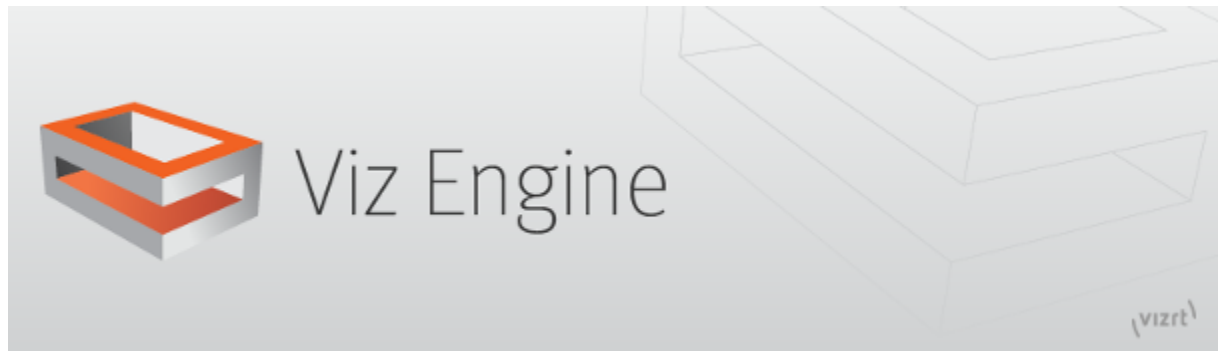


Viz Engine
Administrator's Guide
3.7



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1 Introduction

This Administrator Guide gives details on the configuration and installation of Viz Engine. It will also explain settings available through its configuration user interface.

The term Viz is used for the programs installed and run on the computer. This is used as a general reference for all modes of the program:

- Viz Artist (see the [Viz Artist User Guide](#))
- Viz Engine
- Viz Configuration

What mode of program that can run is determined from the hardware dongle that is attached to the actual machine (the different modes and the hardware dongle are detailed in this User Guide).

This Section contains information on the following topics:

- [Document Structure](#)
- [Related Documents](#)
- [Customer Feedback and Suggestions](#)
- [Customer Support Request](#)

1.1 Document Structure

This section describes the structure and content of the Administrator Guide.

Title	Content
Introduction	This section gives an introduction to the Administrator Guide, and summarizes the document content
Software Configuration	This section describes the basic configuration procedures, installation options, the Viz Artist/Engine license dongle and how to activate Viz Artist/Engine
Getting Started	This section describes how to start Viz Artist/Engine using shortcut keys and command line options
Configuring Viz	This section describes all the configuration properties and parameters, and how to use them to configure Viz Artist/Engine
On Air Mode	These sections describe the Viz Engine On Air user interface
Audio in Viz	This section gives an overview of the Viz Engine audio system. It also gives some information and procedures on how to enable and configure it
Shared Memory (SHM)	This section describes how to work with Shared Memory. Some use cases are described to give a

Title	Content
	better understanding of Shared Memory and its functionality
Frame Accurate Output	This section describes details about the Frame Accurate Output
NVIDIA Graphics Cards BlueFish444 Digital Video Systems Matrox Matrox DSX LE Series Matrox X.mio Series Matrox X.Open Matrox X.RIO NVIDIA Quadro SDI Capture Video, Audio and Graphics Card Installation	These sections give an overview of the supported graphics and video cards, how to install them, what driver versions are supported, etc.
Legacy Cards	This section gives an overview of legacy cards, and describes additional hardware installation procedures that are not part of the default Viz Artist/Engine setup
Glossary	The section gives an extensive description of keywords and acronyms referenced throughout the document, with simple and to the point explanations

1.2 Related Documents

- [Viz Artist User's Guide](#) : Contains information on how to install Viz Engine and create graphics scenes in Viz Artist.
- **Viz Artist Script reference:** Contains information on how to create scripts for a scene.
- **Viz Engine Plug-in SDK reference:** Contains information on how to create a customized Viz plug-in.

1.3 Customer Feedback and Suggestions

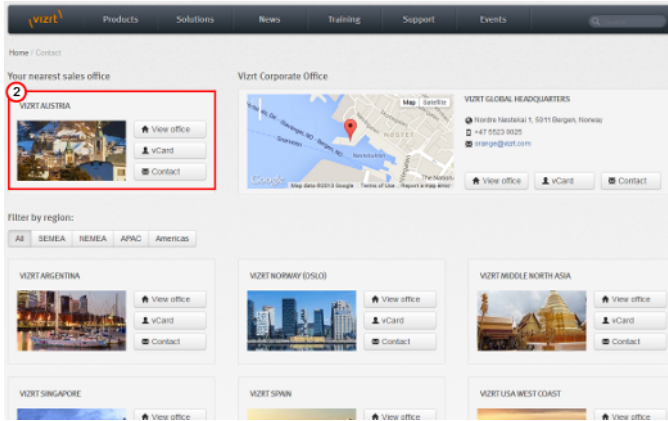
We encourage suggestions and feedback about our products and documentation. To give feedback and, or suggestions, please identify your local Vizrt customer support team at www.vizrt.com.

1. Go to www.vizrt.com.
2. Click on **Contact** (1).



3. The Vizrt office which is nearest to your location will be shown (2), or select from the list of Vizrt offices.

4. Click on 'Contact'.



5. Complete the required details in the window that opens.

Note: If this message is for Customer Support, and there is a Support Contract in place, then click on the 'For support requests, please visit our support portal' link in the message window.

6. Click on **CONTACT ME**.

A Vizrt representative will contact you as soon as possible.

1.4 Customer Support Request

Support Requests are supported by Vizrt if Customers have a valid Service Agreement in operation. Customers who do not have a Service Agreement and would like to set up a Service Agreement should contact their regional sales representative (see [Customer Feedback and Suggestions](#)).

When submitting a Support Request relevant and correct information should be given to Vizrt Support, to make sure that Vizrt Support can give the quickest and best solution to your Support Request.

This section contains information on the following topics:

- [Submitting a Support Request](#)
- [Attach Log Files to a Customer Request](#)

1.4.1 Submitting a Support Request

Before a Support Request is submitted make sure that you:

Read:

- The relevant User Guide or Guides
- The release notes

and Check:

- That the system is configured correctly
- That you have the specified hardware, tested and recommended versions

Always refer to your Vizrt Service Level Agreement document.

When completing a Support Request, add as much information as possible.

This section contains information on the following topics and procedures:

- [Content of a Support Request](#)
- [To Submit a Support Request](#)
- [Attach Log Files to a Customer Request](#)

Content of a Support Request

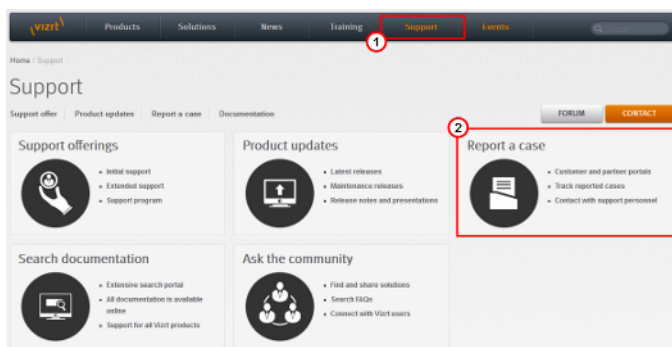
The report should contain information about these topics:

- **Problem Description:** Include a good description of what the problem is and how to reproduce it. Remember to use simple English.
- **Screen Shots and Illustrations:** Use to simplify the message.
- **System Log Files:** Send the system log files (see [Attach Log Files to a Customer Request](#)).
- **Dump Files:** Send any dump files generated from a crash (<viz data folder>).
- **System Viz Config File:** Send the system Config file (<viz data folder>).
- **Software Configuration:** Add exact versions of software (-build) used.
- **Hardware Configuration:** Add exact versions of hardware used.
- **System Setup:** Describe differences in the installation, if any, from the recommended setup.
- **System Network:** Add a description of how the network, bandwidth, routers, and switches are configured.

Always refer to your Vizrt Service Level Agreement document.

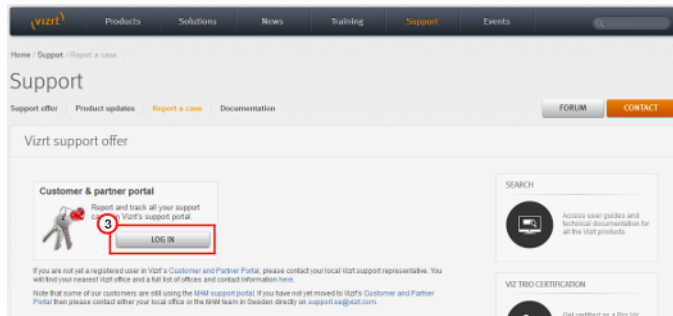
To Submit a Support Request

1. Go to www.vizrt.com.
2. Click on Support (1).
3. Click on Report a case (2).

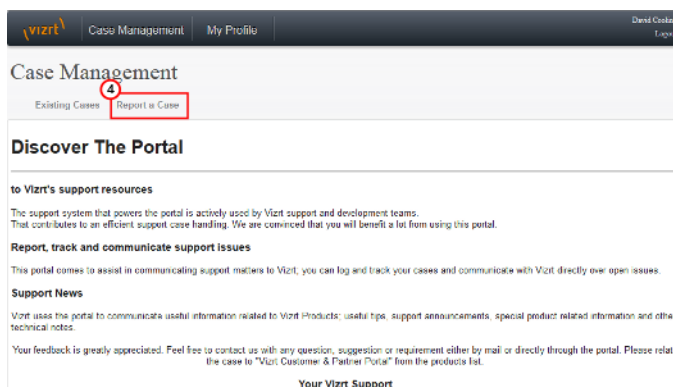


4. Click on **LOG IN** (3).

5. Log-in to the Customer and Partner portal.



6. Click on **Report a Case** (4).



7. In the online form complete the required minimum information (shown by a red asterisk):

- **Contact:** Your name
- **Account:** Your account
- **Product:** The product the support request refers to.
- **Case Type:** The type of support request required

8. Click **SAVE**.

9. In the saved Support Case that opens, complete the various text boxes and upload any required documents, files, etc (see [Content of a Support Request](#)).

Note: The entered text or uploaded documents / files are automatically added.

To track the status of open support tickets, log in to the Customer and Partner portal. Add information or communicate about the cases directly with the support team.

1.4.2 Attach Log Files to a Customer Request

Log files can provide important information when dealing with an error situation or when diagnosing performance issues. Viz Artist/Engine can write various log files that can be valuable when solving issues. For more information about the log files available see the [Viz Artist/Engine Log Files](#) section.

Consult your customer representative when deciding which logs files to attach. As a general rule: the more log files, the better. Always try to include log files for:

- The actual software/hardware configuration in use, as detailed as possible.
- The relevant Viz Artist/Engine log files.
- The Viz Engine configuration file, or if using a dual-engine setup: the Viz Engine configuration files.

Note: The Viz Engine configuration file is a textfile located in *%ProgramData%\Vizrt\viz3*, the filename includes a hostname and numbers indicating which Engine is used: *VIZ-<hostname>-<0.0>.cfg*, example: *C:\ProgramData\vizrt\viz3\VIZ-MyHost-0-0.cfg*

See Also

- [Viz Artist/Engine Log Files](#)

2 Software Configuration

This section details the prerequisites and supported options for the Viz Engine/ Artist installation, and procedures on how and where to install Viz Artist/Engine.

This section contains information on the following topics:

- [Prerequisites](#)
- [Viz Artist/Engine Folders](#)
- [Supported Software](#)
- [Ports and Connections](#)
- [User Account Control \(UAC\)](#)
- [Install Viz Artist/Engine](#)
- [Viz Engine/Viz Artist Platforms](#)
- [Install the Viz License](#)
- [EVS Video Server Control](#)
- [Dual Channel Mode](#)
- [Trio Box CG Mode](#)
- [IP Streaming](#)
- [Integration with Viz One](#)
- [Video Wall Configuration](#)
- [Dolby E Support](#)

See Also

- Video cards
 - [BlueFish444](#)
 - [Digital Video Systems](#)
 - [Matrox](#)
 - [NVIDIA Quadro SDI Capture](#)
- [NVIDIA Graphics Cards](#)
- [Audio in Viz](#)

2.1 Prerequisites

Viz Engine/Viz Artist applications run on a **Windows 7** (64-bit and 32-bit) platform.

The following prerequisites apply:

- The user must have administrator rights
- Windows 7 theme Aero must be disabled
- There must only be one active network card
- Power management and hibernation mode must set to **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 administrator account is as follows:

User name	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

- [Viz Artist/Engine Folders](#)
- [Supported Software](#)

2.2 Viz Artist/Engine Folders

This section details the location of the Viz Artist/Engine default installation and data folders.

This section contains details on the following topics:

- [Installation Folders](#)
- [Data Folders](#)

See Also

- [User Account Control \(UAC\)](#)

Installation Folders

The default installations folders are:

Windows System	Viz Artist/Engine Platform	Installation Folder
Windows 7 32-bit	32 bit	C:\Program Files\vizrt\Viz3\
	64 bit	N/A
Windows 7 64-bit	32 bit	C:\Program Files (x86)\vizrt\Viz3\
	64 bit	C:\Program Files\vizrt\Viz3\ C:\Program Files (x86)\vizrt\Viz3Gui

In this Administrator Guide any reference to the Viz Artist/Engine installation folder, e.g. *C:\Program Files\vizrt\Viz3*, is replaced with the text *<viz install folder>*.

IMPORTANT! In a Viz Artist/Engine 64-bit installation, the GUI is installed in a 32-bit folder (because the GUI is a 32-bit application).

Note: Viz Config files that already exist from a previous installation are automatically copied on install time if the installation folder did not change. If Viz Engine/Artist is installed in a different installation folder then Viz Config files must be manually copied from the old installation folder to *<viz data folder>*.

Data Folders

Files which are created or modified by Viz Artist/Engine are located at *%ProgramData%\vizrt\viz3*, which usually resolves to *C:\ProgramData\vizrt\viz3*. This folder is referenced as *<viz data folder>* throughout this User Guide, and contains, for example:

- Viz Config files
- Script plugins
- Crash dump files

Temporary files are located at: *%TMP%\vizrt\viz3*, which usually resolves to *C:\Users\<user name>\AppData\Local\Temp\vizrt\viz3*. This folder is referenced as *<viz temp folder>* throughout this User Guide.

Script Plugins are located in the *<viz data folder>\ScriptPlugins* subfolder.

Note: Script Plugin files that already exist from a previous installation are automatically copied on install time if the installation folder did not change. If Viz Engine/Artist is installed in a different installation folder then Script Plugin files must be manually copied from the old installation folder to *<viz data folder>\ScriptPlugins*

2.3 Supported Software

This section describes software requirements for Viz Artist/Engine described in this Administrator Guide and the [Viz Artist User Guide](#).

This section contains the following topics:

- [Viz Engine Software](#)
- [Viz Artist Software](#)

See Also

- The [General Requirements Guide](#)
- [Prerequisites](#)
- [Supported Software](#)
- [Supported Software](#)

2.3.1 Viz Engine Software

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

Viz Engine specifications

Software	Extra Viz Artist/Engine 2 or 3 Plug-ins (only for Viz Artist/Engine 2.x) Viz Engine 2.8 PL5 HotFix3 or Viz Engine 3.5.1 or later Datapool 2.10 or later Viz World Client 12.0 or later (see Vizrt Maps in the General Requirements Guide) Optional: When used for local preview of video clips from Viz One, Viz Engine must be installed with an MPEG-4 codec and Matroska splitter
Hardware	Licensed dongle
Executable(s)	viz.exe
Ports and Connections	6100 (preview and playout) 14300 (Viz Multiplexer) 50007-50010 (multiplexing)
Network access	Mapped drive to VOS still store folder Local preview: Mapped drive to Viz Engine data root (see Shared Data in the General Requirements Guide)

Machines configured 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.

This section also contains information on the following topics:

- [Preview Server](#)

Preview Server

The Preview Server option is used in situations where Viz Engine is used to provide frames for snapshot or thumbnail generation. A typical use case would be to connect multiple Newsroom Components to a preview server.

Note: The Preview Server must be installed on a separate Viz Engine machine with its own license.

Software	Preview Server 1.0 or later Microsoft .NET Framework 4 Viz Artist/Engine 2.8 or 3.2 and later
Hardware	Licensed dongle
Executable(s)	PreviewServer.exe
Ports and Connections	54000: Used when connecting over http using the REST interface.
Network access	Uses the ZeroConf protocol to announce available services.

2.3.2 Viz Artist Software

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

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

To run Viz Artist, the following software and configuration is needed:

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 in the General Requirements Guide) Datapool 2.10 or later Extra Viz Artist/Engine 2 plug-ins (for Viz Artist/Engine 2.x) <i>Optional:</i> Mediaftp and Fsmon are used for a Viz One integration. <i>Optional:</i> Viz Pilot with Template Wizard, Media Sequencer, Viz Multiplexer and Thumbnail Generator. <i>Note:</i> 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).
Network access	Mapped drive to VOS still store folder and Viz Engine data root (see Shared Data in the General Requirements Guide)

2.4 Ports and Connections

This section contains information on the following topics:

- [Port Numbers](#)
- [Multiplexing Ports](#)

2.4.1 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.




Listener	Port(s)	Descriptions and Comments
Mediaftp	21	Used for video transfers from Viz One to Viz Engine.
Viz One	22	TCP and UDP for logging in to the Viz One operating system (service: SSH).
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.
Viz One	137 139	Used for SMB file sharing (service: Netbios)
Viz One, Microsoft Bing and Imagery on Demand	80, 8080	Web interface and client software. SOAP port for communication with Viz One. For download of Microsoft Bing and Imagery on Demand images. (service: HTTP)
Viz One	443 445	(service: HTTPS) TCP & UDP used for SMB file sharing (service: Microsoft-DS).
Viz One Delivery	554	Real-time Streaming Protocol (service: TCP).
Oracle database	1521	For clients that connect to the Viz Pilot Database.
Sentinel HASP Run-time Environment	1947	The Sentinel HASP Run-time Environment uses port 1947 to communicate with local and remote components. This relates to hardlock dongles used with Viz Curious Maps.
Viz One	3080	Low resolution video and index files (service: lighttpd).
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 configuration where both program and preview output is on the same machine, the default preview port is set to 6800 in order to separate the program and preview channels. In a dual channel configuration, the default program ports are 6100 and 6800 for channel 1 and channel 2, respectively. In a dual channel configuration, 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 Graphics Plugin to establish a connection to Viz Trio.

Newsroom Component	6220	Used by the Graphics Plugin to establish a connection to Viz Pilot's Newsroom client.
Graphics Plugin Editor	6230	Used by the Graphics Plugin to establish a connection to the Graphics Plugin Editor (on Mac).
Graphics Plugin Config	6240	Used by the Graphics Plugin to establish a connection to the Graphics Plugin Configuration tool (on Mac).
Ticker Service	6300 6301	Ticker handler in the Media Sequencer connects to port 6300 for feedback from Ticker Service. Ticker handler in the Media Sequencer connect to port 6301 when controlling the ticker via a socket connection.
Viz Pilot	6484	Socket connection used for controlling Viz Pilot using macro commands.
Viz One	6555	Message bus port for communication with Viz One (service: Message bus).
Preview License server	7452	For the Newsroom Component using an unlicensed Viz Engine for local preview with a connection to the Preview License server (is not the same as the Preview Server).
Viz 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 One	8080	Used for sending key frames (service: ardok).
Gateway	10001 10002 10540 10541	For DB notification events. For Gateway controller clients. For MOS object updates. For MOS playlist updates.
Viz World Server	10100 10200	10100 (TCP) is a Server Allocator listener port for Viz World Client connections, and is only used in order 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 Pilot	10640	Used by Gateway to establish a connection to Viz Pilot in order 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 Pilot version 4 or Graphics Plugin towards Viz Artist/Engine 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.
Graphic Hub	19392-19396	Ports in use when connecting to different Graphic Hub components.
Connection Broker	21098	Connection to the Connection Broker configuration interface (e.g. http://localhost:21098/)
Viz Engine		Ports 50007 - 50009 are all Multiplexing Ports 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.

2.4.2 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 Pilot Newsroom Client, 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 Client to show 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 configuration, 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

2.5 User Account Control (UAC)

From release 3.7.1, Viz Engine/Artist is UAC aware. This means Viz Artist/Engine can be run when UAC is enabled on a Viz Engine PC.

IMPORTANT! UAC configuration is the responsibility of an individual company's own IT policy.

Note: When UAC settings are modified, a reboot is required.

When UAC is enabled, an additional confirmation prompt will show when these items are installed or uninstalled:

- Viz Artist/Engine
- Viz One Services (Mediaftp or Fsmon)
- The Webservice for the REST interface

Viz Artist/Engine and all Plugins shipped with Viz Artist installer are UAC aware. However, if other plugins are used a warning message may show on Viz Engine startup:

WARNING: The plugin <plugin-name.vip> may not be UAC aware. Contact your plugin vendor for an updated version.

This warning means that the plugin may not work correctly if UAC is enabled. For example, the plugin might attempt to write into the installation folder, where it is not allowed to anymore.

Contact the plugin vendor for information on the UAC awareness of the plugin.

IMPORTANT! Even though the warning shows, the plugin is still loaded on startup.

To make Viz Artist/Engine UAC aware, modifications have been made to the installation and Data folder locations.

See [Viz Artist/Engine Folders](#):

- [Installation Folders](#)
- [Data Folders](#)

Note: Most changes result from the UAC requirement that an application must not write into the installation folder.

2.6 Install Viz Artist/Engine

There is one software installation package for both the Viz Engine and Viz Artist.

Note: Technically, Viz Engine and Viz Artist are the same software but run in different modes. After installation, desktop shortcuts are created to run the software in Viz Engine, Viz Artist or Viz Config mode.



Viz Engine Viz Artist Viz Config

Note: The software package is available as 32-bit and as 64-bit version:

- VizArtist.3.7.0.<build>_32bit.msi
- VizArtist.3.7.0.<build>_64bit.msi

This section contains the following topics and procedures:

- [Install If Previous Versions of the Software are Installed](#)
- [Viz Engine/Viz Artist Platforms](#)
- [To Install Viz Artist/Engine](#)
- [To Install the VizBoldHardlock Dongle Drivers](#)
- [To Silent Install Viz Artist/Engine](#)
- [Viz Artist 64-bit or 32-bit Version](#)

Install If Previous Versions of the Software are Installed

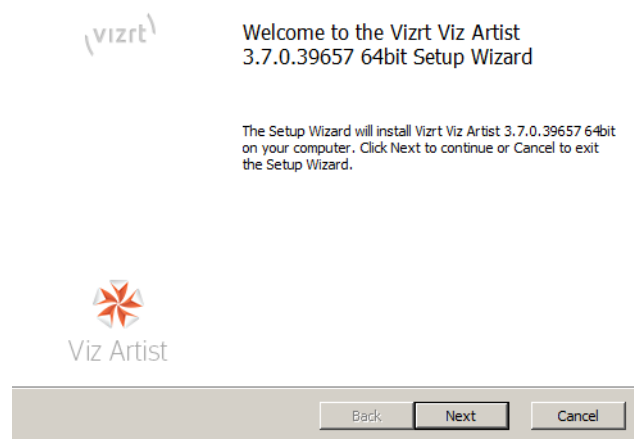
If a new version of Viz Artist/Engine is to be installed on a machine with previous versions of Viz Artist/Engine installed, be aware of the following:

IMPORTANT! Always make sure that there is a backup copy of the current Viz Engine installation before a new version is installed.

- Viz Engine 3.7 cannot be installed in parallel with Viz Engine 3.6.
- You do not need to manually uninstall Viz Engine 3.6 before installing Viz Engine 3.7.
- By installing Viz Engine 3.7 any older versions of Viz Engine 3.6 will be removed, this is true even if you opt to install Viz Engine 3.7 in a different directory than 3.6.X.
- Any modified 3.6.x files like Config-files, Log files or additional files like customer Plugins remain unchanged in their original folder.
- The installation folder of 3.6.x will be pre-selected for 3.7.0 installation. You may change it.
- The features selected for 3.6.3 will be pre-selected for 3.7.0 installation. You may change them.
- Viz Artist 3.7.0 will not upgrade (replace) any Viz Artist installation prior to 3.6.x. However, a warning is shown if the 3.7.0 target installation folder contains already an older viz.exe.
- Viz Artist 3.7.0 **64-bit** will *not upgrade* any Viz Artist 3.6.x installation.
- The default installation directories are *C:\Program Files (x86)\vizrt\Viz3* for the 32bit application and *C:\Program Files\vizrt\Viz3* for the 64bit application.
- Attempting to downgrade Viz Artist installation is not supported and will show an error message.

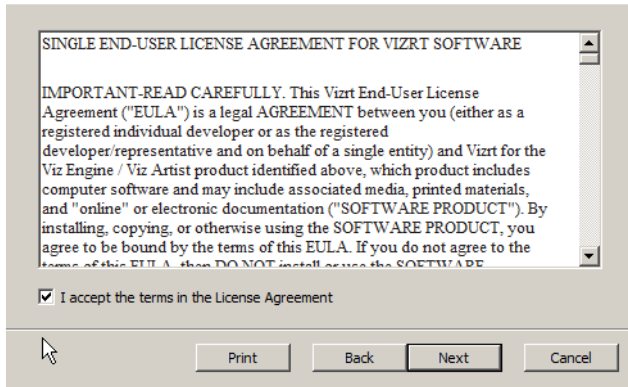
To Install Viz Artist/Engine

1. Log-in to the computer as a Computer Administrator
2. Double-click and run the installer.
3. Click **Next**.

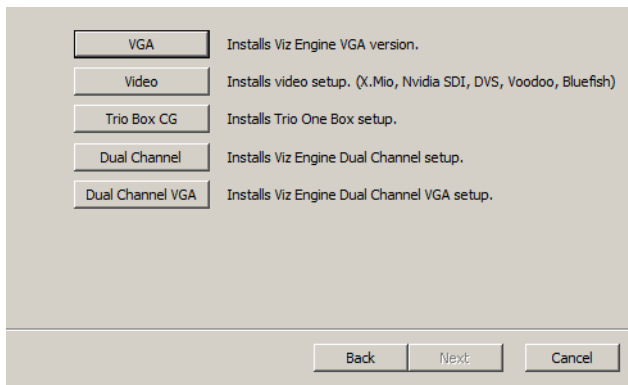


4. Read the agreement.
5. Check the **I accept the terms in the Licence Agreement** check box.

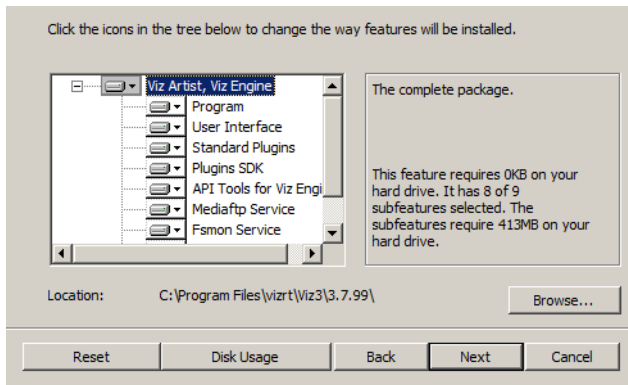
- Click **Next**.



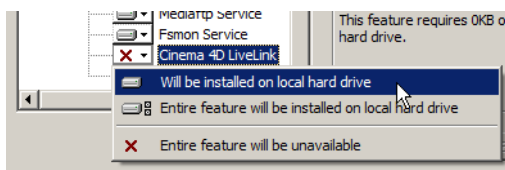
- Click a platform type (see [Viz Engine/Viz Artist Platforms](#)).



- Click **Next**.
- Select the required features of Viz Artist/Engine, to install.

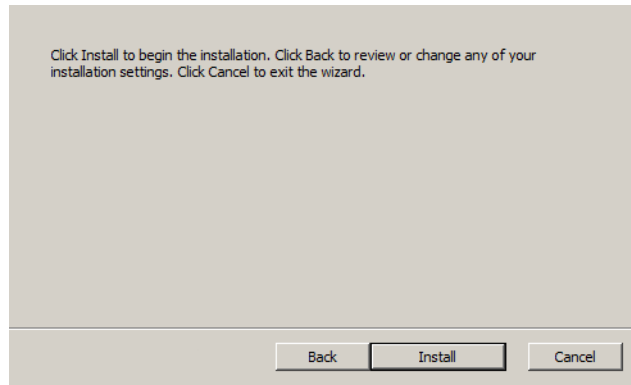


Note: Most features are installed by default. Check the feature list and add or remove features as required:



- Click **Next**.

11. Click **Install**.



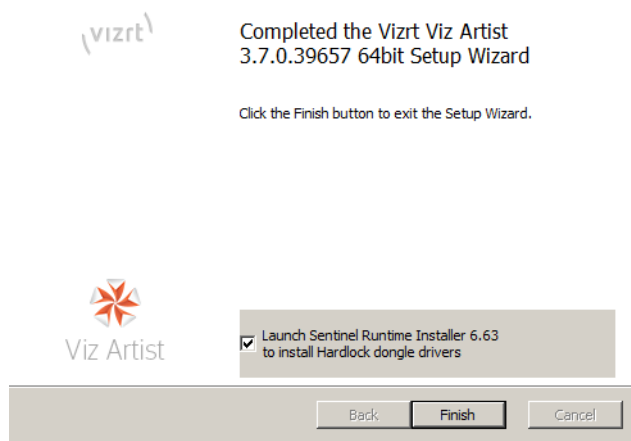
12. Hardlock dongle drivers. The Viz Artist/Engine installer application searches for installed Hardlock dongle drivers:
- If Hardlock dongle drivers are **not installed**, or are not up-to-date, the box will be checked (the Sentinel Runtime Installer will run)
 - If Hardlock drivers **are installed**, and are up-to-date, the box will not be checked (the Sentinel Runtime Installer will not run)

Note: The Hardlock dongle drivers check box can be manually checked or unchecked, as required.

Note: The file HASP_Setup.msi, required to run the **Sentinel Runtime Installer** is always copied to the <viz install folder> for later installation or to repair the dongle drivers.

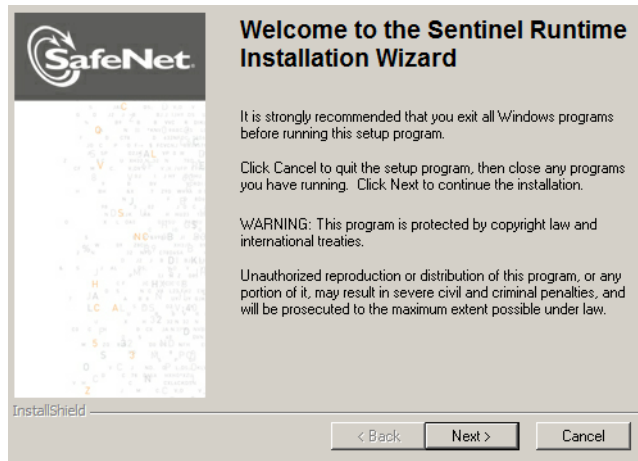
13. Click **Finish**.

- If the Hardlock dongle drivers check box is checked the **Sentinel Runtime Installer** starts (see [To Install the VizBoldHardlock Dongle Drivers](#)).



To Install the Hardlock Dongle Drivers

- Click **Next** and follow the on screen instruction.



To Silent Install Viz Artist/Engine

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

```
@rem silent installation

@rem platformtype: standardpc, video,
trioboxcg, dualchannel

msiexec.exe /i <msi_package> /quiet
PLATFORMTYPE=<platformtype>
```

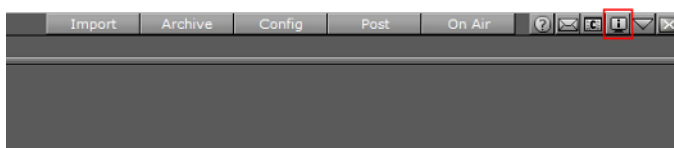
2. To see other options enter `msiexec` on the command line and press enter. Common options are:
 - `/i` : Installs or configures a product. Package: Specifies the name of the Windows Installer package file. ProductCode: Specifies the globally unique identifier (GUID) of the Windows Installer package.
 - `/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 at Microsoft.com

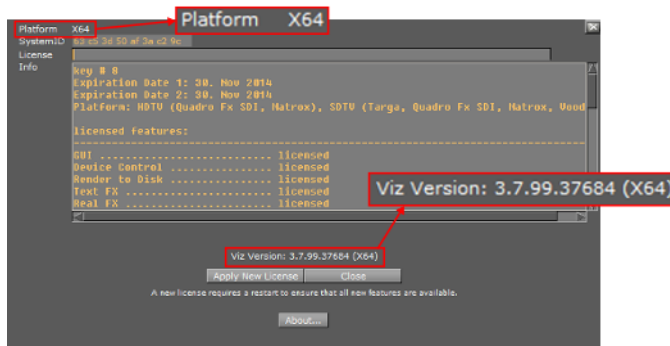
2.6.1 Viz Artist 64-bit or 32-bit Version

To check if Viz Artist is a 64-bit or 32-bit installation, click on the **Show Licence Information** button:



In the Licence Information window the Platform and Viz Version number show as:

- Platform Win32 or X64
- Viz Version 3.7.XX.XXX (Win32) or (X64)



2.7 Viz Engine/Viz Artist Platforms

Viz Engine/Viz Artist can be installed and configured to use five different platforms. When Viz Engine/Viz Artist is installed select which platform is required.

The supported platform version options are:

- [VGA](#)
- [Video](#)
- [Trio Box CG](#)
- [Dual Channel](#)
- [Dual Channel VGA](#)

VGA

VGA is Viz Engine with VGA/DVI preview capabilities. This option has no live input or output options.

This configuration can, for example, be used for a Video Wall solution, Viz Frame Servers (for Viz NLE and Viz Pilot preview/still rendering systems). It can also be used by designers, journalists and operators that require graphics and video clip preview.

Video

The Video option supports live input and output on SDI and/or IP, and typically provides **one program** output (fill and key on one channel). Preview without live video is available through VGA/DVI.

Trio Box CG

Trio Box CG (Character Generator) is a Video version with, typically, **one program** and **one preview** output (fill and key on two channels). To support program and preview output this option supports two graphics cards (see [Trio Box CG Mode](#)).

Dual Channel

Dual Channel is a Video version with, typically, **two program** outputs (fill and key on two channels). To support two program outputs this option supports two graphics cards (see [Dual Channel Mode](#)).

Dual Channel VGA

Dual Channel VGA is a Dual Channel version with additional VGA/DVI preview capabilities.

See Also

- [Install Viz Artist/Engine](#)
- [Integration with Viz One](#)
- Video cards
 - [BlueFish444](#)
 - [Digital Video Systems](#)
 - [Matrox](#)
 - [NVIDIA Quadro SDI Capture](#)
- [NVIDIA Graphics Cards](#)
- [Audio in Viz](#)
- [Prerequisites](#)
- [Supported Software](#)

2.8 Install the Viz License

Viz Engine (and Viz Artist) must have a license to operate. A license is normally acquired when purchasing the product. To get additional or updated licenses contact your local Vizrt representative.

Note: Some of the plug-ins used with Viz are also licensed, in addition to Viz itself.

This section contains information on the following topics:

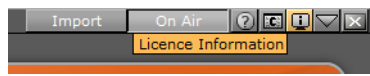
- [To Apply a Viz License in the GUI](#)
- [To Apply a Viz license in Viz Configuration](#)

To Apply a Viz License in the GUI

Use this procedure to apply a first time license, apply a new license after a license expiry, or apply a new license before a license expires.

1. Make sure that the date and time on the computer is correct. The license is only valid for a certain time frame.
2. Insert the License dongle.
3. Start Viz Engine or Viz Artist.
4. Open the License window:
 - If this is a first time license application or the license has expired, the License window will open.

- If this is a new license application before a license expiry date, click on the License Information button.

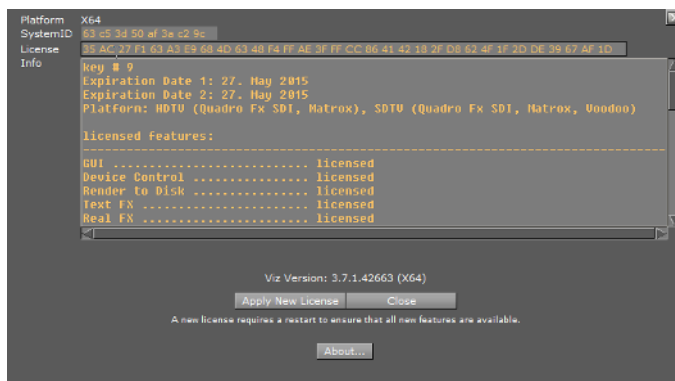


5. Check that the **Dongle ID**, in the License Information text file, is the same as the **System ID** in the License window.

LICENSE INFORMATION

Dongle-ID: 25 10 bd 48 b7 ef 42 da
 License: FD 49 7B 65 05 E5 E7 81 01 25 28 C9 05 0E 57 FF 92 F0 79 C1 C8 6B B5 80 CE FF 19 88 85 25 2B 28

6. Check these details:
 - Check that the license string has 32 pairs of characters and that they are divided by a single space.
 - Check the characters and for spaces at the end.
7. Copy the license string from the License Information text file.
8. Paste the license string in the **License field** of the License window.
 - Check that the license key has not been entered twice.
 - Check that the whole string is pasted.
9. Click **Apply New License**.
10. Restart for the changes to take effect.



To Apply a Viz license in Viz Configuration

Use this procedure to apply new license before a license expires.

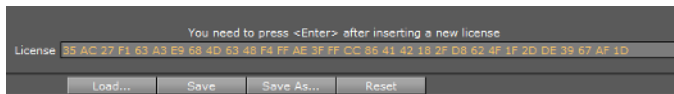
1. Make sure that the date and time on the computer is correct. The license is only valid for a certain time frame.
2. Insert the License dongle.
3. Open **Viz Configuration**.
4. Click on **Viz License Information**.
5. Check that the Dongle ID, in the License Information text file, is the same as the System ID in the Viz License Information panel.

LICENSE INFORMATION

Dongle-ID: 25 10 bd 48 b7 ef 42 da
 License: FD 49 7B 65 05 E5 E7 81 01 25 28 C9 05 0E 57 FF 92 F0 79 C1 C8 6B B5 80 CE FF 19 88 85 25 2B 28

6. Check these License details:

- Check that the license string has 32 pairs of characters and that they are divided by a single space.
 - Check the characters and for spaces at the end.
7. Copy the license string from the License Information text file.
 8. Paste the license string in the **License** field of the Viz License Information panel.
 - Check that the license key has not been entered twice.
 - Check that the whole string is pasted.
 9. Press <ENTER>.
 10. Click **Save**.
 11. Restart for the changes to take effect.



2.9 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 Configuration](#)
- [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 Configuration

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:

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

Configuration 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

Configuration 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

2.10 Dual Channel Mode

This section details how to configure the Dual Channel platform of Viz Artist/Engine (see [Viz Engine/Viz Artist Platforms](#)).

Dual Channel is a video version with, typically, **two program** outputs (fill and key on two channels). To support two program outputs this option requires two graphics cards.

Once installed and configured, open the two Viz Engine consoles and add commands as required, or use an external application (for example Viz Trio or Viz Pilot) to control the Viz Engine.

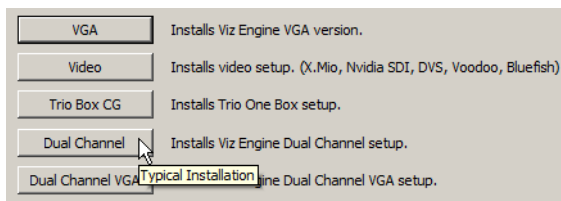
See the [Viz Trio User Guide](#) and [Viz Pilot User Guide](#).

This section contains the following procedure:

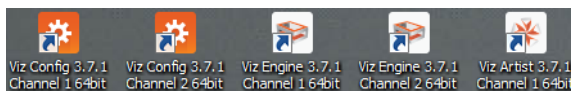
- [To Configure Dual Channel](#)

To Configure Dual Channel

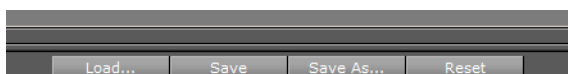
1. Install Viz Artist and select **Dual Channel** mode (see [To Install Viz Artist/Engine](#)).



Dual Channel installs and shows these icons:

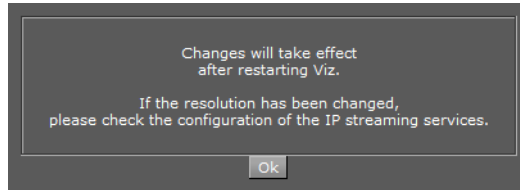


2. Open **Viz Config 3.7.1 Channel 1 64bit**.
3. In **Database**, set **Auto log in** to **Yes** (active).
4. Click **Load...**



5. Select `<viz install folder> / Configuration Profiles/dualchannel-0.cfg`.

6. Click **OK**.
7. Configure Viz Artist/Engine as required, for example, set the **Output Format**, etc.
8. Click **Save**.
9. Click **OK**.



10. Close the Config window.
11. Open **Viz Config 3.7.1 Channel 2 64bit**.
12. Repeat steps 6 to 10 to load the *dualchannel-1.cfg*. file

2.11 Trio Box CG Mode

This section details how to configure the Trio Box CG (Character Generator) platform of Viz Artist/Engine (see [Viz Engine/Viz Artist Platforms](#)).

Trio Box CG mode is a video version with, typically, **one program** and **one preview** output (fill and key on two channels). To support program and preview output this option requires two graphics cards.

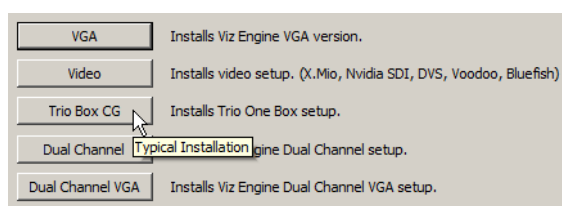
Once installed and configured, use Viz Trio to control the Viz Engines (see the [Viz Trio User Guide](#))

This section contains the following procedure:

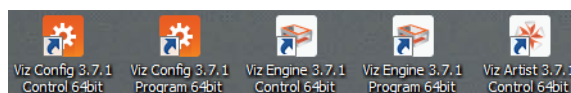
- [To Configure Trio Box CG](#)

To Configure Trio Box CG

1. Install Viz Artist and select **Trio Box CG** mode (see [To Install Viz Artist/Engine](#)).



Trio Box CG installs and shows these icons:

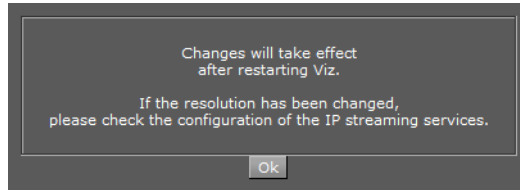


2. Open **Viz Config 3.7.1 Control 64bit**.
3. In **Database**, set **Auto log in** to **Yes** (active).
4. Click **Load...**



5. Select *<viz install folder> / Configuration Profiles/trioonebox-0.cfg*.

6. Click **OK**.
7. Configure Viz Artist/Engine as required, e.g., set the **Output Format**, etc.
8. Click **Save**.
9. Click **OK**.



10. Close the Config window.
11. Open **Viz Config 3.7.1 Program 64bit**.
12. Repeat steps 4 to 10 to load the *trioonebox-1.cfg* file.

2.12 IP Streaming

The IP Streaming Input Service can receive up to four SD IP streams, or up to 2 HD IP streams, decode the received IP streams and distribute the decoded Audio and Video data to:

- One or two (Dual Channel) Viz Engines, and/or
- One or two (Dual Channel) IP Streaming Output Services

The IP Streaming Output Service can receive un-compressed audio and video data from a Viz Engine, and/or, the IP Streaming Input Service. It then encodes the received audio and video data and sends an IP stream to a configured destination.

This section details the installation of and how to configure IP input and output streaming. To activate and use the IP Streaming input and output services see:

- [Video Input](#) in [Configuring Viz](#)
- [Video Output](#) in [Configuring Viz](#)
- **Video Playback** (see the [Viz Artist User Guide](#))
- **Video Playback From a Video Stream** (see the [Viz Artist User Guide](#))

This section contains information on the following topics:

- [IP Streaming Hardware Requirements](#)
- [Installation of IP Streaming Services](#)
- [Configure IP Streaming](#)
- [Configure Dual Channel](#)
- [Failover Mode](#)
- [References and Specifications](#)

2.12.1 IP Streaming Hardware Requirements

The IP Streaming will only run on machines installed with either of these Video Cards:

- Matrox X.mio2 Plus, or
- Matrox X.mio2, or

- Matrox X.open Dongle (USB and PCIe)

For best performance, Vizrt recommend to separate the IP streaming input and output network traffic from other data traffic. Therefore two separate Gigabit Ethernet ports are recommended:

- One Gigabit Ethernet port for management traffic (e.g. to send commands to and from the Viz Engine)
- One Gigabit Ethernet port for IP streaming input and output traffic

See Also

- [Installation of IP Streaming Services](#)
- [Configure IP Streaming](#)
- [Configure Dual Channel](#)
- [Failover Mode](#)
- [References and Specifications](#)

2.12.2 Installation of IP Streaming Services

This section details the installation requirements and procedure required to use Viz Engine's IP Streaming Channels.

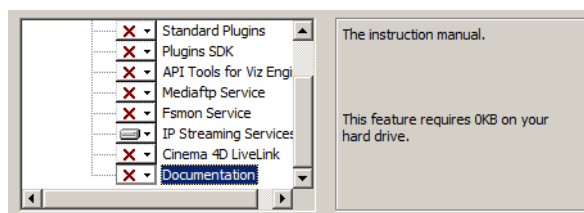
This section contains the following procedures:

- [To Install the IP Streaming Services \(Viz Artist 64-bit\)](#)
- [To Install the IP Streaming Services \(Viz Artist 32-bit\)](#)

To Install the IP Streaming Services (Viz Artist 64-bit)

1. Install Viz Artist 64-bit, as described in [Install Viz Artist/Engine](#):
 - Make sure that either **Video**, **Trio Box CG** or **Dual Channel** is selected.
2. Install Viz Artist 32-bit.

IMPORTANT! Make sure that **IP Streaming Services** is the only feature **enabled**. All other features must be **disabled**.



To Install the IP Streaming Services (Viz Artist 32-bit)

1. Install Viz Artist 32-bit, as described in [Install Viz Artist/Engine](#):
 - Make sure that either **Video**, **Trio Box CG** or **Dual Channel** is selected.
 - The IP Streaming Services are installed by default.

Tip: If IP Streaming Services are not required, make them unavailable.

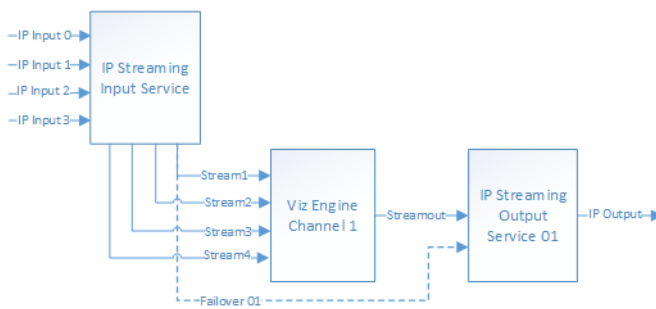
See Also

- [IP Streaming Hardware Requirements](#)
- [Configure IP Streaming](#)
- [Configure Dual Channel](#)
- [Failover Mode](#)
- [References and Specifications](#)

2.12.3 Configure IP Streaming

The IP streaming services are configured through a set of commands that are stored in the startup Config file of the service, whereby each instance of an IP streaming service has its own startup Config file:

- IP streaming input service:
 - File name: IPStreamIn_startup.conf
 - File location: %ProgramData%\vizrt\IP Streaming Input Service
- IP streaming output service:
 - File name: IPStreamOut_startup_01.conf
 - File location: %ProgramData%\vizrt\IP Streaming Output Service



This section details how to complete the configuration and links to further detailed information related to the configuration of the IP Streaming Services

This section contains the following topics:

- [Configure the IP Streaming Input Service URL](#)
- [Configure the IP Streaming Output Service](#)

See Also

- [IP Streaming Hardware Requirements](#)
- [Installation of IP Streaming Services](#)
- [Failover Mode](#)
- [References and Specifications](#)

Configure the IP Streaming Input Service URL

The IP streaming input service comes with a default configuration. The user can (if required) define the input streams (URLs) that the service should playback after its startup procedure.

To Change the Stream Input URL

1. Open the **IPStreamIn_startup.conf** file.

Note: Example file location: C:\ProgramData\vizrt\IP Streaming Input Service

2. Add the **FILTER PLAY [filter_channel] [url]** command, where [filter_channel] is the ID of the channel (0-3) and [url] is the URL of the stream to be received:

```
#MAIN START [number_of_channels] [number_of_viz_instances]
MAIN START 4 1
COMMAND_HANDLER PORT SET 6910
FILTER PLAY 0 udp://127.0.0.1:50101
```

3. Save the file.
4. Restart the IP Streaming Input Service.

See Also

- [Configure the IP Streaming Output Service](#)

Configure the IP Streaming Output Service

This section details the required settings to configure the streaming output of the IP Streaming Output Service.

The configuration of the channel depends on the configured [Output Format](#) format of the Viz Engine connected to the IP Streaming Output Service and must be set in the startup configuration of the service with the CHANNEL SETTINGS SET command.

```
CHANNEL SETTINGS SET [channel] [url] [container] [video] [audio]
```

IMPORTANT! If the output format of the Viz Engine, which is connected to the IP Streaming Output Service, is changed, the IP Streaming Output Service must also be configured to the same settings and restarted as well.

This section contains the following procedure:

- [To Configure Channel Settings](#)

To Configure Channel Settings

1. Open the **IPStreamOut_startup_01.conf** file.

Note: Example file location: C:\ProgramData\vizrt\IP Streaming Output Service

2. Set the **[channel]** parameter to the Id of the channel to configure (usually 0).
3. Set the **[url]** parameter to the destination URL of the stream.
4. Set the **[container]**, **[video]** and **[audio]** parameters as per the [Output Format](#) format of the Viz Engine connected to the service (see [Output Format Setup](#) table).

Example: CHANNEL SETTINGS SET 0 url=udp://239.0.1.1:5050
container=mpegts video=mpeg2_SDi audio=mp2

5. Save the file.

- Restart the IP Streaming Output Service.

Output Format Setup

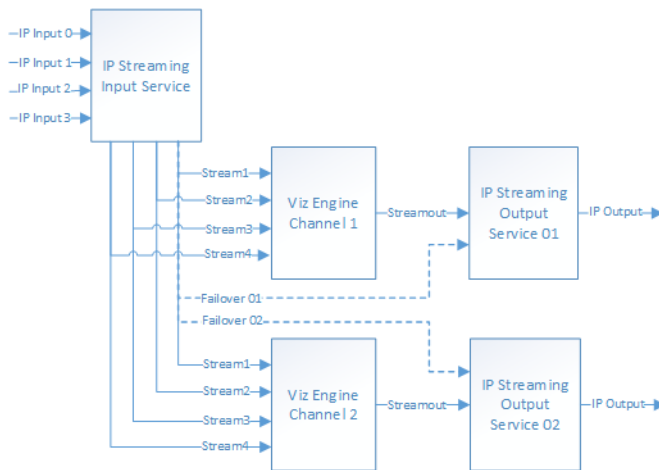
Output Format	Channel Settings
PAL	container=mpegts video=mpeg2_SDi audio=mp2
NTSC	container=mpegts video=mpeg2_SDi audio=mp2
720p HD Progressive	container=mpegts video=mpeg2_720p audio=mp2
1080i HD Interlaced	container=mpegts video=mpeg2_1080i audio=mp2

See Also

- [Configure the IP Streaming Input Service URL](#)

2.12.4 Configure Dual Channel

In a Dual Channel set up two Viz Engines are required.



The input and output services must be configured as described below:

To Enable Dual Channel Mode on the Stream Input

- Open the IPStreamIn_startup.conf file.

Note: Example file location: C:\ProgramData\vizrt\IP Streaming Input Service

- Set the **number of viz instances** to 2.

```
#MAIN START [number_of_channels] [number_of_viz_instances]
MAIN START 4 2
COMMAND_HANDLER PORT SET 6910
FILTER PLAY 0 udp://127.0.0.1:50101
```

- If it required to change the url see [To Change the Stream Input URL](#).
- Save the file.
- Restart the IP Streaming Input Service.

To Enable the Second Output Streaming on Dual Channel

1. Open the IPStreamOut_startup_01.conf file.
2. Change the IPStreamOut_startup_01.conf file as described in [To Configure Channel Settings](#).
3. Save the file.
4. Open the IPStreamOut_startup_02.conf file.
5. Change the IPStreamOut_startup_02.conf file as described in [To Configure Channel Settings](#).
6. Save the file.
7. Restart both IP Streaming Output Services.

See Also

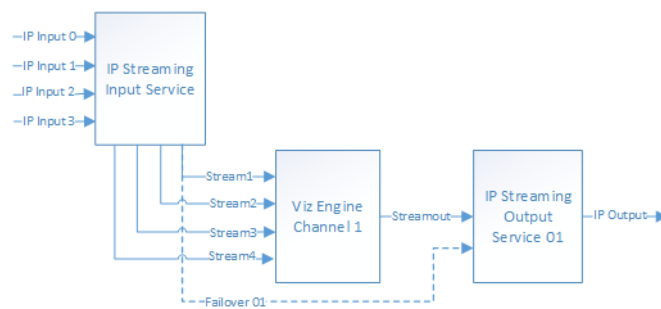
- [IP Streaming Hardware Requirements](#)
- [Installation of IP Streaming Services](#)
- [Configure IP Streaming](#)
- [Failover Mode](#)
- [References and Specifications](#)

2.12.5 Failover Mode

By default the stream output service checks for a stream input, and if available the output service will distribute this stream to the network.

If there is no engine running locally, which could provide an IP stream to the IP output service, the output service will take the stream from **Stream 1** of the input service.

This process is known as IP Streaming Failover and it makes sure that at least the first incoming stream will be forwarded if, for example, the Viz Engine process terminates unexpectedly.



It is possible to disable the failover functionality with the following command in the startup Config files before the MAIN START entry:

```
MAIN FAILOVER SET 0
```

See Also

- [IP Streaming Hardware Requirements](#)
- [Installation of IP Streaming Services](#)
- [Configure IP Streaming](#)

- [Configure Dual Channel](#)
- [References and Specifications](#)

2.12.6 References and Specifications

This section details references and specifications for the IP Streaming Services.

This section contains the following topics:

- [IP Streaming Services Command Reference](#)
- [Files and Directories](#)
- [Specifications](#)

See Also

- [IP Streaming Hardware Requirements](#)
- [Installation of IP Streaming Services](#)
- [Configure IP Streaming](#)
- [Configure Dual Channel](#)
- [Failover Mode](#)

IP Streaming Services Command Reference

This section details IP Streaming Services Command References.

IP Streaming Input Service

```
MAIN START [number_of_filter_channels] [number_of_viz_instances]
```

Defines how many input streams and viz instance can be handled by the service.

[number_of_filter_channels]: Defines the number of filter channels that the service will create internally. The number of filter channels is equal to the number of input streams that the service can handle.

[number_of_viz_instances]: Defines the number of Viz Engine instances that the service can handle.

```
COMMAND_HANDLER PORT SET [port]
```

Sets the communication port for receiving external commands from Viz Engine.

Note: Changes to this setting must be reflected to the Viz Engine configuration: Streaming Input Svc. Port

```
FILTER PLAY [filter_channel] [url]
```

Defines how many input streams and viz instance can be handled by the service.

[number_of_filter_channels]: Defines the number of filter channels that the service will create internally. The number of filter channels is equal to the number of input streams that the service can handle.

[number_of_viz_instances]: Defines the number of Viz Engine instances that the service can handle.

```
FILTER FLUSH [filter_channel]
```

Defines how many input streams and viz instance can be handled by the service.

[number_of_filter_channels]: Defines the number of filter channels that the service will create internally. The number of filter channels is equal to the number of input streams that the service can handle.

[number_of_viz_instances]: Defines the number of Viz Engine instances that the service can handle.

```
MAIN FAILOVER SET 0
```

Enable (1) or disable (0) failover mode (default is enabled)

IP Streaming Output Service

```
MAIN START [number_of_channels]
```

Defines how many output streams can be handled by the service.

[number_of_channels]: Defines the number of streaming output channels that the service will create internally (usually 1).

```
COMMAND_HANDLER PORT SET [port]
```

Sets the communication port for receiving external commands from Viz Engine.

Note: Changes to this setting must be reflected to the Viz Engine configuration:
Streaming output Svc. Port

```
CHANNEL SETTINGS SET [channel] [url] [container] [video] [audio]
```

Defines the output format and destination for a certain streaming output channel.

[channel]: Defines the streaming output channel (usually 0).

[url]: Defines the destination URL of the streaming output channel. Example:
url=udp://127.0.0.1:50101

[container]: Defines the container preset of the streaming output channel. Example:
container=mpegts

[video]: Defines the video preset of the streaming output channel. Example:
video=mpeg2video

[audio]: Defines the audio preset of the streaming output channel. Example:
audio=mp2

```
MAIN FAILOVER SET 0
```

Enable (1) or disable (0) failover mode (default is enabled)

See Also

- [Files and Directories](#)
- [Specifications](#)

Files and Directories

The IP Streaming Services use various files and directories while they are running.

This section contains the following topics:

- [IP Streaming Services](#)
- [IP Streaming Input Service](#)
- [IP Streaming Output Service](#)

IP Streaming Services

Installation Directory	Directory:	<viz install folder>\IP Streaming Services
------------------------	------------	--

IP Streaming Input Service

ProgramData Directory	Directory:	%ProgramData%\vizrt\IP Streaming Input Service
Startup Configuration	File:	IPStreamIn_startup.conf
	Path:	%ProgramData%\vizrt\IP Streaming Input Service \IPStreamIn_startup.conf

IP Streaming Output Service

ProgramData Directory	Directory:	%ProgramData%\vizrt\IP Streaming Output Service
Startup Configuration	Directory:	IPStreamOut_startup_<instance id>.conf
	Path:	%ProgramData%\vizrt\IP Streaming Output Service \IPStreamOut_startup_01.conf
		%ProgramData%\vizrt\IP Streaming Output Service \IPStreamOut_startup_02.conf
Preset Directories	Directory:	%ProgramData%\vizrt\IP Streaming Output Service \presets

See Also

- [IP Streaming Services Command Reference](#)
- [Specifications](#)

Specifications

This section details the specifications for the IP Streaming Input and Output.

This section contains the following topics:

- [IP Streaming Output](#)
- [IP Streaming Input](#)

IP Streaming Output**Output Options**

Transport Protocols	UDP/IP
Transport Formats	MPEG-2 Transport Stream

Video Options

Video Formats	1080i/25, 1080i/29.97, 1080i/30
	720p/50, 720p/59.94, 720p/60
	576i/25
	480i/29.97
Compression Formats	MPEG-2 Video MP @ ML (15 Mbit/s max)
	MPEG-2 Video MP @ HL (80 Mbit/s max)

Audio Options

Audio Formats	Stereo
	Mono
Compression Formats	MPEG-1 Layer 2

IP Streaming Input**Input Options**

Transport Protocols	MPEG-2 Transport Stream over UDP/IP
	MPEG-2 Transport Stream over RTP/IP
Streaming Protocols	RTP, RTSP

Video Options

Video Formats	1080i/25, 1080i/29.97, 1080i/30
	720p/50, 720p/59.94, 720p/60
	576i/25
	480i/29.97
Compression Formats	MPEG-2 Video MP @ ML (15 Mbit/s max)
	MPEG-2 Video MP @ HL (80 Mbit/s max)

	MPEG-4 Part 2
	h.264/AVC

Audio Options

Audio Formats	Stereo
	Mono
Compression Formats	MPEG-1 Layer 2
	AAC

See Also

- [IP Streaming Services Command Reference](#)
- [Files and Directories](#)

2.13 Integration with Viz One

Viz Engine can be integrated with Viz One so that video clips can be transferred, and monitored, to and from Viz One.

The following sections describe how to install the Transfer and Monitor services to the Viz Engine and how to enable clip playout.

A Viz One system, which is configured to communicate with the Viz Engine, must be running during the installation and configuration of the two services.

Administrator rights are required to complete the install (see [Prerequisites](#)).

This section contains information on the following topics:

- [Configure Viz Engine](#)
- [Install Transfer and Monitor Services on Viz Engine](#)
- [Configure Local Preview of Video Files](#)

See Also

- [Prerequisites](#)
- *Viz One Administrator's Guide*

2.13.1 Configure Viz Engine

Viz Engine must be configured for the transfer and playing-out of video clips from Viz One.

To Configure the Viz Engine

1. Open **Viz Configuration**.
2. Click on **Output Format**.
3. Select the correct output format as used in Viz One.

4. Click on **Video Board**.
5. Set the **Viz Link** option to **On**.
6. Click on **Video Input**.
7. Make sure that at least one Clip Channel is active.
8. Click **Save**.
9. Restart Viz Engine.

2.13.2 Install Transfer and Monitor Services on Viz Engine

The **Mediaftp** (file transfer) and the **Fsmon** (file system monitor) Services are required for Viz One to connect to a Viz Engine.

Both services are part of the Viz Artist installation, but must be installed (activated) or uninstalled (deactivated) through the Viz Config.

Note: If these Services are not required, make them unavailable when Viz Artist is installed. The Mediaftp Service will print some feedback to the Viz Engine Console. The Fsmon Service will not.

The files for Mediaftp and the Fsmon are installed into the folders:

- *<viz install folder>\Fsmon*
- *<viz install folder>\Mediaftp*

Log-files are written to the folders:

- *<viz data folder>\Fsmon*
- *<viz data folder>\Mediaftp*

This section contains information on the following topics:

- [To Install the Transfer and Monitor Services](#)
- [To Uninstall the Transfer and Monitor Services](#)

To Install the Transfer and Monitor Services

IMPORTANT! Make sure that the Clip Data Directory is set correctly before the services are installed (see [Video Board](#)).

IMPORTANT! Make sure that Mediaftp service is configured with the correct User. The default user/password combination is: vtrsync:vtrsync (this is activated when mediaftp is installed by the flag '-a').

1. Open **Viz Config**.

2. Click on **Viz One**.



3. In the **Days to keep log files** field, set the number of days log files are to be kept (default is 7 days).
4. **FSMon** Service Only:
 1. Enter the host name of the local host.
 2. Enter the host name of the Viz One Message Queue Server.

IMPORTANT! The local hostname must be exactly the same string that was entered in the Viz One as hostname for the Viz Engine (it must be the exact same string as seen beside Host on the Servers page).

5. **MediaFTP** Service Only: Set the transfer band width (Kbits per second), as required.
6. Click on **Install** for each required Service.

Note: Any currently installed Services must be uninstalled before a new Service can be installed.

To Uninstall the Transfer and Monitor Services

Note: When a Service is uninstalled the Service is made **inactive**. The Service is still available, and if required again click **Install** to make **active**.

1. Open **Viz Config**.
2. Click on **Viz One**.
3. Click on **Uninstall** for each required Service.

2.13.3 Configure Local Preview of Video Files

If a Viz Engine is used for local preview (for example, Viz Engine installed on a control client machine) the FFDSHOW codec package and a Matroska splitter, must be installed.

Note: The procedures, detailed below, are only relevant for low resolution versions of video clips to be previewed on Viz One. In most cases this happens when control applications, such as Viz Trio, are used to, for example, preview a full screen clip. High resolution video clip 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

After the FFDSHOW codec package has been installed:

- Make sure that Viz Engine or generally no applications are excluded (there is an inclusion and exclusion list in FFDSHOW)
- Make sure that there are no other codec packages installed on the machine that will interfere with FFDSHOW or the Matroska splitter.

Note: A license is required for clip playback as FFDSHOW does not come with a decoding license.

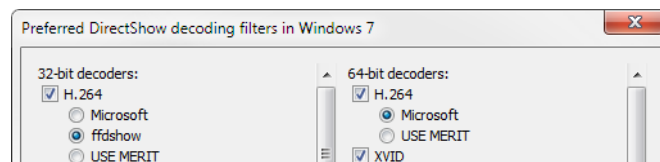
1. Start the browser.
2. Search for and download:
 - The FFDSHOW M PEG-4 Video Decoder

IMPORTANT! Make sure a license is available to use the codec and that the 32-bit version of the codec is downloaded

3. **Uninstall** older **64-bit** versions of the **MPEG-4 codec**
4. Extract:
 - The **Matroska Splitter**, and
 - The **Windows 7 DirectShow Filter Tweaker**.
5. **Install** the **MPEG-4 codec**.
6. Set your **MPEG-4** 32bit decoder to **FFDSHOW** (see how [To Set a Preferred Decoder](#)).
7. **Register** the **Matroska Splitter** (see how [To Register the Matroska Splitter](#)).

To Set a Preferred Decoder

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



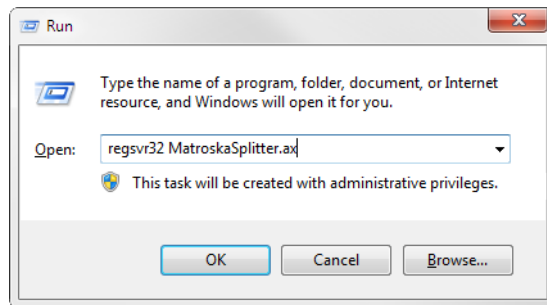
3. Set your **MPEG-4/H.264** 32-bit decoder to **FFDSHOW**.
4. Click **Apply & Close**.
5. Click **Exit**.

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**.
5. Click **OK**. A message box appears confirming your registration
6. Click **OK**.

To Unregister the Matroska Splitter

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

To Configure Preview of Clips Stored on Viz One

If the **VGA version** is installed, do these steps:

1. Open Windows Explorer
2. Open the Viz Config file
3. Locate **SECTION VIDEO**
4. Set `vizlink_mode = 1`
5. Save the file

If the **Video version** is installed, do these steps:

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

2.14 Video Wall Configuration

This section details the hardware, software and configuration required to use a Video Wall.

IMPORTANT! All design and graphics should be tested on the actual Video Wall.

Note: The design and graphics can be tested on computer monitors as well. This must be done on a similar monitor stack as the Video Wall (i.e. 4x2 blocks), and that each monitor is the same make and model as the Video Wall (this is to avoid different configurations, and the look and feel, on the test configuration). For the best results performance tests should be done on the actual Video Wall as well.

Note: Make sure the resolution from each output is the same. The resolution setting depends on the scenes to be shown and how memory intensive they are.

Tip: Installation: Set one screen first (no multiple displays or Mosaic set) in the NVIDIA driver configuration. Make sure that the display can handle the Viz fullscreen.

This section contains the following topics:

- [Hardware Requirements](#)
- [Viz Engine Settings and Cables](#)
- [To Configure a Video Wall](#)

See Also

- [NVIDIA Driver Configuration](#)
- [Video Wall Driver Recommendations](#)

Hardware Requirements

- Xmio.2, DSXLE3 or NVIDIA Capture card (if live video input or clip play is required)
- One graphic card (i.e. one K5000 card) can support up to:
 - Four outputs: 2x DVI, 2x DP
 - Four monitors
- Two graphic cards (i.e. two K5000 cards) can support up to:
 - Eight outputs: 4x DVI, 4x DP
 - (five) Six to eight monitors
- NVIDIA G-SYNC III (Quadro sync card): Used to synchronize the graphics cards, of all Viz Engines, with the house clock

Viz Engine Settings and Cables

- When Viz Engine is On Air for the first time send the command 'RENDERER JOIN_SWAPGROUP 1' to make sure every monitor is in sync.

Note: Send only once while Viz Engine is running. Send RENDERER JOIN_SWAPGROUP 1 each time Viz Engine is re booted.

- Make sure that the monitor cables are the same for both cards. i.e., with 6 monitors three cables in each card
- Connectors from each monitor must be the same - use adaptors to connect to the machine

- Make sure the NVIDIA G-SYNC III receives the same reference signal as the video in card. When X.mio2 is used the loop through of the reference signal can be used:



To Configure a Video Wall

1. Configure the NVIDIA card (see [To Configure NVIDIA Driver Settings](#))
2. Configure the screen layout (see [To Configure Mosaic](#))
3. Configure the G-SYNC card (see [NVIDIA G-SYNC Card](#))
4. Configure the Viz Configuration:

Tip: Open Viz Configuration and import a Video Wall configuration profile (see [Installed Configuration Profiles](#)). Video Wall configuration profiles are located at: `<viz install folder>/Configuration Profiles`.

- [Output Format](#):
 - Set to **Fullscreen**
 - **PAL**: Set **Frame** to 50
 - **NTSC**: Set **Frame** to 59.94
- [Video Output](#):
 - Set **Video wall/Multi-display** to **Active**
 - Set **Show Video Output Config. Editor** to **Blackburst** or **Tri-Level**
 - If the NVIDIA SDI input card is used, set **Use NVIDIA SDI output/capture card(s)** to **Active**
- [Render Options](#): Set **On AIR Resolution** to **Desktop Resolution**

Note: This assumes that the Windows resolution is set as required.

2.15 Dolby E Support

Viz Engine is certified by Dolby for decoding Dolby E streams from the inputs into the Viz Engine, and encoding the first eight audio channels back to Dolby E on the output.

This section contains the following topics:

- [Dolby E Features](#)
- [Dolby E Configuration](#)

2.15.1 Dolby E Features

The Dolby E feature set in Viz Artist/ Engine is defined as follows:

- Dolby E is supported on Matrox Video I/O hardware only
- Dolby E is supported both as AES or embedded audio on the input and output side
- Decoding of one Dolby E stream (minimum eight/maximum 16 Dolby E channels) on all inputs.

Note: The Dolby E stream (encoded in a stereo pair) must be on the first two AES or embedded audio channels

- Encoding of one Dolby E stream (minimum eight/maximum 16 Dolby E channels) on the fill output.

Note: The Dolby E signal is encoded on the first two AES or embedded audio channels on the output.

- All audio channels from the Viz timeline can be mixed, as usual, with the decoded Dolby E signal from the inputs, and will be output together with the input audio as Dolby E
- Dolby E encoding and decoding can be configured independently, i.e. it is possible to input PCM audio and output Dolby E or vice versa
- You can also have PCM audio on one or more inputs and Dolby E audio on different input and mix them together
- Dolby E decoding from clip channels is **not** supported

Dolby E Licence

Each Dolby E stream processed in the system requires a license

For example if there are two input signals with Dolby E and the output is to deliver Dolby E as well, two decoder and one encoder licenses are required.

The Dolby E licenses are software licenses which reside on a software dongle and can hold multiple licenses for one system.

2.15.2 Dolby E Configuration

This section details the set up required in the Viz Config file and GUI.

This section contains the following procedures:

- [To Enable Dolby E Functionality](#)
- [To Set Audio in Channels as Dolby E Inputs](#)
- [To Enable Dolby E Encoding](#)

To Enable Dolby E Functionality

The Dolby E signal can be present in the embedded audio of the video signals, or on the AES inputs of the Matrox card.

1. Open the Viz Config file.
2. Set **DolbyEEnabled** to 1

To Set Audio in Channels as Dolby E Inputs

The Dolby E stream must be present in the sub-channel 0 and sub-channel 1 of the input.

1. Open the Viz Config file.
2. Configure these settings as shown:
 - ChannelDolbyEEnabled__0 = 1
 - ChannelDolbyEEnabled__1 = 0
 - ChannelDolbyEEnabled__2 = 0
 - ChannelDolbyEEnabled__3 = 0
 - ChannelDolbyEEnabled__4 = 0
 - ChannelDolbyEEnabled__5 = 0
 - ChannelDolbyEEnabled__6 = 0
 - ChannelDolbyEEnabled__7 = 0

To Enable Dolby E Encoding

This enables the encoding of the first eight internal audio channel to a Dolby E stream which will be sent to the output.

- Set **DolbyEOutput** to 1

Note: Only live video inputs are supported.

3 Getting Started

This section describes how to log in to a Graphic hub and start Viz Engine, and how to close Viz Engine.

This section contains information on the following topics:

- [Viz Engine Start-up and Close](#)
- [Viz Console](#)
- [Viz Command Line Options](#)

3.1 Viz Engine Start-up and Close

Viz Engine is started from various desktop options. To start and run Viz Engine a Graphic Hub must also be available.

Viz Engine can also be started with various options included (see [Viz Command Line Options](#)). To start Viz Engine with an option or options, the command for that option must be added before Viz Engine start-up.



This section contains information on the following topics and procedures:

- [To Start Viz Engine](#)
- [To Add a Viz Engine Startup Option](#)
- [To Close \(Quit\) or Restart Viz Engine](#)
- [Viz Configuration](#)
- [Viz Console](#)




See Also

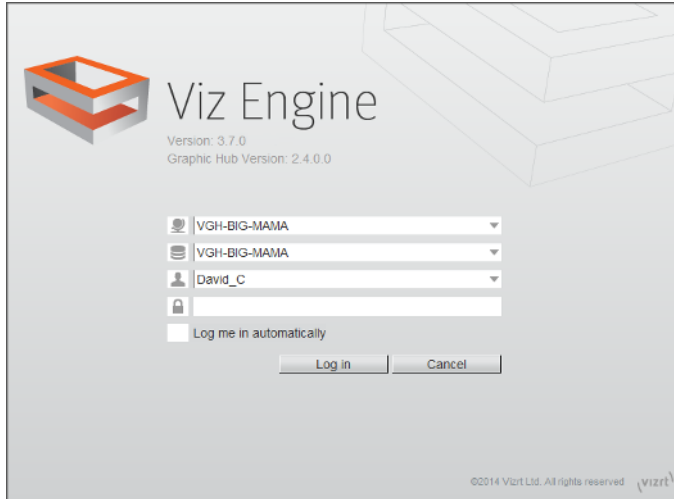
- [Install Viz Artist/Engine](#)
- [Dual Channel Mode](#)
- [Trio Box CG Mode](#)
- [Configuring Viz](#)

To Start Viz Engine

1. Start Viz Engine:
 - <double-click> the icon on the desktop  , or
 - <right-click> the desktop icon and select **Open** from the context menu, or
 - Use the Windows **Start** menu (example: *Start menu -> All Programs -> Vizrt -> Viz 3.x 64bit-> Viz Engine 3.x 64bit*)
2. In the Graphic Hub login window select the required details:
 -  : Select a Host from the drop-down list

Note: In some circumstances (e.g., server located in different sub-net) the host will not show in the list. The host name must then be typed in.

-  : Select a Graphic Hub from the drop-down list
-  : Select a User from the drop-down list
-  : Type the correct password for the selected User




- **Log me in automatically:** If auto log in is available, click to activate auto log in (see [Global Properties](#) in [Database](#) (Viz Configuration panel)).

Note: When auto log in is active Viz Engine will automatically log in into a Graphic Hub and start-up.

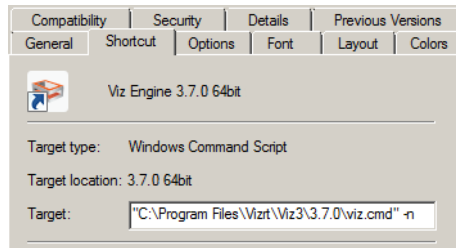
3. Click on:
 - **Log in:** Log in to the selected Graphic Hub and start-up Viz Engine
 - **Cancel:** Exit the login.

After a correct log in to a Graphic Hub, Viz Engine starts and opens the main screen.

To Add a Viz Engine Startup Option

1. Open the Viz Engine Properties panel:
 - <Right-click> the desktop icon and select **Properties** in the context menu  , or
 - Use the Windows **Start** menu (example: *Start menu -> All Programs -> Vizrt -> Viz 3.x 64bit-> Viz Engine 3.x 64bit*) and <right-click> the Viz Engine link and select **Properties** in the context menu
2. In the Properties window, apply a command in the **Target** field (see [Viz Command Line Options](#)).

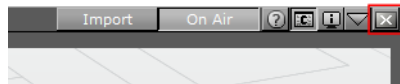
Example: "<viz install folder>\3.xx.x\viz.cmd" -n



3. Click **OK**.
4. Start Viz Engine ([To Start Viz Engine](#)).

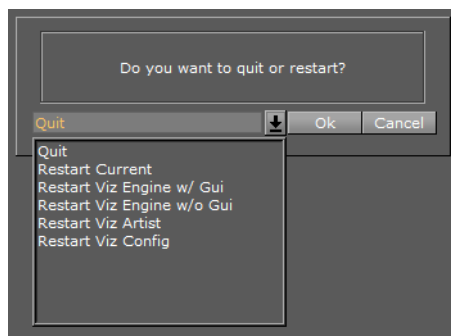
To Close (Quit) or Restart Viz Engine

1. Start the Quit or Restart, either:
 - Click on the **Quit** button (top right Button Bar)



or

- Press <double-Esc>, or
 - Press <Alt+Q>, or
 - Press <Alt+F4>
2. In the **Do you want to quit or restart?** panel:
 - Click **OK** to Quit (Quit (close) is the default option), or
 - Click on the drop down arrow to open the Quit or Restart menu
 3. In the Quit or Restart menu, select from the available options.
 4. Click **OK** or **Cancel**.



3.1.1 Viz Configuration

Viz Artist/Engine is mainly configured by the [Configuring Viz](#) panel. All configuration settings are stored in a Viz Config file, found in the <viz data folder>. The Viz Config file uses the machine hostname to uniquely identify which machine Viz Artist/Engine is installed on, for example, *Viz-<hostname>-0-0.cfg*.

Any changes to the hostname will affect the Viz Artist/Engine. If a hostname is changed, a new Viz Config file is created with a default setup. The old Viz Config file is not deleted, but left unused. If required, use the command **-g <config file>** (see [Viz Command Line Options](#)) to reassign the old Viz Config file.

IMPORTANT! Folder, File and Path Naming Convention: Do not use the Hash tag (#) in any folder, file or path name. If used in Folder, File and Path Names, text after a Hash tag will be ignored.

3.2 Viz Console

The Viz Console shows the commands that are used for the communication between the Viz Engine renderer and other components such as the Viz Artist GUI, Viz plug-ins and scripts.


The Viz console window is mainly used for debugging purposes.

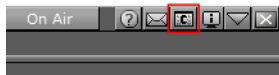
Internal Commands

For ease of use, internal commands can be set to be hidden or visible.

Example: Commands sent from plug-ins or scripts. Under certain circumstances some plug-ins need to send commands on every frame. This can make the Viz Console unreadable.

In the Viz Config file set `show_internal_commands` to 1, to view internal commands. This flag is set to 0 by default (internal commands are not visible).

To view the Viz Console, at any time, click the  (Show Commands) icon in the Viz Artist or Viz Engine GUI.



3.3 Viz Command Line Options

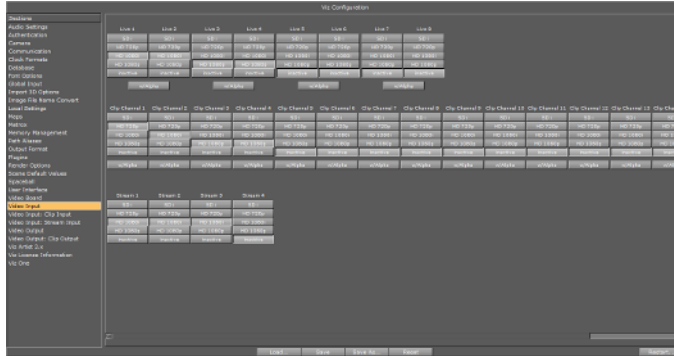
Viz Artist and Viz Engine can be started with various options included (see [To Add a Viz Engine Startup Option](#)). The table below details the available option commands.

Command	Description
-3D	To playback 3D Stereo Clips. This sets Viz Artist 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: This is for clips only
-B<path>	Specify the path where Viz Engine stores its temporary data (see Viz Artist/Engine Folders)
-c	Start in Viz Configuration mode (see also -u1, -u2, -u3)
-C	Start without a console

Command	Description
-g <config file>	Start with a predefined Viz Config file. This allows a User to have more than one startup option
-i	Enable pre-initialization of textures. Textures are generated on the graphics card immediately after loading an image
-l	Specify a console title to distinguish Viz Engines in a Dual Channel setup (example: <code>-l <title></code>)
-n	Start in Viz Engine mode (see also -u1, -u2, -u3)
-o <scene>	Start in Viz Engine mode with an optional auto load scene in the Main Layer (example: <code>-o SCENE*<path></code>)
-o <layer> <scene>	Start in Viz Engine mode with an optional auto load Scene and loads it into a specific layer: 0 ... Back Layer 1 ... Main Layer 2 ... Front Layer (example: <code>-o 2 SCENE*<path></code>)
-T	Keep the Viz Engine Console always on top
-u1, -u2, -u3 (up to a maximum of 24)	For systems with two or more graphic cards (i.e. Trio One Channel / Dual Channel). Specify GPU1 (-u1), GPU2 (-u2), etc., to run the program on (see -c and -n), for example: <code>"<viz install folder> viz.cmd" -c -u2</code> <code>"<viz install folder> viz.cmd" -n -u1</code> When either Trio One Channel or Dual Channel Viz Artist versions are installed, GPU's are selected by default. Note: Viz Artist will run on one GPU only. Only the control GPU should have a display connected and will be used for Artist/Preview.
-v	Enable verbose mode. This enables all possible information to be shown in the Viz Engine Console
-V	Show the last rendered frame on video output (only Digital Voodoo cards)
-Y<path>	Specify the path where Viz Engine stores its program data (see Viz Artist/Engine Folders)

4 Configuring Viz

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



The Viz Configuration user interface is divided in two:

- **Sections:** Shows a list of all the sections available for configuration
- **Configuration Parameters:** Shows all available configuration parameters for each section

Various parameters regarding the program functionality can be set in the configuration.

Note: Additional and more advanced settings can be set in the Viz Config file (not recommended).

Viz Artist/Engine is mainly configured with the Viz Configuration. However, all configuration settings are stored in a Viz Config file (located in the <viz data folder>). The Config file uniquely identifies the machine that Viz Artist/Engine is installed on by the use of its hostname (e.g. *Viz-<hostname>-0-0.cfg*).

Any changes to the hostname will affect the configuration. If a hostname is changed, a new Viz Config file is created with a default setup. The old Viz Config file is not deleted, but left unused. If required, the old Viz Config file can be reassigned with the command `-g <config file>`.

Caution: Make sure that any changes are saved before Viz Configuration is closed. Changes are not saved and will not take effect until Viz Artist has been closed and started again.

IMPORTANT! Folder, File and Path Naming Convention: Do not use the Hash tag (#) in any folder, file or path name. If used in Folder, File and Path Names, text after a Hash tag will be ignored.

This section contains information on the following topics:

[Working with Viz Configuration](#)

[Audio Settings](#)

[Authentication](#)

[Output Format](#)

[Plugins](#)

[Render Options](#)

Camera	Scene Default Values
Communication	Spaceball
Clock Formats	User Interface
Database	Video Board
Font Options	Video Input
Global Input	Video Input: Clip Input
Import 3D Options	Video Input: Stream Input
Image File Name Convert	Video Output
Local Settings	Video Output: Clip Output
Maps	Viz Artist 2.x
Matrox	Viz License Information
Memory Management	Viz One
Path Aliases	Viz Artist/Engine Log Files

4.1 Working with Viz Configuration

Viz Artist/Engine is configured by a Viz Config file. Click the Viz Artist GUI **Config Button** or start Viz Configuration from the program menu.

Viz Artist/Engine also has a selection of [Installed Configuration Profiles](#).


IMPORTANT! Folder, File and Path Naming Convention: Do not use the Hash tag (#) in any folder, file or path name. If used in Folder, File and Path Names, text after a Hash tag will be ignored.

Note: Saved configuration profiles only save settings that differ from the default configuration of a setup (e.g. VGA, Video, etc.).

This section contains information on the following topics and procedures:

- [To Start Viz Configuration](#)
- [Modify Viz Configuration](#)
- [Installed Configuration Profiles](#)

To Start Viz Configuration

- Click on the Viz Configuration icon on the desktop , or
- Click *Start > All Programs > Vizrt > Viz 3 > Viz Config 3*, or
- If Viz Artist is running, click **Config**, or
- If Viz Artist is running, press <F11>

4.1.1 Modify Viz Configuration

This section details how to Save, Save as..., Reset and Load saved Viz Configurations.

This section contains the following procedures:

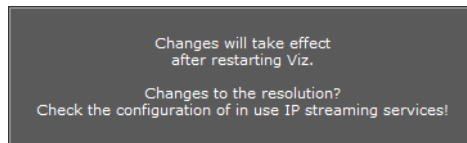
- [To Save a Current Configuration](#)
- [To Save a New Configuration Profile](#)

- [To Load a Saved Configuration Profile](#)
- [To Reset the Viz Config File](#)
- [To Restart Viz Configuration](#)

To Save a Current Configuration

1. Start Viz Configuration.
2. Change the configuration as required.
3. Click **Save**.

IMPORTANT! Changes made to the resolution can affect an in use IP streaming service. Make sure to check the IP streaming service configuration.

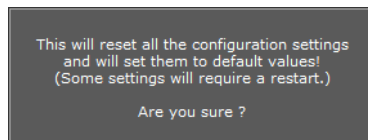


4. Click the **Restart...** button to apply the saved changes. The Viz Config file is updated.

To Reset the Viz Config File

The **Reset** button sets the configuration to default settings.

1. Start Viz Configuration.
2. Click **Reset**.



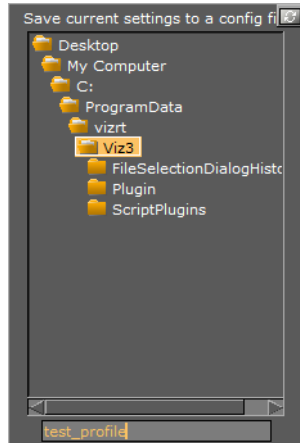
3. Click **Restart...** to apply the changes.

To Save a New Configuration Profile

Note: A saved Configuration Profile cannot be save to the <viz install folder>. A UAC requirement is that an application must not write into the installation folder (see [User Account Control \(UAC\)](#)). The default location for saved Configuration Profiles is <viz data folder>.

1. Start Viz Configuration.
2. Change the configuration as required.

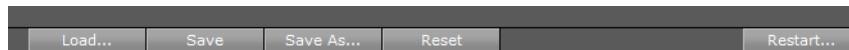
3. Click **Save As...**



4. Select a location to save the new Configuration Profile (default location is <viz data folder>).
5. Type a name for the new Configuration Profile.
6. Click **OK**.

To Load a Saved Configuration Profile

1. Start Viz Configuration.
2. Click **Load...**
3. Locate a saved Configuration Profile (*.cfg).
4. Open the required Configuration Profile.
5. Click **Restart...** to load the saved Configuration Profile.



To Restart Viz Configuration

Click the **Restart...** button to save changes.

1. Click **Restart...**
2. Select from:
 - Current
 - Viz Engine w/GUI
 - Viz Engine w/o GUI
 - Viz Artist
 - Viz Config

4.1.2 Installed Configuration Profiles

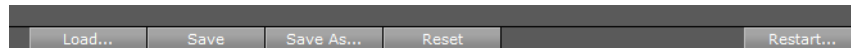
Viz Artist/Engine is also installed with a selection of Configuration Profiles. These profiles are a set of predetermined basic settings to run Viz Artist/Engine for specific purposes, for example, [Dual Channel Mode](#), [Trio Box CG Mode](#) or a [Video Wall Configuration](#).

Once loaded in to the Viz Configuration these files can be modified to refine the profile to specific needs, which can then be saved (see [To Save a New Configuration Profile](#)).

The installed Configuration Profiles are located at: <viz install folder>/Configuration Profiles.

To Load an Installed Configuration Profile

1. Start Viz Configuration.
2. Click **Load...**
3. Go to <viz install folder>/Configuration Profiles.
4. Open the required Configuration Profile.
5. Click **Restart...** to load the Configuration Profile.



4.2 Audio Settings

This section contains information on the following topics:

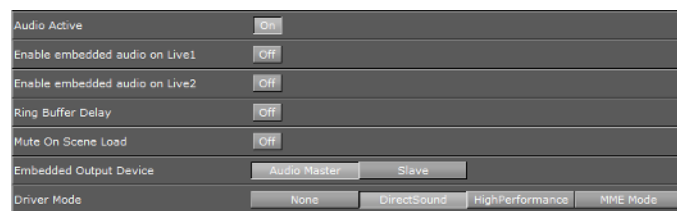
- [Audio Properties](#)
- [Audio Panel Procedures](#)

4.2.1 Audio Properties

This section contains the following topics:

- [VizBoldVarious Tab](#)
- [Channels Tab](#)
- [Setup Tab](#)

Various Tab



- **Audio Active:** Makes audio active or inactive
- **Enable embedded audio on Live1:** Enable embedded audio for use together with video as Texture or DVE. Live1 channel must be enabled (see [Video Input](#))
- **Enable embedded audio on Live2:** Enable embedded audio for use together with video as Texture or DVE. Live2 channel must be enabled (see [Video Input](#))
- **Ring Buffer Delay:** Audio system compensates the ring buffer delay during clip playback. Ring buffer is ignored when disabled
- **Mute On Scene Load:** If this flag is active, the audio is muted before any Scene load commands are executed. This is necessary for video cards which do not mute the audio automatically, when no video refresh happens.

.....
Note: Additional commands to mute audio can be added in the Viz Config file.

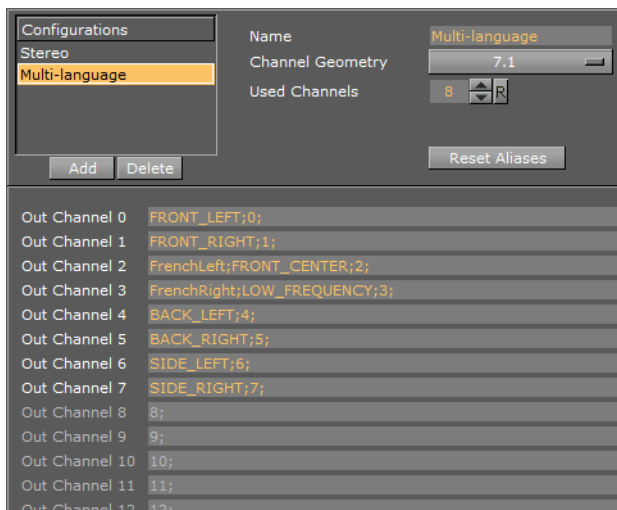
- **Embedded Output Device:** In a Matrox/NVIDIA SDI combination, two audio devices are available. This parameter defines which audio card is responsible for the audio output:

- **Audio Master:** The NVIDIA Card is the audio output. Matrox audio will be mixed in (clips) but does not output on the AES outputs
- **Slave:** Audio is done on the Matrox card only. NVIDIA audio is disabled

Note: In an **NVIDIA SDI** only environment, the Slave button changes to Disabled (disable the audio for this device). In a Matrox only environment, Embedded Output Device is not available.

- **Driver Mode:** Select from:
 - **None:** No sound card output
 - **DirectSound:** Use Direct sound
 - **High Performance:** Use high performance [MME](#) mode (this only works for Wave driver cards)
 - **MME Mode:** Use [MME](#) mode

Channels Tab



- **Configurations:** Shows a list of channel configurations.
- **Add:** Adds a new channel configuration to the Configurations list.
- **Delete:** Deletes the selected channel configuration from the Configurations list.
- **Name:** Set the name of the selected channel configuration.
- **Channel Geometry:** Sets the channel geometry. Options are:
 - Mono
 - Stereo
 - Anamorphic wide-screen
 - 7.1
 - Quad
- **Used Channels:** Set 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:** Set the channel aliases to the default option (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 useful to create multilingual systems, and also to define the channel geometry for the Default and FX audio clip mix modes. Aliases are separated by a semicolon. The **Audio** plugin only uses the channel aliases to find the correct speakers for Pan and 3D sound effects in FX mode. With this functionality any of the 16 internal audio channels can be used to play any audio geometry.

Setup Tab

The Setup tab lists all available audio devices available to the Viz Engine audio mixer (see [Audio in Viz](#)).

All devices listed with **Device0** are DirectSound compatible devices installed on the system. **Device0** is always the default playback device, configurable through **Sound** options in the Windows system **Control Panel**.

When a Matrox card is installed, Matrox audio is available.

With Matrox audio there are different ways of to capture audio for use with the Viz Engine audio mixer, before it is sent to output, again:

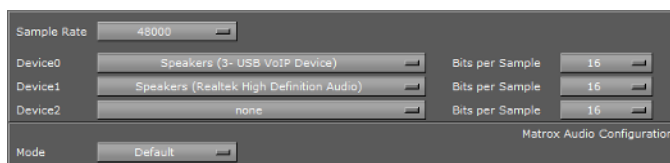
- 1) Capture audio embedded in the live video input signal from the live input connectors, or
- 2) Capture audio from the AES connectors

The final output is the same, either embedded as part of the live video output signal, or separated out to the AES output connectors.

In addition, simply loop audio through the system. This will make the embedded or AES audio unavailable to the Viz Engine audio mixer.

The **Default** mode captures audio and directs it to the default onboard audio device with no output on the Matrox card output connectors.

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



- **Sample Rate:** *Reserved for later use.* Shows the sample rate. Default sample rate is 48kHz (48000) which is the maximum allowed.
- **Device n :** Shows the name of the audio card.
- **Bits per Sample:** *Reserved for later use.* Shows the number of bits used per sample. Default value is 16 Bit per sample rate.
- **Mode:** Refers to the audio mode of the Matrox board. Options are:

- **Embedded:** Audio is captured from the Live video input connectors and made available to the Viz Engine audio mixer, to mix it with other audio sources. Then output as embedded audio on the live video output connectors
- **AES:** Audio is captured from the AES input connectors and made available to the Viz Engine audio mixer, to mix it with other audio sources. Then output on the AES output connectors
- **Embedded -> AES:** Embedded audio is captured from the live video input connectors and made available to the Viz Engine audio mixer, to mix it with other audio sources. Then output on the AES output connectors
- **AES -> Embedded:** Audio is captured from the AES input connectors and made available to the Viz Engine audio mixer, to mix it with other audio sources. Then output as embedded audio on the live video output connectors
- **Loop:** Audio is looped through. No audio is mixed
- **Default:** Audio is captured, but no output on the Matrox card

Note: Matrox X.mio only supports balanced audio through XLR connectors. X.mio 2 and X.mio 2 Plus only supports unbalanced audio through BNC connectors.

4.2.2 Audio Panel Procedures

This section contains the following topics and procedures:

- [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](#)

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.mio
- Up to 8 channels per engine for an X.mio2 and X.mio2 Plus.

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.mio/X.mio2/X.mio2 Plus.

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

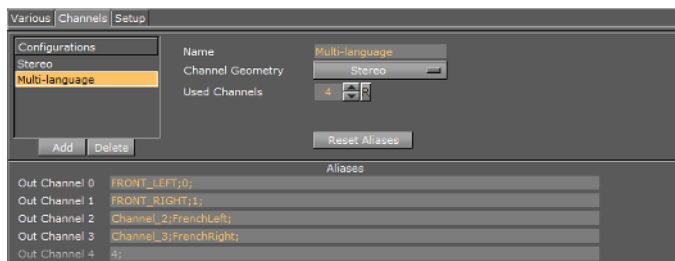
To Add New Audio Channels

1. Click the [Channels Tab](#).
2. Click **Add**.
3. Select the new entry in the **Configurations** list
4. Enter the new name in the **Name** field.
5. Set the **Channel Geometry**.

6. Set the number of **Used Channels**.
7. Click **Save**.

To Add Multi-language Audio Channels

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



To Add Multiple Audio Channel Configurations

1. Repeat [To Add Multi-language Audio Channels](#) to add three more Multi-language Audio Channels.

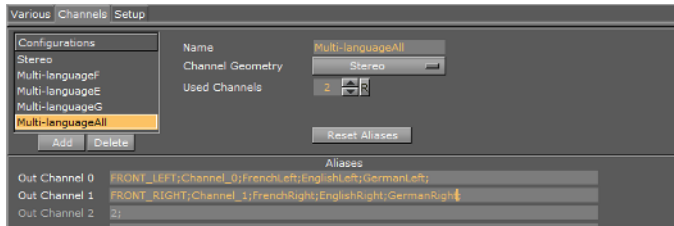
Name the configurations the following way:

- **Multi-languageF**
- **Multi-languageE**
- **Multi-languageG**

2. Add a **Multi-languageAll** configuration (see [To Add Multiple Audio Channel Configurations](#)).
3. 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;
```

4. Click **Save**.



To Map Audio Output for a Dual Channel Setup

1. In a Dual Channel environment there are two Config 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 = 0
```

Note: In a stereo setup the audio must be set to OFF completely in Viz Engine (2).

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 set to off:

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

To Delete Audio Channels

1. Select a configuration entry from the **Configurations** list.
2. Click the **Delete**.
3. Click **Save**.

To Manually Activate an Audio Device

1. Open the Viz Config 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 Viz Config file.

Example: AudioDevice0 = Realtek HD Audio output

4.3 Authentication

The Authentication panel is for the authentication of one or more Viz One systems on Viz Artist. Enter the details of each Viz One system to connect to.

All three panels (Host Info, Realm and User Info) of the Authentication panel must be completed to save a new User (if a Realm is not required type <empty> in the Realm panel). If only one or two panels are completed then the information will not be saved.

- **Host Info:** The host name of the Viz One server

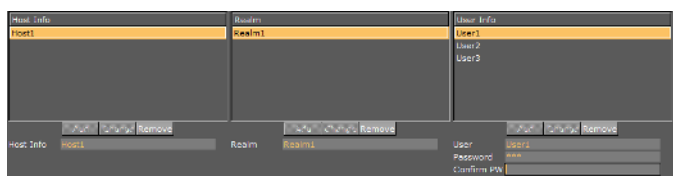
Note: The host info is in the form 'host:port', where the : sign and the port number is optional. A single value of * shows that it should be used against all hosts. The host info is not just the Viz One host name, it could also be the IP address.

Example: Host Info = hostname[:port] or ip-address[:port] or '*'

- A Host cannot be added without at least one Realm (or an empty Realm with <empty> entered) and one User defined
- A Host can have more than one Realm.
- **Realm:** Used to determine whether this entry should be used in an authentication process for a given URI

Example: A single value of * shows that it should be used against all realms, i.e., Realm = [a-zA-Z_0-9]* or '*'

- A Realm cannot be added to a Host without at least one User defined
- A Realm can have more than one User.
- **User Info:** Name and password for each User, for the selected Host and Realm



This section contains information on the following topics:

- [Authentication Properties](#)
- [Authentication Panel Procedures](#)

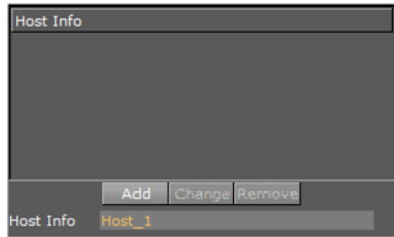
4.3.1 Authentication Properties

This section contains information on the following topics:

- [Host Info Properties](#)
- [Realm Properties](#)

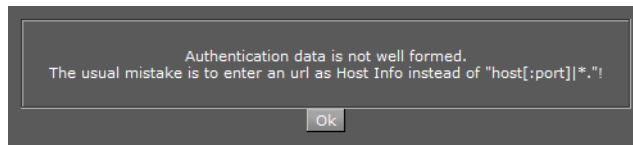
- [User Info Properties](#)

Host Info Properties

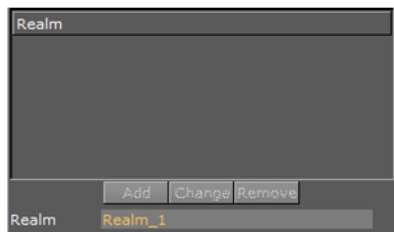


- **Add:** Add a host name (see [To Add a Viz One Host](#))
- **Change:** Change a selected host name (see [To Change a Host, Realm or User Name](#))
- **Remove:** Remove a selected host name (see [To Change a Host, Realm or User Name](#))
- **Host Info:** Enter the name of the required Viz One host

Note: Do not enter a URL as the Host Info name. The Host Info name format must be "host[:port]]*" (example: vmetest04.ardendo.se:8080).

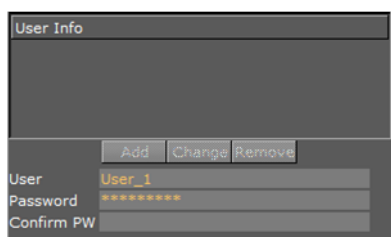


Realm Properties



- **Add:** Add a Realm (see [To Add a Realm](#))
- **Change:** Change a selected Realm (see [To Change a Host, Realm or User Name](#))
- **Remove:** Remove a selected Realm (see [To Change a Host, Realm or User Name](#))
- **Realm:** Enter the name of the required Realm

User Info Properties



- **Add:** Add a User (see [To Add a User](#))
- **Change:** Change a selected User (see [To Change a Host, Realm or User Name](#))
- **Remove:** Remove a selected User (see [To Change a Host, Realm or User Name](#))
- **User:** Enter the User name
- **Password:** Enter a password for the User (if required)
- **Confirm PW:** Confirm the User password (if required)

Note: A User password is not mandatory.

4.3.2 Authentication Panel Procedures

This section contains information on the following topics:

- [To Add a Viz One Host](#)
- [To Add a Realm](#)
- [To Add a User](#)
- [To Change a Host, Realm or User Name](#)
- [To Delete a Host, Realm or User Name](#)

Note: Do not enter a URL as the Host Info name. The Host Info name format must be "host[:port]|*." (example: vmetest04.ardendo.se:8080).

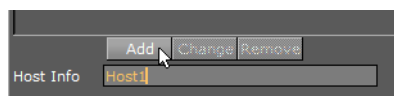
Note: After the completion of the required procedures make sure that Viz Artist is restarted. Changes are not save until Viz Artist has been restarted.

Note: Only entries which consist of Host + Realm + User will be saved to the config-file.

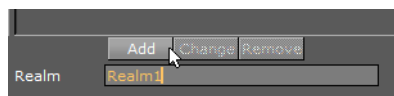
To Add a Viz One Host

To add a Viz One Host, a Realm and a User must also be defined.

1. Enter a Viz One Host name.
2. Click **Add**.



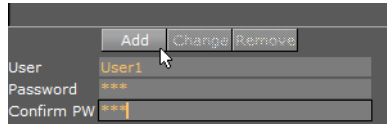
3. Enter a Realm name (if no Realm is required enter <empty>).
4. Click **Add**.



5. Enter the new User name.
6. Enter a User password (if required).

Note: A User password is not mandatory.

7. Confirm the User password (if required).
8. Click **Add**.

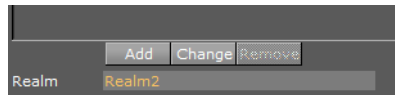


9. Click **Save** or **Save as...**



To Add a Realm

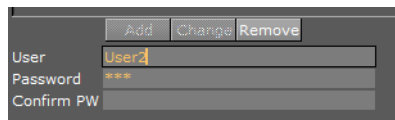
1. Click on a Viz One Host.
2. Enter a Realm name.
3. Click **Add**.



4. Enter a User name.
5. Enter a User password (if required).

Note: A User password is not mandatory.

6. Confirm the User password (if required).
7. Click **Add**.



8. Click **Save** or **Save as...**



To Add a User

1. Select a Viz One Host.
2. Select a Realm.
3. Enter a User name (overwrite any current User name).
4. Enter a User password (if required (overwrite any current User password)).

Note: A User password is not mandatory.

5. Confirm the User password (if required).
6. Click **Add**.
7. Click **Save** or **Save as...**

Note: The password of the currently highlighted User will always show in the **Password** box.

To Change a Host, Realm or User Name

1. Click in the name field for either the:
 - Host Info
 - Realm
 - User
2. Make a change to the name as required.
3. Click **Change**.
4. Click **Save** or **Save as...**

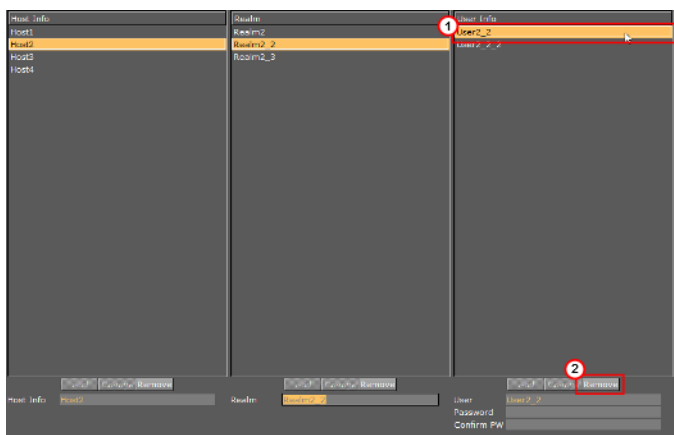
To Delete a Host, Realm or User Name

Note: If a Host is removed, any defined Realms or Users for that Host will also be removed.

Note: If a Realm is removed, all Users for that Realm will also be removed.

Note: When the last User is deleted then the related realm is deleted as well.

1. Make sure that the item to be deleted is highlighted (1).
2. Click **Remove** (2) for either the:
 - Host Info
 - Realm
 - User
3. Click **Change**.
4. Click **Save** or **Save as...**



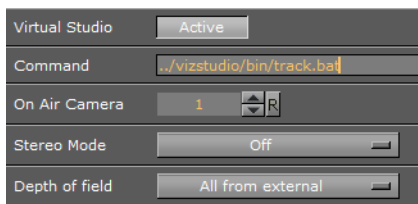
4.4 Camera

In the Camera section, special camera behavior settings which are used for virtual studio setups, can be set. 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.

This section contains information on the following topics:

- [Camera Properties](#)
- [EVS Epsio Tracking](#)

4.4.1 Camera Properties



- **Virtual Studio:** When set to **Active** the tracking process will be started when Viz Engine is started
- **Command:** Set 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:** (license required):

Note: Stereo Mode settings only take effect when the design is taken on air.

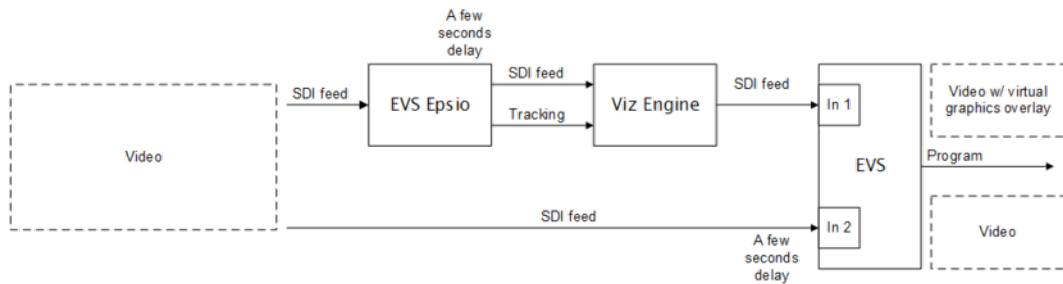
- **Off:** Stereo mode is not available and can not be seen in the GUI **Camera Editor**
- **Quad Buffered:** When using nVisio glasses together with a monitor with a frequency >100Hz the image for the left/right eye will be shown alternately and the glasses will darken the other eye. This configuration provides the full resolution
- **Over Under Left Top/Over Under 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 Eye/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/Side By Side Right:** Both images will be rendered side by side, either left or right first. The image width will be halved, providing half resolution
- **Depth of field:** Define from where parameters will be taken:
 - **Use editor:** parameters for depth of field are taken from the editor
 - **Focal plane from external:** only the focal plane is taken from the external camera
 - **All from external:** all parameters are taken from the external camera

See Also

- [EVS Epsio Tracking](#)

4.4.2 EVS Epsio Tracking

EVS Epsio is an optical tracking system produced and sold by [EVS Broadcast Equipment SA](#). When integrated with Viz Engine, it is commonly used in combination with a Matrox board.



The Epsio system is based on image recognition and is able to analyze a dirty feed of field-based sports (e.g. soccer and tennis) to generate camera position, rotation and field of view information for external render engines like Viz Engine.

As the Epsio system analyzes the video and generates tracking information for the actual camera, tracking data is shared with Viz Engine by sending video to the Matrox' live input. The tracking data is used to modify Viz Engine's virtual cameras accordingly. For the graphics designer nothing changes, except that the camera is moved by an external source.

Note: For information on how to setup and connect the Epsio system, please refer to relevant Epsio documentation.

This section contains information on the following procedures:

- [To Activate Epsio Tracking for Viz Engine](#)
- [To Activate Epsio Tracking for Viz Engine via a Command](#)

To Activate Epsio Tracking for Viz Engine

1. Open the **Viz Config** file (e.g. *VIZ-<machine name>-0-0.cfg*)
2. Go to **SECTION CAMERA**
3. Set the **evs_tracking_port** entry to match the port used by the Epsio tracking system to send the camera tracking data
 - If this port is set to 0, the Epsio system is deactivated
 - The **evs_command_port** is for future use and should be set to 0
4. **Restart** Viz Engine
 - Viz Engine's EVS Epsio receiver should be ready to use.

To Activate Epsio Tracking for Viz Engine via a Command

In Viz Engine the system is activated by the following command:

```
-1 RENDERER*CAMERA1*EVS_TRACKING SET <delay>
```

<delay> tells the system for how many fields the tracking should be delayed. Usually a delay of 10 fields is used. This can vary depending on the video card used. If <delay> is set to 0 the EVS system is deactivated.

The following example activates Epsio tracking with a delay of 10 fields

```
-1 RENDERER*CAMERA1*EVS_TRACKING SET 10
```

The following example deactivates Epsio tracking

```
-1 RENDERER*CAMERA1*EVS_TRACKING SET 0
```

See Also

- [Camera Properties](#)

4.5 Communication

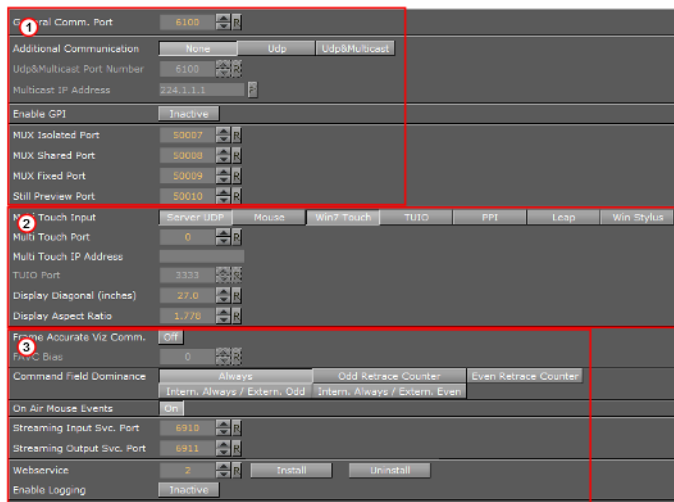
In this section, network connections can be set. External control software, for example, Viz Trio, uses TCP/IP network connections to send commands to the Viz Engine renderer engine (some external communications are also through UDP). Viz Artist expects the commands at the ports which are defined here.

The Communication panel has three tabs, Global, Shared Memory and VDCP (Video Disk Control Protocol).

This section contains information on the following topics:

- [Global Properties](#)
- [Shared Memory Properties](#)
- [VDCP Properties](#)

4.5.1 Global Properties



This section contains the following topics:

- [Properties in Global Tab \(1\)](#)
- [Properties in Global Tab \(2\)](#)

- [Properties in Global Tab \(3\)](#)

Properties in Global Tab (1)

General Comm. Port	6100
Additional Communication	None Udp Udp&Multicast
Udp&Multicast Port Number	6100
Multicast IP Address	224.1.1.1
Enable GPI	Inactive
MUX Isolated Port	50007
MUX Shared Port	50008
MUX Fixed Port	50009
Still Preview Port	50010

- **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 (TCP).
- **Additional Communication:** Enables commands to be sent to Viz Engine on UDP and Multicast or a combination of the two. This is used by 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.

Note: The default maximum number of TCP connections is limited to 255. Within this number of connections a User defined limit of maximum connections can be set (see [To Limit the Number of TCP Connections](#)).

- **Enable GPI:** GPIO device control. Enables frame accurate triggering of commands via GPI (general purpose interface). Vizrt 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.

Properties in Global Tab (2)

Multi Touch Input	Server UDP Mouse
Multi Touch Port	0
Multi Touch IP Address	
TUIO Port	3333
Display Diagonal (inches)	27.0
Display Aspect Ratio	1.778

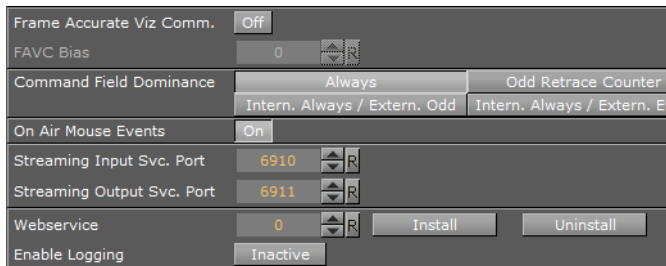
- **Multi Touch Input:**
 - **Server UDP:** The Viz Multi Touch Interface (see protocol documentation, Viz MultiTouchServer) is used to retrieve Multi Touch events. An external server application is connected to the touch device, it translates the hardware messages into the Viz Multi Touch Protocol and sends it via UDP to Viz Artist/Engine. The internal Multi Touch events in script and plugin API will be triggered.
 - **Mouse:** Use to test trigger Multi Touch callbacks through a standard mouse device

- **Win7 Touch:** Win7 Touch messages are used to generate Multi Touch events in Viz Artist/Engine
- **TUIO:** (Tangible User Interface Object) Select this if the touch device and/or application works with TUIO/OSC (Open Sound Control).
- **PPI:** With the Perceptive Pixel API it is possible to retrieve additional information from PPI touch screens, e.g. it is possible to get pressure information for each touch on the device. A license from Perceptive Pixel is required to use this Multi Touch input

Note: Many PPI screen drivers support a Win7 Touch emulation mode as well, which means that the system is not bound to the PPI API.

- **Leap:** Leap Motion is a hand and finger tracking device. Activate to receive multi-touch events from Leap.
- **Win Stylus:** Activates stylus pen input.
- **Multi Touch Port:** Port number to listen to the multi touch server. Required for Server UPD communication.
- **Multi Touch IP Address:** IP address to listen to the multi touch server. Viz Artist/Engine sends Keep-Alive messages to the Multi Touch Server. You need to enter the IP address of this server. Required for Server UPD communication.
- **TUIO Port:** Sets the TUIO port number for communicating with a TUIO enabled multi-touch device. TUIO is a protocol for Table-Top Tangible User Interfaces. Default port for most TUIO applications is 3333.
- **Display Diagonal (inches):** (used for gesture recognition) Viz Artist/Engine can calculate transformations with momentum. For this it needs to know the real, physical, screen-dimension to calculate the correct animation speeds. The entered value should be in inches.
- **Display Aspect Ratio:** (used for gesture recognition) The real aspect ratio of the screen is needed as well (some screens do not have pixel aspect ratios of 1.0).

Properties in Global Tab (3)



- **Frame Accurate Viz Comm.:** Frame accurate commands through 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 Command is set to on. Could be negative as well.
- **Command 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.
- **On air Mouse Events:** Set mouse events in [On Air Mode](#) to On or Off
- **Streaming Input Svc. Port:** Port number for communication between the Viz Engine and a streaming input service
- **Streaming Output Svc. Port:** Port number for communication between the Viz Engine and a streaming output service
- **Webservice:** Enter the port number for communication with the Viz Engine REST interface. Default is 0 (Webservice inactive)

Note: To view the current documentation for the REST interface go to `http://localhost:<port number>/#/documentation`

- **Install:** Enter a port number and click **Install** to install the Webservice
 - **Uninstall:** Uninstall the Webservice
-

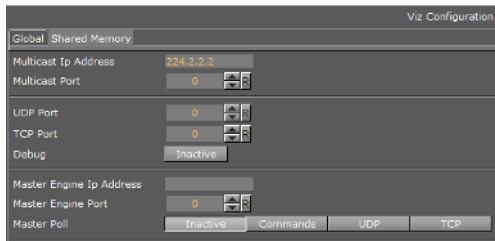
IMPORTANT! If [UAC](#) is active, the Webservice is not automatically installed, it must be installed (click **Install**).

- **Enable Logging:** Enable Webservice logging in the Viz Console

See Also

- [Shared Memory Properties](#)

4.5.2 Shared Memory Properties



- **Multicast IP Address:** Set the address for synchronizing distributed shared memory map without a Graphic Hub.
- **Multicast Port:** Synchronize shared memory between all Viz Engines listening to the multicast.
- **UDP Port:** Set the UDP listening port for the shared memory input.
- **TCP Port:** Set the TCP listening port for the shared memory input.
- **Debug:** Enable Shared Memory logging for UDP and TCP communication.
- **Master Engine IP Address:** Set the IP address of the master Viz Engine which holds the complete shared memory map (loaded during startup of Viz Engine).

- **Master Engine Port:** Set the initializing port for the shared memory on startup (the command port of the master Viz Engine).
- **Master Poll:** When enabled the Viz Engine will load the shared memory map from the master Viz Engine through the set communication protocol. Available options are:
 - Inactive
 - Commands
 - UDP
 - TCP

See Also

- [Global Properties](#)
- [Shared Memory \(SHM\)](#)
- **VizCommunication.Map** (see the [Viz Artist User Guide](#))

To Limit the Number of TCP Connections

From Viz Engine 3.3 the number of TCP connections to Viz Artist can be set in the Viz configuration.

Note: The maximum number of TCP connections is limited to 255.

1. Open the **Viz Config** file(for example: *Viz-<hostname>-0-0.cfg*).
2. Under **SECTION COMMUNICATION** set '**max_tcp_connections**' to the number of TCP connections required.

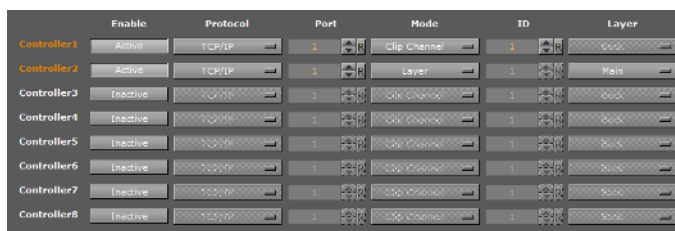
Note: If the number is set to 1 the first control application connecting to Viz Artist/Engine will get exclusive control over Viz Artist/Engine.

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

4.5.3 VDCP Properties

The VDCP (Video Disk Control Protocol) tab enables the configuration of up to eight external controllers which can then have basic control over clip-channels and render-layers (Front, Main, Back).

Basic control is the ability to set a clip and to start, stop, pause or continue playback of a clip, or the scene animation in the specific layer.

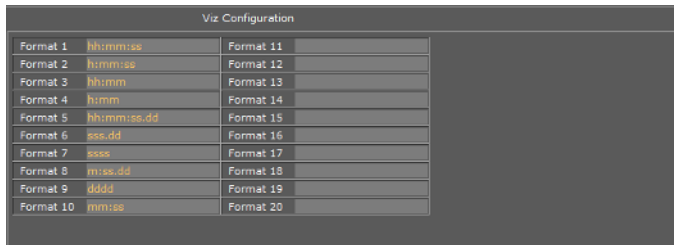


- **Controller <1 to 8>:** Configure up to eight external controllers.

Each Controller has these parameters:

- **Enable:** Make the Controller connection Active or Inactive
- **Protocol:** Select a protocol (TCP/IP or Serial connections) for the external control device
- **Port:** Enter a port number. This port is where an external VDCP client can connect to the specified VDCP controller of the Viz Engine.
- **Mode:** Select a mode:
 - **Clip Channel:** Enable the control of a selected video clip channel
 - **Layer:** Enable the control of animation in a layer
- **ID:** Available if **Mode** is set to **Clip Channel**. Select a Clip channel (an ID (1 to 16)) to control
- **Layer:** Available if **Mode** is set to **Layer**. Select either **Back, Main or Front**

4.6 Clock Formats



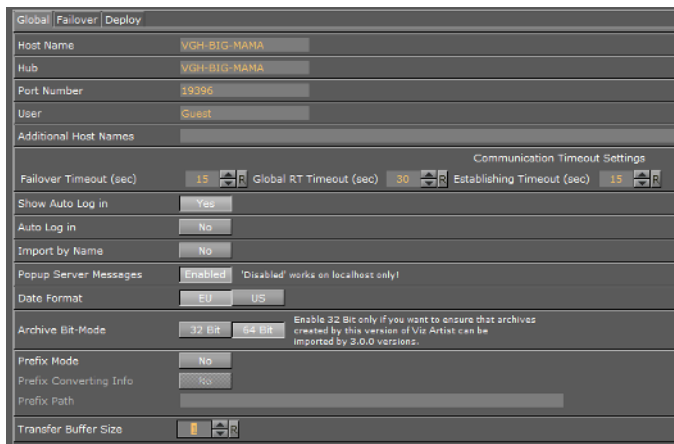
In this section, twenty (20) various digital date and time formats can be set.

- **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.

4.7 Database

The Database section has three tabs for setting connections to, e.g. a Graphic Hub, Failover servers and Deploy servers.



This section contains the following topics:

- [Global Properties](#)
- [Failover Properties](#)
- [Deploy Properties](#)

See Also

- [Graphic Hub User Guide](#)

4.7.1 Global Properties

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

Host Name	VGH-BIG-MAMA
Hub	VGH-BIG-MAMA
Port Number	19396
User	Guest
Additional Host Names	
Communication Timeout Settings	
Failover Timeout (sec)	15
Global RT Timeout (sec)	30
Establishing Timeout (sec)	15
Show Auto Log in	Yes
Auto Log in	No
Import by Name	No
Popup Server Messages	Enabled <small>'Disabled' works on localhost only!</small>
Date Format	EU US
Archive Bit-Mode	32 Bit 64 Bit <small>Enable 32 Bit only if you want to ensure that archives created by this version of Viz Artist can be imported by 3.0.0 versions.</small>
Prefix Mode	No
Prefix Converting Info	Yes
Prefix Path	
Transfer Buffer Size	1

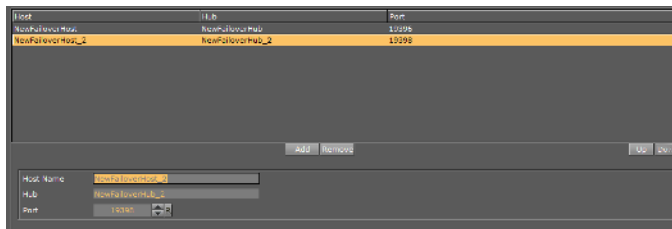
- **Host Name:** Enter the name of the Graphic Hub naming service. The naming service will always be a one to one map to the Host Name of the machine running a Graphic Hub.
- **Hub:** Enter the Graphic Hub server name.
- **Port Number:** Enter the listener port number for a Graphic Hub. The default port number is 19396, and should normally not be changed.
- **User:** Set the default user.
- **Additional Host Names:** If a Graphic Hub database, which is located on another sub-network, is used regularly, enter its Host Name. If multiple Host Names are required, separate them with ; (semi colon). Host Names entered will show in the Host Name drop-down box, at startup, highlighted in turquoise.
- **Communication Timeout Settings:**
 - **Failover Timeout (sec):** Set the maximum time to wait before a fail over is initiated from the main to the replication Graphic Hub.
 - **Global RT Timeout (sec):** Set the maximum response time for any request to a Graphic Hub.
 - **Establishing Timeout (sec):** Set the maximum waiting time to establish a connection to a Graphic Hub.
- **Show Auto Log in:**
 - **Yes:** Show the Auto log in check box in the Graphic Hub login window.
 - **No:** The auto log in check box is hidden.
- **Auto Log in:** Enable or disable automatic log in to a Graphic Hub. This will disable the log in screen for Viz Artist/Engine.

- **Import by Name:** Set to **Yes** to check for objects by name rather than by UUID. Set to **No** to check by UUID.
- **Popup Server Messages:** Enable or disable popup server messages. Disabled only works on local host.
- **Date Format:** Set the date format to EU (DD.MM.YYYY 13:54) or US (MM/DD/YY 01:54).
- **Archive Bit-Mode:** Set 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 versions prior to build 2310.

- The following prefix settings are needed if an external control application is used that sends commands containing certain path locations, but where the path of the files is a different one on the Graphic Hub (e.g. because they were deployed to a specific location).
 - **Prefix Mode:** Activate the prefix mode.
 - **Prefix Converting Info:** Show 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.
- **Transfer Buffer Size:** The entered value is a multiplier for the standard buffer size of 51200 bytes and is only for the transfer buffer size to the Graphic Hub (Graphic Hub 2.4 and above only).

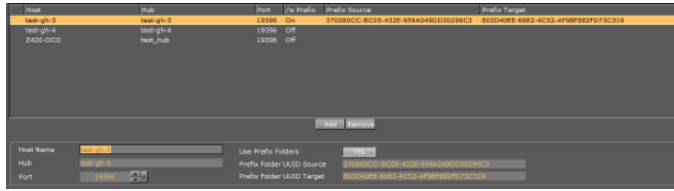
4.7.2 Failover Properties



To Add Redundant Servers to the Failover List

1. Enter the **Host Name** of a Failover server.
2. Enter the Graphic **Hub** instance for Failover.
3. Enter the **Port** number of the Graphic Hub for Failover.
4. Click **Add**.
5. Use the **Up** and **Down** buttons in the database Failover list to raise and/or lower a database's priority in the event of Failover.
6. Click **Save**.

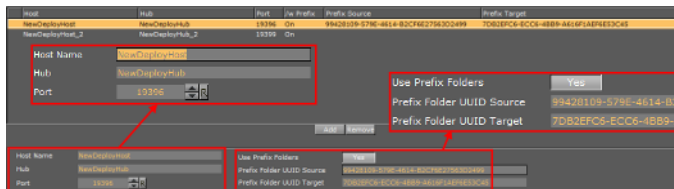
4.7.3 Deploy Properties



- **Added Deploy Servers Box:** View all available Deploy Servers
- **Add:** Add Deploy Servers (see [To Add Deploy Servers](#))
- **Remove:** Click to remove a selected Deploy Server
- **Host Name:** Enter the host name of the Graphic Hub machine to deploy files to
- **Hub:** Enter the name of the Graphic Hub instance to deploy files to.
- **Port:** Enter the Graphic Hub listener port number
- **Use Prefix Folders:** Set to **Yes** to select a source and destination folder for the deployment. Set to **No** to keep the structure the same as on the source server
 - **Prefix Folder UUID Source:** Enter the source folder UUID (Graphic Hub to deploy from)
 - **Prefix Folder UUID Target:** Enter the target folder UUID (Graphic Hub to deploy to)

Note: The Source folder must be a child folder of the Target folder.

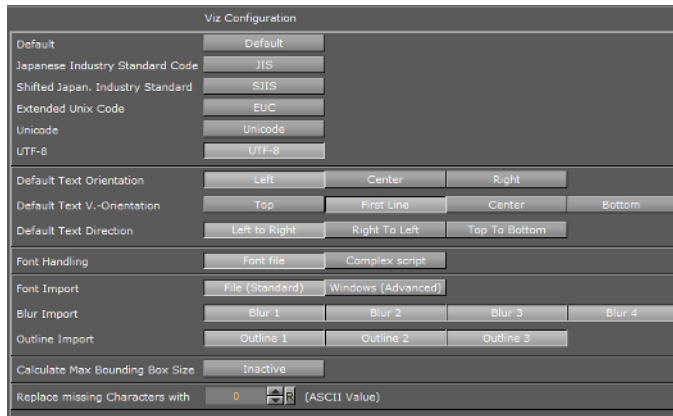
To Add Deploy Servers



Note: To configure deploy servers, the same User must also be logged in to the required source and deploy servers.

1. Enter the **Host Name** of a deploy server.
2. Enter the name of the deploy Graphic **Hub**.
3. Enter the **Port** number of the deploy Graphic Hub (default is 19396).
4. If specific source and destination folders are required, set **Use Prefix Folders** to **Yes**.
 1. Enter the UUID of the **Prefix Folder UUID Source**
 2. Enter the UUID of the **Prefix Folder UUID Target**
5. Click **Add**.
6. Click **Save**.

4.8 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 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 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 Artist/Engine 3.x to calculate the bounding boxes as they were calculated in Viz Artist/Engine 2.x. In Viz Artist/Engine 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 Artist/Engine 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 0-65535). Normal usage would select a * (42) or _ (95).

4.9 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 Artist/Engine is able to translate into three coordinates (xyz) based on a grid.



- **Group:** Define 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:** Make the synchronization of Viz Engine Scene properties Active or Inactive

To Synchronize Multiple Viz Engines

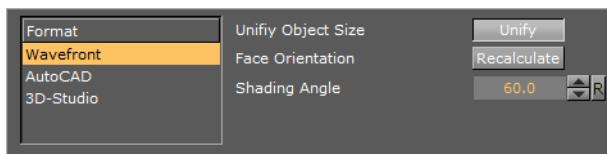
1. Start Viz Config on all involved render machines.
2. Set the same Group ID for all Viz Engines

3. Set **Synch. Properties** to Active.
4. Save and close all Viz Configs.
5. Open the Control Panel on all render machines
6. 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
 - The first connection can be determined by setting a manual metric in Windows: see <http://support.microsoft.com/kb/299540>
7. Start all Viz Engines again.
8. Create a simple test scene with a geometry and the Synchronized Properties plugin (Built Ins > Container > Global) on the same container.
9. Save the Scene.
10. Open the Scene on all involved Viz Engines.
11. Move the geometry on one Viz Engine.
 - All the other Viz Engines will show the same object movement.

4.10 Import 3D Options

In this section, parameters which influence the import of 3D objects can be configured. There are three different formats:

- Wavefront
- AutoCAD
- 3D-Studio



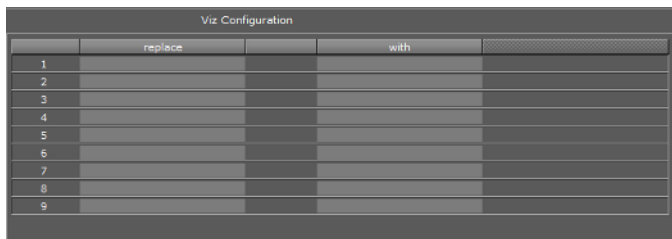
- **Unify Object Size:** If enabled, all vertices are recalculated during import in a way that the object center is moved to the origin (0,0,0), and the size of the object is 100 cm in its largest extent. If disabled, all vertices retain their values as defined in the original file. An object could appear invisible in a Viz Artist 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 renderer expects that all faces of an object point to the same direction. If enabling this function, Viz Artist 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 normals 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.

4.11 Image File Name Convert

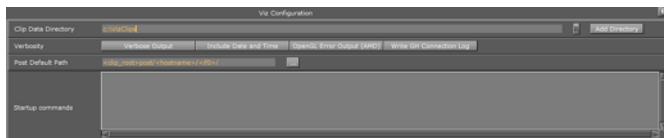
In this section, nine different replacement configurations can be set for image file names.

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:** Define the string to be replaced
- **With:** Define the replacement string

4.12 Local Settings



- **Clip Data Directory:** Set the clip directory (default directory is D:\ drive). Multiple directories can also be selected (see [Select Multiple Directories](#))

Note: This directory is also used for Viz One installations, as the root parameter for the Fsmon and Mediaftp services (see [Viz One](#)).

- **Verbosity:** Select content of log files, if no selection is made only the default content of the log file will be created:
 - **Verbose Output:** Enables the most information to be shown in the Viz Engine Console
 - **Include Date and Time:** Default content of the log file with date and time added
 - **OpenGL Error Output (AMD):** Default content of the log file with OpenGL Error Output (AMD) added
 - **Write GH Connection Log:** Default content of the log file with Write GH Connection Log added
- **Post Default Path:** Set the default location of **Render to Disk** clips

- **Startup commands:** Enter and save commands that will be executed on startup, but after the initial setup configuration and before the main render loop activates. Examples:

```

FEEDBACK*CLIENT ADD localhost 2001

FEEDBACK*COMMAND ADD localhost 2001 CLIPOUT

RENDERER*MAIN_LAYER SET_OBJECT Vizrt_RD/mra/
Reference/TC/TC_DISPLAY

MAIN*DEBUG_CONTROL*RENDERINFO*PERFORMANCE SET 1
    
```

Note: Log files will be written to the <viz data folder> directory, normally c: \ProgramData\Vizrt\viz3. This directory is by default hidden in Windows, so to navigate to this directory in Windows Explorer specify the explicit path. For more information see [Viz Artist/Engine Log Files](#).

4.12.1 Select Multiple Directories

More than one clip directory can be selected.

When more than one directory path is selected, for example, D:\AEClips; D:\DecoClips, etc., in the **Clip Name** box (see **Clip Properties** in the [Viz Artist User Guide](#)), change the file path to '<clip_root>'. The file name is then searched for, in the selected directories, one after the other, for stored video clips with the same name.

Example: Search for a video clip named 'next_tuesday.avi' in D:\AEClips\AFL \Promos. In the **Clip Name** box change 'D:\AEClips\AFL\Promos' to '<clip_root>'. The filename shown in Viz Artist should be <clip_root>\next_tuesday.avi

Note: The directory has to match the directory set when the Mediaftp service for video transfer from Viz One was installed.

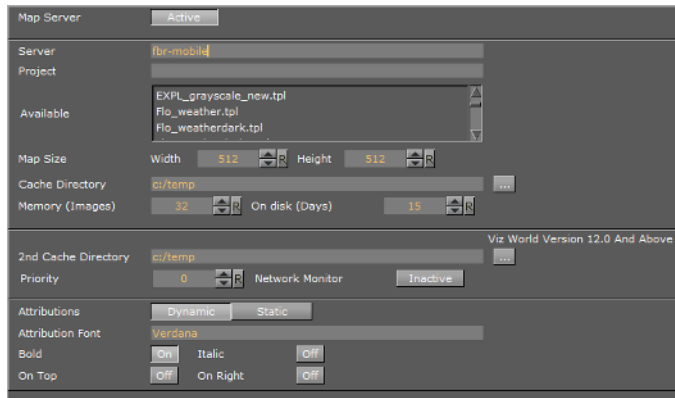
Multiple directories can be used with:

- A Dual Channel or Trio Box CG configuration, or
- With any Viz Artist/Engine configuration for the selection of a secondary video clip directory if a directory fails.

If the file path for a video clip is set to '<clip_root>', and the first directory falls over the same video file will be searched for and used, from the next directory in the Clip directory list.

If, when multiple Clip directories are selected, the **Clip Name** box (see **Clip Properties** in the [Viz Artist User Guide](#)) is used to search for a video, the search will default to the last used directory.

4.13 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 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.
- **2nd Cache Directory:** Enables a second cache (see Cache above). The main purpose of the second cache is to enable redundancy in those cases where a main cache directory is on a different computer and for some reason fails. Another use case is to use it as a local cache to save loading time (e.g. if you load all borders for the entire world you would have 100MB+ of cached files). To shorten load time you can copy large static files to the correct local cache folder. In the *3D Map Setting* plugin you will also find a *Sync Local Cache Folder* button which will copy all the needed files to your local cache. Note that the second cache directory settings can only be used by Viz World version 12.0 and later.
- **Priority:** Sets the machine's connection priority to the Viz World Server (Wos). Setting a number, where 1 is the lowest and 100 is the highest you may override connection priorities set by other machines. The configuration interface will allow you to prioritize client connections from Viz Artist and On Air Viz Engine's used for preview and program output. Viz Engines must be in On Air mode for them to be prioritized. For Viz World Map Editor you can set it from its context menu. To enable this behavior on the server side you need to enable WoS to prioritize its connections/log ins. For more information, see the [Viz World User's Guide Server Launcher Configuration](#) section. If the configuration option is not visible, please read how [To Add the VizWorld.ini File](#) and set the priority.
- **Network Monitor:** Enables you to monitor relevant network connections (server and cache folders). If you do not monitor the network and you try to connect

over a “disconnected network”, connecting to a server or a UNC path, it will take time before the system reports back (e.g. 30 seconds or more). Enabling network monitoring will avoid such connection issues. Note that the network monitor will only monitor a cache folder that use a UNC path (not mounted/mapped drives). If the configuration option is not visible you need [To Add the VizWorld.ini File](#).

- **Attributions:** Adds an attribution to the map. Alternatives are; Static and Dynamic.
 - **Dynamic:** Shows the attribution when a licensed imagery is in view and disappears when the image is out of view.
 - **Static:** Shows the attribution as long as there is a licensed imagery in the scene.
- **Attribution Font:** Sets the font for the attribution.
- **Bold:** Sets the attribution font to **bold**.
- **Italic:** Sets the attribution font to *italic*.
- **On Top:** Places the attribution image to the top in the screen. Default is bottom.
- **On Right:** Places the attribution image to the right in the screen. Default is left.

To Add the VizWorld.ini File

1. Create and save a VizWorld.ini file to the following location:
 - `<viz install folder>\plugin\data\maps`
2. Open the file and enter the following:

```
Monitor=1
Priority=1
Language=[my Language ID]
```
3. Save the file and start, for example Viz Config, to see the configurable parameters.

Monitor enables network monitoring. For more information see the **Network Monitor** setting under the [Maps](#) section.

Priority sets Viz' connection priority to the Viz World Server. For more information see the **Priority** setting under the [Maps](#) section and the [Viz World User's Guide Server Launcher Configuration](#) section on how to momenton the server side.

my Language ID refers to the order of languages in your list of languages (e.g. English = 0, Arabic = 1, Hebrew = 2 and so on). For more information see the **Languages** setting under the [Maps](#) section.

4.14 Matrox

In the Matrox section assign Matrox Input and Output channels to Viz Engine Input and Output channels.

The GUI shows a drop down menu for the configurable parameters. The parameters available is dependent on the installed hardware.

This section contains information on the following topics:

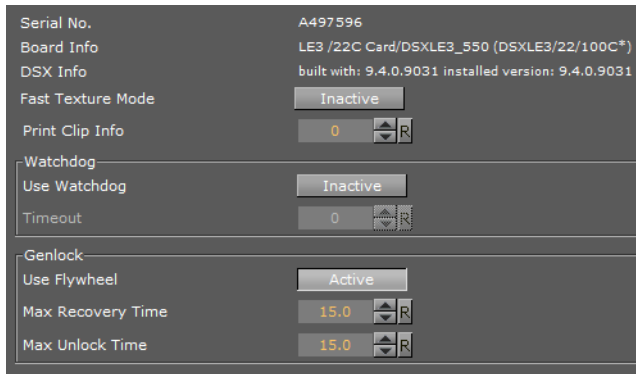
- [General Properties](#)
- [VideoOut Properties](#)
- [VideoIn Properties](#)

See Also

- [Video Input: Clip Input](#)
- [Video Input: Stream Input](#)
- [Video Output: Clip Output](#)

4.14.1 General Properties

The General properties panel 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.
- **Fast Texture Mode:** Activate to shorten the 'in out' delay in Texture Mode to a minimum.

Note: If **Fast Texture Mode** is set to Active, **DVE** will not work (see **Video Clip Playout Considerations** and **Video Playout** in the [Viz Artist User Guide](#)).

- **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.
- **Watchdog:** A timer that allows a system to continue video pass-through during an application crash or system failure (see also [Watchdog](#) (Matrox X.mio Series) and [Video Board](#)):
 - **Use Watchdog:** When set to **Active** enables the Matrox X.mio watchdog feature. It passes the input signal to the output when the Viz Engine is unresponsive. Default mode is **Inactive**. When set to **Active**, video out set to off, will activate the [VizBoldHardware Bypass](#) after a given timeout (see **Timeout**) (see also [VizBoldMechanical Bypass](#)).
 - **Timeout:** Set 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.

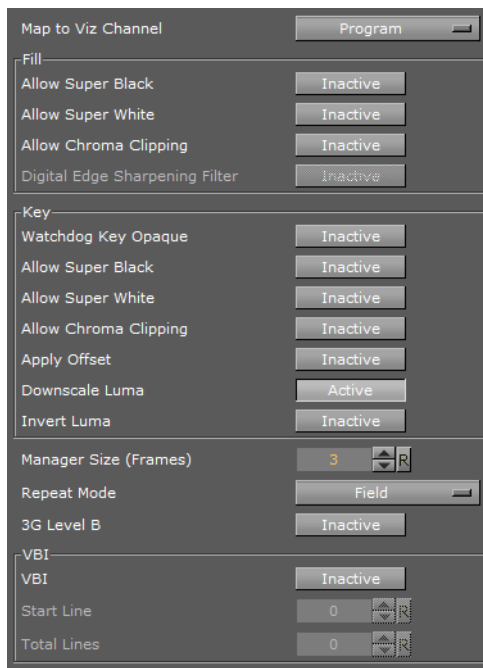
Note: **Use Watchdog** and **Timeout** can also be set and changed in [Video Board](#).

- **Genlock:**
 - **Use Flywheel:** When activated, the Matrox board 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 Unlock 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.

4.14.2 VideoOut Properties

In the VideoOut panel select which Viz Artist/Engine Output is mapped to the selected Matrox Output. The VideoOut panel shows the mapped Viz output channel and its editable parameters.



This section contains information on the following topics:

- [VizBoldMap to Viz Channel](#)
- [VizBoldFill Properties](#)
- [VizBoldKey Properties](#)
- [VizBoldManager, Repeat and 3G Properties](#)
- [VizBoldVBI Properties](#)

Map to Viz Channel

- Select which video out channel is mapped to the selected Matrox video out channel. Select an Output channel from the drop-down menu. Only channels not already used are shown:
 - **Unused:** Do not map this Matrox channel for output.
 - **Program:** Map the Program output to the selected video output of the Matrox card.
 - **Preview:** Map the Preview output to the selected video output of the Matrox card.

Note: On a single channel configuration **VideoOut A** is usually mapped to Program, and **VideoOut B** to Preview. On a Dual Channel configuration usually the first channel maps **VideoOut A** to **Program**, and the second channel maps **VideoOut B** to **Program**.

Fill Properties

- **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.

Key Properties

- **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.

Manager, Repeat and 3G Properties

- **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 board. 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).

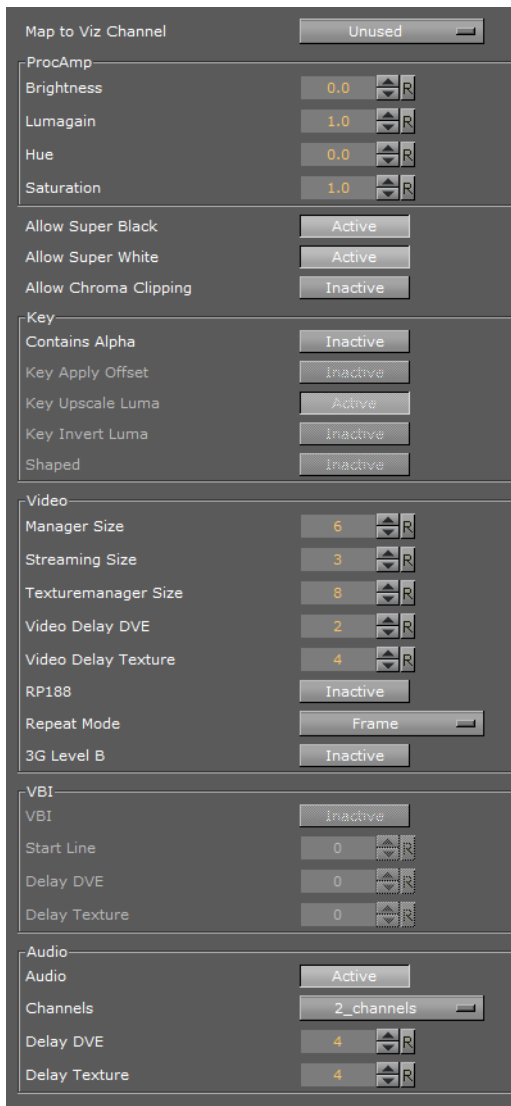
VBI Properties

- **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 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

4.14.3 VideoIn Properties

The VideoIn tab shows the mapped Viz Artist channel and every setting of the input channel which can be controlled.



This section contains information on the following topics:

- [VizBoldMap to Viz Channel](#)
- [VizBoldProcAmp Properties](#)
- [VizBoldAllow Properties](#)
- [VizBoldKey Properties](#)
- [VizBoldVideo Properties](#)
- [VizBoldVBI Properties](#)

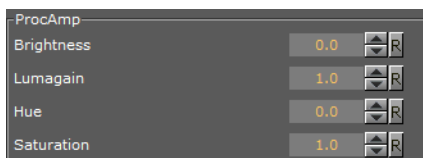
Map to Viz Channel

- Set which 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
 - **Video <1 to 8>:** Captured input is available in Video1.

Note: On a single channel configuration **VideoIn A** is usually mapped to Video1 and **VideoIn B** to Video2 and so on whereas for a Dual Channel configuration usually the first channel maps **VideoIn A** to Video1 and the second channel maps **VideoIn B** to Video1. In this case both the first and the second channel have one video input configured, namely Video1.

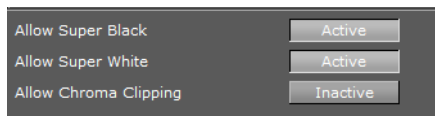
Note: When running a machine with two graphics cards (i.e. a Dual Channel or Trio Box CG setup) video inputs are hardware resources on the Matrox board, that cannot be shared. If one input for both Viz Engine instances is required, split the signal and apply it to 2 video input connectors.

ProcAmp Properties



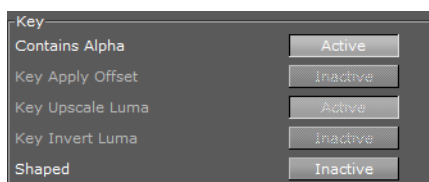
- **Brightness:** Sets the relative offset on the luminance component of the incoming video (min./max. values are dynamic and determined by the hardware). Default value is 0 (Off).
- **Lumagain:** Sets the gain on the luminance component of the incoming video (min./max. values are dynamic and determined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

Allow Properties



- **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.

Key Properties

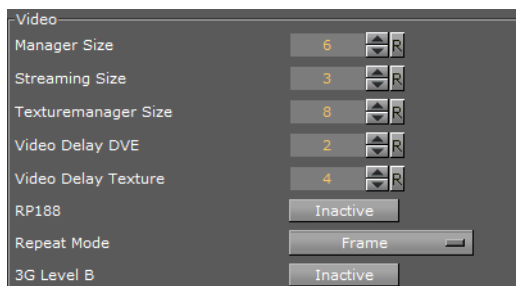


- **Contains Alpha:** Enables/Disables use of alpha component.

Note: This switch is only enabled on input channels where capture with alpha is supported.

- **Key Apply Offset:** Applies an offset to the luminance values so that the inverted result still falls within the 16-235 range.
- **Key Upscale Luma:** Expands the luminance range of the input key signal from 16-235 to 0-255.
- **Key Invert Luma:** Inverts the luminance part of the key signal (inverts the key).
- **Shaped:** Enables/Disables capture in shaped format.

Video Properties



- **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 board. Default value is 6.
- **Streaming Size:** *Not in use.*
- **Texturemanager Size:** Defines the size of the texture buffer in frames. Default value is 8.

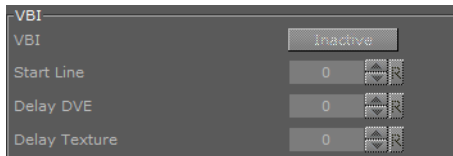
- **Video Delay DVE:** Sets the number of frames the live input should be delayed before it can be used as a DVE layer. Default value is 0 (Off).
- **Video Delay Texture:** Sets the number of frames the live input should be delayed before it can be used as a texture in the scene (default value is 4 (this is the minimum value, the maximum value is 50)).

Note: X.mio2 and DSX.LE3 minimum delay is 4, and the X.mio2 Plus minimum delay is 1. These values are for the hardware and cannot be decreased. If set to below the minimum value in the GUI the engine will reset to the minimum value.

Note: For certain input resolutions these minimum values are not sufficient and need to be increased. The the Viz Engine installation provides configuration templates for each video resolution.

- **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. Options are:
 - **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).

VBI Properties

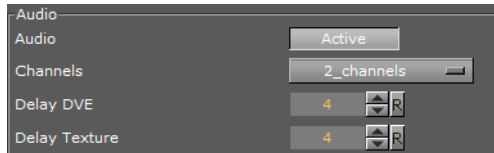


- **Enable:** When set to Active this setting will enable VBI for this channel. Default is Inactive. Note that if the input resolution is different from the output resolution it is impossible to activate since can only be inserted if the resolutions are the same.
- **Start Line:** Defines at which line 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 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 is 0 (Off).

Note: The Viz Engine configuration-file flag **vbi_control_layer = <VALUE>** controls which layer can influence the setting of the active VBI channel. The default value **vbi_control_layer = ANY_LAYER** allows scenes which are being set to any layer to define the VBI channel. By setting **vbi_control_layer**

to *BACK_LAYER*, *MAIN_LAYER* or *FRONT_LAYER*, only scenes which are set to these layers will influence the VBI channel setting. Currently this setting must be changed, if required, by editing the Viz Engine configuration file in a text editor, see [Working with Viz Configuration](#). Care should be taken when editing the Viz Engine configuration file directly.

Audio Properties

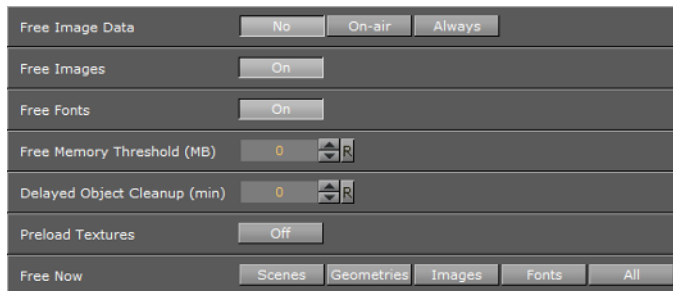


- **Audio:** When set to Active this setting enables audio capturing on this channel. Default mode is Active.
- **Channels:** Sets the number of audio channels to capture (see also [Audio in Viz](#)). Default number of channels are 2. Available channel options for AES on X.mio are:
 - None, 1, 2, and 4.

For AES on X.mio 2/X.mio 2 Plus 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.

4.15 Memory Management



Application memory management involves supplying the memory (main memory and graphic card memory) needed for a program's objects and data structures used for in-memory objects such as images, fonts and so on from the limited resources available. Memory management also recycles memory for reuse when required and appropriate.

Note: Using the 64-bit version of Viz Engine on hardware that supports it with sufficient memory (>4GB RAM) can in many cases help performance and is generally recommended.

In the Memory Management section of the configuration you can give detailed hints to the Viz Engine how memory should be handled:

- **Free Image Data:** When enabled (*On-Air* or *Always*), then image data is freed after texture creation.

Note: If there are modifications done to an image then its texture will be rebuilt 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 requires 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:** When enabled (*On*), then unused images (i.e. not referenced in a loaded scene) are removed from the Image Pool (main memory and graphics card memory).
- **Free Fonts:** When enabled (*On*) 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.
- **Delayed Object Cleanup (min):** Set the delay to clean up pool objects. Default: 0 minutes which effectively disables the delayed clean up. If set to a value greater than 0, objects do not immediately get deleted when unloaded from the renderer, and keeps objects in memory for subsequent use. While this improves performance for certain scenarios, it increases the memory footprint of Viz Engine.
- **Preload Textures:** When enabled (*On*), all images which are to 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.

4.16 Path Aliases

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

Name	Archive-Export-Path	
		...
		...
		...
		...
		...
Name	Import-Path	
		... Images
		... Fonts
		... Objects
		... Scenes
		... Audio

- **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. Options are:
 - Images
 - Fonts
 - Geometries
 - Scenes
 - Audio

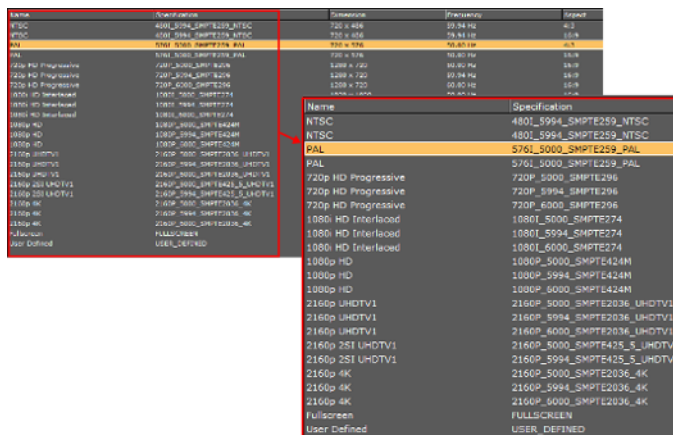
In this way, when you click on an alias before a file imported, it automatically takes you to the designated folder and switches to the assigned type.

4. Click **Save**.

Name	Import-Path	Type
Hot	C:\Program Files (x86)\vizrt\Viz3\ConfigEx	Images
Arial	C:\Program Files (x86)\vizrt\Viz3\Docume	Fonts
Cone	C:\Program Files (x86)\vizrt\Viz3\HotFolde	Objects
		Scenes
		Audio

4.17 Output Format

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.

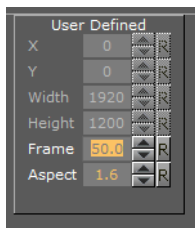


For PAL and NTSC, the aspect ratio of the format can be set to 4:3 (standard TV) and 16:9 (wide screen TV). **Fullscreen** sets the output format to the screen size on the current machine.

Note: UHDTV and 4K are supported (see [UHDTV and 4K Support](#)). UHDTV and 4K formats will show if the system hardware supports it.

Note: Fullscreen also allows the modification of the frame rate setting, but not other settings.

When the **User Defined** option is clicked on it opens a panel below the output format list. The user defined output format 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.

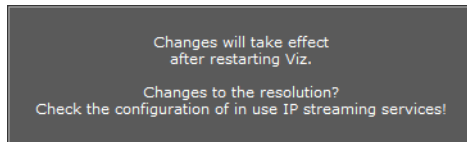
UHDTV and 4K Support

- 4K (4096x2160) is supported on DSX.LE3/4KO only
- 3G Level B for UHDTV and 4K are supported on DSX.LE3/4KO only
- To output fill and key in UHDTV and 4K two video boards are required. One board will provide fill, the other board provides the key

- UHDTV and 4K setups always need correct genlocking. When two video boards are used (e.g. 2x DSX.LE3) bot boards need to be genlocked to the same sync source
- Inputs are not yet supported in UHDTV and 4K

Viz Engine Output Format and IP Streaming Services Configuration

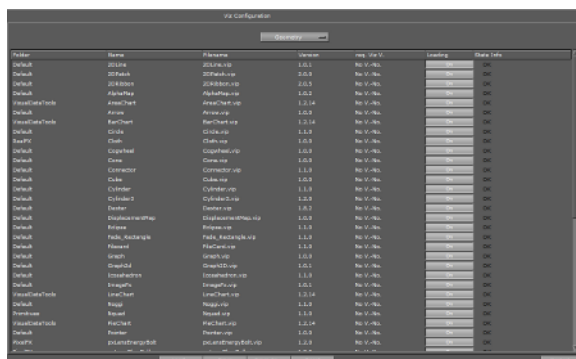
When you press save you will be presented with a reminder popup window:



For IP streaming services configuration see [IP Streaming](#) and [Configure the IP Streaming Output Service](#).

4.18 Plugins

In the Plugins panel, all installed plugins, that are identified as valid plugins, are listed.



Plugin categories are:

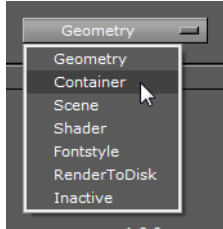
- **Geometry**
- **Container**
- **Scene**
- **Shader**
- **Fontstyle**
- **RenderToDisk**
- **Inactive**

For detailed information about the various available Plugins see the [Viz Artist Use Guide](#) in these sections:

- Geometry Plugins
- Container Plugins
- Scene Plugins
- Shader Plugins
- Working with Modifiers
- Post Rendering

All plugins can individually be activated or deactivated. If a plugin is inactive it will not be loaded at startup. All inactive plugins are listed under the Inactive panel.

Click on the Plugin drop-down menu to select a Plugin category.



Note: Some unlicensed plugins will not be loaded while others will. In the latter case a watermark will be shown.

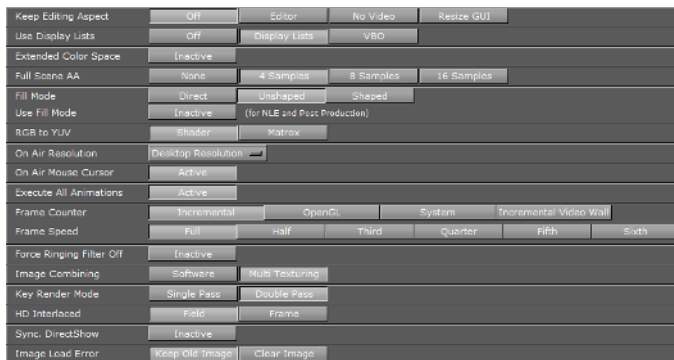
Note: The Config section in Viz Artist must open to show all information. In the Viz Config standalone application, the plugins are not actually loaded. However you can still enable or disable the loading state.

Warning: Viz Artist/Engine does not load inactive plugins during run-time. If a scene uses a plugin that is deactivated Viz Artist/Engine is unable to activate it.

See Also

- [Viz License Information](#) .

4.19 Render Options



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

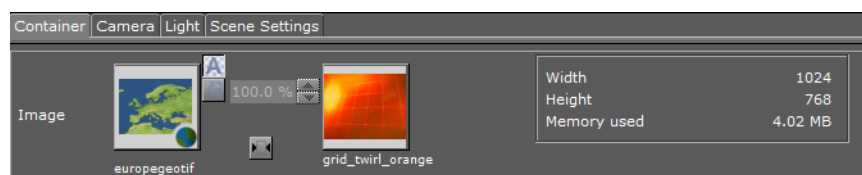
- **Force Sleep:** Activate on a low performance renderer (e.g. laptops) if Viz Artist/Engine is running inside a control application like, for example, Viz Trio
- **Keep Editing Aspect:** Influences scene designs in Viz Artist mode. Options are:
 - **Off:** Scenes are only shown in Anamorphic widescreen in the 4:3 VGA render window.
 - **Editor:** Scenes are shown using a letter-box format during scene editing giving designers the option to set a user defined **camera aspect** ratio (under *Scene Settings -> Rendering*). OnAir 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:** Set the use of **Display Lists** (OpenGL) or **VBO** (Vertex Buffer Objects). On most systems this can boost render performance. Set to **Off** reduces memory use.
 - **Off:** No display list is used. Geometries have to be redefined in each render step
 - **Display Lists:** Used to buffer the geometry definition, which can then be drawn faster. The display list only needs to be updated if the geometry or its parameter changes. Therefore activating display lists boosts the render-performance in most cases
 - **VBO:** (Vertex Buffer Objects) Used instead of Display Lists. VBO is faster than a Display List, but has the downside that a VBO cannot be drawn as fast as a Display List. VBO is a required setting for object background loading
- **Extended Color Space:** *Not in use.*
- **Full Scene AA:** Sets the hardware Anti aliasing (provided by the graphics card). Options are:
 - None
 - 4 Samples
 - 8 Samples
 - 16 Samples
- **Fill Mode:**
 - **Direct:** Unmodified fill output.
 - **Unshaped:** Brightened fill when AutoKey is enabled.
 - **Shaped:** Fill is premultiplied with key.
- **Use Fill Mode (for Post Production and NLE):**
 - **Active:** Use Fill Mode for Post Production and NLE.
 - **Inactive:** Fill mode is not used for Post Production and NLE.
- **RGB to YUV:** Enables color conversion either in the Shader or on the Matrox board.

Note: If GpuDirect is set to ON (see [Video Board](#)) make sure that RGB to YUV is set to Matrox.

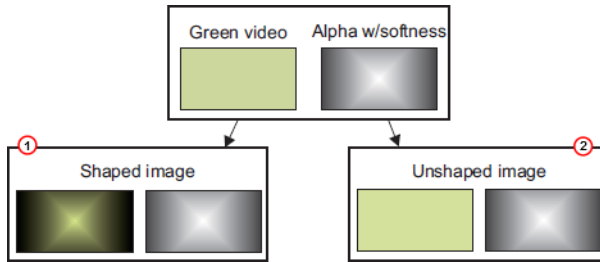
- **On Air Resolution:** Sets the DVI output resolution for Video Wall. Video Wall must activate DVI Output in the [Video Output](#) section for the On Air Resolution to take effect. Options are:
 - Desktop Resolution
 - 800x600
 - 1024x768
 - 1280x1024
 - 1600x900
 - 600x1200

- **On Air Mouse Cursor:** Enable a mouse cursor when in On Air mode and using interactive applications. Should be disabled for 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.
- **Frame Counter:** Select the Frame Counter type for animations. This setting takes effect for Standard-PC versions, that use NVIDIA cards and drivers:
 - **Incremental:** Increases the field counter with every field (smooth animations)
 - **OpenGL:** Tries to requests the retrace counter through OpenGL. If not possible, due to driver or hardware problems, it falls back to the Incremental mode.
 - **System:** Uses the internal CPU clock.
 - **Incremental Video Wall:** In a Video Wall environment, with more than one Viz Engine, the animation on all Viz Engines should advance simultaneously (by incrementing the frame counter based on the elapsed time between render steps). If a Viz Engine runs slower than real-time, the next frame, or frames, will be skipped to catch up with the Viz Engines running real-time
- **Frame Speed:** Enable Viz Artist/Engine 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), which means that 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 (animation will not be as smooth).
- **Image Combining:** In a Texture Editor (see [Scene Tree Knowledge and Skills](#) in the [Viz Artist User Guide](#)) 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 Artist/Engine 2.x, it is recommended to change this setting to Multi Texturing.



- **Key Render Mode:** This configuration is used when the **Key Render Mode** (see **Global Settings** in Scene Settings (see the [Viz Artist User Guide](#))) 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.

A shaped video image has its video data multiplied by its alpha component (1) while the video data of an unshaped image remains untouched (2). 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. Options are:
 - Field
 - Frame
- **Sync. DirectShow:** Synchronize DirectShow clip playback with renderer (may cause video jumps and audio cracks).
- **Image Load Error:** If an image load error occurs you can configure Viz Engine to keep the old image or clear the image (i.e. not showing anything).

4.20 Scene Default Values

Key	Virtual Set	Full Screen	Overlay	Auto Key
Animation Motion Path	Smooth	Linear		
Animation Motion Speed	Manual	Linear		
Flicker Filter	Off	Level 1	Level 2	Level 3
Camera Clipping Plane	Near	50.0	Far	20000.0
Ringing Filter	Inactive			
Show Merge Style Dialog	Active			
Output Region	Full	License Info: Full Edition		
Half Edition	Left	Right	Top	Bottom
	Bottom Left	Bottom Right	Bottom Top	
Quarter Edition	Left	Right	Top	Bottom
	Middle Left	Middle Right	Middle Top	Middle Bottom
Show Black After End	Active			
Texture Sharpen Default	0.0			
Video Input Layer Targets and Priority				
Live 1	Inactive	DVE	Texture	Priority 3
Live 2	Inactive	DVE	Texture	Priority 6
Live 3	Inactive	DVE	Texture	Priority 9
Live 4	Inactive	DVE	Texture	Priority 12
Live 5	Inactive	DVE	Texture	Priority 15
Live 6	Inactive	DVE	Texture	Priority 18
Live 7	Inactive	DVE	Texture	Priority 21
Live 8	Inactive	DVE	Texture	Priority 24
Clip Channel 1	Inactive	DVE	Texture	Priority 27
Clip Channel 2	Inactive	DVE	Texture	Priority 30
Clip Channel 3	Inactive	DVE	Texture	Priority 33
Clip Channel 4	Inactive	DVE	Texture	Priority 36
Clip Channel 5	Inactive	DVE	Texture	Priority 39
Clip Channel 6	Inactive	DVE	Texture	Priority 42
Clip Channel 7	Inactive	DVE	Texture	Priority 45
Clip Channel 8	Inactive	DVE	Texture	Priority 48

This section configures the default values for new scenes.

- **Key:** Sets the key mode. Alternatives are; Virtual Set, Full Screen, Overlay, and Auto Key.

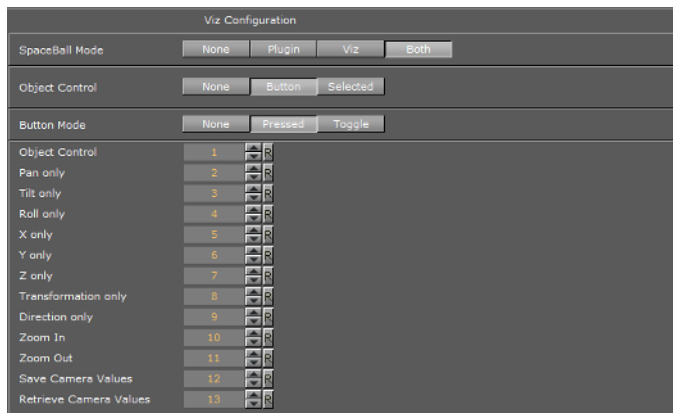
- **Animation Motion Path:** Sets the default setting for all new position Key Frames. When set to Smooth all handles in the scene output enables a smooth motion path. When set to Linear no handles are available; hence the motion path is not smooth. This setting corresponds with the Path Control setting in the Key Frame editor. When set to manual handles are made available in the spline view that enables speed to be manually handled between Key Frames. When set to Linear no handles are available.
- **Animation Motion Speed:** Sets the default setting for all new position Key Frames.
- **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.
- **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 Artist/Engine is licensed to render.
- **Half Edition:** Allows Viz Artist/Engine to render half screen. Available options are; left, right, top, bottom, bottom left, bottom right and bottom top.
- **Quarter Edition:** Allows Viz Artist/Engine 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.
- **Video Input Layer Targets and Priority:** Set the defaults for how the specific input channel should be used and its priority. Available options are, Inactive, Texture, DVE and Priority.

4.21 Spaceball

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



- **SpaceBall Mode:** Sets special setups where the spaceball should only control specific plugins without influencing the scene (objects/camera):
 - **None:** No setup.
 - **Plugin:** Controls plugins.
 - **Viz:** Controls Viz Artist/Engine objects.
 - **Both:** Controls both plugins and Viz Artist/Engine objects.
- **Object Control:**
 - **None:** No setup.
 - **Selected:** Modifies only the selected object.
- **Button Mode:**
 - **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 [Viz Artist User Guide](#) 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
- Retrieve Camera Values

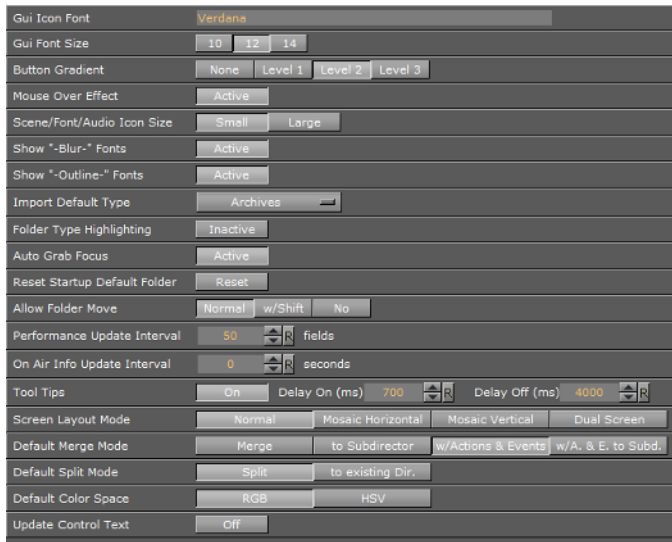
4.22 User Interface

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:

- [Various](#)
- [Colors](#)
- [Shortcuts](#)

4.22.1 Various



- **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 to show the correct names for the icons.
- **GUI Font Size:** Sets a global font size for the Viz Artist 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:** Set the default show or hide blur fonts in the Server area. The option can then be toggled with the **Element Context Menu** (see the [Viz Artist User Guide](#)).
- **Show “Outline” fonts:** Set the default for showing or hiding the outline fonts in the Server area. The option can then be toggled with the **Element Context Menu** (see the [Viz Artist User Guide](#)).
- **Import Default Type:** Selects the default Element type for imports, which will be pre-selected in the GUI **Import Menu**. Options are:
 - Fonts
 - Images
 - Geometries
 - 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, Geometry, Material, Image, Font, Audio, etc.).

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.
- **Allow Folder Move:** Allow or restrict the users ability to move/organize projects and folders in a Graphic Hub. Options:
 - **Normal:** Drag folders freely, as required to move (Default setting)
 - **w/Shift:** Press <Shift> and drag to move folder or folders
 - **No:** No folder movement allowed
- **Performance Update Interval:** Sets how often Viz Engine should update the [Performance Bar](#) when it is opened.
- **OnAir Update Interval:** Update interval for the [On Air Information Panel](#) window. Note that a shorter interval decreases render performance. Setting to 0 means that no update occurs.
- **Tooltips:** Enables or disables the tool tip information (pop-ups) in the Viz Artist user interface.
 - **Delay On (ms):** Sets the amount of time in milliseconds before the tool tip shows. 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.

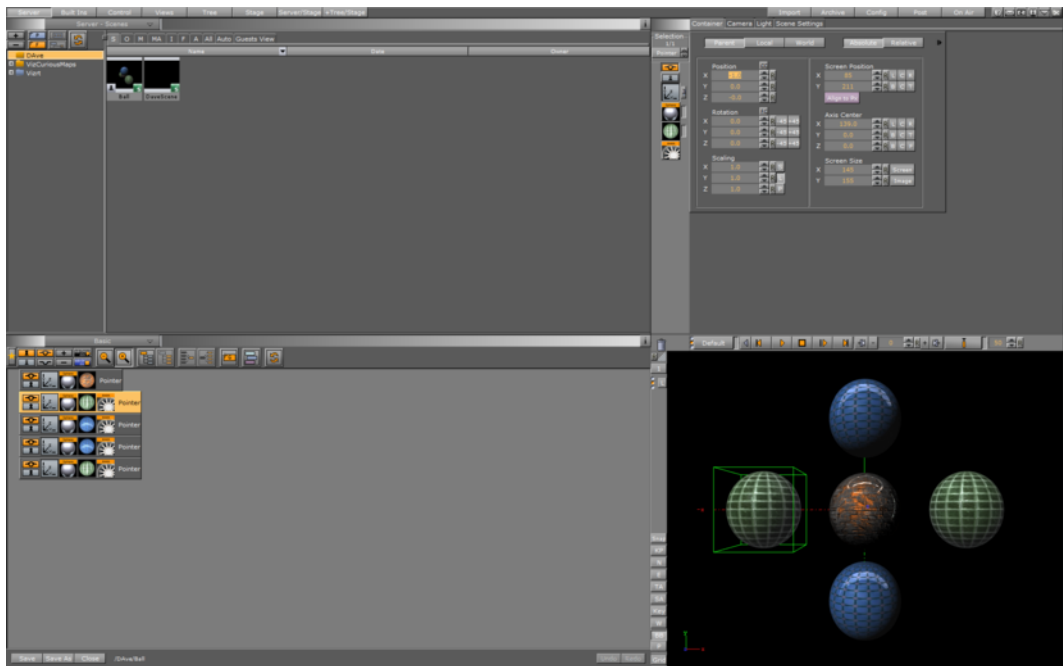
- **Screen Layout Mode:** Set to either:

- **Normal:** Default screen (single monitor)
- **Mosaic Horizontal:** **Viz Artist** shows on the left monitor and the **Scene Editor** shows on the right monitor (two monitors).
- **Mosaic Vertical:** **Viz Artist** shows on the top monitor and the **Scene Editor** shows on the bottom monitor (two monitors).

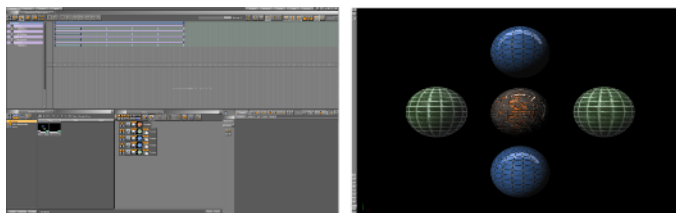
Note: Mosaic Horizontal and Mosaic Vertical are only available with NVIDIA graphics cards, with Windows 7 and onwards. Open the NVIDIA properties to setup Mosaic before changing the Viz Config file.

- **Dual:** The Scene Editor opens in a new window (two monitors).

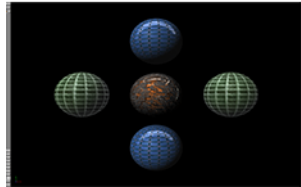
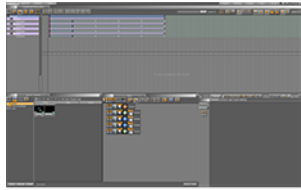
Normal Screen



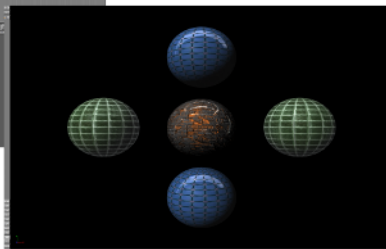
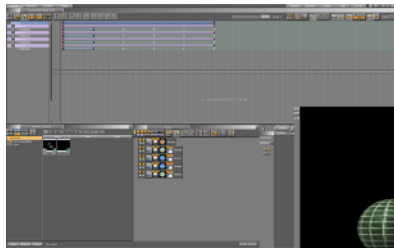
Mosaic Horizontal



Mosaic Vertical



Dual Screen



- **Default Merge Mode:** Sets the default merge behavior available in the Viz Artist user interface. Options are:
 - Merge
 - [Merge] to sub director
 - [Merge] w/actions & events
 - [Merge] w/actions and events to sub director (*w/A. & E. to Subd.*)
- **Default Split Mode:** Sets the default split behavior available in the Viz Artist user interface. Options are:
 - Split
 - [Split] to existing director
- **Default Color Space:** Select RGB or HSV as the default color space for the Material editor
- **Update Control Text:** Click to make Update Control Text active or inactive:
 - **Active:** The Control text, in Control Objects, is updated with every key stroke
 - **Inactive:** The Control text, in Control Objects, is not updated with every key stroke

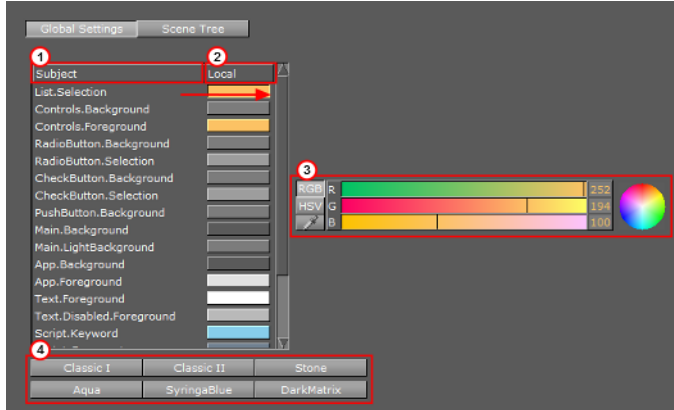
4.22.2 Colors

The Colors tab gives the ability to change the User Interface color theme.

This section contains information on the following topics:

- [Global Settings](#)
- [Scene Tree](#)

Global Settings



Use Global Settings to change the color theme of the User Interface.

Note: All the changes made to the User Interface are local. Click **Save** then restart Viz Artist for the changes to take effect.

There are six pre-set color themes (4):

- Classic I
- Classic II
- Stone (default)
- Aqua
- SyringaBlue
- DarkMatrix

To Change a Pre-set Color Theme

- Click on a pre-set color theme (4).

Individual parts of the User Interface can be assigned a new color, if the part is listed in the Subject panel (1).

To Change a Subjects Color

1. Click on a Subjects color bar in the Local panel (2).
2. In the color selection area (3) select RGB or HSV.
3. In the color selection area, click a color bar, or the color circle, and drag to change the color.

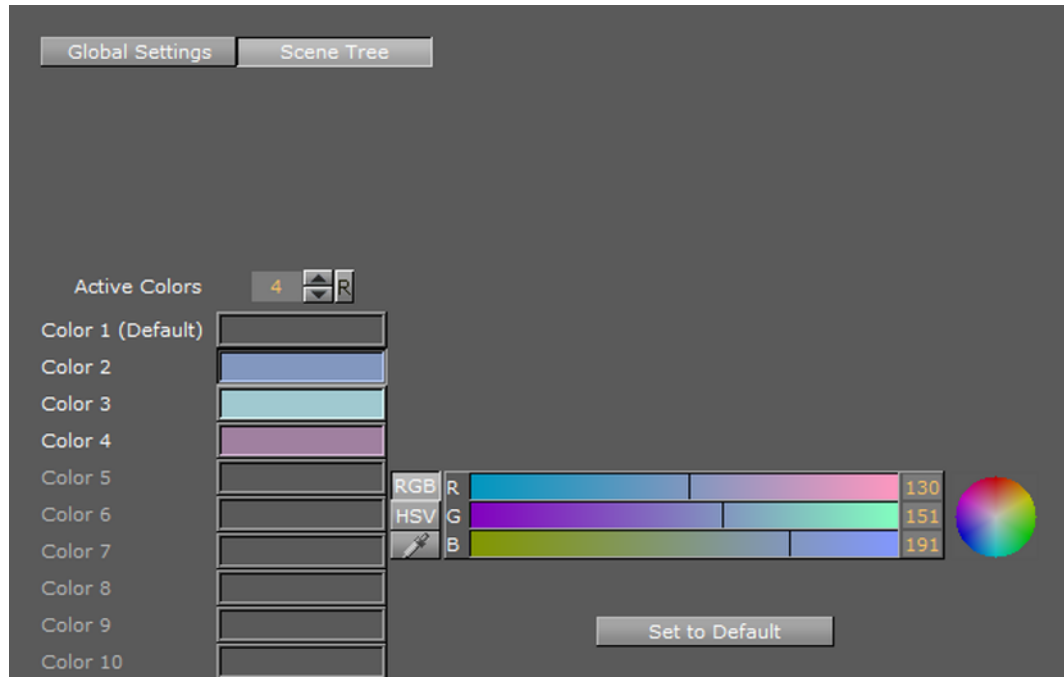
or

1. Drag one of the current Subjects color (in the Local field).
2. Drop it onto another Subjects Local field.

or

1. Click on the eye dropper icon in the color bar.
2. Move the cursor to an area, color on-screen.
3. Click to accept the new color.

Scene Tree



Use the Scene Tree panel to set the color codes for Containers in the Scene Tree. A Container with a color code can be searched for in the Scene Tree, and the Scene Tree can be restricted to Containers with certain colors (see **Scene Tree Menu** in the [Viz Artist User Guide](#)).

A text tag can also be added to the color. The text is Scene specific and saved with the Scene on the Graphic Hub. Note that the colors might change if the Scene is opened on a different machine with a different color setting.

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 colors are configured and active by default with no text descriptions. Click **Set to Default** to set all color bars to their default setting.

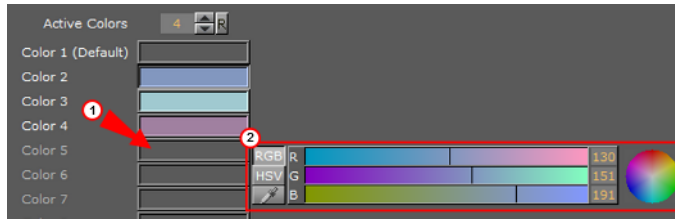
The color options are available in the GUI **Scene Settings** panel in the Tree Color Text setting, and available for use in the Scene Tree panel.

To Change the Amount of Active Colors

- In the **Active Colors** field enter the amount of colors to be active.

Note: Up to 16 colors can be configured and made active.

To Create a Color



1. Click on a unused color bar (1).

Note: It is also possible to change the color of the first four colors. Click in their color bar.

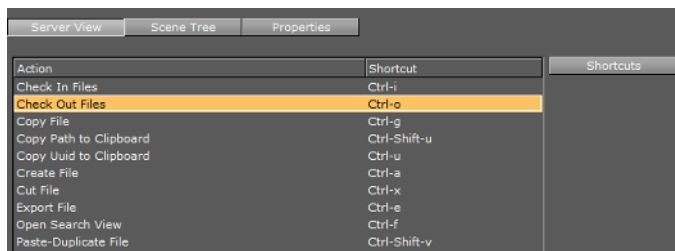
2. In the color selection area (2) select RGB or HSV.
3. In the color selection area, click a color bar, or the color circle, and drag to change the color.
4. If required: Click the color bar (1) and enter a name for it.

or

1. Click on the eye dropper icon in the color field.
2. Move the cursor to an area, color on-screen.
3. Click to accept the new color.

4.22.3 Shortcuts

The shortcuts view shows 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.



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

4.23 Video Board

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

This section contains information on the following topics:

- [Video Board Properties](#)
- [Video Input](#)

4.23.1 Video Board Properties

Loophthrough Delay (EE)	2	frames
Videooout Ring Buffer	On	
Ring Buffer Size	5	frames
Viz Link	Off	
Use Watchdog	On	
Watchdog Timeout	999	frames
Watchdog Mode	First Geom Load	At Startup
Watchdog Reactivation	Off	
Use GPU Direct	Off	
Check Video Card	Matrox	Xmio2Plus
	Epoch	Voodoo

- **Loophthrough Delay (EE):** Set the delay for live video input (DVS, Bluefish and NVIDIA SDI boards only). This setting applies for all input channels. For Matrox, see **Video Delay DVE** in [VizBoldVideo Properties](#).
- **Videooout Ring Buffer:** 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.
- **Ring Buffer size:** Sets the size of the Ringbuffer in frames.
- **Viz Link:** Enables clip transfer from Viz One. When enabled this option has these effects:
 - Setting the clip takes immediate effect instead of the command traveling through the ring buffer (VGA version only)
 - A clip channel set to DVE will play the clip in Texture mode (VGA version only)
 - Activates the asynchronous Command feedback when setting a clip. The first answer in this case is an **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.
 - A clip loaded as back to back will play immediately, even if the current clip is still playing, if the Play command is sent.

Note: Back to back: Controlled from external control programs (i.e. Viz Trio). In the [Video Input: Clip Input](#) section Pending (clip player support) must be set to Active (Active is set by default).

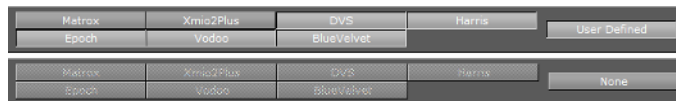
- **Use Watchdog:** Set Watchdog **On** or **Off:**
 - **Matrox:** see [Watchdog](#)
 - **Bluefish:** see [Watchdog](#)

Note: Matrox Only: Use Watchdog can also be set and changed in [Matrox](#).

- **Watchdog Timeout:** Set 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
-

Note: Matrox Only: Watchdog Timeout can also be set and changed in [Matrox](#).

- **Watchdog Mode:** Set the Watchdog mode:
 - **First Geom Load:** Video Out is activated when the first geometry is loaded.
 - **At Startup:** Video Out is activated at startup.
 - **First Geom Load/DVE:** Video Out is activated when the first geometry is loaded or an input or clip channel is set to DVE.
- **Watchdog Reactivation:** Set to **On** to activate the watchdog again if scenes are unloaded from renderer.
- **Use GPU Direct:** Set to **On** to enable a fast, low latency method to copy frames from the video IO device to the GPU and back (gives more time for the renderer to process complex and GPU intense visual effects).
- **Check Video Card:** Select which video cards to search for and use when Viz Artist/Engine is started. If a video card is not selected it is not used, even if it is installed in the system.

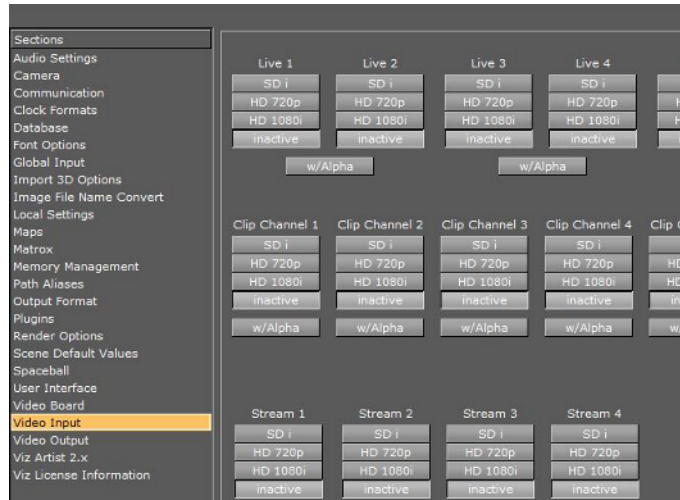


- **Select Individual Cards:** If **User Defined** is selected, click on each listed card to select or deselect, as required
 - **User Defined/None:** If **None** is selected all video cards are unavailable (no video cards are used). To select and use individual cards, **User Defined** must be selected
-

Tip: To run a Viz Artist video version as a VGA version, even if video cards are installed, make sure that **None** is selected (no video cards used). Use cases for this are setups like dual channel trio one boxes, where there are three Viz Artist/Engine instances running and only the first two should use the Matrox. The third one is for Trio preview. The other use case is the TriCaster implementation, where Viz Artist must run as a video version, running as VGA.

4.24 Video Input

Video input channels are enabled or disabled in this section. To be able to use a Live input channel, a Clip channel or a Stream channel, it first has to be set to active in this panel.



The frequency of the channels is defined in the [Output Format](#) section.

This section contains information on the following topics:

- [Live and Clip Channels](#)
- [Stream Channels](#)
- [No Onboard Video Board](#)

Live and Clip Channels

This panel activates the Live input and Clip channels and defines the video standard that the channel is 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.

Clip channels are for video clips. Clip Channel 1 and Clip Channel 2 must be configured to the same video standard.

- **Live w/Alpha:** For the Input this will combine the two (Live 1 and Live 2) channels to one channel carrying fill and key. This means that the Y (luminance) from Live 2 in YUV will be used as the key signal.
- **Clip Channel 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.

Stream Channels

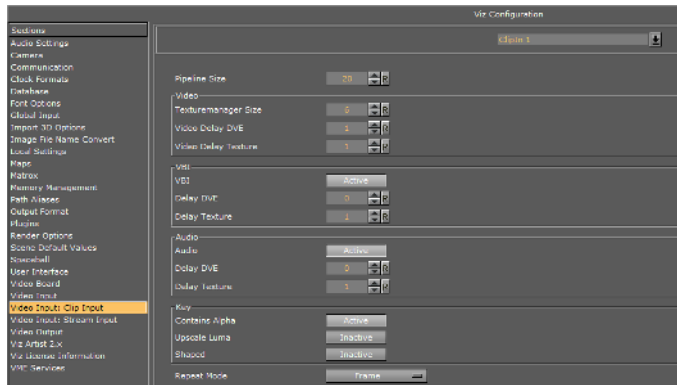
The Stream channels are for live video streams (see **Video Playback From a Video Stream** in the [Viz Artist User Guide](#)). Set each Stream to active or inactive.

No Onboard Video Board



When there is no onboard video board (standard-PC) the video input section no longer shows the Alpha options for Live and Clip. Video input for standard-PC versions enable clip playback through the Properties Panel.

4.25 Video Input: Clip Input



Use the Video Input: Clip Input panel to configure available playback channels. The number of available clip input channels is set in [Video Input](#).

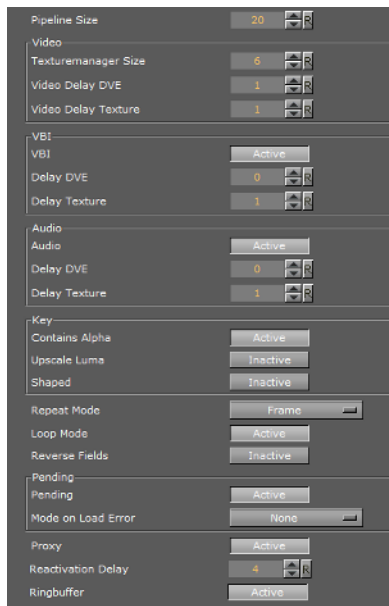
This section contains information on the following topics:

- [Clip Input Properties](#)

See Also

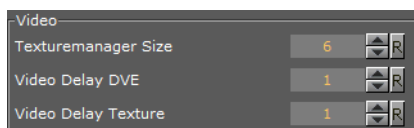
- [Matrox](#)

4.25.1 Clip Input Properties



- **Pipeline Size:** Defines the number of frames Matrox' internal clip reader buffer should buffer in advance. Default value is 20.

Video Group



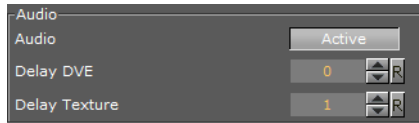
- **Texturemanager Size:** Texture download buffer size.
- **Video Delay DVE:** DVE Delay of video when used as DVE.
- **Video Delay Texture:** Texture Delay of video when used as Texture.

VBI Group



- **VBI:** Set to Active or Inactive. Defines whether VBI should be used for this channel. Default mode is Inactive.
- **Delay DVE:** Sets the number of frames 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 VBI should be delayed, before the clip can be used, in texture mode. Default value is 1

Audio Group



- **Audio:** 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.

Key Group



- **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.

Repeat, Loop and Reverse



- **Repeat Mode:** Determines the behavior of the video input in case of capture drops. Options are:
 - **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.

Pending Group



- **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.

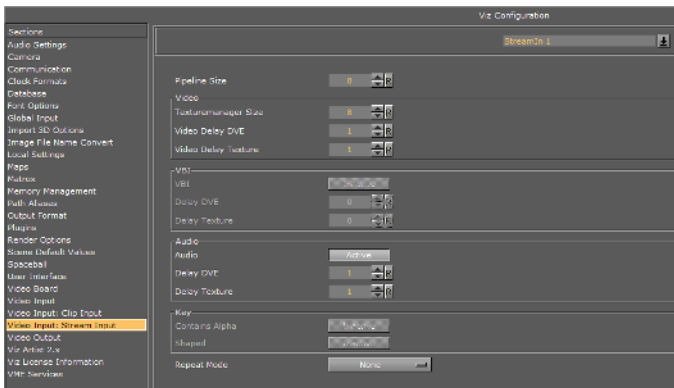
- **Mode on Load Error:** Determines the behavior of the current clip when loading of the pending clip fails. Options are:
 - **None:** Current clip mode is not changed.
 - **Stop:** Performs a Stop command on the current clip.
 - **Pause:** Current clip enters pause mode.
 - **Flush:** Unloads the current clip.

Proxy, Reaction and Ringbuffer



- **Proxy:** If set to Active, video clips of a resolution different to the current configured resolution, can be played. If set to Inactive a video clip of a different resolution cannot be played.
- **Reactivation Delay:** Defines the minimum number of frames the texture contains black after the channel was activated to texture.
- **Ringbuffer:** If set to Active the input ringbuffer is enabled when played with a NVIDIA SDI output.

4.26 Video Input: Stream Input



Use the Video Input: Stream Input panel to configure available IP stream input channels. The number of available IP Stream input channels is set in [Video Input](#).

This section contains information on the following topics:

- [Clip Input Properties](#)

4.26.1 Stream Input Properties



- **Pipeline Size:** Defines the size of the input queue. Default value is 8.

Video Group

- **Texturemanager Size:** Texture pre-allocated buffer size, in frames.
- **Video Delay DVE:** DVE video delay when used as DVE.
- **Video Delay Texture:** Texture video Delay when used as Texture.

VBI Group

(not in use)



- **VBI:** Defines whether VBI should be used for this channel. Default mode is Inactive.
- **Delay DVE:** Sets the number of frames VBI should be delayed, before the IP stream can be used, in DVE mode. Default value is 0 (Off).
- **Delay Texture:** Sets the number of frames VBI should be delayed, before the IP stream can be used, in texture mode. Default value is 1

Audio Group



- **Audio:** 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.

Key Group

(not in use)



- **Contains Alpha:** Enables/disables playback of clips with alpha.
- **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.

Repeat



- **Repeat Mode:** Determines the behavior of the IP stream input in case of capture drops. Options:
 - **None:** Does not repeat. Input goes black.
 - **Field:** Repeats the last field.

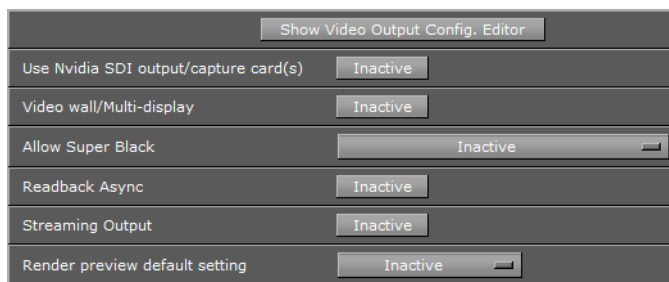
4.27 Video Output

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

This section contains information on the following topics:

- [Video Output Properties](#)
- [Video Output Editor](#)

4.27.1 Video Output Properties



- **Show Video Output Config. Editor:** Opens the [Video Output Editor](#) , or press (Alt +V).
- **Use NVIDIA SDI output/capture card(s):** Enables the NVIDIA card SDI module to output video. This will shorten the output delay when outputting graphics and video through the video board.

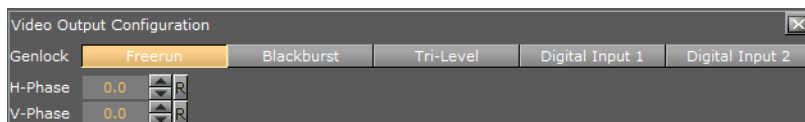
Note: Embedded audio output is supported if the NVIDIA Output card is used with firmware 3.10. If not, audio must be handled externally, since NVIDIA's SDI Output card, before firmware 3.10, does not support embedded audio output.

- **Video wall/Multi-display:** Sets the main output to the Digital Visual Interface (DVI). Viz Artist will render to full-screen (set the resolution in [Render Options](#) section).
- **Allow Super Black** (NVIDIA SDI card only): Controls the key output:
 - **Inactive:** Use the video range (only valid in conjunction with NVIDIA SDI and driver versions older than 259.12).
 - **Active:** Use the full signal range. When active it will determine to clip or not to clip the key output video signal that is under 7.5 IRE units or over 100 IRE units.
- **Readback Async:** (DVS board only) Output only, see [Video Board](#), 'Use GPU Direct'.
- **Streaming Output:** Activate or deactivate IP Streaming output.
- **Render preview default setting:** Sets the default value for the Preview button (see [Control Buttons](#)) when Viz Engine is in On Air mode.
 - **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.
 - **Active:** Rendering will be done for both video out signals and on-screen (this will decrease the performance).
 - **Fullscreen:** Set the On Air window to screen size.

Note: Machines without a video board do not have the Video Output section.

4.27.2 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.

1. 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*
2. 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 Artist/Engine console during startup.

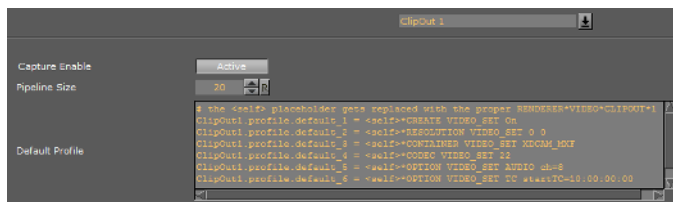
It should be taken into account that when the genlock video format is different from the fill/key video format the value of the *V-delay* matches the genlock lines and not the video output lines. The same applies to *negative H-phase* values.

See Also

- [Output Format](#)
- [Video Input](#)

4.28 Video Output: Clip Output

In the Video Output: Clip Output panel, configure the available Clip Channel outputs.



- **Capture Enable:** Enable or disable the clip writer functionality. The main use is to give 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:** Control the number of frames that the clip writer uses to handle a file. It is recommended to leave the default value.
- **Default Profile:** Enter a default profile that can be loaded on request, with the command `RENDERER*VIDEO*CLIPOUT*1*PROFILE APPLY`. Example:

```
# the <self> placeholder gets replaced with the
proper RENDERER*VIDEO*CLIPOUT*1
```

```
ClipOut1.profile.default_1 = <self>*CREATE VIDEO_SET
On
```

```

ClipOut1.profile.default_2 = <self>*RESOLUTION
VIDEO_SET 0 0

ClipOut1.profile.default_3 = <self>*CONTAINER
VIDEO_SET XDCAM_MXF

ClipOut1.profile.default_4 = <self>*CODEC VIDEO_SET
22

ClipOut1.profile.default_5 = <self>*OPTION VIDEO_SET
AUDIO ch=8

ClipOut1.profile.default_6 = <self>*OPTION VIDEO_SET
TC startTC=10:00:00:00

ClipOut1.profile.default_7 = <self>*NAME SET d:/out/
<base_scene2_name>/<clip_name>
    
```

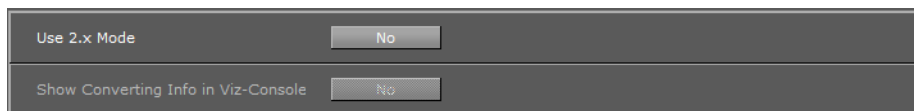
Place Holders for Variables

Place Holder	Description
<hostname>	Expands to the hostname
<if0>	Expands to the IPV4 network address of the first network interface
<if1>	Expands to the IPV4 network address of the second network interface
<if2>	Expands to the IPV4 network address of the third network interface
<absolute_scene_name>	Expands to the complete path of the loaded scene
<absolute_scene2_name>	

4.29 Viz Artist 2.x

In the Viz Artist 2.x panel, Viz Artist 3 can be switched to Viz Artist 2 mode for compatibility issues.

Viz Artist 2.x



In Viz Artist versions before 3.0, assets were stored in specific subdirectories (Scene, Geometry, 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.

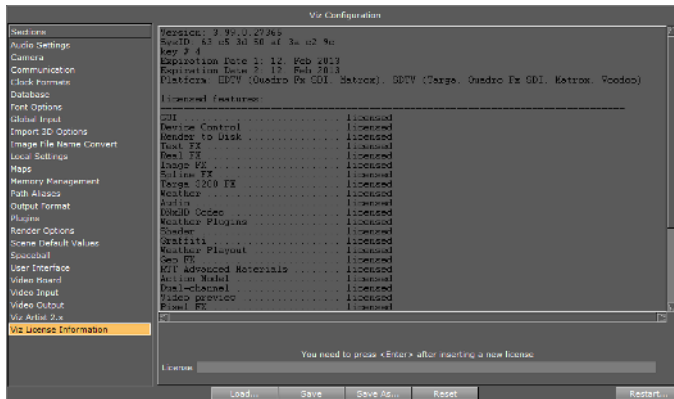
When working in 2.x mode, *Viz_2x* will automatically be added before the default messaging path. Furthermore, the paths sent by the external control applications will be converted to lower case (as the names of the data will be converted to lower case when importing). So, external control programs must 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.

4.30 Viz License Information

In the Viz Artist/Engine License Information panel, information about the current Viz Artist/Engine license is shown. The panel lists the various licensed features, for example, the available plugin packages.



- **License:** Enter a license key into the License field, press <Enter>, and click **Save**. Restart Viz Artist/Engine for the new license key to take effect.

See Also

- [Plugins](#)

4.31 Viz One

The Viz One File System Monitor and File Transfer services are available in the Viz Artist installation by default, but must be installed or un-installed as a service through this panel.

In the Viz One panel, set the required parameters for the File System Monitor (Fsmon) and File Transfer services (Mediaftp). These services are required for Viz One to successfully connect to a Viz Engine.

When each service is installed they are directed to the current Clip Data directory location (`--root=d:/`) to monitor and transfer video files.

IMPORTANT! If the location of the Clip Data directory is changed after installation, uninstall and install the two services again. They will automatically set to the new Clip Data Directory (see [Local Settings](#)).

See [Integration with Viz One](#) for Fsmon and Mediaftp for the install and uninstall procedures.

This section contains information on the following topics:

- [Viz One Properties](#)

4.31.1 Viz One Properties



- **Days to keep log files:** Set the number of days to keep log files (default is seven days). Log files older than the set number of days are deleted

Fsmon (File System Monitor)

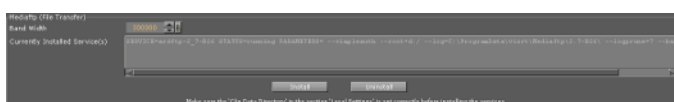


- **Host Name:** Specify the name of the local host. Make sure that the host name is exactly the same as the string specified in the Viz One Server Configuration.
- **Viz One (MessageQueue Server):** Specify the host name of the active Message Queue server for Viz One
- **Currently Installed Service(s):** Shows the currently installed Fsmon service or services, with parameters
- **Install:** Install a Fsmon service

Note: Any currently installed service must be un-installed before a new service can be installed.

- **Uninstall:** Uninstall a Fsmon service

Mediaftp (File Transfer)

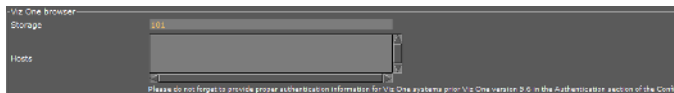


- **Band Width:** Set the transfer bandwidth, in kbits per second
- **Currently Installed Service(s):** Shows the currently installed Mediaftp service or services, with parameters
- **Install:** Install a Mediaftp service

Note: Any currently installed service must be un-installed before a new service can be installed.

- **Uninstall:** Uninstall a Mediaftp service

Viz One Browser



- **Storage:** Enter the Storage ID for Viz Artist as configured in Viz One
- **Hosts:** Select a host for the Viz One Browser. Separate each host with a new line. The host has to be entered including the **http://**, for example: 'http://vme56-sia'

4.32 Viz Artist/Engine Log Files

All Viz Artist/Engine log files are located in the *<viz data folder>*

Note: This will normally be *C:\ProgramData\Vizrt\viz3*. Check the actual directory name with the command "echo %programdata%", in a Windows command-prompt. This directory is by default hidden in Windows, so to navigate to this directory in Windows Explorer specify the explicit path.

Viz Artist/Engine can provide various log files as documented in the section below.

Viz Render Log

- **Name:** VizRender_<timestamp>.log
- **Purpose:** Information on current status of the engine

Viz Trace Log

- **Name:** VizTrace_<timestamp>.vlog
- **Purpose:** Command trace that facilitates playback for error reproduction, contains at most the last 500 commands

Viz Gui Log

- **Name:** VizGui .log
- **Purpose:** Information on Viz Gui errors.
- **Log Description:** Each line in the log file will have 6 components or entries, each separated by '|'. A typical log-line will be:

```
Tue Nov 04 10:02:15 EST 2014|LM_ART|5420|Version: 3.7.1.42057|CONFIG|GPU1
```

The components for each logline are:

- Date/time
- Type, one of:
 - LM_STARTUP (Regular startup)
 - LM_QUIT (Regular quit)
 - LM_QUIT_TIMEOUT (Timeout quit)
 - LM_QUIT_LOGIN (Login canceled)
 - LM_CFG (Restart with configuration)
 - LM_ENG_GUI (Restart engine with gui)
 - LM_ENG (Restart engine without gui)
 - LM_ART (Restart of Artist)
 - LM_ (Current mode restarted)
- Pid (Process id)
- Viz version
- Mode:
 - CONFIG (Config Mode)
 - NOGUI (Engine Mode)
 - NORMAL (Artist Mode)
- Starting on GPU<x>, for example *GPU1* (Graphical Processing Unit no 1)

Viz Shaders Log

- **Name:** VizShaders.log
- **Purpose:** Information on shader compilation

Viz Console Log

- **Name:** Viz_<timestamp>.log
- **Purpose:** Log console output to a file when the engine is started without console (-C option)

Viz Gui Connection Log

This Log is created if 'Write GH Connection Log' is active (see [Local Settings](#)).


- **Name:** VizGuiConnection<timestamp>.log
- **Purpose:** Information on the Graphic Hub Manager database connection

Create Log Files with Log and Clog Commands

The output of the Viz Engine can be redirected to a file using the command "**log** <filename>" for example "**log** c:\temp\my-engine-log.txt". Note that the log file will not have content until the Viz Engine in-memory buffers are flushed (i.e. written to disk). The log memory buffers are flushed to disk either when the buffer are full or when Viz Engine quits. You can force the buffer to be written to the log file on disk by sending the command: **CONSOLE FLUSH**

You can take an immediate snapshot of the Engine's current in-memory log with the command "**clog**". A new logfile will immediately be written to <viz data folder> \VizRender-ID.log The ID in the filename is the GPU ID, making it easy to differentiate log files in a Dual Engine setup for example.

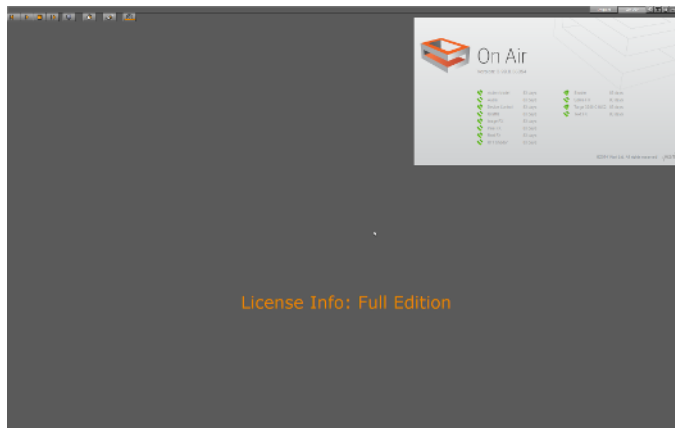
Both the **log** and **clog** commands can be executed by sending them to Viz or by entering them directly in the Engine Console window.

Click on the  button to access the Console window.



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).



The top left of the On Air screen shows a set of [Control Buttons](#), as well as a [Performance Bar](#) button. All [License Information](#) is shown 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 shown to overlap the Scene Editor as this would interfere with the broadcast.

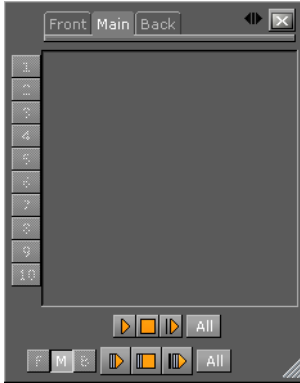
All script events that are added to a scene or to single containers will be executed in On Air mode. To learn more about scripting see the script documentation.

This section contains information on the following topics:

- [Director Control Panel](#)
- [Control Buttons](#)
- [Performance](#)
- [On Air Information Panel](#)
- [License Information](#)

5.1 Director Control Panel

The clapper board button, when in On Air mode, opens the Director Control Panel window.

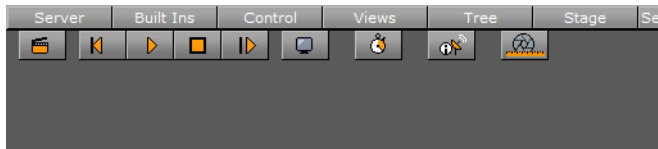








The Director Control Panel window can be used to select and animate one, multiple or all directors in the front, main or back layer. In addition it can be used to set slots and to animate a combination of director(s).

See **Director Control Panel** ([Viz Artist User Guide](#)) for a detailed description of the Director Control Panel.



5.2 Control Buttons


This section contains information on the Controls Buttons, which include the Play and the On Air buttons.



-  **Clapper Board:** Show or hide the [Director Control Panel](#) window
-  **Back:** Jump to the beginning of the animation in the scene
-  **Play:** Start the animation of the scene
-  **Stop:** Stop the animation of the scene
-  **Continue:** Continue the animation after it stopped at a stop point
-  **Render Preview:** Show or hide the VGA Preview window (only available on machines with video cards).

Note: Preview is always enabled on Viz Artist machines without a video card.

-  **Performance Editor:** Show or hide the [Performance Bar](#) .
-  **System Information:** Show or hide the [On Air Information Panel](#) window.

-  **Lens File Editor:** Show or hide the Lens File Calibration Editor. Use to adjust the lens files for virtual studios. Adjust the field of view, lens deformation, mobile point and center ship. It is useful in combination with lens calibration.

5.3 Performance

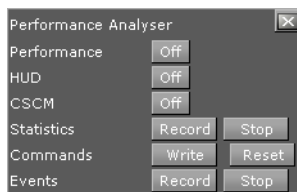
Analyzing the performance of Viz Artist/Engine can be done with two tools:

- [Performance Bar](#): The Performance Bar closely monitors a range of parameters for analyzing real-time performance
- [Performance Analyzer](#): The Performance Analyzer monitors key performance and camera parameters, as a head-up display in the renderer window and initiate logging of statistic, command and event information to log files.

This section contains information on the following topics:

- [Performance Analyzer](#)
- [Performance Bar](#)

5.3.1 Performance Analyzer



The performance analyzer enables key performance and camera information to be shown 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.

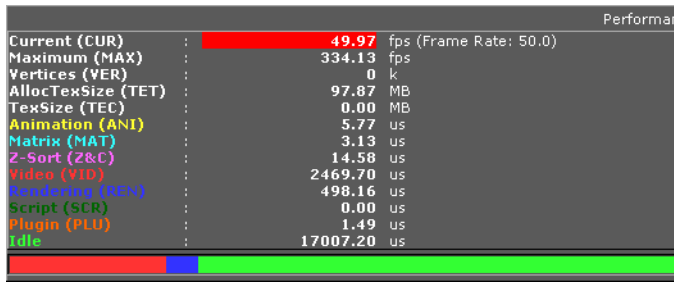
- **Performance:** Shows the current (CUR) and (MAX) parameters (see Performance Bar).
- **HUD:** Enables the head-up display (HUD) showing the following parameters in the renderer view:
 - **Camera 1-n:** Show the currently selected camera.
 - **Position:** Show the camera's X, Y and Z position.
 -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

The Log files can be found in the *<viz data folder>*.

To open the performance analyzer

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


5.3.2 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 plugins 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 .
2. To see all parameters, extend the view by clicking the Eject button.

5.4 On Air Information Panel

The On Air Information panel shows the required parameters to send external control commands and all connected clients, with the IP address, host name and Viz Port.

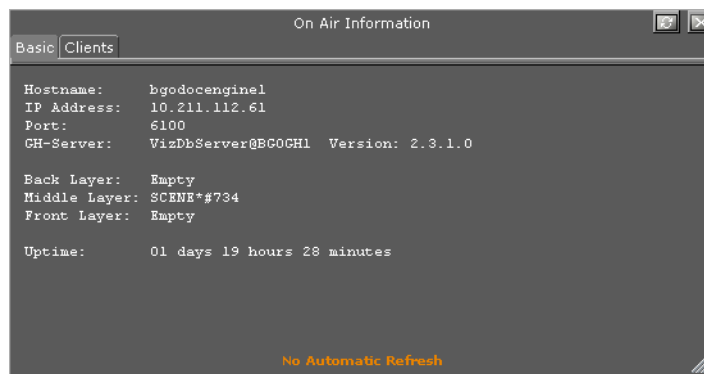
Note: Polling for On Air information can decrease the performance. For information on how to adjust the On Air Update Interval see the [User Interface](#) section.

This section contains the following topics:

- [Basic Tab](#)
- [Clients Tab](#)

Basic Tab

In the Basic tab, the parameters required to send external control commands are shown:



- **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 Graphic Hub Manager 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.

Clients Tab

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



5.5 License Information



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

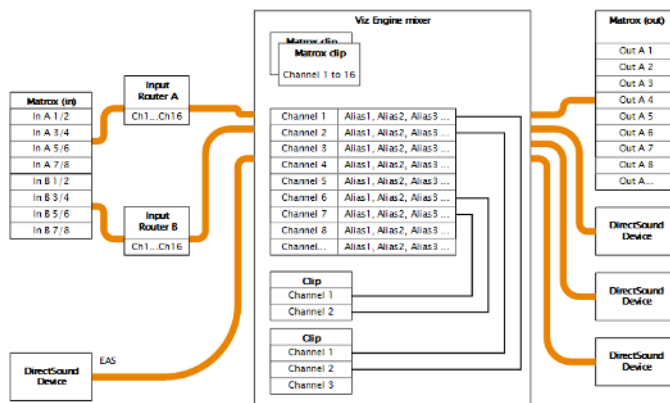
6 Audio in Viz

This section contains the technical description of the Viz Engine audio system, and 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](#)

6.1 Overview

There are two ways to capture audio in the Viz Engine, through Matrox or a DirectSound compatible device.



This section contains information on the following topics:

- [Channels](#)
- [Matrox Routing](#)
- [DirectShow](#)

6.1.1 Channels

This section contains the following topics:

- [Audio Channels](#)
- [Matrox Input Channels](#)
- [Matrox Output Channels](#)

Audio Channels

Internally Viz Engine can use 16 audio channels. The channels work with floats. Every channel can be named with an arbitrary number of aliases.

Matrox Input Channels

If the system has a Matrox card, 16 input channels are available as AES/EBU input or embedded in the video stream.

Matrox 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](#)

6.1.2 Matrox Routing

This section contains the following topics:

- [Matrox Live Input Routing](#)
- [Matrox Clip Routing](#)

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.

Matrox Clip Routing

Audio from Matrox 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](#)

6.1.3 DirectShow

This section contains the following topics:

- [DirectShow Filters](#)
- [DirectSound Input](#)
- [Emergency Alert System](#)
- [DirectSound Audio Card](#)

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 on-line 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.

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 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 board.

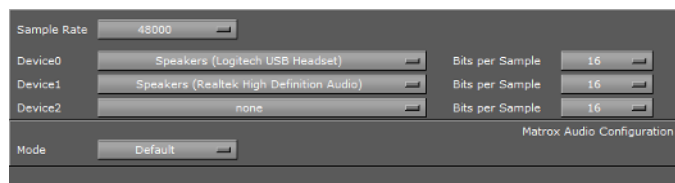
DirectSound Audio Card

Viz Engine 3 is able to use any [DirectSound](#) capable audio card installed in the system. If a Matrox 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](#)

6.2 Device Recognition and Selection



The audio system is able to use any installed DirectSound capable audio device. On every device up to 16 channels can be used.

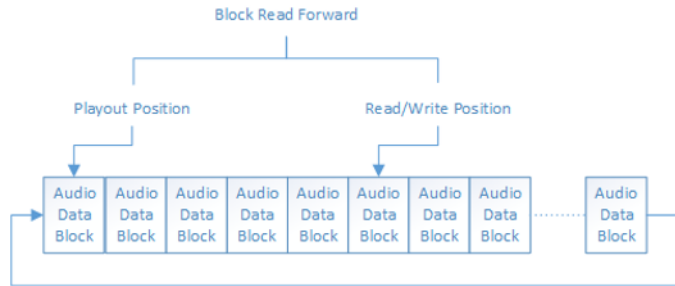
During the startup process Viz Engine tests all available audio cards installed on the system. It is currently only possible [To Manually Activate an Audio Device](#) by configuring the audio device, or devices, listed in SECTION AUDIO_CONFIG of the Viz

Config file. By default a one to one channel assignment from the first audio device is done when a new device is selected.

6.3 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.

Latency adjustment on the DirectSound audio device

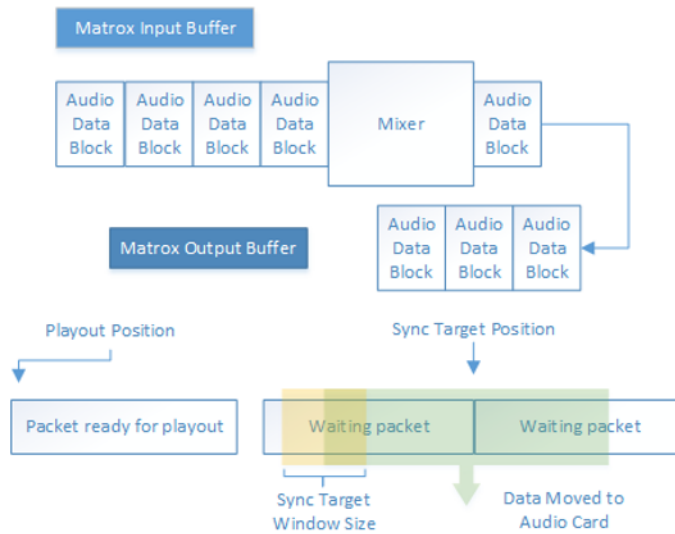


All sound devices use a [Ring buffer](#) that stores data until it is sent out to the audio channels, and this ring buffer is organized in blocks of data. All sound hardware defines a distance in blocks (or bytes) that needs to be maintained. For almost all devices on the market a distance of 6 blocks is sufficient to have a “clean output” without artifacts.

Tip: Try to decrease the 'Block Read Forward' 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 Viz Config file's SECTION AUDIO_CONFIG).

Note: An audio card which is not synchronized 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 below, is used by Viz Engine to fulfill this condition:



After mixing the packages received from the Matrox 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 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](#)

6.3.1 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 internally 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 Viz Config file's SECTION AUDIO_CONFIG.

6.4 Channel Setup and Clip Channel Routing

Channel setup is configured in the [Audio Settings](#) section in Viz Configuration. To get a correct mixing of clip channels to the Viz Engine 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

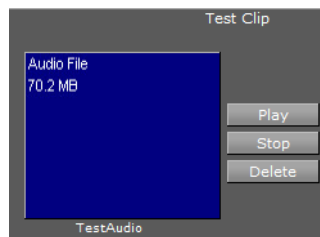
for example one or several remote Viz Engine audio setups. Configurations can also be tested separately or all together.

This section also contains information on the following procedures:

- [To Test Audio Channel Setup](#)

To Test Audio Channel Setup

1. Start Viz Artist.
2. Create a new Scene.
3. Add a group container to the Scene Tree.
4. Add the [Audio Plug-in](#) .
5. Open the Audio plug-in editor.
6. Add an audio clip to the *Test Clip* drop-zone
7. Click **Play**.

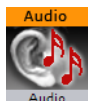


Tip: Always have a set of test clips that will provide audio for the different channel setups.

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](#)

6.5 Audio Plug-in



The Audio plug-in allows a designer to configure audio channels.

Go to **Audio** in [Container Plugins](#) (see the [Viz Artist User Guide](#)), for more information on the Audio Plug-in.

This plugin is located in Viz Artist (*Built-ins -> Container Plugins -> Global*) and can be applied to any container.

6.6 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 matches the Viz Engine 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 Cable Assignment](#)
- [Matrox](#) configuration interface

6.7 Speaker Names

Viz Engine understands 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

6.8 Matrox Audio

The Matrox card is able to up to 16 channels for capture and payout. 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 available.

On the X.mio cards there are balanced 75 Ohm connectors. On newer cards, 110 Ohm connectors are used.

This section also contains information on the following procedure:

- [To Enable Matrox Audio](#)

To Enable Matrox Audio

1. Open **Viz Config**.
2. Click on [Audio Settings](#) .
3. In the [VizBoldVarious Tab](#), set either, or both, **Enable embedded audio on Live1** or **Enable embedded audio on Live2** to **On**.
 - This must be done for [AES](#) / [EBU](#) audio as well.
4. Click on the [Setup Tab](#).
5. Set a **Mode**. Select from:
 - Embedded
 - AES
 - Embedded AES
 - AES Embedded
 - Loop
6. Click on [MatroxVizBold](#) .
7. Select **VideoIn A** or **VideoIn B**
8. In the **Audio** section:
 - Set **Audio** to **Active**
 - Set the required **Channels**
 - Set the required **Delay**

Tip: Use the provided config templates to set defined parameters in the **Audio** section. Go to <viz install folder> -> import -> AE -> templates

9. Click **Save**.
10. Close **Viz Config**.

7 Shared Memory (SHM)

The information in this section relates to the [VizCommunication.Map](#) (see the [Viz Artist User Guide](#)).

A local VizCommunication.Map in each Viz Engine (as part of a cluster), collects and stores data. This data can be internal data, like a scene script pushing data to the map, or data from external control applications through TCP or UDP.

This section contains information on the following topics:

- [External Data Input](#)
- [Internal Data \(Interactive Scene\)](#)
- [Synchronization](#)
- [Snapshot](#)

See Also

- Data Sharing (see the [Viz Artist User Guide](#))

7.1 External Data Input

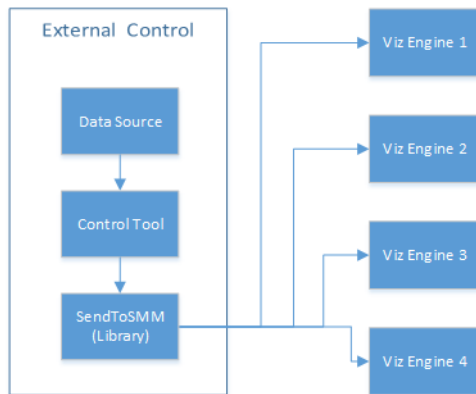
Data feed into the Shared Memory (SMM) should be done through the dedicated UDP or TCP IP ports for the SMM. Vizrt provides a set of components, SendToSMM, to makes this task easier.

Note: Go to <Viz Install Directory> -> Tools -> SendToSMM, for more information about SendToSMM.

Data can also be sent to SHM through a Command Interface. Data sent through the Command Interface may be seen as a good option because the data would need to be sent to one Viz Engine only, and this Viz Engine would then distribute the data to the other Viz Engines. But Data sent to SHM through the Command Interface has problems:

- Data sent through the Command Interface will block the render queue of the receiving engine causing potential frame drops. Since the data needs to be sent through a command significant more bytes are transferred over the Network.
- This Viz Engine is also a single point of failure
- The data will arrive at this one Viz Engine sooner than on all other Viz Engines
- The notification method of the Graphic Hub Manager is used to distribute the data and can cause additional load for the Graphic Hub Manager

The preferred method to send data is to use the 'SendToSMM' library (or an equivalent) to send the data to the individual Viz Engines.



The communication protocol for the import of Shared Memory data depends on the type and final output of the data. There are set protocols to use with large amounts of data, in which all of the data must reach its destination graphic, and also where large amounts of data must be received, quickly, but some loss of data is acceptable.

For use cases see:

- [TCP Protocol](#)
- [UDP Protocol](#)
- [Plugin API](#)
- [Command Interface](#)

Note: It is also possible to import data through Multicast. This method is not recommended as it can pollute the network.

This section contains information on the following topics:

- [TCP Protocol](#)
- [UDP Protocol](#)
- [Plugin API](#)
- [Command Interface](#)

7.1.1 TCP Protocol

The SHM TCP communication protocol guarantees a reliable delivery of packages. It is a much more efficient than the [Command Interface](#), but not as fast as the [UDP Protocol](#) protocol.

Use cases for a TCP connection could be finance stocks and currencies, or election result information, where the requirement is to deal with large amounts of information, and all of this data must reach its destination graphic. A single piece of lost data can have economic consequences, falsify charts, show mathematically wrong results, etc.

A TCP connection to a Viz Engine can be held open for a long time (this is recommended), and should not be opened and closed between sending variables.

Note: The default maximum number of TCP connections is limited to 255. Within this number of connections a User defined limit of maximum connections can be set (see [To Limit the Number of TCP Connections](#))

IMPORTANT! The external program which provides the data, must connect and send the data to each Viz Engine individually. Vizrt provides a C# library, SendToSMM (part of the Viz install), for this purpose.

To Use TCP for SHM

1. Go to the [Configuring Viz](#).
2. Click on [Communication](#).
3. Click on the [Shared Memory Properties](#) tab.
4. In the Shared Memory panel set these parameters:
 - **TCP Port:** Vizrt does not recommend a specific port. Always make sure that the selected port is not in use by any other program on the same subnet.
5. Click **Save**.

The syntax for the key-value pairs is:

- key|value\0

Multiple key-value pairs can be sent, at once, as well. To do this make sure that each pair is terminated with 0.

- key1|value1\0key2|value2\0key...

See Also

- [UDP Protocol](#)
- [Plugin API](#)
- [Command Interface](#)

7.1.2 UDP Protocol

The SHM UDP communication protocol should be used for the delivery of volatile data. It is quicker than the [TCP Protocol](#) protocol, but less reliable, and is much more efficient than the [Command Interface](#).

A use case for UDP would be Motor Sports, where data like speed, velocity, etc., is required. This is where there is a requirement to deal with large amounts of data, but

not all of this data must reach its destination. A single piece of data lost will not affect the constant data update.

To Use UDP for SHM

The screenshot shows a configuration window for Shared Memory. It has a title bar with 'Global' and 'Shared Memory'. The fields are as follows:

- Multicast Ip Address: 224.2.2.2
- Multicast Port: 0
- UDP Port: 0
- TCP Port: 0
- Debug: Inactive
- Master Engine Ip Address: (empty)
- Master Engine Port: 0
- Master Poll: Inactive, Commands, UDP, TCP

1. Go to the [Configuring Viz](#).
2. Click on [Communication](#).
3. Click on the [Shared Memory Properties](#) tab.
4. In the Shared Memory panel set these parameters:
 - **UDP Port:** Vizrt does not recommend a specific port. Always make sure that the selected port is not in use by any other program on the same subnet.
5. Click **Save**.

The syntax for sending key-value pairs is the same as for [TCP and UDP Synchronization](#).

See Also

- [TCP Protocol](#)
- [Plugin API](#)
- [Command Interface](#)

7.1.3 Plugin API

An option to manipulate data in SHM is by a plugin interface.

A use case would be where a TCP or UDP connection can not be used, or is not to be used. It is possible to write a plugin to import data (e.g. from an XML file, another database, etc.) and push it to SHM.

Another use case would be an interactive Scene (see [7.2 Internal Data \(Interactive Scene\)](#)).

Note: The Plugin API is documented in the plugin API documentation and comes with the Viz installer (go to, *Start -> All Programs -> vizrt -> Viz 3.x -> Documentation -> Plugin SDK Documentation -> Classes -> Class List -> Shared_Memory*).

See Also

- [TCP Protocol](#)
- [UDP Protocol](#)
- [Command Interface](#)

7.1.4 Command Interface

For small and single value changes the Command Interface of Viz Artist can be used. For example, to update a headline in a Scene.

IMPORTANT! A command operation can block the renderer. If there are too many commands, within a small time, or commands containing a large amount of data, are sent, this can result in not rendering real-time anymore.

Note: Vizrt do not recommend this as a method for data import.

Any external program should consider the performance of the single or all connected Viz Engines. If there is a burst of thousands of SHM variables this can have implications on the Viz Engine rendering performance (Current (CUR) and Maximum (MAX)).

A full list of commands is at:

- `<viz install folder>\Documentation\CommandInterface\index.html`

Note: From the list of commands, the commands, `CLEAR`, `DELETE_ELEMENT` and `PURGE_ELEMENT` will only work when sent through the command interface of Viz Artist.

IMPORTANT! The command `CLEAR` must be run on each Engine where the MAP is to be reset (`VIZ_COMMUNICATION*MAP CLEAR`).

Whenever a new entry is made in the map (a new key-value pair) or values are changed, then the change is propagated to the other Viz Engines through a database messaging service to update the local copy of each Viz Engine's map (this only works when sent over the general communication port of Viz Engine (default port 6100)).

Command Examples

`VIZ_COMMUNICATION*MAP` can be used to access the map.

`SET_DOUBLE_ELEMENT` and `GET_DOUBLE_ELEMENT`

Example: `VIZ_COMMUNICATION*MAP SET_DOUBLE_ELEMENT "my_double" 1.2`

Example: `VIZ_COMMUNICATION*MAP GET_DOUBLE_ELEMENT "my_double"`

See Also

- [TCP Protocol](#)
- [UDP Protocol](#)
- [Plugin API](#)

7.2 Internal Data (Interactive Scene)

When data is modified on one Viz Engine through a script or through a plugin, the data change will get reflected on the other Viz Engines automatically.

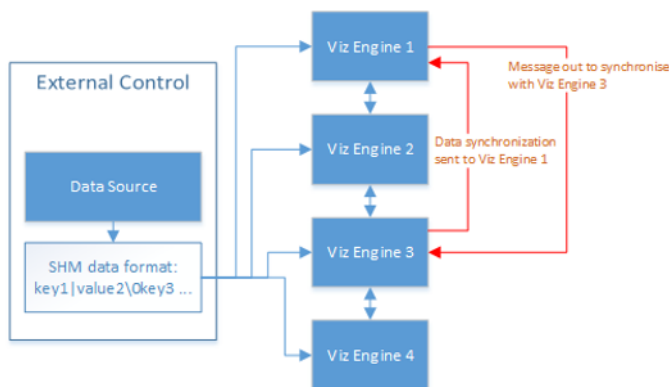
A use case could be a touch screen scene which modifies data, which is also used for HD-SDI Viz Engines or Viz Engines driving a Video Wall.

This synchronization uses the Graphic Hub Manager as a relay. Therefore it is important that all Viz Engines, which are to receive the data, are connected to the same Graphic Hub Manager, which use the same user or at least the same group.

7.3 Synchronization

If a Viz Engine is restarted or added to the cluster of Viz Engines for playout, the VizCommunication.Map data will not be available on this Viz Engine. The local map on a new or restarted Viz Engine can be synchronized with the local map on another running Viz Engine in the same cluster.

Example: If Viz Engine 1 restarts it will look to, for example, Viz Engine 3 to update its local VizCommunication.Map.



A start-up Viz Engine can be synchronized through:

- TCP, or
- UDP, or
- An External Control Application, or
- Commands

This section contains information on the following topics:

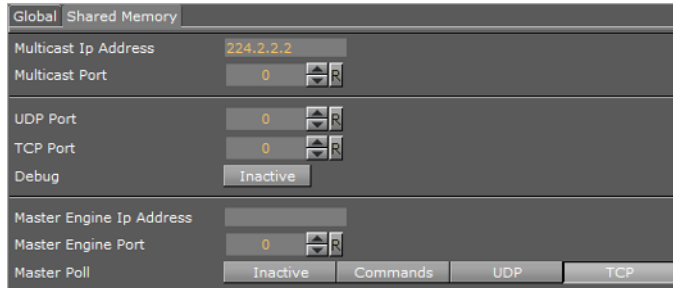
- [TCP and UDP Synchronization](#)
- [External Control Synchronization](#)
- [Command Synchronization](#)

7.3.1 TCP and UDP Synchronization

Use the procedure detailed below to synchronize a restarted or added Viz Engines, in a cluster, with the TCP or UDP protocol:

- **TCP:** The recommended communication protocol to synchronize maps on start-up because it is reliable and efficient (see [TCP Protocol](#)).
- **UDP:** For fast communication, but has drawbacks. For instance, packets can get lost (see [UDP Protocol](#)).

To Synchronize a Viz Engine with TCP or UDP



1. Go to the [Configuring Viz](#).
2. Click on [Communication](#).
3. Click on the [Shared Memory Properties](#) tab.
4. Enter the port number for:
 - **UDP Port**, or
 - **TCP Port**

Note: Vizrt does not recommend a specific port number. Always make sure that the selected port number is not in use by any other program on the same subnet.

5. In **Master Engine Ip Address** type the Ip address of a running Viz Engine to synchronize with. Example <IP/hostname of Viz Engine 3>.

Note: Must be the Ip address of a running Viz Engine in the same cluster system.

6. In **Master Engine Port** type the port number to be used (default 6100). This port sends the single startup synchronization command to start synchronizing. It should be the same as the general communication port of the Viz Engine set in **Master Engine Ip Address**.
7. In **Master Poll** click on:
 - **UDP**, or
 - **TCP**

Note: Must be the same protocol as selected in step 4.

8. Click **Save**.

See Also

- [Command Synchronization](#)

7.3.2 External Control Synchronization

Synchronization can also be done from an External Control Application. The following command has to be sent to the Viz Engine which has the memory map populated:

- **From a Command Interface**

```
VIZ_COMMUNICATION SYNCHRONIZE_TO <engine port>
```

where the Viz Engine is the engine which receives the data through the Command Interface. The port is usually 6100 (standard command interface port).

Note: Vizrt do not recommend this as a method for synchronization.

- **Through TCP Communication**

```
VIZ_COMMUNICATION SYNCHRONIZE_SMTCP <engine port>
```

where the Viz Engine is the engine which receives the data, and the port is the one that was specified for incoming TCP key|value pairs on the Viz Engine which is to receive the data (see [TCP Protocol](#)).

- **Through UDP Communication**

```
VIZ_COMMUNICATION SYNCHRONIZE_UDP <engine port>
```

where the Viz Engine is the engine which receives the data, and the port is the one that was specified for incoming UDP key|value pairs on the Viz Engine which is to receive the data (see [UDP Protocol](#)).

7.3.3 Command Synchronization

Another communication option is by Commands. Here each map entry is synchronized through commands.

It is reliable, but very slow and blocks the engine for quite an amount of time, if the map is large.

Note: Vizrt do not recommend this as a method for synchronization.

To synchronize a Start-up Viz Engine with Commands

1. Go to the [Configuring Viz](#).
2. Click on [Communication](#).
3. Click on the [Shared Memory Properties](#) tab.
4. In the Shared Memory panel set these parameters:
 - **Master Engine Port:** Enter the communication port of the Master engine (default is 6100).
 - **Master Poll:** Click on **Commands**.
5. Click **Save**.

See Also

- [TCP and UDP Synchronization](#)

7.4 Snapshot

It is also possible to take a data 'snapshot' (save the whole content of the map) at any time. One Viz Engine can save the whole content of the map by calling the map's SaveToDb procedure, and another client can read it by calling LoadFromDb.

The downside of this approach is that these functions block the renderer and can cause poor performance of the Graphic Hub Manager database, if the map is stored repeatedly.

IMPORTANT! The resulting SHM map objects are replicated as well. So saving the map each field or every minute can result in serious problems for the Graphic Hub Manager database (replication failing, etc.).

Note: For more information see the script function documentation. Go to, *Start -> All Programs -> vizrt -> Viz 3.x -> Documentation -> Script Documentation -> Data Types and procedures -> Shared Memory*, or *<Viz Install Directory> -> ScriptDoc -> DataTypeSharedMemory*.

See Also

- [External Data Input](#)
- [Synchronization](#)

8 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](#)
- [Configure Frame Accurate Output](#)
- [Commands](#)

8.1 Prerequisites

To make sure clip handling is fast the system has to be configured to use a RAID-0 hard disc configuration. Also it is best to use a Matrox X.mio2 or X.mio2 Plus 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 [Configure 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 four 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 Artist/Engine.

See Also

- [Configure Frame Accurate Output](#)
- [Render Options](#)
- [Shader](#) definition

8.2 Configure Frame Accurate Output

To Configure Frame Accurate Output

1. Open **Viz Configuration**
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 [Memory Management](#) 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**

8.3 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

8.4 GPI Commands

Viz Engine supports frame accurate commands being sent via GPI. This section contains information on the following topics:

- [Prerequisites](#)
- [Functionality](#)
- [Commands](#)

8.4.1 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)

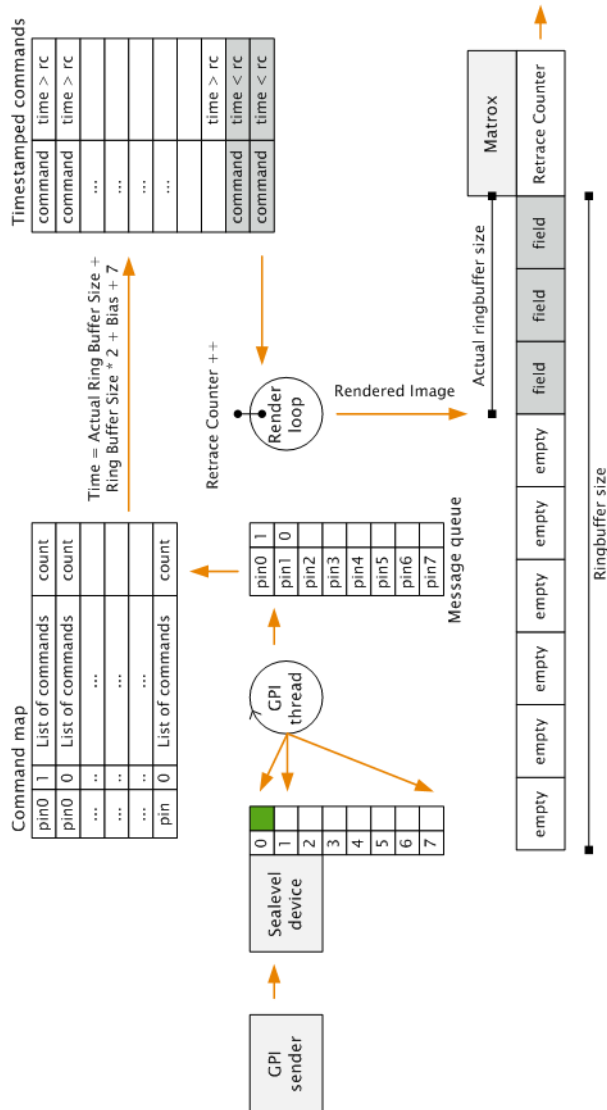
8.4.2 Functionality

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.

Flow of the GPI signal



8.4.3 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 be 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: $\text{Ring_Buffer_Size} * 2 + 7 + \text{Delayed_Command_Bias}$. The **<Delayed_Command_Bias>** can be set in the Viz Config file. Therefore $\text{Ring_Buffer_Size} * 2 + 7$ 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 shown in the console and a warning is shown, that GPI is disabled. The TEST command is working as usual, even if GPI is disabled.

- 1 enables GPI execution

- 0 disables GPI execution

9 NVIDIA Graphics Cards

This section describes the NVIDIA graphics cards, their configuration and drivers supported by Viz Engine.

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:

- [Working with Two Graphics Cards](#)
- [Working with Synchronous Output](#)
- [NVIDIA Driver Configuration](#)
- [NVIDIA Driver History](#)

See Also

- [Video, Audio and Graphics Card Installation](#)

9.1 Working with Two Graphics Cards

A machine with two graphics cards can run two instances of Viz Engine simultaneously.

Currently there are three options;

- **Two Program Outputs:** Use two instances that can run two program channels, e.g. one for SD and one for HD output.
- **One Program Output and One Preview Output:** Run a control application with one instance for preview and one instance for program output with video. Ideal for Outside Broadcast environments.
- **One Program Output for Stereoscopy:** Produce graphics composited for stereoscopic use. In addition this will also save rack unit space as all hardware is installed into one machine.

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.

See Also

- [Working with Synchronous Output](#)

9.2 Working with 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 [Video Wall Distributor](#)

synchronously distributes one command to the two instances of the Viz Engine. For Viz Engine version 3.3 and later, it includes a built-in locking mechanism that makes sure both Viz Engines stay in sync, even if one of them drops a frame. This feature can be set On or Off by a simple command sent through the distributor.

This section contains information on the following topics:

- [Hardware Requirements](#)
- [Software Requirements](#)
- [Synchronous Output Configuration](#)
- [Video Wall Distributor](#)
- [To Configure a Machine with Two Graphics Cards](#)

Hardware Requirements

- HP Z800 machine or better
- 2 x NVIDIA Quadro FX 3800 or 2x NVIDIA Quadro FX 4800 (GPUs must be identical)
- Matrox X.mio2 video in- and output card

Software Requirements

- Viz Artist/Engine version 3.3 or later

Synchronous Output Configuration

The Viz Engine installer, version 3.3 and later, 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 channel 2.

Note: Viz Artist will only be available for channel 1 as it will always run on the first GPU.

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

	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

	Viz Engine 1	Viz Engine 2
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.

Video Wall Distributor

The Video Wall distributor listens to port 6100 as if it was a regular Viz Engine. The engines are connected through 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 Box CG** setup.
2. From the Viz3 sub folder **ConfigExample/TrioOneBox** or **ConfigExample/DualChannel1**, select the example Viz Config file that suits your desired video output format.
3. Create two copies of the selected Viz Config 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 1 and channel 2) and enter settings for the Viz Graphics Hub (see [Database](#)) and enable Auto Log-in.
 - Auto log-in 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).

Note: Viz Trio Box CG requires Viz Trio 2.9 or later and Media Sequencer 1.19 or later. Viz Trio Box CG is a single channel setup where you have a program channel on the client machine in addition to your regular local Viz Engine preview.

See Also

- [Viz Command Line Options](#)
- [HP Z800 Installations](#)
- [Stereo Settings](#) and Stereoscopy best practices (see the [Viz Artist User Guide](#))
- [Setup of the output channels using two graphics cards](#) (see the [Viz Trio User Guide](#))

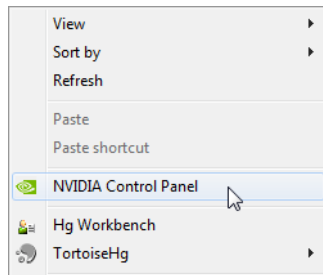
9.3 NVIDIA Driver Configuration

This section contains information on the following procedures:

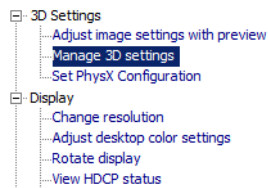
- [To Configure NVIDIA Driver Settings](#)
- [To Configure the V-phase Settings when Synchronizing the Card](#)
- [To Configure Mosaic](#)
- [NVIDIA G-SYNC Card](#)

To Configure NVIDIA Driver Settings

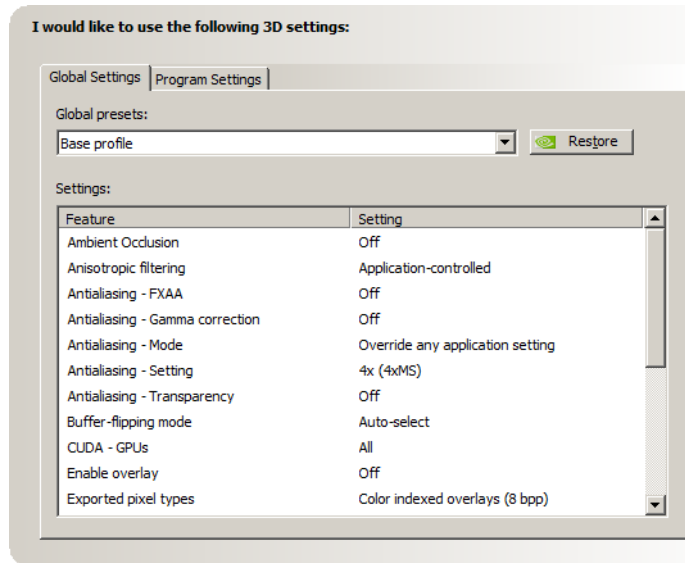
1. Right-click the desktop and select the **NVIDIA Control Panel**.



2. Click **Manage 3D settings**.



3. In **Global Settings** select the Global presets option **Base profile**.



4. Set the following parameters:
 - **Ambient Occlusion:** Off
 - **Anisotropic filtering:** Application controlled
 - **Antialiasing-Gamma correction:** Off
 - **Antialiasing-FXAA:** Off
 - **Antialiasing-Mode:** Override any application settings
 - **Antialiasing-Setting:** 4x (4xMS)
 - **Antialiasing-Transparency:** Off
 - **Power management mode:** Prefer maximum performance
 - **Vertical Sync:** Off (see [Vertical Sync](#) (below))
5. In the **Global presets** drop down box select **Workstation App - Dynamic Streaming**.
6. Click on **Apply**.

Vertical Sync

Notes for Vertical Sync:

- **Use the 3D application setting:** Use for Viz installations (running in Standard PC (VGA) mode) and for Video Wall setups where video is in use.
- Off: 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 4500 SDI, and FX 5500 SDI boards the parameter `use_old_nvsdk` may need to be set to 1 in the Viz Config file, if stability issues encounter, on unsupported systems.

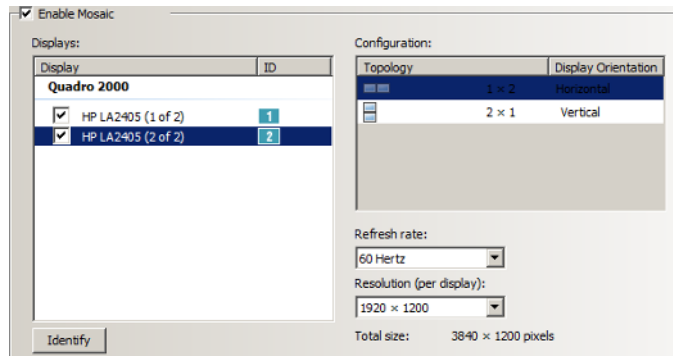
To Configure the V-phase Settings when Synchronizing the Card

1. Start Viz Config, or open the configuration from Viz Artist (Config button in the upper right corner)

2. Select [Video Output](#).
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

To Configure Mosaic

1. Right-click the desktop and select the **NVIDIA Control Panel**.
2. Click **Set up Mosaic**.
3. Tick the **Enable Mosaic** box.
4. Tick all required displays.
5. Set the **Refresh rate**.
6. Set the **Resolution (per display)**.



7. Click **Apply**.
8. Open Viz Config.
9. Click on **User Interface**.
10. Set **Screen Layout Mode** to **Mosaic Horizontal** or **Mosaic Vertical**.

NVIDIA G-SYNC Card

The G-SYNC card makes sure that all screens, which make up a Video Wall, are synchronized, therefore, check that all the G-SYNC cards are connected in a chain through an ethernet cable.

When there are several Viz Engines in use, one is defined as the master and all the others as slaves.

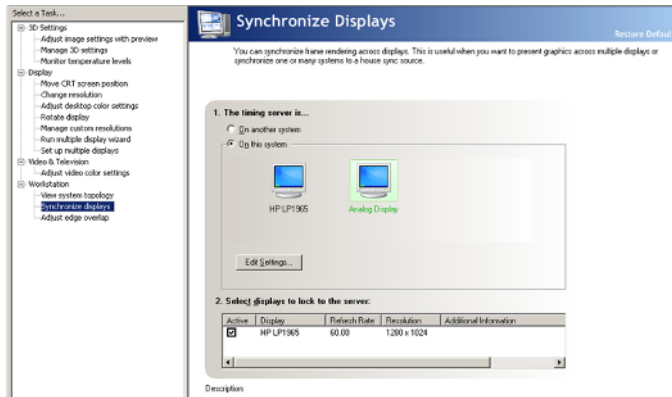
This section contains the following procedures:

- [To Configure G-SYNC on one Viz Engine](#)
- [To Configure the G-SYNC Card on Viz Engine Slaves](#)

- [To Check the G-SYNC Status](#)
- [Genlock \(House Sync\)](#)

To Configure G-SYNC on one Viz Engine

1. On Viz Engine, go to the NVIDIA control panel.

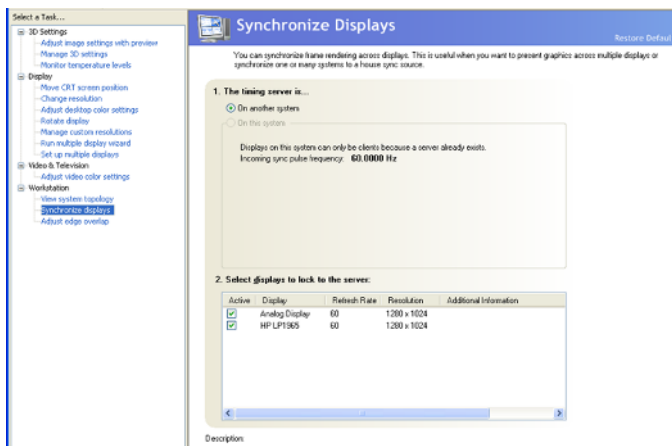


2. In **Workstation**, click **Synchronize displays**.
3. In **The timing server is...**, click **On this system**.
4. In **Select displays to lock to the server**, click each available display, in the field below, to make them active.

To Configure the G-SYNC Card on Viz Engine Slaves

Do this procedure on each Viz Engine slave.

1. On the Viz Engine slave, open the NVIDIA control panel.



2. In **Workstation**, click **Synchronize displays**.
3. In **The timing server is...**, click **On another system**.
4. In **Select displays to lock to the server**, click each available display, in the field below, to make them active.

To Check the G-SYNC Status

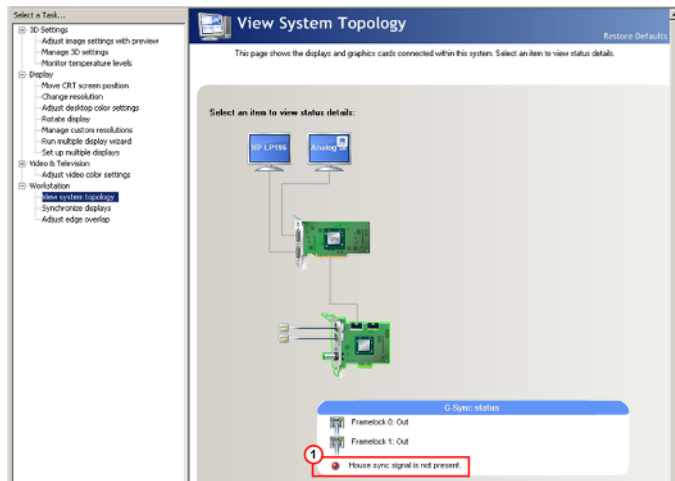
1. On each machine, in turn, open the NVIDIA control panel.
2. In **Workstation**, click **View system topology**.

- On the slave system, make sure that **Frame lock sync pulse is present** shows in the G-SYNC status portion on the lower part of the screen.

Genlock (House Sync)

There also the option to use a genlock (house sync) signal from the studio as an input to the G-SYNC card. In this case, once connected, check the signal in the **View system topology** screen, in **Workstation**.

House sync signal is not present (1) means that no external genlock is connected and that the pulse is generated internally. If the external genlock is not used, this message can be ignored.



9.4 NVIDIA Driver History

This section lists all the current NVIDIA Graphic boards and their recommended drivers. For non current NVIDIA boards see [NVIDIA Legacy Cards](#).

When the latest Viz Artist version is to be installed on a workstation or laptop, Vizrt recommended to use NVIDIA driver version 340.84 (check the list in this section for specific requirements).

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

This section contains information on the following topics:

- [Video Wall Driver Recommendations](#)

NVIDIA Quadro K6000	NVIDIA Quadro K4200
NVIDIA Quadro K5200	NVIDIA Quadro K2200
NVIDIA Quadro K5000	NVIDIA Quadro K2000

See Also

- [NVIDIA Legacy Cards](#)
- [NVIDIA Driver Configuration](#)

9.4.1 Video Wall Driver Recommendations

The NVIDIA driver 340.89 is recommended for Video Wall setups with [NVIDIA G-SYNC Card](#) and graphics cards [NVIDIA Quadro 4000](#), [NVIDIA Quadro K6000](#), to enable a stable clock on all machines.

Configure the NVIDIA driver for Mosaic with all screens (see [To Configure Mosaic](#)).

See Also

- [Video Wall Configuration](#)
- [NVIDIA Driver History](#)

9.4.2 NVIDIA Quadro K6000

Windows 7 (64bit) / Windows Server 2008 R2/SP1 (64bit)

Viz Artist/Engine Version	Driver
3.6.4 and later	341.21

See Also

- [To Configure NVIDIA Driver Settings](#)
- [NVIDIA Driver History](#)

9.4.3 NVIDIA Quadro K5200

Windows 7 (64bit) / Windows Server 2008 R2/SP1 (64bit)

Viz Artist/Engine Version	Driver
3.6.4 and later	341.21

See Also

- [To Configure NVIDIA Driver Settings](#)
- [NVIDIA Driver History](#)

9.4.4 NVIDIA Quadro K5000

Windows 7 (64bit) / Windows Server 2008 R2/SP1 (64bit)

Viz Artist/Engine Version	Driver
3.6.4 and later	341.21

Windows XP

Viz Artist/Engine Version	Driver
3.5.4 and later	311.50

Support	SDI output with Matrox X.mio2 SDI capture with NVIDIA Quadro SDI Output card G-SYNC II
----------------	--

See Also

- [To Configure NVIDIA Driver Settings](#)
- [NVIDIA Quadro SDI Capture](#)
- [NVIDIA Driver History](#)

9.4.5 NVIDIA Quadro K4200

Windows 7 (64bit) / Windows Server 2008 R2/SP1 (64bit)

Viz Artist/Engine Version	Driver
3.6.4 and later	341.21

- [To Configure NVIDIA Driver Settings](#)
- [NVIDIA Driver History](#)

9.4.6 NVIDIA Quadro K2200

Windows 7 (64bit) / Windows Server 2008 R2/SP1 (64bit)

Viz Artist/Engine Version	Driver
3.6.4 and later	341.21

See Also

- [To Configure NVIDIA Driver Settings](#)
- [NVIDIA Driver History](#)

9.4.7 NVIDIA Quadro K2000

Windows 7 (64bit) / Windows Server 2008 R2/SP1 (64bit)

Viz Artist/Engine Version	Driver
3.6.4 and later	341.21

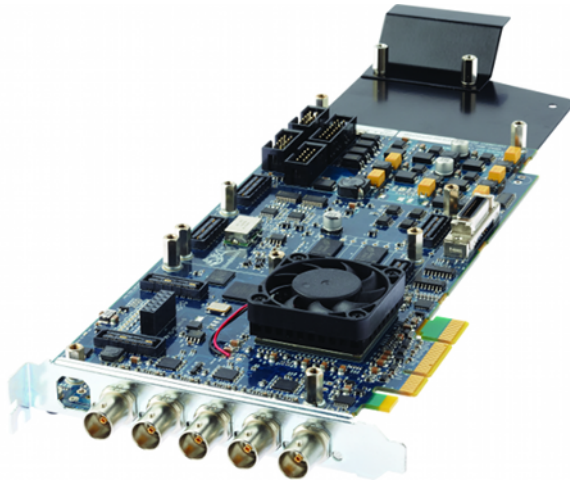
Windows XP

Viz Artist/Engine Version	Driver
3.5.4 and later	311.50

See Also

- [To Configure NVIDIA Driver Settings](#)
- [NVIDIA Driver History](#)

10 BlueFish444



Viz 3.5 and later supports the BlueFish444 Epoch 4K SuperNova board. This board replaces the SD Lite Pro Express, which for Viz 3.5 installations will work, but is considered a legacy board.

Note: Other BlueFish444 and Digital Voodoo boards are no longer supported (see the [Legacy Cards](#) section).

The BlueFish444 Epoch 4K SuperNova board is intended for character generators such as Viz Trio, but can also be used as an alternative where only two inputs and outputs are required. The board is typically installed on HP Z800 machines.

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 overlaid on the output. Ingestion of timecodes from time code reader boards are supported as well
- Two video inputs and outputs and one genlock
- Automatic bypass (aka [Watchdog](#)) of video if the Viz Engine crashes
- Constant delay of 4 frames from input to output

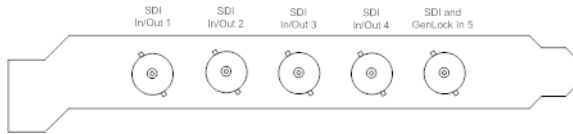
This section contains information on the following topics:

- [Connectors](#)
- [Configuration History for BlueFish444](#)
- [Watchdog](#)

See Also

- [Video, Audio and Graphics Card Installation](#)

10.1 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](#)).

10.2 Configuration History for BlueFish444

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
3.7.1	v5.11.0.14
3.7.0	v5.11.0.7
3.6.4	v5.11.0.3 (firmware 96)
3.6.3	v5.10.2.18
3.6.1 - 3.6.2	v5.10.2.4
3.5.1 - 3.5.4	v5.10.1.11
3.5.0	v5.9.0.78

10.3 Watchdog

Viz Engine supports automatic mechanical bypass (copper-to-copper) of video for BlueFish444 Epoch boards. To use this feature enable the [Watchdog](#) feature.

To Enable Automatic Bypass for BlueFish444 Epoch Boards

1. Stop Viz Engine.
2. Open the **Viz Config** file (for example: *VIZ-<hostname>-0-0.cfg*)
3. Locate the **SECTION MATROX_CONFIG**.
4. Enable the Matrox watchdog setting:

```
Matrox0.WatchDogUseHardwareBypass = 0
```
5. Save the file
6. Start Viz Engine

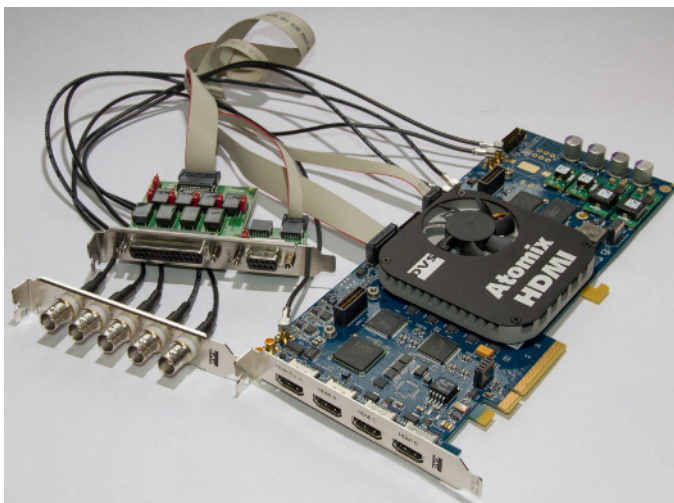
11 Digital Video Systems

This section describes the Digital Video Systems (DVS) video boards and drivers supported by Viz Engine.

This section contains information on the following topics:

- [DVS Atomix HDMI](#)
- [DVS Atomix LT](#)

11.1 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 section contains information on the following topics:

- [Connectors](#)
- [Supported Codecs](#)
- [Configuration History](#)
- [Licensing](#)

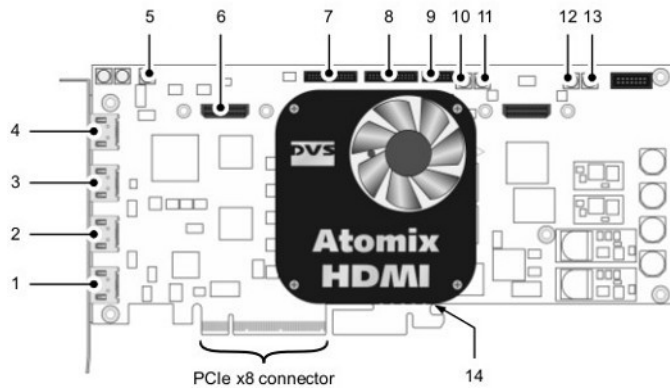
See Also

- [Video, Audio and Graphics Card Installation](#)

- [DVS support](#)

11.1.1 Connectors

Component Side



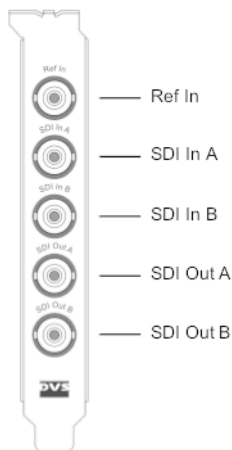
This section is an excerpt from the **DVS Atomix HDMI Installation Guide (version 2)**, section 2.2.2: *Overview of the Component Side* and section 2.3.3: *Audio and RS-422 Panel*. For complete information, see the DVS Installation Guide available for download on their website.

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)
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)

No.	Item	Description
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

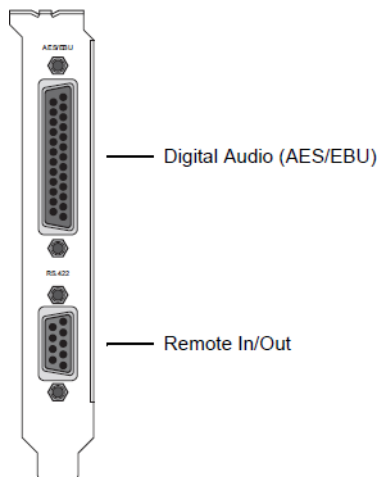
The SDI panel provides the serial digital interface connectors for Atomix HDMI:



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

Item	Description
	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 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]

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.

11.1.2 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.

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.

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.

See Also

- [Supported Codecs](#) in the [Viz Artist User Guide](#)

11.1.3 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:

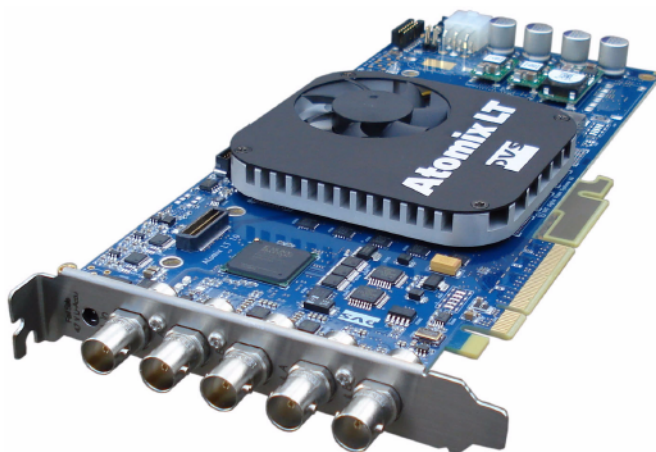
Viz Release	Driver Version
3.5.4 and later	SDK 4.3.5.10 (firmware 7.4.0.20_7.0.10)
3.5.2 - 3.5.3	SDK 4.2.9.8 (firmware 7.4.0.6_7.0.10)

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*.

11.1.4 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*.

11.2 DVS Atomix LT



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

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:

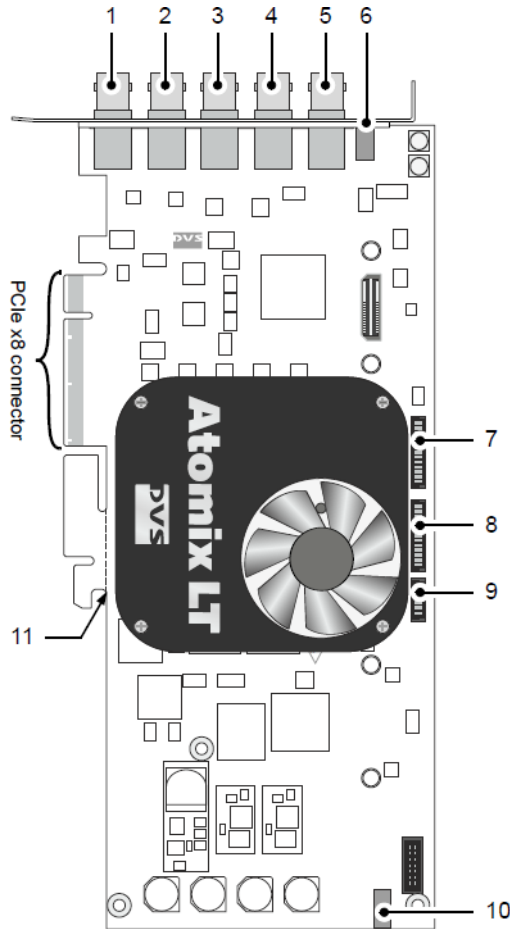
- [Connectors](#)
- [Supported Codecs](#)
- [Configuration History for DVS](#)
- [Licensing](#)

See Also

- [Video, Audio and Graphics Card Installation](#)
- [DVS support](#)

11.2.1 Connectors

Overview of the items and connectors on the DVS Atomix LT board

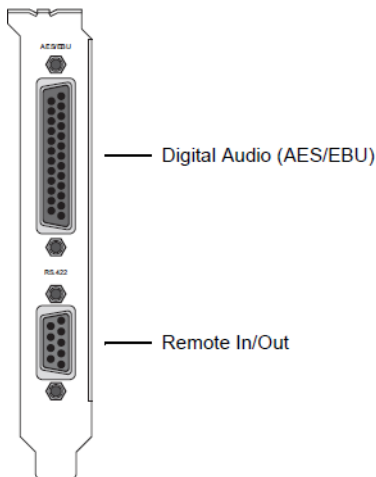


This section is an excerpt from the **DVS Atomix LT installation guide** (version 1.0) section 2.2.1 and 2.3.2: *Overview of the Component Side and Audio and RS-422 Panel*. For complete information, please refer to DVS' installation guide available for download on their website.

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);

No.	Item	Explanation
		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

Panel with audio and remote control connections



With the board 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.

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.

11.2.2 Supported Codecs

Currently, the DVS implementation only supports the **Microsoft DirectShow Filtergraph** framework to render video clips. This enables you to play for example 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 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.

11.2.3 Configuration History for DVS

The following driver versions are supported:

Viz Release	Driver Version
3.5.4 and later	SDK 4.3.5.10
3.5.2 - 3.5.3	SDK 4.2.9.8
3.3.0 - 3.5.1	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*.

11.2.4 Licensing

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

12 Matrox

Viz Engine supports a wide range of Matrox boards and dongles that all have common installation procedures which are detailed in this section.

For a more detailed overview of the different Matrox products Viz Engine supports please see:

- [Matrox DSX LE Series](#)
- [Matrox X.mio Series](#)
- [Matrox X.Open](#)
- [Matrox X.RIO](#)
- [Video, Audio and Graphics Card Installation](#)

This section contains information on the following topics:

- [Matrox Driver Installation](#)
- [Mixed Mode Video Support](#)
- [Supported Codecs](#)

12.1 Matrox Driver Installation

The first time a machine is started with a Matrox board or dongle installed, the operating system (OS) will ask to install the Matrox Driver.

IMPORTANT! It is not recommended to use the OS installation procedure, but the supplied driver installer application.

Before a new driver or driver upgrade is installed, any installed old drivers must first be uninstalled (see [To Remove the Matrox Driver](#)).

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 board.
- A driver version, which is not recommended, will in most cases cause the system to be **unresponsive**.

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

As there are many driver versions available, it is important to compare the versions of those reported by the Matrox X.info utility to check that the driver and firmware versions match. A warning will show if the versions do not match.

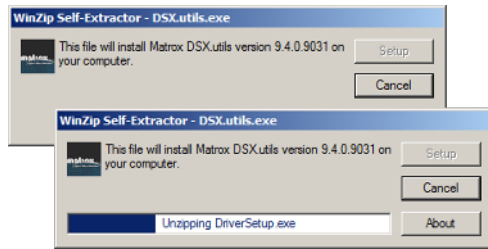
This section contains information on the following topics:

- [To Install the Matrox Driver](#)

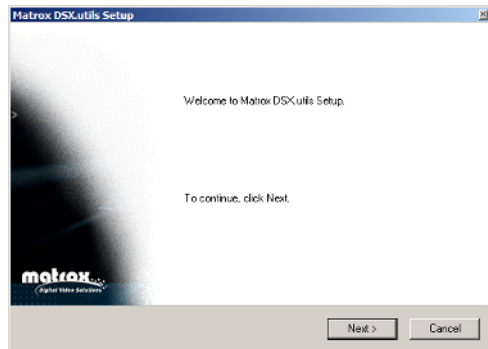
- [To Remove the Matrox Driver](#)
- [To Check the Installation](#)
- [To Check the Installation with Windows Device Manager](#)

To Install the Matrox Driver

1. Locate the latest Matrox (DSX.utls) driver:
ftp://ftp.vizrt.com/products/Vizrt%20Drivers/Matrox/Xmio/<driver>/
2. Download and save.
3. Open the DSX.utls.exe file. The file unzips and loads.

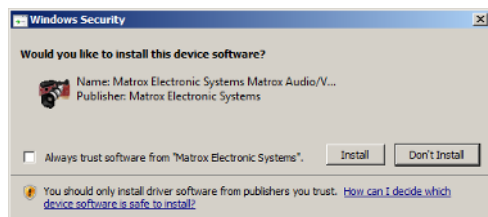


4. Follow the on screen instructions.

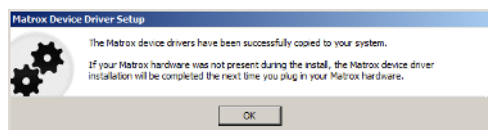


5. In the Windows Security window tick the **Always trust software....** box.

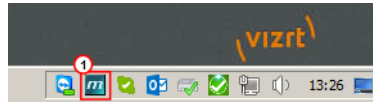
Note: If the **Always trust software....** box is ticked any subsequent Matrox Drivers are installed automatically. Otherwise each required driver will need permission to install.



6. Click **Install**.
7. The DSX.utls file starts to install (the install can take several minutes).
8. Click **OK**.



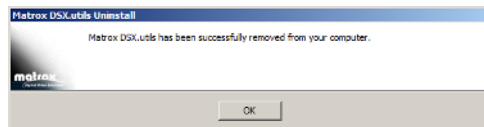
9. After the driver has been installed, a Tray icon (1) will show.



Note: The firmware upgrade now starts. This can take a few minutes to complete.

To Remove the Matrox Driver

1. Go to *Start -> Control Panel -> Program and Features*.
2. Locate the **Matrox DSX.utils <version>**.
3. Click **Uninstall** (or right click on the entry and select **Uninstall**).
4. Follow the on screen instructions.



5. Reboot the machine.

Note: In some cases the Matrox driver uninstall will automatically reboot the machine.

To Upgrade the Matrox Driver

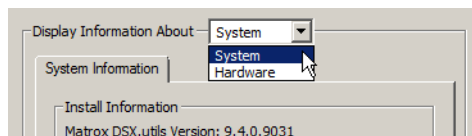
1. Uninstall old DSX.utils (see [To Remove the Matrox Driver](#))
2. Reboot system.
3. Install new DSX.utils (see [To Install the Matrox Driver](#)).

To Check the Installation

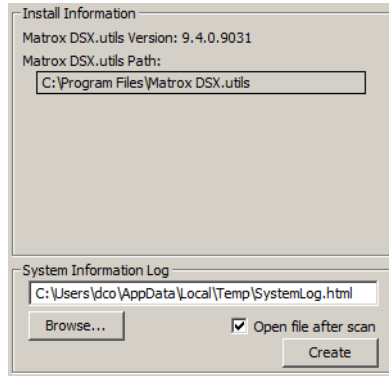
1. Click the Matrox system tray icon.
2. Select **Open X.info**.



3. In the **Display Information About** drop-down, select **System**.

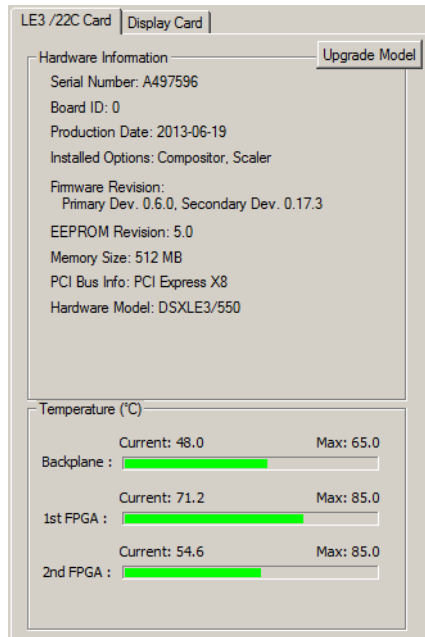


4. Check that the correct driver version was installed.



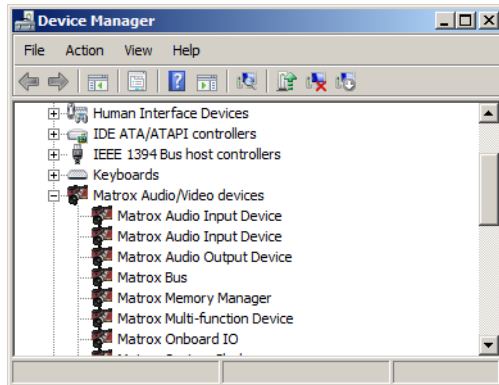
5. In the **Display Information About** drop-down, select **Hardware**.
6. Click on the installed card tab (e.g. LE3/22C).

Note: The information shown on the panel can look different with different Matrox cards installed.



7. Check the these details:
 - Some boards may not have an on-board compositor. See **Hardware Information** and check that **Installed Options** list **Compositor** as this checks that the board is taking advantage of the **on-board compositor** . X.mio2 Plus has an on-board compositor even though this is not listed.
 - See **PCI Bus Info** and check that the board was put into a [PCIe](#) slot operating at the right frequency.
 - See **Hardware Model** (e.g. X.mio2 + 8500) to check for [Mixed Mode Video Support](#).

To Check the Installation with Windows Device Manager



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

See Also

- [Drivers and Firmware](#) for Matrox DSX.LE series
- [Drivers, Firmware and Configuration History](#) for Matrox X.mio series

12.2 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 Engine. 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: The two cannot be mixed.

The following tables contain information on the following topics:

- [Source: PAL or NTSC](#)
- [Source: 720p](#)
- [Source: 1080i](#)

12.2.1 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: The genlock families cannot be mixed (e.g. NTSC and 1080i50)

Video In to DVE and Texture.

Output DVE	Video In		
	PAL/NTSC	720p	1080i
PAL/NTSC	OK	-	-
720p	-	-	-
1080i	OK	-	-

Output Texture	Video In		
	PAL/NTSC	720p	1080i
PAL/NTSC	OK	-	-
720p	OK	-	-
1080i	OK	-	-

Clip In to DVE and Texture

Output DVE	Clip In		
	PAL/NTSC	720p	1080i
PAL/NTSC	OK	-	-
720p	-	OK	-
1080i	OK	OK	-

Output Texture	Clip In		
	PAL/NTSC	720p	1080i
PAL/NTSC	OK	-	-
720p	OK	OK	-
1080i	OK	OK	OK

12.2.2 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).

Video In to DVE and Texture

720p sources

Output DVE	Video In		
	PAL/NTSC	720p	1080i
PAL/NTSC	-	-	-
720p	-	OK	-
1080i	-	OK	-

Output Texture	Video In		
	PAL/NTSC	720p	1080i
PAL/NTSC	-	OK	-
720p	-	OK	-
1080i	-	OK	-

Clip In to DVE and Texture

Output DVE	Clip In		
	PAL/NTSC	720p	1080i
PAL/NTSC	OK	-	-
720p	-	OK	-
1080i	OK	OK	OK

Output Texture	Clip In		
	PAL/NTSC	720p	1080i
PAL/NTSC	OK	OK	-
720p	OK	OK	-
1080i	OK	OK	OK

12.2.3 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).

Video In to DVE and Texture

Output DVE	Video In		
	PAL/NTSC	720p	1080i
PAL/NTSC	-	-	-

Output DVE	Video In		
720p	-	-	-
1080i	-	-	OK

Output Texture	Video In		
	PAL/NTSC	720p	1080i
PAL/NTSC	-	-	OK
720p	-	-	OK
1080i	-	-	OK

Clip In to DVE and Texture

Output DVE	Clip In		
	PAL/NTSC	720p	1080i
PAL/NTSC	OK	-	-
720p	-	OK	-
1080i	OK	OK	OK

Output Texture	Clip In		
	PAL/NTSC	720p	1080i
PAL/NTSC	OK	-	OK
720p	OK	OK	OK
1080i	OK	OK	OK

12.3 Supported Codecs

The Matrox X.mio2 Plus 24/6000 card, which can play the SD codecs, except D10/ D12, is Vizrt's standard card. This model can be upgraded to 8500 class by a license upgrade.

Note: The 8500 class is only available for X.Mio2 and X.Mio2 Plus, not for X.Mio. The 8000 class upgrade is available for X.Mio.

The Matrox X.mio, X.mio2 and X.mio2 Plus cards support a selection of different codecs for both SD and HD.

The Matrox codecs use the Matrox card itself as a kind of a licence dongle, therefore certain codecs require certain card classes as follows (these classes apply to X.mio, X.mio2 and X.mio2 Plus):

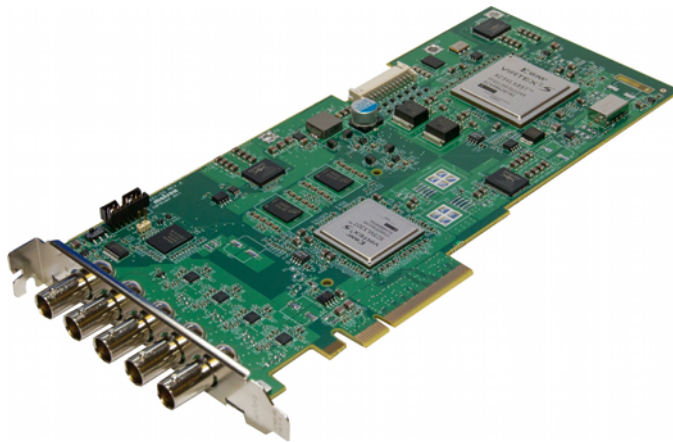
- 6000 class (SD codecs only. No D10)
- 8000 class (Same as 6000 + HD codecs and D10, D12)
- 8500 class (Capable of Apple ProRes playback)

See [Supported Codecs](#) in the [Viz Artist User Guide](#) for a complete list of all supported codecs and formats.

IMPORTANT! Codec DNxHD: The use of codec DNxHD requires its own license, issued by Vizrt.

All codecs are implemented in the software.

13 Matrox DSX LE Series



Viz Engine supports the Matrox DSX LE series, version 2 and 3:

Note: The Matrox DSXLE3 does not provide DVE capabilities or other high-end features, for example, the frame synchronizers on the input or advanced failsafe capabilities.

- The DSXLE3/**/100 can not play video clips. To play video clips (SD and HD) as Texture, upgrade from 100 to 550.

For more information see the following sections:

- [Cables and Connectors](#)
- [Drivers and Firmware](#)

13.1 Cables and Connectors

The connectors for DSX.LE3 are:

- [PCIe](#) board compliant to PCIe 2.0 in x8 or x16 slot
- x4 [SDI](#) video outputs in [SD](#) and [HD](#)
- x16 Embedded Audio [I/O](#) Channels per SDI Stream

The board comes with an additional card and break-out cables for [AES](#) audio. Fill and key signals and reference signals ([GenLock](#)) have their own [BNC](#) connectors. The board should be installed in the same slot as the X.mio2/2 Plus board, and use the same driver versions as Matrox X.mio2/2 Plus.

The connectors for DSX.LE2/CG are:

- [PCIe](#) board compliant to PCIe 2.0 in x8 or x16 slot
- x2 [SDI](#) video outputs in [SD](#) and [HD](#)
- x16 Embedded Audio [I/O](#) Channels per SDI Stream

This section contains information on the following topics:

- [Breakout Cables and Connectors](#)
- [Video Cable Assignment](#)
- [Audio Cable Assignment](#)

See Also

- [Video, Audio and Graphics Card Installation](#)

13.1.1 Breakout Cables and Connectors

Both the DSX.LE3 and DSX.LE2/CG come with a set of breakout cables (no breakout box required).

Note: The DSX.LE2/CG also comes complete with power cables, which must be connected, or else the board will not work.

The breakout cable is used for the reference signal ([GenLock](#)) and [AES](#) output. Fill and key signals have their own [BNC](#) connectors. Both boards should be installed in the same slot as the X.mio2/2Plus board. Note that the DSX boards only supports embedded audio, hence, there are no audio-extension cards for [AES](#) input.

13.1.2 Video Cable Assignment

Matrox DSX.LE3 and DSX.LE2/CG are both HD ready. The DSX.LE3 has 4 video output connectors, whereas the DSX.LE2/CG has 2 video output connectors. None of them have video input capabilities. The boards are used for outputting fill and key signals, and are useful in systems that do not need live video input or codec support.

The 4 video output connectors for the DSX.LE3 will give you two pairs of fill and key, where output A and B are Fill and output C and D are Key, respectively.

The 2 video output connectors for the DSX.LE2/CG 2 will give you one pair of fill and key, where output A is Fill and output B is Key.

13.1.3 Audio Cable Assignment

This section contains information on the following topics:

- [AES Input Cable Assignment](#)
- [AES Output Cable Assignment](#)
- [Embedded Input](#)
- [Embedded Output](#)

AES Input Cable Assignment

Card	Viz Audio Config	AES Cable	Matrox Video Channel
DSX.LE3 DSX.LE2/CG	2 tracks	Not supported	
	4 tracks	Not supported	

	8 tracks	Not supported	
	16 tracks	Not supported	

AES Output Cable Assignment

Card	Viz Audio Config	AES Cable	Matrox Video Channel
DSX.LE3	2 tracks	A OUT 1/2	Audio OUT 0
	4 tracks	A OUT 1/2+3/4	Audio OUT 0
	8 tracks	A OUT 1/2+3/4+5/6+7/8	Audio OUT 0
	16 tracks	A OUT 1/2+3/4+5/6+7/8+9/10+11/12+13/ +14+15/16	Audio OUT 0
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	

Embedded Input

Card/Viz Audio Config	2 tracks	4 tracks	8 tracks	16 tracks
DSX.LE3	-	-	-	-
DSX.LE2/CG	-	-	-	-

Embedded Output

Card/Viz Audio Config	2 tracks	4 tracks	8 tracks	16 tracks
DSX.LE3	yes	yes	yes	yes
DSX.LE2/CG	yes	yes	yes	no

13.2 Drivers and Firmware

This section contains information on the following topics and procedures:

- [Driver and Firmware Versions for DSX LE3](#)
- [Configuration History for DSX LE3](#)
- [Driver and Firmware Versions for DSX LE2/CG](#)

- [Configuration History for DSX LE2/CG](#)

Driver and Firmware Versions for DSX LE3

Driver Version	Primary Device Firmware	Secondary Device Firmware
9.4.0.9065	0.8.0	0.17.3
9.4.0.9040 (release)	0.8.0	0.17.2
9.2.2.2343	0.6.0	0.10.0

Configuration History for DSX LE3

Viz Artist/Engine Version	Driver
3.7.2	DSX.utils 9.4.0.9065
3.7.0	DSX.utils 9.4.0.9040 (release)
3.6.3	DSX.utils 9.2.2.2335 (SP2)
3.6.2	DSX.utils 9.2.2.2331 (SP2)
3.6.0	DSX.utils 9.2.2.2317 (SP2)

Driver and Firmware Versions for DSX LE2/CG

Driver Version	Primary Device Firmware	Secondary Device Firmware
9.4.0.9065	11.1	2.1
9.4.0.9040 (release)	11.1	2.1
9.2.2.2343	11.1	2.1

Configuration History for DSX LE2/CG

Viz Artist/Engine Version	Driver
3.7.2	DSX.utils 9.4.0.9065
3.7.0	DSX.utils 9.4.0.9040 (release)
3.6.4	DSX.utils 9.2.2.2343
3.6.3	DSX.utils 9.2.2.2335 (SP2)
3.6.2	DSX.utils 9.2.2.2331 (SP2)
3.6.0	DSX.utils 9.2.2.2317 (SP2)
3.5.3 (see note)	DSX.utils 7.5.2.1448

Viz Artist/Engine Version	Driver
3.5.0 - 3.5.2	DSX.utils 7.5.2.447 (SP2)

.....
Note: Version 3.5.3: 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.
.....

14 Matrox X.mio Series



The Matrox X.mio series boards are used as Vizrt's [HD](#) and [SD](#) multi-channel video- and audio [I/O](#) solution.

This section contains information on the following topics:

- [Cables and Connectors](#)
- [Drivers, Firmware and Configuration History](#)
- [License Upgrade](#)
- [DVE Performance with X.mio2 and X.mio2 Plus Systems](#)
- [Watchdog](#)
- [Troubleshooting](#)

See Also

- [Matrox](#)
 - [Matrox Driver Installation](#)
 - [Mixed Mode Video Support](#)
 - [Mixed Mode Video Support](#)
- [Video, Audio and Graphics Card Installation](#)

14.1 Cables and Connectors

The connectors for X.mio2/2 Plus are:

- PCIe board 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 X.mio2 and 2 Plus boards are equipped with [Sub-D](#) connectors. A breakout-cable or rack mountable Break Out Box

(BOB), which translates the Sub-D connectors to regular connectors/plugs, is included for every machine.

The connectors for X.mio are:

- 133 MHz [PCI-X](#) board 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

This section contains information on the following topics:

- [Standard Cable Configuration](#)
- [Breakout Cables and Connectors](#)
- [Video Cable Assignment](#)
- [Audio Cable Assignment](#)
- [Matrox \(Viz Configuration\)](#)

14.1.1 Standard Cable Configuration

This section contains the standard configuration, set in the in the Viz Configuration, to cable a Viz Engine to the correct SDI IN and OUT connectors.

This section contains the following topics:

- [Viz Engine Single Channel Configuration](#)
- [Dual Channel Configuration](#)
- [Trio Box CG/Viz Trio OneBox Configuration](#)

See Also

- [Matrox](#) configuration

Viz Engine Single Channel Configuration

- SDI OUT A: mapped to Program Fill
- SDI OUT C/KEY: mapped to Program Key
- SDI OUT B: mapped to Preview Fill
- SDI OUT D/KEY: mapped to Preview Key
- SDI IN A: mapped to Video1
- SDI IN B/KEY: mapped to Video2, and so on

Dual Channel Configuration

- **Channel 1:**
 - SDI OUT A: mapped to Program Fill
 - SDI OUT C/KEY: mapped to Program Key
 - SDI IN A: mapped to Video1 for the first channel
 - SDI IN B/KEY: unused for the first channel, and so on.
- **Channel 2:**

- SDI OUT B: mapped to Program Fill
- SDI OUT D/KEY: mapped to Program Key
- SDI IN A: unused for the second channel
- SDI IN B/KEY: mapped to Video1 for the second channel, and so on

IMPORTANT! Both Viz Engines must be set to the same genlock setting.

Note: When running a machine with two graphics cards - i.e. a Dual Channel - video inputs are hardware resources on the Matrox board that cannot be shared. If one input for both Viz Engine channels are required, split the signal and apply it to the two video input connectors.

Note: Each Matrox video input can only be mapped in one Viz Engine instance and has to be set to unused in the other instance.

Trio Box CG/Viz Trio OneBox Configuration

- **Program:**
 - SDI Out A: mapped to Fill
 - SDI OUT C/KEY: mapped to Key
 - SDI IN A: mapped to Video1
 - SDI IN B/KEY: mapped to Video2, and so on.
- **Preview:**
 - SDI Out B: mapped to Fill
 - SDI OUT D/KEY: mapped to Key
 - no Inputs are mapped by default

IMPORTANT! Both Viz Engines must be set to the same genlock setting.

Note: Each Matrox video input can only be mapped in one Viz Engine instance and has to be set to unused in the other instance

14.1.2 Breakout Cables and Connectors

A Breakout Box (BOB) is often used for Viz Engine solutions that need to be rewired in regular intervals. The 1U Rack unit chassis is designed to install into a standard 19" rack.



This section contains information on the following topics:

- [Video Cables for X.mio Series](#)
- [Video Connectors for X.mio2 Plus](#)
- [Video Connectors for X.mio2](#)
- [Video Connectors for X.mio](#)
- [Audio Connectors for X.mio2 and 2 Plus](#)
- [Audio Connectors for X.mio](#)

See Also

- [Standard Cable Configuration](#)
- [Video Cable Assignment](#)
- [Audio Cable Assignment](#)
- [Matrox \(Viz Configuration\)](#)

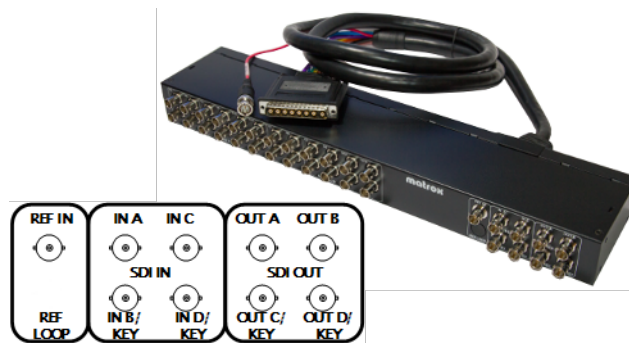
Video Cables for X.mio Series

This image shows the cables responsible for transmitting any video related signals to and from the X.mio2 Plus board.



Video Connectors for X.mio2 Plus

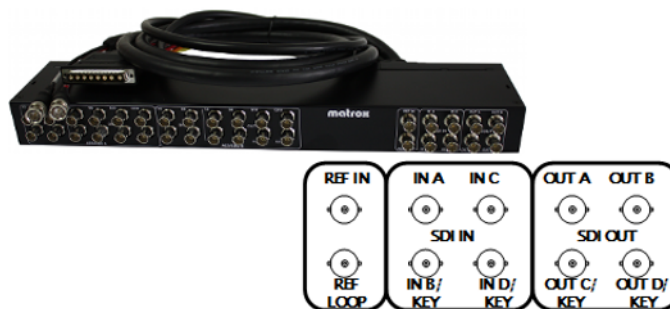
The front panel of the X.mio2 Plus breakout box provides the user with 8 or 9 standard [BNC](#) connectors.



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

Video Connectors for X.mio2

The front panel of the X.mio2/2 Plus 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 X.mio2 board for synchronization, the REF LOOP connector must be terminated with a 75 Ohm resistor unless it is being used to loop an incoming [GenLock](#) signal.

Video Connectors for X.mio

The front panel of the X.mio breakout box provides the user with 8 standard [BNC](#) connectors.

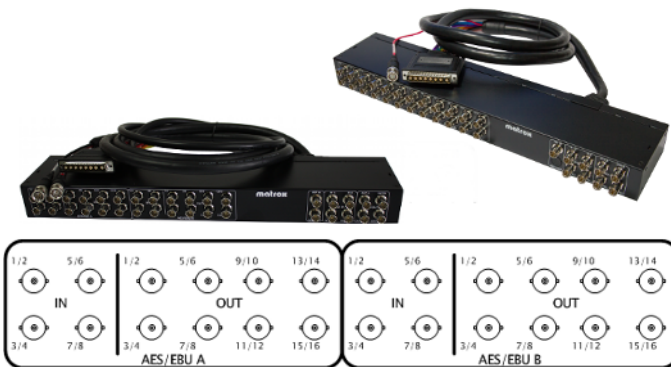


- x2 HD/SD SDI In
- x4 HD/SD SDI Out
- x1 Analogue REF IN
- x1 Analogue REF LOOP

IMPORTANT! When using the Ref. In connector on the Matrox X.mio board 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 Connectors for X.mio2 and 2 Plus

On the X.mio2/2 Plus 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.

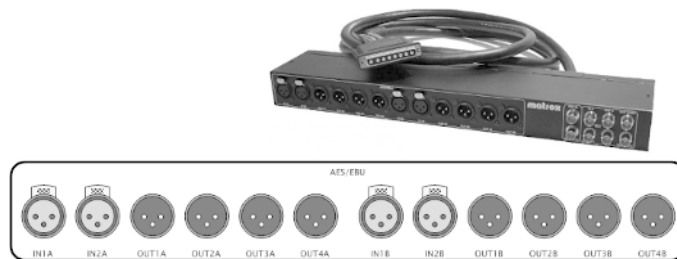


Note: Bay cables are not included.

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 series [Matrox \(Viz Configuration\)](#) to the computer.

Audio Connectors for X.mio

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



14.1.3 Video Cable Assignment

Connect the relevant video input(s) and output(s), and the reference signal(s) as per the labels attached to each cable.

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 or Tri-level as required (see [Video Output Editor](#)).

If the reference signal (for synchronization) is relayed from a Matrox X.mio and X.mio2 to a graphics card (e.g. NVIDIA) make sure to check that all internal connections between the graphics card and its SDI extension are connected correctly, and that the extension is correctly supplied with power.

When the **ANALOG REF IN** connector is used with a Matrox X.mio or X.mio2 boards, for synchronization, the **ANALOG REF LOOP OUT** connector must be terminated with a 75 Ohm resistor, unless it is being used to loop an incoming [GenLock](#) signal. The **ANALOG REF LOOP OUT** for the X.mio2 Plus is terminated by default, and so only supports **REF IN** on the actual board (see [Video Connectors for X.mio2 Plus](#)).

See Also

- [Video Cables for X.mio Series](#)
- [Video Connectors for X.mio2 Plus](#)
- [Video Connectors for X.mio2](#)
- [Video Connectors for X.mio](#)

14.1.4 Audio Cable Assignment

This section contains information on the following topics:

- [AES Input Cable Assignment](#)
- [AES Output Cable Assignment](#)
- [Embedded Input](#)
- [Embedded Output](#)

AES Input Cable Assignment

Card	Viz Audio Config	AES Cable	Matrox Video Channel
X.mio2 X.mio2 Plus	2 tracks	A IN 1/2 A IN 3/4 A IN 5/6 A IN 7/8	Video IN A Video IN B Video IN C Video IN D
	4 tracks	A IN 1/2+3/4 A IN 5/6+7/8 B IN 1/2+3/4 B IN 5/6+7/8	Video IN A Video IN B Video IN C Video IN D
	8 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 C 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
X.mio	2 tracks	A IN 1 B IN 1	Video IN A Video IN B
	4 tracks	A IN 1+2 B IN 1+2	Video IN A Video IN B
	8 tracks	A IN 1+2 B IN 1+2	Video IN A
	16 tracks	Not supported	

AES Output Cable Assignment

Card	Viz Audio Config	AES Cable	Matrox Audio Channel
X.mio2 X.mio2 Plus	2 tracks	A OUT 1/2 B OUT 1/2	Audio OUT 0 Audio OUT 1
	4 tracks	A OUT 1/2+3/4 B OUT 1/2+3/4	Audio OUT 0 Audio OUT 1
	8 tracks	A OUT 1/2+3/4+5/6+7/8 B OUT 1/2+3/4+5/6+7/8	Audio OUT 0 Audio OUT 1

Card	Viz Audio Config	AES Cable	Matrox Audio Channel
	16 tracks	A OUT 1/2+3/4+5/6+7/8+9/10+11/12+13/ +14+15/16 B OUT 1/2+3/4+5/6+7/8+9/10+11/12+13/ +14+15/16	Audio OUT 0 Audio OUT 1
X.mio	2 tracks	A OUT 1 A OUT 3	Audio OUT 0 Audio OUT 1
	4 tracks	A OUT 1+2 A OUT 3+4	Audio OUT 0 Audio OUT 1
	8 tracks	A OUT 1+2 B OUT 1+2 A OUT 3+4 B OUT 3+4	Audio OUT 0 Audio OUT 1
	16 tracks	A OUT 1+2+3+4 B OUT 1+2+3+4	Audio OUT 0

Embedded Input

Card/Viz Audio Config	2 tracks	4 tracks	8 tracks	16 tracks
X.mio2 Plus	yes	yes	yes	yes
X.mio2	yes	yes	yes	yes
X.mio	yes	yes	yes	yes

Embedded Output

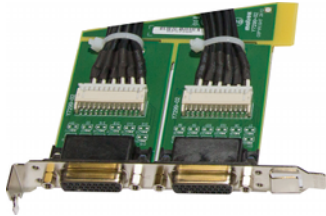
Card/Viz Audio Config	2 tracks	4 tracks	8 tracks	16 tracks
X.mio2 Plus	yes	yes	yes	yes
X.mio2	yes	yes	yes	yes
X.mio	yes	yes	yes	yes

See Also

- [Standard Cable Configuration](#)
- [Video Cable Assignment](#)
- [Audio Cable Assignment](#)
- [Audio-extension Card](#)
- [Matrox](#) (Viz Configuration)

14.1.5 Audio-extension Card

The audio-extension card and audio cables are part of the X.mio series break-out box or the X.mio series cable kit (that comes with the X.mio series boards), 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 with the Matrox X.mio series boards in terms of power and data.

In some cases the design of the 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 environments like a dedicated machine room. Do not apply these instructions to machines intended to be used for outside broadcasting ([OB](#)) or equipment that will be moved around a lot.

See Also

- [Standard Cable Configuration](#)
- [Video Cable Assignment](#)
- [Audio Cable Assignment](#)
- [Audio-extension Card](#)
- [Matrox](#) (Viz Configuration)
- [Audio Settings](#)
- [Mixed Mode Video Support](#)

14.2 Drivers, Firmware and Configuration History

This section contains information on the following topics and procedures:

- [Driver and firmware versions for X.mio2 Plus](#)
- [Configuration History for X.mio2 Plus](#)
- [Driver and Firmware Versions for X.mio2](#)

- [Configuration History for X.mio](#)
- [Driver and Firmware Versions for X.mio](#)
- [Configuration History for X.mio](#)

Driver and firmware versions for X.mio2 Plus

Driver Version	Primary Device Firmware	Secondary Device Firmware	Tertiary Device Firmware	Firmware Version
9.4.0.9065	0.25.0	0.28.0	0.5.0	0.4.106
9.4.0.9040 (release)	0.25.0	0.28.0	0.5.0	0.4.105
9.2.2.2343	0.25.0	0.21.1	0.4.1	0.2.51

Configuration History for X.mio2 Plus

Viz Artist/Engine Version	Driver
3.7.2	DSX.utils 9.4.0.9065
3.7.0	DSX.utils 9.4.0.9040 (release)
3.6.4	DSX.utils 9.2.2.2343
3.6.3	DSX.utils 9.2.2.2335 (SP2)
3.6.2	DSX.utils 9.2.2.2331 (SP2)
3.6.0	DSX.utils 9.2.2.2317 (SP2)

Driver and Firmware Versions for X.mio2

Driver Version	Primary Device Firmware	Secondary Device Firmware
9.4.0.9065	6.43.3	6.49.0
9.4.0.9040 (release)	6.43.3	6.49.0
9.2.2.2343	6.40.2	6.40.0

Configuration History for X.mio2

Viz Artist/Engine Version	Driver
3.7.2	DSX.utils 9.4.0.9065
3.7.0	DSX.utils 9.4.0.9040 (release)
3.6.4	DSX.utils 9.2.2.2343
3.6.3	DSX.utils 9.2.2.2335 (SP2)

Viz Artist/Engine Version	Driver
3.6.2	DSX.utils 9.2.2.2331 (SP2)
3.6.0	DSX.utils 9.2.2.2317 (SP2)
3.5.3 (see note)	DSX.utils 7.5.2.1448
3.5.0 - 3.5.2	DSX.utils 7.5.2.447 (SP2)
3.3.x	DSX.utils 7.5.2.443
3.2.2 (see note)	DSX.utils 5.0.3.171
3.1.0	DSX.utils 5.0.3.166

Note: Version 3.5.3: 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.

Note: Version 3.2.2: DSX.utils 5.0.3.171 is required on Windows XP SP3.

Driver and Firmware Versions for X.mio

Driver Version	Primary Device Firmware	Secondary Device Firmware
9.4.0.9065	194.1	198.0
9.4.0.9040 (release)	194.1	198.0
9.2.2.2343	194.1	198.0

Configuration History for X.mio

Viz Artist/Engine Version	Driver
3.7.2	DSX.utils 9.4.0.9065
3.7.0	DSX.utils 9.4.0.9040 (release)
3.6.4	DSX.utils 9.2.2.2343
3.6.2	DSX.utils 9.2.2.2331 (SP2)
3.6.0	DSX.utils 9.2.2.2317 (SP2)
3.5.3	DSX.utils 7.5.2.1448
3.5.0 - 3.5.2	DSX.utils 7.5.2.447 (SP2)
3.3.x	DSX.utils 7.5.2.443
3.2.2 (see note)	DSX.utils 5.0.3.171

Viz Artist/Engine Version	Driver
3.1.0 - 3.2.1	DSX.utils 5.0.3.166
3.1.0 - 3.2.1	DSX.utils 4.0.0.132 (SP1), or DSX.utils 4.0.0.136 (SP3)
3.1.0 - 3.2.1	DSX.utils 2.5.0.673

Note: Version 3.2.2: DSX.utils 5.0.3.171 is required on Windows XP SP3.

See Also

- [Cables and Connectors](#)
- [License Upgrade](#)
- [DVE Performance with X.mio2 and X.mio2 Plus Systems](#)
- [Watchdog](#)
- [Troubleshooting](#)
- [Matrox](#) (Viz Configuration)

14.3 License Upgrade

The Matrox X.mio2 and X.mio2 Plus boards include all SD codecs except [D10 Television](#) / [D12 Television](#) . These two boards can be upgraded to any higher class model by a license upgrade (to do this use the Matrox X.info utility).

To upgrade a video board to a higher class model it is necessary to [To Generate a Matrox Dongle Information File \(.MDIF\)](#) , and then to do an [To Upgrade with a Matrox Dongle Upgrade File \(.MDUF\)](#) .

It is also possible [To Reset to Factory Settings](#) at any time.

The X.mio2 Plus board video inputs can also be upgraded from 2 to 4.

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

Note: Driver versions before 9.0 do not support X.mio2 Plus

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 (to find the local Vizrt customer support team go to www.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.

See Also

- [Cables and Connectors](#)
- [Drivers, Firmware and Configuration History](#)
- [DVE Performance with X.mio2 and X.mio2 Plus Systems](#)
- [Watchdog](#)
- [Troubleshooting](#)
- [Matrox](#) (Viz Configuration)

14.4 DVE Performance with X.mio2 and X.mio2 Plus Systems

This section details the available DVE inputs, which can be used at the same time on X.mio2 and X.mio2 Plus systems.

X.mio2 Card Only: The installation of the [Matrox X.RIO](#) expansion module provides more inputs than available on the Matrox X.mio2 board alone. With the Matrox X.mio2 (not X.mio2 Plus) and X.RIO combined, Viz Engine supports up to 8 video inputs.

Note: The values detailed in the tables below could still slightly differ, dependent on the performance of the system which is used.

This section contains the following topics:

- [PAL/NSTC](#)

- [720p50](#)
- [720p60M](#)
- [1080i50](#)
- [1080i60M](#)

PAL/NSTC

Scaling [%]	Foreground/Background	Inputs (Video)
100	On	8 (with X.RIO installed)
	Off	8 (with X.RIO installed)
99	On	8 (with X.RIO installed)
	Off	8 (with X.RIO installed)
50	On	8 (with X.RIO installed)
	Off	8 (with X.RIO installed)

720p50

Scaling [%]	Foreground/Background	Inputs (Video)
100	On	4
	Off	5 (with X.RIO installed)
99	On	3
	Off	4
50	On	6 (with X.RIO installed)
	Off	6 (with X.RIO installed)

720p60M

Scaling [%]	Foreground/Background	Inputs (Video)
100	On	3
	Off	4
99	On	2
	Off	3
50	On	5 (with X.RIO installed)
	Off	5 (with X.RIO installed)

1080i50

Scaling [%]	Foreground/Background	Inputs (Video)
100	On	4
	Off	5 (with X.RIO installed)
99	On	3
	Off	4
50	On	5 (with X.RIO installed)
	Off	5 (with X.RIO installed)

1080i60M

Scaling [%]	Foreground/Background	Inputs (Video)
100	On	3
	Off	4
99	On	2
	Off	2
50	On	2
	Off	2

See Also

- [Cables and Connectors](#)
- [Drivers, Firmware and Configuration History](#)
- [License Upgrade](#)
- [Watchdog](#)
- [Troubleshooting](#)
- [Matrox](#) (Viz Configuration)

14.5 Watchdog

A watchdog is essentially a timer that allows a system to continue video pass-through when an application has crashed or there is a 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 can be used as a [VizBoldMechanical Bypass](#) (copper-to-copper) or a [VizBoldHardware Bypass](#) (default).

This section contains the following topics and procedures:

- [VizBoldMechanical Bypass](#)
- [VizBoldHardware Bypass](#)
- [Transition from Watchdog to Video](#)

- [To Enable Mechanical Bypass](#)

See Also

- [Watchdog](#) (Bluefish cards)
- Matrox [General Properties](#)
- Matrox [VideoOut Properties](#) ([VizBoldKey Properties](#))
- [Video Board Properties](#)

Mechanical Bypass

A relay (input to output) that works in case of a power loss. To use mechanical bypass see [To Enable Mechanical Bypass](#).

Hardware Bypass

Operates in a powered machine state (input to the board's output). In hardware bypass mode the incoming video and reference signals must be compliant to provide the correct watchdog functionality.

Tip: The hardware bypass introduces an h-phase on the output. The value of this phase depends on the video output format.

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. To provide a glitch free transition from watchdog to video configure the watchdog's deactivation delay by setting the delay in fields for the watchdog to wait before deactivation.

To Enable Mechanical Bypass

1. Stop Viz Engine.
2. Open the **Viz Config** file (for example: `VIZ-<hostname>-0-0.cfg`).
3. Locate **SECTION MATROX_CONFIG**.
4. Enable the Matrox watchdog setting:

```
Matrox0.WatchDogUseHardwareBypass = 0
```
5. Save the file.
6. Start Viz Engine.

See Also

- [Cables and Connectors](#)
- [Drivers, Firmware and Configuration History](#)
- [License Upgrade](#)
- [DVE Performance with X.mio2 and X.mio2 Plus Systems](#)
- [Troubleshooting](#)
- [Matrox](#) (Viz Configuration)

14.6 Troubleshooting

It might be necessary to reset the X.mio2 Plus board. This needs to be done for example when Viz Engine reports:

- "0xefac9019: Generic driver error: The requested operation was unsuccessful" at startup.
- "0xeddd8008: Topology driver error: Watchdog specified already in use by another application." at startup.
- "VideoClipInOut_Xmio2Plus::SequenceVideoOut SequenceVideoOut no output node." during operation.

For this a reset mechanism has been implemented for the Viz Engine. To activate this mechanism do this procedure:

1. Stop all Viz Engines (in dual channel setups both Viz Engines must be stopped).
2. Open the Viz Config file.
3. Set `Matrox0.ResetTopology = 1`.
4. Start up the respective Viz Engines.
 - The `Matrox0.ResetTopology` setting will be automatically set back to 0 after the reset was done

The reset feature also clears the on-board memory of the X.mio2 Plus board. This operation removes all [Watchdogs](#) and their topologies from the on-board memory.

After the reset everything will be restored automatically according to the configuration settings (this applies to both Viz Engines in a Dual Channel setup).

See Also

- [Cables and Connectors](#)
- [Drivers, Firmware and Configuration History](#)
- [License Upgrade](#)
- [DVE Performance with X.mio2 and X.mio2 Plus Systems](#)
- [Watchdog](#)
- [Matrox](#) (Viz Configuration)

15 Matrox X.Open

Matrox X.Open is a USB dongle with no video outputs or inputs that you will find on a regular video board (e.g. [Matrox X.mio Series](#)), but it has support for all the same codecs as a typical Matrox board. It is therefore well suited for video clip playback using the Matrox clip player for IP, DVI and/or VGA output.

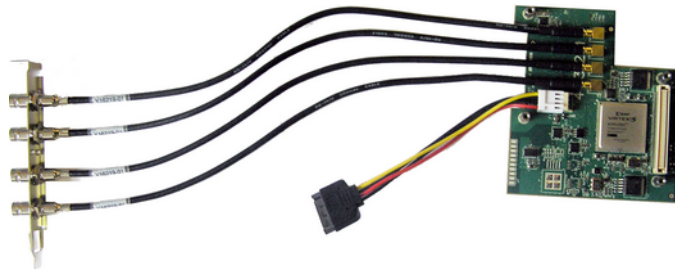


Configuration History for X.Open

Matrox X.Open uses the same drivers as a typical [Matrox X.mio Series](#) board (see [Drivers, Firmware and Configuration History](#)).

- [Matrox](#)
 - [Matrox Driver Installation](#)
 - [Supported Codecs](#)

16 Matrox X.RIO



Matrox X.RIO is an expansion module for the Matrox X.mio2 board that gives more inputs than available on the Matrox X.mio2 board alone (see [Matrox X.mio Series](#)).

With the Matrox X.mio2 (not X.mio2 Plus) and X.RIO combined, Viz Engine supports up to 8 video inputs (see [DVE Performance with X.mio2 and X.mio2 Plus Systems](#)).

Note: The use of 8 inputs will require an upgrade of the X.mio2 which, in most cases, are shipped with 2 inputs and 4 outputs (see [License Upgrade](#)).

This section contains information on the following topics:

- [Cables and Connectors](#)
- [Driver Information](#)
- [Install and Configure](#)

See Also

- [License Upgrade](#)
- [Matrox X.mio Series](#)

16.1 Cables and Connectors

As the X.RIO module expands the capabilities of the Matrox X.mio2-based systems providing four extra inputs you will be able to have 4 key and 4 fill inputs and 2 key and 2 fill outputs. Note that the extra connectors can only be used as 4 extra inputs (not outputs).

With an HP Z800 machine, Matrox X.mio2, and X.RIO the following is possible: with **SD eight inputs** are working as DVE or Texture, whereas with **HD six inputs** are working as DVE (at approximately 65%) or Texture.

Note: The actual number of working inputs depend 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:

- [Breakout Cables and Connectors](#)
- [Video Cable Assignment](#)

- [Audio Cable Assignment](#)

Breakout Cables and Connectors

All breakout cable assignments are handled by the X.mio2 board and its breakout box, see the [Matrox \(Viz Configuration\)](#) section.

Video Cable Assignment

All video cable assignments are handled by the X.mio2 board, see the [Video Cable Assignment](#) section.

Audio Cable Assignment

All audio cable assignments are handled by the X.mio2 board, see the [Audio Cable Assignment](#) and [Matrox \(Viz Configuration\)](#) sections.

16.2 Driver Information

The X.RIO is a module which installs on an X.mio2 board. Support for X.RIO started with Viz Engine 3.5.

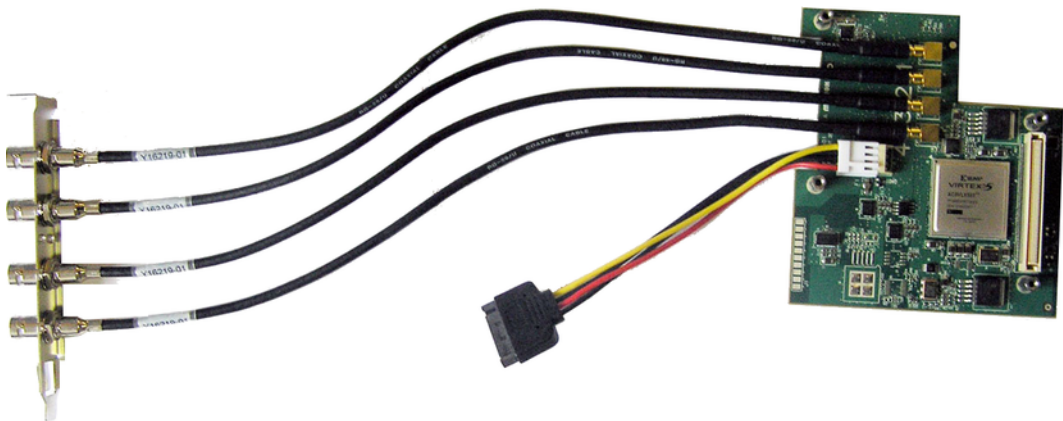
For the Configuration History and the Driver and Firmware versions see [Matrox X.mio Series](#).

16.3 Install and Configure

This section contains information on the following procedures:

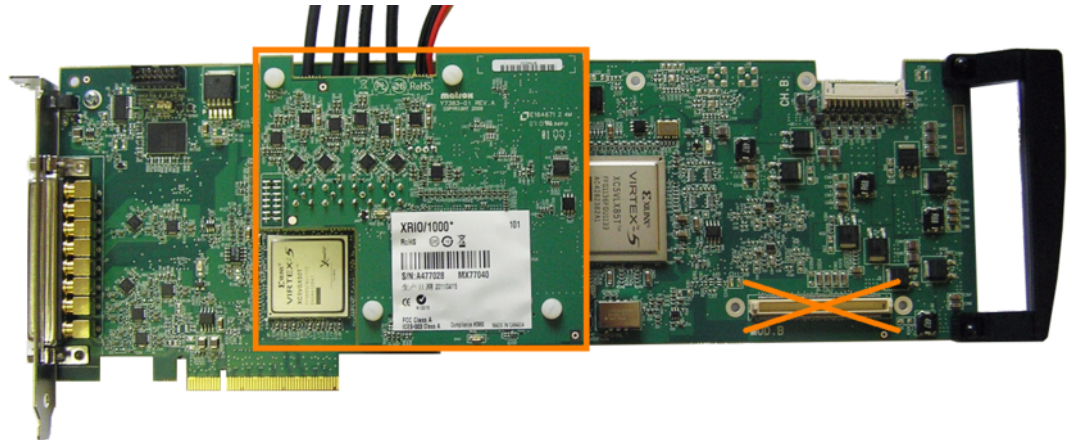
- [To Install the Matrox X.RIO Board](#)
- [To Configure the Matrox X.RIO Board](#)

To Install the Matrox X.RIO Board

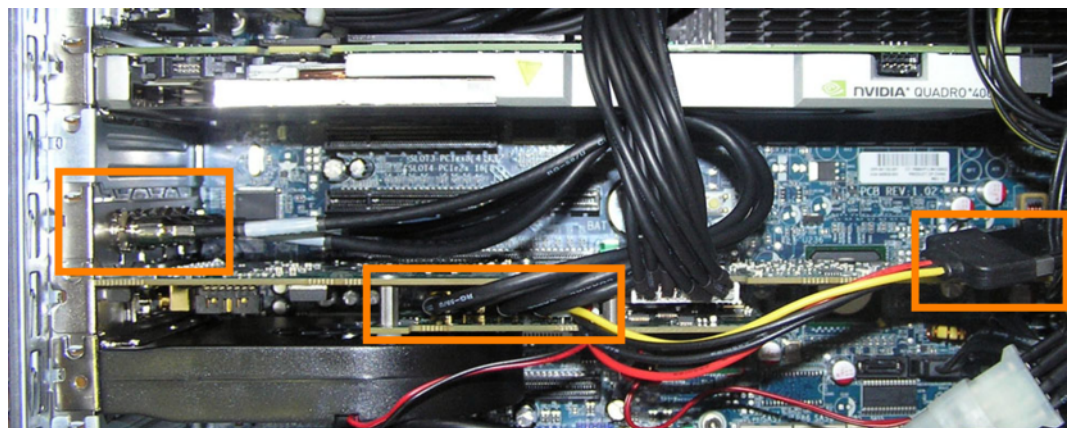


1. Connect the power cable to the X.RIO board.

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



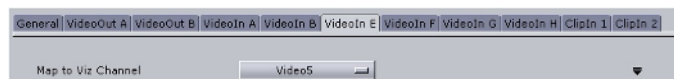
- Mount the X.RIO on the X.mio2 board "Mod A" connector. The Mod B connector will not work.
- Use the screws to fix the X.RIO board.
- When building the X.mio2 with X.RIO into the Z800 be careful that the mini BNC's do not get disconnected as they are very hard to connect while the X.RIO board is mounted on the X.mio2.



- 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 Configure the Matrox X.RIO Board

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



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

17 NVIDIA Quadro SDI Capture



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.

This section contains information on the following topics:

- [Connectors](#)
- [Configuration History for NVIDIA Quadro SDI Capture](#)

See Also

- Compatible and recommended NVIDIA SDI out cards supported by Vizrt:
 - [NVIDIA Quadro FX 4400](#)
 - [NVIDIA Quadro FX 5500](#)
 - [NVIDIA Quadro K5000](#)
- Available machine configurations:
 - [HP Z800 Installations](#)
 - [HP DL370 Installations](#)

17.1 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).

17.2 Configuration History for NVIDIA Quadro SDI Capture

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.

18 AJA Io 4K

Viz 3.7 and later supports the AJA Io 4K (Io4K), a portable size professional video and audio I/O solution.

Io4K supports 4K, UltraHD, 3G-SDI, Dual Link, HD-SDI and SD-SDI as well as UHD and HD over HDMI 1.4a for both capture and output. A dedicated, real time, always-on HD-SDI output allows Io 4K to simultaneously output to HD monitors when working at 4K or UHD resolutions, providing cost-effective monitoring options in addition to full resolution outputs.

Note: Support for the AJA Io 4K requires Viz Engine 3.7.1 or later.

IMPORTANT! All possible modes of operation for the AJA Io 4K is currently **not** supported by Viz Engine, see [Configuration](#).



This section contains information on the following topics:

- [Overview and Connectors](#)
- [Configuration](#)
- [AJA Io 4K Features and Specifications](#)
- [Configuration History](#)

See Also

- [Video, Audio and Graphics Card Installation](#)
- Manufacturer's documentation (external link at www.aja.com): [AJA Io 4K](#)

18.1 Overview and Connectors

Io4K supports your current SD and HD SDI workflows and also provides support for future UltraHD and 4K (with downscaling, if needed) with frame rates up to 50p/60p whenever the need arises.

Embedded 16-channel SDI and 8-channel HDMI audio are supported as well as analog audio outputs via a standard DB-25 connection. Stereo monitoring is also possible with 2 x RCA outputs and a front panel mini-TRS headphone jack.



18.2 Configuration

io4K is supported by Viz Engine version 3.7.1 and higher.

IMPORTANT! Currently 4K and HDMI output is not supported. Support for this will be considered in future Viz Engine releases. For 1080P only Level A for 3G is supported.

This section contain information about the following subjects:

- [Audio configuration](#)
- [Video Configuration](#)
- [Configuration Utilities](#)
- [Firmware Upgrade](#)

Audio configuration

Embedded audio is supported, always with 16 channels in and out. However, mixer settings are active, and respected. Example: if the user requests only two-channel output, the remaining 14 channels will be silent.

Video Configuration

The six BNC connectors on the back of the io4K are labeled [LTC OUT], [LTC IN/REF IN] and [SDI 1 to 4] as indicated in the picture below:



The default configuration is:

Viz Reference	io4K BNC Connector
Live Input 1	SDI 1

Viz Reference	Io4K BNC Connector
Live Input 2	SDI 2
Fill Output exits from:	SDI 3
Key Output exits from:	SDI 4
Genlock	[REF IN]

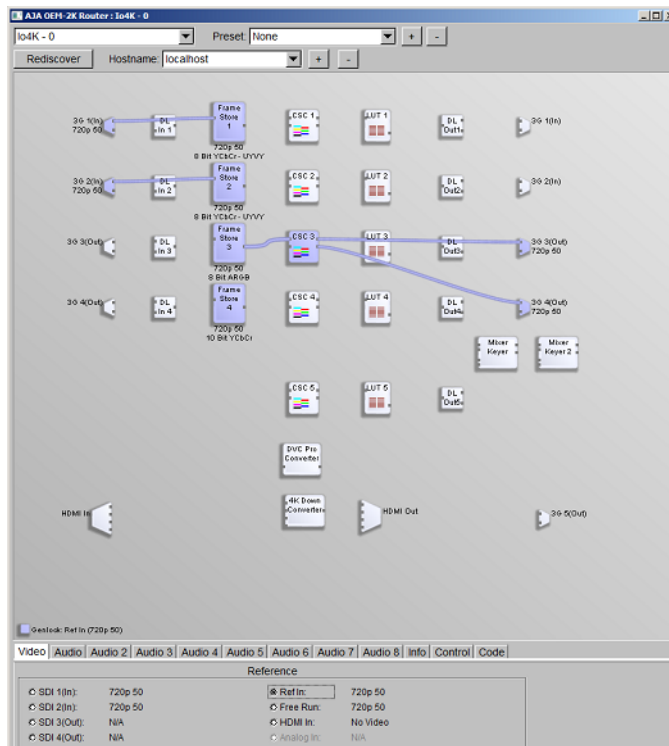
If Live Input 2 is inactive in the configuration, SDI 2 will be enabled for preview output.

Configuration Utilities

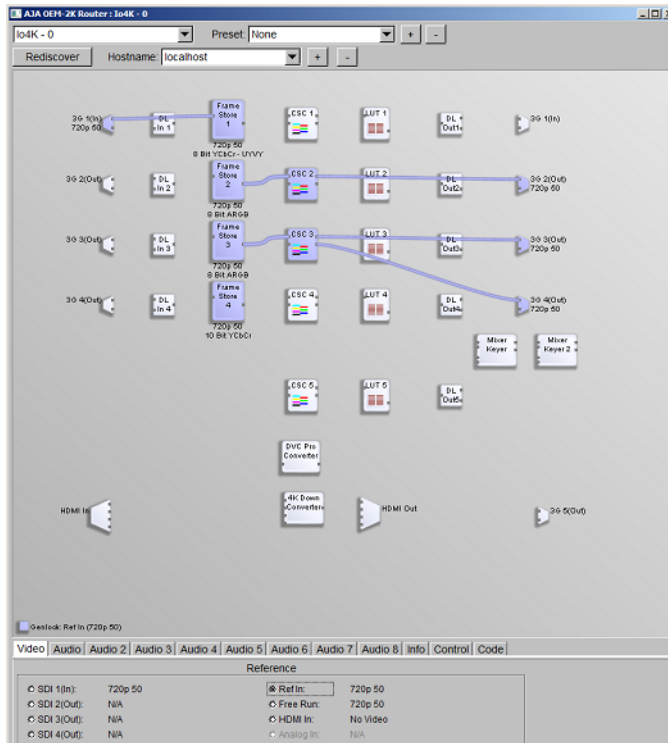
Vizrt includes two configuration utilities from AJA:

- cables.exe** This utility shows the current topology running: inputs, outputs, color space conversion, fill and key paths. Firmware and driver version information is also accessible. Screen-shots of cables.exe usage showing two typical topologies (A: two video inputs and B: one video and one preview) are shown below

Example **A** - topology using two video inputs:



Example **B** - One video input, one preview:



- **watcher.exe** This utility shows register settings. You may also write out a status log file. The auto-circulate engine is also observable. This utility is mostly of value for support specialists.

Firmware Upgrade

Only do an upgrade of io4K firmware if instructed to do so by Vizrt or AJA support. All files for firmware upgrade will be provided in a separate directory, typically supplied as a zip-archive. To install the firmware:

1. Open a command window.
2. `cd` to the directory where the firmware upgrade files are located. Make sure no other programs are running that could interfere with the firmware upgrade.
3. Install the firmware, in this example named `IO_XT_4K_13.bit`, using the `ntv2firmwareinstaller` utility. Example: `ntv2firmwareinstaller -f IO_XT_4K_13.bit`
4. The window will then pause for a few minutes. When the firmware upgrade is complete, the command line program will ask for a return key press to exit. Please be patient, the firmware upgrade can take 3 to 6 minutes or more, depending on hardware.
5. Power-cycle the io4K and reboot the computer to make sure the upgraded firmware configuration is active.

18.3 AJA Io 4K Features and Specifications

The io4K features and specifications as provided by the manufacturer are provided for your reference below.

Note: Not all possible modes of operation are supported by Viz Engine, see [Configuration](#).

Features:

- 4 x bi-directional 3G-SDI
- 4K/UHD HDMI I/O
- Simultaneous SDI and HDMI outputs
- Real time 4K to HD down-conversion for HD-SDI and HDMI monitoring
- 10-bit high-quality 4:2:2, 4:4:4 and High Frame Rate work-flow support
- Two Thunderbolt 2 ports
- Use with any Thunderbolt 2 system for up to 4K at 10-bit quality and up to 50p/60p
- Backwards compatible with existing Thunderbolt hosts
- 16-channel embedded audio on SDI
- 8-channel embedded audio on HDMI
- DB-25 analog audio output connector
- XLR 12V power for battery or AC use
- RS-422 VTR control, Reference, LTC Input
- Headphone jack and level control for mobile environments

Technical Specifications

For the full technical specifications, visit the manufacturers website at www.aja.com - [Io4K Tech Specs](#).

18.4 Configuration History

- The AJA Io 4K requires Viz Engine 3.7.1 or higher.
- Current Drivers and Firmware:

Driver	12.0.0.123
Firmware	13

19 Video, Audio and Graphics Card Installation

The installation of video, audio or graphics cards is, under normal circumstances, not required, as all components are pre-installed on all new systems with the latest driver versions. However, for maintenance or upgrades, it is important to know how to do the installation for the different models.

This section mainly describes how to install BlueFish444, DVS and Matrox X.mio series cards with an NVIDIA graphics card. The following type machines are covered:

- [HP ML350p Gen8 Installations](#)
- [HP Z420 Installations](#)
- [HP Z820 Installations](#)
- [HP Z800 Installations](#)
- [HP DL370 Installations](#)
- [HP xw8600 Installations](#)
- [HP xw8400 Installations](#)
- [HP xw8200 Installations](#)

For more information on how to replace a Matrox X.mio board and connect an audio-extension card, read the [Replace a Matrox X.mio Series Board](#) and [Connect a Matrox X.mio Series Audio-extension Card](#) sections.

See Also

- [NVIDIA Graphics Cards](#)
- [BlueFish444](#)
- [Digital Video Systems](#)
- [Matrox](#)
- [Matrox DSX LE Series](#)
- [Matrox X.mio Series](#)
- [Matrox X.Open](#)
- [Matrox X.RIO](#)
- [NVIDIA Quadro SDI Capture](#)

19.1 HP ML350p Gen8 Installations

This section describes how to setup a HP ML350p Gen8 machine with the different cards provided by Vizrt:

- [To Setup an HP ML350p Gen8 with a DVS board](#)
- [To Setup an HP ML350p Gen8 with a Matrox board](#)

See Also

- [NVIDIA Graphics Cards](#)
- [Digital Video Systems](#)
- [Matrox X.mio Series](#)

To Setup an HP ML350p Gen8 with a DVS board

[PCI-X](#) , [PCI](#) slots, HP ML350p Gen8

Slot	Processor 1	
1		PCIe3 x16 (8, 4, 2, 1)
2		PCIe3 x8 (4, 1)
3		PCIe3 x16 (16, 8, 4, 1)
4		PCIe3 x8 (4, 1)
Processor 2		
5		PCIe2 x8 (4, 1)
6		PCIe3 x16 (16, 8, 4, 1)
7		PCIe3 x8 (4, 1)
8		PCIe3 x16 (16, 8, 4, 1)
9		PCIe3 x8 (4, 1)

IMPORTANT! Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.

1. Disconnect the power and all other peripherals.
2. Install the video board in slot 1.
3. Install the graphic card in slot 6.

Note: Make sure that the cable connections are correctly mounted and that they stay clear of any supplemental aerators or the aerator of the graphics device.

4. Tidy up all cables and close the computer case.

Note: Placement of cards are the same for both DVS Atomix HDMI (see [Digital Video Systems](#)) and [DVS Centaurus II](#)

To Setup an HP ML350p Gen8 with a Matrox board

[PCI-X](#) , [PCI](#) slots, HP ML350p Gen8

Slot	Processor 1	
1		PCIe3 x16 (8, 4, 2, 1)
2		PCIe3 x8 (4, 1)
3		PCIe3 x16 (16, 8, 4, 1)
4		PCIe3 x8 (4, 1)
Processor 2		
5		PCIe2 x8 (4, 1)
6		PCIe3 x16 (16, 8, 4, 1)
7		PCIe3 x8 (4, 1)
8		PCIe3 x16 (16, 8, 4, 1)
9		PCIe3 x8 (4, 1)

IMPORTANT! Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.

1. Disconnect the power and all other peripherals.
 2. Insert the video board in slot 1.
 3. Insert graphic card 1 in slot 6.
 4. Insert graphic card 2 in slot 8.
 5. Insert the Matrox audio board in slot 3.
 6. Insert the radial-aerator in slot 2.
-

IMPORTANT! A radial-aerator is mandatory as the video board reaches high temperatures during operation.

7. Insert the slot panel (x2) for the X.mio2/44 board in slot 4. Connect it to the X.mio2 board.
8. Tidy up all cables and close the computer's casing.
9. Start the machine.

Once the machine is powered up, check that the Matrox X.mio board has been correctly installed. Check that the blue **OB** -light on the (top) backside of the slot panel is set to ON. If the LED is ON the board is correctly supplied with power.

19.2 HP Z420 Installations

This section describes how to setup a HP Z420 machine with the different cards provided by Vizrt:

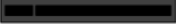





- [To Setup an HP Z420 with a BlueFish444 Epoch board](#)
- [To Setup an HP Z420 with a DVS board](#)
- [To Setup an HP Z420 with a Matrox board](#)
- [To Setup an HP Z420 with a capture card](#)

See Also

- [NVIDIA Graphics Cards](#)
- [BlueFish444](#)
- [Digital Video Systems](#)
- [Matrox X.mio Series](#)
- [Matrox DSX LE Series](#)
- [NVIDIA Quadro SDI Capture](#)

To Setup an HP Z420 with a BlueFish444 Epoch board

PCI-X , PCI and AGP slots, HP Z420

Audio card	19		PCIe2 x4(1)
Graphics card	20		PCIe3 x16
	21		PCIe2 x8(4)
Video card	22		PCIe3 x8
Radial aerator	23		PCIe3 x16
	24		PCI 32bit/33MHz

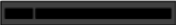





IMPORTANT! Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.

1. Disconnect the power and all other peripherals.
2. Insert the graphics card in slot 20.
3. Insert the BlueFish444 video board in slot 22.

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

4. Tidy up all cables and close the computer's casing.

To Setup an HP Z420 with a DVS board**PCI-X , PCI and AGP slots, HP Z420**

Audio card	19		PCIe2 x4(1)
Graphics card	20		PCIe3 x16
	21		PCIe2 x8(4)
Video card	22		PCIe3 x8
Radial aerator	23		PCIe3 x16
	24		PCI 32bit/33MHz

IMPORTANT! Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.

1. Disconnect the power and all other peripherals.
2. Install the video board in slot 22.
3. Install the graphics card in slot 20.
4. Install the video board two extension boards:
 - SDI/RS-422 panel in slot 19
 - BNC panel in slot 23

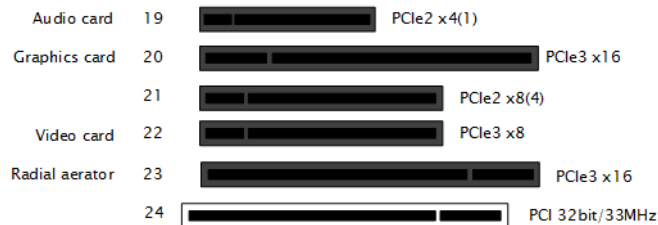
Note: Make sure that the cable connections are correctly mounted and that they stay clear of any supplemental aerators or the aerator of the graphics device.

5. Tidy up all cables and close the computer's casing.

Note: Placement of cards are the same for both DVS Atomix HDMI (see [Digital Video Systems](#)) and [DVS Centaurus II](#)

To Setup an HP Z420 with a Matrox board

PCI and PCIe slots, HP Z420



IMPORTANT! Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.

1. Disconnect the power and all other peripherals.
2. Insert the graphics card in slot 20.
3. Insert the Matrox video board in slot 22.
4. Insert the radial-aerator in slot 23.

IMPORTANT! A radial-aerator is mandatory as the video board reaches high temperatures during operation.

5. *Optional:* Insert the [Matrox \(Viz Configuration\)](#) in slot 19.
6. *Optional:* Insert the extra slot panel for the X.mio2/44 board in any of the vacant slots, and connect it to the X.mio2 board.
7. Tidy up all cables and close the computer's casing.
8. Start the machine.

The Matrox XMio2Plus gets very hot in the HP Z420, make sure that the HP Z420 Fan and Front Card Guide Kit is installed, and in BIOS (Power: Thermal) set the fan speed to a higher value.

Once the machine is powered up, check that the Matrox X.mio board has been correctly installed. Check that the blue **OB** -light on the (top) backside of the slot panel is set to ON. If the LED is ON the board is correctly supplied with power.

To Setup an HP Z420 with a capture card

PCI and PCIe slots, HP Z420



IMPORTANT! Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.

1. Disconnect the power and all other peripherals.
2. Insert the graphics card in slot 20.
3. Insert the NVIDIA capture card in slot 22.
4. Tidy up all cables and close the computer's casing.

19.3 HP Z820 Installations

This section describes how to setup a HP Z820 machine with the different cards provided by Vizrt:

- [To Setup an HP Z820 with a Matrox board](#)
- [To Setup an HP Z820 with two graphics cards](#)

See Also

- [NVIDIA Graphics Cards](#)
- [Digital Video Systems](#)
- [Matrox X.mio Series](#)
- [Matrox DSX LE Series](#)
- [NVIDIA Quadro SDI Capture](#)

To Setup an HP Z820 with a Matrox board

PCI and PCIe slots, HP Z820

Audio card	16		PCIe3 x8(4)
Graphics card	17		PCIe3 x16
	18		PCIe3 x16(8)
	19		PCIe3 x16
	20		PCIe2 x8(4)
Video card	21		PCIe3 x16
Radial aerator	22		PCI 32bit/33MHz

IMPORTANT! Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.

1. Disconnect the power and all other peripherals.
 2. Insert the graphics card in slot 17.
 3. Insert the Matrox video board in slot 21.
 4. Insert the radial-aerator in slot 22.
-

IMPORTANT! The Matrox video boards can reach very high temperatures when in operation. If a Xmio.2 board is used, a radial-aerator must be installed. If a Xmio.2 Plus board is used a radial-aerator can not, physically,

be installed. In this case the chassis fan speed (in BIOS) must be set to maximum to achieve sufficient cooling.

5. *Optional:* Insert the [Matrox \(Viz Configuration\)](#) in slot 16.
6. *Optional:* Insert the extra slot panel for the X.mio2/44 board in any of the vacant slots, and connect it to the X.mio2 board.
7. Tidy up all cables and close the computer's casing.

Once the machine is powered up, check that the Matrox X.mio board has been correctly installed. Check that the blue **OB** -light on the (top) backside of the slot panel is set to ON. If the LED is ON the board is correctly supplied with power.

To Setup an HP Z820 with two graphics cards

[PCI](#) and [PCIe](#) slots, HP Z820

Audio card	16		PCIe3 x8(4)
Graphics card	17		PCIe3 x16
	18		PCIe3 x16(8)
	19		PCIe3 x16
	20		PCIe2 x8(4)
Video card	21		PCIe3 x16
Radial aerator	22		PCI 32bit/33MHz

IMPORTANT! Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.

1. Disconnect the power and all other peripherals.
2. Insert the weaker graphics card in slot 17.
3. Insert the stronger graphics card in slot 19.
4. Insert the Matrox video board in slot 21.
5. Insert the radial-aerator in slot 22.

IMPORTANT! A radial-aerator is mandatory as the video board reaches high temperatures during operation.

6. *Optional:* Insert the [Matrox \(Viz Configuration\)](#) in slot 16.
7. Tidy up all cables and close the computer's casing.
8. Connect the computer's monitor to the graphics card in slot 17.
9. Start the machine.
10. 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 the 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 board runs at PCIe x8 speed.

Once the machine is powered up, check that the Matrox X.mio board has been correctly installed. Check that the blue **OB** -light on the (top) backside of the slot panel is set to ON. If the LED is ON the board is correctly supplied with power.

19.4 HP Z800 Installations

This section describes how to setup a HP Z800 machine with the different cards provided by Vizrt:

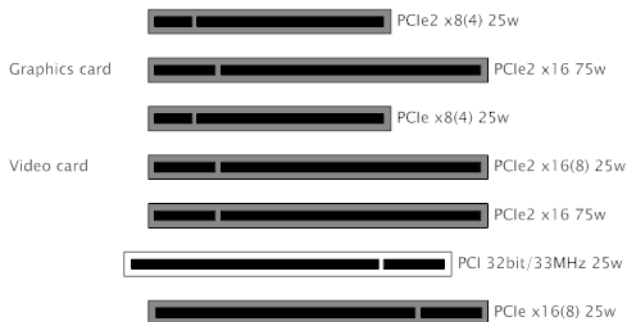
- [To Setup an HP Z800 with a BlueFish444 Epoch board](#)
- [To Setup an HP Z800 with a DVS board](#)
- [To Setup an HP Z800 with a Matrox board](#)
- [To Setup an HP Z800 with two graphics cards](#)
- [To Setup an HP Z800 with a capture card](#)

See Also

- [NVIDIA Graphics Cards](#)
- [BlueFish444](#)
- [Digital Video Systems](#)
- [Matrox X.mio Series](#)
- [Matrox DSX LE Series](#)
- [NVIDIA Quadro SDI Capture](#)

To Setup an HP Z800 with a BlueFish444 Epoch board

[PCI-X](#) , [PCI](#) and [AGP](#) slots, HP Z800



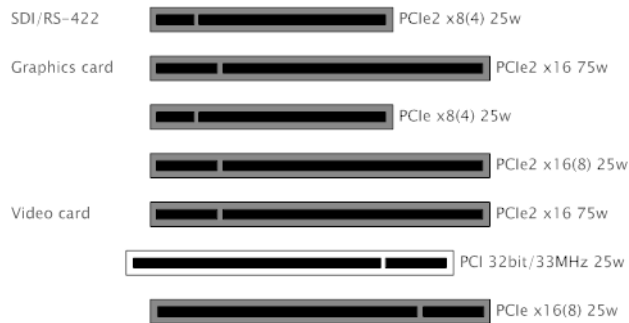
IMPORTANT! Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.

1. Disconnect the power and all other peripherals.
2. Insert the graphics card in the [PCIe](#) slot number 2 from the top.
3. Insert the BlueFish444 video board in the [PCIe](#) slot number 4 from the top.

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

To Setup an HP Z800 with a DVS board

[PCI-X](#) , [PCI](#) and [AGP](#) slots, HP Z800



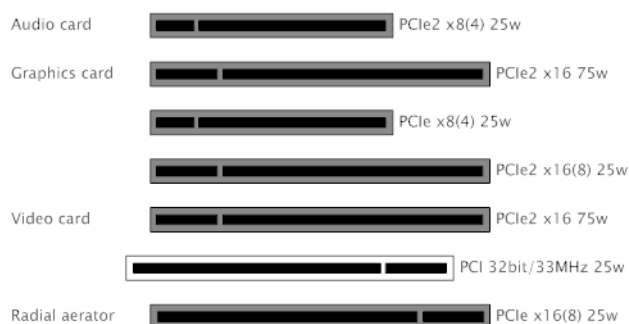
IMPORTANT! Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.

1. Disconnect the power and all other peripherals.
2. Install the video board in slot number 5 from the top.
3. Install the graphics card in slot number 2 from the top.
4. Install 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.
5. Tidy up all cables and close the computer's casing.

Note: Placement of cards are the same for both [Digital Video Systems](#) and [DVS Centaurus II](#)

To Setup an HP Z800 with a Matrox board

[PCI](#) and [PCIe](#) slots, HP Z800



IMPORTANT! Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.

1. Disconnect the power and all other peripherals.
2. Insert the graphics card in PCIe2 slot number 2 from the top.
3. Insert the Matrox video board into the PCIe2 slot number 5 from the top.

4. Insert the radial-aerator into the PCIe slot number 7 from the top.

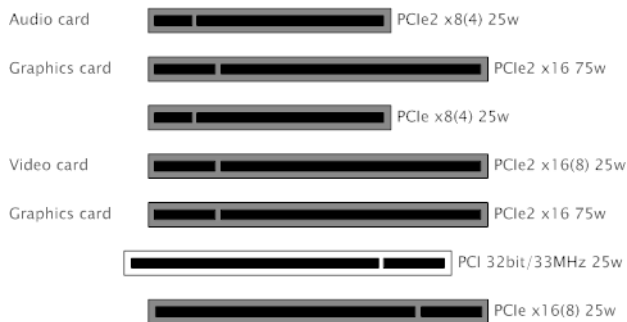
IMPORTANT! The Matrox video boards can reach very high temperatures when in operation. If a X.mio.2 board is used, a radial-aerator must be installed. If a X.mio.2 Plus board is used a radial-aerator can not, physically, be installed. In this case the chassis fan speed (in BIOS) must be set to maximum to achieve sufficient cooling.

5. *Optional:* Insert the [Matrox \(Viz Configuration\)](#) into the PCIe2 slot number 1 from the top.
6. *Optional:* Insert the extra slot panel for the X.mio2/44 board in any of the vacant slots, and connect it to the X.mio2 board.
7. Tidy up all cables and close the computer's casing.

Once the machine is powered up you may verify that the Matrox X.mio board has been correctly installed by looking for the blue **OB** -light on the (top) backside of the slot panel. A lit light indicates that the board is correctly supplied with power.

To Setup an HP Z800 with two graphics cards

PCI and PCIe slots, HP Z800



IMPORTANT! Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.

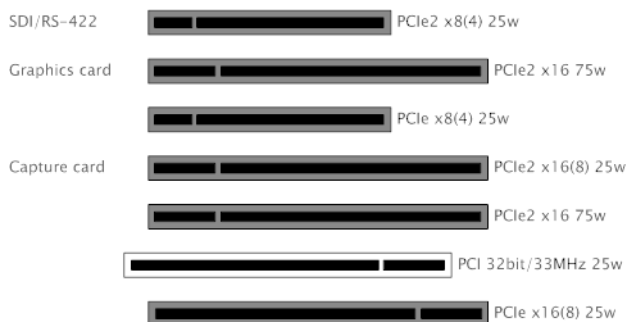
1. Disconnect the power and all other peripherals.
2. Insert the weaker graphics card in PCIe2 slot number 2 from the top.
3. Insert the stronger graphics card in PCIe2 slot number 5 from the top.
4. Insert the Matrox video board in the PCIe2 slot number 4 from the top.
5. Insert the radial-aerator into the PCIe slot number 3 from the top.
 - A radial-aerator is mandatory as the video board reaches high temperatures during operation.
6. *Optional:* Insert the [Matrox \(Viz Configuration\)](#) into the PCIe2 slot number 1 from the top.
7. Tidy up all cables and close the computer's casing.
8. Connect the computer's monitor to the graphics card in slot 2 from the top.
9. Start the machine and in the BIOS (Advanced: Thermal – Full Fan speed) set all fans to run at full speed.
10. Boot and log on to the machine.
11. Install NVIDIA and Matrox drivers.

12. 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.
13. Open Matrox X.info from the system tray and check that the video board runs at PCIe x8 speed.

Once the machine is powered up you may verify that the Matrox X.mio board has been correctly installed by looking for the blue **OB** -light on the (top) backside of the slot panel. A lit light indicates that the board is correctly supplied with power.

To Setup an HP Z800 with a capture card

PCI and PCIe slots, HP Z800



IMPORTANT! Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.

1. Disconnect the power and all other peripherals.
2. Insert the graphics card in PCIe2 slot number 2 from the top.
3. Insert the NVIDIA capture card into the PCIe2 slot number 4 from the top.
4. Tidy up all cables and close the computer's casing.

19.5 HP DL370 Installations

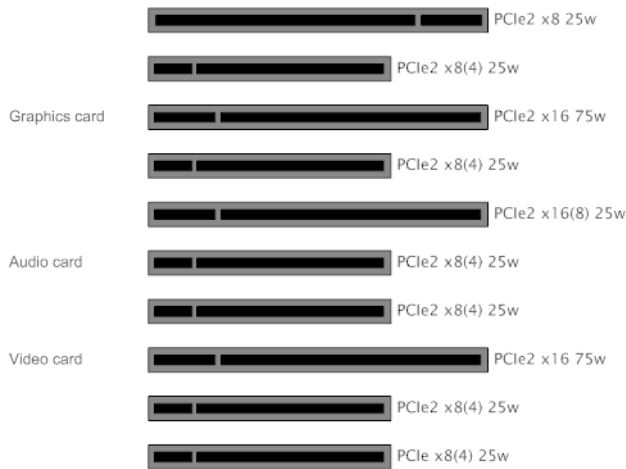
This section describes how to setup a HP DL370 G6 machine with the different cards provided by Vizrt:

- [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

- [NVIDIA Graphics Cards](#)
- [NVIDIA Quadro SDI Capture](#)

To Setup an HP DL370 G6 with one graphics card

PCI and PCIe slots, HP DL370 G6

IMPORTANT! Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.

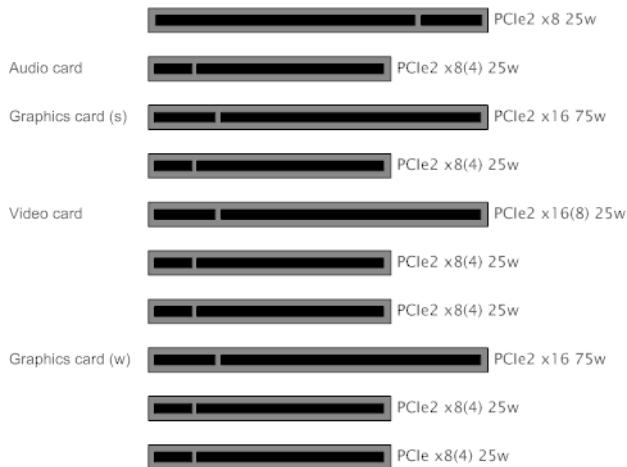
1. Disconnect the power and all other peripherals.
2. Insert the graphics card in PCIe2 slot number 8 from the left.
3. Insert the video board (i.e. Matrox X.mio2) into the PCIe2 slot number 3 from the left.
4. If you have a Matrox board, insert the radial-aerator into the PCIe slot number 2 from the left.
 - A radial-aerator is mandatory as the video board reaches high temperatures during operation.
5. *Optional:* Insert the [Matrox \(Viz Configuration\)](#) into the PCIe2 slot number 5 from the left.
6. *Optional:* Insert the extra slot panel for the X.mio2/44 board in any of the vacant slots, and connect it to the X.mio2 board.
7. Tidy up all cables and close the computer's casing.

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

Once the machine is powered up you may verify that the Matrox X.mio board has been correctly installed by looking for the blue **OB** -light on the (top) backside of the slot panel. A lit light indicates that the board is correctly supplied with power.

To Setup an HP DL370 G6 with two graphics cards

PCI and PCIe slots, HP DL370 G6



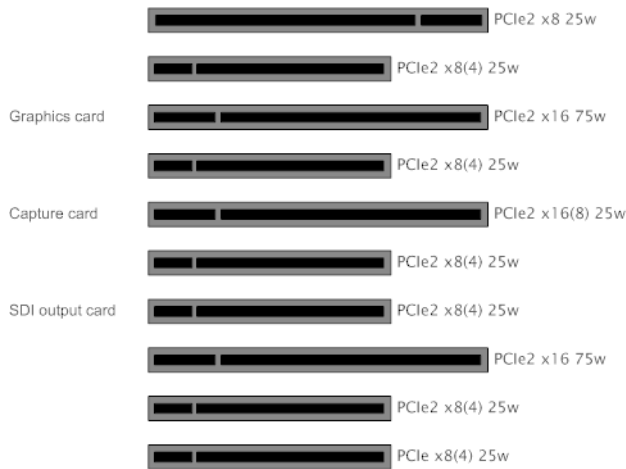
IMPORTANT! Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.

1. Disconnect the power and all other peripherals.
2. Insert the weaker graphics card in PCIe2 slot number 3 from the left.
3. Insert the stronger graphics card in PCIe2 slot number 8 from the left.
4. Insert the video board (i.e. Matrox X.mio2) in the PCIe2 slot number 6 from the left.
5. If you have a Matrox board, insert the radial-aerator into the PCIe slot number 5 from the left.
 - A radial-aerator is mandatory as the video board reaches high temperatures during operation.
6. *Optional:* Insert the [Matrox \(Viz Configuration\)](#) into the PCIe2 slot number 9 from the left.
7. Tidy up all cables and close the computer's casing.
8. Connect the computer's monitor to the graphics card in slot 3 from the left.
9. Start the machine and in the BIOS (Advanced: Thermal – Full Fan speed) set all fans to run at full speed.
10. Boot and log on to the machine.
11. Install NVIDIA and Video board drivers.
12. 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.
13. If you installed a Matrox board, open Matrox X.info from the system tray and check that the video board runs at PCIe x8 speed.

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

Once the machine is powered up you may verify that the Matrox X.mio board has been correctly installed by looking for the blue **OB** -light on the (top) backside of the slot panel. A lit light indicates that the board is correctly supplied with power.

To Setup an HP DL370 G6 with a capture card

PCI and PCIe slots, HP DL370 G6

IMPORTANT! Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.

1. Disconnect the power and all other peripherals.
2. Insert the graphics card in PCIe slot number 8 from the left.
3. Insert the capture card in PCIe slot number 6 from the left.
4. Insert the SDI output board in the PCIe slot number 4 from the left.
5. 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**
3. Deactivate **Hyperthreading**
 - The Matrox X.mio2 board will not function if this setting is enabled
4. Deactivate Intel **Virtualization Technology**
5. Deactivate Intel **VT-d2**

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

6. Go to **Power Management Options > Advanced Power Management Options > PCI Express Generation 2.0 Support**
7. Activate **Force PCI-E Generation 2**
8. **Save** and **exit** the BIOS

19.6 HP xw8600 Installations

This section describes how to setup a HP xw8600 machine with the different cards provided by Vizrt:

- [To Setup an HP xw8600 with a DVS Centaurus board](#)
- [To Setup an HP xw8600 with a Matrox board](#)

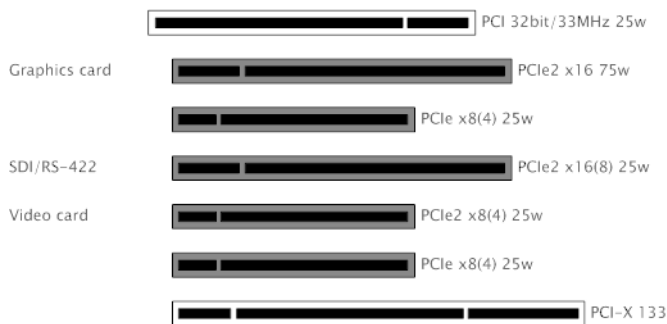
- [To Setup an HP xw8600 with a Matrox board](#)

See Also

- [NVIDIA Graphics Cards](#)
- [BlueFish444](#)
- [Digital Video Systems](#)
- [Matrox X.mio Series](#)
- [Matrox DSX LE Series](#)
- [NVIDIA Quadro SDI Capture](#)

To Setup an HP xw8600 with a DVS Centaurus board

[PCI-X](#) , [PCI](#) and [AGP](#) slots, HP xw8600

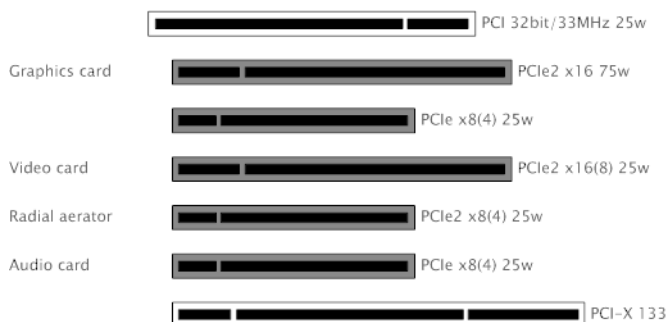


IMPORTANT! Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.

1. Disconnect the power and all other peripherals.
2. Install the graphics card in slot number 2 from the top.
3. Install the video board in slot number 4 from the top.
4. Install 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 Matrox board

[PCI](#), [PCIe](#) and [PCI-X](#) slots, HP xw8600



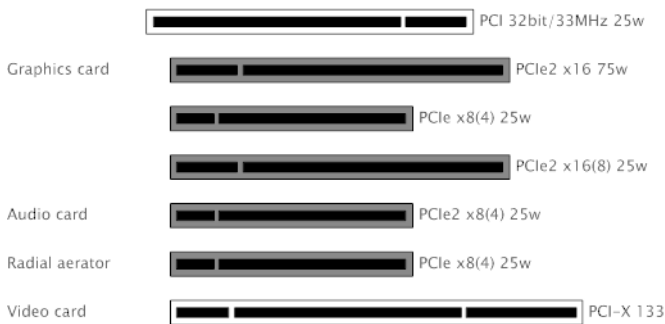
IMPORTANT! Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.

1. Disconnect the power and all other peripherals.
 2. Insert the graphics card in the [PCIe](#) slot number 2 from the top.
 3. Insert the Matrox video board in the [PCIe](#) slot number 4 from the top.
 4. Insert a powerful radial-aerator in the [PCIe](#) slot number 5 from the top.
 5. *Optional:* Insert the [Matrox \(Viz Configuration\)](#) in the [PCI-X](#) slot number 6 from the top.
 6. *Optional:* Insert the extra slot panel for the X.mio2/44 board in any of the vacant slots, and connect it to the X.mio2 board.
-

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

To Setup an HP xw8600 with a Matrox board

[PCI](#), [PCIe](#) and [PCI-X](#) slots, HP xw8600



IMPORTANT! Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.

1. Disconnect the power and all other peripherals.
 2. Insert the graphics card in the [PCIe](#) slot number 2 from the top.
 3. Insert the Matrox video board into the [PCIe](#) slot number 7 from the top.
 4. Insert a powerful radial-aerator into the [PCIe](#) slot number 6 from the top.
 5. *Optional:* Insert the [Matrox \(Viz Configuration\)](#) into the [PCI-X](#) slot number 5 from the top.
-

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

Once the machine is powered up you may verify that the Matrox X.mio board has been correctly installed by looking for the blue **OB** -light on the (top) backside of the slot panel. A lit light indicates that the board is correctly supplied with power.

19.7 HP xw8400 Installations

This section describes how to setup a HP xw8400 machine with the different cards provided by Vizrt:

- [To Setup an HP xw8400](#)

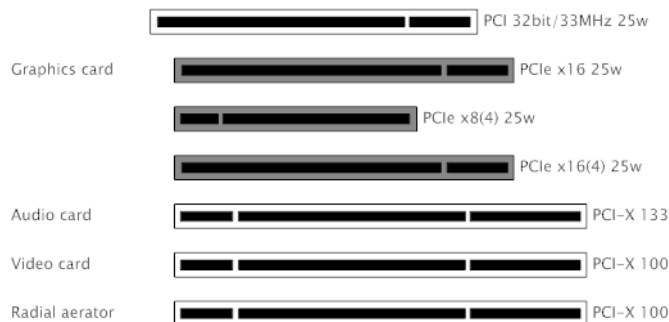
To Setup an HP xw8400

[SATA](#) plug, HP xw8400



IMPORTANT! Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.

1. Disconnect the power and all other peripherals.
2. Before mounting the video board, the [SATA](#) connector originally connected to the SATA port 0 needs to be reconnected to SATA port 1 to make room for the video board.



Note: For an HP xw8400, the X.mio24/6000 video board requires a 64-bit [PCI-X](#) slot operating at a minimum of 100 MHz.

3. Insert the graphics card in the [PCIe](#) slot number 2 from the top.
4. Insert the Matrox video board into the [PCI-X](#) slot number 6 from the top.
5. Insert a powerful radial-aerator into the [PCI-X](#) slot number 7 from the top.
6. *Optional:* Insert the [Matrox \(Viz Configuration\)](#) into the [PCI-X](#) slot number 5 from the top.

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

Once the machine is powered up you may verify that the Matrox X.mio board has been correctly installed by looking for the blue [OB](#) -light on the (top) backside of the slot panel. A lit light indicates that the board is correctly supplied with power.

See Also

- [NVIDIA Graphics Cards](#)

- [BlueFish444](#)
- [Digital Video Systems](#)
- [Matrox X.mio Series](#)
- [Matrox DSX LE Series](#)
- [NVIDIA Quadro SDI Capture](#)

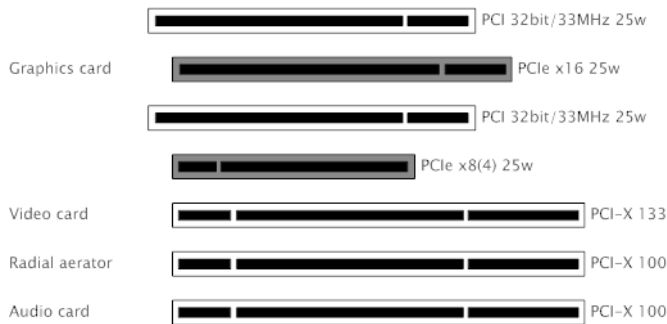
19.8 HP xw8200 Installations

This section describes how to setup a HP xw8400 machine with the different cards provided by Vizrt:

- [To Setup an HP xw8200](#)

To Setup an HP xw8200

PCI , PCIe and PCI-X slots, HP xw8200



IMPORTANT! Before touching any components make sure you use an anti-static wrist strap to prevent electrostatic discharge.

1. Disconnect the power and all other peripherals.
2. Insert the graphics card in the [PCIe](#) slot number 2 from the top.
3. Insert the Matrox video board into the [PCI-X](#) slot number 4 from the top.
4. Insert a powerful radial-aerator into the [PCI-X](#) slot number 6 from the top.
5. *Optional:* Insert the [Matrox \(Viz Configuration\)](#) into the [PCI](#) slot number 7 from the top.

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

Once the machine is powered up you may verify that the Matrox X.mio board has been correctly installed by looking for the blue [OB](#) -light on the (top) backside of the slot panel. A lit light indicates that the board is correctly supplied with power.

See Also

- [Matrox X.mio Series](#)
- [Replace a Matrox X.mio Series Board](#)
- [Connect a Matrox X.mio Series Audio-extension Card](#)

- [NVIDIA Graphics Cards](#)

19.9 Replace a Matrox X.mio Series Board

To Replace a Video Board

This procedure describes how to safely remove a video board driver from a system with an existing video board, or a system that previously has had a video board installed.

1. Remove the video board drivers.
2. Shut down the machine.
3. Install the replacement video board.
4. Install the video board drivers.

IMPORTANT! When changing a Matrox video board the *Matrox.Devices* setting, set in the Viz Config file's SECTION MATROX_CONFIG, will not be updated. The Matrox support will not be correct and the new board 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

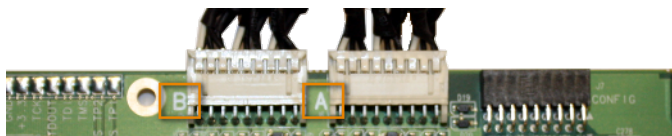
- [Matrox X.mio Series](#)

19.10 Connect a Matrox X.mio Series Audio-extension Card

Matrox X.mio and X.mio2 has support for audio-extension cards. Such a card is installed when [AES](#) / [EBU](#) audio support is required.

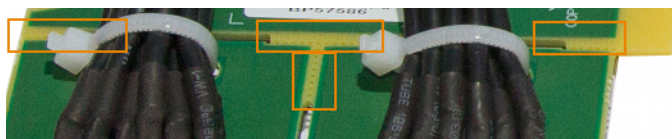
IMPORTANT! The Matrox audio-extension card only supports digital audio.

To Connect the Audio-extension Card to the Video Board



1. Locate the connectors on the audio-extension card labeled A and B.
2. Locate the connectors on the video board labeled A and B.
3. Use the cables to connect A on the audio-extension card to A on the video board, and do the same for the B connectors.

To Remove the Audio-extension Card Back-end



1. Locate the audio-extension card's weak spots
2. Carefully break the connections.

Caution: Do not break the weak spots that hold the two remaining pieces together.

See Also

- [Matrox X.mio Series](#)

20 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:

- [NVIDIA Legacy Cards](#)
- [BlueFish444 SD Lite Pro Express](#)
- [BlueFish444 Iridium|SD](#)
- [BlueFish444 Epoch 2K Horizon](#)
- [Digital Voodoo D1 Desktop](#)
- [Digital Voodoo DeepBlue LT](#)
- [Digital Voodoo Red Devil V3](#)
- [DVS Centaurus II](#)
- [Pinnacle Targa 3200](#)
- [LPT Controller for a Viz License Dongle](#)

20.1 NVIDIA Legacy Cards

This section details all the NVIDIA legacy cards:

NVIDIA Quadro 6000	NVIDIA Quadro FX 3700
NVIDIA Quadro 5000	NVIDIA Quadro FX 3800
NVIDIA Quadro 4000	NVIDIA Quadro FX 4400
NVIDIA Quadro 2000	NVIDIA Quadro FX 4500
NVIDIA Quadro FX 1400	NVIDIA Quadro FX 4600
NVIDIA Quadro FX 1500	NVIDIA Quadro FX 4800
NVIDIA Quadro FX 1700	NVIDIA Quadro FX 5500
NVIDIA Quadro FX 1800	NVIDIA Quadro FX 5600
NVIDIA Quadro FX 3400	NVIDIA Quadro FX 5800
NVIDIA Quadro FX 3450	NVIDIA Quadro K600
NVIDIA Quadro FX 3500	

20.1.1 NVIDIA Quadro 6000

Windows XP / Windows 7 (64bit)

Viz Artist/Engine Version	Driver
3.5.4 and later	311.50
3.5.2 - 3.5.3	296.70
3.1.0 - 3.5.1	275.36

Support	SDI output with Matrox X.mio2 SDI capture with NVIDIA Quadro SDI Output card G-SYNC II
----------------	--

20.1.2 NVIDIA Quadro 5000

Windows XP / Windows 7 (64bit)

Viz Artist/Engine Version	Driver
3.5.4 and later	311.50
3.5.2 - 3.5.3	296.70
3.1.0 - 3.5.1	275.36

Support	SDI output with Matrox X.mio2 SDI capture with NVIDIA Quadro SDI Outlet card G-SYNC II
----------------	--

20.1.3 NVIDIA Quadro 4000

Windows XP / Windows 7 (64bit)

Viz Artist/Engine Version	Driver
3.5.4 and later	311.50
3.5.2 - 3.5.3	296.70
3.1.0 - 3.5.1	275.36

20.1.4 NVIDIA Quadro 2000

Windows XP / Windows 7 (64bit)

Viz Artist/Engine Version	Driver
3.5.4 and later	311.50
3.5.2 - 3.5.3	296.70
3.1.0 - 3.5.1	275.36

20.1.5 NVIDIA Quadro FX 1400

Windows XP

Viz Artist/Engine Version	Driver
3.5.2 and later	296.70
3.1.0 - 3.5.1	275.36
3.0	81.67

20.1.6 NVIDIA Quadro FX 1500

Windows XP

Viz Artist/Engine Version	Driver
3.5.2 and later	296.70
3.1.0 - 3.5.1	275.36
3.0	162.62

20.1.7 NVIDIA Quadro FX 1700

Windows XP

Viz Artist/Engine Version	Driver
3.5.4 and later	311.50
3.5.2 - 3.5.3	296.70
3.1.0 - 3.5.1	275.36
3.0	162.62

20.1.8 NVIDIA Quadro FX 1800

Windows XP

Viz Artist/Engine Version	Driver
3.5.4 and later	311.50
3.5.2 - 3.5.3	296.70
3.1.0 - 3.5.1	275.36

20.1.9 NVIDIA Quadro FX 3400

Windows XP

Viz Artist/Engine Version	Driver
3.5.2 and later	296.70
3.1.0 - 3.5.1	275.36
3.0	81.67

20.1.10 NVIDIA Quadro FX 3450

Windows XP

Viz Artist/Engine Version	Driver
3.5.2 and later	296.70
3.1.0 - 3.5.1	275.36

20.1.11 NVIDIA Quadro FX 3500

Windows XP

Viz Artist/Engine Version	Driver
3.5.2 and later	296.70
3.1.0 - 3.5.1	275.36
3.0	81.67

20.1.12 NVIDIA Quadro FX 3700

Windows XP

Viz Artist/Engine Version	Driver
3.5.4 and later	311.50
3.5.2 - 3.5.3	296.70
3.1.0 - 3.5.1	275.36
3.0	162.62

20.1.13 NVIDIA Quadro FX 3800

Windows XP

Viz Artist/Engine Version	Driver
3.5.4 and later	311.50

Viz Artist/Engine Version	Driver
3.5.2 - 3.5.3	296.70
3.1.0 - 3.5.1	275.36

20.1.14 NVIDIA Quadro FX 4400

Windows XP

Viz Artist/Engine Version	Driver
3.5.2 and later	296.70
3.1.0 - 3.5.1	275.36

20.1.15 NVIDIA Quadro FX 4500

Windows XP

Viz Artist/Engine Version	Driver
3.5.2 - 3.5.3	296.70
3.1.0 - 3.5.1	275.36
3.0	83.62

Support	SDI output with Matrox X.mio2 G-SYNC II
----------------	--

20.1.16 NVIDIA Quadro FX 4600

Windows XP

Viz Artist/Engine Version	Driver
3.5.4 and later	311.50
3.5.2 - 3.5.3	296.70
3.1.0 - 3.5.1	275.36
3.0	162.62

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

20.1.17 NVIDIA Quadro FX 4800

Windows XP

Viz Artist/Engine Version	Driver
3.5.4 and later	311.50
3.5.2 - 3.5.3	296.70
3.1.0 - 3.5.1	275.36

Support	SDI output with Matrox X.mio2 G-SYNC II
----------------	--

20.1.18 NVIDIA Quadro FX 5500

Windows XP

Viz Artist/Engine Version	Driver
3.5.2 and later	296.70
3.1.0 - 3.5.1	275.36 (or 91.36 when used with Video Wall (SDI only))
3.0	162.62

Note: If problems are experienced with the latest driver then set **use_old_nv sdk** to 1 in the Viz Config file.

Support	SDI output with Matrox X.mio2 G-SYNC II
----------------	--

20.1.19 NVIDIA Quadro FX 5600

Windows XP

Viz Artist/Engine Version	Driver
3.5.4 and later	311.50
3.5.2 - 3.5.3	296.70
3.1.0 - 3.5.1	275.36
3.0	162.62

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

20.1.20 NVIDIA Quadro FX 5800

Windows XP

Viz Artist/Engine Version	Driver
3.5.4 and later	311.50
3.5.2 - 3.5.3	296.70
3.1.0 - 3.5.1	275.36

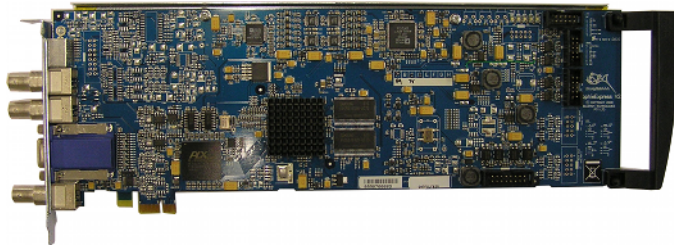
Support	SDI output with Matrox X.mio2 G-SYNC II
----------------	--

20.1.21 NVIDIA Quadro K600

Windows 7 (64bit) / Windows Server 2008 R2/SP1 (64bit)

Viz Artist/Engine Version	Driver
3.6.4 and later	341.21

20.2 BlueFish444 SD Lite Pro Express



Viz supports the SD Lite Pro Express card, and the more recent [BlueFish444](#) cards.

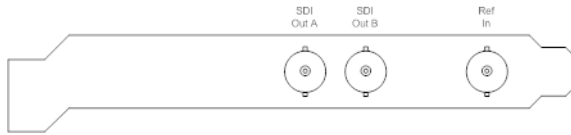
BlueFish444 SD Lite Pro Express provides Fill, Key and [GenLock](#) connectors, and is the successor of the [BlueFish444 Iridium|SD](#) and the [Digital Voodoo DeepBlue LT](#) , that are no longer officially supported.

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 Series](#) . 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:

- [Connectors](#)
- [Driver Installation](#)

20.2.1 Connectors



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

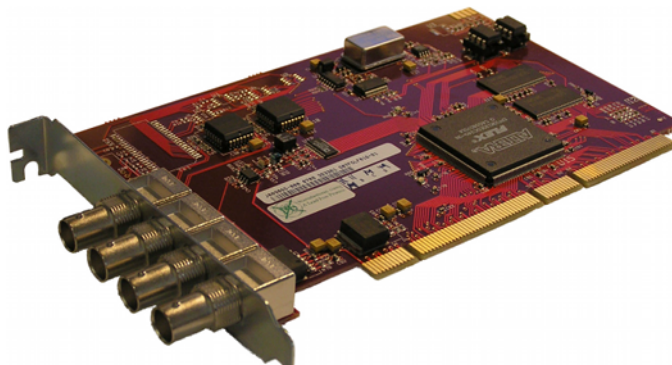
20.2.2 Driver Installation

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

Viz Artist/Engine Version	Driver
3.6.3 and later	Bluefish444 v5.10.2.18
3.6.1 and later	Bluefish444 v5.10.2.4
3.5.1 and later	Bluefish444 v5.10.1.11
3.5	Bluefish444 v5.9.0.78
3.2.7 and later	Bluefish444 v5.9.0.25
3.2.2 and later	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.

20.3 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.

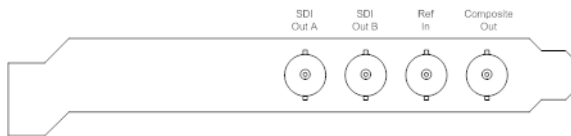
The card was mostly used with Viz Trio NV which basically was a system with the ability to run a Viz Trio client with local preview and video output on a single machine; hence, there was no video input or video playback support as with the [Matrox X.mio Series](#) . The local preview was able to render 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 officially supports the Iridium|SD card. For supported versions, see the most recent [BlueFish444](#) cards.

This section contains information on the following topics:

- [Connectors](#)
- [Driver Installation](#)

20.3.1 Connectors



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

20.3.2 Driver Installation

The driver installation works the same way as for DeepBlue-LT cards. Use driver versions available on [Vizrt's FTP](#) server to make sure of correct functionality and ring buffer support.

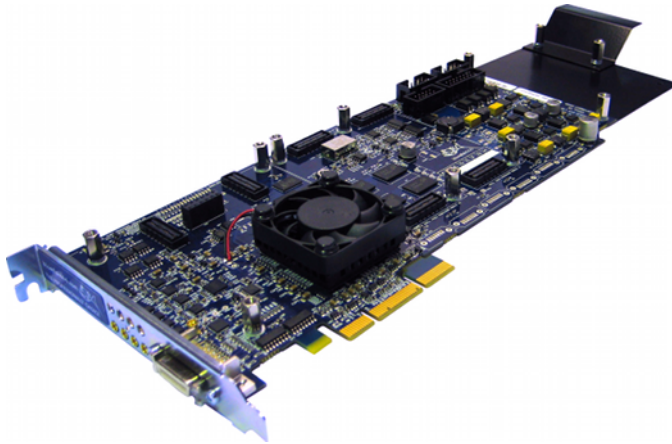
Iridium|SD is fully compatible with existing DeepBlue-LT installations and can be used with any recent Viz version supporting the older DeepBlue-LT device.

Viz Artist/Engine Version	Driver
3.6.3 and later	Bluefish444 v5.10.2.18
3.6.1 and later	Bluefish444 v5.10.2.4
3.5.1 and later	Bluefish444 v5.10.1.11
3.5	Bluefish444 v5.9.0.78
3.2.7 and later	Bluefish444 v5.9.0.25
3.2.2 and later	Bluefish444 v5.7.6
3.1.0-3532 and later	Bluefish444 v3.1

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.

Caution: Only Bluefish444 v3.1 is guaranteed to support an adequate ringbuffer size. Any other driver will cut down or completely disable ringbuffer support.

20.4 BlueFish444 Epoch 2K Horizon



The BlueFish444 Epoch 2K Horizon board is intended for character generators such as Viz Trio, but can also be used as an alternative where only two inputs and outputs are required. The boards are typically installed on HP Z800 machines.

Configuration History

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

- 3.6.3 and later, driver version Bluefish444 v5.10.2.18
- 3.6.1 - 3.6.2, driver version Bluefish444 v5.10.2.4
- 3.5.1 - 3.5.4, driver version Bluefish444 v5.10.1.11
- 3.5.0, driver version Bluefish444 v5.9.0.78

20.5 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 officially supports the D1 Desktop card. For supported versions, see the most recent [BlueFish444](#) cards.

Configuration History

Viz Artist/Engine Version	Driver
Up to Viz 3.5	VizrtVideo 2.3 (Revision - V1 and V2)

Caution: Older card 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](#)

20.6 Digital Voodoo DeepBlue LT

Digital Voodoo DeepBlue LT was used as Vizrt's standard card 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 officially supports the DeepBlue LT card. For supported versions, see the most recent [BlueFish444](#) cards.

Configuration History

Viz Artist/Engine Version	Driver
3.6.3 and later	Bluefish444 v5.10.2.18
3.6.1 and later	Bluefish444 v5.10.2.4
3.5.1 and later	Bluefish444 v5.10.1.11
3.5	Bluefish444 v5.9.0.78
3.2.7 and later	Bluefish444 v5.9.0.25
3.2.2 and later	Bluefish444 v5.7.6
3.1.0-3525 and later	BlueFish444 v3.1

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.

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](#)

20.7 Digital Voodoo Red Devil V3

Digital Voodoo Red Devil V3 alias IO/2020 was Vizrt's standard card 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 officially supports the Red Devil card. For supported versions, see the most recent [BlueFish444](#) cards.

Configuration History

Viz Artist/Engine Version	Driver
Up to Viz 3.5	VizrtVideo 2.3 (Revision - V3)

See Also

- [Digital Video Systems](#)
- [DVS Centaurus II](#)

20.8 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

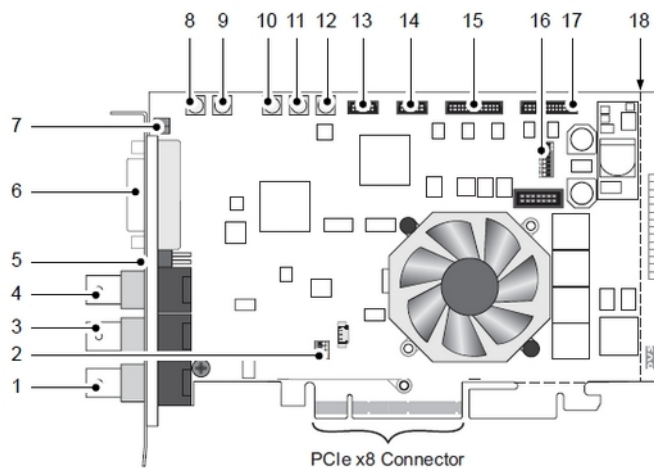
20.8.1 Connectors

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



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.
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.



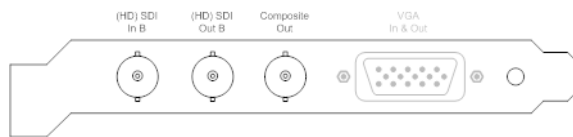
17. **Audio 9-16:** Flat cable connector for the digital audio channels 9 to 16.
18. **Breaking line:** The printed circuit board provides at its bottom (PCIe variant only) and right side extensions void of any electrical parts; these may serve to stabilize the installation of the card in a computer 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.

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 <i>internal</i> is set - Sync mode <i>external</i> is set and a correct signal is connected - Sync mode <i>analog</i> is set and an analog GenLock signal is connected - Sync mode <i>digital</i> is set and a correct signal is connected
		Off	A wrong input signal is detected, i.e.: - Sync mode <i>external</i> is set and no SDI input signal. - Sync mode <i>analog</i> is set and no GenLock signal connected. - Sync mode <i>digital</i> is set and no SDI input signal.
Red	Signals the status of the video raster	Blinking slowly	No input signal is available

LED	Function	Mode	Description
	detection feature		
		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



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.

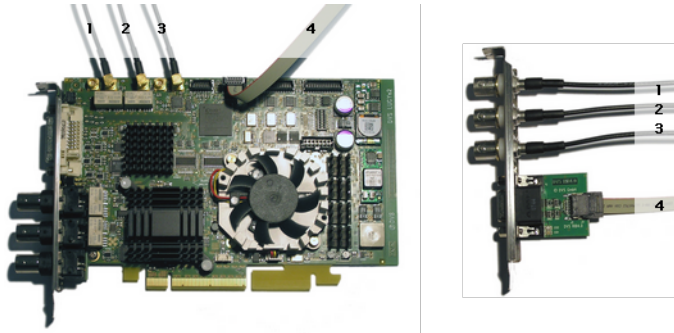
The RS-422 connector available on the panel is a DB-15 (HD) connector.

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



- Connect the separate SDI/RS-422 panel with the DVS Centaurus II main card according to the enumeration shown in the illustration above.

20.8.2 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.

20.8.3 Driver Installation

The following driver versions are supported:

Viz Artist/Engine Version	Driver
3.5.4 and later	SDK 4.3.5.10
3.5.2 - 3.5.3	SDK 4.2.9.8
3.3.0 - 3.5.1	SDK 4.0.1.15

For information on how to install or update the driver, see the DVS SDK 2.7 User Guide.

20.8.4 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 pre installed 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.

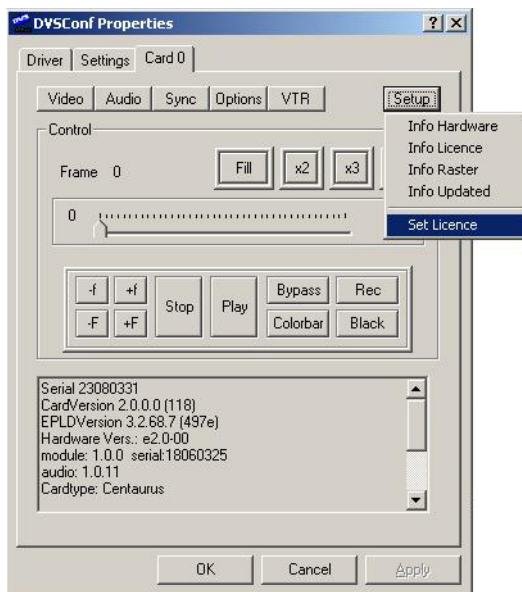
The license key required during the installation process is shipped together with the device and comes as a single sheet of machine-written paper looking something like the illustration below:

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 *dvconfig.exe* file located in the driver folder downloaded from [Vizrt's FTP](#).
2. Select the *Card 0* tab.

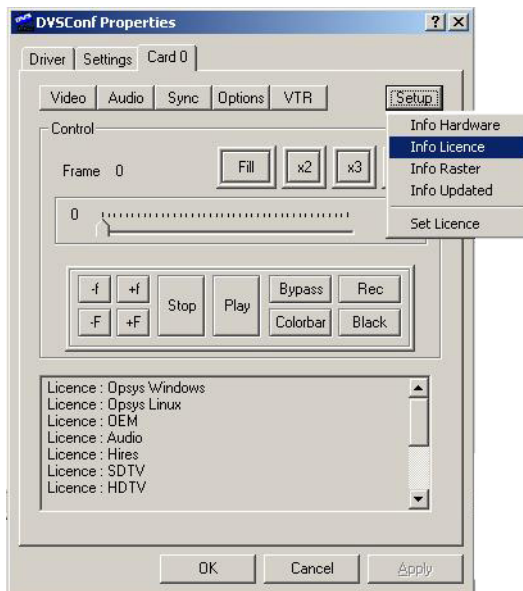
- When selecting the *Card 0* tab for the first time the system will inform that a license needs to be installed for the product.
3. Click *OK* to close the DVSConf Warning dialog box.



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 *dvconfig.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.

20.9 Pinnacle Targa 3200

Pinnacle Targa 3200 was Vizrt's standard card for SD Viz systems until 2007, and was typically used with IBM ZPro 6221, IBM Z-Pro 6223 and HP xw8200.

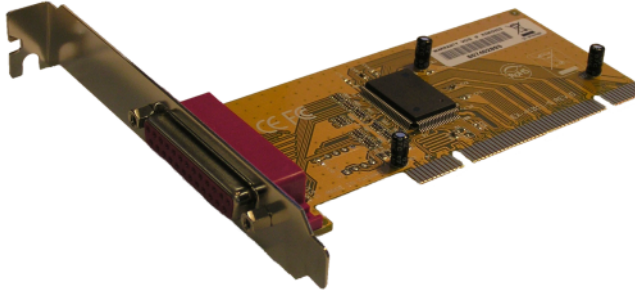
Configuration History

Driver	Revision
CODI v2.42	3213. Revision 3213 crashes the machine when used with CODI v2.41rc13.
CODI v2.41rc13	3212, 3214. Installation of CODI Compatibility Patch for revision 3214 is no more required.
CODI v2.42	3212, 3213, 3214. Installation of CODI Compatibility Patch is required.
CODI v2.2 RC4	3212, 3213

See Also

- [Matrox X.mio Series](#)

20.10 LPT Controller for a Viz License Dongle



To provide recent render engines of type HP xw8600 with support for parallel dongles, an additional LPT controller card needs to be installed in the machine. For this purpose the topmost 32-bit [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](#) (32-bit) slot.
3. Turn 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.

21 Glossary

This section describes words and acronyms that are used throughout the documentation:

5.1	EBU	PCM
6DoF	GenLock	Quad
7.1	Glyph	Rack unit
AES	GPUDirect (NVIDIA)	RF
AGP	HANC	RGB
Anamorphic widescreen	HD	RGBA
ANC data	I/O	Ring buffer
Anti aliasing	IEEE	Safe Area
Audio codec	IRE	SATA
AVI	IRE unit	SAV
Bi-level sync	Ligature	SD
BIOS	Lip-sync	SDI
BNC	LTC	SECAM
BSOD	MCX	Shader
Viz Config file	MDIF	SMPTE
CVBS	MDUF	SPG
D10 Television	MMCX	Squeezeback
D12 Television	MME	Stereo
DIF	Mono	Sub-D
Digital Voodoo	MPEG	Surround sound
DirectSound	MXF	Title Area
DV	NTSC	Tri-level sync
DV25	OB	UAC
DV50	OP-Atom	UNC
DVCAM	Reference	VANC
DVCPRO	PAL	VBI
DVI	PCI	VITC
EAS	PCIe	Writing system
EAV	PCI-X	XLR
		YUV

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.

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](#).

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 shown 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.

Viz Config file

Holds all settings, which can be configured, used by Viz Artist/Engine and various integrated applications. The Viz Config file can be found in the *<viz data folder>*.

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.

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. See also [ANC data](#).

EBU

European Broadcasting Union. See also [AES](#) .

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 [Video Output](#).

Glyph

A glyph is an element of writing. Glyphs may also be [Ligatures](#), that is, compound characters, or diacritics.

GPUDirect (NVIDIA)

NVIDIA® GPUDirect for Video technology allows 3rd party hardware to communicate directly with NVIDIA GPUs. This means that the historical issues of introducing too much delay or latency are gone. With NVIDIA GPUDirect for Video, devices are fully synchronized and the CPU does not waste cycles copying data between device drivers. This flexible API gives full control to 3rd party hardware to stream video to and from the GPU at Sub-Frame transfer times.

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 shown 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. See also [VITC](#) .

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 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.

MME

The MME API or the Windows Multimedia API (also known as WinMM) was the first universal and standardized Windows audio API. Wave sound events played in Windows (up to Windows XP) and MIDI I/O use MME. The devices listed in the Multimedia/Sounds and Audio control panel applet represent the MME API of the sound card driver.

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 extent 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.

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.

Safe Area

(or Action Safe Area) Depending on how a television set is adjusted, viewers can see a larger area than the [Title 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](#).

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](#) , [Anamorphic widescreen](#) and [7.1](#) .

TCP

Transmission Control Protocol: A protocol that works with the Internet Protocol (IP) to send packets of data between computers over the Internet. Together, the TCP and IP protocols establish rules for how information is passed through the Internet. TCP is known as a connection-oriented protocol, which means that a connection is established and maintained until the application programs at each end have completed exchanging messages.

Title Area

(or 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](#).

UAC

(User Account Control) A technology and security infrastructure introduced with Microsoft's Windows Vista operating systems, with a more relaxed version also present in Windows 7. It aims to improve the security of Microsoft Windows by limiting application software to standard user privileges until an administrator authorizes an increase or elevation. In this way, only applications trusted by the user may receive administrative privileges, and malware should be kept from compromising the operating system. In other words, a user account may have administrator privileges assigned to it, but applications that the user runs do not inherit those privileges, unless they are approved beforehand or the user explicitly authorizes them.

UDP

User Datagram Protocol: A communications protocol that offers a limited amount of service when messages are exchanged between computers in a network that uses the Internet Protocol (IP). UDP is an alternative to the Transmission Control Protocol ([TCP](#)) and, together with IP, is sometimes referred to as UDP/IP.

UNC

(Universal Naming Convention) 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

VBI (Vertical blanking interval) is an interval of time between the last line of a given field/frame and the beginning of the next field/frame, during which the incoming data stream is not shown on a monitor. In analog TV it was the time interval allowed for the electron gun beam to move from the bottom of the current field/frame to the top of the next one. This requires the last 45 lines of each 525-line NTSC frame.

When using digital TV, the VBI can be used to send digital data. Types of data sent include closed captions, teletext, time codes and other digital data.

Video codec

A video codec is a device or software that enables video compression and/or decompression for digital video.

VITC

Vertical Interval TimeCode. See also [LTC](#) and [VBI](#).

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: Viz Engine's Matrox card 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.