 8 from the left.
5. Insert the video card (i.e. Matrox X.mio2) in the PCIe2 slot number 6 from the left.
6. If you have a Matrox card, insert the radial-aerator into the PCIe slot number 5 from the left.
   - A radial-aerator is mandatory as the video card reaches high temperatures during operation.
7. *Optional:* Insert the Audio-extension Card into the PCIe2 slot number 9 from the left.
8. Tidy up all cables and close the computer's casing.
9. Connect the computer's monitor to the graphics card in slot 3 from the left.
10. Start the machine and in the BIOS (Advanced: Thermal – Full Fan speed) set all fans to run at full speed.
11. Boot and log on to the machine.
12. Install NVIDIA and Video card drivers.

13. Open the NVIDIA Control Panel, and click on System Information in the bottom left corner and check that both graphics cards are installed and run at PCIe x16 speed.
14. If you installed a Matrox card, open Matrox X.info from the system tray and check that the video card runs at PCIe x8 speed.

Note: Matrox DSX.LE cannot be mounted in the DL370 G6

To setup an HP DL370 G6 with a capture card

Figure 92: PCI and PCIe slots, HP DL370 G6



1. Disconnect the power and all other peripherals.
2. Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.
3. Insert the graphics card in PCIe2 slot number 8 from the left.
4. Insert the capture card in PCIe2 slot number 6 from the left.
5. Insert the SDI output card in the PCIe2 slot number 4 from the left.
6. Tidy up all cables and close the computer's casing.

To configure the BIOS

1. Start the machine and open the machine's **BIOS** system
2. Go to **System Options** > **Processor Options**
1. Deactivate **Hyperthreading**
   - The Matrox X.mio2 card will not function if this setting is enabled

2. Deactivate Intel **Virtualization Technology**
3. Deactivate Intel **VT-d2**

Note: Steps 2 and 3 are only needed for VMWare setups

1. Go to **Power Management Options** > **Advanced Power Management Options** > **PCI Express Generation 2.0 Support**
2. Activate **Force PCI-E Generation 2**
3. **Save** and **exit** the BIOS

9.3 HP xw8600 Installations

This section describes how to setup the HP xw8600 machine with the different cards provided by Vizrt:

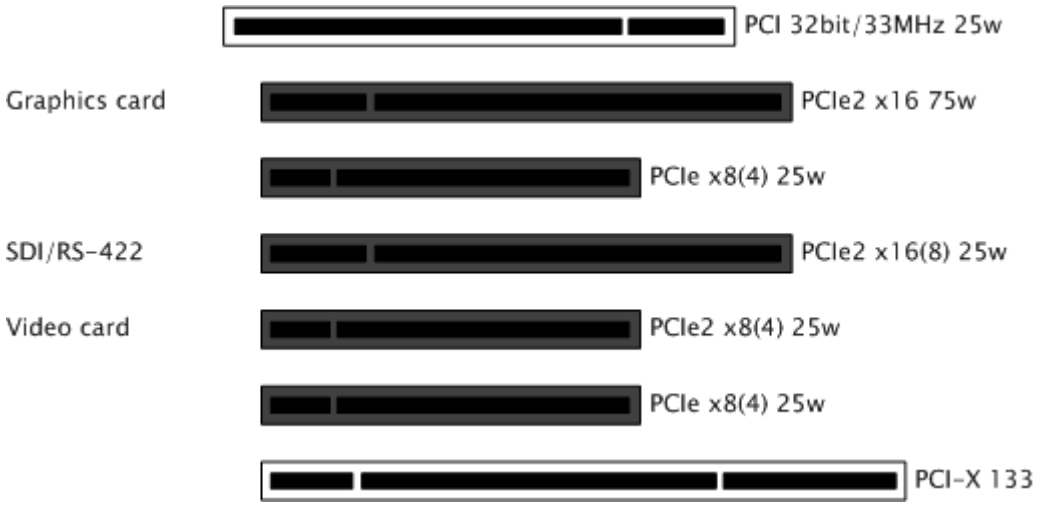
- To setup an HP xw8600 with a DVS Centaurus card
- To setup an HP xw8600 with a Martox card
- To setup an HP xw8600 with a Matrox card

See Also

- Graphics Cards
- Video Cards

To setup an HP xw8600 with a DVS Centaurus card

Figure 93: PCI-X, PCI and AGP slots, HP xw8600

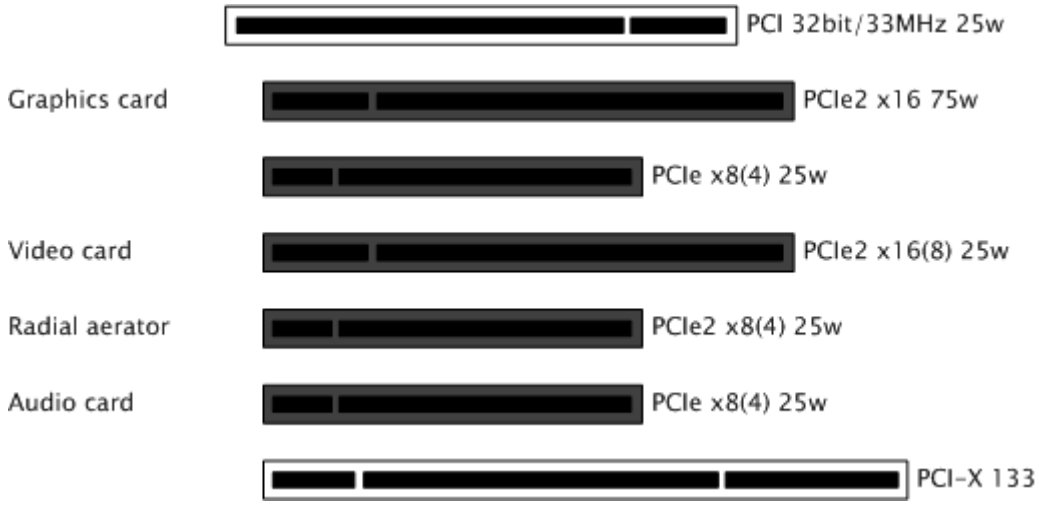


1. Disconnect the power and all other peripherals.

2. Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.
3. Mount the graphics card in slot number 2 from the top.
4. Mount the video card in slot number 4 from the top.
5. Mount the separate SDI/RS-422 panel in slot number 1 from the top.
   - Make sure that the cable connections are properly mounted and that it stays clear of any supplemental aerators or the aerator of the graphics device.

To setup an HP xw8600 with a Martox card

Figure 94: PCI, PCIe and PCI-X slots, HP xw8600

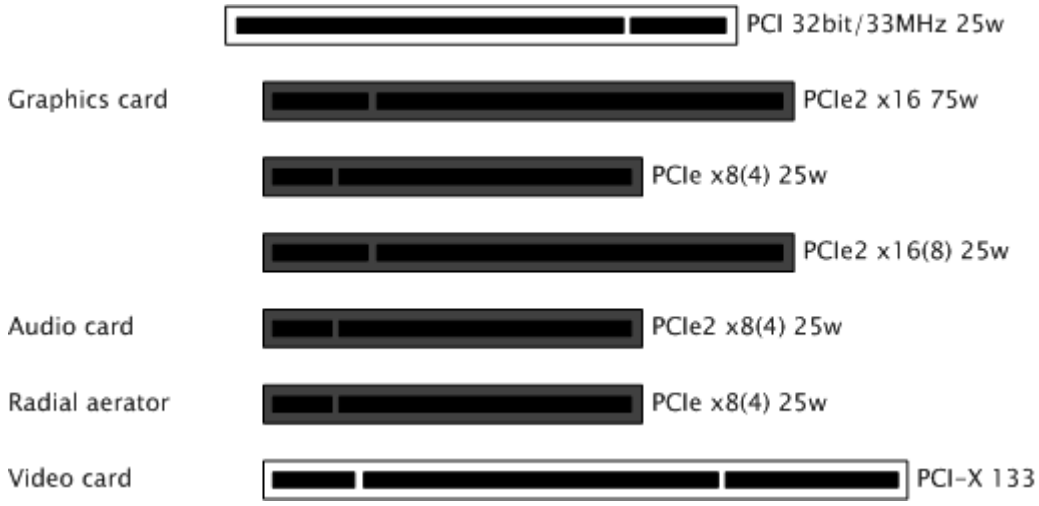


1. Disconnect the power and all other peripherals.
2. Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.
3. Insert the graphics card in the PCIe slot number 2 from the top.
4. Insert the Matrox video card in the PCIe slot number 4 from the top.
5. Insert a powerful radial-aerator in the PCIe slot number 5 from the top.
6. *Optional:* Insert the Audio-extension Card in the PCI-X slot number 6 from the top.
7. *Optional*: Insert the extra slot panel for the X.mio 2/44 card in any of the vacant slots, and connect it to the X.mio 2 card.

Note: A radial-aerator is mandatory as the video card reaches high temperatures during operation.

To setup an HP xw8600 with a Matrox card

Figure 95: PCI, PCIe and PCI-X slots, HP xw8600



1. Disconnect the power and all other peripherals.
2. Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.
3. Insert the graphics card in the PCIe slot number 2 from the top.
4. Insert the Matrox video card into the PCIe slot number 7 from the top.
5. Insert a powerful radial-aerator into the PCIe slot number 6 from the top.
6. *Optional:* Insert the Audio-extension Card into the PCI-X slot number 5 from the top.

Note: A radial-aerator is mandatory as the video card reaches high temperatures during operation.

9.4 HP xw8400 Installations

This section describes how to setup the HP xw8400 machine with the different cards provided by Vizrt:

- To setup an HP xw8400

To setup an HP xw8400

Figure 96: SATA plug, HP xw8400

1. Disconnect the power and all other peripherals.
2. Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.

3. Before mounting the video card, the SATA connector originally connected to the SATA port 0 needs to be reconnected to SATA port 1 in order to make room for the video card.

Figure 97: PCI, PCIe and PCI-X slots, HP xw8400

Note: For an HP xw8400, the X.mio 24/6000 video card requires a 64bit PCI-X slot operating at a minimum of 100 MHz.

4. Insert the graphics card in the PCIe slot number 2 from the top.
5. Insert the Matrox video card into the PCI-X slot number 6 from the top.
6. Insert a powerful radial-aerator into the PCI-X slot number 7 from the top.
7. *Optional:* Insert the Audio-extension Card into the PCI-X slot number 5 from the top.

Note: A radial-aerator is mandatory as the video card reaches high temperatures during operation.

See Also

- Video Cards
- Graphics Cards

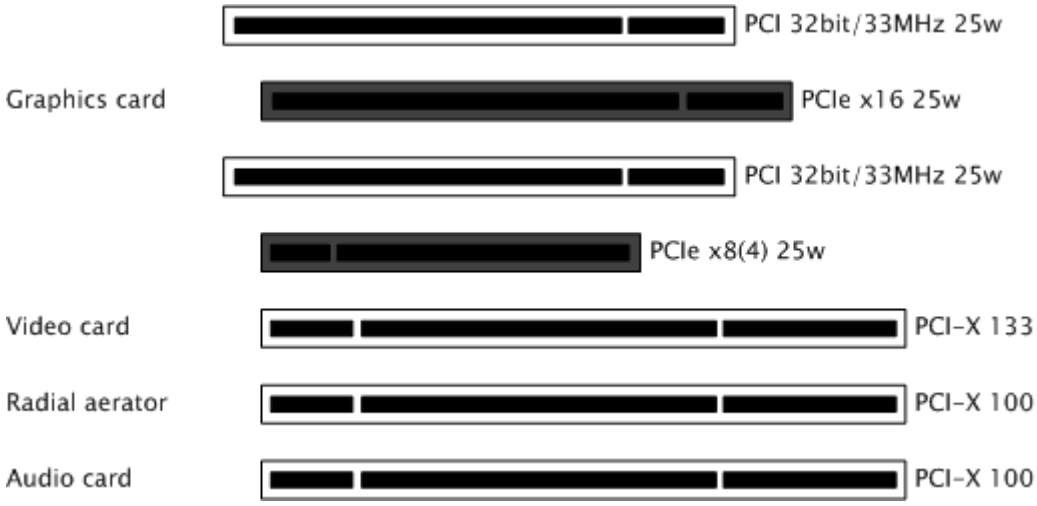
9.5 HP xw8200 Installations

This section describes how to setup the HP xw8400 machine with the different cards provided by Vizrt:

- To setup an HP xw8200

To setup an HP xw8200

Figure 98: PCI, PCIe and PCI-X slots, HP xw8200



1. Disconnect the power and all other peripherals.
2. Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.
3. Insert the graphics card in the PCIe slot number 2 from the top.
4. Insert the Matrox video card into the PCI-X slot number 4 from the top.
5. Insert a powerful radial-aerator into the PCI-X slot number 6 from the top.
6. *Optional:* Insert the Audio-extension Card into the PCI slot number 7 from the top.

Note: A radial-aerator is mandatory as the video card reaches high temperatures during operation.

See Also

- Matrox X.mio 1 and X.mio 2
- Verifying the Matrox X.Mio Installation
- Replacing the Matrox X.Mio Card
- Connecting the Matrox X.Mio Audio-extension Card
- Graphics Cards

9.6 Verifying the Matrox X.Mio Installation

While an installation verification is usually performed once all drivers are installed and the hardware is being used, some basic verification can be performed by having a look at the back-end of the installed video card when powering up the machine.

Do the following:

- Look for the blue LED-light on the (top) backside of the slot panel, and make sure it is lit as this will indicate if the card is correctly supplied with power.

See Also

- Video Cards

9.7 Replacing the Matrox X.Mio Card

To replace a video card

This procedure describes how to remove the video card drivers for a system with an existing video card, or a system that previously has had a video card installed.

1. Remove the video card drivers.
2. Shut down the machine.
3. Mount the replacement video card.
4. Install the video card drivers.

IMPORTANT! When changing a video card the *Matrox.Devices* setting, set in the configuration file's SECTION MATROX_CONFIG, will not be updated. The Matrox support will not be set up correctly and the new card will not work. In this case the setting must be removed and Viz Engine restarted such that Viz Engine can insert the new serial number.

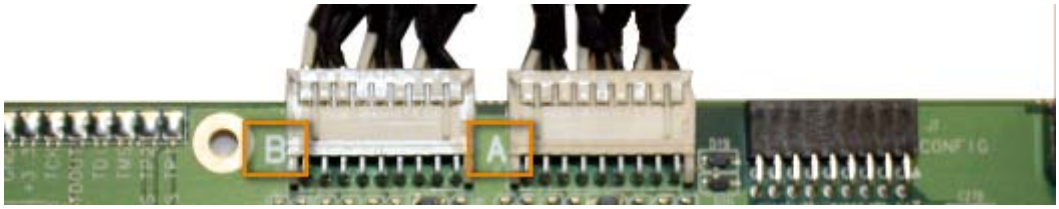
See Also

- Video Cards

9.8 Connecting the Matrox X.Mio Audio-extension Card

To connect the audio-extension card to the video card

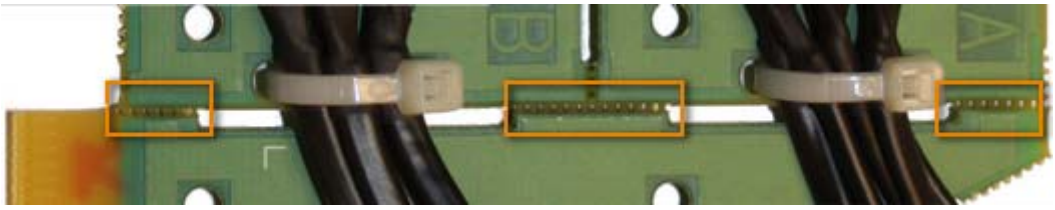
Figure 99: Connecting the audio-extension card to the video card.



1. Locate the connectors on the audio-extension card labeled A and B.
2. Locate the connectors on the video card labeled A and B.
3. Use the cables to connect A on the audio-extension card to A on the video card, and do the same for the B connectors.

To remove the audio-extension card back-end

Figure 100: Audio-extension card's weak spots



- Locate the Audio-extension card's weak spots, and carefully break the connections.

CAUTION! Do not break the weak spots that hold the two remaining pieces together.

See Also

- Video Cards

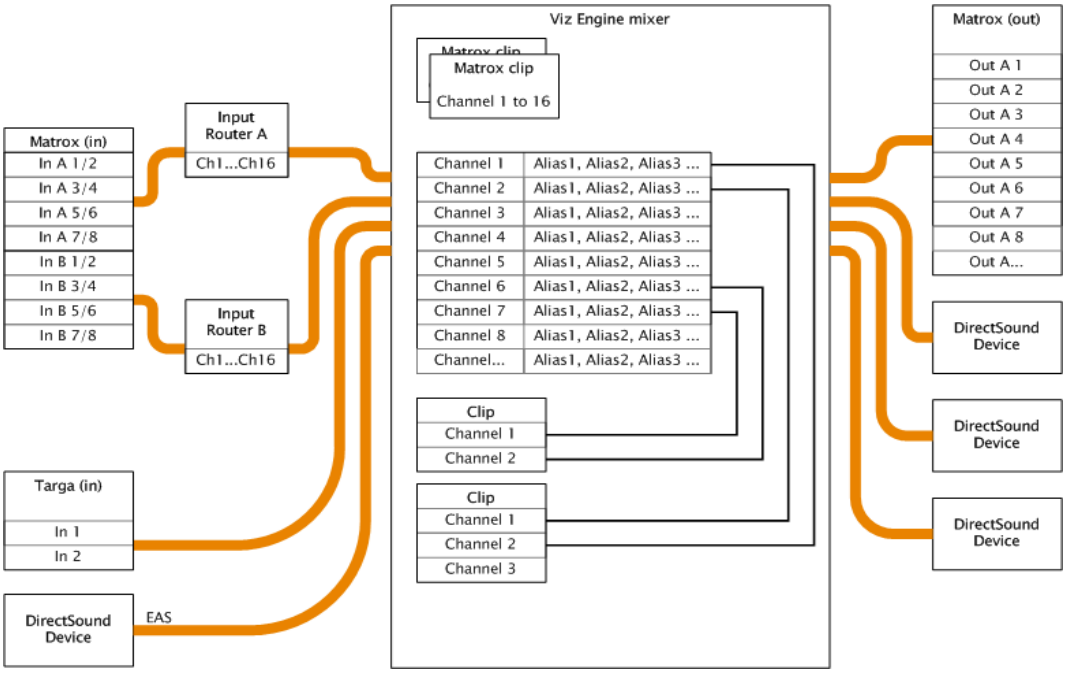
10 Audio in Viz

This chapter contains the technical description of the Viz Engine 3 audio system, contains the following information:

- Overview
- Device Recognition and Selection
- Timing Behavior and Delay Settings
- Channel Setup and Clip Channel Routing
- Audio Plug-in
- Clip Formats
- Speaker Names
- Matrox Audio

10.1 Overview

Figure 101: Schematic layout of the audio system



As the above diagram shows, there are three different ways to capture audio in Viz Engine 3.x; through Matrox, Targa or a DirectSound compatible device.

This section contains information on the following topics:

- Audio Channels
- Matrox (and Targa) Input Channels
- Matrox (and Targa) Output Channels
- Matrox Live Input Routing
- Matrox (and Targa) Clip Routing

- DirectShow Filters
- DirectSound Input
- DirectSound Audio Card

10.1.1 Audio Channels

Internally Viz Engine can use 16 audio channels. The channels are working with floats. Every channel can be named with an arbitrary number of aliases.

10.1.2 Matrox (and Targa) Input Channels

If a Matrox card is present in the system, 16 input channels are available as AES/EBU input or embedded in the video stream.

The old Targa board offers 2 input channels embedded in the video signal.

10.1.3 Matrox (and Targa) Output Channels

After mixing, Viz Engine writes the data of the internal channels one by one to the available output devices. On the direct sound devices you have the possibility to route the Viz Engine channels to any available output channels.

See Also

- Device Recognition and Selection

10.1.4 Matrox Live Input Routing

On Matrox cards it is possible to route live input channels to any internal Viz Engine channel. It is possible to route more than one channel to an internal channel, but it is not possible to duplicate input channels.

Note: It is not possible to route Targa input channels.

See Also

- Channel Setup and Clip Channel Routing

10.1.5 Matrox (and Targa) Clip Routing

Audio from Matrox or Targa clips are mapped one by one to the internal Viz Engine channels; hence, no routing is possible.

Audio from audio clips played through the stage is routed to the internal audio channel. This can be done automatic or manual.

See Also

- Matrox Live Input Routing
- Channel Setup and Clip Channel Routing

10.1.6 DirectShow Filters

Viz is able to play any audio file for which a DirectShow filter is installed.

DirectShow provides a set of default filters that install automatically with Microsoft® Windows®. These filters support many data formats while providing a high degree of hardware independence.

All the filters supported by the DirectShow Software Development Kit (SDK) are listed on the Microsoft Developer Network (MSDN) website. If a filter appears in GraphEdit but is not documented by the MSDN online reference, it means the filter has either been installed by a third party or is used internally by some other Microsoft technology. Such filters are not supported by the DirectShow SDK.

10.1.7 DirectSound Input

Microsoft DirectSound provides a system to capture sounds from input devices and play sounds through various playback devices using advanced 3-dimensional positioning effects, and filters for echo, distortion, reverberation, and other effects.

A DirectSound compatible card is an alternative for designers that use laptops with no video card installed, or if analog audio is needed.

Viz supports DirectSound compatible cards that support DirectX version 8 or later.

Note: Matrox and Targa are only able to output digital audio.

Emergency Alert System

The analog audio input through the DirectSound device is also, for broadcasters in the United States of America, reserved for the Emergency Alert System (EAS).

If the EAS is activated all audio will be muted and the source from the first analog audio card installed in the system will be played through the Matrox or Targa board.

10.1.8 DirectSound Audio Card

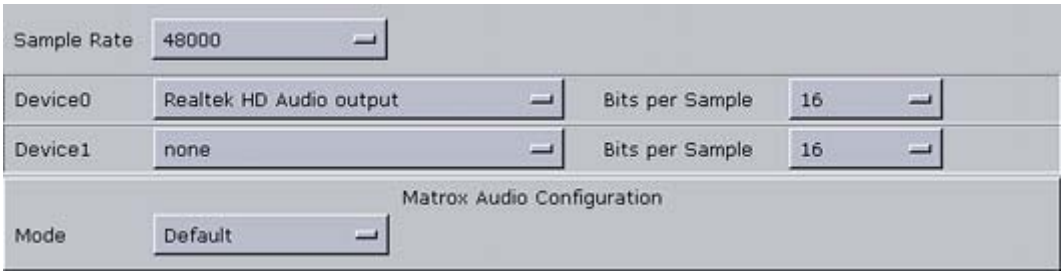
Viz Engine 3 is able to use any DirectSound capable audio card installed in the system. If a Matrox or Targa board is installed on the system, Viz Engine synchronizes the audio output of the DirectSound cards to the video sync signal coming in to the video card.

See Also

- Device Recognition and Selection

10.2 Device Recognition and Selection

Figure 102: Audio Settings, Viz Config



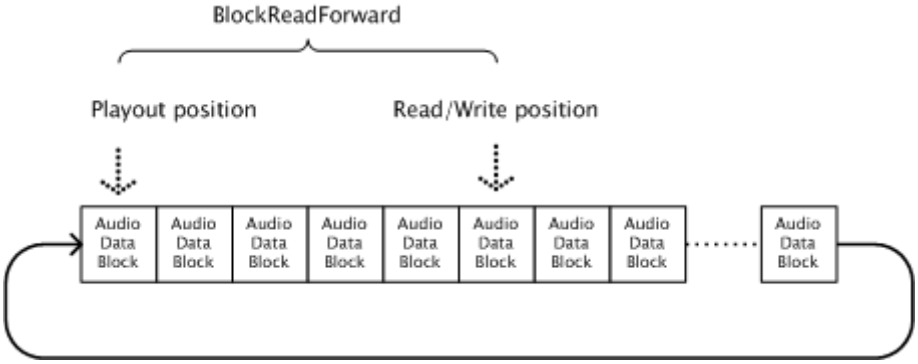
The Viz Engine 3 audio system is able to use any installed DirectSound capable audio device. On every device up to 16 channels can be used.

During the startup process Viz Engine tests all available audio cards installed on the system. It is currently only possible To manually activate an audio device by configuring the audio device(s) listed in the configuration file's SECTION AUDIO_CONFIG. By default a one to one channel assignment from the first audio device is done when a new device is selected.

10.3 Timing Behavior and Delay Settings

In this timing behavior for every activated DirectSound only card can be set. The default values should work for most devices; however, differences may occur.

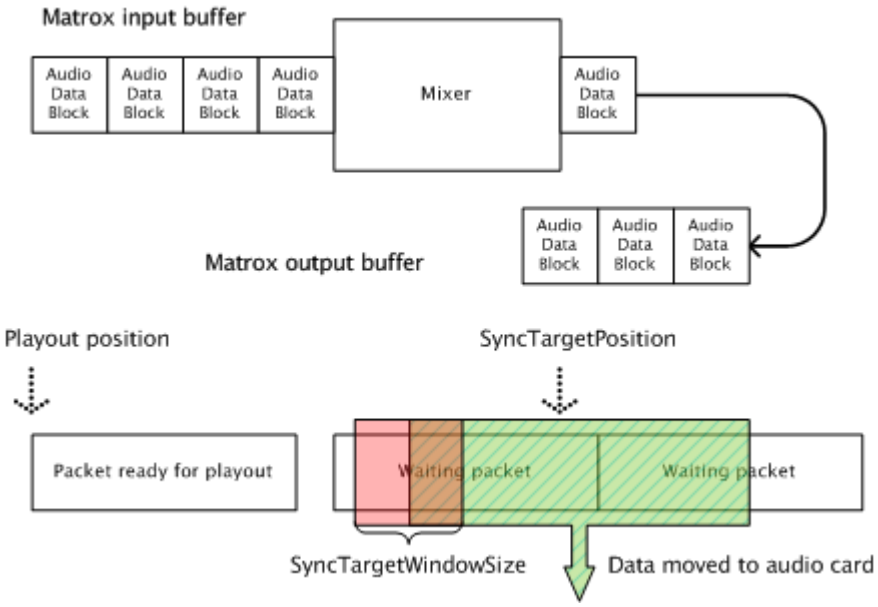
Figure 103: Latency adjustment on the DirectSound audio device



All sound devices use a Ring buffer that stores data until it is sent out to the audio channels, and this ring buffer is organized in blocks of data. All sound hardware defines a distance in blocks (or bytes) that needs to be maintained. For almost all devices on the market a distance of 6 blocks is sufficient to have a "clean output" without artifacts.

Tip: Try to decrease the BlockReadForward value down to 3 to accomplish less delay for the output. Viz Engine creates a ring buffer of 1 second which is split in 60 blocks. This gives an output delay of 10 milliseconds when the *BlockReadForward* value is 6 (see the configuration file's SECTION AUDIO_CONFIG).

Figure 104: Matrox input and output buffer



Note that an unsynchronized audio card will always run faster or than a synchronized video or audio card. There is a mechanism needed to keep all audio cards synchronized with each other. The mechanism shown in Figure 104: Matrox input and output buffer, is used by Viz Engine to fulfill this condition.

After mixing the packages received from the Matrox or Targa board the blocks of audio data are moved to the Matrox output buffer. This buffer is organized as a ring buffer and holds one second of data and this is the maximum delay that can be achieved with the described mechanism.

The *SyncTargetPosition* (set in SECTION AUDIO_CONFIG) defines the position (relative to the play out position of the Matrox or Targa board) where the audio data for the direct sound cards are branched. If the card is running slower than the reference card, the synchronized position will move away from the play out position. If it is faster, the *SyncTargetPosition* will move to the playout position. The *SyncTargetWindowSize* (set in SECTION AUDIO_CONFIG) defines the border, when Viz Engine starts to resample the direct sound data to bring the *SyncTargetPosition* back in place. The predefined value of 250 samples is a good compromise between performance and quality. If a cheap audio card is used, and small artifacts can be heard, try to increase this value. Good ranges are 250 up to 600.

The *SyncTargetPosition* is used to synchronize the different audio cards to each other. Every audio card shows a specific delay behavior. Increase or decrease this value if one card is faster than the other. If the value is too small artifacts will occur; however, most audio cards work fine with the predefined values. *SyncTargetPosition* and *SyncTargetWindowsSize* (set in SECTION AUDIO_CONFIG) are configurable settings that can be set separately for every activated audio card.

This section also contains information on the following topics:

- Channel Device and Channel Track settings

10.3.1 Channel Device and Channel Track settings

In Viz Engine it is possible to combine two or more devices for playout of the Viz Engine's internal audio channels.

Note that Viz Engine internaly can use up to 16 channels. On many professional multichannel cards the channels are organized in virtual devices with 2 channels. A good example is the following configuration:

```
Available2 = M-Audio Delta 66 1+2
Available3 = M-Audio Delta 66 3+4
```

In Viz Engine it is possible to combine these two devices and create a quad speaker configuration as shown below.

```
VIZChannelDevice0 = M-Audio Delta 66 1+2
VIZChannelDevice1 = M-Audio Delta 66 1+2
VIZChannelDevice2 = M-Audio Delta 66 3+4
VIZChannelDevice3 = M-Audio Delta 66 3+4
VIZChannelDevice4 = Realtek HD Audio output
VIZChannelDevice5 = Realtek HD Audio output
VIZChannelDevice6 = Realtek HD Audio output
VIZChannelDevice7 = Realtek HD Audio output
VIZChannelDevice8 = none
VIZChannelDevice9 = none
VIZChannelDevice10 = none
VIZChannelDevice11 = none
VIZChannelDevice12 = none
VIZChannelDevice13 = none
VIZChannelDevice14 = none
VIZChannelDevice15 = none
VIZChannelTrack0 = 0
VIZChannelTrack1 = 1
VIZChannelTrack2 = 0
VIZChannelTrack3 = 1
VIZChannelTrack4 = 4
VIZChannelTrack5 = 5
VIZChannelTrack6 = 6
VIZChannelTrack7 = 7
VIZChannelTrack8 = 0
VIZChannelTrack9 = 0
VIZChannelTrack10 = 0
VIZChannelTrack11 = 0
VIZChannelTrack12 = 0
VIZChannelTrack13 = 0
VIZChannelTrack14 = 0
VIZChannelTrack15 = 0
```

See also the configuration file's SECTION AUDIO_CONFIG.

10.4 Channel Setup and Clip Channel Routing

Channel setups are configured using the Audio Settings section in Viz Config. In order to get a correct mixing of clip channels to Viz Engine's internal channels it is important to set the audio channels in a correct way.

The Audio Settings section can for example be used To add new audio channels and To add multi-language audio channels. The latter allows the same scene with the same audio clips to for example output English, German, French and background music on three different machines. It is also possible to create 3D and other channel configurations for as many environments as needed. Stereo is configured by default.

From Viz Artist a scene designer is able To add multiple audio channel configurations, To test audio channel setup, and switch between the different

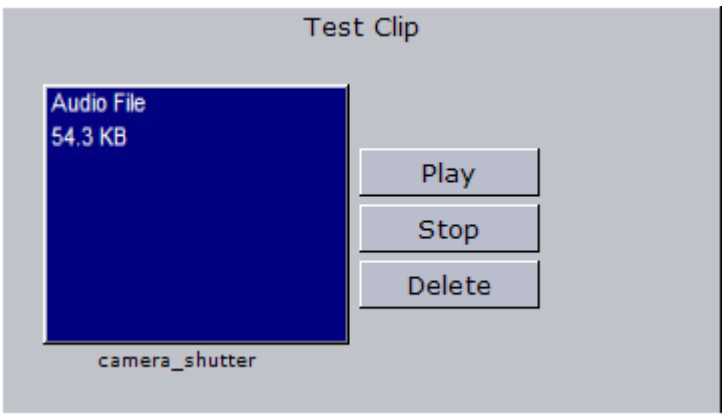
local setups matching for example one or several remote Viz Engine audio setups. Configurations can also be tested separetely or all together.

This section also contains information on the following procedures:

- To test audio channel setup

To test audio channel setup

Figure 105: Test Clip, Audio Plug-in



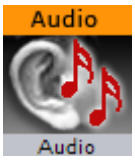
1. Start Viz Artist
2. Create a new scene
3. Add a group container to the scene tree
4. Add the Audio Plug-in to the group container
5. Open the Audio plug-in editor, and add an audio clip to the *Test Clip* drop-zone, and click Play

Tip: Always have a set of test clips that will provide audio for the different channel setups.

See Also

- To add new audio channels
- To add multi-language audio channels
- To add multiple audio channel configurations
- To delete audio channels
- To manually activate an audio device

10.5 Audio Plug-in



The Audio plug-in allows a designer To configure audio channels. The Audio plug-in is located in Viz Artist's Function Container section, and can be applied to any container.

This section contains information on the following topics:

- Audio Clip Mixing Modes

10.5.1 Audio Clip Mixing Modes

The Audio plug-in has four differet audio clip mixing modes; Default, FX and Manual. These are all selectable from Viz Artist.

This section contains information on the following topics and procedures:

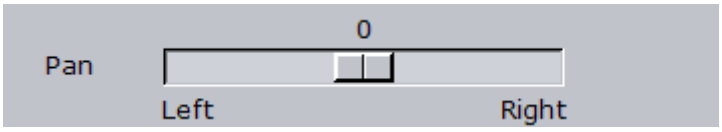
- Default
- FX
- Manual
- To configure audio channels

Default

The Default mode uses the Channel settings stored in the clip. For example FrontLeft and FrontRight are mixed to the aliases FRONT_LEFT, FRONT_RIGHT and so on. See also Audio Settings.

If Viz Engine is configured with fewer channels, Viz Engine mixes the remaining clip channels according to the channel geometry. For example if Viz Engine only has stereo configured, but the clip used has 7.1 surround sound, Viz Engine mixes LeftBack and LeftMiddle to FRONT_LEFT and so on.

Figure 106: Pan slider, Audio plug-in



The Pan slider adjusts the volume of the left and right speakers. This is valid for multichannel configurations as well. If the slider is moved to the right in a 7.1 configuration LeftBack, LeftMiddle and LeftFront will be muted.

Figure 107: Volume, Audio plug-in

The Volume field controls the overall audio volume of all clip channels.

FX

In the FX mixing mode Viz Engine mixes the clip in relation to the listener position which can be defined in the fields X and Y. Viz Engine takes the channel geometry into account.

Manual

In the Manual mixing mode it is possible to manually enter the internal Viz Engine channel target for every clip channel. The mask can hold more than one channel.

The syntax for the string is as follows:

```
CHANNEL_ALIAS%VOLUME+CHANNEL_ALIAS%VOLUME…..
```

or

```
[CHANNEL_ALIAS%VOLOUME]+
```

Example: FrontRight%50+EnglishLeft%20

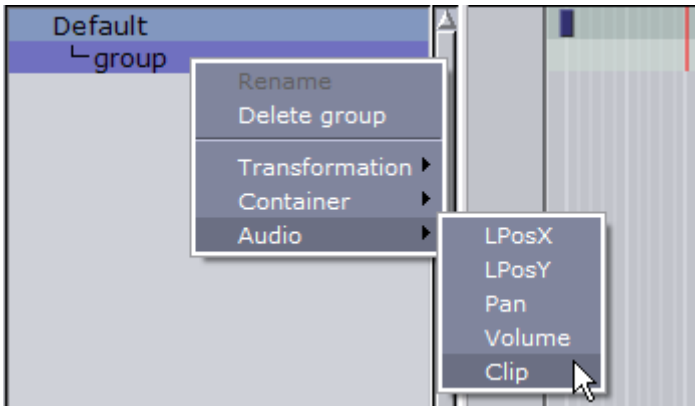
To configure audio channels

1. Add a group container to the Scene tree.

Figure 108: Set Key, Viz Artist

2. Click the Set Key button to add a key frame for the container.
3. Add the Audio plug-in to the new group container.
4. Click the Stage (not Server/Stage) button, and select the Dopesheet/Spline view (CTRL+4).

Figure 109: Add audio clip, Viz Artist



5. Right-click the group node, and select Audio -> Clip from the appearing context menu.
6. Click the Server button to return to the Server view.
7. Click the Audio plug-in icon to open the Audio plug-in editor.
8. Click the Manual button to enable manual configuration of Viz Engine's audio channels.
9. Enter the following channel configurations:
   - Channel 1: FrontLeft
   - Channel 2: FrontRight
   - Channel 3: EnglishLeft
   - Channel 4: EnglishRight
   - Channel 5: FrenchLeft
   - Channel 6: FrenchRight
   - Channel 7: GermanLeft
   - Channel 8: GermanRight
10. Save the scene.

Depending on the settings in the channel configuration a clip will now play the different languages.

10.6 Clip Formats

The recommended audio format is WAVE. It gives the least decoding time and gives the best performance. Additionally it is the only format that match Viz' support for 16 channels.

Video clips can have interleaved audio in it. The format is limited to 24bit and 48khz. There needs to be at least 2 channels in it as mono is not supported. Again, the maximum channels are 16.

SDI in, break-out box (BOB) out is supported as well as BOB in and SDI out. It can be controlled by the video/clip channels controls.

Viz Engine is able to import and play the following Formats:

- WAVE: Up to 96kHz, 24Bit and 16 Channels.
- MP3: All Formats (Stereo only)
- OggVorbis: All Formats, up to 16 Channels.

See Also

- Audio Settings
- Audio Configuration
- Matrox configuration interface

10.7 Speaker Names

Viz Engine knows the following default speaker names:

- FRONT_LEFT, FRONT_RIGHT and FRONT_CENTER
- LOW_FREQUENCY
- BACK_LEFT, BACK_RIGHT, and BACK_CENTER
- FRONT_LEFT_OF_CENTER and FRONT_RIGHT_OF_CENTER
- SIDE_LEFT and SIDE_RIGHT
- TOP_CENTER, TOP_FRONT_LEFT, TOP_FRONT_CENTER, TOP_FRONT_RIGHT, TOP_BACK_LEFT, TOP_BACK_CENTER and TOP_BACK_RIGHT
- SPEAKER_RESERVED

See Also

- Audio Settings
- Matrox configuration interface

10.8 Matrox Audio

The Matrox card is able to capture and playout using up to 16 channels. The audio can be embedded into the video signal or be an external signal through the AES/EBU connectors. It depends on the Matrox version which AES/EBU connectors are present.

On the X.mio cards there are balanced 75 Ohm connectors. On newer cards, 110Ω connectors are used.

Viz Engine is only able to mix PCM data. Dolby Digital can only be used in the MATROX_LOOP Mode, which allows no mixing (see also SECTION AUDIO_CONFIG's *MatroxAudioMode* settings).

On the Targa board only embedded audio in Stereo is supported.

This section also contains information on the following procedure:

- To enable audio

To enable audio

1. Start **Viz Config**
2. In the Audio Settings section activate at least one of the **Enable embedded audio on Input1** or **Enable embedded audio on Input2** buttons.
   - This needs to be done for AES/EBU audio as well.

3. Select one of the following Matrox audio modes: Embedded, AES, Embedded AES, AES Embedded or Loop.
4. Click **Save** and close Viz Config.
5. Open the configuration file and check that the following values are set in SECTION AUDIO_CONFIG:
   - Matrox0.AudioOut.Enable = 1
   - Matrox0.AudioOut.Delay = 4
   - Matrox0.AudioIn1.AudioEnable = 1
   - Matrox0.AudioIn1.AudioChannels = 2
   - Matrox0.AudioIn1.AudioDelayDVE = 4
6. If required, also change these:
   - Matrox0.AudioIn2.AudioEnable = 1
   - Matrox0.AudioIn2.AudioChannels = 2
   - Matrox0.AudioIn2.AudioDelayDVE = 4

11 Frame Accurate Output

At the moment the frame accurate commands only work with DVE as clip target. Due to different usage of the ring buffer (another place in the timeline) the texture target is not working.

This section contains information on the following topics:

- Prerequisites
- Configuring Frame Accurate Output
- Commands

11.1 Prerequisites

To ensure fast clip handling the system has to be configured to use a RAID-0 hard disc configuration. Also it is best to use a Matrox X.mio2 rather than an X.mio because of the increased memory usage and performance required.

If the system is fitted with an X.mio you could increase the performance by setting the used RGB to YUV conversion to Shader (see Render Options). For further details, see the Configuring Frame Accurate Output section.

As all of the clip players are initialized at first usage it is necessary to do so prior to starting a frame accurate scene. Do this by loading a dummy scene that has all clip channels set to either DVE or texture mode and a valid clip name given.

Note: It can take up to 4 seconds for the clip players to initialize. Do this a second time to also initialize the pending clip players. Please keep in mind that this procedure is only needed after a fresh restart of the Viz Engine/Artist.

See Also

- Configuring Frame Accurate Output
- Render Options
- Shader definition

11.2 Configuring Frame Accurate Output

To configure frame accurate output

1. Start **Viz Config**
2. Select the Communication section and **enable Frame Accurate Viz Communication**
3. Set **FAVC Bias** as needed
   - Delay fields (in addition to ring buffer size) for frame accurate commands via TCP or GPI. This is the bias in frames for the commands if Frame Accurate Viz Command is turned on. Could be negative as well.

4. Set **FAVC Field Dominance** to **Odd Retrace Counter**
   - For FAVC Field Dominance you can set Odd Retrace Counter or Even Retrace Counter where Odd retrace counter is the recommended option.

5. Select the Render Options section and set the **RGB to YUV** setting to **Shader**
   - The following setting will increase performance only when an X.mio is installed.

6. Select the Matrox section and click the ClipOut Properties tab
7. Expand the **ClipIn** settings for the clip channel you use (1 or 2) and set **Video Delay DVE** to **0** and **Pending** to **Active**
8. Click **Save** and **close** Viz Config
9. **Open** Viz Engine's **configuration file**
10. Locate **SECTION TARGA3200** and set **clip_stage_use_pending** to **1**
    - This setting is used to enable pre-loading of clips in the stage when having more than one clip in the timeline.
    - It only has an effect when pending is activated (see above).

11. **Save** and **close** the configuration file

11.3 Commands

To enable frame accurate handling of clips, it is necessary to preload the next scene by using the CUE command:

```
SCENE*<Scene Name>  CUE
```

Because the loading time of clips is affected by disc speed and the used codec, allow at least 1 second head start for the CUE command. The earlier you cue the next scene the more likely all of the clips are prepared when needed.

After the initial CUE command it is/could be necessary to send the following commands. If the scene was saved at another position than 0 send:

```
SCENE*<Scene Name>*STAGE SHOW 0.0
```

The following is always needed to finally set and activate the scene:

```
RENDERER SET_OBJECT SCENE*<Scene Name>
```

If the director is not configured to auto start you should use:

```
MAIN_SCENE*STAGE START
```

Note: The first and last commands are optional

11.4 GPI Commands

Viz Engine supports frame accurate commands being sent via GPI. This section contains information on the following topics:

- Prerequisites

- Functionality
- Commands

11.4.1 Prerequisites

- PCI / PCI Express Sealevel I/O device with 8, 16 or 32 digital inputs. Devices connected via Ethernet or USB cannot be used.
- Viz Engine 3.3 (rev 8394) or later
- Installed Matrox X.mio or X.mio2 video board (this is required for getting the actual field which is played out)

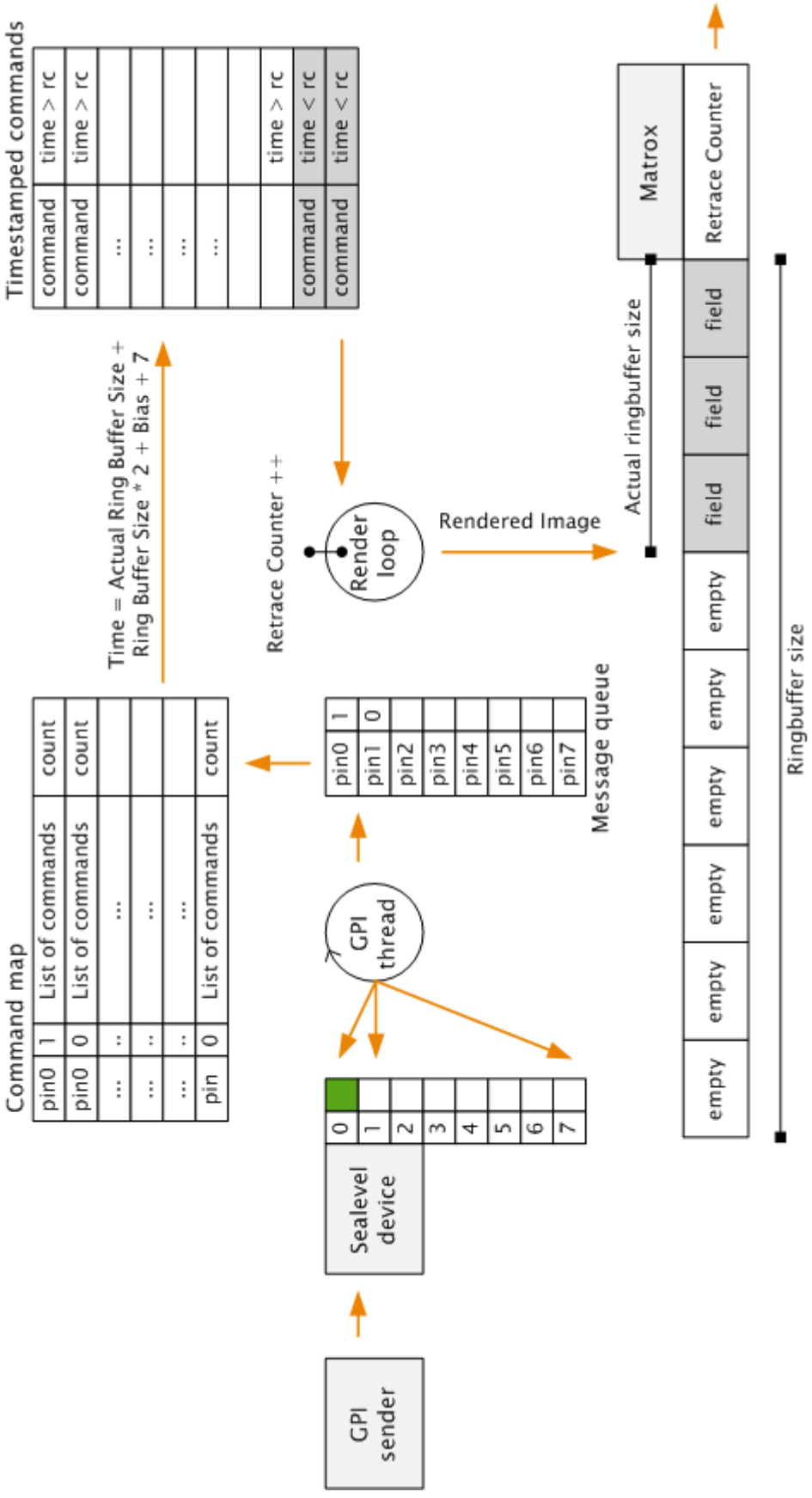
11.4.2 Functionality

Currently there are five commands available which enables you to queue commands for execution when a pin on the Sealevel board shows a raising or trailing edge. For every Pin an arbitrary amount of commands can be queued for the raising and trailing event. Every command can be armed with a counter which tells Viz Engine how often the command should be executed before it is removed from the queue. A counter of 0 tells Viz Engine that the command should never be removed from the queue.

The following diagram illustrates the Flow of the GPI signal from the sender until the consequences of the executed command are rendered into the correct position in the Matrox ringbuffer. As soon as a *GPI sender* changes the status of a pin, connected to the *Sealevel device*, the change is reflected in an internal register of the card. In Viz Engine a *thread* polls this register every millisecond. As soon as a change is found it calculates the timestamp for when the command should be executed.

The thread looks for the pin command in the *Command map* and queues the command into the *Timestamped commands* queue. As the actual depth of the Matrox ring buffer is known the render loop checks every field if it is time to execute a command from the queue. This guarantees that the command is executed at the correct field, no matter how large or full the ringbuffer actually is.

Figure 110: Flow of the GPI signal



11.4.3 Commands

The following are the available GPI commands:

- Pin Command – Set
- Command – Clear
- Information – Get
- Pin Command – Test
- Enable – Set

Pin Command – Set

```
VIZ_COMMUNICATION*GPI_PIN_COMMAND SET  "<Command>" <PIN> <UP_DOWN>
<COUNT>
```

Adds a command to the queue.

- **<Command>** : Command string which should be queued.
- **<PIN>** : Input pin number (valid from 0–31) where the first Pin is 0.
- **<UP_DOWN>** : 0 means the command should be executed on a trailing edge, 1 means the command should be executed on a raising edge.
- **<COUNT>** : The command will be executed <Count> times. The command will executed once per event and NOT <Count> times per event. A value lower or equal 0 means that the command will never be removed from the queue.

Remarks: After the GPI event occurs, the execution time of the command will be calculated. The execution time is calculated in the following way: `Ring_Buffer_Size*2+7+Delayed_Command_Bias`. The `<Delayed_Command_Bias>` can be set in the configuration file. Therefore `Ring_Buffer_Size*2+7` is the minimum delay for GPI triggered commands.

Command – Clear

```
VIZ_COMMUNICATION*GPI_PIN_COMMAND CLEAR <PIN> <UP_DOWN>
```

Clears all commands from the queue.

- **<PIN>** : Input Pin number (valid from 0–31) where the first Pin is 0.
- **<UP_DOWN>** : 0 means the command should be executed on a trailing edge, 1 means the command should be executed on a raising edge.

Information – Get

```
VIZ_COMMUNICATION*GPI_INFO GET
```

Sends information on the installed GPI device.

If a valid device is present the command will return the number of available GPI Banks. Therefore a value of 1 means that 1 bank (8 inputs) is available.
If the command returns 0 no valid GPI device is present.

Pin Command – Test

```
VIZ_COMMUNICATION*GPI_PIN_COMMAND TEST <PIN> <UP_DOWN>
```

Sends all queued commands for the pin and signal to the Viz Engine. The counter for the commands is not decremented.

- **<PIN>** : Input Pin number (valid from 0-31) where the first Pin is 0.
- **<UP_DOWN>** : 0 means the command should be executed on a trailing edge, 1 means the command should be executed on a raising edge.

Enable - Set

```
GLOBAL*GPI_ENABLE SET <1 or 0>
```

Enables or disables GPI commands for the Viz Engine. All functionality is available except of sending the commands on a GPI signal. If disabled the command will be displayed in the console and a warning is displayed, that GPI is disabled. The TEST command is working as usual, even if GPI is disabled.

- 1 enables GPI execution
- 0 disables GPI execution

12 Legacy Cards

This section describes hardware installations that no longer are delivered as part of Vizrt's standard hardware setup.

This section contains information on the following topics:

12.1 BlueFish444 SD Lite Pro Express

Figure 111: BlueFish444 SD Lite Pro Express

Viz supports the SD Lite Pro Express card, and the more recent BlueFish444 Epoch cards.

BlueFish444 SD Lite Pro Express provides Fill, Key and GenLock connectors, and is the successor of the BlueFish444 Iridium|SD and the Digital Voodoo DeepBlue LT, that are no longer officially supported.

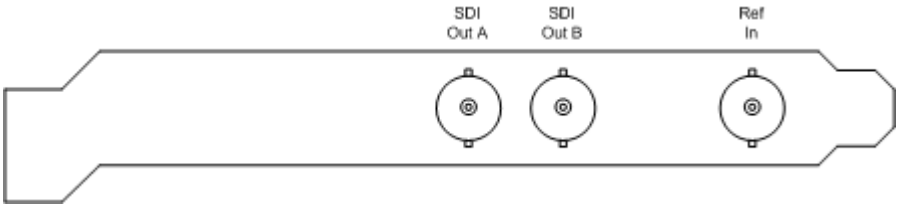
The card was mostly used with Viz Trio NV which basically was a system with the ability to run a Viz Trio client with local preview and video output on a single machine; hence, there was no video input or video playback support as with the Matrox X.mio 1 and X.mio 2. The local preview was able to render a different scene than the one being output on video. The card was typically seen on HP xw4600 workstations.

This section contains information on the following topics:

- Driver Installation

12.1.1 Connectors

Figure 112: BNC Connectors, BlueFish444 SD Lite Pro Express



The BNC connectors from left to right are:

- **SDI Out A (Fill):** SDI 4:2:2/4:4:4/Video
- **SDI Out B (Key):** SDI 4:2:2/4:4:4/Video
- **Ref In:** Analog GenLock input

12.1.2 Driver Installation

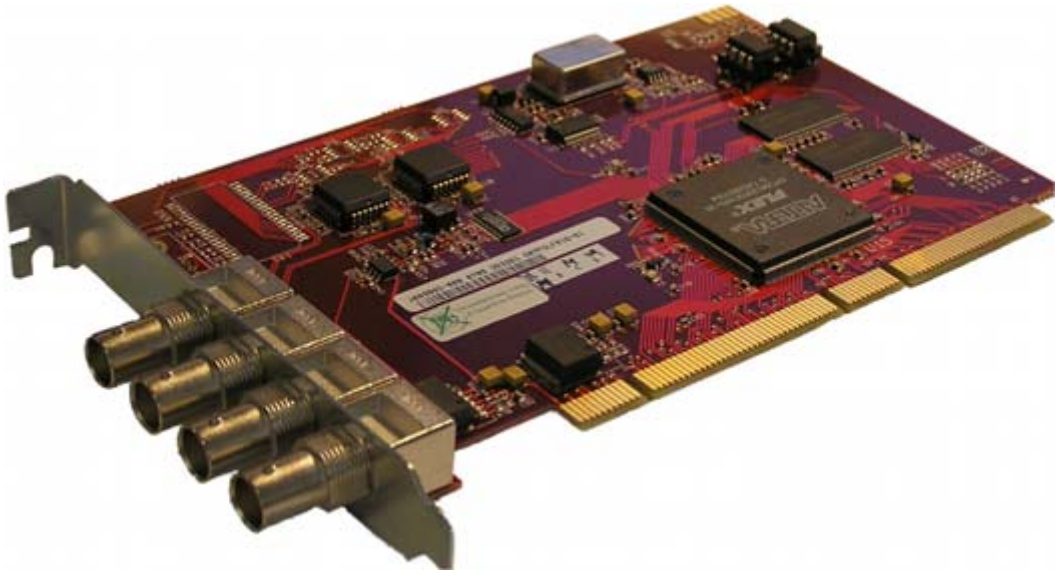
Use the driver version available on Vizrt's FTP server in order to ensure proper functionality and ring buffer support.

- **Viz 3.x**: 3.5.1 – 3.5.4
  - **Driver**: Bluefish444 v5.10.1.11
- **Viz 3.x**: 3.5.0
  - **Driver**: Bluefish444 v5.9.0.78
- **Viz 3.x**: 3.2.7 – 3.3.0
  - **Driver**: Bluefish444 v5.9.0.25
- **Viz 3.x:** 3.2.2 – 3.2.6
  - **Driver:** Bluefish444 v5.7.6

Note: For Viz Engine 3.2.7 and 3.3.0 the Bluefish444 v5.9.0.25 driver is required for all Digital Voodoo / Bluefish cards.

12.2 BlueFish444 Iridium|SD

Figure 113: BlueFish444 Iridium|SD



BlueFish444 Iridium|SD is the native successor of the Digital Voodoo DeepBlue LT and the predecessor of BlueFish444 SD Lite Pro Express, providing Fill, Key, GenLock and Composite Fill connectors. The Iridium|SD is fully compatible with older DeepBlue-LT installations.

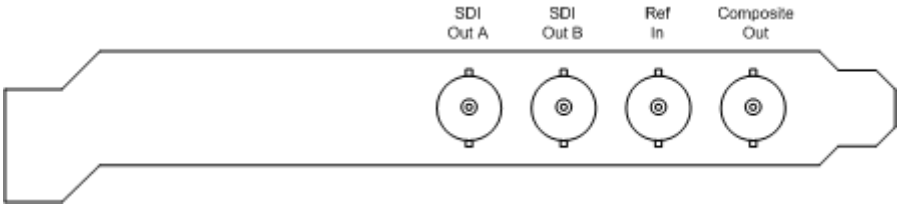
The card was mostly used with Viz Trio NV which basically was a system with the ability to run a Viz Trio client with local preview and video output on a single machine; hence, there was no video input or video playback support as with the Matrox X.mio 1 and X.mio 2. The local preview was able to render a different scene than the one being output on video. The card was typically seen on HP xw4600.

IMPORTANT! Viz Engine 3.5 or later no longer offically supports the Iridium|SD card. For supported versions, see the most recent BlueFish444 Epoch cards.

This section contains information on the following topics:

12.2.1 Connectors

Figure 114: BNC Connectors, BlueFish444 Iridium|SD



The BNC connectors from left to right are:

- **SDI Out A (Fill)** – SDI 4:2:2/4:4:4/Video
- **SDI Out B (Key)** – SDI 4:2:2/4:4:4/Video
- **Ref In** – Analog GenLock input
- **Composite Out** – Composite fill output

12.2.2 Driver Installation

The driver installation works the same way as for DeepBlue-LT cards. Use driver versions available on Vizrt's FTP server in order to ensure proper functionality and ring buffer support.

Iridium|SD is fully compatible with existing DeepBlue-LT installations and can be used with any recent Viz version supporting the older DeepBlue-LT device.

- **Viz 3.x**: 3.5.1 – 3.5.4
  - **Driver**: Bluefish444 v5.10.1.11
- **Viz 3.x**: 3.5.0
  - **Driver**: Bluefish444 v5.9.0.78
- **Viz 3.x**: 3.2.7 – 3.3.0
  - **Driver**: Bluefish444 v5.9.0.25
- **Viz 3.x**: 3.2.2 – 3.2.6
  - **Driver**: Bluefish444 v5.7.6

Note: For Viz Engine 3.2.7 and 3.3.0 the Bluefish444 v5.9.0.25 driver is required for all Digital Voodoo / Bluefish cards.

- **Viz 3.x** – 3.1.0
  - **Driver** – Bluefish444 v3.1

CAUTION! Only Bluefish444 v3.1 is guaranteed to support an adequate ringbuffer size. Any other driver will cut down or completely disable ringbuffer support.

12.3 Digital Voodoo D1 Desktop

Digital Voodoo D1 Desktop is an older standard definition card that is rarely used, but sometimes used with older machines such as IBM Z-Pro 6221, IBM 6223 and HP xw8200.

IMPORTANT! Viz Engine 3.5 or later no longer offically supports the D1 Desktop card. For supported versions, see the most recent BlueFish444 Epoch cards.

Configuration History

- **Driver –** VizrtVideo 2.3
  - **Revision –** V1 and V2

CAUTION! Older board revisions (V1) are incompatible with recent systems like HP xw8200, xw8400, and IBM Z-Pro 6223. Symptoms are BSOD, machine freeze at Viz startup or corrupted live-video in Viz.

See Also

- BlueFish444 SD Lite Pro Express
- BlueFish444 Iridium|SD

12.4 Digital Voodoo DeepBlue LT

Digital Voodoo DeepBlue LT was used as Vizrt's standard board for standard definition Viz Trio NV (no video) systems and was typically used with HP xw4200, xw4300 and xw4400 workstations.

IMPORTANT! Viz Engine 3.5 or later no longer offically supports the DeepBlue LT card. For supported versions, see the most recent BlueFish444 Epoch cards.

Configuration History

- **Viz 3.x**: 3.5.1 – 3.5.4
  - **Driver**: Bluefish444 v5.10.1.11
- **Viz 3.x**: 3.5.0
  - **Driver**: Bluefish444 v5.9.0.78
- **Viz 3.x**: 3.2.7 – 3.3.0
  - **Driver**: Bluefish444 v5.9.0.25
- **Viz 3.x**: 3.2.2 – 3.2.6
  - **Driver**: Bluefish444 v5.7.6

Note: For Viz Engine 3.2.7 and 3.3.0 the Bluefish444 v5.9.0.25 driver is required for all Digital Voodoo / Bluefish cards.

- **Viz 3.x** – 3.1.0
  - **Driver** – BlueFish444 v3.1

CAUTION! Only BlueFish444 v3.1 is guaranteed to support an adequate Ringbuffer-size. Any other driver will cut down or completely disable ring buffer support.

See Also

- BlueFish444 SD Lite Pro Express
- BlueFish444 Iridium|SD

12.5 Digital Voodoo Red Devil V3

Digital Voodoo Red Devil V3 alias IO/2020 was Vizrt's standard board for SD virtual sets and Viz Arena. It was typically used with IBM Z-Pro 6221, IBM ZPro 6223, and HP xw8200.

IMPORTANT! Viz Engine 3.5 or later no longer offically supports the Red Devil card. For supported versions, see the most recent BlueFish444 Epoch cards.

Configuration History

- **Driver** – VizrtVideo 2.3
  - **Revision** – V3

See Also

- DVS Atomix LT
- DVS Centaurus II

12.6 DVS Centaurus II

Figure 115: DVS Centaurus II

This section contains a description of the Digital Video Systems (DVS) Centaurus II video card.

The DVS was mainly sold with Viz Virtual Set and Viz Arena, and was Vizrt's successor of the Digital Voodoo Red Devil V3 card. The DVS is able to output both HD and SD unlike the Red Devil which could only output SD. The DVS was typically mounted in HP wx8400, HP xw8600 or HP z800 machines.

This section contains information on the following topics:

- Connectors
- Supported Codecs
- Driver Installation
- Licensing

See Also

- Video, Audio and Graphics Card Installation
- DVS support

12.6.1 Connectors

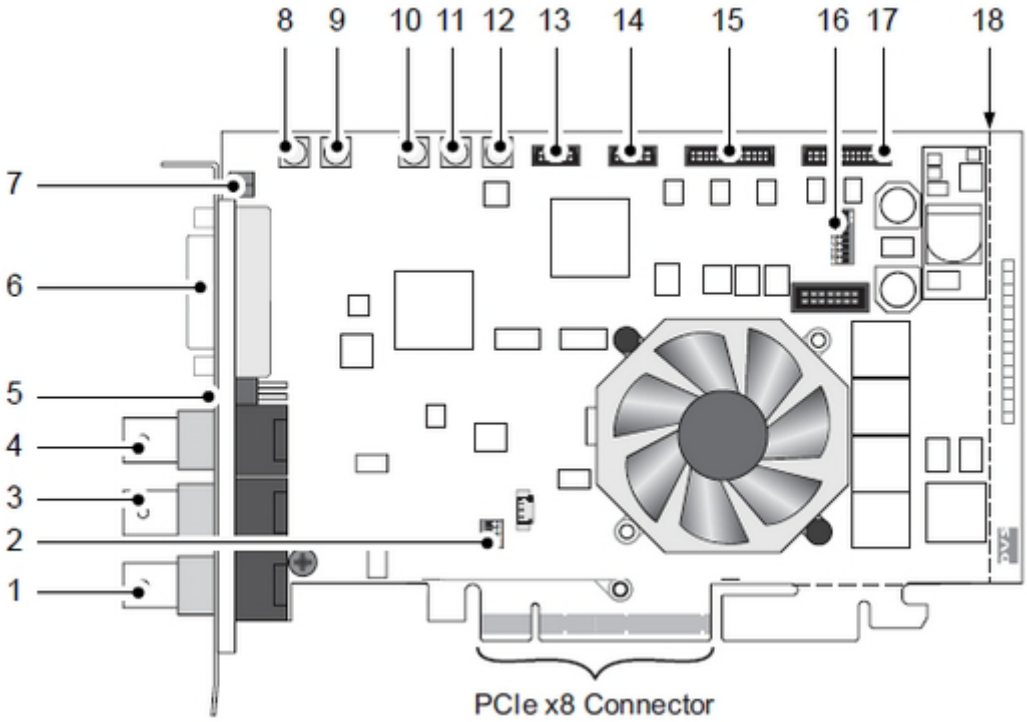
This section describes the main video card, the SDI/RS-422 extension card and how To connect the DVS Centaurus II and SDI/RS-422 extension card.

This section contains information on the following topics:

- Main Card Connectors
- SDI and RS-422 Extension Card Connectors
- To connect the DVS Centaurus II and SDI/RS-422 extension card

Main Card Connectors

Figure 116: Layout and Connectors, DVS Centaurus II



1. **Ref. In:** BNC connector for the reference input. May be Bi-/Tri-Level sync.
2. **DIP Switch for PCI:** PCI-X variant only: DIP switch to set up the PCI video card interface, that is its clock frequency; This switch is not available on the PCIe version of the card used by Vizrt.
3. **(HD) SDI OUT A:** BNC connector for a video output at port A (serial digital interface); usually used for an output of the first video channel in single-link (YUV) or the first stream of YUVA or RGBA in dual-link mode.
4. **(HD) SDI IN A:** BNC connector for a video input at port A (serial digital interface); usually used for an input of the first video channel in single-link (YUV) or the first stream of YUVA or RGBA in dual-link mode.
5. **Ref. Term:** Termination switch for the reference input; switches off the termination of the GenLock signal manually, for example if the Centaurus II card is not the last link in a GenLock connection chain.
6. **DVI OUT:** DVI connector for an output of analogue and digital video signals.
7. **LEDs:** Two status LEDs (Red/Green) indicating the presence of correct video and sync signals (see also Description of the LEDs on the video card).
8. **SD SDI IN1:** MCX connector for an input of digital SD video signals (serial digital interface)
9. **(HD) SDI IN B:** MCX connector for a video input at port B (serial digital interface); usually used for an input of the second video channel in single-link (YUV) or the second stream of YUVA or RGBA in dual-link mode.
10. **(HD) SDI OUT B:** MCX connector for a video output at port B (serial digital interface); usually used for an output of the second video channel in single-link (YUV) or the second stream of YUVA or RGBA in dual-link mode.
11. **SD SDI OUT1:** MCX connector for an output of digital SD video signals (serial digital interface)-

12. **CVBS OUT**: MCX connector for a composite video burst signal, either analogue output of SD video or used for synchronization purposes .
13. **GPI**: Flat cable connector for the general purpose interface.
14. **RS-422**: Flat cable connector for an in- and output of RS-422 signals
15. **AUDIO 1-8/LTC**: Flat cable connector for the digital audio channels 1 to 8 and LTC.

Figure 117: DIP switch

16. **DIP Switch for Flash Controller**: This switch controls the operation of the on-board Flash controller; it defines the version set of the map file that will be loaded at startup. The image above depicts the default setting of the DIP switch for the Flash controller; please observe the orientation of the switch on the card.
17. **Audio 9-16**: Flat cable connector for the digital audio channels 9 to 16.
18. **Breaking line**: The printed circuit board provides at its bottom (PCIe variant only) and right side extensions void of any electrical parts; these may serve to stabilize the installation of the card in a computer system; when not needed or interfering, you can break them off the circuit board at the breaking line(s); see also dotted lines in figure 1 on the previous page.

Table 54: Description of the LEDs on the video card

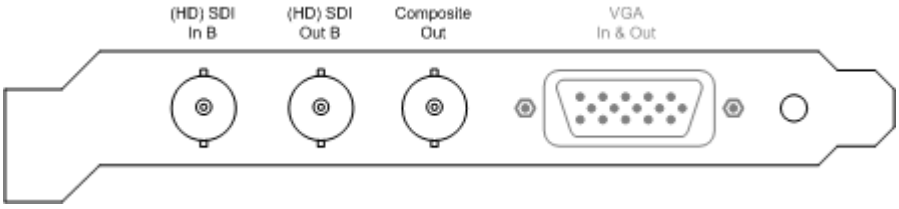
LED	Function	Mode	Description
Green	Signals the status of the sync input	On	A correct sync signal is detected, that is: - Sync mode *internal* is set - Sync mode *external* is set and a correct signal is connected - Sync mode *analog* is set and an analog GenLock signal is connected - Sync mode *digital* is set and a correct signal is connected
		Off	A wrong input signal is detected, i.e.: - Sync mode *external* is set and no SDI input signal. - Sync mode *analog* is set and no GenLock signal connected. - Sync mode *digital* is set and no SDI input signal.

Table 54: Description of the LEDs on the video card

LED	Function	Mode	Description
Red	Signals the status of the video raster detection feature	Blinking slowly	No input signal is available
		Blinking fast	A wrong input signal is detected (for example DVS Centaurus II is set to NTSC video mode, but a PAL signal is connected to the active input)
		Off	A correct input signal is detected

SDI and RS-422 Extension Card Connectors

Figure 118: SDI and remote control connections, DVS Centaurus II



The SDI and RS-422 panel is included in the standard configuration of DVS Centaurus II. It provides the connectors for the second link of the dual-link connections. Additionally a CVBS output is installed on this panel that provides a composite video signal showing the fill signal generated by Viz Engine.

The RS-422 connector available on the panel is a DB-15 (HD) connector.

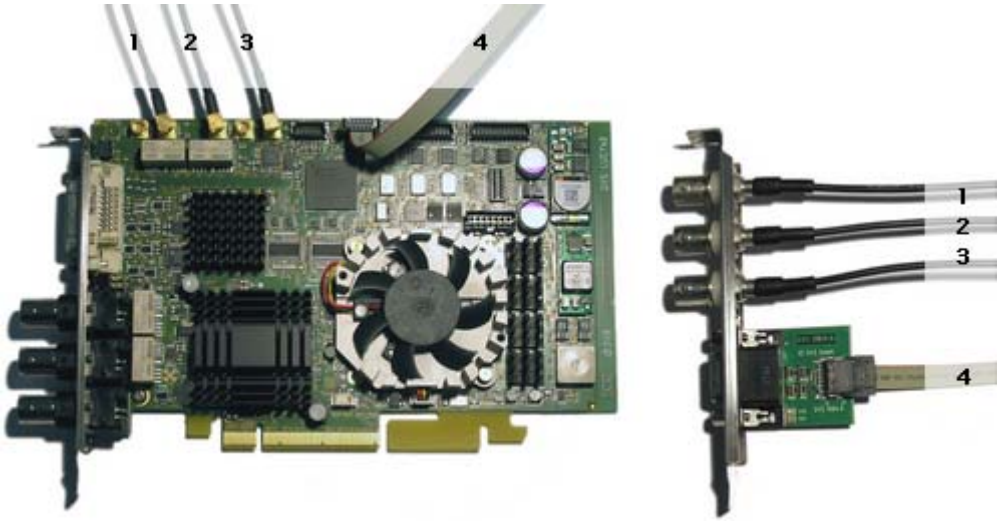
Note: This connector does not provide any additional functionality in regards to Viz Engine and should be ignored. The RS-422 port is not accessible to the operating system and can therefore not be used to transceive any kind of data by third-party applications.

- **(HD) SDI In B:** BNC connector for a video input at port B (serial digital interface); usually used for an input of the second video channel in single-link (YUV) or the second stream of YUVA or RGBA in dual-link mode.
- **(HD) SDI Out B:** BNC connector for a video output at port B (serial digital interface); usually used for an output of the second video channel in single-link (YUV) or the second stream of YUVA or RGBA in dual-link mode.
- **CVBS Out:** BNC connector for a composite video burst signal, either analogue output of SD video or used for synchronization purposes. Provides the fill output of Viz engine as an analogue signal.
- **RS-422 In & Out:** DB-15 (HD) connector (female), serial RS-422 interface for master/slave control, a breakout cable to two DB-9 connectors is included in the delivery.

Note: This RS-422 connector is inactive and not accessible to the OS and can therefore not be used to transceive data.

To connect the DVS Centaurus II and SDI/RS-422 extension card

Figure 119: DVS Centaurus II and the extension card



- Connect the separate SDI/RS-422 panel with the DVS Centaurus II main card according to the enumeration shown in the illustration above.

12.6.2 Supported Codecs

Currently, the DVS implementation only supports the Microsoft DirectShow Filtergraph framework to render video clips. Therefore it is possible to play for example MPEG files or streams from a server. For more information on how to use video clips in Viz, see the Viz Artist manual and in particular the Mo Viz plug-in.

Basically, it can play everything that can be played out by the Windows Media Player, so it depends on what codecs/DirectShow filters that are installed on the machine.

12.6.3 Driver Installation

The following driver version is supported by Vizrt:

- **Viz 3.x**: Viz 3.5.4 and later
  - **Driver**: SDK 4.3.5.10
- **Viz 3.x**: Viz 3.5.2 - 3.5.3
  - **Driver**: SDK 4.2.9.8
- **Viz 3.x**: Viz 3.3.0 - 3.5.1
  - **Driver**: SDK 4.0.1.15

For information on how to install or update the driver, see the DVS SDK 2.7 User Guide.

12.6.4 Licensing

A few additional steps are required before Viz Engine is able to use the DVS Centaurus II card after a first time installation. First it is necessary To install a DVS Centaurus II license, and then To validate the DVS Centaurus II license.

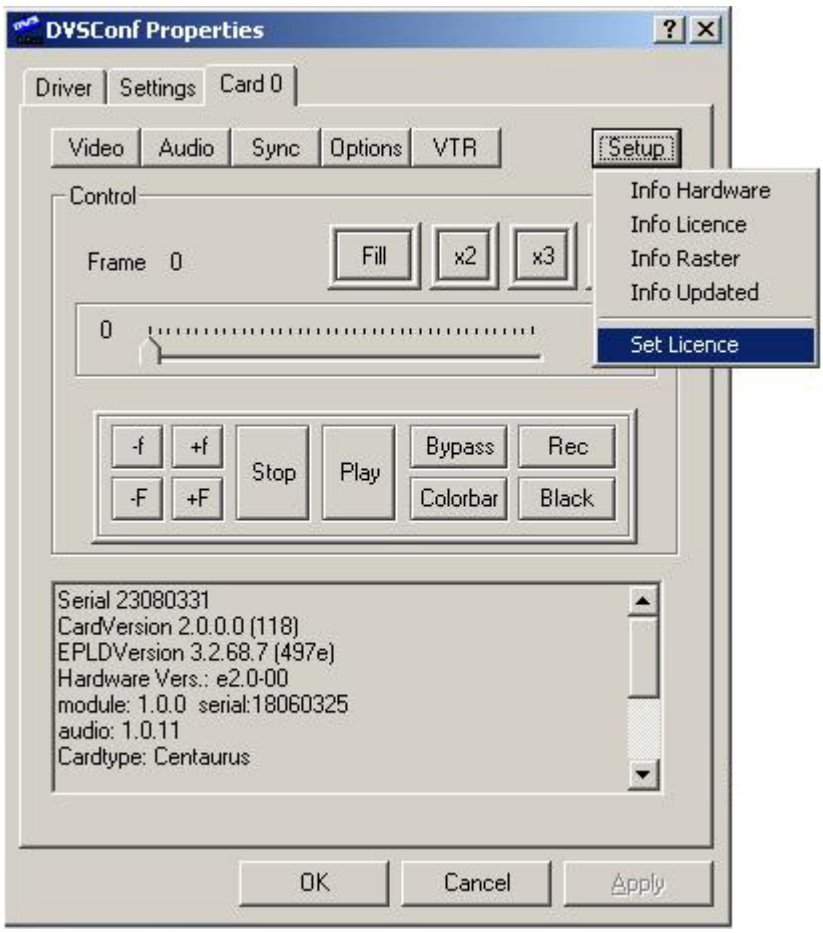
Note: Licensing should not be an issue if the DVS Centaurus II card came preinstalled with the Viz Engine machine.

Note: License information is stored in a memory region on the device itself and will not be lost if the card is mounted on another computer.

The license key required during the installation process is shipped together with the device and comes as a single sheet of machine-written paper looking something like the illustration below:

```
lic<xxxxx>.txt
-------------------------------------------------------------------
Date: <xxxxx>
Licenser: <xxxxx>
Serialnumber: <xxxxx>
License does not expire

rawkey 1 = <xxxxx>
rawkey 2 = <xxxxx>
rawkey 3 = <xxxxx>

To check licenses 'svram license show'

For DDR type:
sv license key1 <yyyyy>

For OEM type:
svram license key1 <yyyyy>
-------------------------------------------------------------------
# Product: Centaurus 2 PCIe
# License Key Options:
#
# Not-Expire
#
# Centaurus 2-Dual-Link
# Centaurus 2-Multi-Channel
-------------------------------------------------------------------
Page 1
```

To install a DVS Centaurus II license

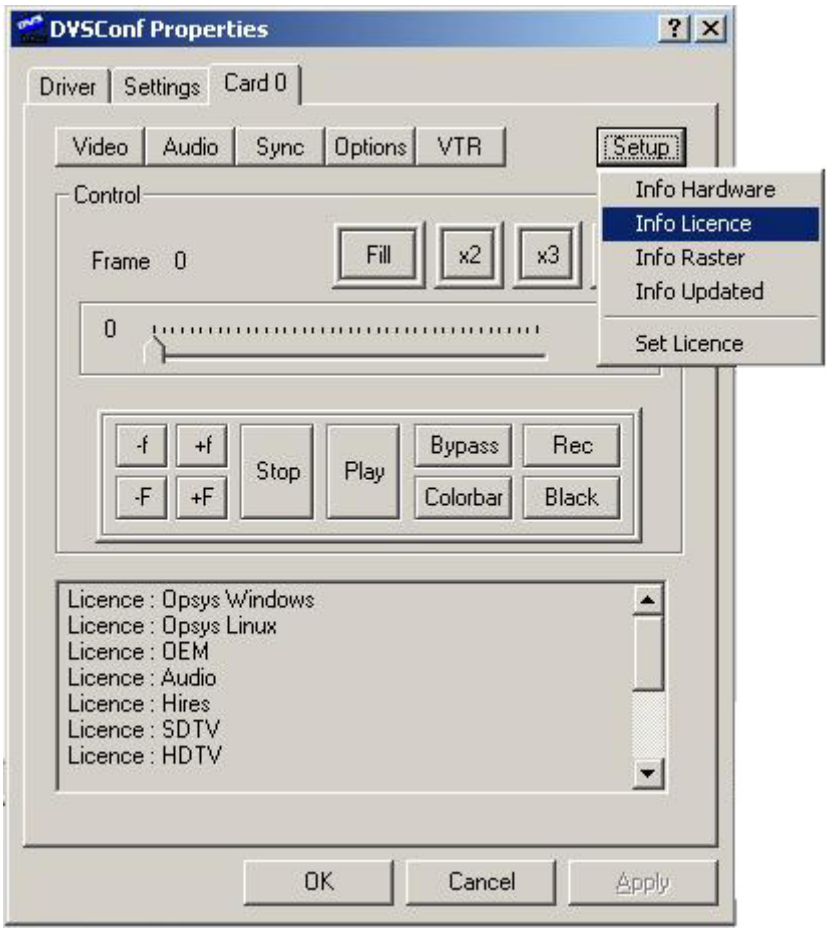


1. Locate and double-click the *dvsconfig.exe* file located in the driver folder downloaded from Vizrt's FTP.
2. Select the *Card 0* tab.
   - When selecting the *Card 0* tab for the first time the system will inform that a license needs to be installed for the product.
3. Click *OK* to close the DVSConf Warning dialog box.

4. Click the *Setup* button and select *Set License* from the appearing drop-down menu.
5. Enter the license key in field *Key 1* and click the *Set Key 1* button.

Note: It has been reported that the key might be ignored and that validation fails although it was correctly entered. Re-enter the license string and try again.

To validate the DVS Centaurus II license



1. Locate and double-click the *dvsconfig.exe* file located in the driver folder downloaded from Vizrt's FTP.
2. Select the *Card 0* tab.
3. Click the *Setup* button and select *Info License* from the appearing drop-down menu.
4. Check the following entries (bottom of the dialog box):
   - License : Opsys Windows
   - License : Opsys Linux
   - License : OEM
   - License : Multidevice
   - License : Audio
   - License : Hires
   - License : SDTV
   - License : HDTV
   - License : 12Bit
   - License : Processing

- License : Mixer
- License : ZoomAndPan
- License : ColorCorrector
- License : HDTVKeyChannel
- License : HDTVDualLink
- License : SDTVKeyChannel
- License : SDTVDualLink

5. Once all licenses are verified, click *OK* to close the program.

12.7 Pinnacle Targa 3200

Pinnacle Targa 3200 was Vizrt's standard board for SD Viz systems until 2007, and was typically used with IBM ZPro 6221, IBM Z-Pro 6223 and HP xw8200.

Configuration History

- **Driver** – CODI v2.42
  - **Revision** – 3213. Revision 3213 crashes the machine when used with CODI v2.41rc13.

- **Driver** – CODI v2.41rc13
  - **Revision** – 3212, 3214. Installation of CODI Compatibility Patch for revision 3214 is no more required.

- **Driver** – CODI v2.42
  - **Revision** – 3212, 3213, 3214. Installation of CODI Compatibility Patch is required.

- **Driver** – CODI v2.2 RC4
  - **Revision** – 3212, 3213.

See Also

- Matrox X.mio 1 and X.mio 2

12.8 LPT Controller for a Viz License Dongle

Figure 120: Exsys EX-41011 LPT Controller

In order to provide recent render engines of type HP xw8600 with support for parallel dongles, an additional LPT controller board needs to be installed in the machine. For this purpose the topmost 32bit PCI slot should be used.

To install an LPT controller card

Adding the LPT controller card will enable Viz to read the license from a parallel port dongle.

1. Power down the system and prepare it for hardware installation as documented in the manufacturer's manual(s).
2. Install the controller in the xw8600's topmost standard PCI (32bit) slot.
3. Turn on on the machine.
4. After the operating system has started up, insert the LPT controller driver disk and install as denoted in the manufacturer's documentation.
5. After installation has finished, do not modify any device configurations, but instead simply use the default settings automatically applied at installation time.

.

13 Glossary

This section describes words and acronyms that are used throughout the documentation.

Table 55: Glossary

Name (acronym)	Description
5.1	Delivers five audio channels and 1 Low-frequency Effect (LFE) channel from a 6 channel source.
6DoF	Six degrees of freedom (6DoF) is used in interactive scenes to move and rotate objects in 3D on a defined grid.
7.1	Delivers seven audio channels and one Low-frequency Effect (LFE) channel from an 8 channel source.
AES	Audio Engineering Society (AES). Also known for the digital audio standard frequently called AES/EBU, officially known as AES3, is used for carrying digital audio signals between various devices; hence, the term AES/EBU connectors.
AGP	Accelerated Graphics Port (AGP) is a high-speed point-to-point channel for attaching a graphics card to a computer's motherboard, primarily to assist in the acceleration of 3D computer graphics.
Anamorphic widescreen	Anamorphic widescreen is a videographic technique utilizing rectangular (wide) pixels to store a widescreen image to standard 4:3 aspect ratio.

Table 55: Glossary

Name (acronym)	Description
ANC data	Ancillary data refers to a means which by non-video information (such as audio, other forms of essence, and metadata) may be embedded within the serial digital interface (SDI). Ancillary data packets are commonly divided into two types, depending on where they are located. Ancillary packets located in the *horizontal blanking region* (after EAV but before SAV), regardless of line, are known as horizontal ancillary data, or HANC. HANC is commonly used for higher-bandwidth data, and/or for things that need to be synchronized to a particular line; the most common type of HANC is *embedded audio*. Ancillary packets located in the *vertical blanking region*, and after SAV but before EAV, are known as vertical ancillary data, or VANC. VANC is commonly used for low-bandwidth data, or for things that only need be updated on a per-field or per-frame rate. Closed *caption data* and *VPID* are generally stored as VANC. Note: ANC packets which lie in the dataspace which is in both the horizontal and vertical intervals, is considered to be HANC and not VANC.
Anti aliasing	Anti-aliasing is the technique of minimizing the distortion artifacts known as aliasing when representing a high-resolution signal at a lower resolution.
Audio codec	An audio codec is a hardware device or a computer program that compresses and decompresses digital audio data according to a given audio file format or streaming audio format.
AVI	Audio Video Interleave (AVI) is a multimedia container format introduced by Microsoft in November 1992 as part of its Video for Windows technology.
Bi-level sync	In standard-definition applications, a bi-level sync signal, often with a colorburst signal in facilities that have analog equipment. Typically, this is either in NTSC or PAL format. As the resulting signal is usually indistinguishable from an all-black television signal of the same format, this sort of reference is commonly known as black or black burst. See SPG and Tri-level sync.
BIOS	Basic Input/Output System (BIOS) is a system that defines the firmware interface. The initial function of the BIOS is to identify, test, and initialize system devices, and prepare the machine into a known state.
Black burst	See SPG and Bi-level sync.

Table 55: Glossary

Name (acronym)	Description
BNC	The BNC (Bayonet Neill Concelman) connector is a very common type of RF connector used for terminating coaxial cable.
BSOD	The Blue Screen of Death (also known as a stop error or blue screen) is an error screen displayed by some operating systems, most notably Microsoft Windows, after encountering a critical system error which can cause the system to shut down, to prevent damage.
Configuration file	Holds all configurable settings used by Viz Engine and various integrated applications. The configuration file can be found under Viz Engine's installation directory; C:\Program Files\vizrt\viz3\.
CVBS	Composite video (aka CVBS or Composite Video Burst Signal) is the format of an analog television (picture only) signal before it is combined with a sound signal and modulated onto an RF carrier. It is a composite of the three source signals Y, U and V (YUV) with sync pulses.
D10	Television: Type D-10 Stream Specifications: MPEG-2 4:2:2P @ ML for 525/60 and 625/50. SMPTE D10 (356M) is a professional video compression format composed of MPEG-2 Video 4:2:2 Intra-frame (I-frame) only and 8 channel AES3 audio streams.
D12	Television: 6.35-mm Type D-12 Component Format: Digital Recording at 100 Mb/s 1080/60i, 1080/50i, 720/60p. Also known as Digital Betacam.
DIF	DV-DIF (Digital Video Digital Interface Format) is an interface format for DV, the Digital Video family of related video encodings (DV, DVCAM, and DVCPRO). DV Audio/Video data can be stored as raw DV data stream file (data is written to a file as the data is received over FireWire, file extensions are .dv and .dif) or the DV data can be packed into AVI container files.
Digital Voodoo	Digital Voodoo is a broadcast capture and playback card used for uncompressed Standard Definition 10-bit SDI solution on Macintosh computers.

Table 55: Glossary

Name (acronym)	Description
DirectSound	DirectSound is a software component of the Microsoft DirectX library, that resides on a computer with the Windows operating system. It provides a direct interface between applications and the sound card drivers on Windows. It provides audio data to the sound card, recording and mixing sound; adding effects to sound for example reverb, echo, flange; using hardware controlled buffers for extra speed; positioning sounds in 3D space (3D audio spatialization), capturing sounds from a microphone or other input and controlling capture effects during audio capture.
DV	Digital Video.
DV25	DV25 applies a 5:1 compression and a 4:1:1 color space and achieves a fixed data rate of 25Mbps.
DV50	DV50 applies a 3.3:1 compression and a 4:2:2 color space and achieves a fixed data rate of 50Mbps.
DVCAM	Sony's DVCAM is a professional variant of the DV standard that uses the same cassettes as DV and MiniDV, but transports the tape 33% faster.
DVCPRO	Panasonic's DVCPRO family is specifically created for electronic news gathering use, with good linear editing capabilities and robustness.
DVI	Digital Visual Interface (DVI) is a video interface standard designed to maximize the visual quality of digital display devices such as flat panel LCD computer displays and digital projectors.
EAS	The Emergency Alert System (EAS) is a national warning system in the United States of America (USA). The official EAS enables the President of the USA to speak to the citizens of the USA within 10 minutes.
EAV	Horizontal scan lines of video pixel data are delimited in the stream by 4-byte long SAV (Start of Active Video) and EAV (End of Active Video) code sequences. SAV codes also contain status bits indicating line position in a video field or frame. Line position in a full frame can be determined by tracking SAV status bits, allowing receivers to "synchronize" with an incoming stream. ANC data.
EBU	European Broadcasting Union. AES.

Table 55: Glossary

Name (acronym)	Description
GenLock	Genlock (Generator Lock) is a common technique where the video output of one source, or a specific reference signal, is used to synchronize other television picture sources together. GenLock type is set in Viz Config's Video Output section.
Glyph	A glyph is an element of writing. Glyphs may also be Ligatures, that is, compound characters, or diacritics.
HANC	See ANC data.
HD	High-definition television or HDTV is a digital television broadcasting system with higher resolution than traditional television systems (standard-definition TV, or SDTV).
I/O	I/O is short for Input/Output, and is a common term used for hardware connectors.
IEEE	The Institute of Electrical and Electronics Engineers, Inc.
IRE	Institute of Radio Engineers. Is now part of the IEEE.
IRE unit	An IRE unit is used in the measurement of composite video signals. The range of a video signal is defined to be 1.0 volts peak to peak (p/p) which again is divided into the picture and the synchronization portion of the signal. The picture portion is defined as 0 IRE to 100 IRE. The synch portion is defined as -40 IRE to 0 IRE; hence, the total range of IRE values is 140 units making each IRE unit equivalent to 1/140 volts. Picture sources are typically set with *black* somewhere between 7.5 to 10 IRE. The maximum signal brightness is usually set to just below 100 IRE. A third signal, the burst signal, is present from +20IRE to -20IRE. It is a short sample of the color subcarrier frequency, and is used to control how colors are displayed on screen.
LED	Light-emitting-diode.
Ligature	In writing and typography, a ligature occurs where two or more graphemes (fundamental unit in a written language) are joined as a single Glyph.
Lip-sync	Lip-sync (short for lip synchronization) is a technical term for matching lip movements with voice. The term refers to a technique in movie and broadcast production for synchronization of visual and audio signals.
LTC	Linear TimeCode. VITC.

Table 55: Glossary

Name (acronym)	Description
MCX	MCX connectors are coaxial RF connectors. They use a snap-on interface and usually have a 50 Ohm impedance. They offer broadband capability from direct current (DC) to 6 GHz.
MDIF	Matrox Dongle Information File (.MDIF) can be generated and sent to Vizrt in order to upgrade the Matrox X.mio video card to a higher class model.
MDUF	Matrox Dongle Upgrade File (.MDUF) is the file, provided by Vizrt, that will upgrade the Matrox X.mio video card to a higher class model.
MMCX	MMCX (micro-miniature coaxial) connectors are coaxial RF connectors similar to MCX but smaller.
Mono	Monaural (often shortened to mono) sound reproduction is single-channel.
MPEG	Moving Picture Experts Group, is the name of a family of standards used for coding audio-visual information (e.g., movies, video, music) in a digital compressed format.
MXF	Material Exchange Format (MXF) is an object-based file format that wraps video, audio, and other bitstreams, optimized for content interchange or archiving by creators and/or distributors, and intended for implementation in devices ranging from cameras and video recorders to computer systems.
NTSC	National Television System Committee (NTSC) is the analog television system used in the north, mid and to some extend in south America and also in some Asian countries.
OB	Outside Broadcasting is the production of television or radio programmes (typically to cover news and sports events) from a mobile television studio.
OP-Atom	MXF Operational Pattern Atom. OP-Atom was designed to address the needs of non-linear video and audio editing. Reference: SMPTE 390M-2004 Television - Material Exchange Form at (MXF) - Specialized Operational Pattern "Atom" (Simplified Representation of a Single Item).
PAL	Phase Alternating Line, is a color-encoding system used in broadcast television systems in large parts of the world.

Table 55: Glossary

Name (acronym)	Description
PCI	PCI Local Bus (usually shortened to PCI), or Conventional PCI, specifies a computer bus for attaching peripheral devices to a computer motherboard.
PCIe	PCI Express was designed to replace the general-purpose PCI (Peripheral Component Interconnect) expansion bus, the high-end PCI-X bus and the AGP graphics card interface.
PCI-X	PCI-X (Peripheral Component Interconnect eXtended) is a computer bus and expansion card standard that enhanced the PCI Local Bus for higher bandwidth demanded by servers.
PCM	Pulse-code modulation (PCM) is a digital representation of an analog signal.
Quad	Quadraphonic (or quadrophonic) sound – also called 4.0 stereo – uses four channels in which speakers are positioned at the four corners of the listening space, reproducing signals that are (wholly or in part) independent of one another.
Rack unit	A rack unit or U (less commonly, RU) is a unit of measure used to describe the height of equipment intended for mounting in a 19-inch rack or a 23-inch rack (the dimension referring to the width of the rack).
RF	A radio frequency (RF) connector is an electrical connector designed to work at radio frequencies in the multi-megahertz range.
RGB	RGB stands for Red Green Blue, and its color model is an additive color model in which red, green, and blue light are added together in various ways to reproduce a broad array of colors.
RGBA	RGBA stands for Red Green Blue Alpha. It uses the RGB color model with extra information, and is normally used as an transparency/opacity channel.
Ring buffer	A circular buffer or ring buffer is a data structure that uses a single, fixed-size buffer as if it were connected end-to-end. This structure lends itself easily to buffering data streams.

Table 55: Glossary

Name (acronym)	Description
Safe Area (aka Action Safe Area)	Depending on how a television set is adjusted, viewers can see a larger area than the Title Area (aka Title Safe Area). The safe area is in Viz Artist shown as a green rectangle in the preview window. This area can be considered a "safe margin" to create a buffer and avoid that elements are butted up against the edge of the screen. However, the area outside the safe area is often used to place graphics (for example tickers that run horizontally across the screen) that butt up against the edges of the screen.
SATA	The Serial Advanced Technology Attachment (SATA) computer bus has the primary function of transferring data between the motherboard and mass storage devices (such as hard disk drives and optical drives) inside a computer.
SAV	See EAV and ANC data.
SD	Standard-definition television or SDTV refers to television systems that have a resolution that meets standards but not considered either enhanced definition or high definition.
SDI	Serial digital interface (SDI) refers to a family of video interfaces standardized by the SMPTE.
SECAM	Séquentiel couleur à mémoire, French for "Sequential Color with Memory"), is an analog color television system first used in France.
Shader	A shader in the field of computer graphics is a set of software instructions, which is used by the graphics resources primarily to perform rendering effects. A shader is a part of the renderer, which is responsible for calculating the color of an object; hence, the Viz Engine renderer has a shader that handles the video input (normally provided as interlaced YUV images). To be able to use the YUV images in a CG scene they need to be RGB, and in addition they need to be de-interlaced. All this is done by Viz Engine's shader. The shader not only takes two, but four input images when it does the color conversion from YUV to RGB and the de-interlacing. As this is a very heavy process it can only be done in SD.
SMPTE	Society of Motion Picture and Television Engineers.

Table 55: Glossary

Name (acronym)	Description
SPG	A sync pulse generator (SPG) is a special type of generator which produces synchronization signals, with a high level of stability and accuracy. These devices are used to provide a master timing source for a video facility. See Bi-level sync and Tri-level sync.
Squeezeback	Squeezeback (or squeeze back) is a screen size adjustment process that reduces the size of a display area to allow other items (such as logos, text crawls or other graphics) to be seen in the new exposed display area. Squeezebacks are often seen during the closing credits of a show to introduce the viewer to upcoming content along with other promotions.
Stereo	Stereophonic sound (often shortened to Stereo) is the reproduction of sound, using two or more independent audio channels.
Sub-D	Sub-D, D-subminiature or D-sub is a common type of electrical connector used particularly in computers.
Surround sound	See Quad, 5.1 and 7.1.
Title Area (aka Title Safe Area)	The title area is in Viz Artist shown as a purple rectangular area which is far enough in from the four edges, such that text or graphics show neatly: with a margin and without distortion.
Tri-level sync	In some high-definition applications, a tri-level sync signal is used instead. This signal is virtually identical to the synchronization signal used in component analogue video (CAV); and is similar to the synchronization signals used in VGA (the main difference being, in VGA the horizontal and vertical syncs are carried on different wires; whereas TLS signals include both H and V syncs). See SPG and Bi-level sync.
Universal Naming Convention (UNC)	Specifies a common syntax to describe the location of a network resource, such as a shared file, directory, or printer. \\ComputerName\SharedFolder\Resource
VANC	See ANC data.
VBI	Vertical blanking interval (VBI) is the time difference between the last line of one frame or field of a raster display, and the beginning of the next.
Video codec	A video codec is a device or software that enables video compression and/or decompression for digital video.
VITC	Vertical Interval TimeCode. LTC and VBI.

Table 55: Glossary

Name (acronym)	Description
Writing system	A writing system is a type of symbolic system used to represent elements or statements expressible in language.
XLR	The XLR connector is an electrical connector, and a standard for broadcast audio equipment. The 3-pin XLR3 is used as a balanced audio connector for both analog and digital audio. Note that Viz Engine's Matrox board only supports digital audio.
YUV	YUV is a color space typically used as part of a color image pipeline. Y' stands for the luma component (the brightness) and U and V are the chrominance (color) components. The Y'UV color model is used in the NTSC, PAL, and SECAM composite color video standards.