



# Viz Vectar Plus User Guide

Version 1.6.1



TriCaster®



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### **Created on**

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# 1 Introduction

The next stage of software-driven live production has arrived. Viz Vectar Plus is the first and only major live production solution offered both as a software download for local installation on a consumer PC and as a virtualized package for private or public cloud environments.

- Both solutions are graphic-intensive and have specific GPU processing requirements, as described in section [Installation Requirements](#).
- Viz Vectar Plus from Vizrt is compatible with the Vizrt Group TriCaster switchers from the NewTek company. Many add-ons, enhancements and utilities, previously only available to NewTek's Tricaster series, can now be accessed with Viz Vectar Plus.

**Note:** Opening-up NewTek's TriCaster features for Viz Vectar Plus means that some resources are provided by newtek.com, rather than vizrt.com.

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## 1.1 Related Documents

- [Viz Engine Administrator Guide](#) : Comprehensive guidelines for the onboard Viz Vectar Plus rendering engine.
  - [NewTek NC2 IO](#) : Studio quality input/output module for managing multiple video and audio formats including NDI®, SDI, and other IP formats.
- 

## 1.2 Feedback And Suggestions

We encourage suggestions and feedback about our products and documentation. To give feedback and/or suggestions, please contact your local Vizrt customer support team at [www.vizrt.com](http://www.vizrt.com).

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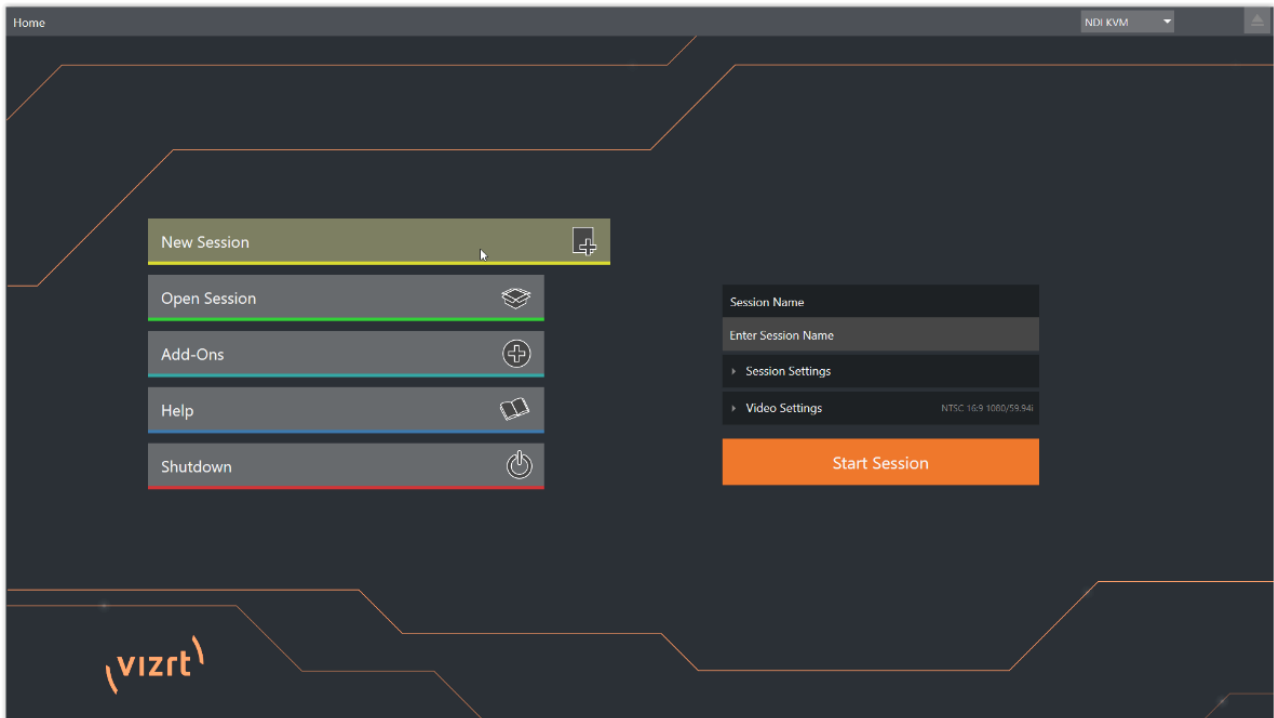
## 1.3 Overview

Vizrt is determined to deliver the most complete, reliable and efficient integrated systems available for live production and web streaming, with capabilities suited to almost any broadcast and content creation need. This unit allows you to produce and distribute live video programs from diverse sources in ultra-high definition formats, up to 2160/59.94p. Viz Vectar Plus is the first and only major live production solution to be offered both

- as a software download to install locally on a standard computer system that meets the necessary performance requirements on-premise
- as a virtualized package that runs in private or public cloud environments that support GPU processing.

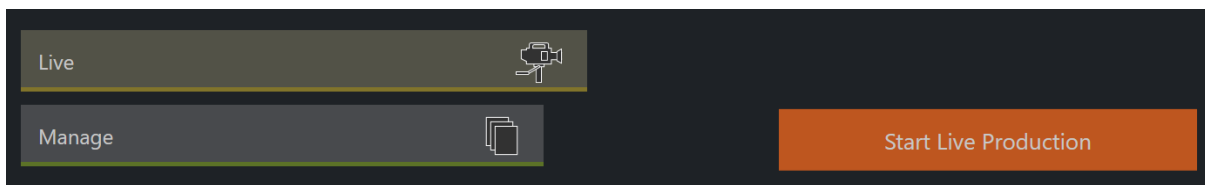


## 1.3.1 Launch Screen



The Launch screen appears shortly after you power up your live production system. This page is where you create and re-open *sessions*.

A session is a customized workspace, prepared for an specific type of production.



After you create or select an existing session, Viz Vector Plus displays the Session page, with some file management features, and the **Start Live Production** button.

## 1.3.2 Live Desktop

All live production features are on the Live Desktop, where all video production equipment (monitors, mixers etc.) appear in one place.

The Live Desktop features controls and modules are arranged as horizontal bands:



- **Dashboard:** System control on a single dashboard. Mouse-over to reveal a menu bar for other menus.
- **Monitoring:** Below the Dashboard is a multi-pane monitoring display, with source and output views. Called a *Multiview*, this area can be re-sized or hidden. Display attributes can be customized to complement external Multiview(s), or other workflow requirements.
- **Live Control:** The central Live Control section contains the switcher, transition, DSK (overlay channels) and M/E controls. M/E panes can be minimized. In the screenshot above they are hidden from view.
- **Tabbed Modules:** By default, the bottom third of the Live Desktop contains tabbed control modules, including media players, buffers and an audio mixer.

## 1.4 Features

A brief overview of some key features of your system:

- [A/V Input and Output](#)
- [Viz Engine Integration](#)
- [Conference Call Connectivity](#)
- [Monitoring](#)
- [Video Processing](#)
- [The Switcher](#)
- [M/Es](#)
- [Record and Stream](#)
- [Media Export](#)
- [Automation](#)
- [Hotspots, Triggers and Trackers](#)
- [Import](#)

- [Audio Mixer](#)
- [Integrated Media Players](#)
- [Buffers](#)
- [Optional Control Surfaces](#)

## 1.4.1 A/V Input and Output

With built-in media players, recording, streaming, audio, and graphics control, this product reaches more audiences with aspect ratio, resolution, and frame rate independence, providing simultaneous delivery for distribution to multiple destinations supporting various screen types.

The underlying software integrates standard computing and network infrastructures with NDI® IP integration.

Other features include:

- Support for up to 44 external inputs in resolutions up to UHD 60p with alpha channel, and support for over 40+ output signals over IP, all independently configurable through software.
- Live switch up to 44 external video sources, and nearly as many internal sources.
- LivePanel buttons add the convenience of presetting and editing macros, without ever leaving the user interface.
- Media Player conveniently saves imported/transcoded clip(s) in the same location.
- Video resolution/frame rate display of every video source coming into the system. Switcher outputs (MIX) can now be specified to support the rendering of alpha channel, including NDI outputs which can also be used in Adobe CC or DDR's.
- With Virtual PTZ, you can create and access multiple shots from any individual video signal; complete with live virtual zoom and real time pan and scan effects.
- Powerful, multi-bus mix effects with eight M/E busses, plus preview bus, all supporting zero-latency video reentry.
- Freely mix multiple video formats, and output UHD and HD sessions simultaneously.
- Supply Microsoft Windows® or Apple Macintosh® computer displays as Switcher inputs over the network using NDI® Scan Converter clients.
- Load layered animations and PSD files directly into system buffers.
- Cascade effects in endless creative ways using multiple re-entrant M/Es.
- Readily access all sources, destinations, and media assets from any location on the network.
- Create complex M/E effects and compositions multiple sources with (virtual) camera moves.
- Use color groups to link switcher row sources for associating entities like multiple M/ Es.
- Manage the input and output of video in non-standard aspect ratios like 9:16 and square video, non-standard video frame rates, rotate and flip to produce content for any platform and destination.
- Send Main or AUX bus audio mixes to a variety of IP audio outputs.
- Flexibility to mix and match caller software applications, streaming formats, websites, video formats and a wide range of media files.

## 1.4.2 Viz Engine Integration

- Viz Engine is a powerful compositing and real-time 3D rendering platform that forms the foundation for a range of graphics and video production.
- Viz Engine comes with Viz Artist, a powerful graphics design tool that supports a range of production use cases including live motion graphics, virtual sets, augmented reality, and complex 3D animations.
- Viz Engine connectivity enables integration of customized control software, 600+ user-specific plug-ins, Unreal Engine 4 rendering, importing models from Autodesk's Maya and 3ds Max, Maxon's Cinema4D, and Adobe After Effects, and support for multiple tracking systems.

## 1.4.3 Conference Call Connectivity

- Live Call Connect is a flexible and powerful integrated support for a wealth of popular remote calling and conferencing applications, plus supported web browsers.
- Install popular applications like Microsoft® Teams, Zoom, Google Chrome, FaceTime, Facebook Messenger, WhatsApp and many others, and assign their individual audio and video outputs directly to the Switcher and Audio Mixer inputs.
- App Return, a special designated source to route and configure audio & video to supported applications using Live Call Connect. Video routing options support MIX 1-8 and audio routing corresponds to a mix minus of the Master and AUX busses, or any input.
- Productions are enhanced with real-time interactions that feature multiple high quality video and audio inputs, so that show producers are able to connect between studios and remote guests or callers from anywhere in the world, without compromise or worrying about connectivity.
- Use the native Skype TX support with Microsoft's powerful Skype TX™ platform to connect Skype™ calls directly to the Switcher, with automatic handling of return audio and video (including mix minus).
- Viz Vectar Plus offers a unique TalkBack feature to provide private direction to callers.

### □ **Note on Deployment platforms:**

Viz Vectar plus is designed to take advantage of the hardware accelerated capabilities of the latest versions of Windows. Because of this, the Live Call Connect feature requires Windows Build 29041 or later. For some cloud platforms like AWS, this might not be available as default configuration. This will change over time. You can in most cases work around this by bringing your own Windows 10 version and deploying it manually in the cloud platform.

This may have implications on cost, technical complexity and licensing agreements with Microsoft. This manual process is not supported by Vizrt. However, we do support our software.

## 1.4.4 Timecode

- NDI QuickTime® recording format includes embedded time-code.
- Recorded clips are easily aligned for synchronized post-show editing using timecode.



## 1.4.5 Monitoring

- The Live Desktop includes a large monitoring pane with multiple, easily customized workspaces.
- This multiview displays all live and internal video sources, including media players and network sources.
- A multiview workspace can contain external resources, offering alternatives like numerous multi-bridge layouts, overlays and event clocks.
- The monitor sources presented on the Live Desktop and up to four external multiview's, are all user-configurable. This includes media player clip timecode counters and custom logo display.
- Waveform and vectorscope monitors help you calibrate your signal to ensure the output meets broadcast standards.

## 1.4.6 Video Processing

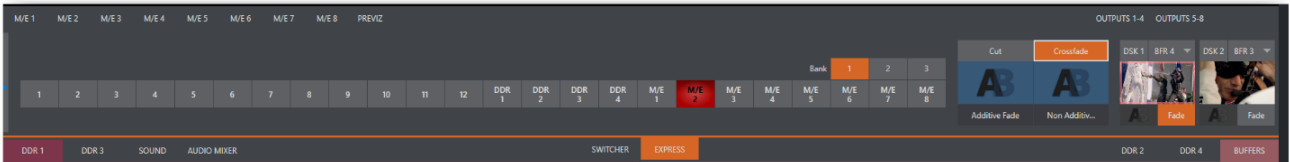
- Full 4:4:4:4 32-bit floating point internal processing of all video sources.
- Proc Amps and White Balance controls for every source preserve pristine image and color fidelity.

## 1.4.7 The Switcher

The powerful Switcher module, which provides native support for the popular NDI® (Network Device Interface) protocol, puts your sources at your fingertips in a familiar Program/Preview row control layout.



For less complex productions, the Switcher’s convenient Express mode simplifies the process. This one-button operating mode is especially welcome in environments where volunteers or less experienced operators are involved.



Additionally, optional support for switching with a touchscreen has been provided. Just tap the corresponding viewport to instantly send that source to Program output, using the current background transition.

### Video Layers and Transitions

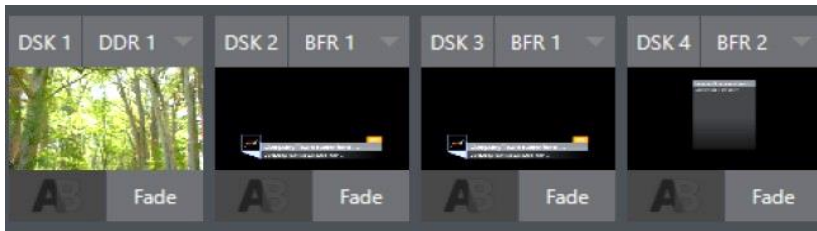
The Transition section of the Live Desktop provides powerful tools for arranging and displaying the numerous video and graphic layers contributing to your ultimate program output.



- Freely hot-punch or transition between external sources, internal media players, and M/E effects.
- Latch selected Switcher and M/E source rows in color groups to synchronize switching operations.
- Multiple DSK (downstream key) Switcher channels and independent KEY channels for each M/E, permit endless creative possibilities.
- Bring DSK’s on and off screen with PGM/PST background sources using combined layering and transition effects.
- Use any of the hundreds of transitions supplied to reveal either Background or DSK/Key channels with animated wipes, trajectories and dissolves, including colorful Animation Store transitions with sound effects.
- Reveal combinations of video layers with one operation of the T-bar or click on Take/Auto buttons.
- Use per-layer controls to independently display any layer with or without transitions.
- Employ Speed, Reverse and Ping Pong options to modify individual transition effects for any layer.

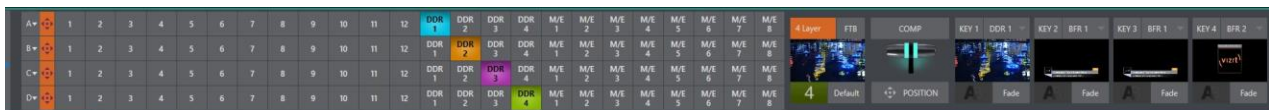


## DSK Channels



- Display DSK channels independently and swap them during a switch with custom transitions.
- DSK layers support downstream overlays (M/E Keys are upstream overlays, ahead of the main Switcher).
- Assign media players, buffers, camera or network sources to an overlay channel.
- Independent Crop, Position, 3D Rotation, and Scale controls for each DSK channel enable multiple source configurations as picture-in-picture elements and reveal them with custom effects.

## M/Es



Color-coded M/E (Mix/Effect) banks provide stunning effects.

These include secondary video mixing capabilities, switching with traditional wipes, full alpha channel support and real-time keying technology for green/blue screen effects, and much more.

Each M/E bank supports:

- Up to eight primary video sources per effect.
- KEY (overlay) channels with individual transition capabilities.
- Sub-mix functionality, with individual transitions for A/B Background layers and all KEY channels.
- Individual Scale, Position, Crop and Rotation controls and motion Tracker support for all channels.
- Powerful Comp (composition) preset features let you animate layer and overlay position, rotation and other attributes.
- Convenient MEM system allows instant access to pre-configured M/E setups.

## 1.4.8 Record and Stream

- Record live-switched production at full resolution in high-quality QuickTime® format.
- Real-time, direct upload of clips, active recordings, and streams to social media, storage volumes, and web-based destinations, with optional transcoding.
- Comprehensive, multi-channel recording configuration for capture, playback, and archive of production content across your ecosystem.
- Capture technology supports multiple simultaneous A/V recordings chosen from among local camera inputs and the four primary outputs.
- Easily grab still images from any Switcher source, or batch capture selected outputs.
- Streaming: RTMP, RTSP, HTTP, SRT, and more.
- Live stream to multiple destinations for redistribution and archive your stream locally.

## 1.4.9 Media Export

Real-time, direct upload of clips, active recordings, and streams to social media, storage volumes, and Web-based destinations, with optional transcoding.

Clips and stills from live sessions can be added to the Export queue without interrupting production, for distribution to multiple hosting services and social media sites (including Twitter®, Facebook®, YouTube®, and more) – even when live production recording is still underway. This is great for concerts, galas, sport events, game shows and more. The Export feature directly addresses FTP sites and network locations too. Transfer media to multiple locations at the same time to meet post-production needs or other collaborative and archival requirements.

## 1.4.10 Automation

Easily accessible through any web browser or operating system, there are production-ready control panels for remote video mixing, media playback, audio mixing, and macro automation, plus a panel builder tool to design your own custom panels geared toward your unique productions and workflows.

## 1.4.11 Hotspots, Triggers and Trackers

Define multiple onscreen Hotspots for different (chromakeyed) sources, and trigger macros automatically whenever something opaque enters the hotspot. This live interactivity opens up countless creative applications.

Trackers provide motion data from selected color regions as they move about the frame in real-time. Lock video sources to Tracker output using Position tools in M/Es banks and DSKs and they follow obediently.

## 1.4.12 Import

With built-in media players, recording, streaming, audio, and graphics control, the integrated Import Media feature provides a convenient one-stop approach to gathering production assets:

- Batch import media files for use in media players.
- Imported files can be pre-assigned automatically to specific players, making them easy to find and use during live productions.
- As necessary, imported files are transcoded.

## 1.4.13 Audio Mixer

The integrated Audio Mixer provides extensive multi-channel control and management.

- All 44 audio inputs can be accessed with the Audio Mixer scroll bar (located below the SOLO buttons).
- Neural Voice Isolation (AI Audio) to enable/disable noise reduction per channel on each audio mixer input.
- Adjust numerous internal and external audio sources, and introduce them into your program manually or automatically.
- Control output levels for program, headphones, auxiliary outputs, recorders, and stream separately.
- Convenient audio mixer MEM system allows single-click access to prepared setups.
- Automation allows complex video follow audio options and threshold macros.
- Exclusive or Latched Solo controls.
- Independent 7-band EQ, Compressor/Limiter and Noise Gate for each source and output.
- Complete multi-bus 8x8 matrix routing options.
- Configurable VU meters: Show calibration on digital (dBFS) or analog (dBVU or dBu) scales.

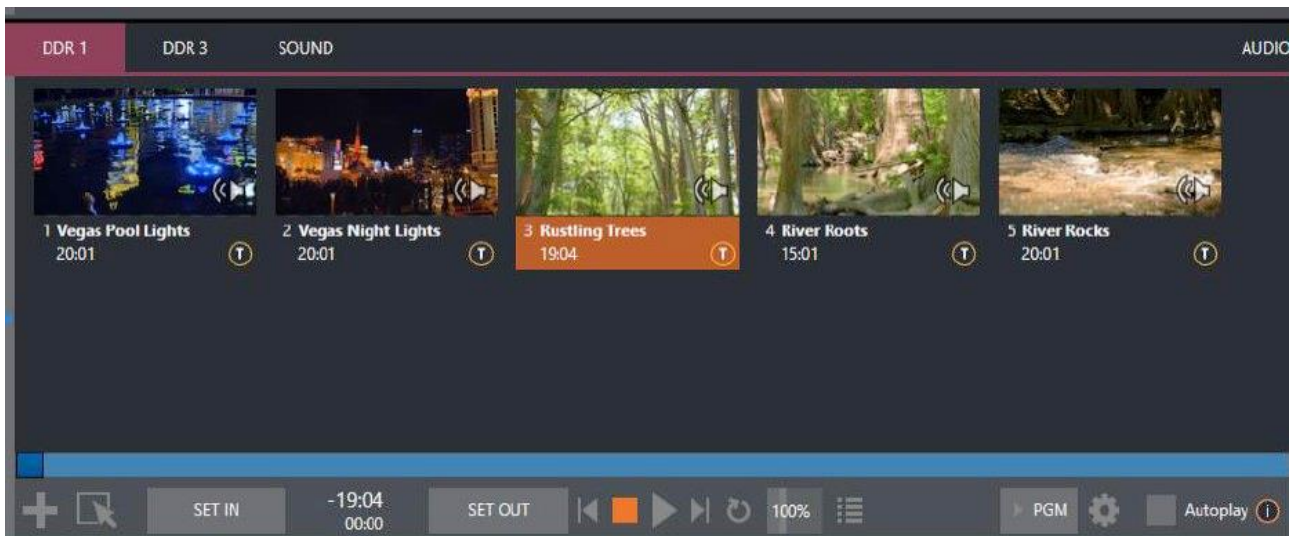


## Advanced Audio Connect

- VST plugin with NDI offers unlimited support for mix minus, intercom, and other advanced capabilities without any restrictions on scale, all with floating point audio, and without any channel restrictions.
- Supports comprehensive integration of system audio with external mixers.
- Provides independent routing of any audio input or audio output channel(s) for external routing.
- Enables extraction of embedded audio from NDI® sources for external routing.

### 1.4.14 Integrated Media Players

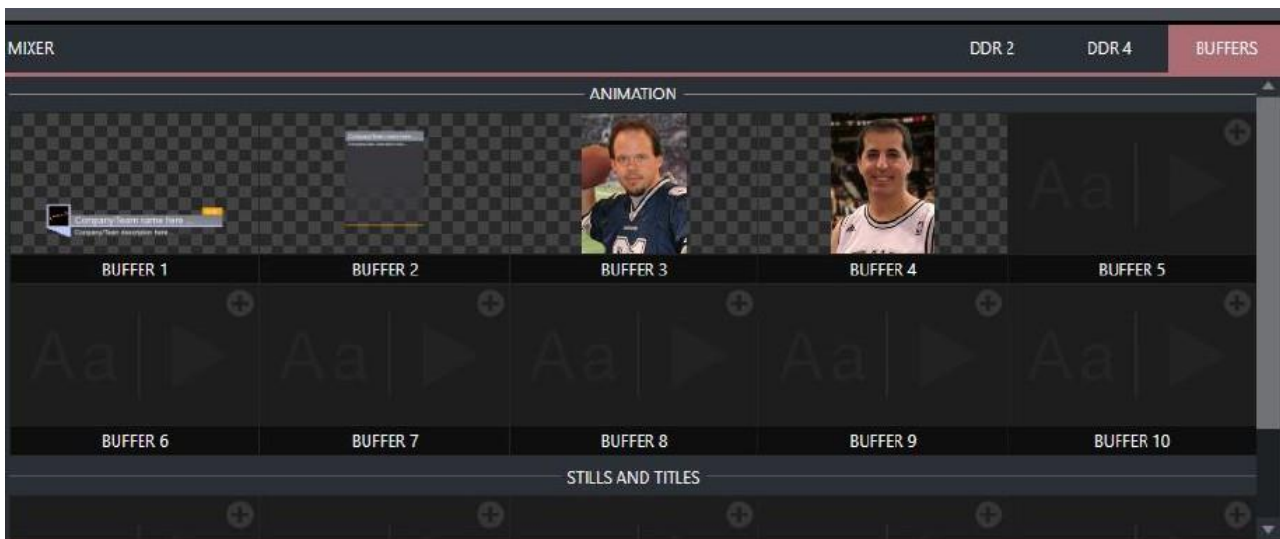
Media players and the title system serve up graphics and audio files quickly and easily.



- Built-in media players, recording, streaming, audio, and graphics control, with aspect ratio, resolution, and frame rate independence.
- Superior stored media playback capabilities, with multiple real-time multimedia players supporting an array of file formats
- Re-order playlist entries.
- Add colorful transitions between playlist items.
- The Sound module has volume and other advanced audio controls in the Audio Mixer.
- Convenient 'per clip' audio level and playback Speed control.
- Auto play feature starts and stops playback automatically based on Switcher activity.
- Control media players with macros triggered by other events.
- Assign titles, graphics, or buffers to multiple DSK or M/E Key channels.
- Instantly transition media to the main Switcher or an M/E and then restore the original source using the Show On feature.
- Store playlists and player configurations in MEM slots for easy recall.

## 1.4.15 Buffers

The Buffers module provides quick review and management of the internal media buffer system, providing combined playback and asset management tools, and is fully supported by the Macro system.



Buffers can be applied in any video channel, including all main Switcher and M/E rows, or as overlays in the countless DSK/KEY channels. Buffer slots can contain animated effects, still graphics or editable title pages.

Buffer effects are resident in reserved Switcher memory, making it possible to use them all at once without tying up media players.

## 1.4.16 Optional Control Surfaces

Several optional control surface options have been designed to complement your system, making your live production operations even more convenient.

---

## 2 Setup

This section explains how to power-up Viz Vectar Plus, configure monitors, audio-visual sources and any external control devices.

It also takes you through licensing and authorization.

- [Installation Requirements](#)
  - [Passwords and Security](#)
  - [Input Connections](#)
  - [Output Connections](#)
  - [Sessions](#)
  - [Configuring A/V Output](#)
  - [Configuring Video Inputs](#)
  - [Configuring Audio](#)
  - [Configuring Genlock](#)
  - [Other Initial Configurations](#)
- 

### 2.1 Installation Requirements

- [Hardware](#)
- [OS](#)
- [Upgrading](#)
- [Installation Procedure](#)
- [Licensing](#)
- [Documentation](#)

#### 2.1.1 Hardware

- Graphics
  - nVidia Board that supports
    - NVenc and NVdec
    - Cuda
  - For Viz Vectar Plus with integrated Viz Engine, Viz Engine requires:
    - nVidia board with OpenGL support
    - Minimum of 6GB of memory for UHD resolutions
- Disk Space
  - 2.1 GB
  - For Viz Vectar Plus with embedded Viz Engine: 3.2GB  
Please refer to [Viz Engine Administrator Guide](#) for more information.

#### 2.1.2 OS

- Windows 10 Build 1809 or higher
- Windows Server 2019 or higher

#### 2.1.3 Upgrading

- Uninstall any previous version of Viz Vectar Plus before installing the new package.
- All sessions, local settings and configurations are automatically saved and reapplied after an upgrade.

## 2.1.4 Installation Procedure

Installation has two flavors, a PC-based switcher, or a PC-based switcher with one or two instances of a rendering engine, Viz Engine.

1. Remove any existing instances of Viz Vector Plus.
2. Download your installation software from the Vizrt FTP <https://download.vizrt.com/> under */products/VizVectorPlus*
3. Follow steps in the Installation Wizard.

## 2.1.5 Licensing

For Viz Engine installations, please refer to section [Licensing](#).

## 2.1.6 Documentation

The latest *Release Notes* are available at: <https://docs.vizrt.com/viz-vector-plus.html>

Viz Vector Plus from Vizrt is compatible with the Vizrt Group TriCaster switchers from the NewTek company.

Many add-ons, enhancements, and utilities previously only available to NewTek's Tricaster series, can now be freely accessed. See <https://www.vizrt.com/support/product-updates/>.

## 2.2 Passwords And Security

### 2.2.1 Windows

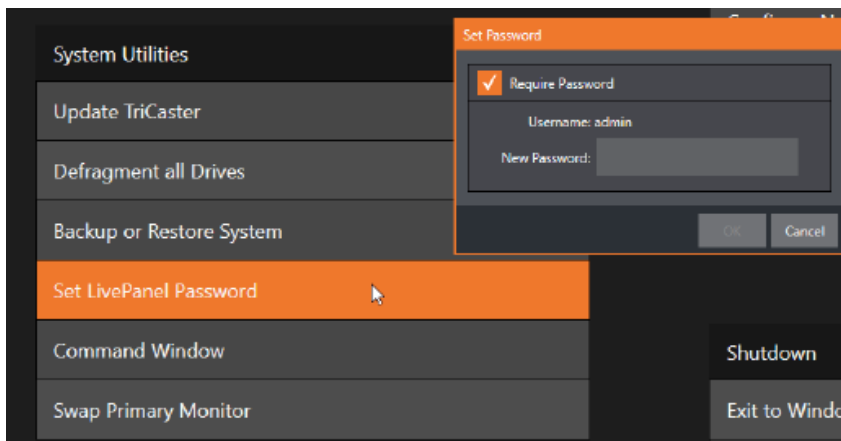
Viz Vector Plus runs on the MS Windows operating system. The system can be operated without a password, however controlling access by password is recommended to preserve system integrity.

### 2.2.2 LivePanel

Viz Vector Plus includes a useful, web-based collection of utilities and resources, displayed through the LivePanel feature.

You can password-protect access to LivePanel features that control your production over the network.

- To enable or disable this security feature, or to modify the password, from the **Shutdown** menu, select **Administrator Mode > System Utilities** (from the main menu in the Launch screen).



**Note:** The default password for new or newly restored systems is admin. It is strongly recommended to change this value!

## 2.3 Input Connections

- [Connecting a Video Router](#)
- [Connecting a Control Surface](#)
- [Black Magic Design® Auto-Detection](#)

### 2.3.1 Connecting a Video Router

Viz Vector Plus responds to your changing requirements by removing the traditional boundaries of media formats, I/O, channels and delivery. It is a one-size-fits-all digital media environment for content creation to Internet, mobile and television distribution.

With the appropriate software installed, your system can control and access output from router models supporting NDI matrix router, DeltaCast, Bluefish444, Matrox, Black Magic Design®, Grass Valley® Native Protocol and many more.

### 2.3.2 To set up a router

A basic setup with any of the above supported cards would be:

1. Connect the ethernet controlled router to the same network as the system, then connect one (or more) of the router's video outputs to external SDI inputs with matching numbers, using suitable video cables. (For example, by default router output number 3 would be connected to Input 3 for control communication between the devices to be properly linked).
2. Click the **Shutdown** icon on the Home page (Launch screen) and then **Administrator Mode** at the right.
3. In Administrator Mode panel, click **Exit to Windows**
4. Navigate to the folder:
  - a. `C:\ProgramData\vizrt\VectarPlus\Configuration`
5. Edit the file named `router_setup.xml`.

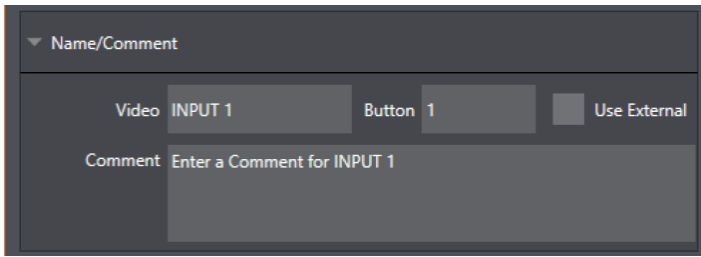
This file is where you add the routers you wish to connect. Each router is identified by an entry you insert between the starting and closing "config" tags, as explained in the file comments.

6. Save the file.

**Example entry:**  
`<grassvalley ip="10.28.1.128" port="12345" name="AJA KUMO"/>`

7. Re-launch the system.

Some routers allow each router input to be provided with a unique name. In such a case, Viz Vector Plus may be able to access that name and use it for Switcher buttons as appropriate.



To enable this behavior, check the Use External (name) switch in the Input Configuration panel. See [Input Configuration](#) for more detail.

### 2.3.3 Connecting a Control Surface

Please refer to section [Connection and Configuration](#).

### 2.3.4 Black Magic Design® Auto-Detection

For backwards compatibility, these routers are by default, auto-detected at connection.

Black Magic® routers may use a USB control connection, or a network connection. The router's firmware must be up to date. If detection fails, please contact BMD support for assistance.

#### To disable auto-detection

You can optionally disable auto-detection . Disabling auto-detection enables further configurations to be manually entered into the file.

1. Edit the XML configuration file described above in procedure [To set up a router](#).
2. Add the line below to the <config> section of the file.

```
<blackmagic_config discovery="false"/>
```

## 2.4 Output Connections

Viz Vectar Plus is a software-only, IP-based live production solution, delivering a choice of configurations for on-premises or virtualized cloud environments.

### 2.4.1 A/V Output

Viz Vectar Plus can switch, mix, and produce many types of live production. There are none of the traditional limitations of media format or I/O. Your content can be delivered to any infrastructure that meets performance requirements.

Here are some of the possibilities:

- Pull in streams across the internet from various sources using standard protocols such as SRT and mix them into your productions.
- Output from a broad range of sources – including eight unique mixed compositions, support for over 40+ output signals over IP, multiple internal recorders, and three additional local multiview monitors.
- Send program output, secondary mixes, or custom ‘monitor bridge’ layouts to three
- supplemental monitors.
- Configure, stream and record to two independent video outputs, to multiple Content Delivery Networks. Each of the primary outputs (referred to as MIX 1 – 8), can be configured independently.

- All video format settings for each output is entered in the Live Desktop's **Output Configuration** panel.
- Output video from anywhere to anywhere with an IP-based software solution.
- Re-entry function allows for multiple versions of the same production to be simultaneously output with different aspect ratios, resolutions, and graphics.
- Native support for network audio input and output via NDI®.

## 2.4.2 Supplemental Video Outputs

Viz Vector Plus comes with fully integrated quad-head multiviewer functionality, with dedicated monitor ports, configurable workspaces, and customizable windows.

**Hint:** You can choose which monitor is the *main display* by selecting **Administrator Mode**, then clicking **Display** under the **Settings** heading.



These supplemental monitors are referred to as Multiview outputs, and can display a variety of optional layouts that can be selected and configured at any time in the Live Desktop.

**Note:** A mismatch of output format and connection type is possible at times. For example, imagery in a media player may not match the current output resolution or the selected connection type. Display mismatches can often be simply reconfigured, but in rare cases the source may just not be shown.



## 2.5 Sessions

### 2.5.1 Working with Sessions

A *session* is a unique Viz Vector Plus production instance, with individual working environment configurations of things like inputs, outputs and equipment specifications.

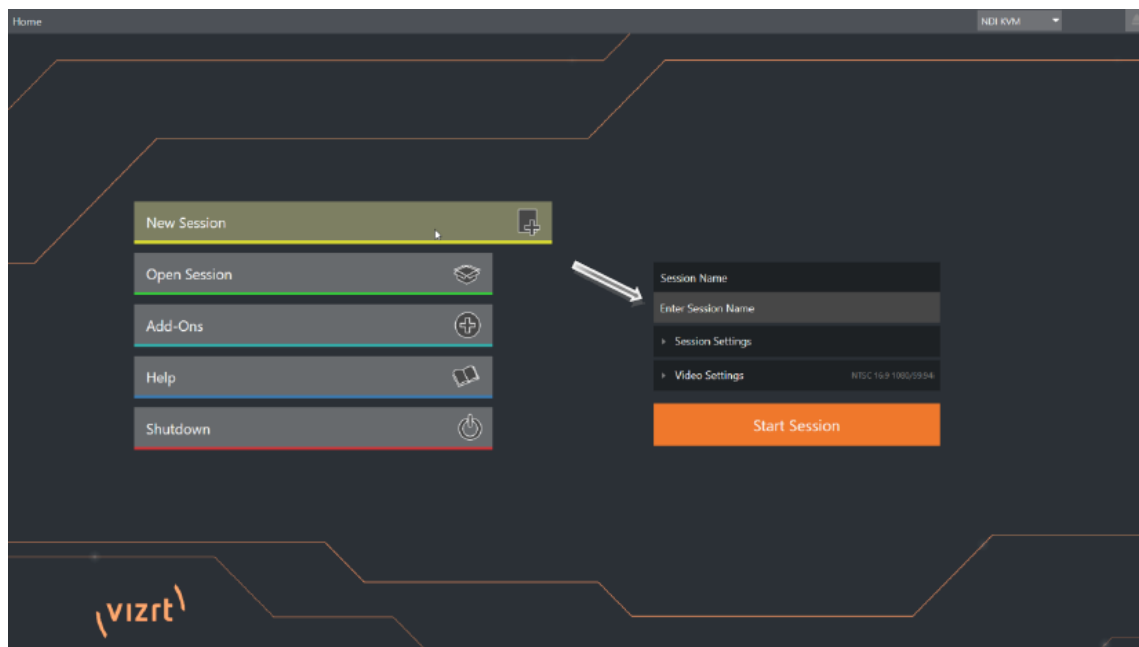
- If Viz Vector Plus is not already running, power it up to reveal the **Home** page.
- If already running, with the Live Desktop displayed, from the menu bar select File > Exit, click the large triangular **Back** button to the left to access the Home Page.

See section [Sessions](#) Introduction for more details.

#### The Home Page

To create a session

1. When no previously created session exists, click the **New Session** button to create a new session.



2. In **Enter Session Name** to the right, click to optionally modify the default name (the default name is the current date).
3. Select **Video Settings** to specify resolution and standards like PAL or NTSC that will be used throughout your production.
4. You can usually skip Session Settings.

**Note:** By default, new sessions are created on the D: (Media) drive. See Section [The Home Page](#) for more about drive options.

5. Click **Start Session**.

This opens the **Session** page, where further once-only configurations are needed.

#### To configure connections in the Live Desktop

6. On the left, click Manage.
7. Enter the location of your various sources that you will use during your live production.

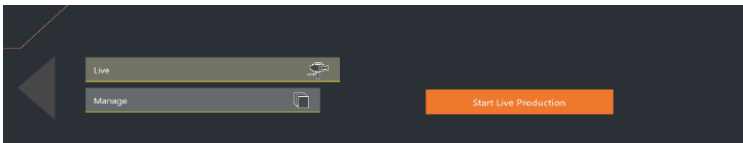




## To start production in the Live Desktop

The Live Desktop is where you operate your live production.

- On the left, click **Live** then **Start Live Production**.



## The Live Desktop



The example above shows a Live desktop with configured input devices content. For further details see section [The Live Desktop](#).

## Networking

Viz Vector Plus has the flexibility to switch, mix, and actualize any type of live production. With built-in media players, recording, streaming, audio, and graphics control, providing simultaneous delivery for distribution to multiple destinations supporting various screen types. Instant access to seamless interchange with essentially unlimited IP sources from anywhere across your network in real time. Viz Vector Plus is digital media production software that employs standard computing and network infrastructures with IP connectivity including NDI.

- Access the system **Network and Sharing** control panel for network configurations. See section Configure Network under *Administrator Mode* in The Session Page. For further help, please consult your system administrator.

## 2.6 Configuring A/V Output

- [Primary Outputs](#)
  - [Output Channel Options](#)
- [Supplemental Outputs](#)
  - [Primary and Secondary NDI](#)
  - [NDI Output Matrix Routers](#)

## 2.6.1 Primary Outputs

Complete video monitoring is provided on the Live Desktop in a multiview occupying the upper section of the screen. This lets you operate without connecting downstream video monitors or devices. Network Device Interface (NDI)-enabled broadcast devices and systems have no traditional, wired connections.

If you want to connect external monitors or other downstream devices to your system, see section [Output Connections](#). You will need to choose output formats, and audio and video sources provided to downstream systems.

The primary mixed A/V outputs are presented to downstream devices by various means as depicted in the following table.

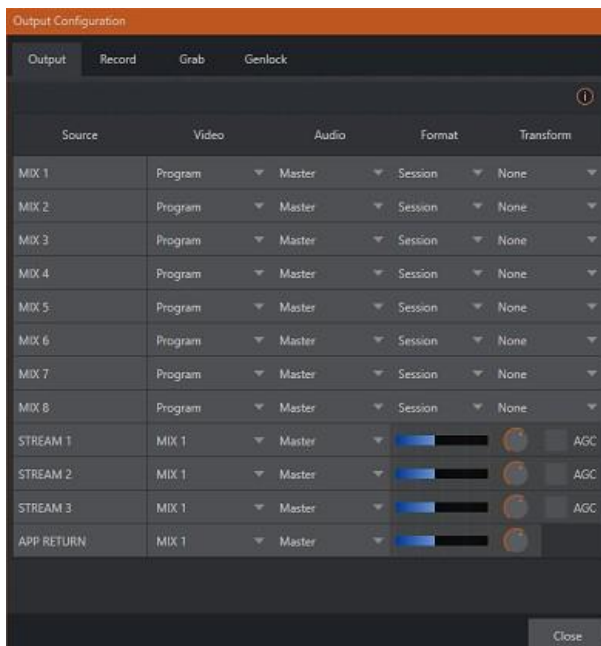
Name	Video Output			Audio Output	
	Source	Format	NDI	Source	Supplemental (NDI and other)
Mix 1	Selectable	Selectable	✓	Selectable	✓
Mix 2	Selectable	Selectable	✓	Selectable	✓
Mix 3	Selectable	Selectable	✓	Selectable	✓
Mix 4	Selectable	Selectable	✓	Selectable	✓

Up to eight audio channels can be mapped to supplementary outputs with the installation of supported third-party audio drivers (such as Audinate’s Dante™).

**Tip:** You can have many outputs in addition to these primary ones and the Stream outputs configured in the same pane. See section [Supplemental Outputs](#).

### To configure outputs

1. Mouse-over the Program Output monitor on the Live Desktop.
2. Click the Configure button (gear) that appears at lower right over the viewport to open the **Output Configuration** panel.



- **Tip:** If you are using a touch interface, tap two fingers together on any viewport to open the corresponding configuration panel.

### 3. Select the **Output** tab.

This is where you configure each video output bus designated *MIX 1-8* as well as *Stream* outputs with settings like:

- a. The video source assigned to the output.
- b. The audio source that will accompany the video, where available.
- c. Video format.

- **Tip:** Resolution and color adjustments for devices connected to the various monitor ports on the backplane are located in the Display Settings panel, accessible from the Workspaces menu in the main Dashboard.

## Output Channel Options

### Video source

You can assign sources to the primary video outputs.

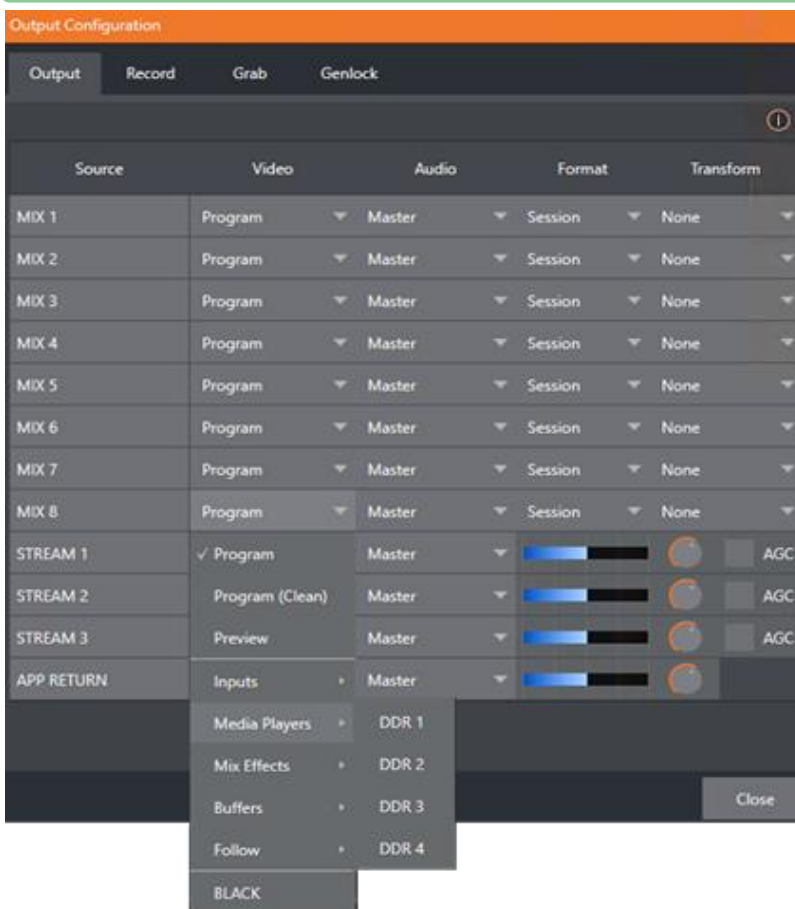
### To assign a video source

- In the **Output Configuration** panel, in the **Video** column, open the drop-down menu. Primary output connectors are identified by number. These sources appear on your network as NDI sources.

**Optional Source selections** for MIX output channels include any of the following:

- Program output
- A clean Program feed
- A look ahead Preview
- A feed from any input
- Graphic or video output from a media player
- Direct output from any M/E
- Clean output from any M/E
- Output from any of the buffers
- Follow selected M/E Program or Preview, or a Switcher color group
- Black.

**Tip:** NDI sources are listed by supporting systems as machine\_name (channel\_name). So, if your system is named *MyVectar*, the second output appears as *MyVectar (MIX 2)*.



**Audio** menu options include any of the Master or Aux mixes or the sound from a selected audio input. The **Resolution** menu lets you configure the format for each output independently.

**Note:** See [Output Configuration](#) for detailed information on all output options.

## 2.6.2 Supplemental Outputs

In addition to the 'mixed' outputs above, Viz Vectar Plus offers direct support for internet streaming, multiviews, and recorders that effectively reduce the need for traditional 'outputs'.

Further system capability is provided through NDI support, as you can deploy, control and output video from anywhere to anywhere with an IP-based software solution.

### Primary and Secondary NDI

In addition to all primary outputs being provided as network sources (NDI), numerous secondary NDI outputs are available. NDI sources available automatically (no configuration required) over the network include:

- **Local SDI sources:** All four SDI inputs, if in use.
- **Media Players:** The visual displays from four media players.
- **Buffers:** Still image output from all buffers (animated buffers are treated as still frames).

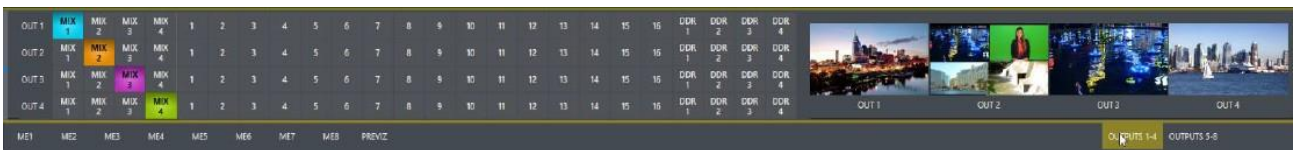
- **Mix 1-8:** Mixed Switcher outputs.
- **Out 1-8:** Eight additional routed NDI outputs, controlled from the user interface (see [NDI Output Matrix Routers](#) below).
- **Multiviews:** With the NDI KVM feature enabled, each monitor screen is available over NDI, with optional remote mouse and keyboard control.
- **Teleprompter:** The **Automation** tab at right in the lower third of the Live Desktop provides a useful teleprompter feature over NDI.

### NDI Output Matrix Routers

Viz Vector Plus also provides eight additional, routable NDI outputs, labeled **OUT 1-8** on the Live Desktop.



The above image highlights two tabs labeled **OUTPUTS 1-4** and **OUTPUTS 5-8**. Clicking a tab reveals one of two specialized crosspoint panels.



These panels and their associated NDI outputs form an integrated Output Matrix Router, their features being similar to an external SDI matrix router.

**Note:** You can assign several sources to each of the eight supplemental NDI outputs in these panels. Output source options occupy three banks, similar to Switcher source rows.



For further details on internal Output Matrix Routers, see [NDI Output Routers](#).

## 2.7 Configuring Video Inputs

Video inputs appear as monitors in the Live Desktop's monitoring section.

- [Working with Monitors](#)
- [Video Router Inputs](#)

### 2.7.1 Monitors

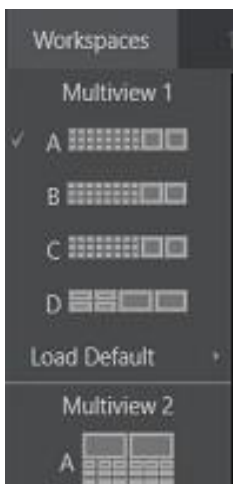
Individual monitor viewports on the Live Desktop can be flexibly assigned to different Switcher sources and outputs.

#### Working with Monitors

Complete monitor layouts can be stored and recalled using tools in the main menu, **Workspaces**.

#### To create a monitor

1. From the menu bar, select **Workspaces**.
2. Monitoring layout presets are listed at the top of the menu *A* through *D*. Select the layout labeled *A* under Multiview 1 (if it isn't already check-marked).

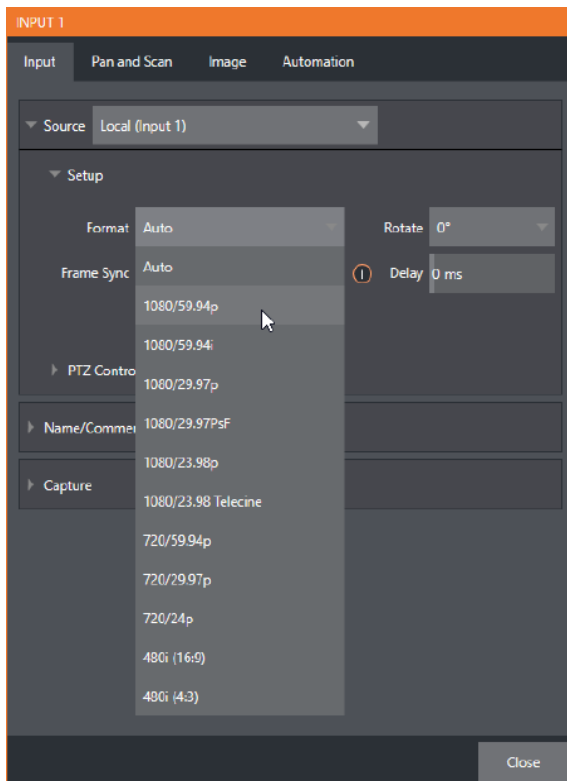


3. By default, this default monitoring pane shows individual viewports for the various Switcher sources.
4. To continue to assign sources, either
  - a. Select Configure from an input monitor's (right-click) context menu, or ...
  - b. Move your mouse over the viewport (for example) INPUT 1.
  - c. A Configure button (gear icon) appears at lower right. Click to open a tabbed settings panel.

**Tip:** A quicker way to access the **Input** configuration panel: Double-click the viewport (for a touch-screen, tap the viewport with two fingers).

- d. Click the Source drop-down for a list of sources. Black and other local system resources are listed first under the Local heading. Additional NDI sources discovered on your network are listed below.

For NDI sources, selecting an entry completes the connection. If you choose local system resources, further selections may be required.



- e. The **Format** field defaults to *Auto-Detect*. Generally, this option suffices. For other sources, select the correct format.
- f. Close the Configuration panel for now (click **Close**, or click outside the panel to close).
- g. Continue to configure additional video sources in the same manner.

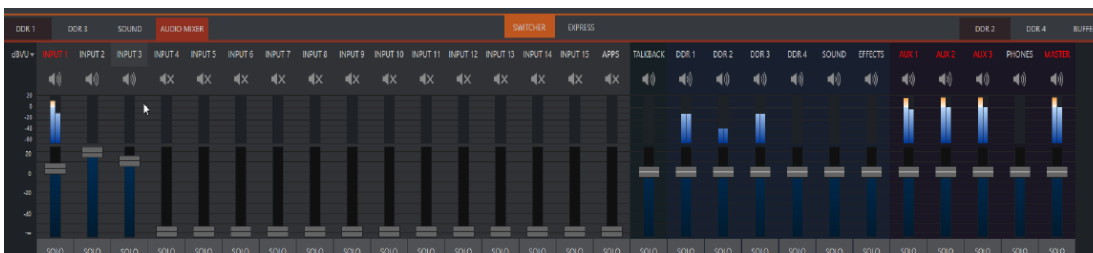
You can now view the video inputs you have configured among the Live Desktop multiview monitors.

## Video Router Inputs

To configure a video router input

- To select which router input will be transmitted to the Switcher input, right-click on the **Switcher** row button for the video input where the router is connected (see [Input Connections](#)).

## 2.8 Configuring Audio





## 2.8.1 Working with Audio Levels

- [Audio Meter](#)
- [Audio Headroom](#)
- [Advanced Settings](#)

### Audio Meter

Click the **AUDIO MIXER** tab for audio features and configuration controls for all internal and external audio sources and outputs, including streaming.

In addition to internal sources and outputs, the Audio Mixer supports sixteen external multichannel audio connections, each channel can be assigned to an extensive list of audio source types.

Each input and output has its own control column with volume slider, VU meter, control features and an identifying label at the top.

### To configure an audio mixer channel

1. Roll the mouse pointer over the label to reveal the **Configuration** button (gear).
2. Click to open a configuration panel for this input.
3. Click the **Input Settings** tab to display options for an input. Local inputs are listed in the Local group as *Input 1*, *Input 2*, etc.).

**Note:** Analog audio levels conform to SMPTE RP-155. The maximum input/output level is +24 dBu and the sample rate is 48 kHz.

4. (Optional) Assign the input to sound delivered over the network from any NDI or other supported network audio source (such as Audinate's Dante™ sources (requires a third-party driver) available on the system).
5. A single multi-channel volume fader appears below the VU meter for each source and output.

On first launch these are at minimum gain level.  
After adding sources, *adjust* the faders as required.

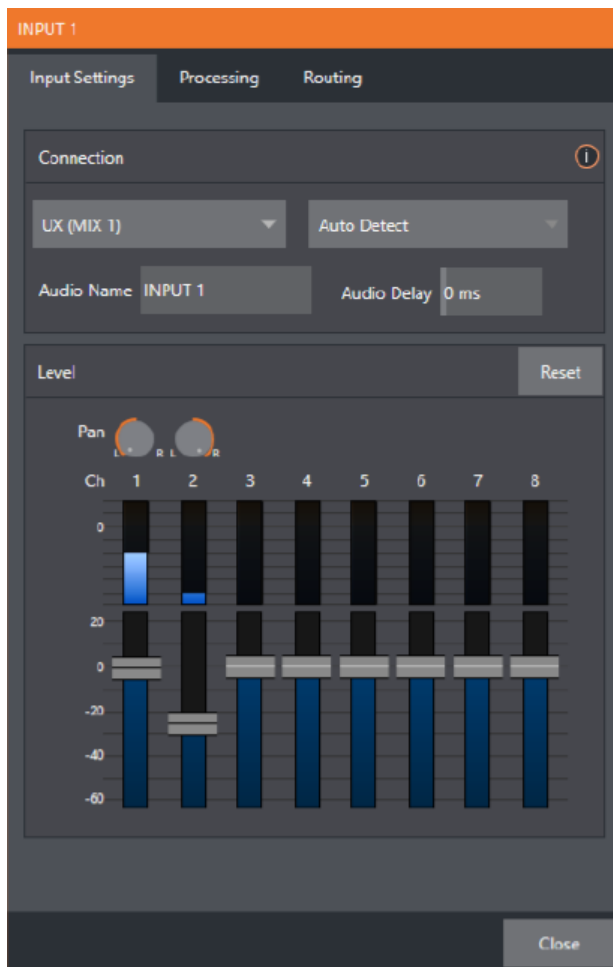
**Tip:** Most numeric controls in this panel can be *reset* to their defaults using **SHIFT + double-click** on the control knob. The default value for **Gain** sliders is *0dBVU*.

### Audio Headroom

The range between nominal level and the highest possible level is referred to as *audio headroom*. What is considered a suitable headroom allowance can vary from one locale to another, in different industry applications, and even in individual studios.

### Recommendations

In digital audio systems, levels exceeding legal values are clipped (uniformly assigned the maximum value). This results in audio issues that cannot be easily corrected later.



- Configure normal operating level (also referred to as the *alignment* level, and sometimes, *nominal* level) well below the clipping limit – sufficiently so that occasional excessively loud sounds (say, loud laughter or applause) can be accommodated without risk.

Viz Vector Plus conforms to established audio conventions, providing 20dB of headroom above nominal level (+4dBu at 0dB on the VU scale).

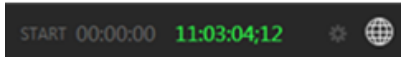
## Advanced Settings

❑ **Tip:** Be aware that *different* calibration scales exist within audio technology, among different device types and software. For example, analog mixers commonly show levels on VU scales. Digital devices and editing software usually display levels in dBFS (Decibels Full Scale) with 0dBFS – the absolute maximum signal level that can be recorded – at the top.

- VU meters have selectable indexing, allowing you to view a traditional dB VU scale or dBFS as you please (see [Output and Primary Bus Controls](#)).
- Whatever scale you choose, use volume controls (and, for *mic* connections, the *gain* controls in the **Input Settings** panel) to avoid over-modulation.
- The **Compressor/Limiter** feature (on the **Processing** tab) is another powerful tool to help you prevent clipping (see [Advanced Configuration](#)).

## 2.9 Configuring Genlock

Viz Vector Plus includes synchronization utilities using a genlock function. When genlocking is active and properly configured, the timecode in the title bar will display in green.



### 2.9.1 Working with Genlock

#### NDI Genlock

NDI Genlock synchronization allows video sync to reference a network-supplied external clock signal over NDI. This type of synchronization is key to future 'cloud-based' (and hybrid) production environments.

The Genlock feature enables Viz Vector Plus to 'lock' its video output or NDI signal, to timing derived from an external reference signal (house sync, such as 'black burst') supplied to its genlock input connector.

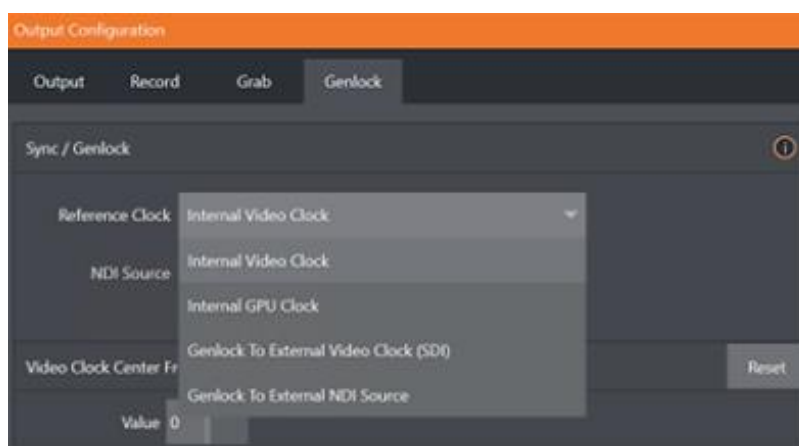
Genlocking is not an absolute requirement in most cases, but it is recommended whenever you have the capability.

#### To configure NDI genlock

Viz Vector Plus output can then be synchronized to other external equipment locked to the same reference. Viz Vector Plus comes with additional options for synchronization, the pull down menu conveniently centralizes all sync options and allows them to be changed on the fly.

Ideally both the cameras and your Vizrt system's output should be genlocked. If they are not genlocked to the same reference signal, by default the Switcher will automatically apply a Time Base Correction (TBC) operation. Time base correction may drop or insert frames as necessary to maintain sync, making this a less-accurate approach.

1. If the Live Desktop isn't already open, launch a live production session from the Viz Vector Plus Home page.
2. Open the **Output Configuration** panel by double-clicking in the PROGRAM viewport.



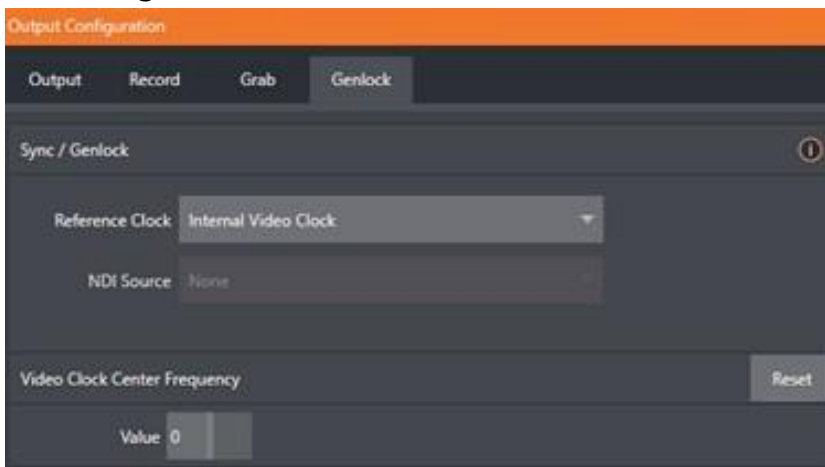
3. Click the **Genlock** tab.
4. From the **Reference Clock** drop-down menu, select the synch source.

□ **Note:**

- *Internal GPU* Clock means following the graphics card output (best quality when connecting a projector to a Multiview output).
- *Internal Video* Clock means clocking to the SDI output (best quality when connecting a projector to an SDI output).

5. When selecting Genlock to External NDI Source, the NDI Source field becomes active, offering a selection of network sources.
6. With the aid of downstream Waveform and Vector Scopes, adjust Horizontal and Vertical Position and Phase settings.

## To Configure Genlock for non-NDI sources



1. If the Live Desktop isn't already open, launch a live production session from the Viz Vector Plus Home page.
2. Open the Output Configuration panel by double-clicking in the PROGRAM viewport.
3. Click the **Genlock** tab.

□ **Note:**

- *Internal GPU* Clock means following the graphics card output (best quality when connecting a projector to a Multiview output).
- *Internal Video* Clock means clocking to the SDI output (best quality when connecting a projector to an SDI output).

4. When connected to SDI, the default Reference Type in the Genlock settings group is SD (Bi-level), as this is currently the most common reference signal type.

If you supply an HD reference signal to the Genlock input, you may want to change the setting to HD (Tri-level).

5. With the aid of downstream Waveform and Vector Scopes, adjust Horizontal and Vertical Position and Phase settings.

---

## 2.10 Other Initial Configurations

### 2.10.1 Auto-Launch Session

By default, after a few seconds, the last session you were using is automatically re-loaded and started. You can modify this behavior, either by designating a specific session to auto-launch irrespective of the most recent manual selection, or by disabling the feature entirely.

**Important:** Modifying this feature requires changes to the Registry. We strongly recommend that edits to the registry be performed only by experienced persons, as the system can be rendered inoperable if this is done improperly.

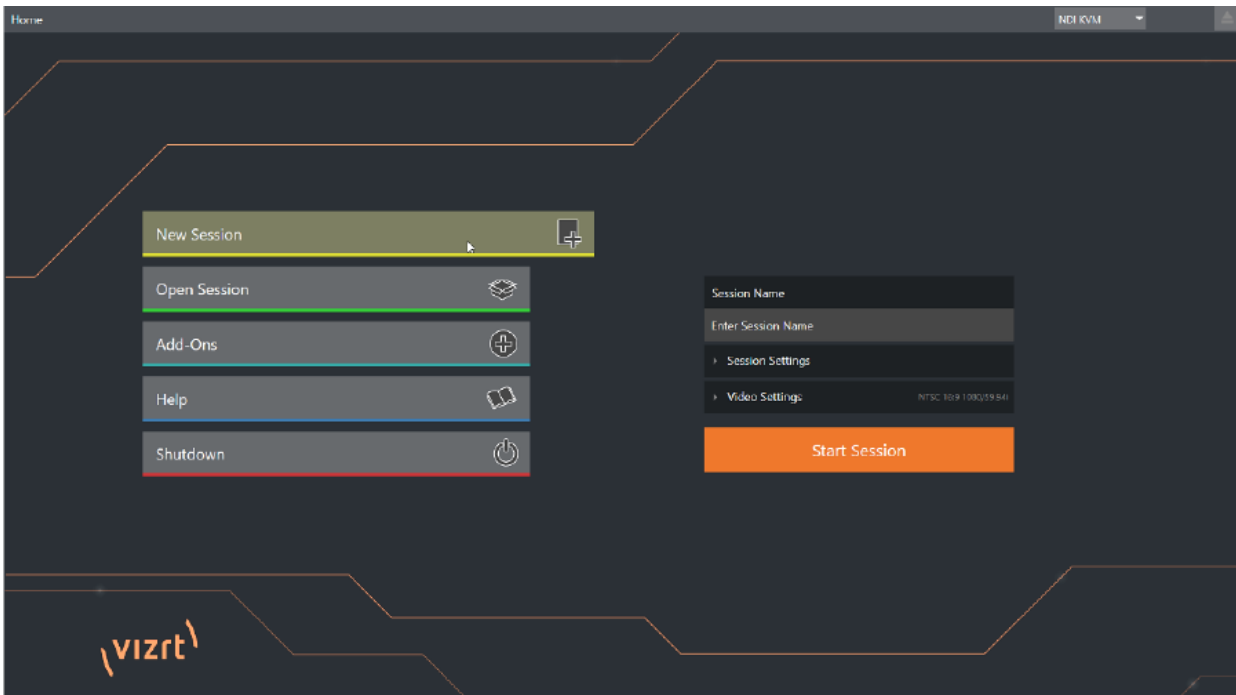
#### To change default startup behavior

1. Locate HKEY\_LOCAL\_MACHINE\SOFTWARE\Vizrt\XD\Admin Screen
2. Add a new key: auto\_launch\_session
3. Set the value for this key to the name of an existing session.
4. This session will then automatically open on launch (instead of the last open session).
5. If the specified session does not exist, the auto-launch feature is disabled..
6. Similarly, by setting auto\_launch\_session to \_Disabled (or some other suitable string) rather
7. than a real session name you can effectively disable auto-launch.



## 3 The Launch Screen

The Launch screen appears shortly after you launch Viz Vector Plus. From this screen you create and launch a *session*.



- Sessions support beginning a new live production or producing another episode of a live series.
- The Launch screen provides access to an Administrator console, for system maintenance and one-off configurations.

This section presents Launch screen topics:

- [Sessions](#)
- [The Home Page](#)
- [Web-based Utilities](#)

### 3.1 Sessions

- [Introduction](#)
- [The Sessions Page](#)

#### 3.1.1 Introduction

Any production involves a specific operating environment. A *session* is where Viz Vector Plus stores details of the environment. Configuring a session settings accurately is important. Typical considerations are:

- What broadcast standard is used in your locale? Is it PAL or NTSC?

- If your production includes external SDI cameras or similar external SDI sources, how will you connect them to this IP-based system; And what video format do they deliver?
- If cameras connect over IP, with NDI, are there firewalling considerations?
- As you continue, you may make other adjustments relevant to your current production requirements. For example:
  - Adjust cameras using the Proc Amps provided in the [Input Configuration](#) panel.
  - When using green screen staging, adjust the [LiveMatte](#) settings for one or more cameras to provide optimal keying.
  - Adjust the preview monitor color characteristics in the Workspace display settings.
  - Modify output device connection preferences.
  - Decide video mixes and other internal sources you want to route to the desired outputs.
  - Configure a connection for a projection system and decide external [audio](#) connections and adjustments.
  - Create a playlist of custom Title pages in a media player, along with additional graphic elements for the [buffers](#).
- During the course of the actual live production can perform further fine-tuning and add to the media content used in the presentation. For example:
  - [Grab](#) a series of still images from Program output.
  - [Record](#) video clips from the production for replay.
  - Capture the network Stream output as a file.

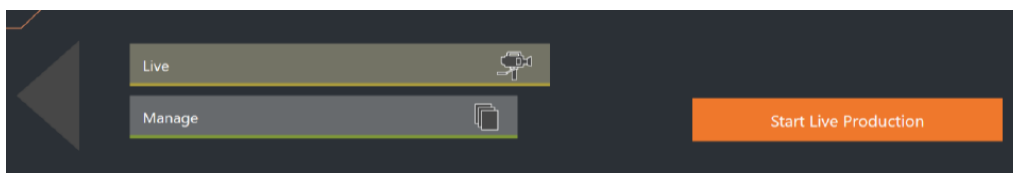
Each session preserves all adjustments, activities and assets involved in the specific production. All session media and settings are ready for immediate recall reuse, until they are manually deleted.

Reopening a session continues an earlier event. Testing critical setups is however recommended before going live again.

- Smart file locating:** Typical sessions include many media clips, along with graphics, titles and buffers. To ensure all required media is available for the session, the system automatically locates the necessary media, even when drive settings have been changed on the system (for example, when a session backup has been restored onto different drives compared to the original setup).

You can save multiple sessions which simplifies management of files associated with producing unique programs. And different users can save their own individual requirements and preferences.

### 3.1.2 The Sessions Page



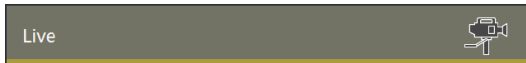
- Opening a session from the Home page (with **Open** or **New**) takes you to the **Sessions** page, with more options.
- The *name* of the current session is shown top-left. The current session is displayed in the form *Home/session name*.





- To leave the current session and return to the Home page, click the large Back Arrow displayed at left, or the word Home in the session name label.

## Live

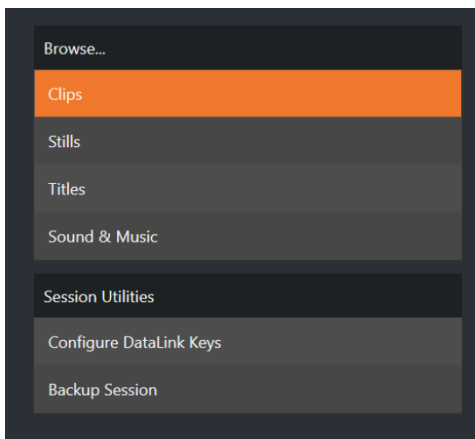


This icon represents the Live Desktop, your live production center. Clicking it presents a **Start Live Production** link button on the right of the Session page. This button launches Live Desktop.

## Manage



Provides file management tools. During your production, the various features create their own file bins. From this menu you can manage files grouped by media type, on a session-basis.



## Browse

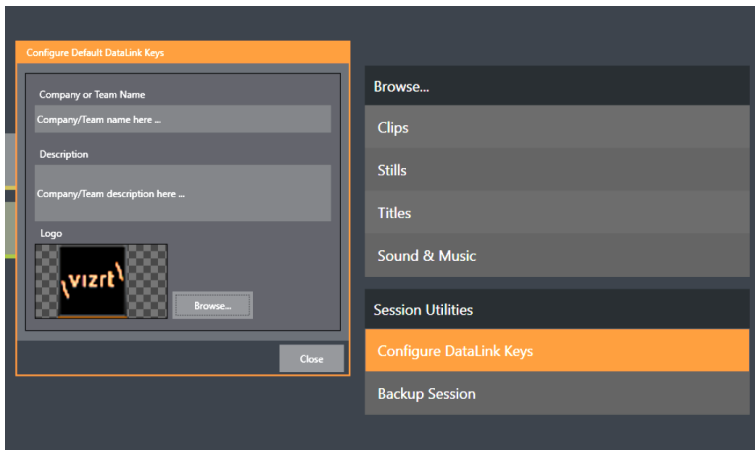
Under **Browse**, are links to the Clips, Still, and other content associated with the current session. Clicking one of these links (or selecting it with the up/down arrow keys and pressing Enter) opens a system file explorer.

You can use the familiar features and shortcut keystrokes in these windows (Cut, Copy, Paste, Rename, Delete and so-on) to manage the session content.

## Session Utilities Configuring DataLink Keys

DataLink enables handling and updating of text and image data from both internal and external source for use in title pages in real-time, as well as other purposes.

DataLink tracks variables (*DataLink keys*), their values, and updates them values on-the-fly for use as entries in Title pages.



These session keys serve as the default first and second line text inserts used by the supplied template Title pages.

Populating these keys with, for example, a *company name*, *motto*, and *logo*, most of your graphic content is then ready to use for a given production.

**Tip:** DataLink keys can serve in other ways, too, as for example to automatically insert information such as time or scores into labels and comments of social media uploads, or as instant replay clip metadata.

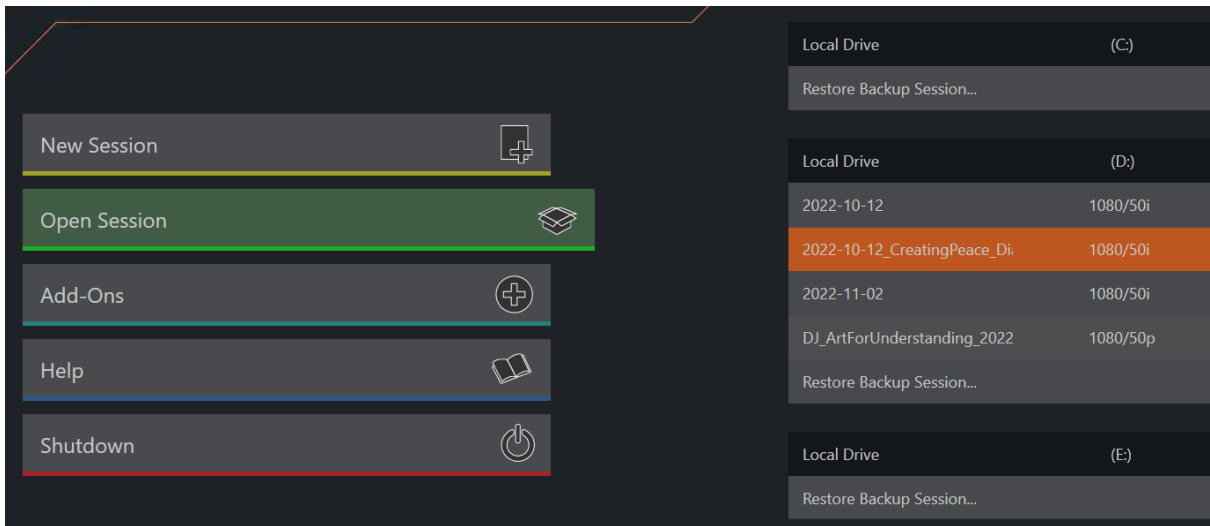
See section [DataLink](#) in section *LivePanel*.

---

## 3.2 The Home Page

- [Session Operations](#)
  - [New Session](#)
  - [Opening a Session](#)
- [Other Menu Operations](#)
  - [Title Bar Tools](#)
  - [Start Menu Tools](#)
  - [Administrator Mode](#)
  - [Help](#)
  - [Add-ons](#)

About 30 seconds after you start-up Viz Vectar Plus, the Home page appears. The Home page is where you create and manage your sessions.



For most operations, you choose an operation from the buttons on the left.

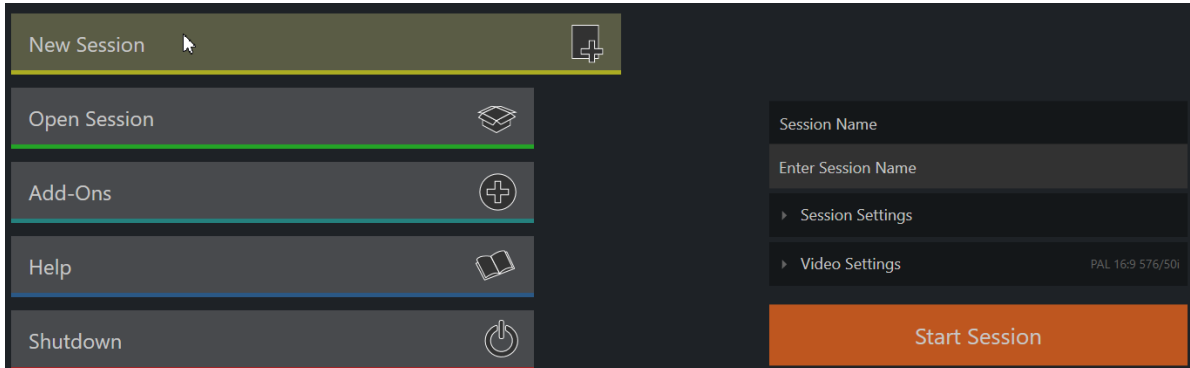
### 3.2.1 Session Operations

#### New Session

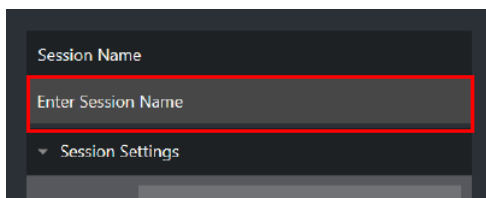
Starting a fresh live production requires a minimal setup.

To create a new session

1. Clicking **New Sessions** populates the pane on the right with input menus **Session Name** and **Settings**, and **Video Settings**.



2. **Session Name:** A Name box for your session appears. Click in this field to modify the default name (the current date).



3. **Session Settings:** Storage and preset configuration settings. You can usually skip this setting to get started.

- a. **Volume:** Displays the primary hard drive assigned for the session. Media and other content created during the session will be stored here by default.

**Note:** When using internal IsoCorder™ capture modules to record multiple sources, you may assign more than one volume for capture tasks. Sessions also automatically manage clips and other media, providing easy access to them for live use.

Detected storage volumes are listed in a drop-down menu when you click **Volume**. You can select any volume shown as the session drive, though external drives are *not* recommended for active use as session drives.

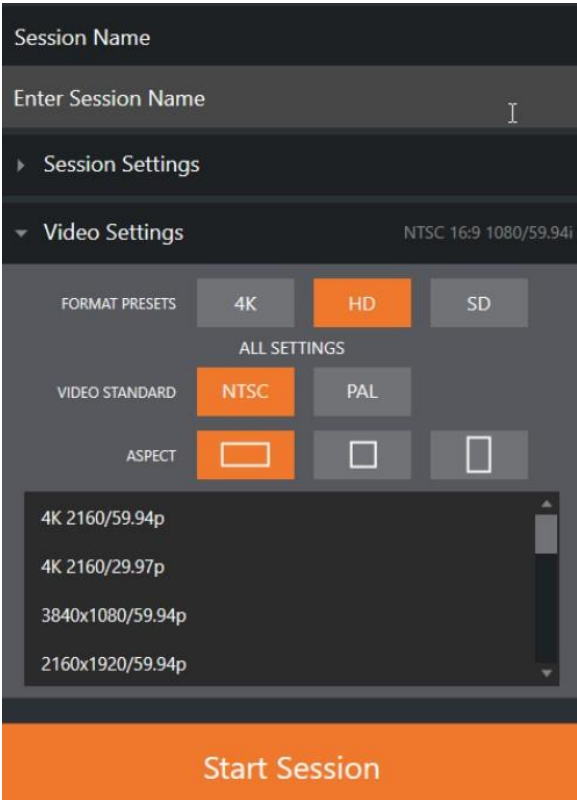
- b. **Template:** Lists all sessions currently available on the system. If you select one of these existing sessions, all session characteristics are used as a basis for your new session.

4. **Video Settings:** Set the standards for your production:

- a. **VIDEO STANDARD:** Define your local video standard. *NTSC* or *PAL* video according to your locale
- b. **ASPECT:** Aspect ratio, landscape, square or vertical aspect for the session.



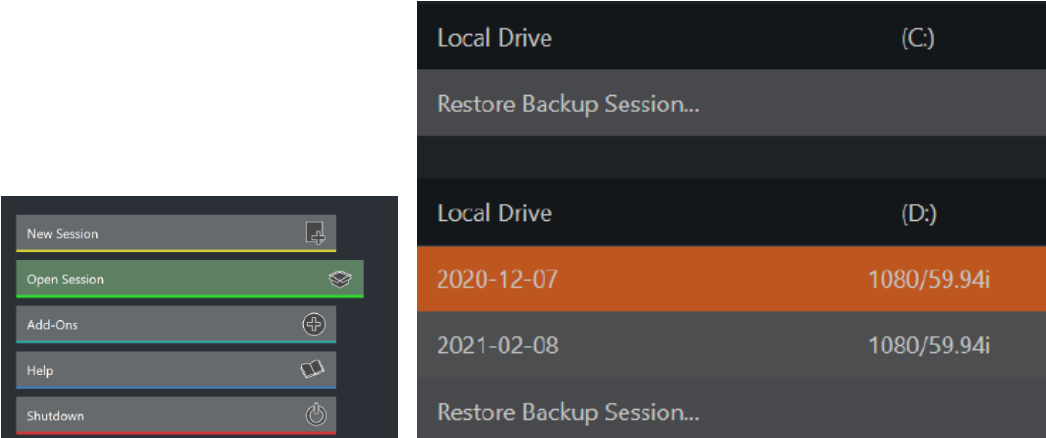
- c. **FORMAT PRESETS:** Select a video format, and then from the listing (for example, 1080/59.94p).



5. To begin your production, click **Start Session**.

### Opening a Session

If there are previously defined sessions on the system, clicking **Open Session** lists all sessions stored on the currently mounted storage media.



Available sessions are grouped under the names of the storage volume. The listing shows the *session name* and *format* for each session, on each drive.

### To open a session

- Click or tap a name in the Session list to launch that session and display the Sessions screen.

## Session Name Context Commands

- Right-clicking a session name opens a context menu:
  - **Rename:** Give the session a more meaningful name.
  - **Delete:** Beware! Cannot be undone.  
All content stored in the named session's folders are deleted, including imported clips, images and titles, any clips captured to the default session folders.

**Note:** Content that is not local to the session but which was used in it is *not* deleted. For example, you may have added still images to your playlist directly from a USB thumb-drive, without importing the files into the session. These external files are not deleted.

## 3.2.2 Other Menu Operations

### Title Bar Tools

Once a session is open, these tools are always available on the top of the screen.

#### Eject



The **Eject** button at the top-right corner safely disconnects external drives. (Drives can also be ejected from the Live Desktop during a production session).

**Note:** Media configured as Read-only is not shown on **New** or **Open** (session) menus, since they cannot be used for session. Read-only media can be used for importing media to a session.

### NDI KVM



The NDI KVM (*keyboard, video and mouse*) menu leverages the NDI® protocol to provide extended KVM functionality, giving you full control of your system from anywhere on the network where a Windows version of *NDI Studio Monitor* is running.

- To enable this feature, see section [NDI KVM](#).

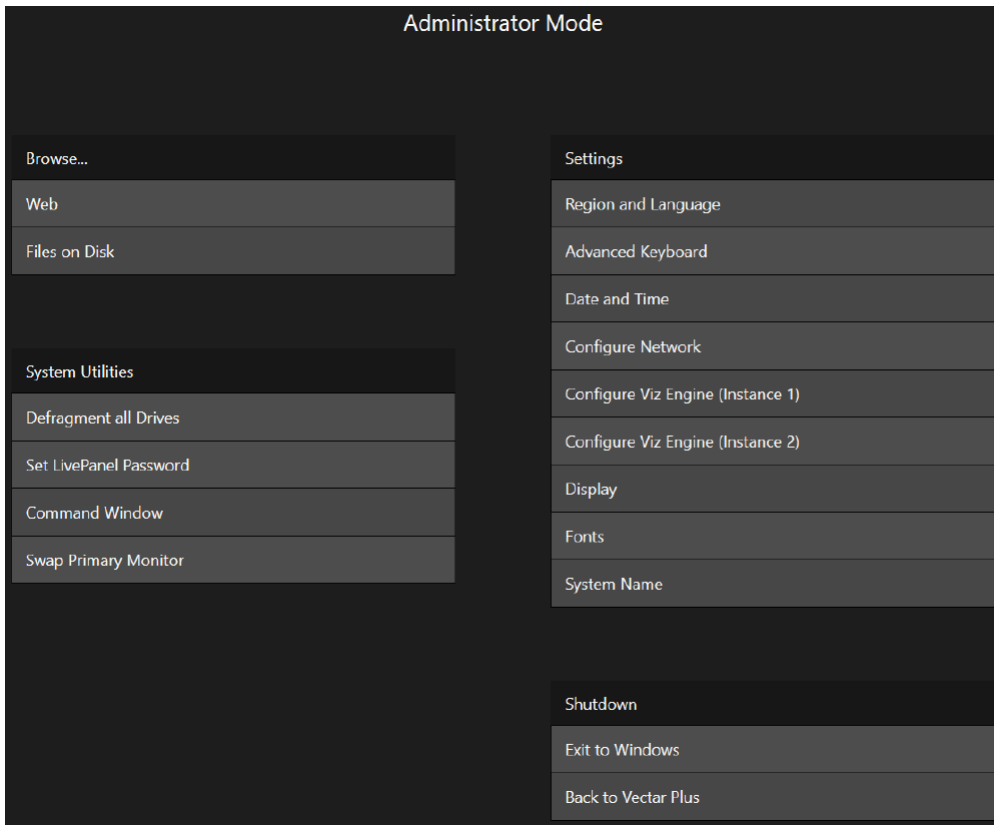
### Start Menu Tools

#### Shutdown

This selection provides *Restart*, *Shutdown*, and [Administrator Mode](#) operations.

#### Administrator Mode

Selecting **Administrator Mode** from the **Shutdown** exits the live production environment, and opens a new screen with system maintenance and management features and settings.



## Browse

- **Web:** Opens the default system Internet browser.
- **Files on Disk:** Opens a Windows file Explorer.

## System Utilities

- **Defragment all Drives:** Over the course of lengthy use, data on hard drives devoted to audio and video storage tends to become fragmented, which degrades playback performance. Defragmenting corrects this condition.

**Tip:** Defragmentation can sometimes take considerable time, so it's not something you want to begin just before an important event.

- **Set LivePanel Password:** Configures the password for access to the web pages and network control features provided by the unit.
- **Command Window:** Opens a Windows system command session.
- **Swap Primary Monitor:** Shows the Live Desktop on the monitor designated as primary.

## Settings

- **Regions and Language:** Opens the Windows **Region** menu.
- **Advanced Keyboard:** Opens the Windows **Language** menu.
- **Date and Time:** Opens the Windows **Date and Time** menu.
- **Configure Network:** Opens the Windows **Network and Sharing** menu.
- **When Viz Vectar Plus is Installed with an embedded Viz Engine**
  - **Configure Viz Engine (Instance 1):** Launches the **Viz Configuration UI**.
  - **Configure Viz Engine (Instance 2):** Launches the **Viz Configuration UI**.

❑ **Note:** If using *both* Viz Engines, configure them separately before using.

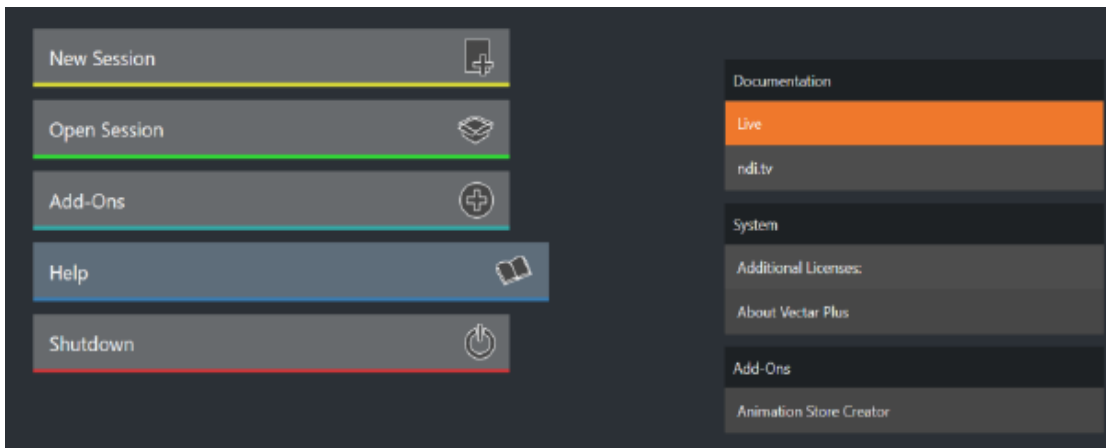
- **Display:** Opens the Windows **Display** settings panel (useful for configuring multiple monitors).
- **Fonts:** Opens the Windows Font management menu. You can add client-specific fonts (for example, used in Title pages).
- **System Name:** Opens the **Computer Name** tab of the Windows **System Properties** menu. Here you can add/modify the name by which your system is identified on the network. Useful to modify a default name when more than one unit is on the same network. (Modify the current name with the **Change** button).

## Shutdown

- **Exit to Windows:** Leave **Administrator Mode** and display the standard Windows desktop.
- **Back to Vector Plus:** Exits **Administrator Mode**, and return to the **Launch** screen.

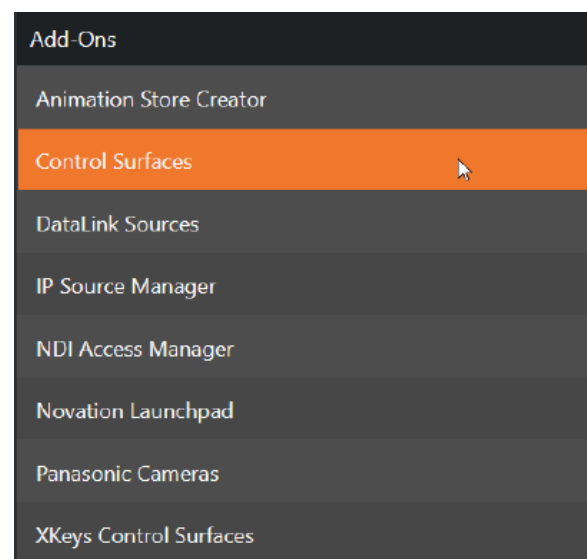
## Help

- **Help** displays links to a user guide, software details and online resources.



## Add-ons

- The **Add-Ons** menu provides access to additional software tools that extend the features of your Live Production.



## 3.3 Web-Based Utilities

With Viz Vector Plus running, you have access to a collection of useful web-based utilities and resources. Most of these tools do not require an external Internet connection.

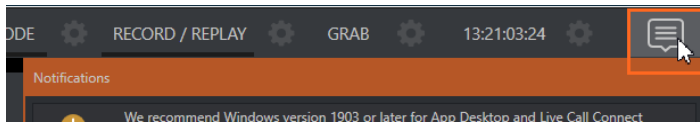
### 3.3.1 LivePanel

All utilities and resources are accessed from the LivePanel.



## To open LivePanel

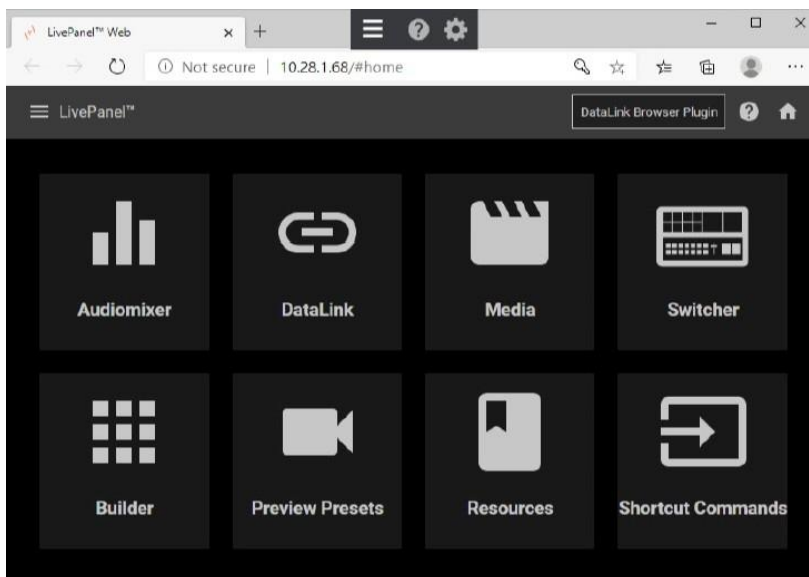
- Click the **Notifications** icon (upper-right in the Dashboard at the top of the Live Desktop), and then click **Web Browser** to view the webpage in a local browser.



- ❑ **Important:** This view is provided so you can preview the LivePanel features. It is *not* intended that you use the LivePanel web apps in a browser running locally on a working Viz Vector Plus .

- If you are prompted to authenticate, get the details from your system administrator. You can also try the default U:admin P: admin.
- View the LivePanel webpages externally (not on the running Viz Vector Plus), by connecting a suitable device to the same network.
- **Then** open a web browser and navigate to the URL shown beside the **Web Browser** button.

- ❑ **Tip:** Whilst access to LivePanel does not require an external Internet connection, some of the links provided on the Resources page will fail without one.



For further details see section [LivePanel](#).

## 4 The Live Desktop

The Live Desktop is the control center for all your live production work. It provides control over switching, transitions and overlays, titles and graphics, audio mixing, playback of digitized content, and much more. In addition, streaming and recording features are located here, along with keying tools.

The Live Desktop is launched by creating (or opening) a session in the Launch Screen's Home Page, then selecting the **LIVE** icon and clicking **Start Live Production**.

This section contains information on the following topics:

- [Requirements](#)
- [Appearance](#)
- [Control Types](#)
- [Customizing the Live Desktop](#)
- [The App Desktop](#)

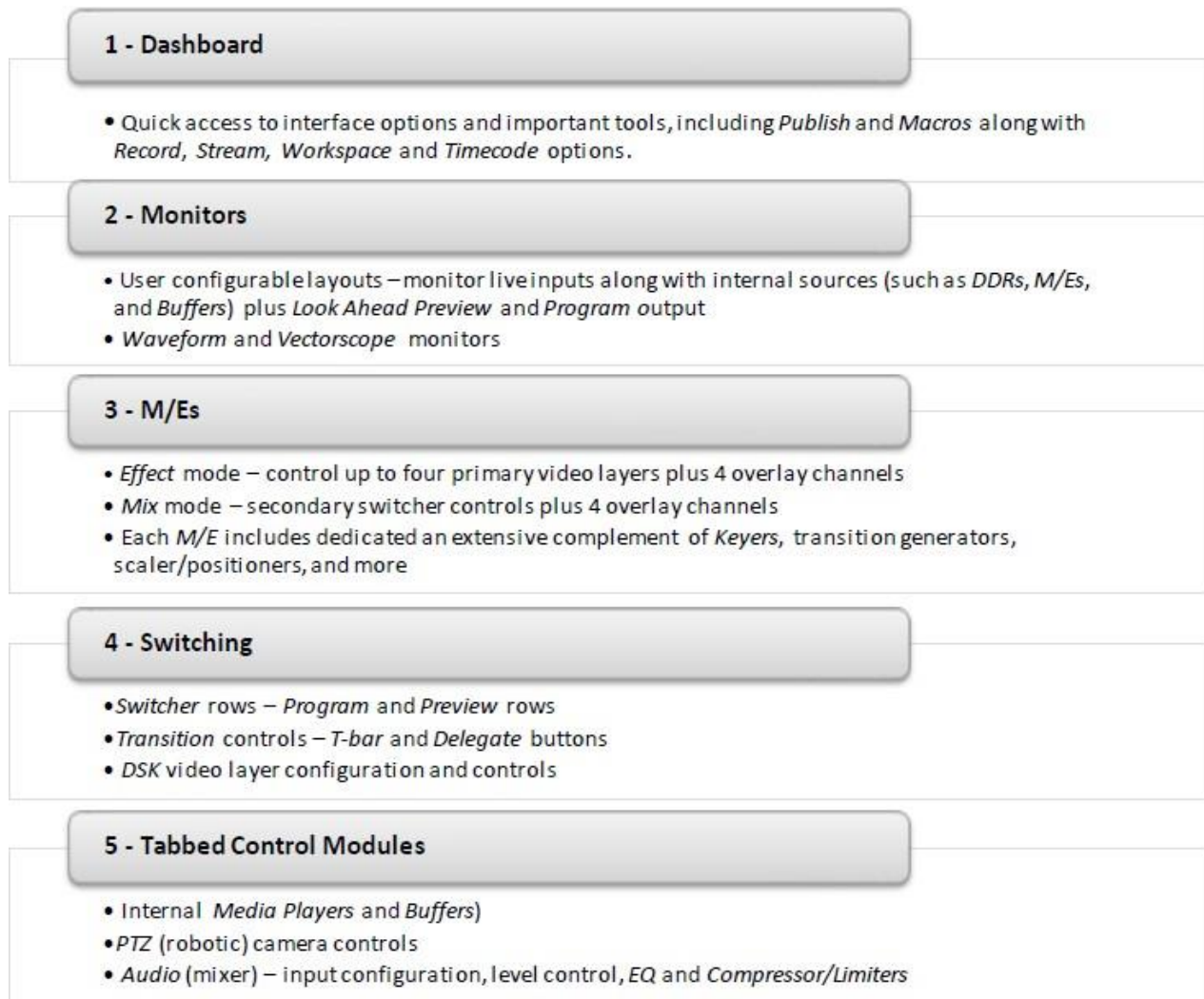
### 4.1 Requirements

The Live Desktop requires a minimum screen resolution of 1920x1080.



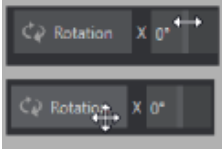

## 4.2 Appearance

The Live Desktop provides visual feedback for operations, including monitoring, live switching, and so on. It is logically divided into five horizontal bands:



## 4.3 Control Types

You will find various control types used repeatedly in the Live Desktop. Some examples are shown in the tables below.

Control Type	Type	Examples	Usage
	Numeric Slider	Gain, Pan	<ul style="list-style-type: none"> <li>Drag in line with the control's orientation to raise or lower the current value.</li> </ul>
	Rotary slider	Position, Size, Rotate	<ul style="list-style-type: none"> <li>Drag up-down to adjust one value, left-right to adjust the other, diagonally to adjust both.</li> <li>Hold down <b>ALT</b> while dragging vertically to modify a third value when provided.</li> </ul>
	Rotary Knob (single-value)	Audio Gain	<ul style="list-style-type: none"> <li>Drag left-right to adjust the current value.</li> </ul>
	Combo-Slider	Transition, Duration	<ul style="list-style-type: none"> <li>Drag left/right to raise or lower the current value.</li> <li>Click the digits to type in a new value.</li> <li>Click the triangle to open a drop-down menu.</li> </ul>

- To make fine adjustments to slider values, hold down the **CTRL** key while dragging the mouse. This increases accuracy by 10x.
- Hold down the **SHIFT** key and double-click a control to reset default values.

## 4.4 Customizing The Live Desktop

The Live Desktop layout can be adapted to many different scenarios, and provides a number of customization options that can be of benefit in your workflow. In this section, we'll touch on several of these:

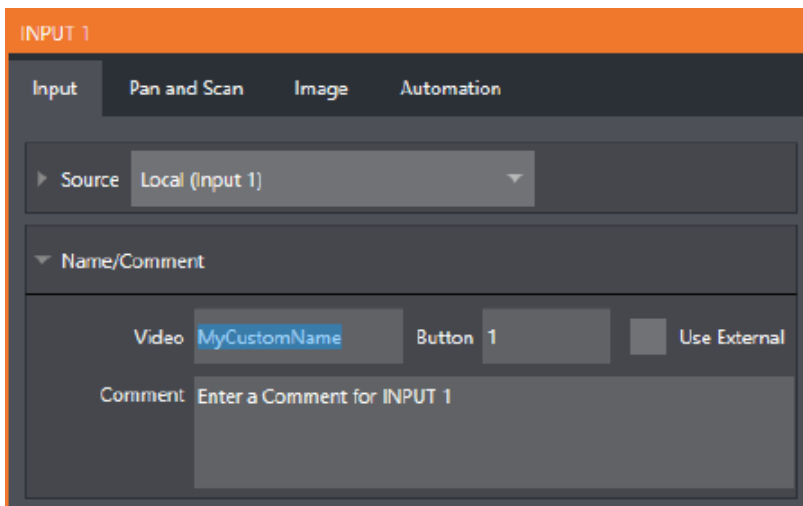
- [Requirements](#)
- [Appearance](#)
- [Control Types](#)
- [Customizing the Live Desktop](#)
  - [Renaming Inputs](#)
  - [Workspaces and Min/Maximize](#)
  - [Screen Dividers](#)
- [The App Desktop](#)
  - [Express Switcher Mode](#)

## 4.4.1 Renaming Inputs

You may wish to change default descriptive names (like Camera 1, DDR 2 and M/E 5) to something more appropriate for your local needs.

Open the Input Configuration pane for the Switcher source in question. There are several ways to open this pane. You can use any of the methods described below to do so.

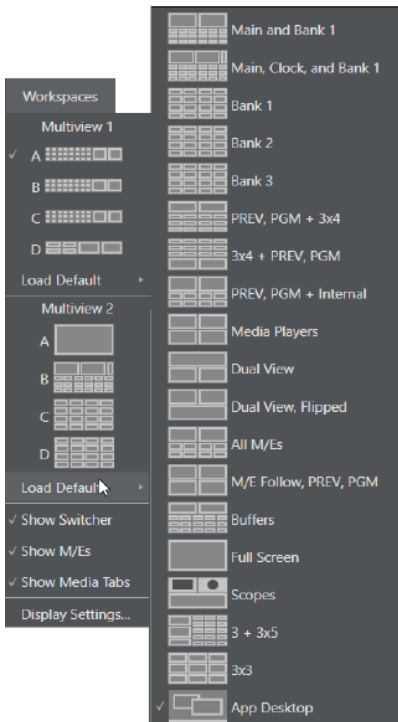
- Right-click a viewport in the Live Desktop or external Multiview, or a Switcher button, and select Configure from the context menu.
- Roll the mouse pointer over the viewport for the source, and click the **Configuration** (gear) icon shown at lower right.
- Two finger tap the viewport.



Expand the Name/Comment group in the Input tab of the Input Configuration pane, by clicking the twirl-down triangle at left. This group contains several editable text fields, including Video (the label shown under monitors), a shorter Switcher Button label, and the longer Comment field.

- **Tip:** The Comment entry is more than just memory aid. The DataLink feature can automatically update title pages as inputs are displayed by drawing on the information you enter here.

## 4.4.2 Workspaces and Min/Maximize



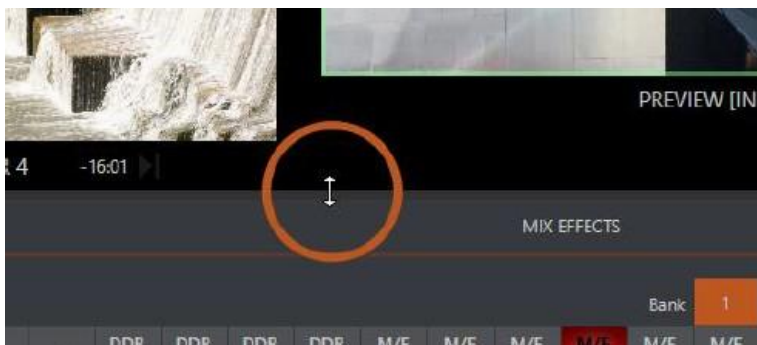
Various layouts and custom monitoring options for the Live Desktop and Multiviews are provided in the Workspace menu. When one or more Multiviews monitor is in use, Workspace preset options can be combined with great flexibility, letting you see what you want to see where you want to see it.

It's easy to set up complementary displays. Each connected monitor, including the Live Desktop screen (listed in the Workspaces menu as Multiview 1) has four unique presets, labeled A-D. You can load a different viewport layout into each of these presets, and recall them easily using this menu, or perhaps using Macros assigned to keystrokes.

In addition, each individual viewport can be assigned to any Switcher input source or output using its own context menu. So, for example, even if you initially use Load Default to assign identical viewport layouts to preset A and preset B for a given screen, you can configure each viewport differently in the two presets.

Switching between presets, then, will allow you to view different sources. Even the overlays (such as Safe Area display) for each viewport are fully independent.

## 4.4.3 Screen Dividers





Notice too that, when the lower tabbed modules are visible, you can also drag the horizontal divider between the Live Desktop monitor pane and the Switcher up or down to modify its position.



You can even move the horizontal divider all the way up to the bottom of the Dashboard, thus hiding the Desktop monitor pane entirely, providing much more room for other modules in the process.

**Tip:** Reset the horizontal divider to its default locations by double-clicking it. Also, note that a vertical drag bar is provided just left of the Program and Preview viewports in some Workspaces.

Neither is it necessary to display modules you don't access frequently (say, for a simpler production) at all times. For example, the M/E pane is hidden by default; click the Mix Effects label or an M/E tab above the Switcher to toggle display of the M/E pane – or press the keyboard shortcut **M**.

## 4.5 The App Desktop

The Application Desktop option (available for all Workspaces other than the primary Live Desktop) is a special case, and clears the designated to provide screen real estate for supported desktop applications.

This special workspace lets you run selected applications inside Viz Vector Plus. A custom taskbar running across the bottom of this screen bears icons you can use to launch (or minimize) the various applications supported. The best part is that you can capture video from selected browsers, video conferencing applications, and their audio output and send it to Viz Vector Plus' Switcher and Audio Mixer.

Supported applications you install appear along the taskbar, as shown next.



### 4.5.1 Supported Applications

Microsoft® Edge Chromium is installed on your Viz Vectar Plus. If you prefer a different browser, Google Chrome or another Chromium™ based browser can be installed. A number of popular video conferencing applications are also supported, such as Microsoft® Teams, Facebook Messenger, WhatsApp, FaceTime, Zoom, Discord, Slack, and many others .

### 4.5.2 Express Switcher Mode



In a related innovation, an alternative Switcher interface provides new opportunities to customize both the interface and workflow. The Switcher’s Express mode is very compact, freeing valuable Live Desktop space. Viewports in the multiview area above are significantly larger than in the more familiar two row (Program/Preview) Switcher mode.





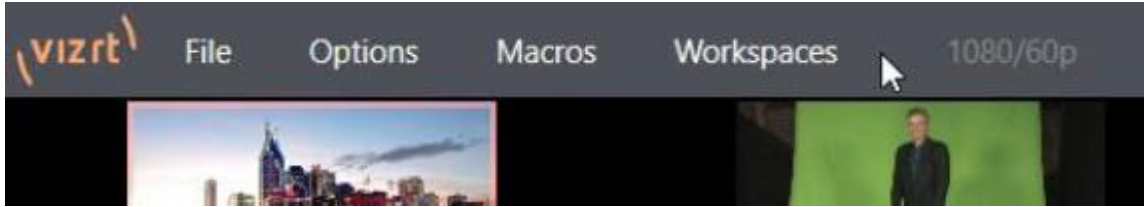
Express mode provides a simple single-click workflow, ideal for less complex productions, when a control surface is in use, or in environments involving student or volunteer operators who may struggle with traditional switcher workflows.

You can easily switch between the standard Switcher mode and Express operating modes by clicking their eponymous tabs at right in the horizontal bar just above the DSK controls.

For more information on these two modes of operation, see Switcher Modes.

## 5 The Dashboard

The Dashboard groups important production features and system display controls in one convenient place for quick access and review. It provides information on the current session, status updates and storage usage, with timecode and includes access to **Macros**, **Workspaces** and **Options** menu.



Initially the Dashboard shows only the name of the current session. Moving the mouse pointer to the top of the screen reveals the menu items.



The right half of the Dashboard contains additional features and tools that are more frequently accessed.

- [File Menu](#)
- [Options Menu](#)
- [Macros](#)
- [Workspaces](#)
- [Clock](#)
- [Notifications](#)

### 5.1 File Menu

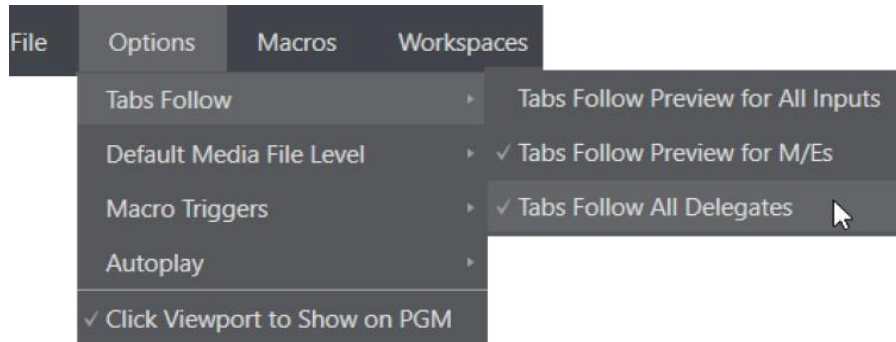
This menu drops down to reveal the following items:

- **Eject:** Opens a sub-menu that lets you safely disconnect selected storage volumes.
- **Import:** Adds media files from external sources to the appropriate session folders and automatically transcodes them to friendly formats for optimal playback if necessary (Import Bin features are similar to those of the Publish Bin).
- Share Media Folders and Buffers (see [Buffers](#)).
- **Exit:** Closes your live production session, and return to the Session page of the Launch Screen (all session settings are stored on exiting).

### 5.2 Options Menu

A number of very useful interface and workflow options are presented in the Options menu.

- **Tabs Follow**
- **Tabs Follow Preview Row for All Inputs:** Displays the tabbed pane for a Preview row source automatically on selection changes (for M/E selections, the M/E pane must be maximized to see the M/E tab update).
- **Tabs Follow Preview for M/Es:** Updates the M/E pane selection only (when you select an M/E as source on Preview) when checked.
- **Tabs Follow All Delegates:** Updates the Desktop in sync with control surface delegate changes.



**Tip:** Control surface delegate operations can sometimes result in a tabbed module that you want to view being obscured when certain options are enabled. When this happens, press the control surface **Delegate** button again to re-display the tabbed pane you are interested in.

- **Default Media File Level:** Controls the default per-clip audio level applied to imported media files is controlled by this option.
- **Macro Triggers**
  - **Tally:** Enables State Change macros configured in the Automation tab (Input Configuration panel) for any video source.
  - **Audio Levels:** Enables the Run Macro at (threshold dB) feature for Audio Mixer sources.
  - **Disable Hotspots:** Disables macro triggering based on Hotspot activity (see [Input Configuration](#)).
  - **Disable Hotspots on M/Es:** When this is on, Hotspot macros are only triggered if the source is visible on Program output (including via an M/E shown on Program output, or a DSK).
- **AutoPlay**
  - **Enable Autoplay Out on M/Es:** Enables Autoplay's transition-out behavior for M/E's (Mix mode) displayed on Program out (off by default).
  - **Extend Play:** Playback extends past any marked out point, up to the last frame of the file (even if the operator manually removes the DDR from output) when enabled along with Autoplay in the DDR. After the last frame is displayed, the playhead advances to the next playlist item.
- **Click Viewport to Show on PGM:** When this feature is enabled, clicking a viewport (or tapping a viewport on a touchscreen) selects the corresponding video source on the main Switcher's Preview row and perform the current Background transition to display it on Program output.
- **Show Tally on Skype Return:** Shows a tally overlay on the return video sent to remote Skype TX callers.

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## 5.3 Macros

Macros provide extremely important production benefits. There is a chapter that follows on [Macros and Automation](#).

- ❑ **Note:** Shortcut Commands used in macros are listed on your locally served **Viz Vector Plus Home** web page.
- 

## 5.4 Workspaces

When clicked, the **Workspaces** menu opens to reveal control groups for each connected screen Viz Vector Plus detects.

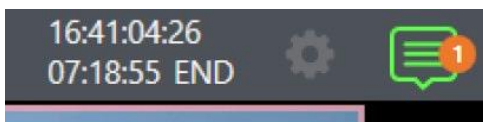
These control the monitor viewport layouts shown on the Live Desktop and external Multiview displays. Workspace features are discussed in [Interface and Multiview](#).

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## 5.5 Clock

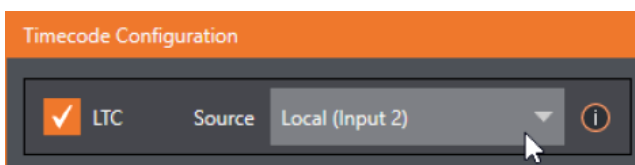
The Dashboard also hosts a clock which, in addition to showing the current time, can display countdowns to event start and end times when enabled.

To access time features, click the small gear icon next to the timecode display at right in Live Desktop's Dashboard.



- ❑ **Hint:** You can set the system clock through the Windows® Desktop.

### 5.5.1 LTC Timecode

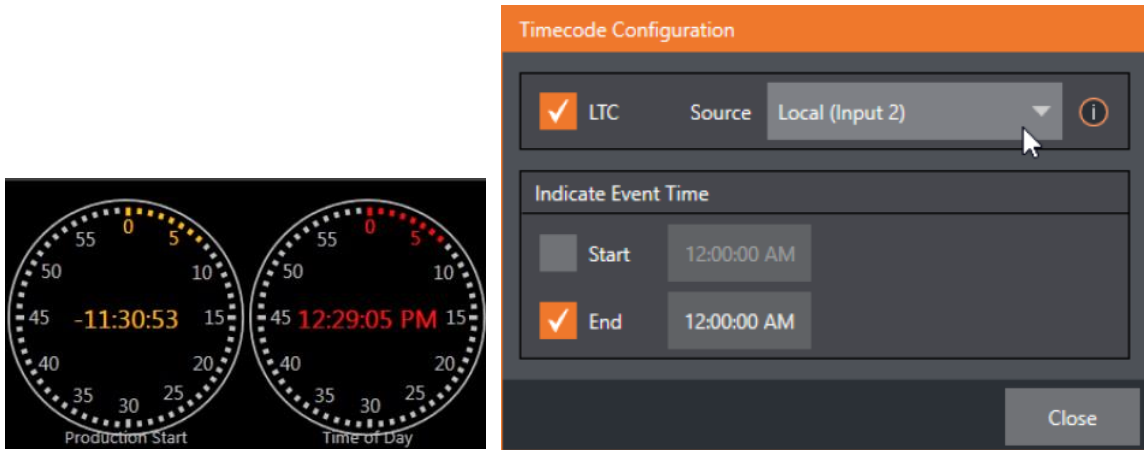


Linear timecode has long served as a method of sharing an external timecode reference in video production. Output from an external timecode generator is supplied to devices in the video pipeline using a standard audio connection.

Choose an LTC source in the Timecode Configuration panel, and the feature decodes time stamps from the audible signal, using the values for clock displays as well as embedded timecode when recording video (if the file format supports this). This is a great asset for post-production purposes.

**Tip:** The timecode display in the Live Desktop titlebar is tinted blue when external timecode is in use. If the external connection is lost for any reason, the display changes to white. Viz Vector Plus attempts to maintain continuous timecode from the interruption on, until a valid signal is restored (in which case the display turns blue once more).

### 5.5.2 Event Time



Two switches under the label Indicate Event Time allow you to configure Start and End times for your upcoming show. Beside each of these is an editable time field. Enable the Start/End switches, then click inside the field to modify the time value by direct entry, or drag left right to raise or lower the current value.

During live production, the Dashboard and monitor panes and default Multiview layouts offer Broadcast Clock displays based on the current timecode. Secondary clock displays show a useful countdown to the (production) Start and End times when the corresponding switches are enabled in the Timecode Configuration panel.

### 5.6 Notifications



The last item at right on the *Dashboard* is the *Notification* icon. A 'number bubble' indicates how many un-viewed entries have accumulated. Clicking the icon displays the *Notification Pane*, which provides both helpful information and some very useful tools.

The *Notification* icon can be colored white, green, amber or red. The color indicates the type of messages available for review:

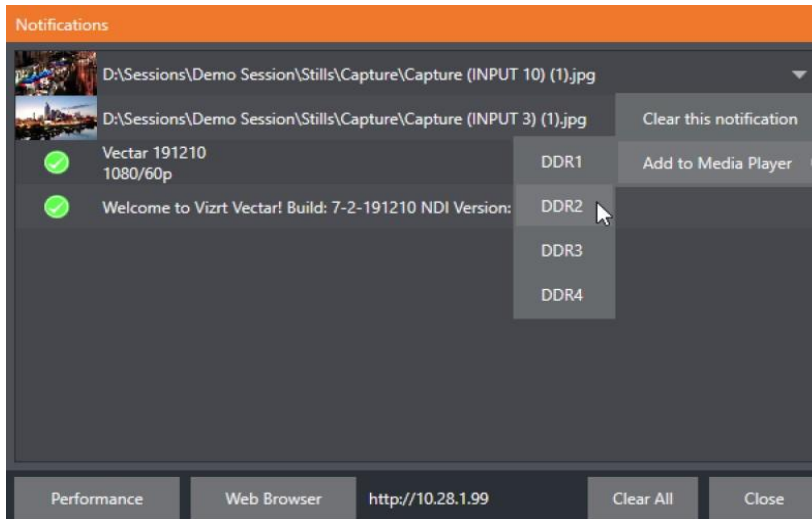
- A green icon denotes an informative message, as well as the availability of new media.
- An amber icon indicates a warning message has been received.
- Higher priority alert messages are denoted by a red icon.

The highest priority (un-viewed) item in the list at the moment determines the *Notification* icon color. After you open the panel to review the notifications in the list, the icon turns white.

Individual items can be cleared from the list using the context menu opened with the triangle gadget shown at right when you roll the mouse over an entry, or you can empty the list with one click using the *Clear All* button in the footer of the panel.

Information appearing in the *Notification Pane* can include the following:

- Session name, format, and software build number (press *Alt + b* on the keyboard to update this item)
- Status messages pertaining to operations or system conditions; these may be benign notifications or cautionary. For example, a message indicating that the connection to a control panel has been lost is given an icon with an amber color. A higher priority warning triggers a message with a red icon.



- A special message is added if a clip or still image is added to one of the *Session's* media file locations (such as the session *Clips* and *Stills* folders). These entries show a thumbnail icon at left, along with the filename and path. In this case, the item's context menu includes an *Add to Media Player* option which lets you immediately append the new file to a selected *Media Player* playlist.

□ **Tip:** This last feature is particularly handy when adding files across the network, as perhaps when using the DataLink™ for Viz Vectar Plus plug-in to import images from the Chrome web browser.

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## 6 I/O Configuration

Your Vizrt system provides extensive control over video sources, along with endless creative features. Each source has Proc Amp, keyer (LiveMatte™) and Crop (a.k.a. *garbage matte*) features. Input Configuration panels are also home to real-time Hotspot and Tracker features. The number and flexibility of outputs supplied is astonishing, too, and we'll discuss these fully in this chapter.

The addition of NDI® (Network Device Interface) support provides you with virtually unlimited input and output possibilities. Generally, an NDI source needs little if any configuration; other source types may require you to choose between optional connection methods and settings.

This section covers the following topics:

- [Input Configuration](#)
  - [Output Configuration](#)
- 

### 6.1 Input Configuration

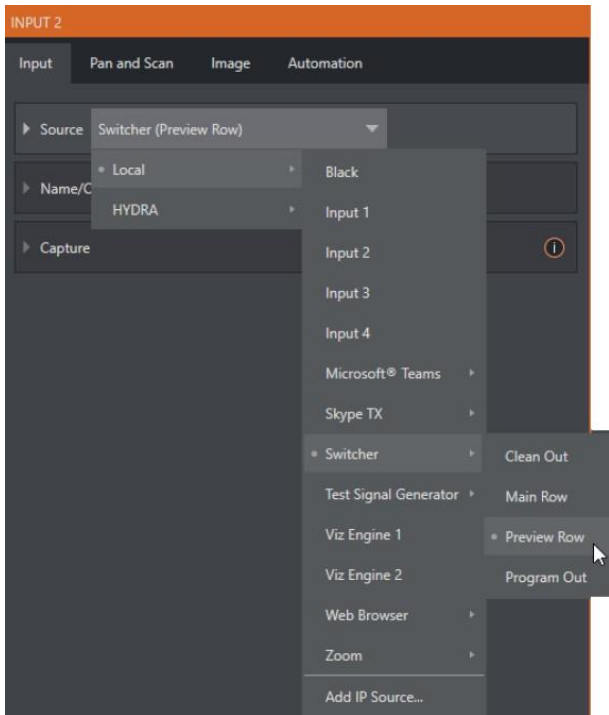
- [Input Tab](#)
  - [Source](#)
  - [Program Re-entry](#)
  - [Setup](#)
- [PTZ/ Pan and Scan Presets](#)
- [Image Tab](#)
  - [Auto Color](#)
  - [Proc Amp](#)
- [Automation Tab](#)
  - [State Change](#)
  - [HotSpots](#)
  - [Tracker](#)

Open Input Configuration by any of the following methods:

- Double-click the monitor viewport for a Switcher input.
- Click the Configuration (gear) icon shown at lower right when the mouse pointer is rolled over above the viewport.
- Two-finger tap the viewport (if you have a touch-screen).
- Right-click a Switcher input button and select the **Configure** menu item.

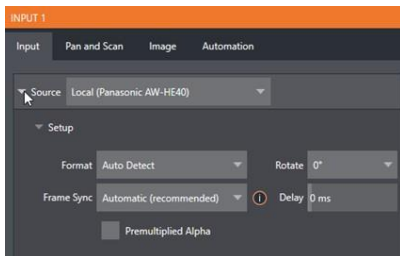
## 6.1.1 Input Tab

Any external NDI source or (if available) a local hardware source connected to one of the system’s hardware input connectors, can be flexibly assigned to any Switcher input.



### Source

Use the **Source** drop-down list to assign one of the many sources available to the corresponding switcher input. Available video sources are grouped under labels named for the device supplying them.

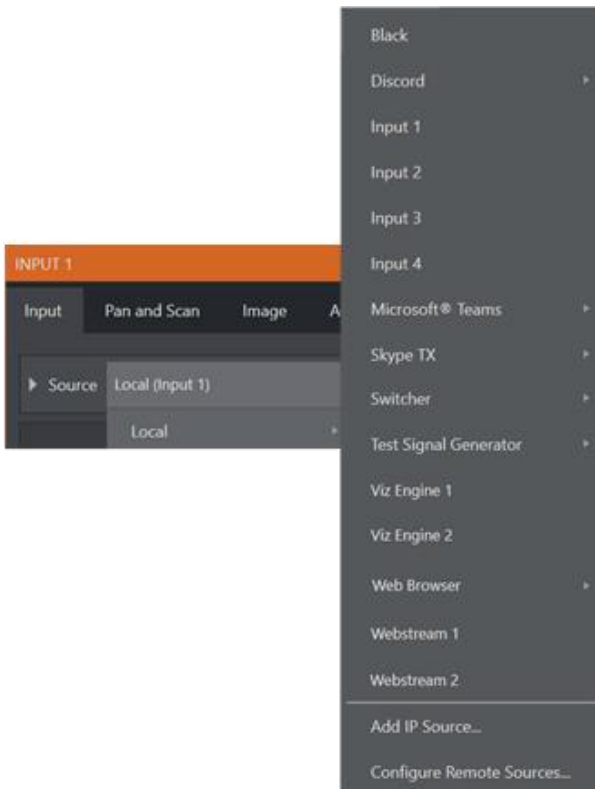


The *Local* group in the **Source** menu includes those sources connected locally to the system’s hardware inputs (for example, IP and *SDI BNC connectors*), any other local hardware sources detected (such as a webcam) and *Black*.

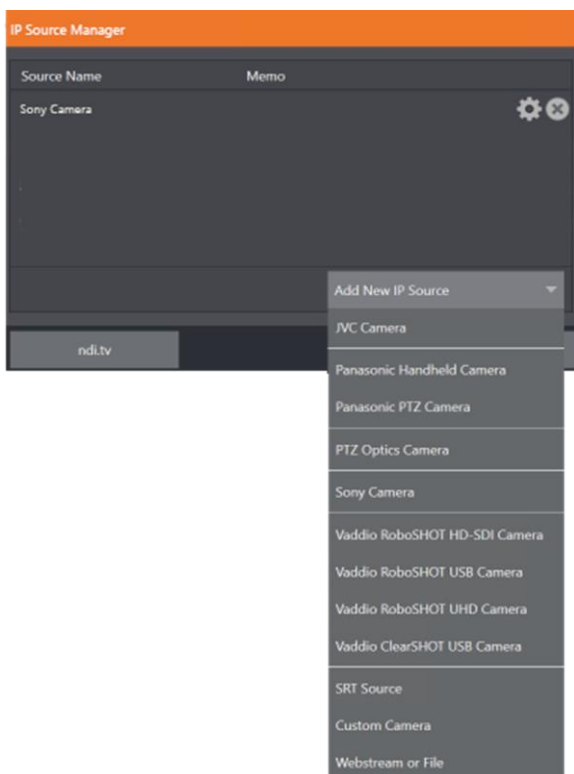
### IP Source

The **Add IP Source** option is near the bottom of the local source list. Clicking **Add IP Source** opens the IP Source Manager. Adding entries to the list of sources shown in this panel causes corresponding entries for new sources to appear in the Local group shown in the **Source** menu of the **Configure** panel:





To add an IP Source select a source type from the dropdown list provided.



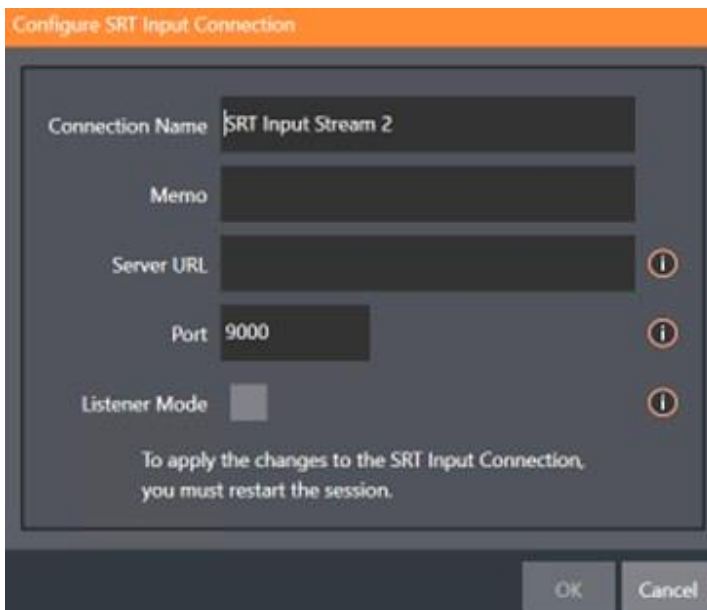
This opens a dialog suited to the particular source device you wish to add, such as one of the numerous supported PTZ camera brands and models.

Additional protocols have been added to provide more options for video sources. RTMP (Real Time Message Protocol), a standard for delivering streams to your online video platform.

RTSP (Real Time Streaming Protocol), used for establishing and controlling media sessions between end points. SRT Source (Secure Reliable Transport) is an open source protocol that is managed by the SRT Alliance. SRT can be used to send media over unpredictable networks, like the internet.

**Note:** It is recommended to first get the stream working, then copy the URL into Viz Vector Plus.

The IP Source manager panel displays the selected source, here you can edit by clicking the gear to the right of the source name, or click the x to remove the source.



- Memo: Enter a brief description for later reference.
- Server URL: The server URL must be the public IP address of the remote source, either as a numerical address, or named such as `endpoint.cloud.website.com`.
- Port: Each SRT stream must have a unique port number. This can be any valid port, but ports in the 9000 or 10000 range are common.
- Listener Mode: the stream connects to the Caller machine, then waits for it to initiate streaming.
- Otherwise, this machine is the Caller and the other side must be the Listener.

## Program Re-entry

This feature enables any video input setting in local IP source to select *Program Out*, *Clean Out*, *Preview Row* or *Main Row* (and allows that input to be used for instance, within M/Es to add additional overlays or other layer combinations).

The main PGM feed can be re-used for other outputs where content can be added and modified to adapt stories with graphics, cropping, aspect ratio, and more. This feature empowers you to make multiple versions of your show easier than ever.

The assignment of one of the various types of source to a Switcher button (for example, *Input 1* on the Switcher) is made in the Input Configuration panel, introduced in [Configuring AV Output](#).

## Setup

### Format

Expand the **Source > Setup** control group to reveal a *Format* list for the type selected in **Source**. Defaults is *Auto*. For an NDI source, no further settings are required.

### Rotate

To assist non-traditional sessions with unusual Switcher sources (for example, non-landscape mobile device output) each input has a **Rotate** menu, which also includes *Flip* options.

### Device Webpage

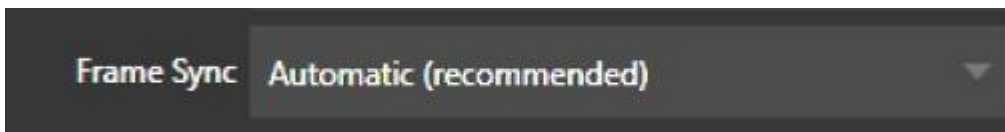
For network connected sources (such as NDI sources), a **Device Webpage** button may appear just right of the **Source** menu. Click this button to access the remote device's own configuration webpage.

### Delay

At times, typically due to upstream processing and architecture, video may arrive at the system's inputs ahead of the corresponding audio. The Video Delay feature allows you to compensate for these issues to establish A/V sync.

### Frame Sync

By default, Frame Sync is set to Automatic for all external source types, allowing you to work with a wide array of potential video sources without concerns about video timing.



This option (Automatic) enables the full array of timing correction tools available to achieve smooth and accurate frame timing in your productions, including features that correct for issues caused by less than ideal networks.

The next menu option (On) enables full-time frame synchronization and may well suffice in some video pipelines. This alternative has the benefit of ensuring the lowest throughput latency possible on a video switcher using frame-sync (2-3 frames).

### Premultiplied Alpha



If you are supplying imagery (video sources, video clips, or still images) that support transparency by means of an embedded alpha channel, your choice here is important. There are two flavors of alpha channel pixel encoding.

The first is often called 'straight' or may be referred to as 'non-premultiplied'. Unsurprisingly, the alternative is 'premultiplied'.

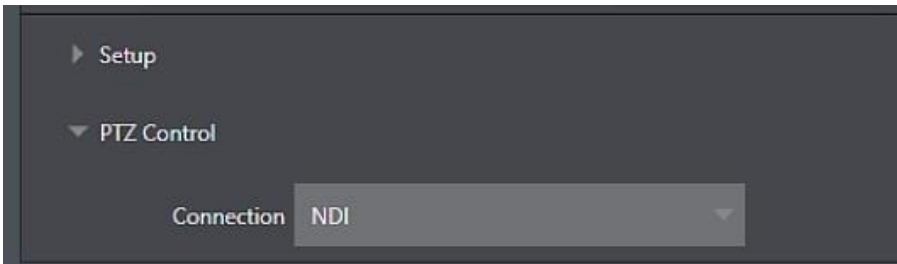
The Premultiplied Alpha switch is off by default. Making the correct selection is necessary for correct compositing over other imagery.

### Low Bandwidth



For NDI source only. This allows you to force the sending device to a lower quality video stream. This compromise is acceptable when the source is not intended to be displayed full screen. Useful in network settings with limited capacity (such as WiFi).

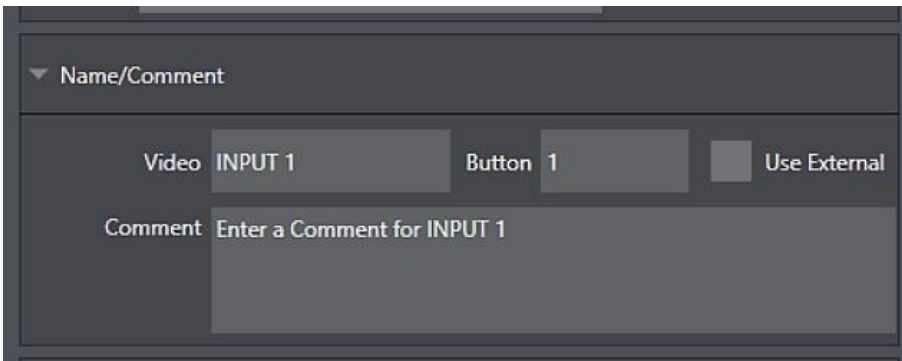
### PTZ Control



For many source types, a PTZ Control menu is shown in the Source control group. The default control Connection type is NDI which, assuming you are configuring an NDI source, makes life a lot easier because there is nothing else to configure.

Otherwise, if you **must** select a legacy control connection type like RS422, etc., or perhaps a non-NDI network connection, additional controls may be shown in this group to let you configure things like Baud Rate, Com Port, IP Address, and the like.

### Name/Comment



Expanding the Name/Comment control group reveals text entry boxes that allow you to provide labels for your video sources – specifically, the Video entry appears beneath viewports in multiviews and some menus (where space permits), and the short Button text is used to label Switcher buttons.

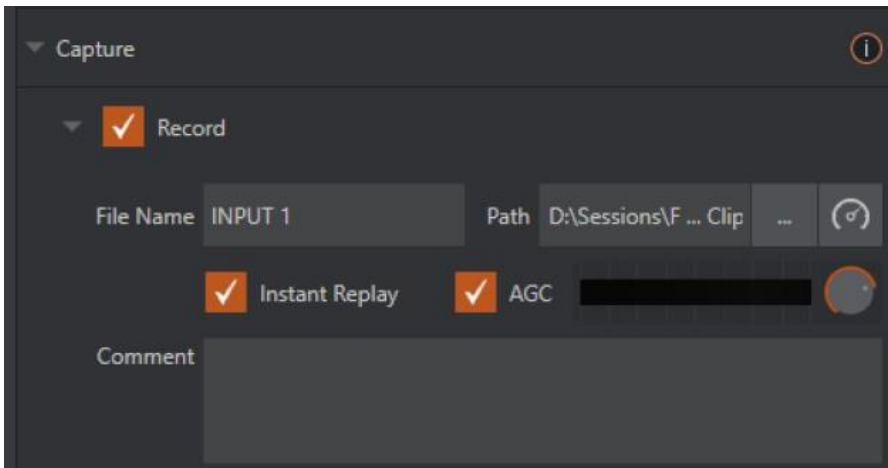
Enable the Use External switch to automatically pass the channel name for a remote source such as an SDI router or NDI channel to the Video label field.

The Comment entry lets you enter memo text that can serve as memory aids, but or another very valuable purpose, too. Specifically, the values entered in these two fields supply the values for special DataLink keys. Among other things, the values from these DataLink keys can be used to update text values in title pages, or to add information to the filename of recordings.

For example, you could use a macro to automatically display a title page briefly any time you switch cameras. The Name and Comment entries for inputs update the values assigned to DataLink Keys named *%PGM Source Name%* and *%PGM Source Comment%* based on Program row selections. You might enter *Bill Jones, CEO* as the Video name for a camera, and *Megadyne Computronics, Inc.* as the Comment.

Continue to give unique values to inputs in similar fashion. Then enter *%PGM Source Name%* on the first line of a title page, and *%PGM Source Comment%* on the second line. When you change cameras, your macro displays the page, correctly identifying the talent based on the input Name and Comment.

## Capture

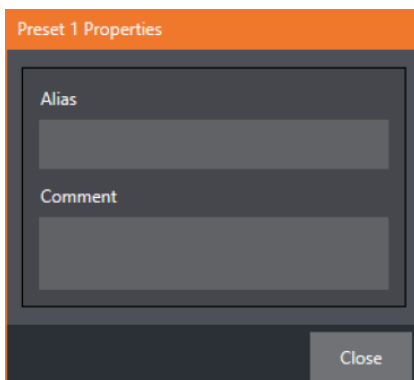


Each Switcher source has a Capture group in the Input tab. This control group shows settings and options for grabbing still images and, for appropriate sources, recording. These important capabilities are discussed in full in [Record, Grab and Replay](#). The controls shown in are detailed in [Record](#).

### 6.1.2 PTZ/ Pan and Scan Presets

Another control group appears on the lower part of the Input tab when appropriate. This group may be labeled either PTZ Presets or Pan and Scan Presets, depending on the source type (one could hardly be blamed for referring to the latter as virtual PTZ presets).

In either case, the features and options presented in this group are similar. At the top, there are 16 numbered preset slots. Rolling over these slots reveals two gadgets: Click the snapshot (camera) gadget to store or update a preset. Click the configuration (gear) gadget to show a Preset

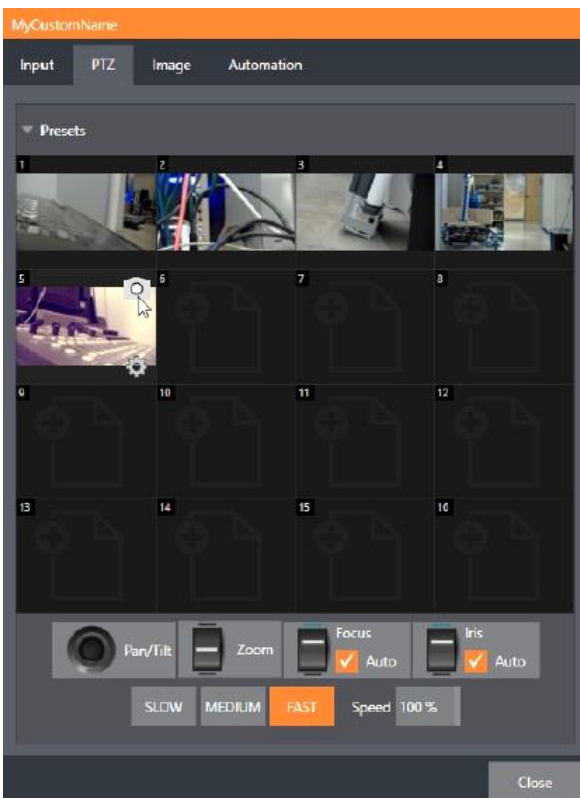


Properties panel, with two text boxes labeled Alias and Comment.

The entries in these two text boxes, like the Name and Comment values discussed earlier, provide the values for special DataLink keys that store the values from the last PTZ preset applied, as follows:

- PTZ PGM Alias
- PTZ PREV Alias
- PTZ PGM Comment
- PTZ PREV Comment

**Tip:** These DataLink keys can be very useful in settings like a town hall meeting, where you might use different PTZ presets to zoom in on a few different council members. In such a case, the last preset applied could update the data shown in a lower-third title overlay.

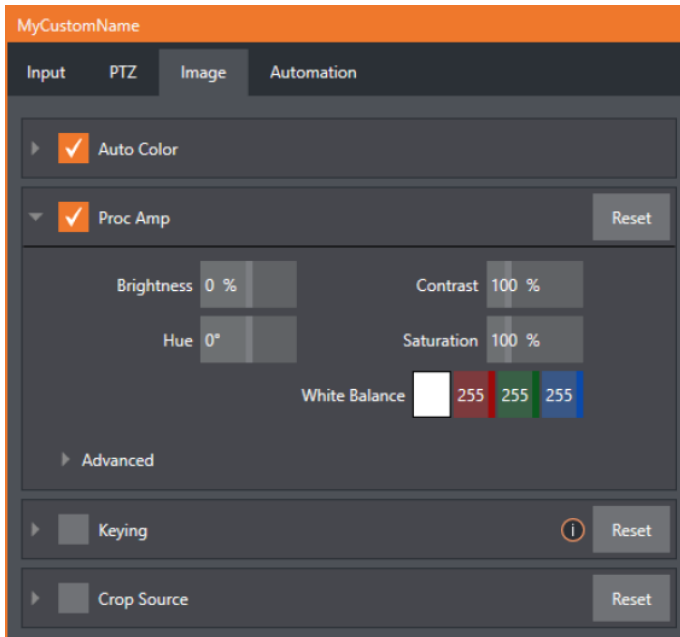


A set of controls located below the preset bin allows you to control connected PTZ cameras, or to affect sources supporting Pan and Scan features in similar fashion (you might think of these sources as providing a sort of virtual PTZ functionality). **SLOW**, **MEDIUM**, and **FAST** preset buttons complement the numeric Speed control slider at right. These affect the speed of the transition from the current position to newly selected preset.

The Options group, when expanded, reveals White Balance options along with a menu that allows you to invert the operation of the Joystick on individual axes (both in the interface and on connected hardware control surfaces).

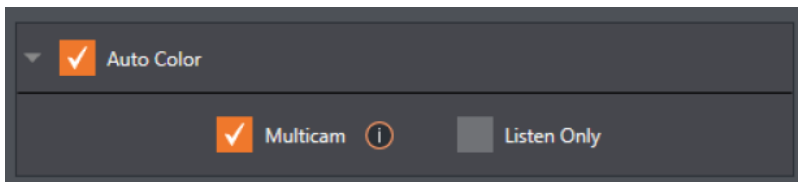
**Note:** Focus, Iris, and White Balance features are only shown when a PTZ camera is connected to the input. However, features in the Input Configuration panel’s Image tab, discussed next, can provide similar functionality to White Balance automation.

## 6.1.3 Image Tab



The Image tab in the Input Configuration panel hosts a set of features that provide extensive color control processing, chromakeying, and cropping options for every video source.

### Auto Color



Lighting conditions can change dramatically during many live events, especially those held outdoors. Adding to this problem, production usually involves multiple cameras and, all too often, these may not have uniform color characteristics. Ensuring consistent color when switching from one angle to another, avoiding unwelcome brightness or color shifts as evening falls or when a cloud obscures the sun briefly can be troublesome, and expensive.

Auto Color, a unique feature capable of dynamically adapting the color characteristics of your video sources as lighting conditions vary, can minimize these problems. For many productions, enabling Auto Color is all it takes to produce a show that looks amazingly consistent.

### Multicam

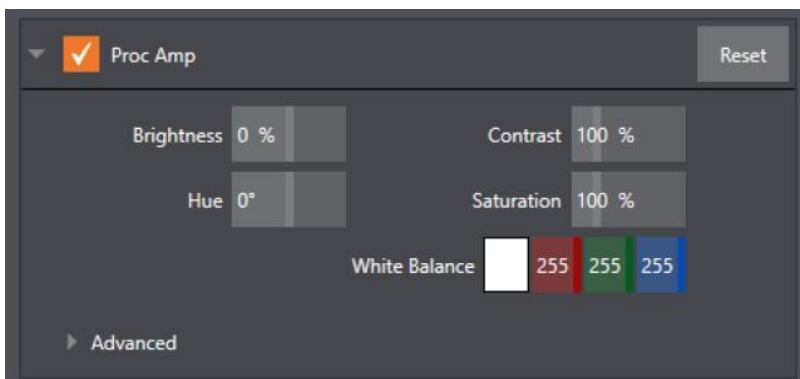
By default, each camera with Auto Color enabled is processed uniquely – without reference to other sources. Often, though, even greater consistency can be achieved by treating sources in similar illumination environments as a group. Enable Multicam for several cameras causes Auto Color to evaluate and adjust these cameras in unison. You might, for example, enable Multicam for courtside cameras in an interior sports venue, while treating exterior or studio feeds individually.

## Listen Only

The Listen Only switch allows you to include a source in the Multicam group without adding its own feed to the group evaluation. Thus, a camera trained on a giant purple dinosaur can be automatically corrected without disproportionately biasing the group evaluation and Auto Color correction. Alternatively, one might enable Multicam for a number of sources, turning Listen Only on for all but one camera – effectively making that camera the color reference all other cameras in the group follow.

- ❑ **Note:** The Proc Amp, discussed next, is downstream of the Auto Color system. This allows you to apply further manual color adjustments to your individual sources, whether for fine tuning or to achieve a specific “look”.

## Proc Amp



A switch at the top of the Proc Amp control group toggles the feature on/off. Other controls operate as follows:

- **Brightness:** Adjustment range from -50 to +50 IRE (the default being 0). As reference, the full luminance range of the visible portion of a video signal can be thought of as 100 IRE units (named for the Institute of Radio Engineers) – ignoring minor regional variations.
- **Contrast:** Adjustment range from 25 - 400% (default 100%).
- **Hue:** Adjustment range between -180° and +180°. Adjusts the master color of the video signal from the attached source, swinging the entire image through the color wheel’s spectrum.
- **Saturation:** Adjustment range from 0-500%. Zero saturation results in a black and white picture; increased saturation results in richer colors. High saturation values can exaggerate the color portion of the signal.

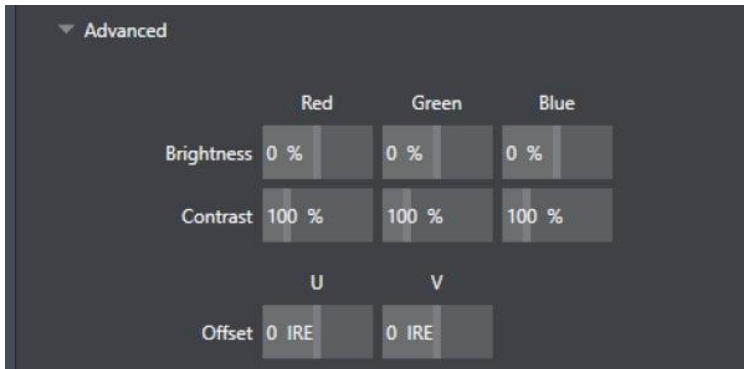
- ❑ **Warning:** Over-saturated colors are considered illegal for broadcast transmission and may result in display problems on some devices.

- ❑ **Tip:** Proc Amp adjustments are applied downstream of LiveMatte, which can help when composing greenscreen shots to match a background or LiveSet.

- **White Balance:** To automatically white balance, click and hold the mouse button on the Color well, and then slide the eyedropper pointer onto the monitor for the corresponding source. Release the mouse button over a part of the image that should appear as white after processing.



## Advanced Color Controls

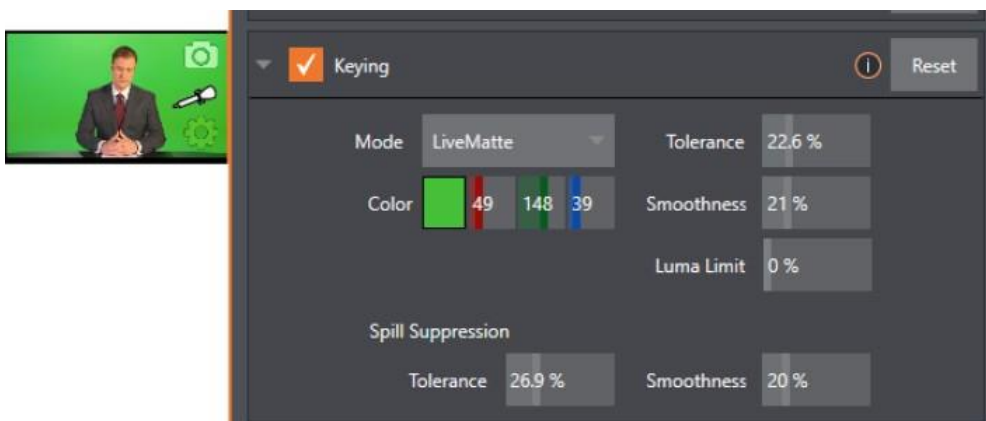


This secondary control group is revealed when you click the expander (triangle) beside its label. In addition to per color channel (RGB) Brightness and Saturation sliders, it adds U Offset and V Offset controls.

- The U portion of the video signal carries blue and yellow color information. Rotating the U Offset knob clockwise shifts the signal toward blue, while a counter-clockwise twist shifts the signal toward yellow.
- The V portion of the video signal carries red and green color information. Rotate V Offset clockwise to shift the signal toward red and counter-clockwise to shift the signal toward green.

**Tip:** Your system provides Waveform/Vectorscope monitors, which are an invaluable aid to you for accurately calibrating your video sources.

## Keying



The Keying control group in the Image tab hosts LiveMatte, a powerful real-time keying system for live production. Keying is a popular and powerful method of compositing multiple images, whether photos, video clips or live camera streams.

The process involves eliminating a portion of the video image (effectively cutting a digital keyhole in it) to reveal a user-defined background scene.

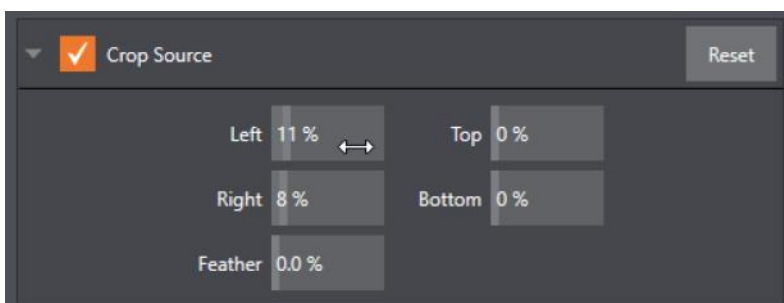


LiveMatte's controls are simple, making a great deal of complex digital manipulations easy to use. Even so, much can be said about getting the best results. For that reason, we have devoted a whole chapter to [LiveMatte](#).

- ❑ **Tip:** When LiveMatte, Proc Amp, or Crop settings are active for a source, bright green, blue and yellow indicators are lit under its monitor.

## Crop Source

It is very common for a source to be supplied with unintentional inclusions; these are often items that remain after chromakeying is applied, but which need to be removed along with the background. Common examples include microphones or lighting fixtures dangling from above, or perhaps a harsh crease, blemish, or tear in the background screen. Or, as is frequently the case, the video itself may have a few pixels of black or video noise along one or more of its edges.



The settings in the Crop Source control group can be used to remove such unwanted garbage from the scene, and other purposes, too – such as to isolate a portion of the screen for use as a Picture in Picture overlay.

Numeric controls in this group let you define margins for each side of the frame. Drag left or right on the number fields to adjust the values interactively or click a field to enter an exact value using the keyboard. The region defined by these controls is completely removed. Use the Feather setting to soften the edges.

- ❑ **Tip:** For added convenience, similar cropping tools are available separately in the Position panels of DSKs, along with the Key and, for LiveSet Effects, each layer's settings for MEs.

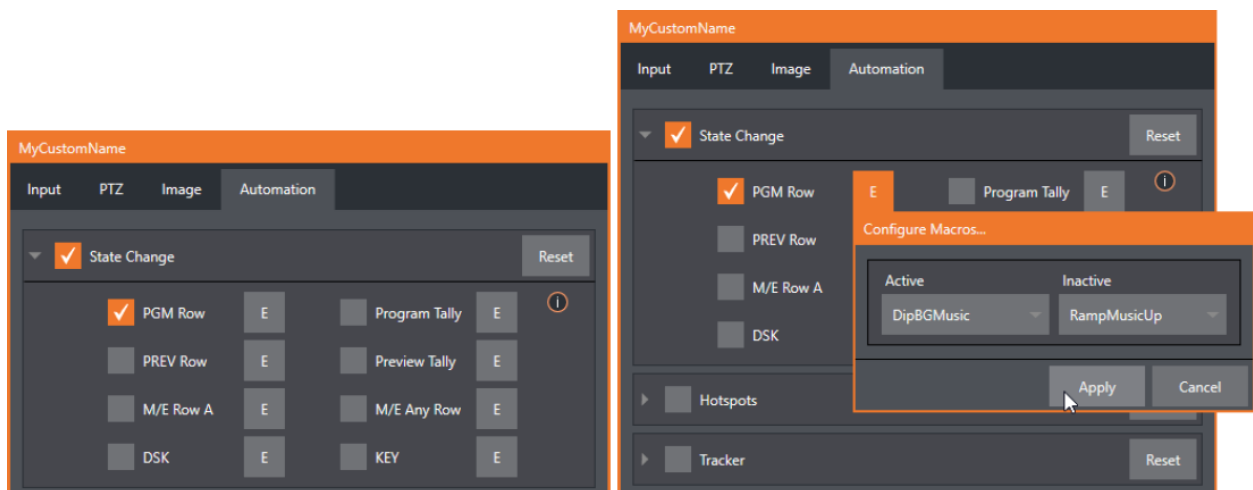
## 6.1.4 Automation Tab

Automation is one of those wonderful things that really transform your workflow. The Automation tab, located in the Input Configuration panels for all video sources is one of several places where related features can be found.

Macros (discussed in [Macros and Automation](#)) might be viewed as the basic building blocks of automation. Macros can easily be recorded and edited, and equally easily they can be triggered by a keystroke shortcut, control surface button, or similar means; but that isn't really automation, is it? It's actually a manual operation.

Somewhat obviously, automation should happen automatically based on predetermined criteria. The automatic transmission in your car shifts all by itself when certain conditions are met. In similar fashion, the features of the Automation tab allow you to predetermine what happens when certain conditions are met. Consider the State Change control group.

### State Change



Click the **E** button next to a one of the state options to assign macros that are executed on specific Switcher operations that affect the specified state.

For example, the accompanying images depict macros that control the volume level of the SOUND player. Whenever Camera 1 is newly selected on the Switcher's PGM row, the Active macro runs. Conversely, replacing Camera 1 with a different PGM row selection executes the Inactive macro.

**Tip:** The **E** on the button is short for *Event*.

The State Change implementation thus allows you to automate all manner of operations based on such things as the following:

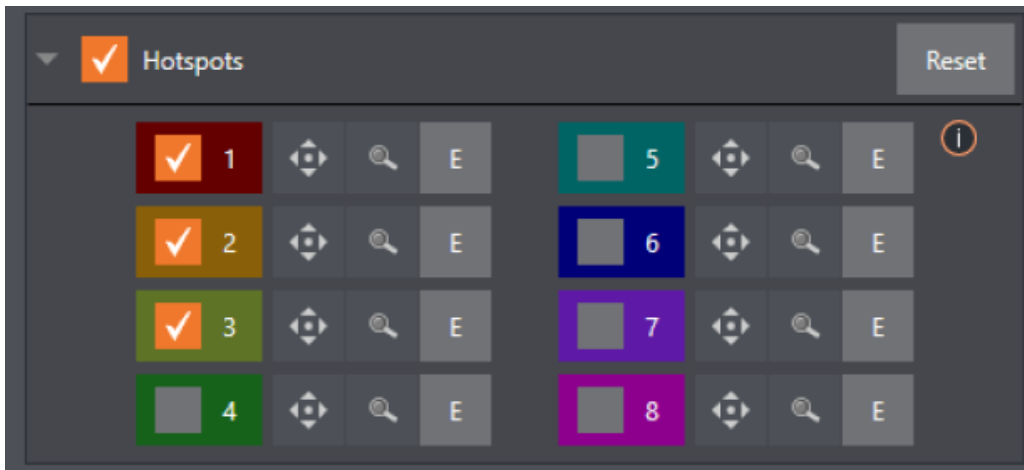
- Program or Preview row selection.
- Displaying/ hiding the source in a DSK or KEY channel.
- Selecting/de-selecting it on an M/E's A row, or any M/E row.
- Showing or hiding a source on the Program or Preview output.

This is immensely powerful, and lends itself to endless applications, such as:

- Automatically fly in a title as you switch to remote sources, and remove it after a specified time.
- Select a different Audio Mixer preset automatically when you switch from viewing a source in the B monitor of a double box effect on Program to displaying it full-screen.
- Then change back to the original audio setup when you switch back to the anchor desk.

The possibilities are truly endless.

## HotSpots



The next control group in the Automation tab is devoted to Hotspots – another powerful and interactive automation feature. A Hotspot is a user-defined region of the screen that (when active) detects opacity changes inside its boundaries (for which reason, Hotspots require LiveMatte to be enabled to work properly).

With LiveMatte properly configured, the Hotspot feature can trigger a macro when opaque pixels are newly detected in an active Hotspot.

For example, someone in a greenscreen set can trigger a macro by walking into a location in the frame where a hotspot has been defined. A second macro when all opaque pixels (the talent) moves out of the defined hotspot zone. All manner of creative implementations are possible.

## Tracker

The Tracker control group provides real-time motion tracking features. This feature allows you to choose a colored region of the video frame using tools similar to those found in the [LiveMatte](#) tab.

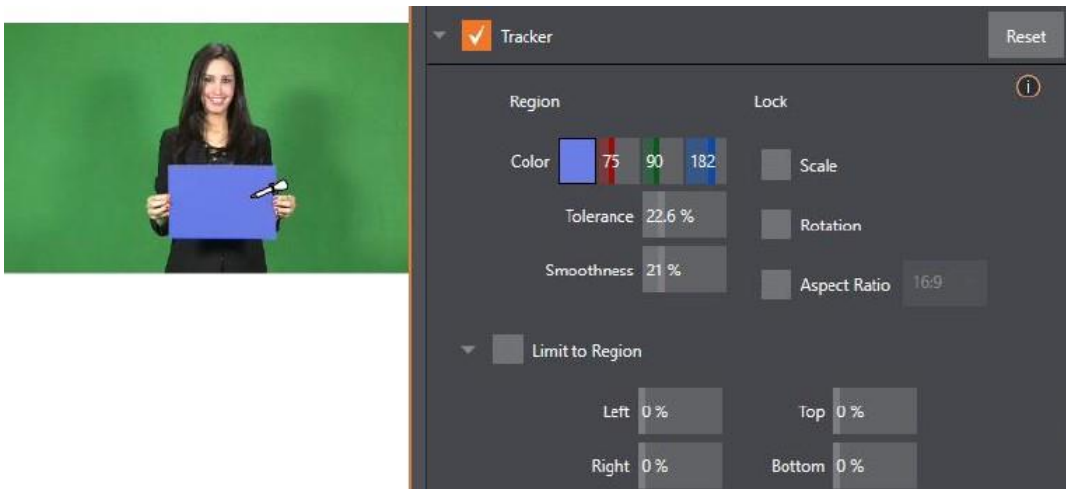
The tracked region is defined by choosing a primary Color using the color picker tool. The Tracker follows this region as it moves and shifts within the frame over time, and outputs the motion data for downstream application.

Tracker output from one source can be used to dynamically modify the positioning of other video sources, when configured to do so in their individual Position panels.

## Adjusting Tolerance

Click the eyedropper, and, while holding the mouse button down, drag the pointer over top of the monitor for the source you want to track.

The Tracker's color swatch updates as you drag, until you release the button to finalize your selection.



To assist you while making adjustments, a yellow rectangle is overlaid on the video to show the effect of the current Tracker settings. Watch how this overlay is affected by adjustments you make to the Tolerance value for the Tracker. Raise or lower the Tolerance value until the result is steady, not jittering or jumping about.

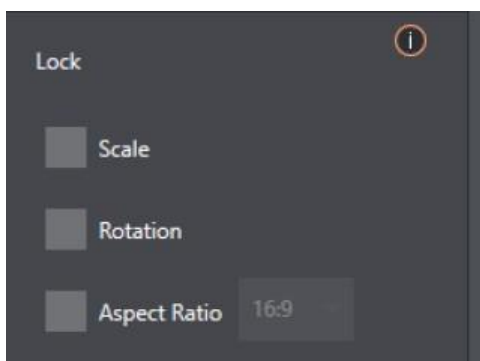
- Tip:** The yellow overlay disappears when you close the panel (or disable the Tracker), but you can show it full-time if you wish. To do so, right-click the desired viewport, and enable Tracking Markers from the Overlays options group in the menu.

## Smoothness

The Smoothness setting works just like the LiveMatte feature with the same name. Its impact on tracking data output may seem minimal, but it can be important when used with the Advanced Tracking effect in M/E panels.

## Lock

These are controls that permit you to Lock certain Tracker attributes, preventing them from changing in the scene.



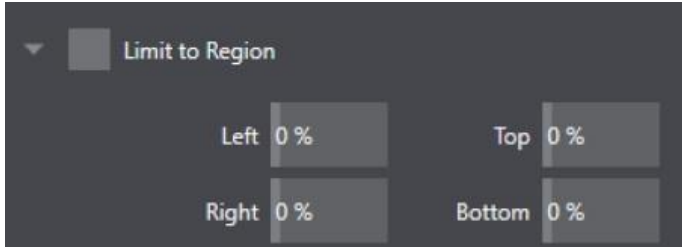
- Lock Scale to prevent the Tracker from automatically compensating when the scale of the tracked region grows or shrinks during motion.
- Likewise, when Rotation is locked, the orientation of Tracker output is constrained.
- The Aspect Ratio lock forces the Tracker to conform to a square (1:1), or rectangular (4:3 or 16:9) shape.

- Tip:** Locking channels in this manner makes it easier to obtain a steady motion track; but often, your choices are dictated by creative requirements.

## Limit to Region

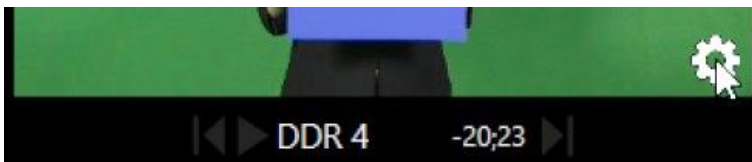
The Tracker is designed to follow the largest shape in a frame that meets the defined color criteria. At times, similar colored articles or inclusions in the frame can interfere with Tracker output.

The settings in this group allow you to limit the area of the frame the Tracker monitors, which can help you sidestep this issue.



## 6.2 Output Configuration

Roll the mouse pointer over the Program monitor to reveal a **Configure** button at right in the title bar below the display. Click it to open the Output Configuration panel.

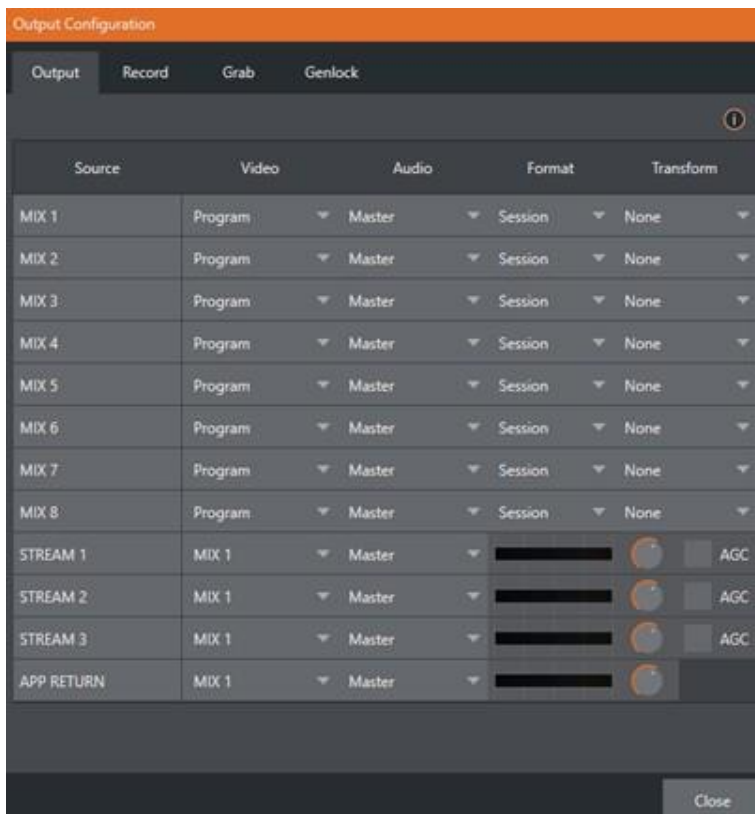


- [Output Tab](#)
  - [Video](#)
  - [Audio](#)
  - [Format](#)
  - [Transform](#)
  - [Stream](#)
  - [App Return](#)
- [Record and Grab Tabs](#)
- [Genlock Tab](#)
  - [Reference Type](#)
  - [Center Frequency](#)

**Tip:** As for other viewports, alternatively two finger tap on a touchscreen or, if Click Viewports to Show on PGM is disabled in the Options menu, double-click the mouse on the viewport to open this panel.

## 6.2.1 Output Tab

The Output tab in this panel contains controls governing the system's primary outputs.



We discussed Primary and Secondary outputs in [Configuring A/V Output](#). The first four entries in this panel are primary outputs; typically, these are also mixed outputs, hence their default labels – MIX 1, 2, etc. These video sources are sent to the corresponding SDI output connectors (when provided), and also as NDI (Network Device Interface) outputs.

### Video

The primary outputs support the largest number of optional video sources and, uniquely, can follow a delegated M/E, or a Switcher color group. All other outputs can be assigned to follow a primary output or show another designated Switcher source (excluding M/Es).

### Audio

In similar fashion, you can choose which audio source accompanies any of the primary outputs. Choose any individual audio mixer input, or any of the mixed audio outputs, Master or Aux (audio mix options vary by model).

### Format

The **Format** menu allows you to choose the video format for each output. Select the video format for downstream devices you intend to connect to the corresponding output here. The formats available are drawn from the list below, according to whether the session is in PAL or NTSC mode:

- 2160p
- 1080i or 1080p – depending on the session format.
- 720p
- 480p – progressive standard definition NTSC sessions only.
- 480i (4:3) – interlaced standard definition NTSC sessions only.
- 480i (16:9) – interlaced standard definition interlaced NTSC sessions only.

- 576p – progressive standard definition PAL sessions.
- 576i (4:3) – interlaced standard definition PAL sessions.
- 576i (16:9) – interlaced standard definition PAL sessions.
- Alpha – for remote workflows, send Alpha Channel through one of the MIX outputs.

**Note:** Output 1 always transmits video in session format, thus shows a Resolution display only.

Generally, source formats that are inconsistent with the current output resolution setting are automatically conformed when possible. In some cases, such as non-standard format sources, the output format may be modified to provide a suitable display. That said, it's best to avoid non-standard sources if possible.

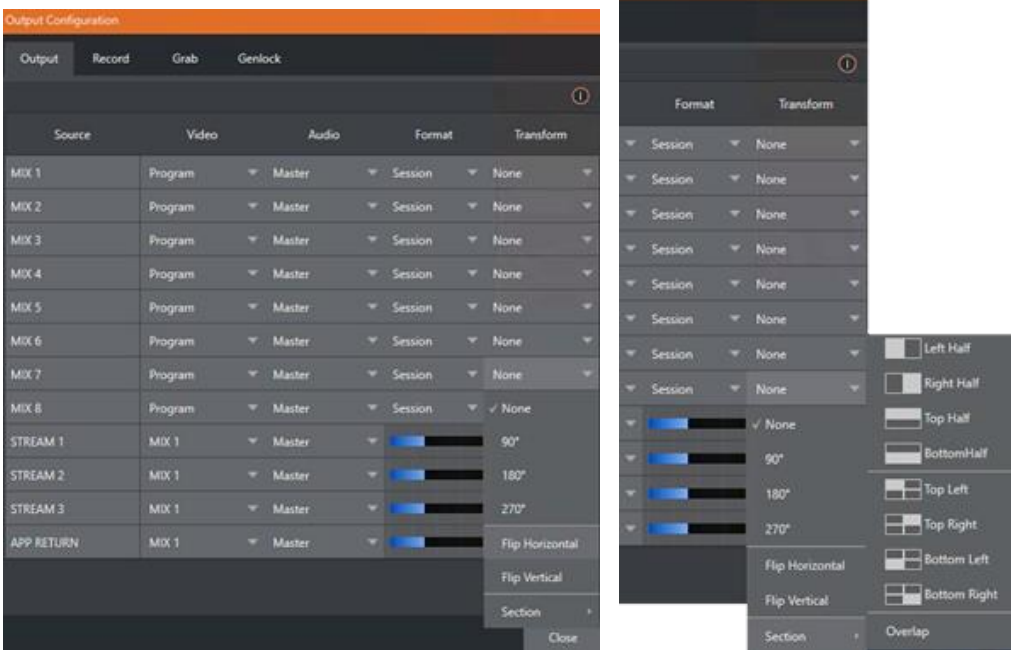
### Alpha

Last on the source format list is the Alpha Channel toggle. Any switcher output can be specified to support rendering of an alpha channel, including NDI inputs from that channel.

Recordings of the alpha outputs can be used in Adobe CC or DDR's and will retain the alpha channel that was generated. Thumbnails or captures of stills also support alpha channel.

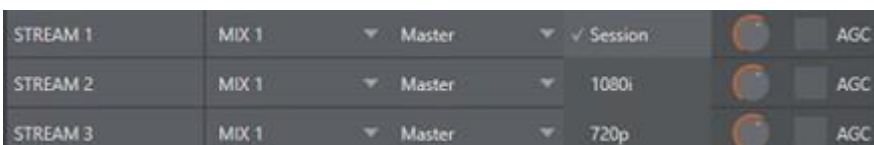
### Transform

Video Mix also support independent rotation and flip controls, as well as Section options.



### Stream

The Stream controls in the Output tab let you independently assign any of the primary mixes to one or two streaming encoders. Likewise, for models with multiple audio busses, you can send audio from the Master audio mix or any of the Aux busses to one of the encoders.



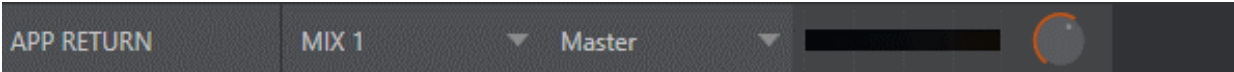


The audio controls also include individual VU meters, Gain knobs, and an AGC (Automatic Gain Control) option. These allow you to modulate audio for the streams separately from your primary audio outputs.

**Tip:** Streaming output is always de-interlaced.

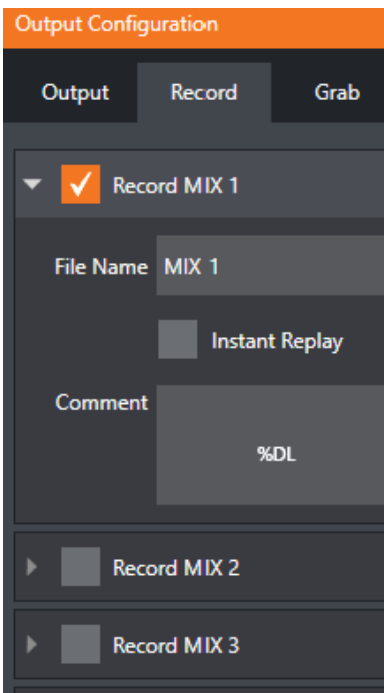
Streaming Output involves more options, too, since there are so many different ways to stream. In this panel, configure the audio and video sources sent to the streaming output. All other options and settings relevant to streaming are discussed in [Stream and Encode](#).

### App Return



*APP RETURN* a special output source to route and configure audio and video for supported applications with Live Call Connect. Video routing options support MIX 1-8 and audio routing corresponds to a mix minus of the Master and AUX busses, or any input.

## 6.2.2 Record and Grab Tabs



Each MIX output source has corresponding Record and Grab control groups to provide settings and options for capture. These important capabilities are discussed in full in [Record, Grab and Replay](#). The controls shown in are detailed in [Record](#) (Grab is virtually identical, but for the lack of an Instant Replay feature).

### 6.2.3 Genlock Tab

The Genlock feature allows your system to ‘lock’ its video output to a reference video signal supplied to its Genlock input connector.

This synchronizes system video output to external equipment locked to the same reference. Genlocking is not a requirement, but it is very beneficial, and you should definitely use it if you have the capability.

Miniscule local timing differences between these may force tiny delays during switching operations, which can contribute to throughput latency. So, serving i) the Genlock input and ii) other video devices in the chain with a single reference is the recommended approach.

You could think of it this way:

- Genlocking your cameras has the effect of locking their output together, ensuring optimal synchronization for live switching. This may result in throughput latency benefits.
- Supplying the same sync source to the Genlock input ensures a match between the system's video output and any downstream video devices required to handle both it and other (genlocked) sources.

**Note:** Digital audio is less tolerant in certain respects than analog. Some devices require SDI sources to be genlocked when mixing digital audio (whether for recording or live production). Vizrt systems include dynamic audio re-sampling for requirement. So genlocking SDI audio/video sources is not a requirement. Still, genlocking sources and other production devices to a single house reference signal, or genlocking the cameras directly to the Vizrt live production system's output is encouraged (to genlock cameras, see your camera manual).

**Tip:** The term "genlock" refers to "generator locking". Professional video devices often provide a "genlock input", which allows an external reference signal (often referred to as 'house sync') to control its video timing. The output of video devices connected in this manner is synchronized to the reference signal, and they are referred to as 'genlocked'.

## Reference Type

The 'bi-level' reference signal long used for standard definition television is often used for genlocking both SD and HD installations. However, the HD (Tri-level) reference sources are also supported by the **Reference Type** settings option.

**Note:** Reference Type options do not appear for SD sessions.

## Center Frequency

This setting is applied when a genlock reference signal is not in use. To adjust the setting, supply color bars to an input and pass video output to a downstream vectorscope. The vectorscope display is completely stable when *Center Frequency* is properly adjusted.

### See Also

- [Input Configuration](#)
- [Configuring Genlock](#)

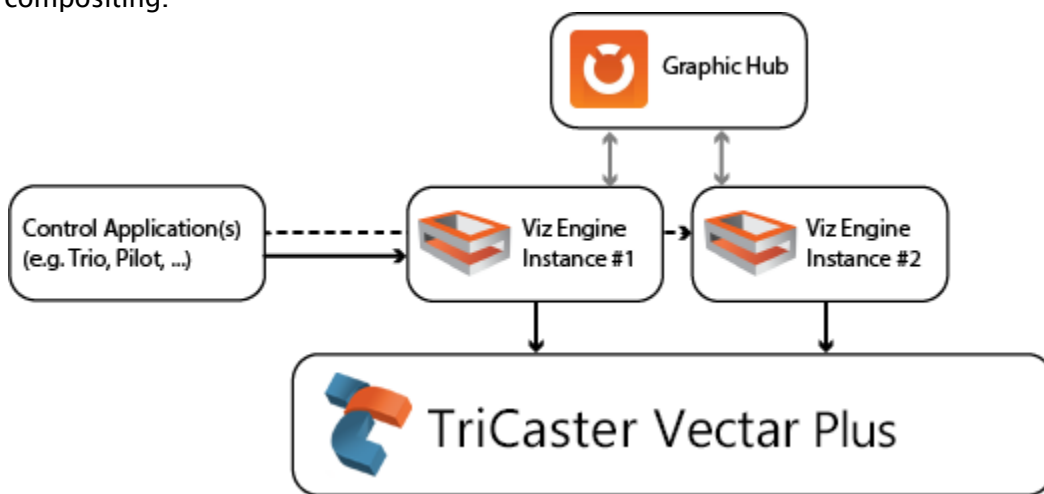
## 7 Viz Engine Integration

Viz Engine is a powerful compositing, real-time 3D rendering, and video playout platform that supplies advanced graphics and video processing for a broad range of Vizrt systems and types of media productions. Using advanced compositing, rendering, and keying,

Viz Engine enables applications to maximize creativity and deliver stronger audience engagement through immersive viewer experiences in any program.

Viz Engine is today's most powerful real-time compositor used in the media industry. The platform architecture offers easy re-purposing as requirements change and is built for extensibility as the foundation for multiple Vizrt systems and production use cases.

The following illustrates how Viz Engine(s) are integrated into Viz Vector Plus. Viz Vector Plus can utilize up to two independent Engine instances and use their rendered output as input source for compositing.



Data is exchanged via shared memory between Viz Vector Plus and Viz Engine. Each Viz Engine can be controlled individually by any control application. A valid Graphic Hub connection must be available.

### Viz Artist

Viz Engine includes Viz Artist. Viz Artist is a powerful graphics design tool that supports a range of production use cases including live motion graphics, virtual sets, augmented reality, and complex 3D animations.

Offering an advanced toolset, Viz Artist creates elements for other Vizrt studio or live environment applications to maximize creativity and deliver stronger audience engagement through immersive viewer experiences for all types of programs.

This section presents:

- [Viz Engine System Requirements](#)
- [Configuration](#)
- [Licensing](#)
- [Sources](#)
- [Troubleshooting](#)

## 7.1 Viz Engine System Requirements

### 7.1.1 System Requirements

Please see Viz Engine Administrator Guide for details on Viz Engine System requirements. In addition, the following lists some (additional) requirements that apply when running two Engine instances next to the Viz Vectar Plus application.

- Codemeter Runtime (installed with the bundle installer) is required to use the WIBU license system. Details can be found in the manual in section **WIBU-based Licensing System**. Please refer to the [Vizrt Licensing](#) documentation for information on how to apply a license container.
- Drivers
  - A valid OpenGL GPU board is mandatory
  - Please refer to the [Viz Engine Administrator Guide](#) for which GPUs and drivers Viz Engine has been tested and certified with .
  - For cloud based installations, make sure a valid driver is installed. Some cloud instances install drivers for computer use only. A OpenGL rendering capable driver is required.
- At least 12 GB of texture memory are required when using both Viz Engine instances in UHD/4K resolutions.
- MultiGPU setups are currently not supported.
- The latest recommended drivers are in the [Viz Engine Release Notes](#).
- 1080i resolutions are automatically rendered in 1080p.

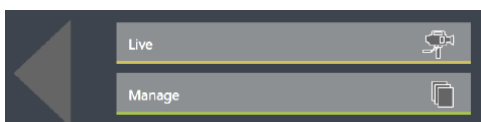
❑ **Note:** Viz Engine will not start up if you are connected via Remote Desktop, as this setup does not allow for OpenGL output. For AWS instances, NICE DCV viewer is recommended. Or consider using a VNC client, for example TightVNC, as an administrative back-end.

## 7.2 Configuration

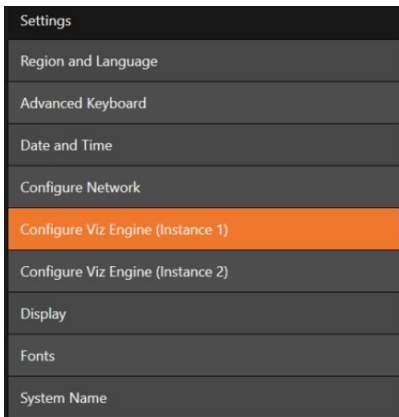
### 7.2.1 Viz Engine Configuration

All required settings for any Viz Vectar Plus Session are set automatically by the application. There is no need to manually configure output resolution or frequencies. However, some other settings cannot be set automatically as the environment is different for each installation and require configuration prior to running a session in Viz Vectar Plus.

These settings reside in the Administrator Mode as presented in section [The Home Page](#). If you have found yourself already in a session and need to return to the Home page, you can click the large Back arrow displayed at left, or the word *Home* in the session name label.



- ❑ **Note:** Launching Viz Engine for the first time can take a few minutes while all required shaders are being built for your system.



- ❑ **Note:** If using *both* Viz Engines, configure them separately before using.

Once configuration is complete, be sure to close the panel to save.

## Mandatory Settings

The following settings are required for the Viz Engine integration in Viz Vector Plus:

## Graphic Hub Connection

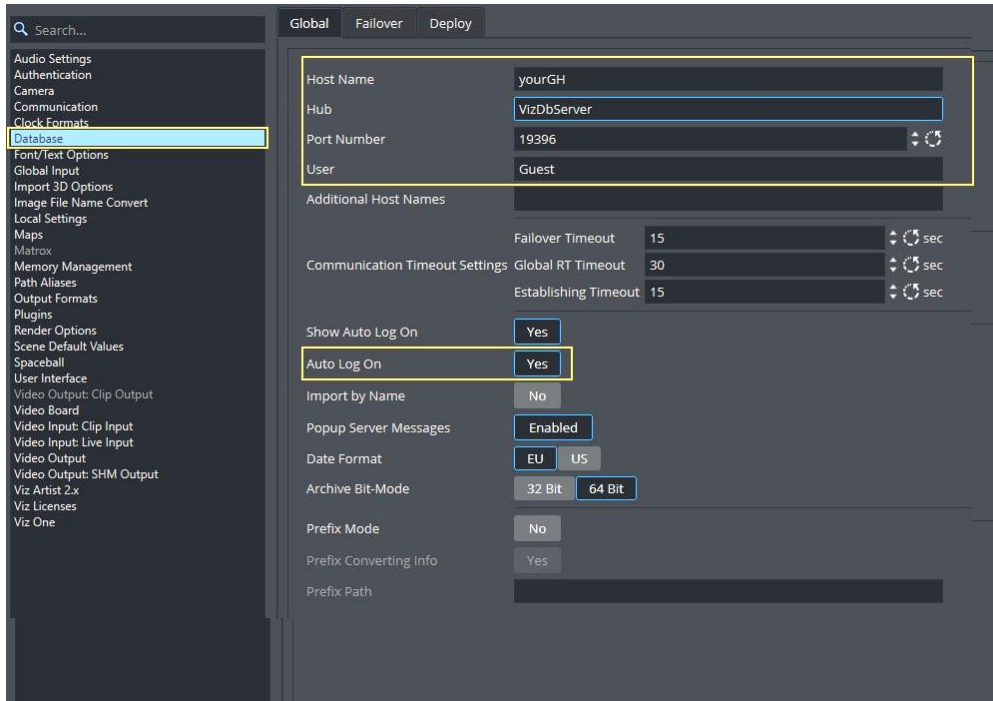
Viz Engine requires a valid Graphic Hub connection to load assets like scenes and materials. The Graphic Hub can be running either as local installation, as a 5/4 installation on another machine or as a Main/Replication Cluster.

The following settings are required:

- **Host Name:** Name of the machine Viz Graphic Hub Nameserver is installed.
- **Hub:** The name of the installed Graphic Hub on the setting above. This is usually VizDbServer.
- **Port Number:** Default *19396* needs only to be changed if the configuration differs from your setup.
- **User:** The username used to connect to the Graphic Hub.

- ❑ **Information:** If you are using another user than *Guest*, you need to provide your password. This can be done by starting *both instances* manually. Viz Config does not allow entering the password required.

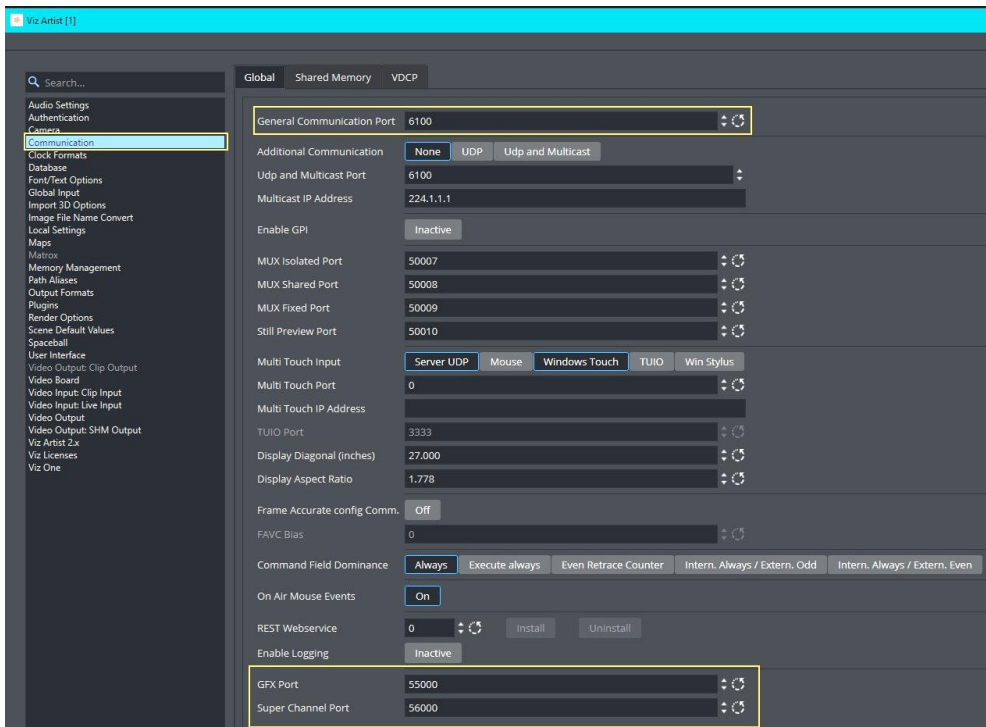
- **Auto Logon:** Does not ask for user and password, once this information is stored. This setting is required otherwise, Viz Engine will wait during Start-up for login credentials.



### Communication Settings

To send commands to Viz Engine, each instance needs to be configured correctly to accept commands on unique TCP ports. The following tables shows default values for both instances.

Setting	Instance 1	Instance 2	Description
General Communication Port	6100	6800	Main TCP command port
GFX Port	55000	55100	First port used by Graphic Channel Communication e.g. (55000 - 55015) and (55100 - 55115)
Super Channel Port	56000	56100	First port to communicate with Super Channels e.g. (56000 - 56015) and (56100-56115)



**Information:** Be sure all ports are accessible through firewall.

## Licensing

Please see section [Licensing](#) for details on how to set correctly the Viz Engine license.

## Additional Settings

Depending on how you integrate Viz Engine into your existing environment and what services to use, it may be necessary to also configure the following:

- **Installed Plugins:** Some graphics require additional plugins (for example Datapool). Ensure all required plugins are installed and activated.
- **Maps integration:** Any map server integration must be configured manually.
- **Viz One:** For with Viz One, please refer to the Viz Engine Administrator Guide (as online help inside the Studio Administration console).

Viz Engine has multiple settings and configurations. The selection above are a few common ones.

## 7.3 Licensing

If Viz Vectar Plus is licensed for embedded Viz Engine, this license automatically installs once the configuration starts. If additional licenses or plugins are required, they need to be installed and configured manually. The Viz Engines embedded into Viz Vectar Plus can also be configured to use Viz Engine licenses not bundled with Viz Vectar Plus.

- Preparation
- Configuring your License in Viz Engine
  - Configuration mode
- Setup Examples
  - Configuring for Output >2K
  - Using Matrox DSX Core

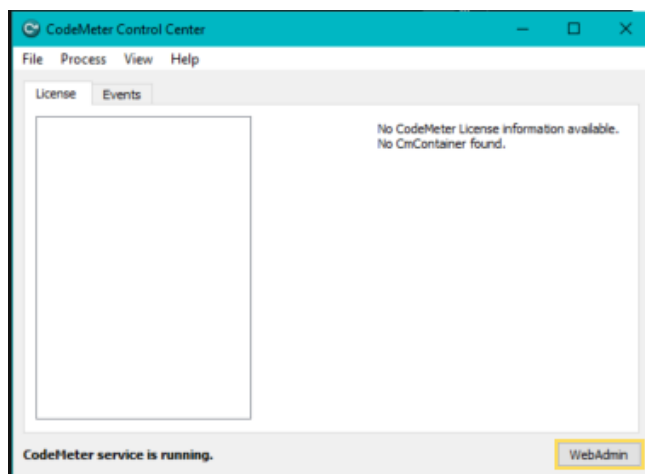
### 7.3.1 Preparation

Viz Engine and Viz Vectar Plus use Codemeter from [Wibu-Systems AG](#) as a licensing backend. The Codemeter Runtime is automatically installed by the Viz Vectar Plus installer.

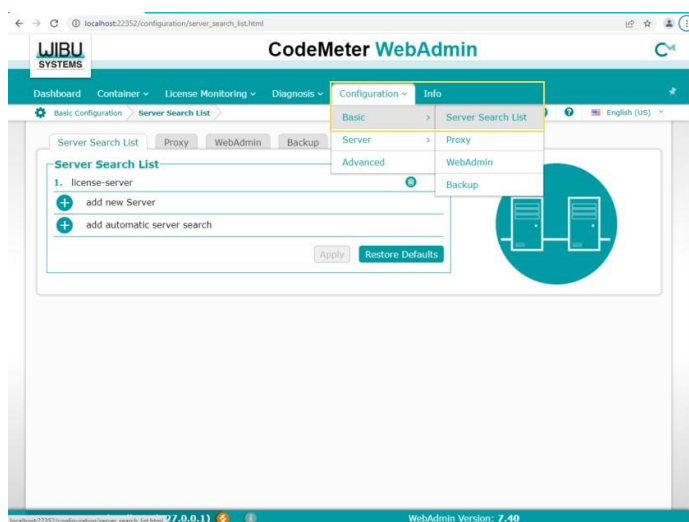
WIBU Licenses can be hosted either on a local dongle or on a dedicated license server.

Dongle based systems do not need any further configuration, server based licenses need to be configured in the Code Meter Control Center web Application.

1. Navigate to <http://localhost:22352/dashboard.html> or open the Codemeter Control Center and click **WebAdmin**.

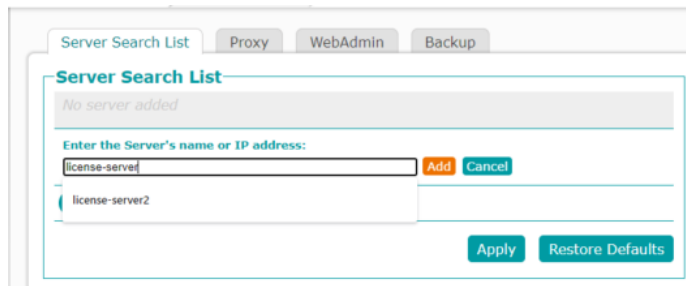


2. Select **Configuration/Basic** and **Server Search List**:



3. Add your license server by clicking **Add new Server** . If you have an additional backup server available, add it as second option.





- ❑ **Note:** It is *not* recommended to use the automatic server search as this will have an impact on startup times

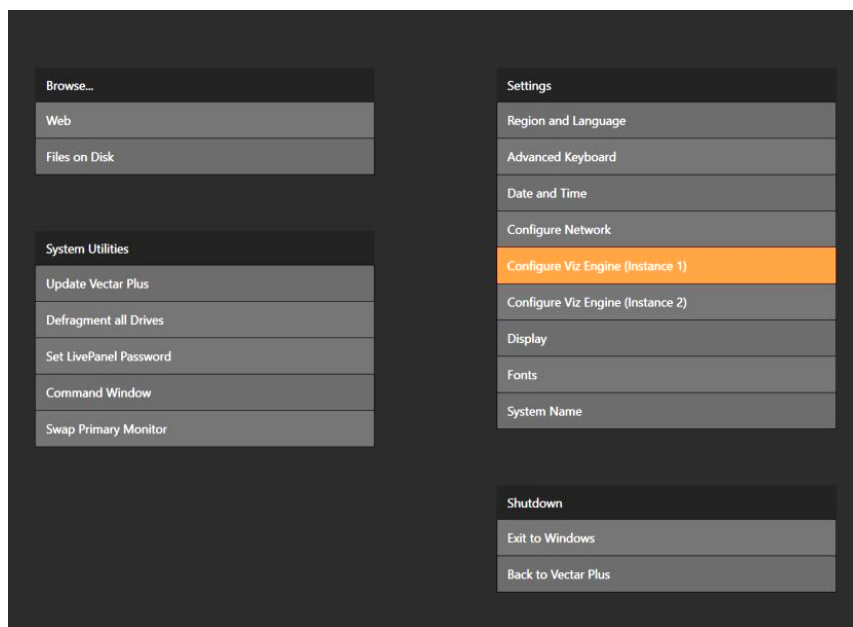
4. Click **Apply** to confirm your configuration.

## 7.3.2 Configuring your License in Viz Engine

### Configuration mode

Viz Engine must be correctly licensed to start up correctly. Any misconfiguration will force Viz Engine to start up automatically in Configuration mode.

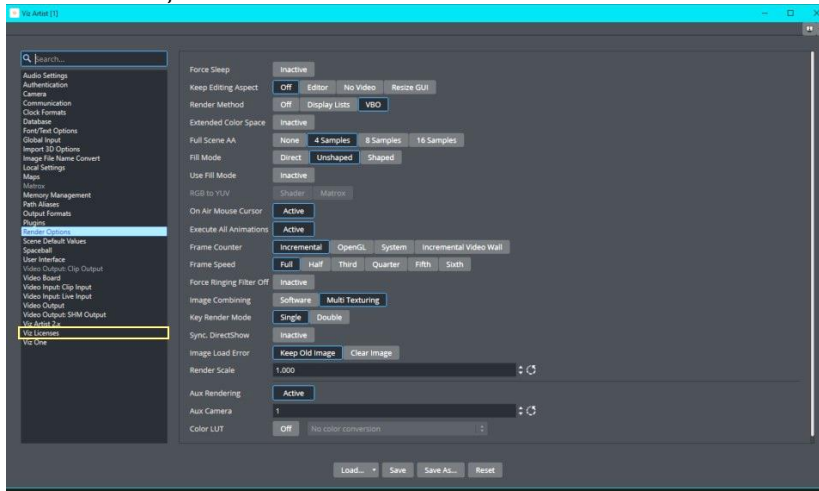
1. Start the Viz Engine in configuration mode. Up to two Viz Engines can be used with Viz Vectar Plus, all instances need to be configured correctly.
2. Start the configuration utility from within Viz Vectar Plus in the Administration section.
3. Click on **Shutdown**, then **Administrator Mode**.
4. Select **Configure Viz Engine (Instance x)**



Viz Engine starts in Configuration mode.

- ❑ **Note:** The first launch might take some while as Viz Engine is building the shaders for your dedicated GPU.

5. Once started, select **Viz Licenses**



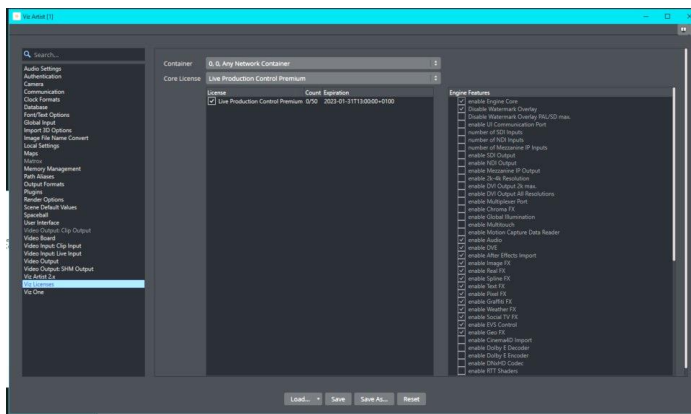
6. License type:

- a. If you use a dongle based license, select the local dongle in the Container location.
- b. If a server based license is used and has been correctly configured (see [Preparation](#) ) the License Server should show up in the Container location:



The cores available on your License Container will be listed.

For Viz Vectar Plus Installations, the **Live Production Control Premium** core should be sufficient. Please see [Use cases](#) for additional information when to re-configure your licenses.



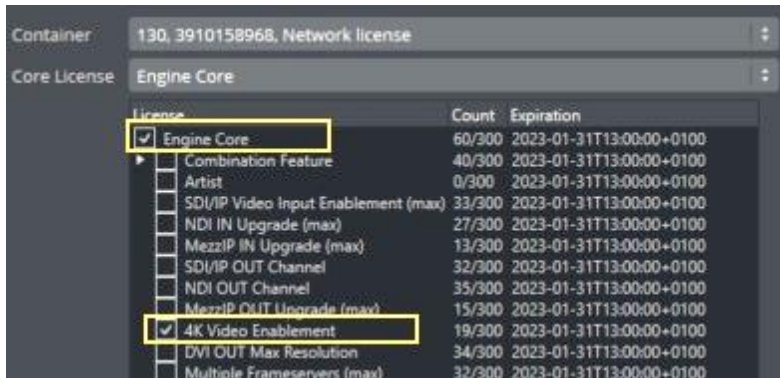
7. Make sure, your second instance is also correctly licensed.

### 7.3.3 Setup Examples

#### Configuring for Output >2K

Every output resolution larger than 2K requires a 4K license. This affects all UHD resolutions, as well as the 1440/50p and 1440/59.94p in portrait and landscape mode. Whilst this is automatically configured, the license needs to be acquired.

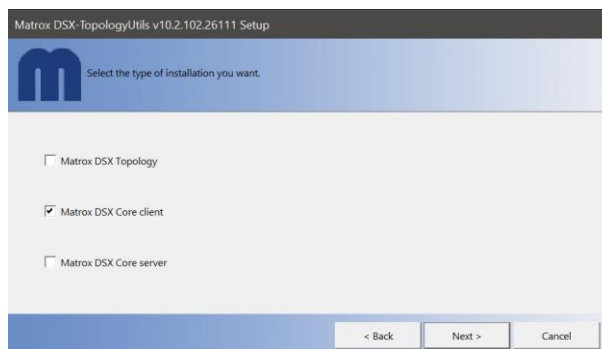
- The Live Production Control Premium Core license does not have a 4K enablement license. Therefore another core license (e.g. ENG\_CORE) is required. To do so, start Viz Engine in Configuration mode via the Admin panel.
- Switch to the Viz License section and select a Core license including the 4K enablement, like the Engine Core license. Enable the 4K Video Enablement by clicking on the checkbox.



## Using Matrox DSX Core

Viz Engine 4.4.1 and higher can handle the licensing of Matrox DSX core automatically. DSX cores can be used in virtualized environments to enable Clip Playback, Recording or RTP streaming. This requires the Matrox Topology Utilities to be installed, they are not part of the Installer but available on the Vizrt FTP or via Vizrt support.

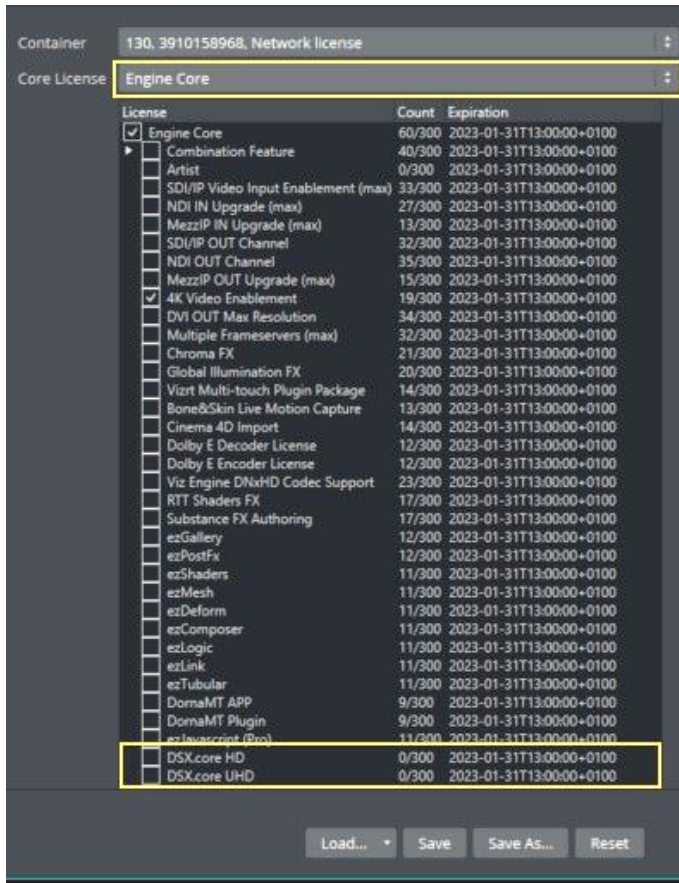
1. Install Matrox Topology utilities and select *Matrox DSX Core client*



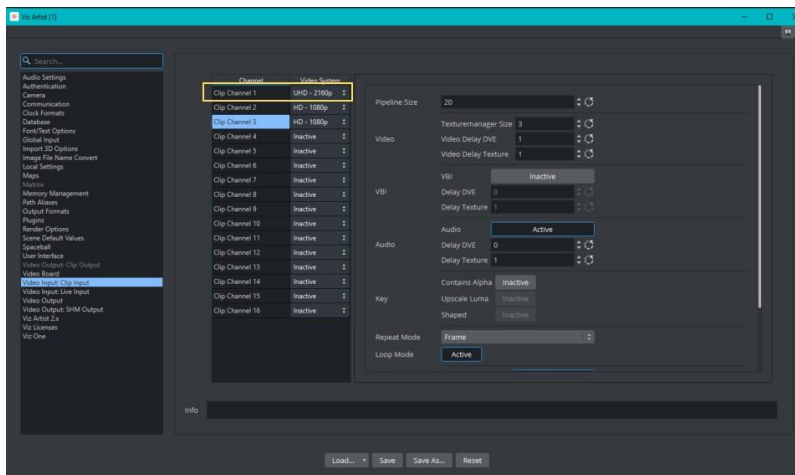
2. Once installed, you need to correctly configure your License. Live Production Control Premium Core does not include the DSX Core enablement, therefore a proper license core needs to be selected, for example *Engine Core*.
3. Start Viz Engine in Configuration mode via the Admin panel.
4. Switch to the Viz License section and select a Core license including the DSX Core license, like the Engine Core license.

There are two licenses for DSX Core:

- a. Any resolution up and including HD (DSX.core HD)
- b. Everything beyond (DSX.core UHD)



**Note:** The DSX.core license is bound to the configured *clip* resolution, not the output resolution. If any of your clip channels are configured higher than HD, you need to have the DSX.core UHD license configured.

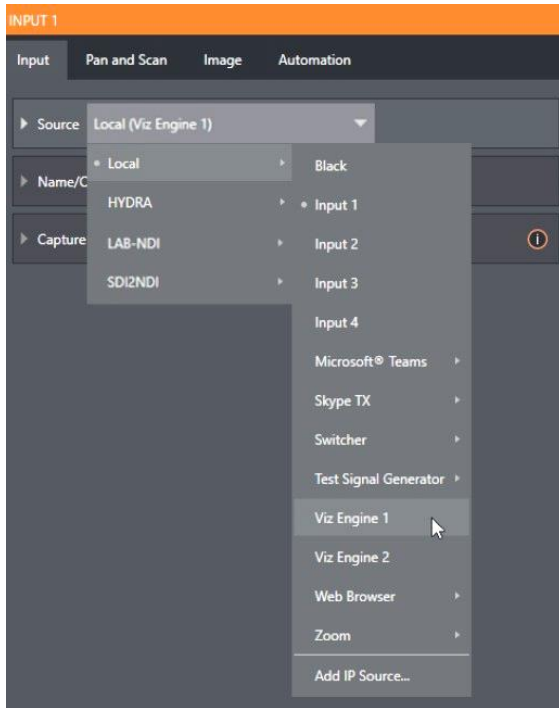


**See Also**

- [Viz License Configuration in the Configuring Viz section of the Viz Engine Administrator Guide.](#)
- [Matrox DSX Core in the Viz Engine Administrator Guide.](#)

## 7.4 Sources

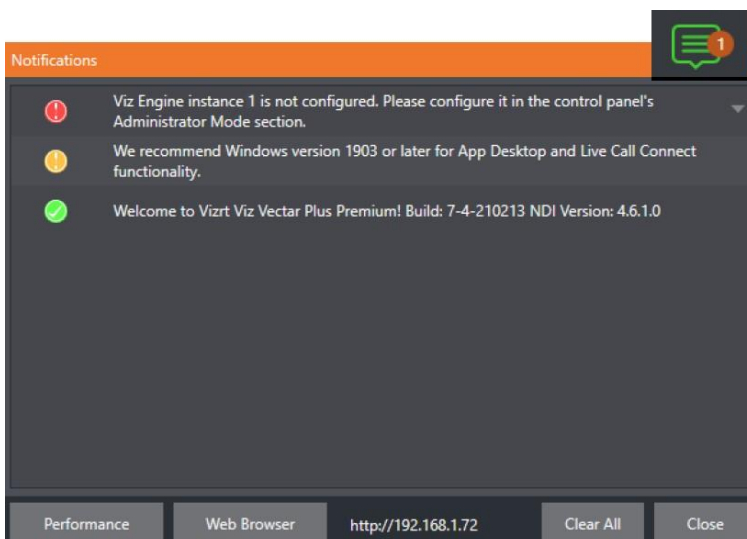
Viz Engine is automatically configured and started if a Viz Engine channel is activated as local input sources.



There is a maximum of two channels. As soon as a local input channel is set to be a Viz Engine, it is configured to the best matching resolution and started in the background.

Viz Engines can be controlled by applications like Viz Trio or Viz Pilot. The rendered graphics are transferred to Viz Vectar Plus and can be used as a normal source.

## 7.5 Troubleshooting



- If Viz Engine cannot be started correctly, an error message is shown in the **Notifications** section of the Dashboard. Viz Engine instances are automatically closed if no longer needed or if the session is closed.
- An unlicensed Viz Engine will instead automatically start in Configuration mode.
- Please make sure your Viz Engine licenses are available, see the section [Licensing](#).
- Viz Engine requires a Graphic Hub connection. See the section **Configuring Viz > Database** in the [Viz Engine Administrator Guide](#).
- Viz Scenes need to have a key plug-in or the **Auto Key** option enabled , otherwise the alpha information is not available and the output stays black.
- See the section **Scene management > Scene Settings** in the [Viz Engine Administrator Guide](#).

**Note:**

- Viz Graphics need to match the chosen resolution and framerate.
- Currently, the Window Capture Input remains black within the Viz Engine UI.

### See Also

- **Database** in the **Configuring Viz** section of the [Viz Engine Administrator Guide](#).
- **Scene Settings** in the **Scene Management** section of the [Viz Artist User Guide](#).

## 8 Switcher Transitions and Overlay

*Live Desktop* features replicate traditional hardware video switcher controls. For example, the Live Desktop includes powerful transition controls, downstream overlay channels, interactive layer monitors, and powerful automation features.

The middle of the Live Desktop (between the monitoring section and the tabbed modules) is the switcher with controls and configurations that include *Layer* controls for *main* and *DSK* (Downstream Keyer) *Transition* controls.

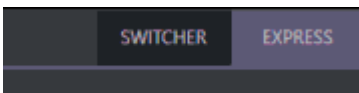
This section covers the following topics and procedures:

- [Switcher Modes](#)
- [Switcher Row Banks](#)
- [Selecting Sources](#)
- [Linking Switcher Rows](#)
- [Transitions and Effects](#)
- [Comps](#)



### 8.1 Switcher Modes

Viz Vectar Plus supports two Switcher modes. Select one that best suits your production.



- To select switch operating mode, click either the **SWITCHER** or **EXPRESS** tab provided at right in the horizontal bar immediately above the Switcher pane.

#### SWITCHER

This is the standard setting, providing control over your main Program video output using the familiar Program/Preview row method.

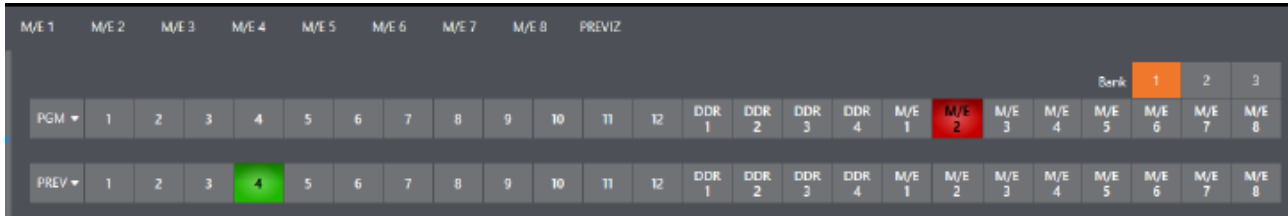


#### EXPRESS

For less complex productions, Express mode simplifies tasks, offering a one-button operating mode. Can be useful where volunteers or less experienced operators are working with the production.

❑ **Tip:** Touchscreens are supported. Tap a source’s viewport to instantly send that input to Program output using any current background transition.

## 8.2 Switcher Row Banks



In *standard* Switcher mode, two Switcher rows labeled **PGM** (Program) and **PREV** (Preview) are shown. Clicking a button in the Program or Preview row selects the active video source for that bus (note that [Audio sources](#) can optionally be affected by Switcher activity).

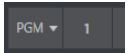
Program and Preview rows represent all available video sources in banks of buttons. The number of banks vary according to the number of supported sources.

- Bank 1 is shown by default.
- Hold down **ALT** on the keyboard to reveal Bank 2.
- Releasing **ALT**, Bank 1 is re-displayed.
- Press **ALT + CTRL** to momentarily display Bank 3 (when supported).
- It’s possible to latch banks, either by clicking Bank buttons on the screen, or by pressing **TAB** to cycle the currently displayed bank.

❑ **Tip:** The standard Switcher (and M/Es with transitions assigned) show selection hint tags beneath their rows when the selected source is in another bank. Click a tag to jump to the bank the source is hosted in.

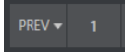
### 8.2.1 Program/Review Rows

The video source selections in the Switcher rows include all external inputs, including video router sources, internal sources (Media Players and Buffers), and the output from all M/Es.



The *PGM* (Program) row selection determines the dominant video stream of the *Background* (BKGD) video layer – that is the rear-most layer of the composition sent to *Program* output.

Other sources may be mixed above the *Background* layer at times as you apply *LiveMatte*, or as portions of an incoming *Preview* row video source appear during a transition.



The *Preview* row appears in standard *Switcher* mode. Selections determine which source is queued up for display in the *Background* layer by a subsequent (BKGD) *Take* or *Transition* operation.



## 8.2.2 Background and DSK Layers

The concept of video layers is central to understanding how the Switcher, M/E and Transition controls relate to one another, and how they combine to form the video seen on Program output

- The Background layer (often shortened to BKGD) is always the base for the video composition displayed on Program output.
- DSK (Down Stream Keyer, or overlay) layers may appear above (in front of) the Background.

DSK layers are typically used for overlaying objects like graphics or titles, although they may serve other purposes as well. In addition to BKGD, up to five additional *primary layers* can contribute to the final Program output:

- Overlay layers (DSKs) are composed above the BKGD layer on output. DSK 2 appears in front of DSK 1 on Program Output (closest to the viewer) and so on, in numerical order.
- FTB (Fade to Black) constitutes a final overlay layer – one that obscures all other layers when applied.



The BKGD layer is often a composite of sub-layers:

- It may include mixed video from both the Program or Preview rows.
- Selecting an M/E as source on Program or Preview can add many sub-layers to the BKGD composition, including the M/E's primary Inputs and dedicated KEY layers.
  - KEY layers are similar to DSK layers but, being upstream of the main Switcher, appear composed in the *background* layer.

**Note:** Multiple M/Es can be in use, so the BKGD layer can comprise high numbers of sub-layers.

## 8.3 Selecting Sources

- Standard Switcher mode: Video sources for PGM (Program) and PVW (Preview) rows are selected individually by pressing buttons on those rows.
- Express mode: By contrast, selecting a button on the single row in Express mode first places the designated source on the (unseen) Preview bus, then immediately switches it to Program output.
- For DSK/Key layers, source selection is made using a drop-down menu above the integrated viewport located in the DSK/Key control group.

**Hint:** Right-click input buttons to select sources from video routers (see [Configuring Routers](#)).

## 8.4 Linking Switcher Rows

It can be useful to link two (or more) Switcher or M/E source rows together, so they operate synchronously.

- Program and Preview rows and M/E source rows all show a **Triangle** beside the row label at left. Click it to open a menu for setting up linking.
- Rows assigned to the same color groups are linked. A selection made in any linked row updates the selection of all other rows in the same color group to match.
- The screenshot shows the Input A row for an M/E linked to the PGM row of the main Switcher.



- The **Ungroup** menu item removes the current row from a group, while **Clear** this group removes all rows from the current group.

## 8.5 Transitions And Effects

This section presents layout and use of the *Transition* controls.

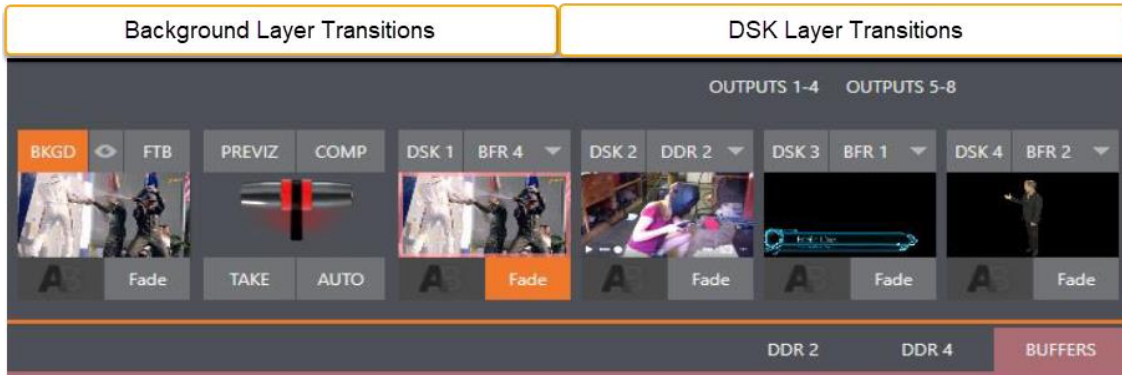
- [Standard Switcher Mode](#)
  - [DSK Controls](#)
  - [DSK Source Configuration](#)
  - [Borders, Edges and Shadows](#)
- [Express Mode Switcher](#)
  - [Background Transition](#)
  - [Switching](#)
  - [DSKs](#)
- [Transitions with Animation Store Creator](#)
  - [To open the Animation Store Creator](#)

See also section Background and DSK Layers.

### 8.5.1 Standard Switcher Mode

With the Switcher in its Standard mode, multiple operations are available.

At left in this group are the main Transition controls, including the T-bar. The control groups right of the T-Bar provide configuration and control options for the individual DSK layers.



## DSK Controls



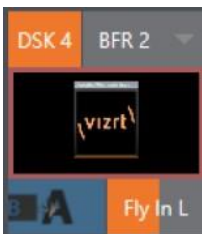
Each DSK layer has a live video viewport showing the current source assigned to it (using the menu at right above the viewport) and its own transition effect. Click the transition icon at lower left below the viewport to reveal a palette of different transition presets provided for quick selection. Click an entry in the palette to select it, or move the mouse pointer to the + sign that pops up for each icon and click to open the Custom Media Browser.

- Tip:** The frequently-used Cut and Fade effects always available in the transition palette. As these cannot be replaced, no + sign appears for these icons.

In the Media Browser, you can choose from hundreds of transition effects. The selected effect replaces the current one in the palette. To display or hide the DSK video layer over the BKGD layer on Program output using the currently selected effect, click (or tap) the viewport or the effect name label just below.

- Tip:** You can halt an unfinished effect by clicking again during the transition. Click it again to continue performing the effect.

## Transition Delegates



You can also control transition progress using the Switcher's T-Bar control, at left. The T-Bar operates on all delegated video layers. To delegate a DSK, click its label at upper left ( ) to turn it blue. Clicking it a second time un-delegates the layer. The T-Bar acts on all delegated layers, including the Background video layer. For example, if DSK 1 is visible, but DSK 2 is not, when both DSKs and BKGD are delegated performing a T-Bar (or BKGD AUTO) operation reverses the visibility of the two DSKs on Program output when the BKGD transition occurs.

## Transition Timing



Per transition timing is set and stored in the effect palette, using the numeric duration control beside the effect icon. Select transition speeds using the menu below the Transition Palette. You can also drag the mouse pointer over the numeric display to set a custom time, or click it to enable keyboard entry of the effect duration.

- Tip:** The direction of Transitions applied as DSK (and M/E KEY) layer effects automatically alternates. If the first click displays the layer using an effect, the next click removes it using the reverse effect.

## DSK Source Configuration

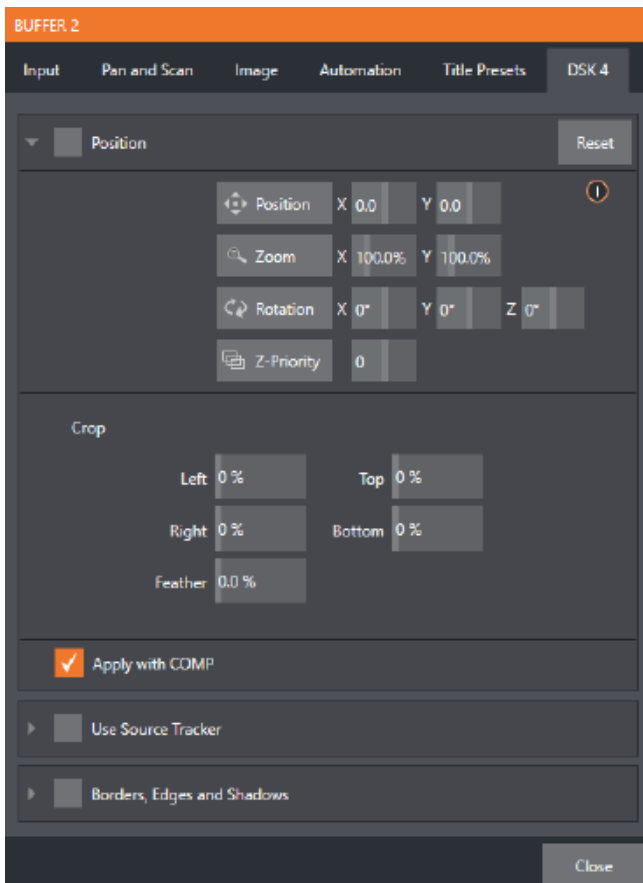


Many more configuration options are available for DSKs (and their siblings, M/E key layers, too). To access these settings and features, roll the mouse pointer over the DSK viewport, and click the configuration (gear) gadget that appears at lower right.

- Tip:** Touchscreen users can two-finger tap the viewport to open the Configuration panel.

Doing so opens the Input Configuration panel for the source assigned to the DSK, but with the addition of a supplemental tab labeled DSK (1-4). The control groups in this new tab expand to reveal Position, Use Source Tracker and Borders, Edges and Shadows settings.

## Position and Crop



- The Position control group includes Position, Zoom, Rotation, and Priority. Position settings can be toggled on and off together using the switch provided in the group header.
- Click and drag on the **Position** button (diamond) to relocate the DSK layer vertically or horizontally within the frame.
- If you drag left or right on either of the two nearby numeric controls to adjust a single axis only. Dragging the cursor on the **Zoom** button (magnifying glass) affects the apparent size of the overlay.
- If you drag just *one* of the associated numeric gadgets you can adjust just one dimension of the corresponding DSK layer – width or height.
- In similar fashion, drag the pointer over the Rotation button with the left mouse button depressed to turn the overlay source on three axes as follows:
  - Drag left/right to rotate the source about the Y (vertical) axis.
  - Drag up/down to rotate about the X (horizontal) axis.
  - Drag while holding ALT down to rotate about the Z axis.
- Drag on a single numeric slider, or hold down CTRL to constrain rotation to one axis.

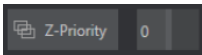
**Tip:** If you click a numeric field (or right-click it), you can type a value into the gadget using the keyboard; press **ENTER** to complete the editing action, or **ESC** to cancel it).

The Crop DSK/KEY controls in this group are similar to those found in the Input tab, as discussed in [Input Configuration](#). However, these settings are applied to the DSK/KEY layer, without any impact on the source itself as it may be displayed elsewhere in the Switcher.

- Info:** DSK and KEY layers automatically appear on the Preview and (M/E Preview) monitors when the Position panel is open (regardless of layer display options). This allows you to modify a layer's position without the result being inadvertently shown on output.

## Z-Priority

Normally, KEY and DSK layers appear in numeric order from back (furthest from the viewer) to front. This if DSK 1 and DSK 2 are both displayed and occupy the same position in the frame, the content in DSK 2 occludes DSK 1.

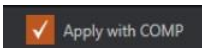


The **Z-Priority** setting in DSK and KEY layer positioning panels allows you to revise the default layer order on a selective basis. This feature was specially implemented to provide additional flexibility for use with the *COMPS* feature.

For example, imagine an M/E set up with 4 KEYS supplying a quad-box setup for four remote interviewees over a background supplied by the M/E. You might want to use Comps to zoom the top-left input up to fill the screen while the moderator chats with that person. Normally, KEYS 1-3 would always appear *behind* KEY 4 – not what you want at all. Z-Priority lets you move any KEY to the front (and the setting is stored in your Comps).

The range of Z-Priority settings runs from *-10* to *+10*, with a default *0*. A layer with a higher index is shown in front of those with lower indices. When two layers have the same layer priority, they are rendered in their natural (DSK/KEY layer) order.

## Apply with Comp

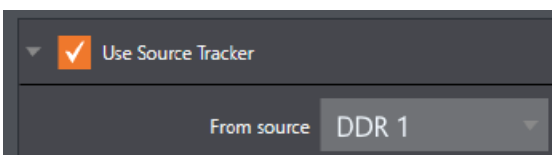


Comps are a type of preset that stores complete Switcher or M/E setups.

By default, the settings stored in a Comp include the Position, Crop and visibility state for each DSK or KEY layer. Disable the Apply with Comp feature if you want to exclude a given DSK/KEY channel from Comp control, handling it manually instead.

- Tip:** Ensure that a station ID bug shown over output is not accidentally removed by application of a Comp.

## Use Source Tracker



**Use Source Tracker** lets you assign motion data output from the Tracker for any video source to modify the position of the current DSK or KEY layer by selecting it in this menu.

Position settings enabled in the DSK/KEY tab continue in force but are applied relative to Tracker output. For example, X and Y Position settings entered in the upper part of the panel result in an offset from the co-ordinates supplied by the Tracker.

See section [Input Configuration](#).

## Borders, Edges and Shadows



The **Borders, Edges and Shadows** group also provides each DSK, KEY and M/E layer with three quick access border preset slots.

- ❑ **Tip:** Since these are per-layer Position effects and can be controlled – even animated – by Comps, you can use the **Borders** feature to create custom multi-box compositions in M/Es.

These powerful effects can include full color overlays, backgrounds, matte layers for keyhole effects, and shadows.

- You can freely scale, position and rotate various Switcher sources, add custom borders, overlays, shadows, and so-on, over custom backgrounds. In addition to hundreds of supplied borders, you can easily create elaborate custom effects using Adobe Photoshop™.
- Define a Photoshop™ format file with three (rasterized) layers.
- The uppermost layer contains foreground elements (such as a bezel).
- The next layer is treated as a mask based on opacity and defines the part of the source image that appear in the result.
- The bottom layer supplies a background to appear behind transparent parts of the source (as, for example, when LiveMatte is applied to a source).





A template PSD file is supplied to assist you to do this. The multi-layer Photoshop™ file is in the Borders folder at C:\ProgramData\vizrt\Effects\Borders.

**Tip:** Since the opacity of the mask layer can vary between fully opaque and fully transparent, you can easily prepare soft-edged effects such as vignettes. Also, as foreground and background layers can optionally be empty, a simple opaque shape in the mask layer can serve a variety of imaginative purposes.

## Transparency

Sources assigned to DSKs are often partially transparent. This might be because they are drawn from a Media Player (DDR) file that includes an embedded alpha channel, or because LiveMatte or Crop options are enabled for the source, or perhaps because a Network source includes an alpha channel, or even all of these factors operating together.

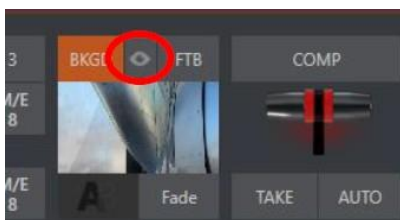
In all of these cases, DSK layers automatically respect transparency when supplied by the source. The BKGD layer and all visible content in lower-numbered DSKs appear through or around sources with transparency as appropriate.

**Important:** It's best to use files with straight (non-premultiplied) alpha channels for media players. Premultiplied files generally do not yield correct results when overlaid on other imagery.



DSK layers offer a lot of creative possibilities. For example, you can use DSK channels to display a permanent station ID bug, superimpose a company logo onto a title page, add a spinning globe animation playing in the DDR to a lower-third, frame a keyed source composed over a title, or set up other similar effects.

## 8.5.2 Background Controls



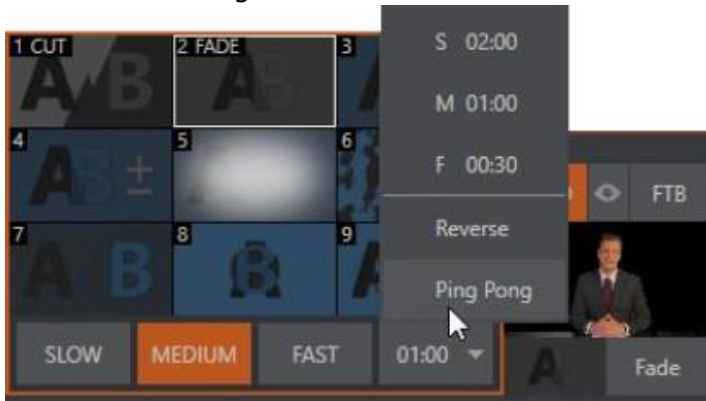
The **QuickSelect** button (marked with an *Eye* icon to associate it with visibility) is located in between **BKGD** and **FTB**.

- Click to update the Switcher's T-Bar delegate and transition states so that the next TAKE or AUTO operation will remove all visible DSK or KEY layers from output. (On supporting control surfaces, press **ALT and BKGD** to trigger the QuickSelect feature).



### 8.5.3 Background Transition Group

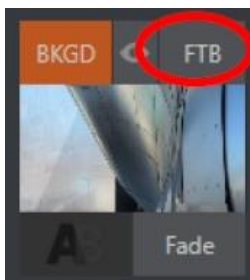
Transition controls in this section apply to the Background video layer only. In most respects, these tools are identical to the DSK transition controls discussed earlier, but there is one difference worth mentioning.



The **Duration** menu for the Background transition offers two items not included in the similar DSK/KEY controls:

- **Reverse:** Configures the current transition to run in reverse direction the next time it is applied.
- **Ping Pong:** Causes the direction of the transition to be automatically swapped after each time it is applied.

#### FTB

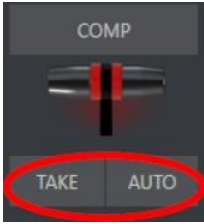


The acronym stands for *Fade to Black*. FTB offers a convenient method of doing what its name implies – fading Program output completely to black. It might help to think of FTB as a final video layer added above all others before Program output, completely obscuring everything below it.

As a memory aid, the FTB button pulses during operation. FTB's fade duration is drawn from the BKGD transition setting.

- Note:** Hold down **SHIFT** while pressing the **FTB** button on a control surface to initiate an FTB operation. Hiding or displaying FTB triggers both Autoplay and Audio Follow Video when enabled for Media Players. It also fades Master Audio to mute when displayed, and back up again when hidden.

## Take and Auto



Clicking the Background layer’s **Take** button (keyboard shortcut **ENTER**) performs a straight cut for all video layers that are currently delegated. Likewise, if you press **Auto** (or the keyboard **SPACEBAR**), the transitions assigned to all delegated video layers are performed.

**Tip:** You can halt an Auto operation partway by clicking the button a second time during the transition. The operation is completed the next time you click the button.

## T-bar

Enables manual transition between selected video layers. Pull it downward by dragging it with the mouse pointer. Drag it all the way to the bottom and release to complete a transition; the T-bar then pops back to the top.

**Tip:** When the T-bar is dragged part way, a partial transition occurs. With certain transitions this can be useful for split screen effects.

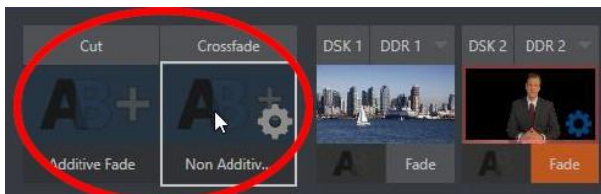
## 8.5.4 Express Mode Switcher

Express mode presents a simpler view of the Switcher, intended for less complex productions.



- To open Express mode, click or tap the **EXPRESS** tab at right above the Switcher.

## Background Transition



Note the quad-selector located between the single Switcher row, and the DSK controls at right. Cut and Crossfade mode buttons top this control group.

1. Click or tap either the **Cut** or **Crossfade** button to activate the corresponding Background transition. Just below these you see two selectable transition controls.
2. Tap or click these to activate the effect represented by the icon as the current Background transition instead.
3. To open a transition selector to choose a different transition for either of these slots, click the gear that appears at lower right when your mouse pointer is over the icon.

- ❑ **Tip:** Although the gear is not visible in a touchscreen scenario, you can still tap the lower right corner of the icon to open the transition bin.

## Switching

1. Selected the Background transition.
2. Click or tap the button for the source you wish to send to Program output.  
There is no need to make a Preview row selection first, as you would need to do in the standard (two-row) Switcher.
3. The Background transition you chose is applied to display the new source.

## DSKs

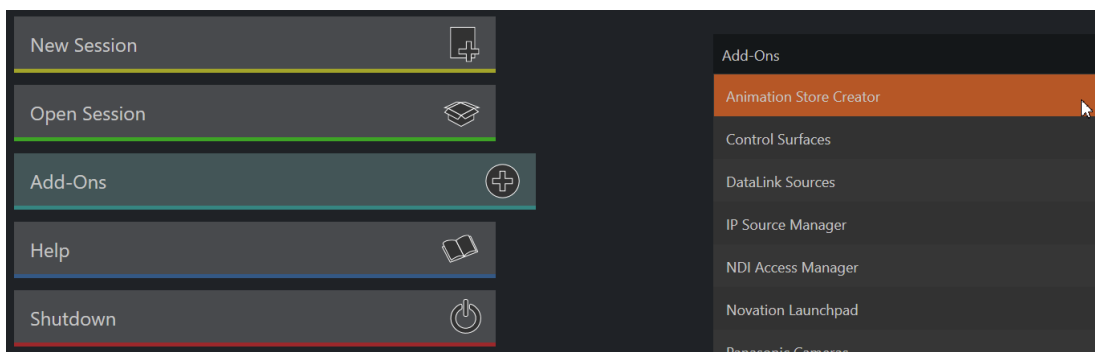
The two DSK control groups at right work just like the [Standard Mode Switcher](#), but it is particularly handy that you need to click or tap their viewport to show or hide the associated DSK layer.

## 8.5.5 Transitions with Animation Store Creator

You can also employ special transition effects called *Animation Stores*. A useful utility the *Animation Store Creator* is included in your Live production system.

- These powerful effects normally include an embedded full color animated overlay, along with sounds for transitioning in and out (sounds are optional).
- The audio level for Effects is controlled in the **Audio Mixer** tab below the Switcher.
- Animation Store transitions are loaded into the **Transition Palette** in the same way as simpler transitions, using the **Browse** feature.
- Some Animation Store transitions contain custom animation content you have to access to can only be modified with third party software.

To open the Animation Store Creator



- From the Start-up screen, select **Add-Ons > Animation Store Creator**.

## 8.6 Comps

The **COMP** button, immediately above the T-Bar opens the Comp Bin, which provides powerful layer and effect control features.

- Refer to section [Comp Bin](#).

- ❑ **Note:** The Animation Store Creator utility is described in its own manual, available at the Launch menu (**Help > Add-Ons > Animation Store Creator**) or at the [Vizrt Documentation Center](#).

**□ Comps are not MEMs**

**Note:** It is important to distinguish Comps and Switcher MEMs.

- The main difference is that MEMs retain (and apply) all settings in the Switcher, including source selection.
- Moving the cursor to the left edge of the screen next to the Switcher or an M/E reveals a *MEM bin* with similar features.

## 9 Monitoring Video

Your Viz Vectar Plus system provides extensive and versatile monitoring for controlling your live productions. Monitoring features also warn you of conditions that might affect output quality, as well as providing access to adjustments providing quality control and creative alternatives.

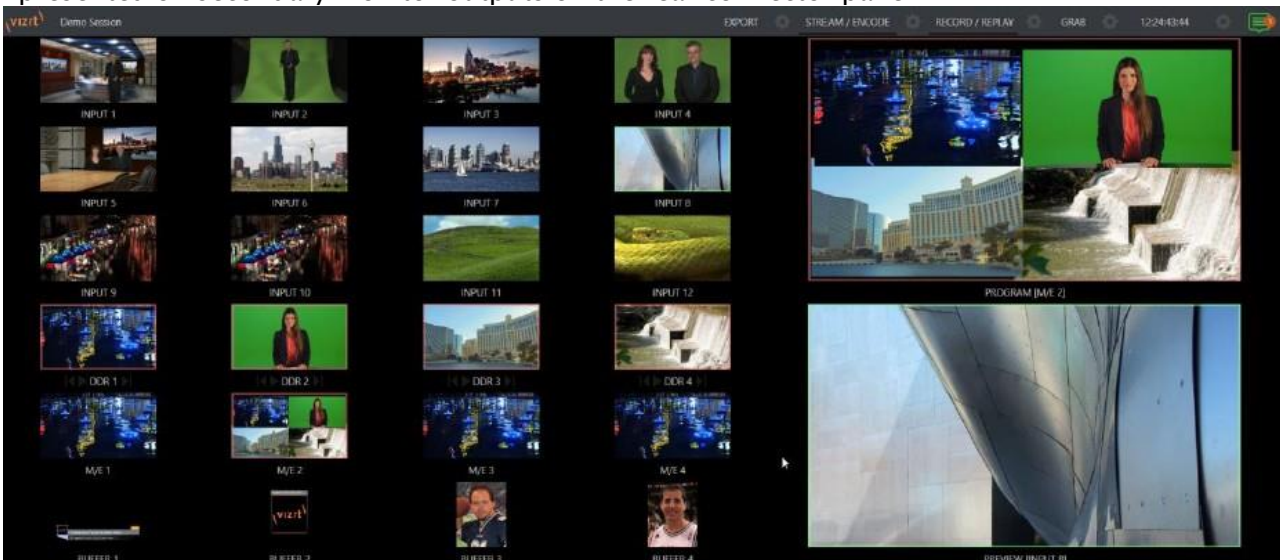
Features include Proc Amp, LiveMatte, Hotspot, Tracking and Edge controls (see section [Input Configuration](#)).

This section covers the following topics and procedures:

- [Live Desktop and Multiview](#)
- [Live Desktop Monitors](#)
- [Workspace Presets](#)
- [Scopes](#)
- [Viewport Options](#)
- [Viewport Tools](#)
- [Program Monitor](#)
- [Look Ahead Preview](#)
- [M/E Preview and Program](#)

### 9.1 Live Desktop and Multiview

The Live Desktop provides a number of multiview monitor displays: One on the Live Desktop (the Interface), normally comprising its upper third, the others consisting of fully independent displays presented on secondary monitor outputs on the rear connector panel.



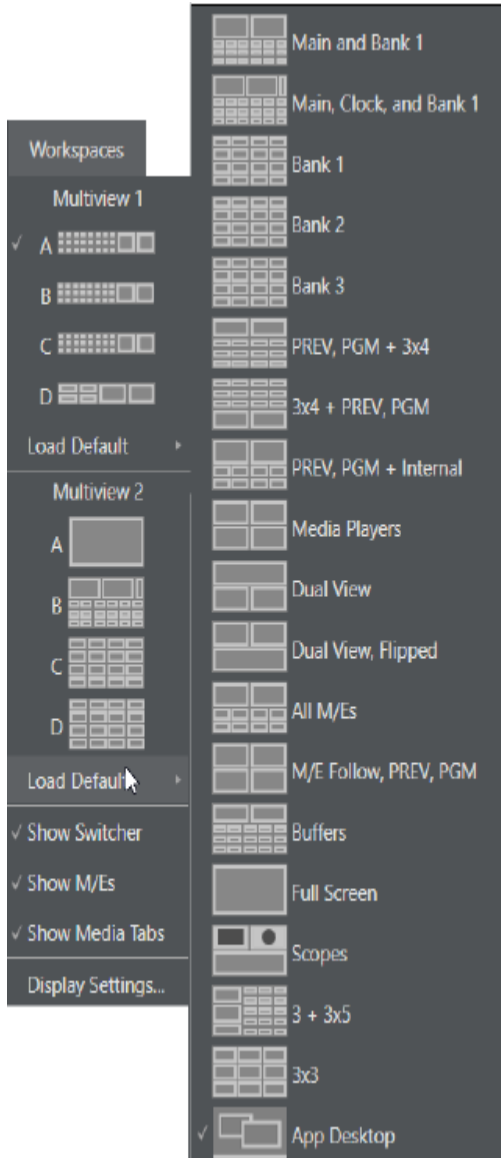
### 9.2 Live Desktop Monitors

Because the Live Desktop provides various control features along with a multiview pane, and controls can consume a greater or lesser amount of the screen, the multiview on the Live Desktop is adaptive.

To put this another way, the viewport layout of the Live Desktop's multiview pane re-arranges itself as required to make optimal use of the space available.

For example, when tabbed modules (such as the DDRs) at the bottom of the Live Desktop are fully expanded, the Program and Preview viewports above are stacked one above the other. On the other hand, if the tabbed modules are minimized, these viewports are side by side.

## 9.3 Workspace Presets

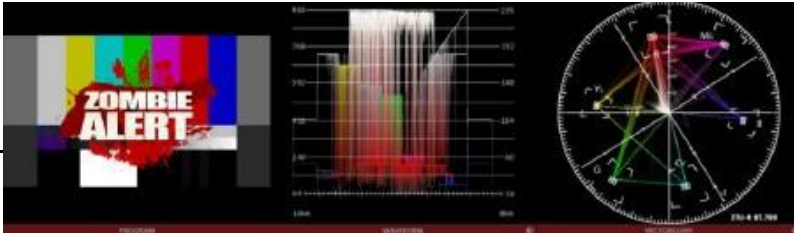


The basic layout of all multiview monitoring areas is established by assigning a Workspace preset to the screen. To access these presets, move the mouse pointer over the left-hand end of the Dashboard at the top of the Live Desktop to reveal the Workspaces menu.

Four presets, labeled A-D, are provided for each connected Multiview screen. Select a preset and assign a layout to it using the Load Default menu point. Continue to customize the display options for the viewports, and recall the entire setup at a moment's notice by reselecting it (to reset a preset, select it again and reload the default layout). Each viewport in any layout offers diverse input or output source options. The settings you select for individual monitors are retained in the current Workspace preset.

- ❑ **Note:** The Display Settings option in the Workspaces menu lets you choose the Resolution of connected monitors, and apply Proc Amp settings to them. Select the native resolution of external display devices for best results. Changing Resolution can cause frames to be dropped, so modifications during live production are discouraged.

## 9.4 Scopes



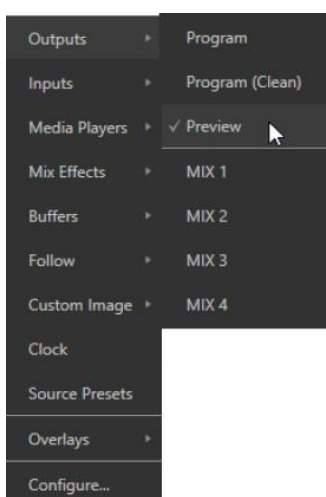
Scopes represent a very useful monitoring option, providing Waveform and Vectorscope displays. Among other things, these help you to judge Proc Amp and LiveMatte settings (see [Video Calibration](#)).

To display the Scopes view, select that entry from the Load Default options for a Workspace. By default, scopes and the associated monitor refer to the Look Ahead Preview composition (including delegated DSK channels, or FTB), shown at left for reference. Right-click a scope to change the monitored source to the source you wish to view. Adjust the Brightness controls in the scope footers, and the trace overlay in full or solid colors using the context menu.

- ❑ **Tip:** To use Scopes to calibrate a DSK source independently, first select it as the Preview row source.

Double-click a monitor in this Workspace to access Proc Amp and LiveMatte™ controls for the current source.

## 9.5 Viewport Options



**Right-clicking** an individual monitor viewport also opens a context menu. The first option group governs the monitor's *source*.

In addition to external video inputs and network sources, you can assign the output of

- Media Players
- M/Es
- Main Program output (including DSK channels and effects)
- Program (Clean)
- The main Switcher's look ahead Preview
- Another Preview showing M/E source B output (Mix mode only)
- Any Output.

Several special displays are also available.

- Selecting the Clock item replaces the video display with Event Clocks showing current time along with countdown style Start and End clocks.
- The Custom Image feature lets you display a network logo.
- A Timecode Only option that appears at the bottom of the Media Players sub-menu. This displays a time counter showing the current position of the playhead in the Media Player (respecting the specified player's *Warning Colors* option, too).



Below the basic source selection options in the menu, you'll find another group that provides access to optional Overlays for the monitor port.

Available overlays include:

- Checkerboard (shows a checked pattern wherever transparency exists in the source).
- Title Safe (note this is a 4:3 format safe margin).
- 4:3 Safe (a true 4:3 frame edge boundary).
- Center Cross to help with alignment.
- Show Illegal.
- Show Alpha.

In addition, you may choose to display:

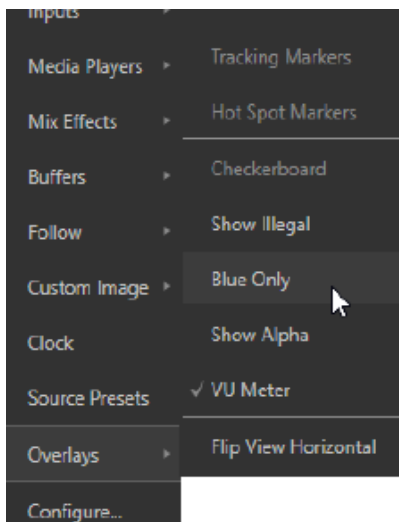
- VU Meters with the source
- Tracking Markers
- Hot Spot Markers.

Long-standing practice when using color bars to calibrate video signal color attributes requires special video monitors with 'blue only' (or 'blue-gun') displays.



The *Blue Only* viewport option means you can now use any color monitor for this purpose.

*Flip View* flips the images horizontally, useful for a variety of studio requirements such as talent orientation in greenscreen applications (including Hotspot operations).



### 9.5.1 Viewport Presets



From corporate video to reality TV, PTZ cameras are playing an expanded role in modern production. Viz Vector Plus gives top billing to your PTZ presets right in its Live Desktop or any connected Multiview. The viewport context menu option **Source Presets** lets you assign preset controls to any viewport. Large, colorful thumbnail icons represent PTZ presets for robotic cameras, Pan and Scan presets (virtual PTZ), and M/E Comps (or zoom presets on systems lacking Comp support).

With a click, or tap on a touchscreen, your source moves to its new position (Pan and Scan sources can also be set to Cut).

Using Viz Vector Plus' Multiview workspace options you can create custom layouts providing one-click access to presets for multiple sources of different types.

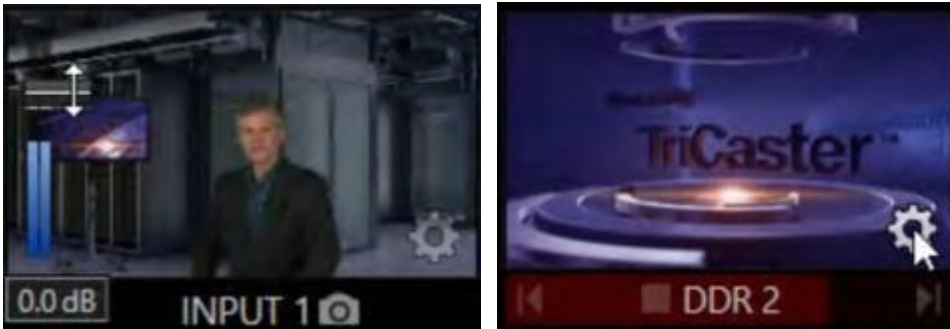
## 9.5.2 Configure

- **Configure:** Opens the Input Configuration panel for the corresponding source.

**Tip:** Double-click a viewport to quickly open Input Configuration without using the gear or menu.

## 9.6 Viewport Tools

Viewports provide additional features when you move your mouse pointer over them.



When the VU meter overlay option is enabled, a volume knob (similar to those in the Audio Mixer) is shown.

- Drag this knob up or down to modify the audio source associated with this input.

**Tip:** When using a touchscreen with the Click Viewports to Show on PGM option enabled, swiping the monitor horizontally (rather than tapping it) will temporarily display viewport overlays.

Clicking the **Configuration** (gear) icon for a Switcher input, a Preview monitor, or Program, opens the corresponding **Configuration** panel. Notice, too, that a snapshot icon appears in the label below most viewports. Click this to quickly grab a still image (images grabbed in this manner obey the Add grabs to option in the Grab Configuration panel).

**Tip:** When LiveMatte, Proc Amp, or Crop settings are active for a source, the configuration gear gadget for a viewport is color coded and shown full-time.

The viewports for Media Players show handy transport control in the label area: From left to right, **Previous**, **Play/Stop**, and **Next**. In addition, a progress gauge is shown in the background to show the playhead position and warning colors as playback nears its end.

## 9.7 Program Monitor

The Program Output monitor could hardly be more important, hence its prominent default location at upper-right on the Live Desktop.



Normally, this viewport shows what the Switcher is sending to Program output at any moment. The display includes the BKGD video layer as well as any other video layers (such as one or more DSKs, or FTB) displayed above it.

- ❑ **Note:** By default, Program output is sent to the MIX 1 output, subject to assignments made in the Output Configuration pane. When you move your mouse pointer over the Program monitor, a **Configure** button (gear) appears at lower right. Clicking this button opens the Configuration panel (see [Output Configuration](#)).

## 9.8 Look Ahead Preview



By default, the Live Desktop also prominently displays the Look Ahead Preview monitor (labeled *Preview*). The Look Ahead Preview is versatile and powerful. Instead of showing just one video source (the Preview row selection), it displays what the outcome of a Take operation applied to all currently delegated video layers would be.

- Delegating the BKGD layer indicates you intend the next transition to swap the Program and Preview layers. The Preview monitor shows the Preview row selection as its background.
- When the BKGD is not delegated, that layer does not change during a transition. In this case the Preview and Program monitors share identical backgrounds.
- Delegated DSK layers are shown above the background on Preview according to their current state. If a delegated DSK layer is currently displayed on Program output it does not appear on Preview (since the next transition would remove it).

In other words, what you see is what you get: After performing the next Take or Auto operation as currently configured. This lets you set up the next shot, check its composition (including titles and overlay positioning), and switch to it with sublime confidence.

## 9.9 M/E Preview And Program

Your live production system also provides a Look Ahead Preview monitoring capability for M/Es.

- Monitor viewports can be assigned to display the output of M/Es.
- You can freely assign a monitor as a secondary program output monitor in cases where you are using an M/E to supply an auxiliary program mix for independent display.
- Viewports can be assigned to specific M/Es, or follow the delegate status (**Outputs > Follow > M/E Program**).

## 9.9.1 To work with the *M/E Preview* option

The **Viewport Options** menu group **Follow**, lists a special *M/E Preview* option for this purpose.

- **Tip:** All viewports assigned as M/E Previews show output from the same M/E. Making an M/E delegate selection updates all viewports when Tabs Follow all Delegates is enabled.

Just like the main Look Ahead Preview, the M/E Preview respects *Delegate* selections made in the **Transition** section of the assigned M/E. This shows what results from the currently configured (M/E) Take/Auto operation.

## 10 Media Players And Buffers

The Media Player manager enables you to add video, stills and title pages to your live presentation. You can either display media sequentially in a playlist, or on-demand for an ad-hoc production.

**Media players** can play, stop and advance automatically in response to Switcher operations.

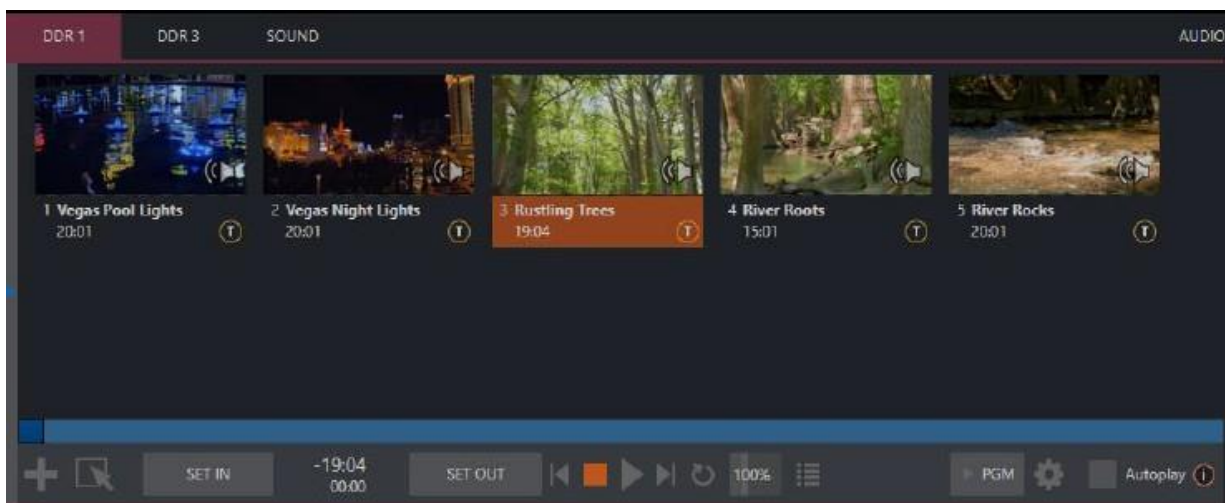
**Buffers** enable you to create and play animated effects, freeing up your media players for longer format playback.

This section presents:

- [Media Players](#)
- [Title Pages](#)
- [Buffers](#)

### 10.1 Media Players

Your live production system includes several integrated media players, providing saving, convenience and opportunities for automation. Media player controls are accessed from the large tabbed panes at the bottom third of the Live Desktop, or from tabs with similar features that appear in the **Input Configuration** panels of each media player.



As well as sound players (accessed from the **SOUND** tab), you have DDRs (clip players) and/or GFX (graphics) players and four DDRs.

- [Playlists](#)
  - [Automatic Clip Trimming](#)
  - [File Operations](#)
  - [Speed](#)
  - [Macro Triggers](#)
  - [Transcode](#)
  - [Properties](#)
  - [Trimming Clips and the Scrub Bar](#)

- Time-Shifting
- Alpha Channel Support
- Media Browser
  - Location List
  - File Pane
- Player Controls
  - Time Display
  - Playlist Mode
  - Transport Controls
  - Speed
  - Loop
  - Autoplay
- Show On (...)
  - M/E on PGM
- MEMs
  - Previewing MEM Slots
- Network Sharing

Media Players can handle numerous media types.

DDRs can display:

- **Video clips:** Including motion titles such as scrolls, and longer format movies.
- **Titles and still images:** Editable title pages prepared using Photoshop®, CG pages prepared as image files, or other still imagery, photos, graphics and more.
- Both sound players and DDRs can play standard *.wav* or *.mp3* format audio files.

**Hint:** DDR is short for *Digital Disk Recorder*, a legacy term that is technically incorrect since these DDRs don't directly support recording.

### 10.1.1 Playlists

The main feature of all media players is a storyboard-style playlist, used to organize content for use during live productions.



This arrangement offers easily visible thumbnail icons for each entry. A scrollbar to the right reveals long playlists, as required. Icons in the playlist can be re-ordered using the familiar drag and drop workflow. The playlist can also be altered during playback (Note that if the currently playing item is removed, playback stops immediately).

An *Alias* (by default, the item's filename) is displayed below the icon, along with the item's duration.

- ❑ **Tip:** The duration shown is the play time after trimming, and thus may be less than the file length on disk. In such cases, the In and Out markers on the Scrub bar (spanning the width of the playlist immediately below it) show the effect of trimming operations, while the full width of the Scrub bar depicts the total length of the file on disk.

Clicking an item selects it. The play position is automatically set to the In Point on selection. Standard **SHIFT** + click and **CTRL** + click multi-selection operations are supported, and all selected items are denoted by a white border around their icon.

When a media player is stopped, its output to video monitors tracks selection and trimming operations. The current item is the media player's output, and appears on monitors dedicated to the player, if any. Only one item can be displayed on output at a time; the frame surrounding the thumbnail icon for the currently displayed item is illuminated. Double-clicking a thumbnail (or clicking the **Play** button) begins playback from the In Point of the current file.

- ❑ **Tip:** Double-clicking elsewhere in the playlist pane opens the **Media Browser** (hold down **SHIFT** when clicking to open a system file explorer instead of the custom Media Browser).

Note that even still images and static title pages added to the playlist are given a play duration. The default duration for these items is *five* seconds. Duration can be adjusted on an item by item basis (or collectively for multi-selected stills or title pages).

During playback, the footer of playlist items illuminates as each is played in turn. When necessary, the playlist pane scrolls to display the icon for the currently playing item. A progress bar is displayed beneath the currently playing thumbnail, and the Scrub bar knob also tracks playback progress.

- ❑ **Tip:** Selection status is independent of which clip is playing. Selected items have a white border in the **Playlist** pane.

## 10.1.2 Automatic Clip Trimming

Clips (*not* still images or titles) in a playlist are automatically trimmed to accommodate the addition of transitions between clips when necessary (If there are no unused frames to display during a transition, motion appears frozen during the transition, which is usually undesirable.)

To reset a clip to its full file-length boundaries, press the **G** key (multi-selection is supported, too).

## 10.1.3 File Operations

- Click the **Add Media** (large +) button at left beneath the playlist pane to open a custom **Media Browser**. Alternatively, **double-click** in an empty part of the **Playlist** pane.

- ❑ **Note:** Add Media also supports compatible third-party asset management systems. Hold down the keyboard **CTRL** key when clicking the + sign to access these tools.

- Newly-added files become selected items in the Playlist pane.
- Drag (appropriate type) file(s) from one module's playlist to another module.



- Right-click in the Playlist pane to show a menu with context-relevant items from the following list (operations affect selected playlist items):
  - Cut
  - Copy
  - Paste
  - Remove
  - Split at Current Frame
  - Audio Level (clips with sound and audio icons) – note that the default per-clip audio level applied to imported media files can be set in the Dashboard Options menu.
  - Duration
  - Speed
  - Use Current Frame as Icon
  - Angle
  - Automation
  - Edit Title
  - Properties
  - Transcode
  - Add to Export Media
  - Send to > Buffer n (Still image and title icons – see [Speed](#))
- Standard Cut, Copy, Paste and Delete keystrokes are supported for playlist entries.
- Unplayable (missing, corrupt, or unsupported) file icons are dimmed.

**Tip:** Multi-selection is supported for most operations, including Set Duration (applies to *Still* and *Title* only).

### 10.1.4 Speed

The playlist context menu item *Speed* permits you to give each clip a custom playback speed. It's important to realize that this *Speed* setting is separate from the Media Player's primary *Speed* control, located in the footer, below the Scrub bar. The latter setting applies to all playlist items.

Both *Speed* settings are applied during playback. So, for example, if you play a clip with both *Speed* values set to 50%, the actual playback rate is just 25%.

### 10.1.5 Macro Triggers

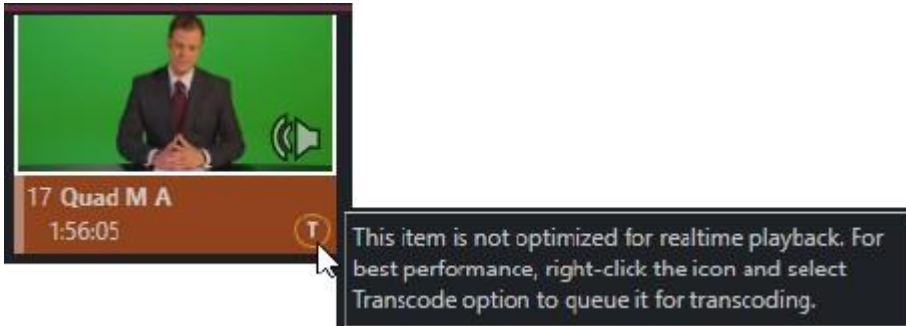
We've discussed in [Input Configuration](#) how you can assign macros to any Switcher source, including Media Player. Beyond this, though, the playlist context menu item *Macro Triggers* allows every item in a playlist – every clip, still image, audio file or title page – to control its own unique macros.

- Any macro you can record or create can be triggered automatically on either playback or end of play for any and every individual playlist item.
- Multi-selection support in the playlist makes it a breeze to assign macros to multiple items.

**Tip:** You can use this capability, for example, to automatically show titles for certain types of clips and not others, give them different title page types, selectively adjust Proc Amps or apply LiveMatte keying automatically when needed for only certain items.



## 10.1.6 Transcode



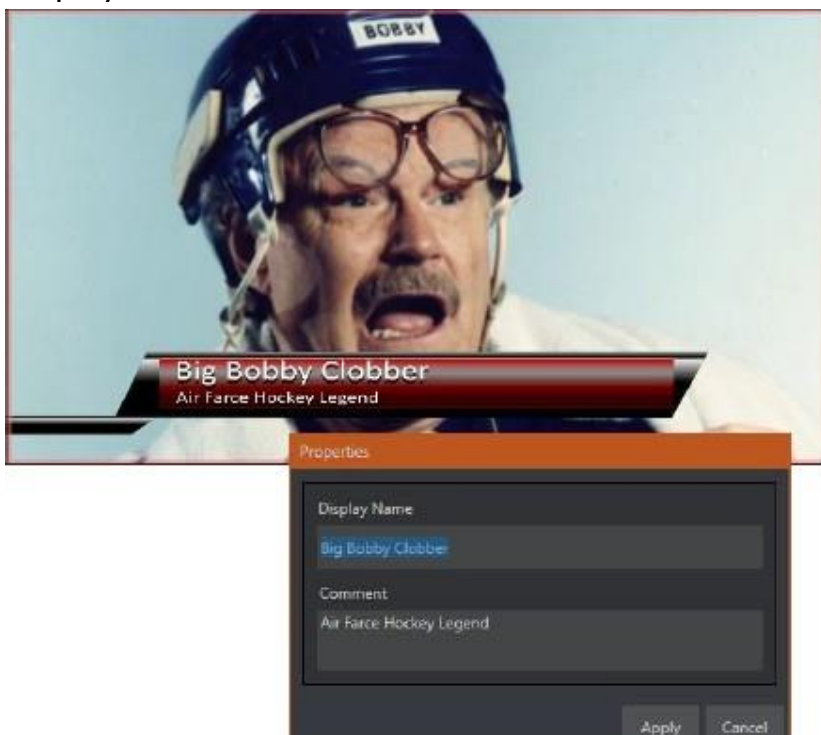
When clips are added to the DDR playlist, their suitability for real-time playback is evaluated. When appropriate, a small **T** icon is added to the entry's label, indicating that the item can be transcoded to a more suitable format.

To transcode the clip, select the Transcode option in the clip's context menu. The process proceeds in the background, and the DDR's link to the original file is automatically replaced when it is complete.

**Note:** Transcoding operations support multi-selection.

## 10.1.7 Properties

### Display Name



The Properties panel allows you to edit the Display Name of a file in the playlist. The Display Name fields defaults to the filename, but is a local alias, or nickname. Thus, editing the name does not change the name of the file on your hard drive.

Roll the mouse over the icon display name to see the true filename and its path.

## Comment

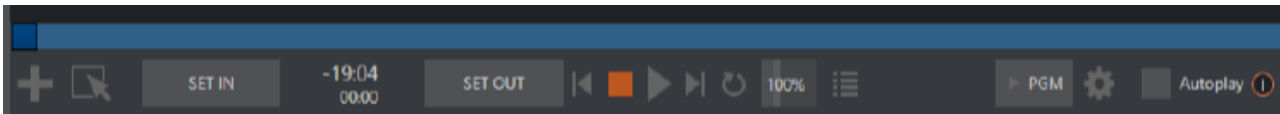
The Comment permits you to supply metadata with the file.

- ❑ **Tip:** Both the Display Name and Comment box content for the selected clip are available as DataLink keys, which can in turn be served to live title pages or supplied along with the file to the Publish module.

## 10.1.8 Trimming Clips and the Scrub Bar

Just beneath the playlist pane is a full-width Scrub bar. The width of the Scrub bar represents the full run time of the current clip or other media file.

- Drag the knob to change time position.



In and Out Points for newly added Media are automatically adjusted when necessary to accommodate motion when transitions you add require it.

- To reset the file to its full length, press the G key.
- To trim a clip manually, move the knob to the desired frame and press I or O on the keyboard (to set the In Point or Out Point, respectively).

During playback, the Scrub bar knob traverses the span between the In and Out Points.

- The duration (taking into account trimming operations) is displayed as a countdown in the upper of two timecode fields at left.
- The lower time display shows embedded clip timecode.
  - Drag the knob to move quickly backward or forward in the clip.
  - Audio is normally muted during scrubbing. Hold down CTRL to unmute it.
  - Hold **SHIFT** while dragging the Scrub bar knob to increase precision.



## Growing files

Quicktime only: Clips that are still being captured, continue to grow even after addition to a DDR playlist. These growing clips, featuring the red recording overlay can be freely extended beyond the bounds of the in and out points they were given when initially added.

It can be very useful to recall that you can easily split clips using either the corresponding context menu item, or the / key.

## Time-Shifting

You can use growing clips to time shift your program:

1. Initiate Recording.
2. Add the captured clip to a DDR.

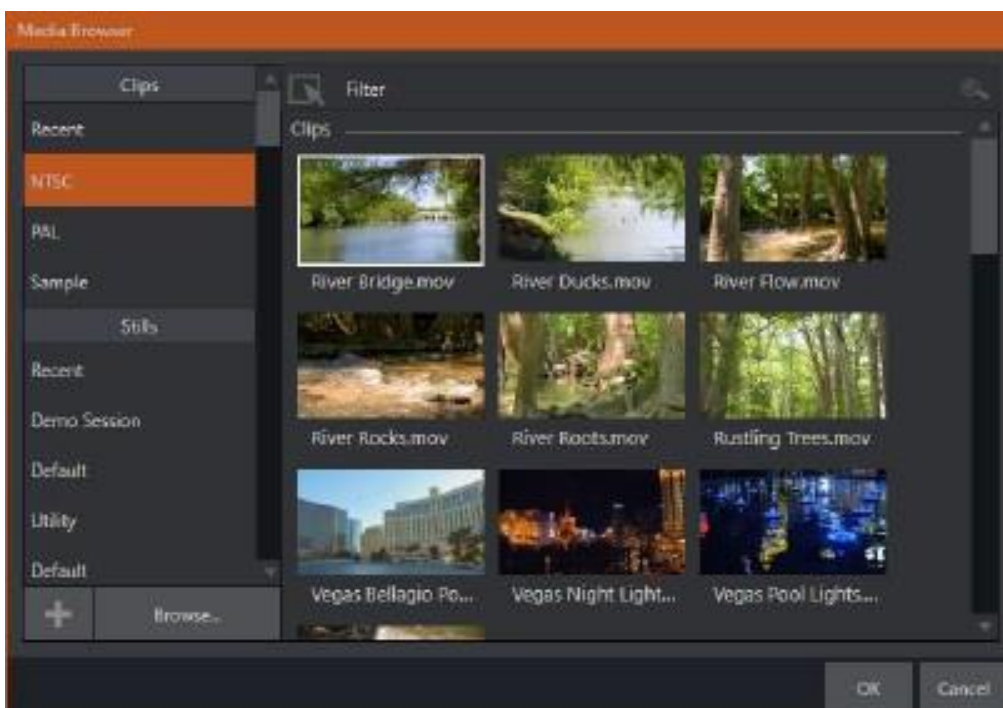
3. Press **G** on the keyboard to clear its Out Point.
4. Trim the In Point to taste.
5. Assign the DDR to an output.
6. Wait some length of time and then begin playing the clip (All this could easily be performed by a *macro*, too.)

## Alpha Channel Support

For files with transparency, such as 32-bit image files, use non-premultiplied (or straight) alpha channels in Media Players (premultiplied files will not give correct results when overlaid on other imagery).

**Tip:** Monitors can optionally show a checkerboard pattern behind transparent content.

## 10.1.9 Media Browser



The custom Media Browser provides easy navigation and selection of content on your Vizrt live production system or on the local network.

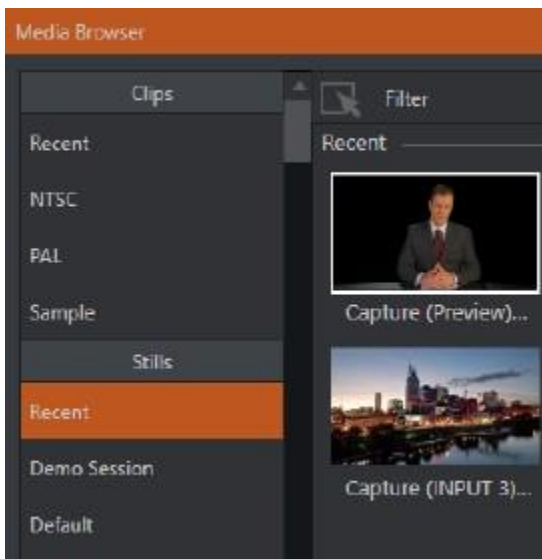
The Media Browser appears anywhere in the Live Desktop that you might wish to select content, transitions or effects for use in your project (such as the Media Players, LiveSet and Transitions sections).

Its layout is principally comprised of two panes at left and right that we'll refer to as the Location List and File Pane.

### Location List

The Location List is a column of favorite locations, grouped under headings such as LiveSets, Clips, Titles, Stills, and so on.

## Session and Recent Locations



The Media Browser layout is principally comprised of two panes displayed at left and right that we'll refer to as the Location List and File Pane.

The Media Browser is context sensitive, so the Location headings shown are generally appropriate for the purpose for which they were opened. A list of sub-headings appears under these main headings in the Location List. These may correspond to named sessions, or groups of content. When you select a sub-heading, the right-hand pane (the File Pane) is populated.

In addition to locations named for your stored sessions, the Location List includes two notable special entries. The Recent location provides quick access to newly-captured or imported files, saving you time hunting through a hierarchy to find them. The Session location (named for the current session) shows you all files captured in the current session.

- ❑ **Tip:** Clips that are being actively captured are marked with a red record overlay. These clips continue to grow, and can be re-trimmed after their addition to DDR playlists or the Publish Queue.

## Add Media Location & Browse

- ❑ **Tip:** To jump to the standard system file explorer (rather than the custom Media Browser) from a Media Player, hold keyboard **SHIFT** while clicking the **Add** button.

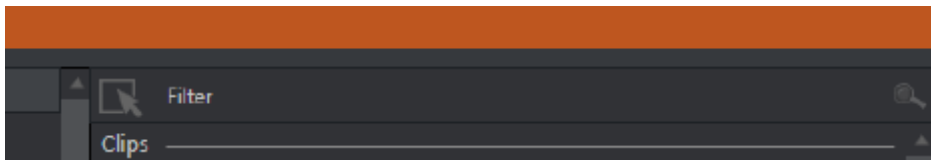
Clicking **Browse** opens a standard system file explorer, rather than the custom Media Browser.

## File Pane

Icons appearing in the File Pane represent content located inside the sub-heading selected at left in the Locations List. These are grouped under horizontal dividers named for sub-folders, which allows related content to be organized conveniently.

## File Filters

The File Pane view is filtered to show only relevant content.



An additional filter appears above the File Pane. This filter quickly locates files matching criteria you enter, doing so even as you type.

For example, if you enter “wav” into the filter field, the File Pane displays all content at the current location with that string as part of its filename. This would include any file with the extension `.wav` (WAVE audio file format), but also `wavingman.jpg` or `lightwave_render.avi`.

## File Context Menu

- **Right-click** on a file icon in the right-hand pane to show a menu providing **Rename** and **Delete** options.

Be aware that **Delete** really does remove content from your hard drive. This menu is not shown if the item clicked is write-protected.

## 10.1.10 Player Controls

Transport controls and playback settings are located directly below the Playlist and Scrub bar.



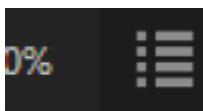
## Time Display

During playback, the uppermost timecode field beside the transport controls displays the current countdown time for active playlist item or for the entire playlist when the Playlist mode button is enabled. (The time show below is the embedded clip timecode.)

- **Tip:** The time display and Scrub bar color provides visual indication that the playback is nearing its end. Ten seconds before the end of play for the current item, the digits in the time display and the Scrub bar background turn amber. With only five seconds left, the color changes to red.

- Left-click the field to type in a timecode, then press **ENTER** to jump to that point in the file (or playlist)

## Playlist Mode



Normally, Media Player playback stops when the Out Point of the current playlist item is reached (unless Loop is also enabled, in which case playback of the current item repeats until manually interrupted).

- Clicking the **Playlist mode** button tells the Media Player to operate in continuous play mode, advancing through the playlist items until the last one has played.

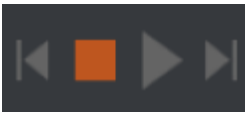
## Transport Controls

A simple set of controls beneath the playlist pane provides all playback-related functions:

- \*Previous button – go to previous playlist entry
- Stop (clicking Stop when already stopped goes to the first frame)
- Play
- \*Next button – go to next playlist entry
- (Not shown) – Double-click an entry in the playlist pane to begin playback at the start of that playlist entry

## Previous, Next and Presentations

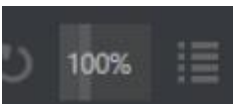
It's extremely useful to realize that, since transitions can be added between playlist items, pressing **Previous** or **Next** likewise employs transitions. Whether playback is underway or stopped, and whether the items are clips or stills, you can use **Previous** and **Next** to transition backward and forward between items.



This provides a perfect way to manage presentations using Media Players, hence our inclination to refer to this as the Presentation workflow. With macros (and perhaps MIDI buttons) driving the presentation, this makes it easy to handle control graphics and video for seminars, to update weather graphics, and more.

- **Tip:** In addition, since transitions support transparency, you can queue up a series of titles in a playlist, display it in a DSK, and transition backward and forward between titles interactively using **Previous** and **Next**.

## Speed



The DDR supports variable speed playback between 25% and 400% of the normal rate (100%). Speed can even be adjusted during playback.

- **Note:** Certain highly compressed video file formats cannot successfully be played back at rates beyond 200%, even though Speed value is set to a higher value.

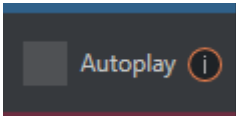
As is common for numeric input controls in the interface, drag left or right to adjust the Speed value, or click the slider to access a direct entry field allowing you to type a value using the keyboard.

- **Tip:** Press **SHIFT** while double-clicking Speed to quickly reset to the 100% default.

## Loop

Enabling Loop repeats playback continuously (respecting the Single switch state).

## Autoplay



When enabled, the Autoplay switch has several important effects. First, it initiates playback automatically when the associated Media Player is placed on Program Out by a (Switcher) Take or Transition operation either directly (as a Switcher row selection) or indirectly: Such as by being displayed via an M/E channel or DSK operation.

If player output is displayed on Program the reverse Switcher transition occurs automatically as the end of play approaches, whether the Out Point of the current item for Single play or the end of the playlist (this behavior is optional for M/Es – see [Mix and Effect Modes](#) and File Menu).

**Note:** Unlike Switcher transitions, the DSK out effect does not occur automatically as the end of play approaches.

In either case, when the Media Player is in standard operating mode (as opposed to Playlist mode), the current play position advances to the next item after playback is automatically stopped.

### 10.1.11 Show On (...)

Another extremely powerful feature is nestled beside just to the left of Autoplay in the footer of each Media Player. Labeled PGM by default, this feature can target M/Es as well as the Program row of the main Switcher. It provides unique playback and display abilities that make instant replay a thing of joy, as well as serving other purposes. Click the **Configuration** button (gear) beside the **SHOW ON** button to display the panel.



The largest part of this panel contains transition bins for custom In and Out transitions which are used to display the current clip. Select **Custom** from the Transition In/Out menus to activate these bins. Otherwise, you can select Cut or Current options.

Note that the bin content displayed is synced with the Background transition bin for the target video bus, be it PGM or a designated M/E. Selecting Current uses the current selection in the Background transition bin of the target bus.

**Tip:** Unlike other transition bins, these icons do not show a + sign gadget on rolling the mouse over them. To replace the effect in slot, modify the content of the Background transition bin of the target you have selected for SHOW ON.



Once configured, clicking the **SHOW ON (...)** button does the following:

- Swaps the current BG transition for the main Switcher or a designated M/E for a custom Animation Store (such as "Replay!") or other specified transition.
- Transitions the current DDR selection in on the main Switcher's PGM row, or the A row of an M/E.
- Plays the clip (overriding the DDR's own Autoplay setting, if necessary).
- Transitions back to the original program using a custom transition (such as "Live!") when done.
- Swaps the Background Transition back to the original selection.

**Tip:** Using Replay complementary features, SHOW ON functionality can be triggered by adding a clip (with custom length and speed defined in the Replay menu) from any source being captured to a DDR. Thus a single button click or number pad key press can trigger all of this.

## M/E on PGM

In a variation on this operation, the On PGM switch, which is available whenever the target is an M/E, provides a different mode of operation. In this case, the output of the Media Player is immediately selected as the top row source of the target M/E, and the M/E is transitioned in on the main Switcher's PGM (Program) row.

This unique feature allows you to use the main Switcher to display the Media Player output – including instant replays – with KEY layers (such as scorebugs) composed above it.

### 10.1.12 MEMs



Another very useful feature of Media Players is the MEM Bin, which provides quick and convenient access to stored playlists. MEM slots also store the state of various Media Player controls.

To display the bin, roll the mouse pointer to the (nearest) side of the screen in a tabbed Media Player or the Audio Mixer tab (for Sound and Audio, MEM slots are presented on the left side of the screen only).

When you change playlists by selecting another MEM slot, it's almost as though you are accessing another Media Player. Use MEM slots for quick access to different categories of content for use during a live presentation, playlists prepared for different clients, or for completely different programs you produce. MEM slots can be named and can also display a small representative image (taken from the first entry in the playlist). As you move the mouse over a MEM slot icon it expands, providing an enlarged view of that playlist item's first frame. To populate a new MEM slot, click a blank icon.

To name a MEM slot, right-click it to open a context menu, and select Rename. Other menu options include **Delete**, **Export** and **Import** (the file is saved with the extension *.pst*).



## Previewing MEM Slots

At times you may wish to preview the contents of a different Media Player MEM slot without disrupting playback of the current playlist. When a clip is playing, a small white play indicator is shown over the icon for the currently selected entry in the fly-out MEM slot bin.

If you select a different MEM slot while the current clip continues to play, the playlist bin view updates, but the original item continues to play. The transport controls (Play, Stop, etc.) at the bottom of the tab remain \*dedicated to the active playlist – that is, the one actually playing, rather than the one currently being previewed in the tab.

To change to the previewed MEM slot immediately – ending playback and display of the current item – you can do so by any of the following means:

- Double-click an icon in the previewed playlist.
- Or press **Stop** twice, and then **Play** (playback of the active item ends with the first Stop command; the second sets the playhead to the start of the current item in the new playlist).

Normally, pressing **Stop** a second time when a clip is playing resets the playhead to the start frame in the same clip. The exception above occurs only when you are previewing the content of a different MEM slot during playback.

### 10.1.13 Network Sharing

Default media file folders are maintained for each session. This approach makes it easy to locate items using the Custom File Browser, and is also convenient for other file management purposes.

The default media locations for the active session can be made accessible across your local network. **Share Media Folders and Buffers in the File menu** is on by default, and allows network clients to update media in the active session, even while live. The following session media locations are dynamically shared:

- Audio
- Clips
- Stills
- Titles
- Buffers

**Note:** Several non-session dependent locations in the main application folder are also shared. This allows applications running on external systems to export directly to the local system. These network shares are unaffected by the **Share Media Folders and Buffers** setting.

When suitable content is added to these shared folders, the **Media Browser** provides immediate access to it. Select the session name (under Clips, Stills, etc.) in the **Location List** at left to reveal the updated files in the **File** pane at right.

This is wonderfully convenient but should be approached with a measure of common sense. Network bandwidth has fixed limits. Be judicious when transferring large files while live. You may be using the network for many purposes – Including streaming, or NDI video feeds from a 3Play® or other third-party software, as well as any unrelated traffic on the network.

**Note:** Transferring very large files across a network can time-consuming and impacts both disk access and network resources. When these resources are already heavily taxed, dropped frames on streaming or video outputs, or sluggish response to controls may result. We strongly urge you to gather media assets before starting your live productions.

## 10.2 Title Pages

### 10.2.1 Working with Title Pages

- [Creating a Title Page](#)
- [Header and Footer Tools](#)
- [Stand-in and Modifiable Images](#)
- [DataLink](#)
- [Title Pages in Buffers](#)

Viz Vector Plus comes with multiple title template pages, each individually styled. They can be edited even while live. Several pages include replaceable images already embedded.

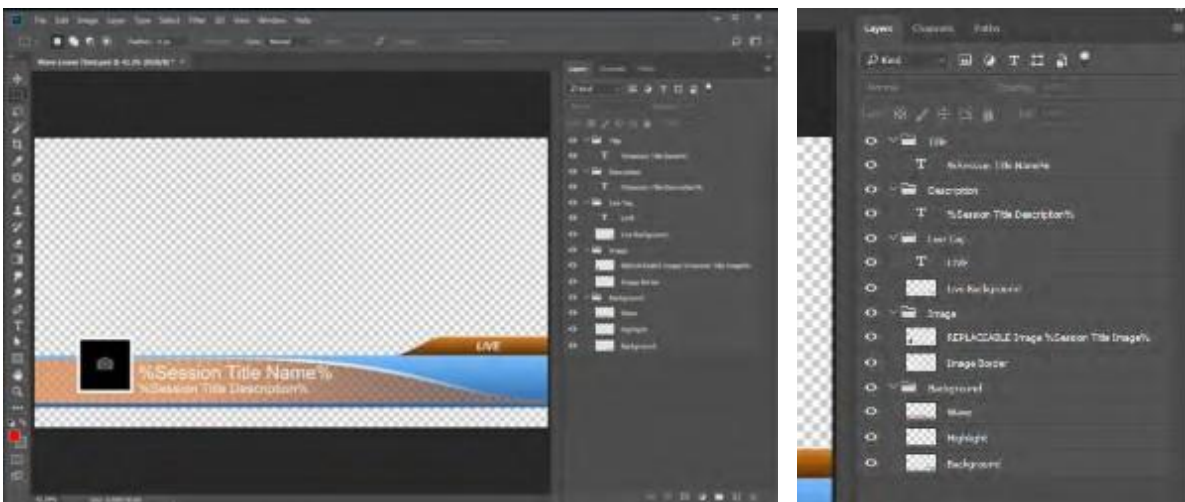
This section explains how you can create your own custom title template pages.

- Loading a *.psd* file created in Photoshop into a Media Player or Buffer automatically compiles an editable title page (CGXML) file that works just like the basic Title pages included with Viz Vector Plus.
- The text remains editable, and embedded images can be marked replaceable too.
- A single Title page can be used to display a whole theme pack of CG elements, and similarly (using Data Presets) a single title page can be updated to show, for example, individual player statistics for an entire team, with a single click.

#### Creating a Title Page

You can always create static Title pages and graphics in editors like Adobe Photoshop® and display them as images in, for example, a DSK.

However, it is usually more useful to create an editable Title page in Photoshop that, once loaded and compiled as a native CGXML file, works just like those supplied with your Viz Vector Plus system.



To make an image replaceable”

- Add the string `REPLACEABLE` to the layer’s label in Photoshop.
- You can even assign a DataLink key to the layer in the same fashion, naming, for example, the layer in the format `REPLACEABLE %twitterpic%`.

## To edit a Title page

1. Mouse-over in a Media Player or Buffer, **Title page** icon display a text edit gadget in their lower-left corner.

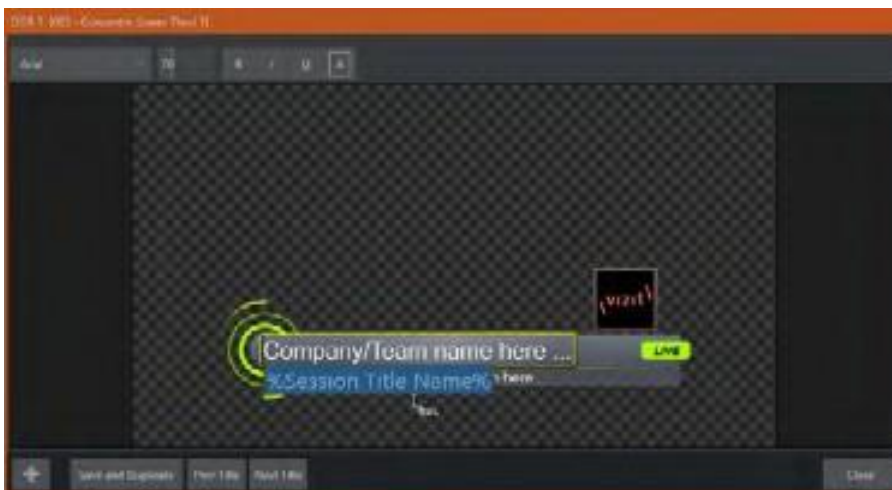


2. Click (or select **Edit Title** in the icon context menu) the icon to open the Title page editor.

**Tip:**

- The editing panel can be re-sized by and re-positioned.
- Opening the Title page editor during playback is permitted, so Title page content can be edited even during display (changes are detected and shown immediately).

3. Move the mouse over text in the Title page editor preview pane. A white bounding-box appears.
4. Click once inside the box. It turns yellow, indicating the text object is selected, and a text edit field opens.



- a. Cursor keys (left/right and up/down arrows) allow you to navigate between text fields on the Title page.
- b. When the text edit box is open, left/right arrows change the edit point as usual, but up/down *close* the edit box. Cursor keys then move to the *next* object.
- c. You can nudge either a pixel at a time using **ALT + ARROW** keys or five pixels at a time using **SHIFT + ALT + ARROW** keys.
- d. Press **TAB** to advance to *next* entry field. **SHIFT + TAB** jumps to *previous* field.
- e. Press **ENTER** or click outside the box to complete editing operations

## Header and Footer Tools

### Header

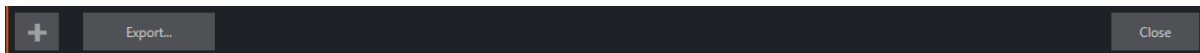
The header of the Title page editor holds an assortment of text attribute controls. These include a capitalizer and standard features like font selector, text size and formatting.



**Tip:** When editing a title page from a [Buffer](#), click **Presets** to access Data Layer presets.

### Footer

The footer contains page file commands.



- Click Close to save the edit session.
- Click the plus sign (+) to open a Media Browser menu. From here, you can immediately load media for editing.
- Click **Export** to save your edits to a sharable CG File (.cgxml format).

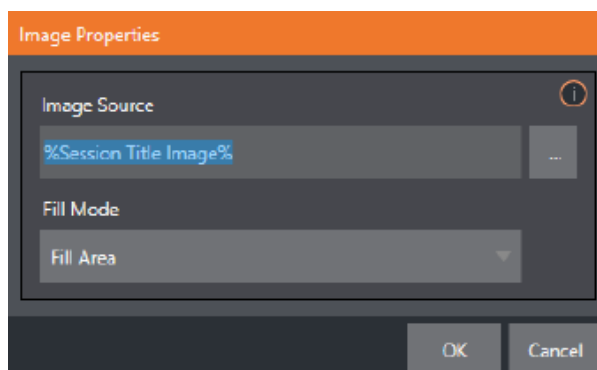
## Stand-in and Modifiable Images

### Stand-in Image

Images embedded in Title pages may be locked, or they may be editable stand-ins.

If, when you roll the mouse over an embedded image and a white border is displayed around the image, the image is a *stand-in*.

- Click a stand-in to open the Media Browser and select a replacement image file (hold **SHIFT** while clicking to use Windows File Explorer instead).



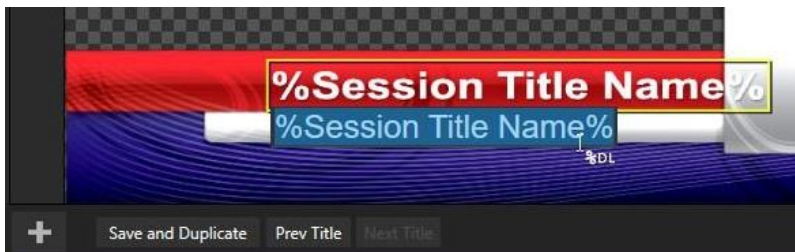
## Modifiable Image

- If you right-click a stand-in image and a context menu appears, you can select one of several optional methods of fitting the source image to its frame.

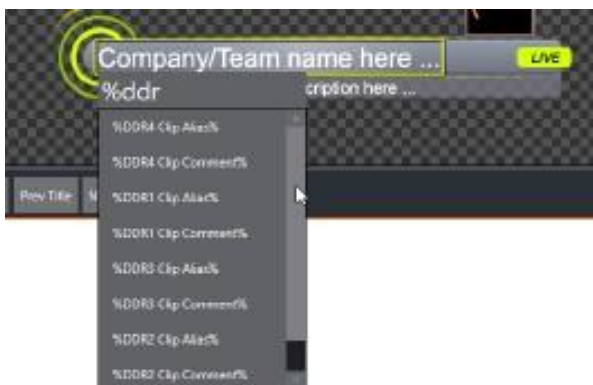
This menu also allows you to open the Image Properties panel. It provides the same set of Fill Mode options but adds an Image Source box supporting direct entry.

- Stretch: The image completely fills the frame.
- Fill Area: Retain the image's original aspect, cropping if necessary to fit inside the frame.
- Show All Image: Retain the original image aspect but fit the entire source image inside the frame (which may result in pillar-boxing or letter-boxing).

### 10.2.2 DataLink



Both text and images on Title pages accept DataLink keys as input. The Title editor indicates which entry boxes accept DataLink keys by showing a custom %DL mouse pointer.



To edit DataLink entries on a Title page:

1. All available DataLink keys are shown in the drop-down menu as soon as you enter a % sign into an entry box (key names are in the format %*key name*%).
2. Continue typing, the list shown is filtered to show only relevant key names.  
A line of text or image on a title page that has been set to a key name will be automatically replaced by the current value assigned to that key when the page is displayed.

There are numerous uses for DataLink, and many ways to supply and update values assigned to DataLink keys. For example, see .

The DataLink™ web browser extension, which makes it easy to populate your title pages over the network from a web browser running on most platforms.

## Title Pages in Buffers

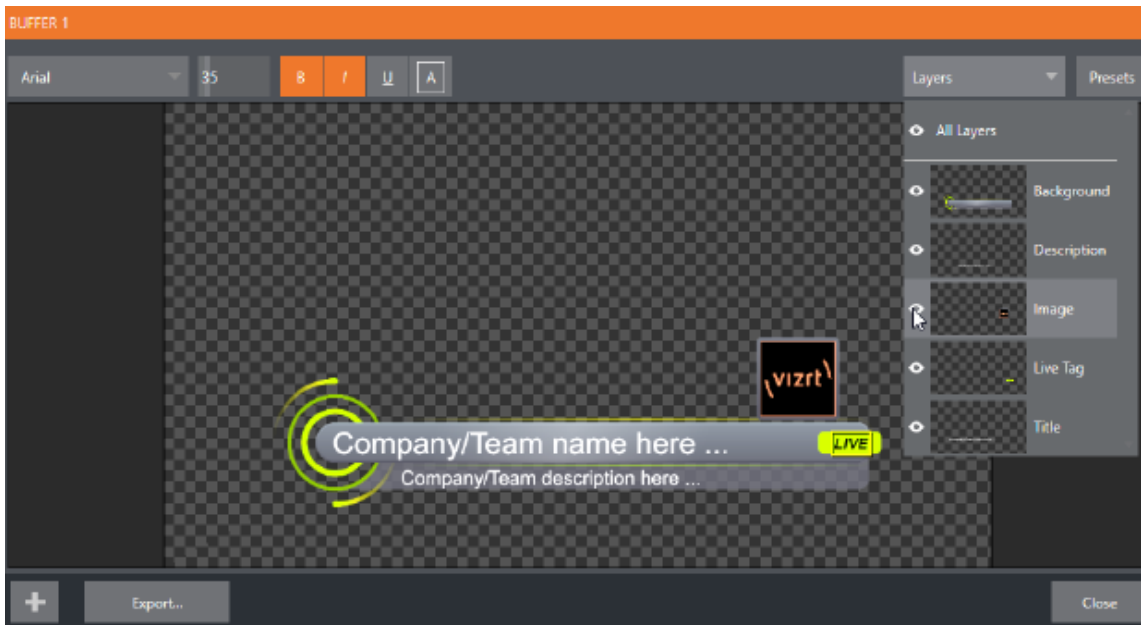
### Data Presets

When a [buffer](#) is used for storing a Title page, selectable *Presets* can store the text data and (replaceable) image content.



This is useful, for example, for storing details like name, player number and images of members of a sports team. A single click (or executing a macro) immediately recalls all data.

- **Tip:** Text values can include DataLink™ key names. On a title page, statistics for a given player can be updated in real-time from external sources or text, XML or from CSV files in a watch folder.



- For further details, please refer to section [LiveGraphics](#).

## 10.3 Buffers

- [Buffer Types](#)
- [Selecting Content](#)
- [Buffers Menu](#)
- [Animation Features](#)
- [Live Link](#)
- [Data Presets](#)
- [Buffer Watch Folder](#)
- [Displaying Buffers](#)
- [Keying, Proc Amps, LiveMatte, Position and Edge](#)
- [Editing Titles](#)

### 10.3.1 Working with Buffers

- Buffers provide alternative to media players as graphics and animation sources for M/Es (including their associated KEY channels), the main Switcher and its DSK channels.
- Selection and display of buffers is controlled by buttons on main Switcher source rows, M/E rows, and similar options in DSK and M/E KEY source menus.

- The top ten buffer slots support all animated effect types, titles and graphics
- The other five slots are for graphical effects, supporting still image files or title pages.

To display the Buffers menu

- Select the **BUFFERS** tab to display icons and controls for the fifteen buffers.



Buffers are always available for immediate recall and display.

- Tip:** Using a buffer for a specific DSK or M/E channel (rather than a media player) eliminates the risk of accidentally selecting the wrong media player and displaying an unintended graphic.

## Buffer Types

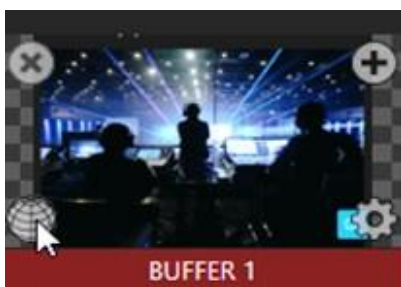
Buffers support the following media types:

### Animation Effects

You select and display buffers with buttons on main Switcher source rows, M/E rows, and similar options in DSK and M/E KEY source menus.

- The first ten buffer slots support *all* types of animated effect (HTML web pages, titles, and graphics)
- Buffer slots 11-15 are for *graphics* content, including standard image formats and special *Title pages* (.cgxml files).

Animation Effects



These are short duration full-motion video effects prepared in your favorite graphics, video application or the add-on utility Animation Store Creator. These sources are compiled into an effect by loading them into a buffer.



- **Looping effects:** These animations endlessly repeat, useful for applications like station ID 'bugs'.
- **Auto-run effects:** These effects auto-run on display following a *Take* or *Auto*. Playback runs the effect, and then holds the last frame.

## Graphics



- **Images:** 24-bit or 32-bit (with embedded alpha channel) images.
- **Title pages:** Editable title pages, identical to those served up by your media players. Layered PSD files are automatically converted to editable CGXML files with layer visibility support in the Title Editor.
- Please refer to section Title Pages for more details.
- **LiveGraphics (optional):** Animated graphics and titles.

See sections [Animation Features](#) and [Live Link](#).

## HTML



You can display a live webpage in Viz Vectar Plus as a switcher source by using HTML in a buffer. Alternatively you can bring in live graphics from a website that provides graphics as ready-rendered HTML output.

- Note:** Displaying a live web page uses the *Live Link* feature. See section [Live Link](#) below for more details.

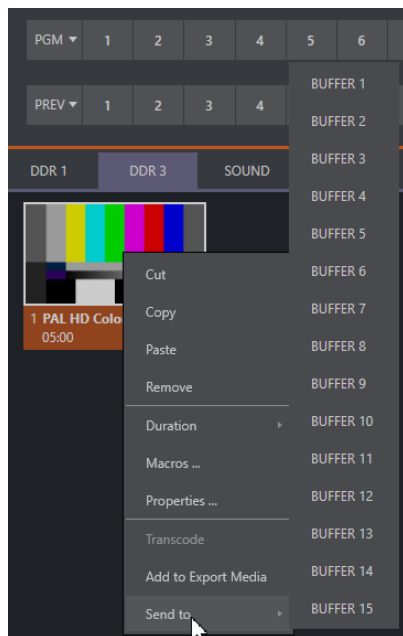
For these HTML web pages, you can:

- Scale and crop using the Viz Vectar Plus input and key layer tools.
- Use keyboard input and mouse movements such as click, back/forward, refresh, scrolling and keyboard input.
- Ingest web output from CG providers.
- Work with audio, macros, and alpha transparency.

## Selecting Content

To select content

1. Open the **Media Browser** menu by either:
  - a. For an in-use buffer: Move the mouse over a Buffer display (top right) to reveal the **Add Media** [+] button. Click on it.
  - b. For an unused buffer: Click in the Buffer display to open the **Media Browser menu**.
2. In the **Media Browser**, menu add media by either
  - a. Selecting from the listed sources.
  - b. Selecting a file to populate the buffer with either **Browse** or the + button.
  - c. Selecting a **Web Browser** source.
3. From the Live Panel, you can also populate a buffer by:
  - a. Dragging the displayed content from a media player to a buffer.
  - b. Right-clicking a *still image* or *title page* in a media player and choosing **Send to** from the context menu and then choosing a buffer slot (1-15) from the selection menu.

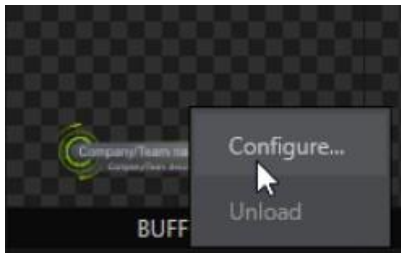


### ❑ Source availability

**Note:** Most buffers are linked to a source file on your hard drive. Having added a file to a buffer using the **Send to (Buffer n)** menu, the item can be removed from your media player. The buffer link will only fail if the media source file is moved or deleted from its assigned location on your hard drive.

However, editable *title page* buffers are stored separately from their originating file and are still available even after the source is deleted.

## Buffers Menu



**Right-click** a thumbnail icon in the **Buffers** pane to open a context menu:

- **Configure:** Open the standard configuration options, including cropping, color processing, and even LiveMatte keying.
- **Unload:** Clear the effect, freeing this buffer slot for another effect.
- **Update Icon:** The thumbnail icon updates to a snapshot of the current web feed.

- When the mouse pointer is over a buffer, the [x] icon in the upper-left corner also *unloads* the effect.
- Similarly, the **Configuration** (gear) icon that appears lower right, opens the **Configuration** panel for the buffer.

## Animation Features



When an animated effect has been created with the Animation Store Creator (ASC), clicking the **A** icon (bottom left) on the buffer provides several additional features.

ASC effects can be either *looping* or *auto-run*. A timer is displayed on the right in the buffer.

To control ASC effects in a buffer

- Select a Slow, Medium, or Fast preset value from the drop-down menu, drag the mouse left or right over the time to change the current value, or click to enter a number directly using the keyboard.
- For auto-run animation effects, mouse-over the buffer to display a Rehearse button (top-center)
- Click to play the animation from first to last frame, before freezing the image.

- In addition to providing a way to preview the effect (by displaying it on the Preview monitor, for example), **Rehearse** enables rerunning *animated alerts* and similar overlays. This is useful in conjunction with the **Macros** feature for driving what a buffer displays.

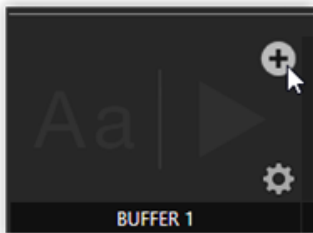
## Live Link

The Live Link feature opens up internet resources to your video switcher. Web page elements can be displayed directly in a production.

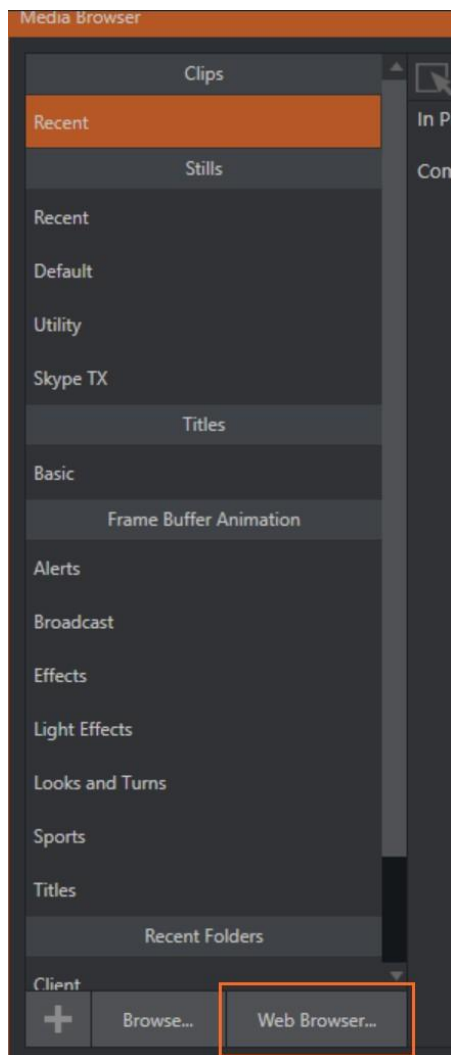
As described above in section [HTML](#), the first ten of the fifteen Viz Vector Plus buffers support HTML/WEB Buffers macros, alpha transparency for HTML5 and audio.

### To work with Live Link

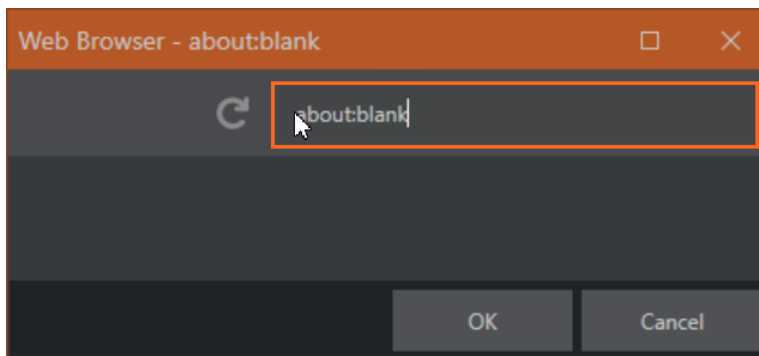
1. Click the **Buffer's** + (add) icon to add or replace a buffer slot source.



- The **Media Browser** menu opens.
- Click the **Web Browser** button to open an integrated browser.



1. Enter the web page (URL) to assign to the specified buffer slot.



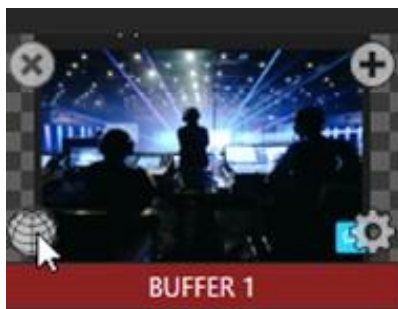
2. Click **OK**.

It may take a few seconds for the thumbnail to update.

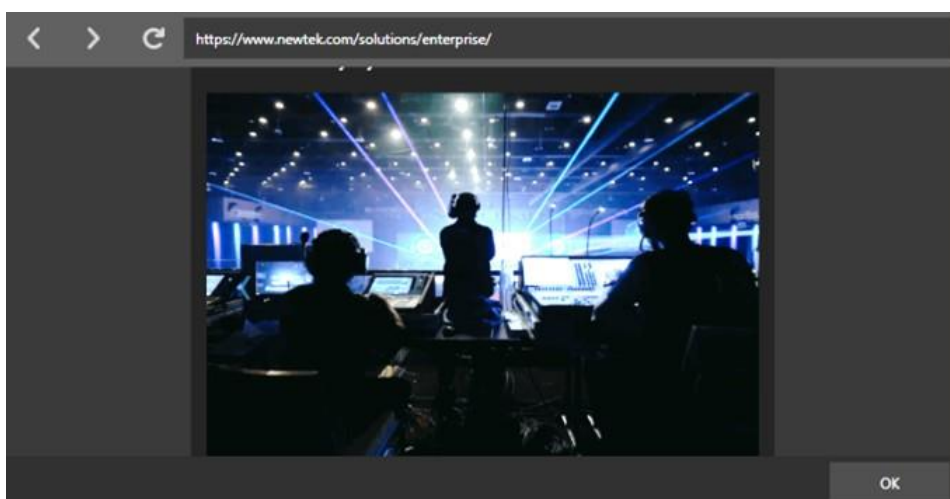
## To create an Internet shortcut

You can also assign a web page to a buffer by creating an *Internet shortcut* URL file by dragging a link from a web browser onto a file folder.

1. Click on a buffer's + icon to open the Media Browser menu.
2. Select **Browse** and find your internet shortcut file.
3. Click **Open**.
4. With the web page displaying in your buffer, hover-over the buffer's thumbnail. A **Web** icon (globe) appears in the bottom left corner of the buffer.



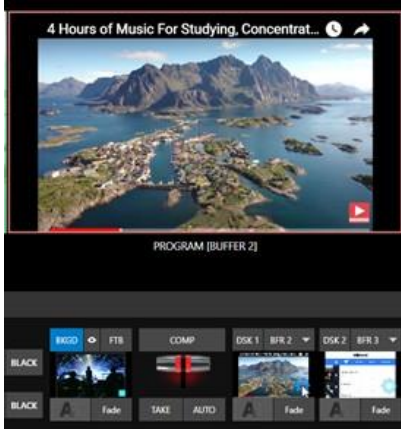
5. Click the Web icon.
6. The Web Browser opens, allowing you to make changes to the web page.
7. Interaction includes mouse movement, back/ forward, scrolling and keyboard input. The URL being viewed can also be changed in the Address field.



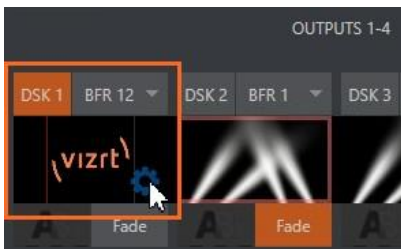
- Use the Web Browser to preview the web page. Once you are happy with your changes, click OK. This closes the Web Browser and applies the URL to the buffer.

**To remove web browser borders**

Once you have delegated the buffer to Preview or Program, the web page borders might appear in the monitor.

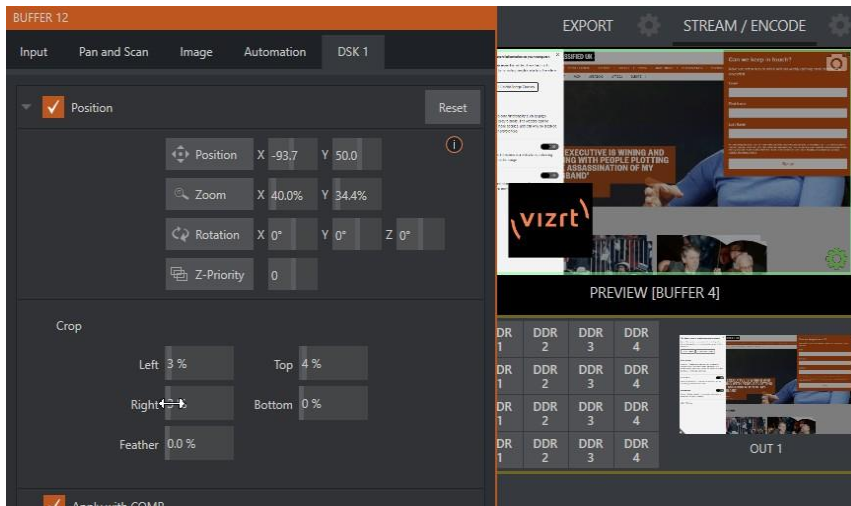


- To *remove* the border, hover-over the buffer thumbnail in the DSK channel.



- A gear icon appears on the lower right of the buffer. Click to open the buffer's Configuration panel.

- Click the **DSK** tab.



- In the buffer's **Configuration** panel, from the **Position** panel, you can position the webpage, crop, and zoom-in to remove the outer borders.

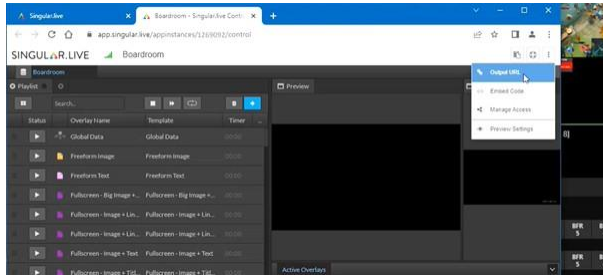
## HTML Buffer Graphics

You can use professional live graphics in your production by bringing in HTML graphics ready-rendered on a CG website.

### To work with rendered HTML graphics

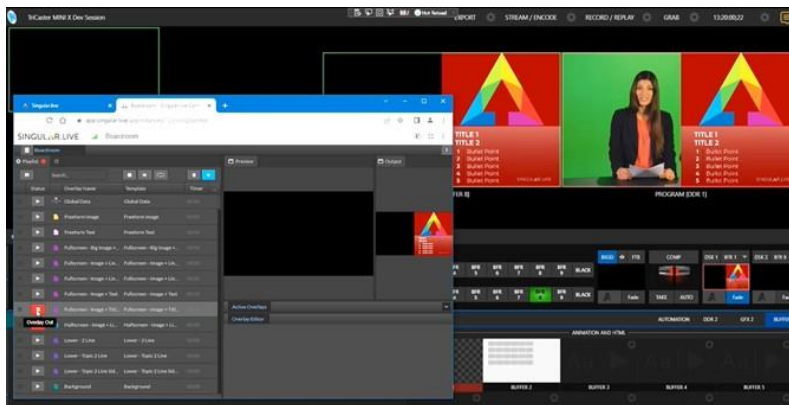
1. Locate the CG site, running on a separate system.
2. Copy the URL into an HTML Buffer Web Browser.

In this example, the site singular.live. There are numerous CG websites online.



3. Changes made on the CG webpage (on the separate machine) appear in your system in real time.

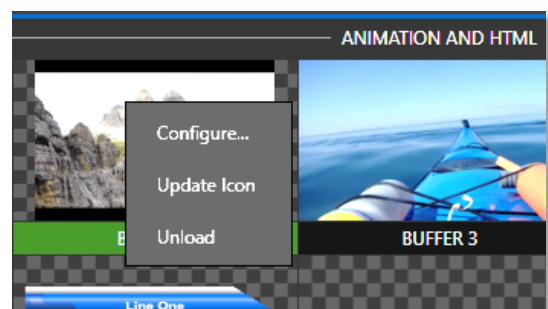
Transparent files are easy to bring into Viz Vector Plus, as the alpha is sent from the render-based platform.



## Persistent Thumbnail

When a *Buffer* is assigned to a webpage a thumbnail is created, however it may not always be representative of the webpage. The *Update Icon* feature (found by right clicking on an HTML buffer thumbnail) will create a new 'persistent' thumbnail for the buffer. The thumbnail can be updated repeatedly using this feature.

Clearing a *Buffer*, or changing it to another type of content will delete the persistent thumbnail file. If the *Update Icon* feature is not used, the existing post-page dynamic thumbnail will be displayed.



## Data Presets

When a buffer is used for storing a Title page, selectable *Presets can* store the text data and (replaceable) image content.

- Please refer to *Data Presets* in section [Title Pages](#).

**Note:** Data Presets can include dynamic, continually updated data through the [LiveGraphics](#) utility.

## Buffer Watch Folder

The *Frame Buffer* folder is a watch folder. When you save an image for a given buffer, the buffer updates even if it is currently displayed, allowing you to refresh overlays instantly across the network.

- Still image buffers are normally stored as 32 bit PNG format. Other formats are also supported.
- Specific filenames are not important in the buffer workflow. Multiple media files with different names can reside in buffer folders.
- A buffer always displays the newest file (the one with the most recent modification date).

## To share the frame buffer folder

The *Frame Buffer* folder for the current session can be made accessible across your network when sharing is enabled. This allows, for example, still image buffers to be modified across a network, using an editor such as Photoshop®.

1. From the **File** menu on the Dashboard, select **Share Media Folders and Buffers** (this operation can be performed during a live production).

A Warning that system resources may be affected by this operation is displayed.

2. If you understand the network performance situation, click **OK**.
3. The files which serve individual still image buffers are located in clearly named sub-folders of the *Frame Buffer* folder for each session.

These folders are arranged as follows:

**Sessiondrive:** \Sessions\sessionname\Fram Buffer\Buffer(#)

**Example:** D:\Sessions\MySession\FramBuffer\Buffer 3

**Note:** This special share name assignment is dynamic. Network sharing is activated, and the current Buffer path is automatically updated whenever you enter a session with the sharing option already enabled. This ensures that applications on networked systems can remotely access and update buffer graphics for the current production session.

## Displaying Buffers

There are many uses for buffers. Sample media content supplied with your system includes various styles of animated buffers. Some are intended for full screen, suitable for looping backgrounds or similar applications, others are suited to overlay, bug or alert tasks.



You can display any type of buffer in the following locations:

- Main Switcher
  - Program/Preview rows: All 15 buffers are directly accessible in the Switcher
  - DSK **channels**: Use the DSK's (drop-down) **Source** menu and choose a specific buffer.
- M/E banks
  - Select a buffer on an M/E row, as you would for the main Switcher.
  - KEY channels: Choose a buffer for any KEY channel using its (drop-down) Source menu.

Buffers enable animations throughout your productions. For example as layered graphics overlays, without employing a media player.

  - M/Es also support buffers. M/Es are re-entrant, so layering possibilities are expansive.

## Keying, Proc Amps, LiveMatte, Position and Edge

- You can apply LiveMatte, Proc Amp and Edge (cropping and feathering, when supported) settings to individual buffers by opening its Input Configuration panel.
- From this configuration, you can also apply Position settings, including Rotation and Scale, in DSK, M/E and KEY channels.

## Editing Titles

When a Title page (.cgxml file) is loaded into a buffer, you can open the Title page editor.

### To edit a title page in a buffer

- Clicking the edit icon **Aa** at lower-left.



See section [Title Pages in Buffers](#).

## 11 PTZ Control

The robotic or PTZ (pan, tilt, zoom) camera features in Viz Vector Plus make it easy to configure and operate multiple external cameras from the Live Desktop or a control surface.

In addition to pan, tilt and zoom control, you can control white balance setting, focus, iris (brightness) and animation speed (travel speed) settings.

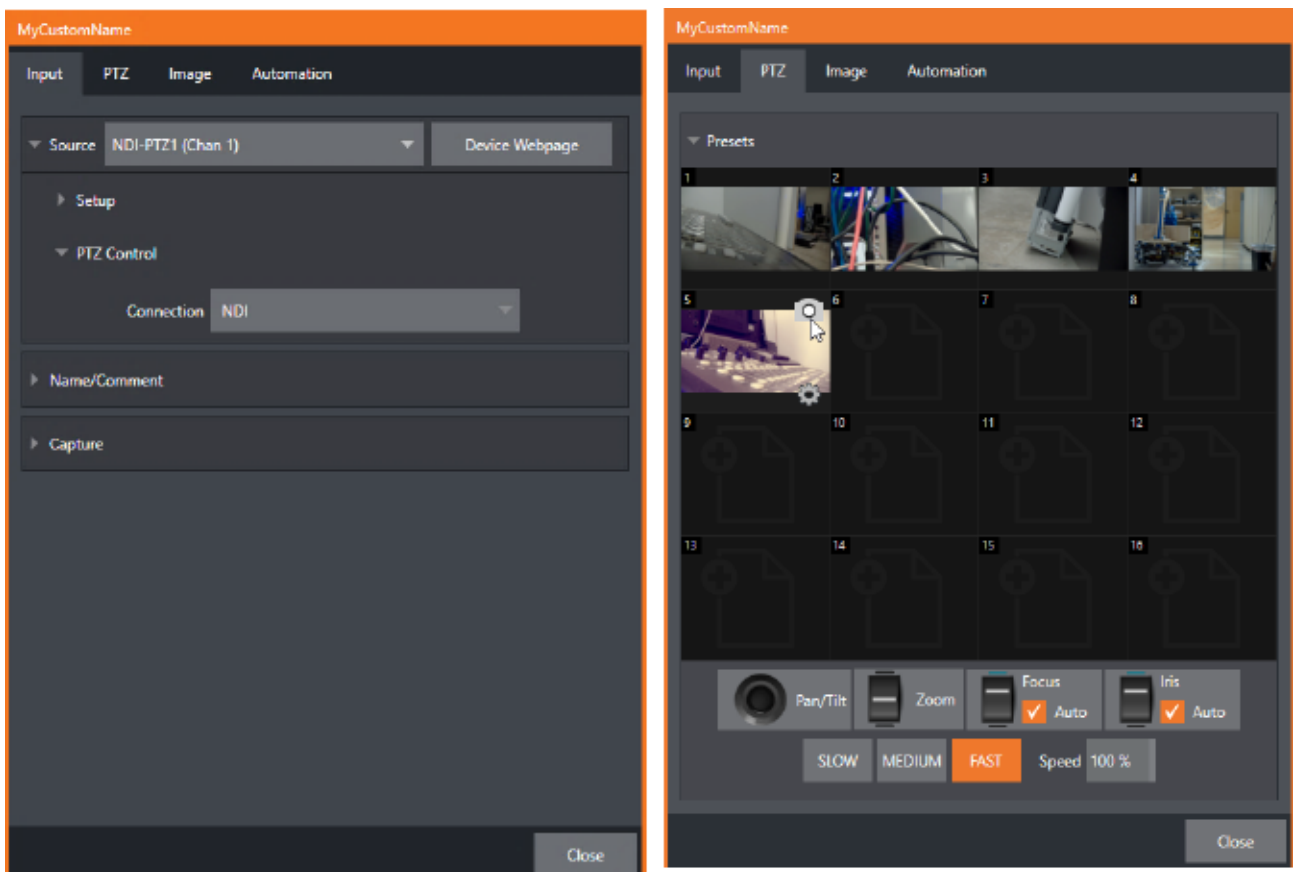
A convenient, visual PTZ preset system is included, enabling locking your shots and quick access.

This section contains information on the following topics and procedures:

- [PTZ Input Configuration](#)
- [LiveMatte](#)

### 11.1 PTZ Input Configuration

Most PTZ camera controls and features are in the **Input Configuration** panel, **PTZ** tab.



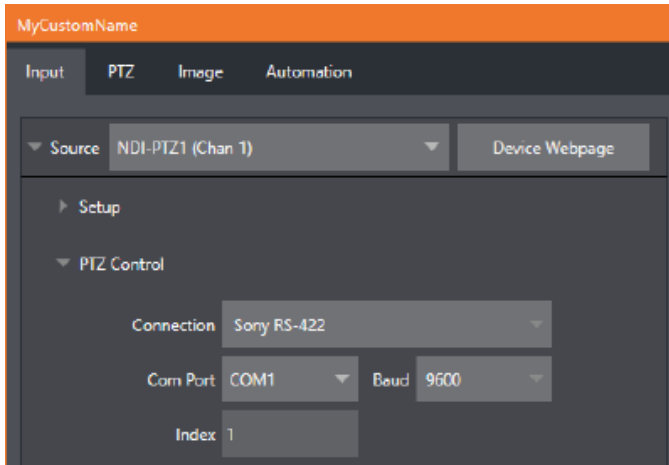
- [Connecting a PTZ Camera](#)
- [Configuring a PTZ camera](#)
- [PTZ Operations](#)
- [Presets](#)
- [PTZ and the Control Surface](#)

### 11.1.1 Connecting a PTZ Camera

- Connect the camera's output to a Switcher input (see [Input Configuration](#)).

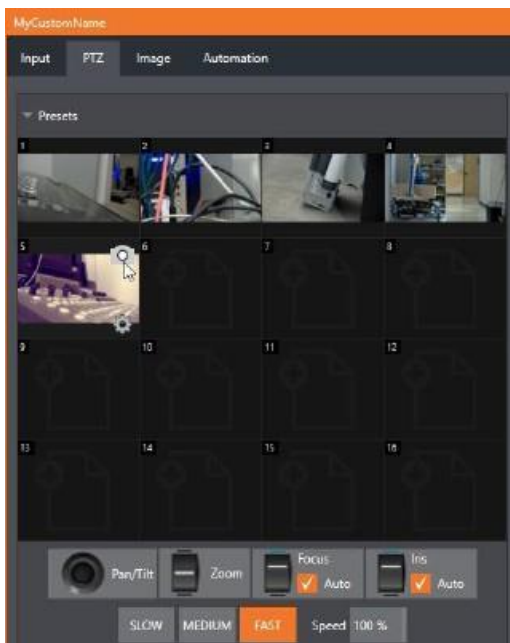
### 11.1.2 Configuring a PTZ camera

- Configure the control connection to the camera by selecting its type.



- Since the default Connection type in this group is NDI, you can skip this step for an NDI camera.
- For non-NDI sources, use the **Connection** menu to choose the correct PTZ protocol or your device, and continue to enter other data as required for that protocol.

### 11.1.3 PTZ Operations

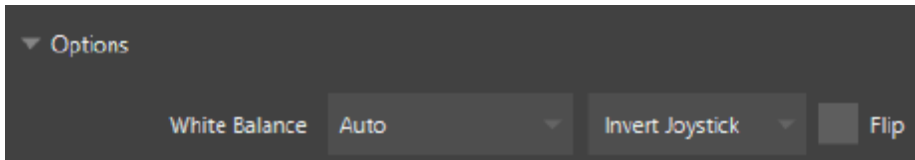


- Expand the PTZ **Presets** control group.

A set of manual Pan/Tilt, Zoom, Focus and Iris controls sits just beneath a large PTZ Preset bin.

- Drag the mouse on these controls to make manual adjustments.  
Speed controls, including *SLOW*, *MEDIUM* and *FAST* presets along with a numeric **Speed** control.

## Options

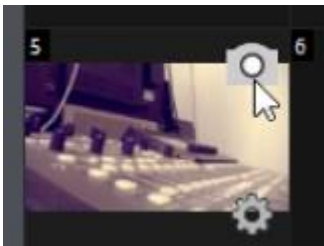


- Expand the **Options** control below the PTZ speed group to access *White Balance* options (which may vary based on the camera model connected) and an Invert menu that lets you reverse the effect of joystick operations.

**Note:** Invert settings affect the related controls both in the Live Desktop and on hardware control surfaces.

### 11.1.4 Presets

The **Preset** bin shows sixteen thumbnail icons for the current PTZ camera.



- Click a preset to select it, and the camera automatically begins moving to the new position.

#### To configure and store a preset

1. Use the Position, Zoom and Focus controls (described above) to navigate to the desired camera angle, etc.
2. Move the mouse over the preset icon you wish to store (or update), and click the **Snapshot** (camera) icon that pops up at upper-right corner of the icon.

**Tip:** Hold **SHIFT** when clicking the Snapshot icon to update the representative thumbnail image without modifying the preset already stored in that slot.

3. (Optional) Click the **Configuration** icon (gear) to open a **Properties** dialog that lets you assign a different *Alias* and *Comment* to each preset (these entries also provide values for DataLink keys that can be used in the usual ways.)

**Tip:** See section *Scopes* to learn how to display and use presets in your multiviews.

### 11.1.5 PTZ and the Control Surface

Pan, tilt, zoom control, and preset selection for connected robotic cameras are also directly supported on some Vizrt hardware control surfaces. See [Control Surfaces](#) for details.

## 11.2 LiveMatte

Although its controls are deceptively simple, the LiveMatte™ feature employs powerful chromakeying technology capable of extremely high-quality results. Used alone or in conjunction with DSKs and M/E Overlays, you will find LiveMatte can play a key role in your live productions.

- Terminology
- Color
- Tolerance
- Smoothness
- Luma Limit
- Spill Suppression
- Compositing
- Cropping the Source
- Recommendations for Your Settings
- Fine Tuning
- Lighting for LiveMatte

### 11.2.1 Terminology

#### Chromakeying

Chromakeying (or keying) is used to combine images by eliminating a portion of a foreground image (effectively cutting a digital keyhole in it) to reveal another background.

It is an essential tool in video and film production. Typically, foreground footage is shot in front of a blue or green screen, and then that background color (the key color) is treated as transparent, allowing another image to be inserted.

For example, when you see a TV meteorologist in front of a weather map, that person is almost certainly posed in front of a green screen. The background is keyed out, to be replaced by computer generated imagery.



If you choose poor settings, foreground areas may inadvertently be cut away as well. Or, some areas that should be transparent may be only partially keyed. Good keying often requires judicious balance between too little and too much.

## 11.2.2 Matte

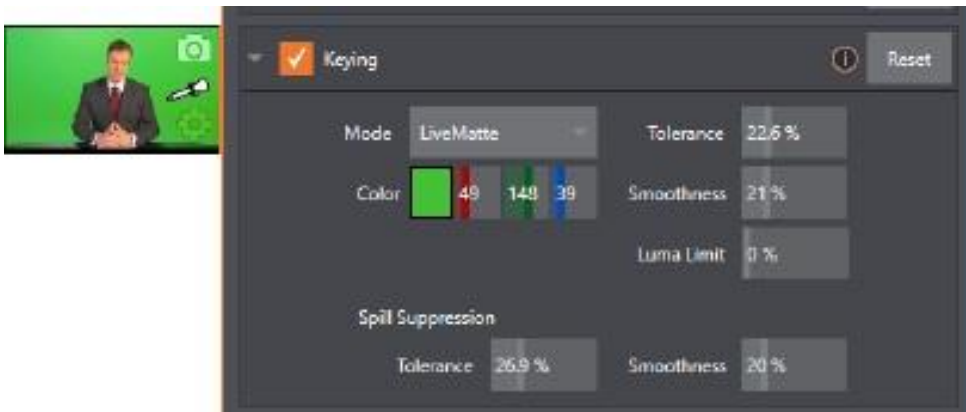
The term Matte refers to a black and white representation defining the transparent (background) and opaque (foreground) parts of an image during compositing. Portions of the matte that are grey are treated as semi-transparent, which is very useful in progressively smoothing edges between foreground source material and inserted background imagery.

Let's consider the tools provided to help you achieve a great result.

The method by which part of the image is defined as transparent is generically referred to as chromakeying, for its dependence on the color values (chrominance) of the video stream (LiveMatte's mature algorithms far exceed typical chromakeying techniques to provide real-time results).

LiveMatte supplies a digital version of this traditional tool. Controls in this group allow you to define and adjust the matte for the corresponding video input.

The controls are located in an expandable group in the **Image** tab of the **Input Configuration** panel for each Switcher source.



To access them, click the **Configure** button (gear) that appears above an onscreen monitor in the **All Monitors** tab.

- Tip:** Crop controls in the **Input Settings** tab can serve as a garbage matte tool for chromakey sources.

## Color

Initially, LiveMatte removes a specific color from the foreground image. This color is chosen using the **Color** button. To choose this key color, click on the Color sample box and keep the mouse button depressed. Drag the eyedropper tool over one of the video monitors to choose the color you wish to remove and then release it. The neighboring color well is updated to show the color selected.

- Tip:** Enable the Lumakey switch to disregard hue and base the effect solely on luminance.

## Tolerance

No physical green screen is perfectly comprised of one color. Wrinkles, folds and shadows along with the seemingly inevitable uneven lighting result in difference. For this reason, LiveMatte supplies a numeric slider **Tolerance**.

The Tolerance setting allows you to broaden the range considered as the key color, including more near-neighbor colors to be included in the matte. A low tolerance removes only color values close to the primary or key color. As you raise the tolerance, you extend the range of values on either side of the primary color that will be treated as transparent. This allows you to deal with those imperfections we mentioned.

On the other hand, it may be that there is (usually unplanned for) detail in the foreground that is somewhat similar to the key color. Reducing Tolerance may allow you to prevent unwanted holes appearing when the subject opts to wear his St. Patrick's Day tie.

## Smoothness

Smoothness defines a further tolerance factor, and a very useful one. We want our keyed foreground to blend smoothly into the background – rather than to stand out in hard relief like a postage stamp or decal. Smoothness serves this purpose, by defining a falloff zone of partial transparency. Don't overdo it though, as aggressive settings can cause the foreground to become unnecessarily muddy.

## Luma Limit

When working with poorly-lit backgrounds (or poor-quality footage), the color tolerance range separating the foreground (talent) from the background can be extremely narrow.

This problem can be aggravated by the subject's choice of clothing, or when there are harsh shadows. There is often a strong chroma component (and associated chroma noise) in dark foreground areas. The noise may be partially or completely transparent when tolerances are critical. Because the noise varies over time, holes in the foreground can result, and even worse these may flicker on and off from one frame to another.

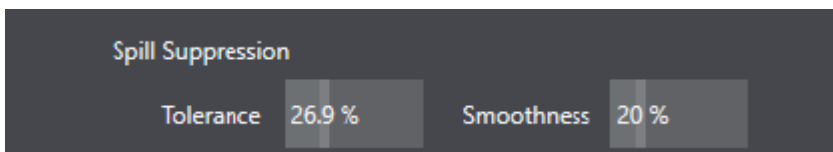
LiveMatte's **Luma Limit** control makes it possible to overcome this issue. In essence, it restricts the chromakey operation based on luminance (brightness) values.

Dark foreground areas which typically cause the problems just described normally have quite different luminance values from the background color, which is usually brightly illuminated. In simplest terms, problem areas of this type can be decisively pulled back into the foreground by pre-filtering the chromakey effect around a luminance threshold.

Generally, try to set up the best key you can before raising the Luma Limit from its default value of zero (no effect). Then gradually raise the limit until you are pleased with the result.

### 11.2.3 Spill Suppression

The term *spill* refers to key color unintentionally reflected or spilled onto the foreground subject. For example, a little green spill often appears on the shoulders of someone in a greenscreen shot.



The **Spill Suppression** controls let you remove key color spill in your scene by reducing the amount of that color in the foreground, where it doesn't belong. The net result is that the impression of spill color is eliminated, or at least reduced to the point where it is not objectionable.

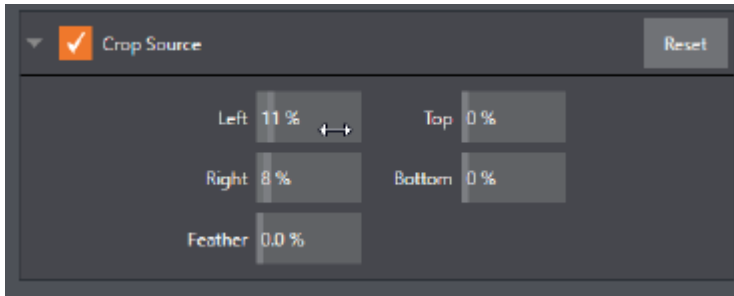
Use the **Tolerance** and **Smoothness** in similar fashion to the controls by the same name discussed earlier. Endeavor to subdue spill without overdoing it, which could result in an unsightly gray fringe around offending edges of your foreground.

### 11.2.4 Compositing

When you enable (and configure) LiveMatte for an input, the onscreen monitor for that input shows the source keyed over a checkerboard pattern (when the **Checkerboard** option is selected in **Overlays** for the monitor).

If you select the (LiveMatte-enabled) input as Input A in an M/E tab in LiveMatte mode, the keyed source is overlaid on sources in lower input rows. The composite result shows when the output is assigned to either the PGM or Preview row.

### 11.2.5 Cropping the Source



Unwanted items often remain after chromakeying. Common examples include microphones or lighting fixtures dangling from above, harsh creases, blemishes, or tears in the background screen.

- **Crop Source**, located in the Image tab just below LiveMatte, can serve as a garbage matte to remove this sort of intrusion.

### 11.2.6 Recommendations for Your Settings

#### Fine Tuning

LiveMatte is straightforward to configure. Some workflow tips:

Initially turn Smoothness off or nearly so. Likewise begin with a low value for Tolerance – perhaps just 5-10, or so. Put the video source on Preview or Program Output before you do so, to provide a larger view to help you assess your settings.

Pick your primary Color, but – before releasing the mouse button – slide the eyedropper around to different parts the background. Watch the monitor as you do so to see how the area of transparency is affected by different Color choices.

Release the mouse when you find the color that produces maximum results. It's often preferable to pick an average color from a location fairly close to the boundary between the background and foreground regions.

Now you can start to ramp up Tolerance. Bring it up slowly until most of the background color has been eliminated, cutting away most of the background to within a few pixels of the foreground/background boundary. Now raise Smoothness to fine tune that edge region, and you're nearly done.

Before considering your settings final, make sure to test the result using a moving source. This sometimes reveals that overly aggressive settings cause small blocks of pixels in the edge region to appear to snap on and off during motion - as they either qualify or disqualify for inclusion in the resulting matte (a little reduction in *Tolerance* and increase in *Smoothness* usually resolves this problem).

**Tip:** It can be useful to zoom in using **Position** controls when fine tuning LiveMatte.

#### Lighting for LiveMatte

When preparing your set, the single most important aspect of pulling a clean key is lighting. The lighting should be even and diffuse. Bright hotspots and shadows create different shades on the wall, and overexposed areas lack sufficient color for clean keying (it is not how much light you have on the key wall, but how evenly lit that wall is). Naturally, you want to keep your green (or blue) screen clean and free of wrinkles, ripples, folds, tears, or other blemishes, as well.



Second, the distance from your talent to the screen behind can make a profound difference in key quality. When the subject stands too close to the key colored background, the key color reflects back onto the subject, creating a green or blue fringe that is difficult to remove. If you have available space, move your subject farther away from the wall.

When good distance is out of the question, you can improve things somewhat by placing lights above and behind the talent, lighting them from behind with a complimentary color filter over the light to cancel out unwanted reflection (for green use a magenta filter; for blue, orange or amber).

Don't overdo back (or top) lighting, however. The limited dynamic range of the camera means there is little useful color data in badly over-exposed highlights. This can make it next to impossible to separate fringe zones (such as hair detail) from the background (especially when this is also overexposed).

## 12 Mix And Effect Tools

M/E banks provide production power and convenience. You can preconfigure multi-layered compositions and switch them as easily as you would to any single input, or use an M/E to control a special purpose sub-mix.

The Mix Effects, labeled M/E 1, 2 and so on, sit just above the main Switcher on the Live Desktop. Click an **M/E tab** (label) to expand or collapse the corresponding M/E. When expanded, M/Es occupy the area of the Live Desktop between the monitors and the main Switcher.



- M/Es are presented individually in tabbed panes, each corresponding to a button in the main Switcher. Eight M/Es are available to fulfill your diverse requirements.
- Selecting an M/E button on the (main Switcher) Program row displays the output from the corresponding M/E on Program Output. Likewise, punching an M/E button on the Preview row cues up that M/E bank's output for an upcoming Take or Auto operation. This makes it easy to Take or Auto directly to, from, or even between M/Es with a single click.
- M/Es are re-entrant, meaning M/E buttons also appear on source selection rows and KEY channel source menus inside the M/E panels themselves. This is an exceptionally powerful feature, and one offering endless creative possibilities.

**Note:** Self-referential reentrancy (re-assigning a given M/E as one of its own sources) is not supported. However you can often mimic effects of this sort by using multiple channels in another M/E.

This section covers:

- [Mix and Effect Modes](#)
- [The T-Bar](#)
- [Input Position Controls](#)
- [Default Effects](#)
- [Key Channels](#)
- [Comps](#)

For an *introduction* to M/Es (Mix/Effect banks), see section [Features](#).

## 12.1 Mix And Effect Modes

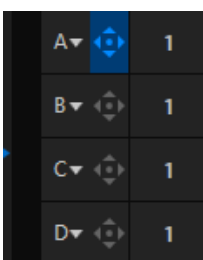


At first glance, an M/E panel in its default operating mode (mix, or transition) is scarcely distinguishable from the main Switcher. However, each M/E actually present two different operating modes:

- **Mix mode (default):** A secondary switcher layout, with controls and options that are very similar to the main Switcher.
- **Effect mode:** The M/E is configured for compositing or utility effects.

The M/E mode is automatically established based on the type of effect you load as its Background effect. Effect selection is done in the usual way using the Media Browser.

Click the + sign gadget that appears at upper right when the mouse is over the thumbnail icon for the Background effect.



For the most part, you initially see very little difference in the M/E panel when you change modes.

- In either mode, source button rows labeled A through (B or D) are arranged at left.
- The number of layers shown varies according the effect selection you make, from two effect layers to four.
- At right are four KEY control groups. In most respects these are identical in appearance and practice to the DSK controls located in the main Switcher.
- Even the central control group mimics the main Switcher, with its Transition controls and options, T-bar and so on.

### 12.1.1 Mix Mode

Really, an M/E in Mix mode is a switcher:

Input rows labeled A and B behave just like the main Switcher's Program and Preview rows.

- Transition controls work in the usual manner.
- KEY channels stand-in for DSKs and behave similarly.
- M/E output can be routed to primary outputs and Record module.

### 12.1.2 Effect Mode



Even casual scrutiny reveals some (outwardly) subtle differences in the M/E control configuration when a LiveSet is loaded as the Background effect selection, as follows:

- The Take/Auto buttons located beneath the **T-bar** and **Transition** icon are replaced by a **Position** button.
- As required, as many as four input rows (A, B, C, and D) may be shown in **Effect** mode.
- **Positioner** controls may appear for these input layers.

Let's consider the reasons behind these changes in the interface. An M/E in Effect mode allows preparation of a composite of two or more video sources, whether for direct output, or as a source for the main Switcher, or as an input for other downstream channels (including other M/Es).

Even in Mix mode, an M/E provides access to effects – including Position and transition effects and animating KEY layers via the Comps feature. In Effect mode, however, an M/E asserts its real-time compositing and effects prowess more aggressively.

## 12.2 The T-Bar

In a mix effect, the T-Bar and associated controls match the main Switcher. The drop-down Duration menu in the footer of the pop-up effect bin offers several convenient presets.

It's different in an M/E displaying a compositing effect (such as the **Default > 4 Layer effect**), however. In this mode, dragging the T-bar vertically adjusts the virtual camera distance for the active effect between 100% and 400%. (Timing controls for virtual camera move are located in the footer of the Comp bin.)

**Tip:** The maximum duration for an animated zoom is 30 seconds.

## 12.3 Input Position Controls



Position controls for all appear to the left of all input rows. Click this button to open the input's Position panel. These controls replicate those discussed in Transitions and Effects.

## 12.4 Default Effects

In Effect mode an M/E may support up to four input layers. The M/E doesn't transition between A and B in Effect mode. Instead, effects of various types are applied to the selected video inputs.

This section focuses on the Default group as examples.

- [Advanced Tracker](#)
- [Utilities](#)
- [3D](#)
- [Photoshop Blend](#)

### 12.4.1 Working with Default Effects

1. Click the + sign shown when you move the mouse to the effect icon located beside the effect duration.

This opens the Media Browser.

2. Select the effect group labeled Default under the LiveSet location at left. With the exception of Advanced Tracking effects, these effects are straightforward compositing effects involving multiple video layers. Effect output (the background prior to KEY overlays) is the sum of all input layers.

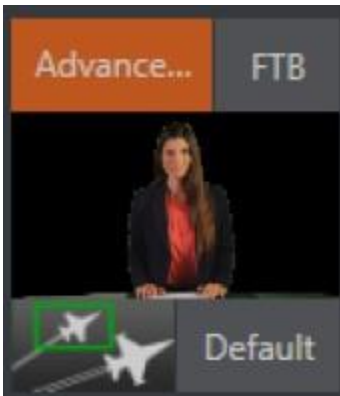
If the source assigned to input A is fully opaque, any content in the layers below is hidden. When input A is at partially transparent, the source assigned to input B is blended into the M/E background layer, and so on.

**Tip:** Don't overlook the fact that the input Position controls, including Borders, let you create very elaborate compositions even with simple compositing effects.

The output of active KEY layers is then added to the effect output before passing the combined result onward as the final M/E output.

### Advanced Tracker

As we mentioned, effects can be simple compositing effects, like most of the Default group, or more advanced. Advanced effects can vary widely, from utility effects to image processing and advanced compositing effects.



For example, we mentioned that one member of the Default group is unique. The Advanced Tracking effect takes three video sources to produce a result that would otherwise require the use of an additional M/E. Set up this effect as follows:

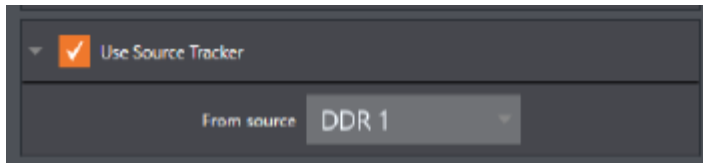
1. Click the label above the Effect icon and use the Media Browser to select the Advanced Tracker effect from the Default group.
2. Add the clip named *Tracking Example.mov* from the (NTSC or PAL)>Tracking file group to the playlist for DDR 1.
3. Enable Loop mode for DDR 1.
4. Add the clip named *River Bridge.mov* (or another clip you like better) to DDR 2, set it to Loop as well.
5. Add an attractive full frame graphic to the DDR 3 player.
6. Select M/E 1 on the main Switcher's Program row, to make it easy to view the result of the following steps.
7. In the M/E 1 tab, select DDR 1 on the input A row.
8. Select DDR 2 as input B.
9. Select DDR 3 as input C.
10. Double-click the monitor for DDR 1 to open its Input Configuration panel.
11. Continue to configure both LiveMatte and the Tracker for the video clip in DDR 1:
12. In the LiveMatte tab, click Reset to update the keyer settings to their defaults, and enable the LiveMatte switch at upper-left.
13. Use the Scrub bar under the playlist in DDR 1 to advance through the clip until the colored card is visible in the frame.
14. Switch to the Automation tab, and expand the Tracker control group.
15. Click the Color picker (eyedropper) keep the mouse button held down, and drag the pointer over the color card and release to assign that color to the Tracker for DDR 1.
16. Boost the Tolerance setting to 34%.
17. Press **Play** for both DDRs.

On the Program monitor, you should see the talent clip overlaid on the image from DDR 3 (LiveMatte is turning the green pixels in the DDR 1 clip transparent). You'll also see imagery from DDR 2 displayed wherever the (originally) blue card appears in the frame.

What's happening is that the Advanced Tracking effect is applying the values from the (DDR 1) Tracker for a secondary iteration of LiveMatte. Our LiveMatte settings cut away the green, revealing the C layer behind. Afterward, the blue color range is also keyed out, revealing the B source through the transparent region where the blue card is.

Up to this point, the effect takes advantage of the Tracker color values, applying them as a secondary keyer – but we haven’t yet done anything with the actual motion data the Tracker is supplying. Let’s do so now.

1. Click the Position button for input B to open the Position Panel for that layer.
2. Select DDR 1 in the Use source Tracker menu.



3. Enable Follow Tracker.

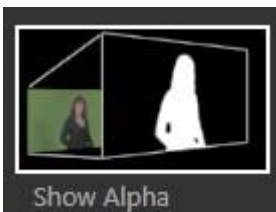
The result on your Program monitor should look much like: Full motion video appears wherever the orange card appears in the foreground clip. This is the standard setup for the Advanced Tracking effect, though it’s possible to use it in different ways too.

**Note:** Advanced Tracker 2 provides much improved compositing. (The original effect is provided for legacy purposes, but might also produce a better result in rare cases where a source has embedded transparency). Among other benefits, the newer effect performs spill suppression at the edges of the tracked region. Using the size (etc.) parameters of the tracker, the region being tracked can be made slightly larger to taste, to moderate this effect.



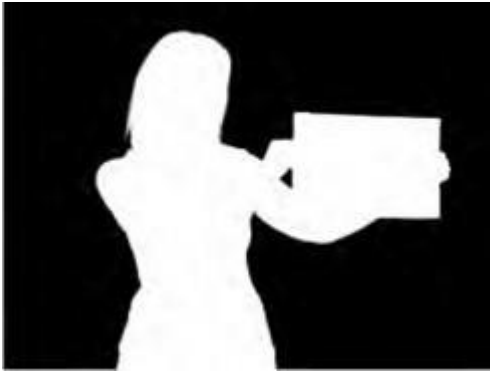
Test the effect of the Scale, Rotation, and Aspect controls in the Tracker tab for DDR 1 (you can double-click the DDR 1 monitor to open this panel).

### Utilities



- Follow the procedure from the *Advanced Tracker* section above, and replace the current effect in M/E 1 with the Show Alpha effect from the Utilities group.

Applying this effect immediately causes the display on the Program monitor to update, showing the content of the alpha channel for input A (Input B is ignored).



The current input A source is keyed, so the effect displays black on Program out wherever transparency exists in the foreground, white for full opacity, and shades of gray for in-between blends. With this in mind, it won't be hard to guess what Show Inverse Alpha does. In contrast, the Show Color effect in this group passes the full color output of LiveMatte prior to being multiplied by the alpha channel (it might seem as though this would be identical to the original source, but you may notice subtle differences. This is because of the Spill Suppression processing).

Other effects in the Utilities group

**Color Correction:** Replace the current effect with the Color Correction effect. M/E 1's output on the Program monitor is now rendered in monochromatic grayscale. Drag the T-Bar down to affect the M/E's color saturation. Click the mouse on the Position button below the T-Bar and drag to modify Hue.

**Make Legal:** Ensures the output of an M/E is within broadcast signal tolerances.

## 3D

The Anaglyph (Red, Cyan) effect found in the 3D category is a special purpose tool.



The anaglyph method of displaying 3D imagery depends on stereo video inputs that are filtered and composited into a single output stream. In turn, this combined stream resolves into 3D when viewed through special glasses with red and cyan (blue-green) filters for left and right eyes respectively.

Viz Vector Plus provides easy access to anaglyphic technology by means of the Anaglyph effect. The effect combines two video inputs selected in an M/E. 3D output can then be switched easily like any other source. No complex configuration steps or tricky control surface operations are required.

## Photoshop Blend

The effects in the Photoshop Blend folder apply well-known blending modes to the A layer in the M/E as these are blended with the B layer. The resulting compositions can serve many purposes, such as adding animated bokeh style overlays using DDR clips or adding interest to still overlays such as vignettes or titles.



## 12.5 Key Channels



In almost all respects, the KEY channels in M/E panes match the DSK channels found in the Switcher's main Transition section. Unlike the DSKs, though, they constitute a pre-main Switcher sub-layer. This means that KEY channels are applied before the composition is sent to the Switcher (or another M/E). Thus, content in a KEY channel appears beneath anything displayed via the (Switcher) DSK channels.

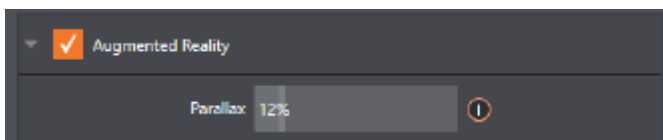
Likewise, KEY channel selection and Position controls largely work just like their DSK cousins, discussed earlier, with two notable exceptions. We'll consider these exceptions next.

### 12.5.1 Key Layers and Autoplay

It's worth noting that the behavior of Autoplay for Media Players selected as sources for KEY channels conforms to the way it works for other M/E sources. That is, newly displaying a Media Player with Autoplay enabled in the A layer or a KEY layer for an M/E triggers playback, but (by default) at the end of play the out transition (and subsequent advance to the next playlist item) does not occur.

This default behavior can be overridden by checking the Options menu item Enable Autoplay Out on M/Es.

### 12.5.2 Augmented Reality



In one other unique and powerful departure from DSK features, the Positioner for KEY layers has an added feature labeled Augmented Reality.

- Note:** The Augmented Reality feature is for use in M/Es that are assigned to compositing effects that allow pseudo-depth, and has no effect when a Mix effect (transition) is loaded as the Background effect for the M/E.



Any KEY layer with the Augmented Reality switch enabled is treated differently from a normal KEY layer in several respects:

- First, it does not merely appear above the main M/E layer composition you configure at left, as a typical KEY channel would. Instead, it is treated like another main layer added above the standard M/E layer rows.
- Thus, when you zoom or pan the M/E the KEY layer zooms and pans right along with it, making its content appear as though it were embedded in the scene.
- This lets you effectively add one or more virtual layers to a LiveSet composition at any time, with complete control over positioning within the composition.
- With the associated Parallax setting at 0%, the KEY source is locked to the background formed by the layers below it in a 1:1 relationship. When the camera viewpoint changes, the KEY layer moves in exactly the same amount and direction as the background.

**Tip:** You can use this ability to pin a graphic element into a LiveSet.

- Raising the Parallax value modifies the motion of the Augmented Reality KEY layer during panning and zooming, making it appear closer to the camera than subject matter behind it. This enhances the impression of three-dimensional depth.

Finally, note that the Tracker feature can also be used along with Augmented Reality and Parallax to produce uniquely dynamic motion graphic compositions.

## 12.6 Comps



Different virtual camera positions, along with other M/E attributes, can be stored in the Comp Bin associated with each M/E. In particular, T-Bar and most Positioner attributes for all layers in the module are stored in a Comp and are re-applied when you click the Comp icon later. This includes such things as cropping and edge-feathering performed using Positioner settings (layer source selections are not stored, nor are Border or Tracking settings).

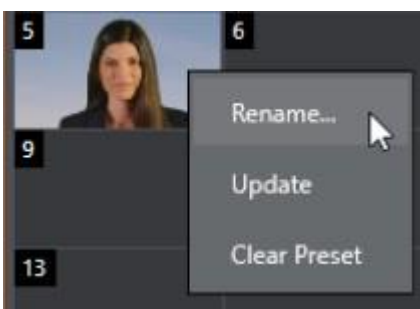
- [Managing Comps](#)
- [Animation](#)

### 12.6.1 Managing Comps



Having prepared a composition you wish to keep, storing a corresponding Comp is simply a matter of clicking the COMP button above the T-Bar to open the Comp Bin, and clicking an empty position. An image grabbed from output of the module is displayed to represent the Comp.

If you later wish to revise a Comp, you can do so either by rolling the mouse over it and clicking the snapshot icon shown at upper-right or by right-clicking the icon and selecting Update in the context menu that appears.



The context menu also allows you to Rename a Comp, update it, or clear it entirely.

## 12.6.2 Animation

Making a selection in a Comp Bin changes the current composition of layers displayed by the module to the new one. Changes can be immediate or animated over time. The timing controls in the footer of the Comp Bin determine the duration of the move from one position to another, while transition effects for layers are governed by their individual effect durations.

**Tip:** The main Switcher also hosts a Comp Bin. However, only Mix effects are supported in this case.

It's worth noting that, since T-Bar states are stored and applied by Comps, transition effects can be applied by selecting a Comp. Let's discuss an example:

- Suppose KEY 1 is a lower third title overlay and has a fly on type transition assigned to it.
- Comp 1 was stored with KEY 1 not visible.
- Comp 2 was stored with KEY 1 hidden.
- Click Comp 1, then - a moment later - Comp 2.

The result is that KEY 1 animates in and out according to the state stored in each Comp. Actually, Comps can apply transitions to multiple layers at one time with a single click. Animation between the current layer states and settings is not limited to the effects provided by transitions, however. Let's consider a different example:

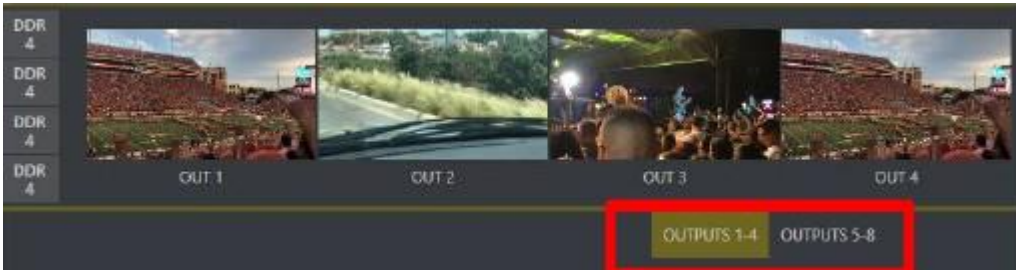
- Select Comp 2, ensuring that KEY 1 is visible.
- Use the Positioner controls for KEY 1 to slide the lower third title off the page, completely hiding it from view.
- Store a new Comp.

Switch back and forth between these two Comps and you'll notice that animating the layer's position of the layer has effectively allowed you to create a custom transition. Experiment with other settings, such as a Z or Y axis rotation and you'll begin to see just how much power Comps give you.

Using these and other settings to animate the various video layers, very complex compositions can be introduced into your production with a single click in the Comp Bin.

## 13 NDI Output Routers

In video production, outputs are a big deal, typically in scant supply, and expensive. Imagine a system where you could have a nearly endless supply of outputs. NDI makes this dream a near reality. Viz Vector Plus supports virtually unlimited expansibility in this respect and provides direct and convenient control over your output sources. Viz Vector Plus provides eight special NDI outputs, labeled *OUT 1-8*.



The image above highlights two tabs labeled *OUTPUTS 1-4* and *OUTPUTS 5-8*, situated just beneath the main PROGRAM output viewport.

Clicking a tab reveals one of these two specialized crosspoint panels, which appear in the same place that M/E modules are normally shown.

The features of these panels are very similar to those normally provided by an commercial external matrix router. Each row in these tabs determines the source sent to the output named at left. The monitors show the video from the selected sources.

OUT 1	MIX 1	MIX 2	MIX 3	MIX 4	1	2	3	4	5	6
OUT 2	MIX 1	MIX 2	MIX 3	MIX 4	1	2	3	4	5	6
OUT 3	MIX 1	MIX 2	MIX 3	MIX 4	1	2	3	4	5	6
OUT 4	MIX 1	MIX 2	MIX 3	MIX 4	1	2	3	4	5	6
	ME1	ME2	ME3	ME4	ME5	ME6	ME7	ME8		

You can assign many different source types to each of these eight NDI outputs.

The source buttons occupy three banks, similar to the Switcher source rows (the same bank of buttons used for the Switcher change the banks shown in **NDI Output Router** panels, although their content is somewhat different).

Outputs can be individually renamed by editing the labels shown at left.

Output source options include the displays and audio assigned to any of the four primary outputs, but also any other Switcher source with the exception of M/Es and animated buffers (a Buffer holding an animated source outputs a still image, which may nevertheless still be useful for some purposes).

### 13.1 NDI Output Applications

This means you can assign one of these outputs to a suitable downstream system or device, and hot-punch them at will. Downstream NDI-enabled devices connected to one of these outputs are effectively reconfigured directly from the Viz Vector Plus Live Desktop (control surface), which provides special support for this feature.

The potential uses of these outputs is nearly unlimited:

- Supply external NDI monitoring solutions (such as the NDI Studio Monitor application included in the free NDI Tools pack).
- Recorded them anywhere your network runs using NDI IsoCorder.

□ **Note:** Each I/O supports has a full suite of production features including per-channel overlays (which can be still images, animated clips, or even other NDI sources), allowing you to re-combine and re-brand your video endlessly.

## 14 Audio

External audio connections and basic configuration were touched on in [Input Connections](#) and [Output Connections](#). A tabbed pane labeled Audio Mixer, found just below the main Switcher presents more precise control over individual audio sources and outputs.

Compact sub-panels in this pane provide configuration and control for individual audio sources and also audio outputs.



- **External audio sources:** Audio INPUTS 1-16.
  - **Apps:** A special input provided for use with Live Call Connect.
  - **Talkback:** A special input provided for use with Skype TX inputs.
  - **Audio Mixer Scrollbar:** Allows you to access all 44 inputs by using the scrollbar located below the SOLO buttons.
- **Internal Sources:** Media Players and Effects (sound embedded in Animation Store transitions).
- **Stream:** Controls streaming output to the web.
- **Aux 1 to 3:** Controls for Aux audio busses.
- **Phones:** Volume control for the system's headphone output.
- **Master:** Controls the primary audio bus.

Audio level control for individual recorders are provided elsewhere.

This section contains information on the following topics:

- [Audio Specifications](#)
- [Headphones](#)
- [VU Meter Calibration](#)

### 14.1 Audio Specifications

Analog audio conforms to SMPTE RP-155. The maximum input/output level is +24 dBu. Nominal input level is +4 dBu (-20dBFS), and the sample rate is 48 kHz. Levels above 0dBVU are shown in red in the VU meters, to caution you that overly high levels can result in clipping in recordings.

### 14.2 Headphones

Utilize Supplemental Audio to route phones anywhere you would like. Normally routing this to the 3.5mm headphone port on the back of your system's motherboard makes for a good and easy solution to preview your audio.

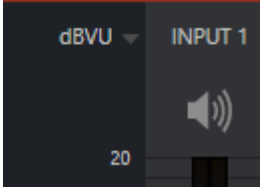
The Phone output is also affected by Solo switches located at the bottom of each control group in the Audio Mixer. When Solo is enabled for one or more sources or outputs, only the soloed sources are sent to the connector.



---

## 14.3 VU Meter Calibration

VU (Volume Unit) meters are located right above the Volume control sliders throughout the Mixer. The calibration of the VU meters can be changed to suit your preference.



A menu on the left side of Input labels opens a small menu offering three options as follows:

- **dBVU:** Typical analog audio mixers.
- **dBFS:** dB Full Scale, the digital standard. See Configuring Audio.
- **dBu:** Based on a voltage of 0.775 VRMS.

---

## 14.4 Audio Specifications

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## 14.5 Headphones

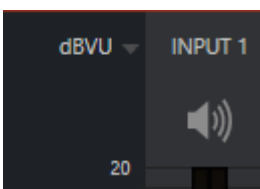
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- **dBFS:** dB Full Scale, the digital standard. See Configuring Audio.
- **dBu:** Based on a voltage of 0.775 VRMS.



## 14.7 External Sources

Columns in the first set of control groups are numbered as Input 1- 16. Each of these can be assigned to any available audio source, whether analog (line level) sound supplied to rear panel connectors, SDI embedded audio from one of the four SDI inputs, available NDI source, or other system audio source (including network audio sources like Audinate's Dante™, with appropriate drivers).

**Note:** Dante support requires a user license from Audinate™.

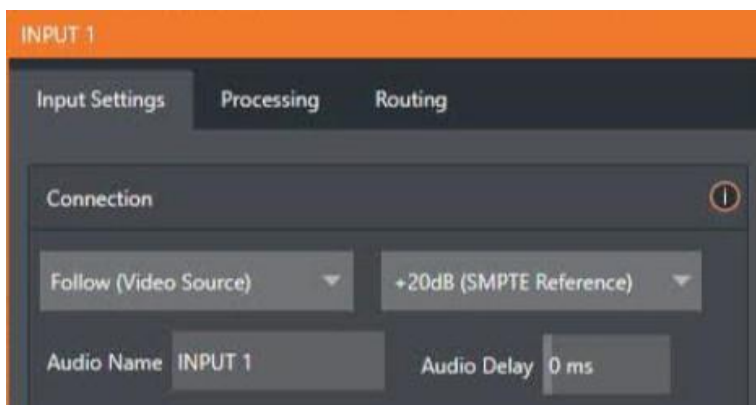
This default linkage is not strictly enforced. However, you can connect directly to any external audio source in [Advanced Configuration](#). Also, you can treat various audio sources as independent of the nominally associated video input. The Follow (audio follows video) features play an important role in this context. See the sub-heading Follow Program Video in [Advanced Configuration](#).

### 14.7.1 Connection Type



Only one connection can be active for a given audio input at any moment. To access the Connection menu, move the cursor into the label of an input, and click the Configure (gear) button that appears there. The Advanced Audio Configuration panel shows.

The drop-down Connection menu at the top of this pane allows you to assign any one of the supported sources connected to the system to this Audio Mixer control column.



- Local sources support different connection types, as determined by a menu in the same group. This option typically defaults to Auto-detect, but depending on the model, it may include Line, Mic, or Embedded (which is the correct setting for audio included with an SDI or NDI video connection).
- Dante sources (network audio from systems supporting this protocol from Audinate™).
- Follow (Video Source) is the default selection and causes the control column to follow the same numbered video Switcher input.
- All available NDI audio sources.

**Note:** Channels 1 and 2 from Master and Aux 1 are always placed on Dante output channels 1-4, respectively.

---

## 14.8 Local Skype TX Callers And Mix Minus

The default Connection option for external Audio Mixer inputs is Follow Video Source. When an audio input is set this way, it is assigned to a Local > Skype TX Caller channel. The audio control group is automatically assigned to govern incoming audio from that remote Skype caller.

It is not necessary to use an Aux audio bus to configure a special audio mix minus to return to the remote Skype caller in this case. The return audio for Skype TX is handled automatically, ensuring that (except when the TalkBack feature is engaged) the remote caller will receive a special mix comprised of the Master mix with the remote caller's sound removed.

---

## 14.9 TalkBack

The Audio Mixer input labeled TALKBACK serves a special purpose, providing a way to converse with remote Skype callers off-air (without intruding into your live program). You can choose what audio source to supply for TalkBack purposes from a variety of input types, as discussed in the previous sections.

As mentioned earlier, by default the Connection option for an external Audio Mixer input assigned to a Skype TX™ channel allows the corresponding control group to govern incoming audio from that remote Skype caller. In this case (that is, when an audio control is 'listening' to incoming audio from a Skype TX channel), a new button labeled TALK appears beside the group's SOLO button.

When the TALK button is lit, audio you supply via the TALKBACK input (typically a microphone connected to one of the inputs on the system's backplane, or perhaps the system Stereo Mix supplying audio with sound from a 1/8" motherboard audio input) is sent to the remote caller, temporarily replacing the normal mix-minus sound that remote caller would otherwise hear.

At the same time, the Mixer sends incoming sound from the remote Skype caller to its Headphone output, enabling you to have a two-way conversation Off Air.

- ❑ **Tip:** You will want to take steps (such as by enabling Mute, or perhaps Follow Program Video) to prevent sound from the Skype caller being sent to your live audio mix during TalkBack conversations.
- 

## 14.10 Common Controls

These common controls offer a variety of important features and optional settings.

### 14.10.1 Mute

Mute switches for inputs and outputs appear as speaker icons located just above in the main Mixer panel. A single switch controls multiple channels, as appropriate for that source. Enabling Mute removes the sound from that source from all downstream audio mixes and outputs.

- ❑ **Tip:** Muted sources still show signal activity on the VU meters, but levels are drawn in gray rather than full color. This is also true for sources with Follow set that are not currently audible on output.

One important exception to Mute operation involves recording. The IsoCorder™ feature lets you capture any MIX a/v output (the primary output outputs or directly from hardware audio and video inputs with matching numbers). That is, the audio recorded with the video is taken from the audio input having the same number as the video input. In this latter case, the captured audio is routed directly to the recording module prior to most adjustments in the Audio Mixer, including Mute.

## 14.10.2 Solo

Solo implementations and options vary widely, but all variants provide very useful functions. The Solo feature offers remarkable flexibility without overly confusing complexity.

These are a few basic design concepts:

- Enabling Solo for a source sends its (post-fader) sound to the Headphones output and removes all other sources from that output.
- Solo has no impact on audio mix (es) sent to any other output.
- This Solo feature is normally what it called exclusive Solo (or X-Or type). This means that enabling Solo for a given source disables all other Solo buttons.
- It is possible to use what is called Solo latching, ganging multiple sources for Solo output. Hold down the **CTRL** key and click additional Solo buttons to add or remove their respective audio contributions from the latched Solo group.

### Auditioning an Audio Source

It can be very useful to be able to preview one or more audio sources, doing so without allowing the test sound to be audible on Program output. Typically, this need arises in connection with testing microphones or other audio sources to be used in the production.

To audition an audio source in this manner:

1. Mute the source, removing it from primary outputs.
2. Enable Solo to hear it on the Headphones output.

---

## 14.11 Internal Sources

Besides external audio sources, sounds played from internal storage volumes (including removable media such as external hard drives or thumb drives) via the Media Players (DDR, etc.) can be added to the output mix.

### 14.11.1 Media Players

Video and audio-only files in DDR playlists, along with audio files in the Sounds player, may contain one or more audio channels. At most, Media Players output the first four audio channels of multiple channels; additional embedded channels are ignored. Other options and controls in these sub-panels are similar to those provided for external audio sources.

### 14.11.2 Effects (Transitions)

This control group governs the sound embedded in Animation Store Transitions. The remaining control groups in the Audio Mixer are dedicated to various audio outputs.

### 14.11.3 Secondary Audio Busses

Beyond the primary busses mentioned here, the system maintains a large number of secondary internal busses. For example, the Solo switch for each input (and output) is actually a send that adds sound to a Solo bus.

Likewise, the IsoCorder™ module (on supporting models) permits discrete recording from the unmodified audio input associated with any single video source; this constitutes up to eight additional audio busses.

## 14.12 Output And Primary Bus Controls

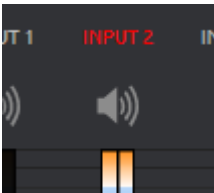
The Mixer on most models support four primary audio busses: MASTER and AUX 1-3. Each of these is represented by its own control group in the Audio Mixer output section, and regulates sound sent to physical connectors or to logical outputs.

**Tip:** **SHIFT** + double click **Volume** knobs to restore their default values (0dB).

Settings in all of the control groups in this section take effect downstream from all audio sources, further modulating and processing audio sent to outputs as the AUX and MASTER mixes, for recording, and for Internet streaming.

### 14.12.1 Headroom Notes

In digital audio systems, signal levels that exceed maximum values are uniformly assigned the maximum value, a condition known as *clipping*. Clipping inevitably results in audible issues. Over-modulation that may not be apparent while listening during live production, may appear in recorded files. This is often true even when levels appear to be below the ceiling level (0dBFS, the maximum allowable digital level).



**Note:** When clipping has occurred, the label for the problem channel turns red briefly.

Due to this problem, digital audio system designs customarily allow substantial headroom above the benchmark alignment level, making over-modulation much less likely. Often this allowance seems high to those familiar with analog audio systems; headroom levels between 18 and 24dB are not uncommon in professional digital audio realms.

You can apply level control to suit your own preference in this regard, using the separate Record (and Stream) level controls. For example, levels set at -20dBFS in the Record Configuration panel approximate typical professional practice. This has no impact on levels at the system's audio outputs, but ensures clipping in recorded files is avoided. Advanced users can thus record files conforming to regional standards or personal preference, substantially reduce the possibility of audio clipping in recorded files, and even adjust the level on the fly if necessary.

**Note:** The Audio Mixer also provides Compressor/Limiters for each input and output. These can also be invaluable in defeating clipping due to over-modulation.

### 14.12.2 Stream

Level controls for the stereo audio that accompanies Streaming outputs are provided in the [Output Configuration](#) panel.

## 14.13 Advanced Configuration

The controls for each inputs (including internal audio sources) as well as the *Effects*, *Stream*, *Aux* and *Master* output groups, include a **Configuration** (gear) button shown when you move the mouse over the input label.



- Clicking the **Configuration** (gear) icon opens the advanced Audio Configuration panel, offering many more important features and controls.
- [Input Settings Tab](#)
  - [Connection Panel](#)
- [Processing Tab](#)
  - [Equalizer](#)
  - [Compressor Limiter](#)
  - [Noise Gate](#)
  - [Neutral Voice Isolation](#)
  - [Triggers](#)
- [Routing Tab](#)
  - [Busses and Outputs](#)
  - [Sub-Mixes and Mix Minus](#)
    - [Mix Minus for External Audio Devices](#)
- [Supplemental Audio Devices](#)

### 14.13.1 Input Settings Tab

#### Connection Panel Audio Delay

Audio and video arriving at inputs in sync maintain sync throughout the system to output or recording. However, you should note that upstream issues can cause video to arrive at system later than the corresponding sound. To mitigate this sort of external problem, the Audio Mixer provides an adjustable Audio Delay feature (for example, many cameras support simultaneous digital and analog audio output).

In-camera processing can delay digital A/V output, resulting in analog audio output actually leading the digital output by a meaningful measure).

## Gain

On selected models, and usually for sources set to Mic input type, Gain knobs may appear in the Input Settings tab to allow you to compensate for microphone variances.

## Pan

The Audio Configuration panel also provides Pan controls. It adjusts placement of sound from source audio channels on the stereo channels comprising the audio mix(es). Using Pan, you can place all or part of channel 1 onto channel 2, and vice versa.

- When Pan is set to the extreme left position for channel 1, its audio is sent exclusively to the first channel for the Input 1 group.
- Centering the Pan 1 knob splits the sound from Input 1 equally onto channels 1 and 2.
- Sliding Pan for channel 1 fully clockwise results in that source only being audible on channel 2.

Pan also modulates the sound levels on the left and right channels so that the overall volume neither rises nor drops as a result of adjustments.

**Note:** Pan is not the same as Balance. The balance control in a stereo system varies the relative level of the left and right channels, but sound from the left channel never comes out of the right speaker, or vice versa (pan does permit this).

## 14.13.2 Processing Tab



## Equalizer

The seven-band equalizer allows you to shape sound to taste, accommodate sources with different acoustic characteristics, minimize feedback or roll off unwanted parts of the audio spectrum.

Enable or disable the Equalizer using the switch beside the label above its control group. The vertical sliders attenuate or boost the tonal range centered on the frequency shown at the top. The effect applied falls off gradually as sound draws closer to neighboring frequencies on either side. Click **Reset** to return all sliders to 0dB.

- **Tip:** Reducing or increasing the level of one or more tonal bands affects the overall output level as well. You can trim the main level setting for the affected input or output.

## Compressor Limiter

The Compressor/Limiter is capable of preventing clipping (see [Output and Primary Bus Controls](#)) from unexpected peaks or transients, and making talent sound better, bringing voices, music and other audio sources into an optimal dynamic range. Compression takes the form of a subtle, almost imperceptible modulation of the sound level to bring it into a more convenient range, and a limiter is essentially just a compressor set to a high ratio and, generally, a fast attack time. Audio engineers typically consider compression with a ratio of 1:1.

- **Threshold:** Sound above the set Threshold level is compressed. The amount of compression and the manner in which it is applied are both dictated by the other settings.
- **Ratio:** A Ratio of 4:1 means that if input level is 4 dB over the threshold, the output signal level after compression is just 1 dB over the threshold. The gain (level) is reduced by 3dB. Very high ratio settings are the reason the word limiter is part of the label for this feature. The highest ratio setting effectively reduces any signal that would rise above the threshold all the way down to the threshold level (with the exception of a brief period during a sudden increase in source loudness, as dictated by the Attack setting).
- **Attack:** Attack is also in milliseconds. The setting represents the amount of time it takes for the gain to change by a specified amount. Shorter values are more aggressive, while longer values are more subtle (and tend to be less noticeable to the audience).
- **Release:** Refers to the speed with which the compression effect is removed as a source signal falls back on its own so that it no longer exceeds the Threshold.
- **Makeup Gain:** The Gain control allows you to compensate, bringing the post-compressor/limiter signal back to a comfortable nominal range.

## Noise Gate

The Audio Mixer's advanced options panel also include a configurable Noise Gate for each audio source, as well as all outputs. This lets you ensure that unwanted low-level sounds are prevented from inadvertently intruding into the mix.

## Neutral Voice Isolation

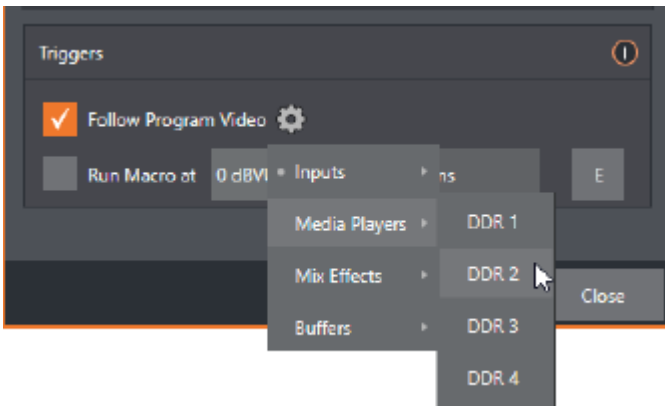


Used to enable and disable noise reduction.

- Check the **Neutral Voice Isolation** box and select your channel(s). The AI audio can be individually selected for each channel of an input.

## Triggers

Several different per-input automation features are found in the Processing tab.



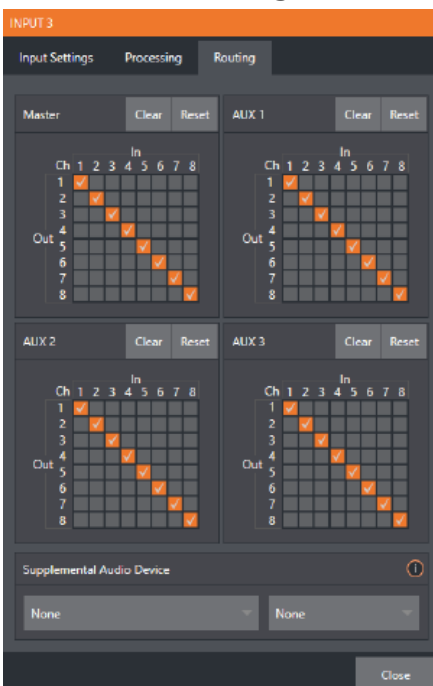
- Follow Program Video:** Enable this option for an audio source, directs it to track switcher operations affecting the related video source. Audio for sources with Follow Program video enabled in the Audio Configuration panel, is automatically removed from mixed outputs until one or more specified video sources are actually displayed on Program Output.

**Note:** When the corresponding video source is not displayed on output, the audio source’s VU meter level is displayed as a grayscale.

- Run Macro at:** Is part of the Audio Mixer’s powerful automation toolset. Click the E button to assign macros to run when the sound level for the input passes the threshold audio level.

**Note:** Not included on some models.

### 14.13.3 Routing Tab





The controls in this group determine output routing of the various channels supplied as inputs to the various output mix busses (MASTER, AUX 1, etc.).

## Busses and Outputs

Advanced mixers often provide more than one send for individual inputs. For example, sound from all inputs may be sent to the master mix. A different mix, sometimes called a sub-mix, might also be created by sending certain signals to a secondary (auxiliary, or Aux) bus.

**Tip:** A secondary mix, prepared on an Aux bus, can serve many purposes. For example, you might wish to record a mix with all sound from talent microphones but that excludes any sound effects or music.

The Audio Mixer provides four primary audio busses. These are identified in the Audio Mixer as:

- Master
- AUX 1, 2 and 3

The Audio Mixer provides controls for each of these busses, allowing you to manage levels and signal processing. It is important to understand the distinction between busses and outputs.

An output may be physical, or virtual (it may involve a connector on the rear panel, or not). For example, audio recorded internally does not require an output connector. Likewise, it may initially be analog or digital.

**Note:** Analog outputs 1 and 2 are permanently assigned to Master and AUX 1, respectively. In contrast, digital (or embedded) outputs are configurable in the Output Configuration panel.

## Sub-Mixes and Mix Minus

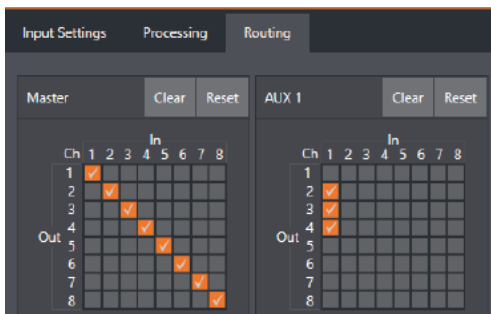
Specialized sub-mixes of this sort are often referred to as mix-minus, since sources are deliberately subtracted from the mix. Mix-minus can be invaluable for productions like phone-in shows to eliminate annoying echoing or feedback.

### Mix Minus for External Audio Devices

The Routing tab provides 8x8 matrix routing panels for each input, allowing for more sophisticated mixes than the example above. Viz Vectar Plus supports eight channel NDI output, so it is possible to route a unique mono mix-minus on each of these channels for an Aux bus. Thus, a single NDI a/v output can provide all the mix-minus needed for up to eight callers.

For example, if you configured Switcher inputs 13-16 to receive audio from four unique remote callers, video MIX 2 can be used to supply Program video to each caller (if the equipment supports video return). AUX 1 is configured as the Audio source for MIX 2, then assign a unique (mono) mix minus to four of its channels to supply return audio for each caller.

- In the Output Configuration panel, assign Aux 1 as the Audio source for MIX 2.
- In the Audio Mixer, open the audio configuration pane for Input 13.



- Access the Routing tab and click the **Clear** button above the Aux 1 routing matrix.

- Check channels 2, 3 and 4 in the column below In 1. This routes sound from the first incoming caller to all Aux 1 output channels except channel 1.

	In							
Ch	1	2	3	4	5	6	7	8
1	<input checked="" type="checkbox"/>							
2		<input checked="" type="checkbox"/>						
3			<input checked="" type="checkbox"/>					
4				<input checked="" type="checkbox"/>				
5								
6								
7								
8								

- Open the audio configuration pane Input 14 and, in the Routing tab, clear the Aux 1 matrix.
- Check channels 1, 3 and 4 in the column below In 1. This routes sound from the second incoming Skype caller to all Aux 1 output channels except channel 2.
- Repeat the steps above for audio inputs 15 and 16, omitting the Aux 1 checkmarks under In 1 for channels 3 and 4, respectively.

This is a mix minus configuration for return to four callers, using a single NDI output.

#### 14.13.4 Supplemental Audio Devices

Viz Vectar Plus features two additional menus provided at the bottom of the **Routing** tab, in panel **Supplemental Audio Device**.

This menu lists any additional devices detected by the system. Viz Vectar Plus' support for ASIO drivers allows you to easily transmit or receive audio using these popular audio over IP protocols. For example, transmit channels from Audinate's Dante network audio protocol is listed here if you have installed Dante Virtual Sound Card software. Any audio connections on the motherboard are also listed here.

Making a selection results in the sound from source being sent to the corresponding audio channels of the designated output. You can, for example, send your Media Player output to an external hardware mixer supporting the same protocol, and route that mixer's out back into your Vizrt system for output with your video.

**Note:** Apart from the AUX and Master mixes, routing or mixing is not applied to supplemental outputs. Each source channel is mapped to the corresponding output channel in 1:1 fashion, limited by the number of channels the output driver supports (for example, a stereo output always transmits channels 1 and 2 from the source).

#### 14.14 MEMs

Roll the mouse to the left edge of the screen in the Audio Mixer to show its MEM bin. Audio MEMs work just like their counterparts in the [Media Players](#).

MEMs are a convenient way to quickly store and recall audio steps and settings for different venues, productions, and users.

## 15 Macros And Automation

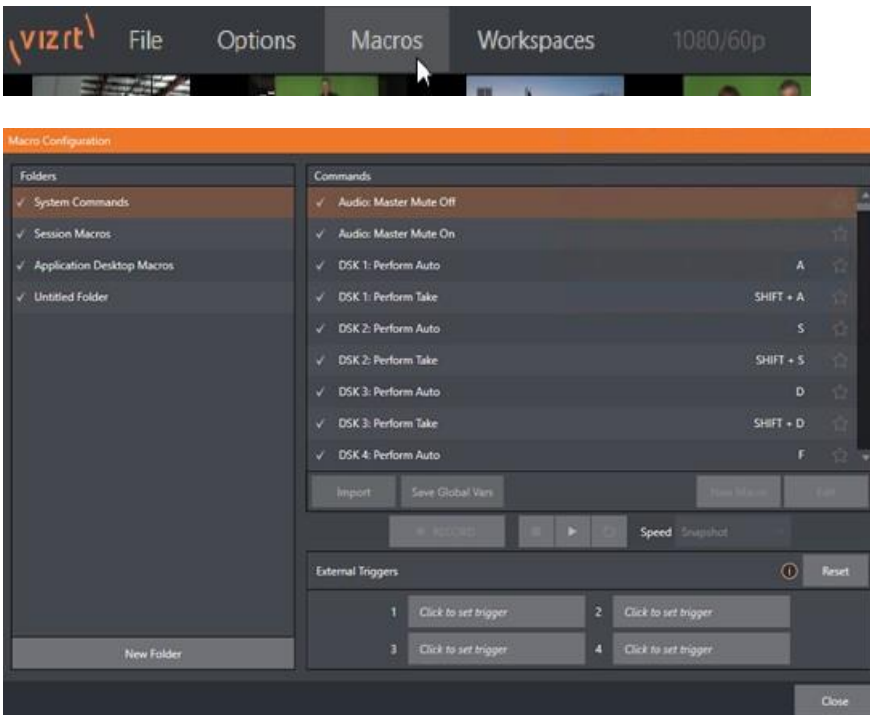
Macros smooth out your workflow, reduce complex operations to a single button press, and make it easier to produce sophisticated programs.

- Macros provide many opportunities for both workflow streamlining and creative applications. Macros can also reduce or eliminate operator errors.
- Macros can automate most operations. Preload and play content, modify audio settings, automate complex switcher sequences or perform synchronous operations.
- Record any sequence of events as a macro and play it back with one click, a keystroke, control surface operation, or Hot Spot.

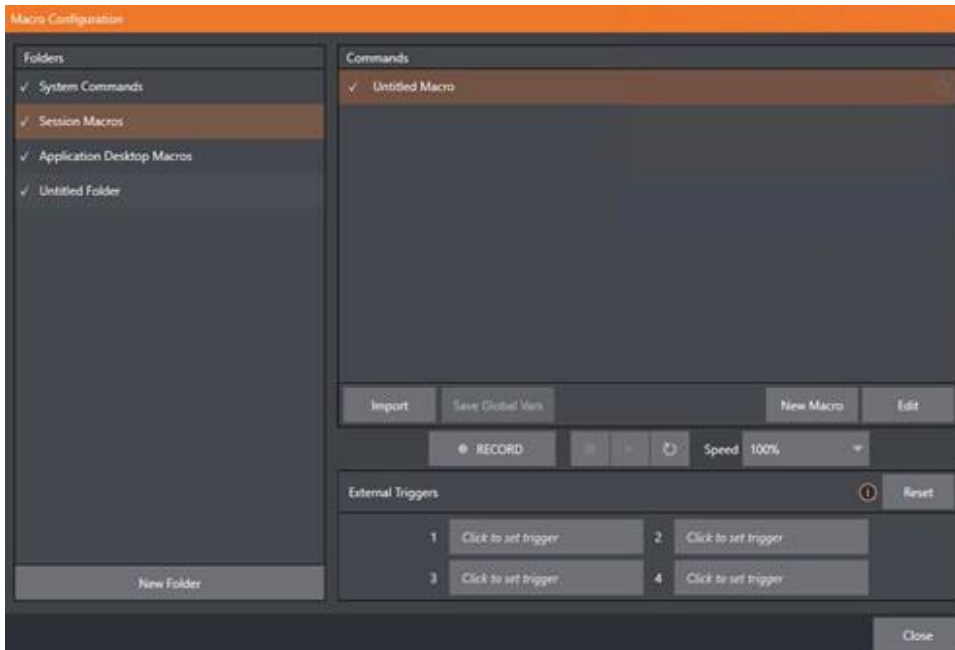
### 15.1 Working With Macros

- [Creating a Macro](#)
- [Macro Variables](#)
- [Speed and Snapshot Mode](#)
- [Triggers](#)
- [Live Panel Builder](#)
- [Managing Macros](#)
- [Automation](#)
- [Session Macros](#)
- [Macro Calls to Integrated Systems](#)

The usefulness of macros places them prominently in the Dashboard at the top of the Live Desktop, the **Macros** menu.



## 15.1.1 Creating a Macro



To create a macro

1. From the Dashboard (menu bar at the top), click **Macros > Configure Macros** to open the **Macro Configuration** menu.
2. Select a folder in the **Folders** panel.  
This will contain the new entry (or add one, with **New Folder** below).
3. Click **New Macro** (below the Macros bin on the right).
4. Define the macro by clicking **Record** button at the bottom of the panel.
5. Perform the sequence of operations you wish to include in the macro.  
You can use mouse, keyboard, and Control Surface operations.
6. When finished, click the **Stop** button to complete recording.
7. Test the new macro by clicking the **Play** button.

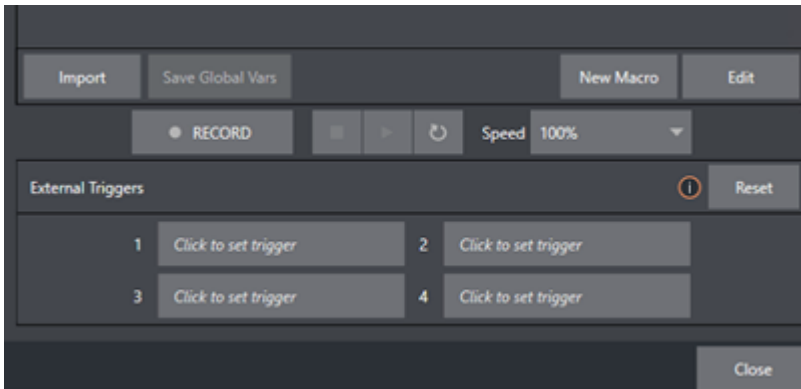
Notice that an animated bar in the background of the macro entry in the list tracks playback progress.

You can modify the playback rate using the menu next to the **Record** button. You can even set macros to loop using the button at extreme right.

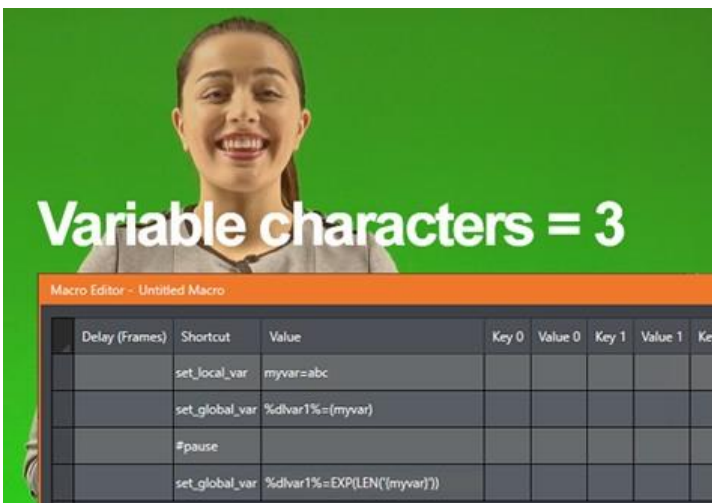
**Tip:** You can record a macro that includes other macros. Depending on your order of operations, you may need to re-highlight the newly recorded macro in the list to show its Stop control (to end macro recording).

## 15.1.2 Macro Variables

Using a variable name, rather than fixed name, a macro can easily be repurposed. When the value assigned to the variable is changed (either within the macro or by another method), the macro can rapidly be empowered with a new task.



For example, suppose you have a macro that sends multiple shortcuts to *DDR1*. By replacing *DDR1* with a variable name, the macro can retarget the shortcuts.



Variables also support expressions, allowing values to be updated by operands and more. Conditional (*IF*) and comparison expressions ( $=$ ,  $>=$ , etc.) are also valid, as are string operations (such as *LEN*, *TRIM* and *SUBSTRING*), wildcards, and conversion to and from DataLink keys and values.

Both global (per session) and local (valid during execution of their parent macro) variables are supported.

## Global Variables

Global variables can be invoked in any macro you execute.

- They can be created and their values can be set or modified in two ways:
  - Using the convenient **Configure Global Variables** dialog (in the **Macros** menu).
  - Use the shortcut “set\_global\_var” with a value like “myvar=4” (both without quotation marks)
- Global variable names and values persist within a session - even after you shut down the system.
- A **Save Global Variables to Macro** option is in the context menu of the **Macro Configuration** (right-hand pane).
- There is also a **Save** button below the settings.
- Global variables are saved for export, editing or later recall.

## Local Variables

Local variables are not persistent. They existing only during the execution of a macro. They are exclusively created and populated using the shortcut command `set_local_var` within a macro.

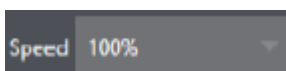
**Note:** It is recommended to use unique variable names. If a local variable and a global variable have the same name, the *local* one is used.

- Although a local variable is only useful in the macro it is defined in, there is an important exception: Local variables extend to macros run by the same parent macro. This lets you write 'generic' macros with targets or values to be provided later.
- For example, a macro might include a shortcut like `ddr{DdrNum}_play`, with no value supplied `DdrNum`.
- However, if you run this macro from one which does provide the value, the child macro derives the necessary value for `DdrNum` from the parent.
- Outside the defining macro and those it spawns, though, local macros have no lifecycle'
- You can use a single local variable name in simultaneous macros with different values.

**Tip:** It can be useful to convert a global variable to a local one. For example, you might want to increment a value as a macro runs without affecting the global variable's value. You can do this by copying the global value to a local variable, and referring to the local variable on subsequent lines. Conversely, a similar approach allows modifying of a global value once a macro begins, without effecting the local variable.

### 15.1.3 Speed and Snapshot Mode

#### Speed



- **Speed** menu settings enable modifying the playback rate of your macro.

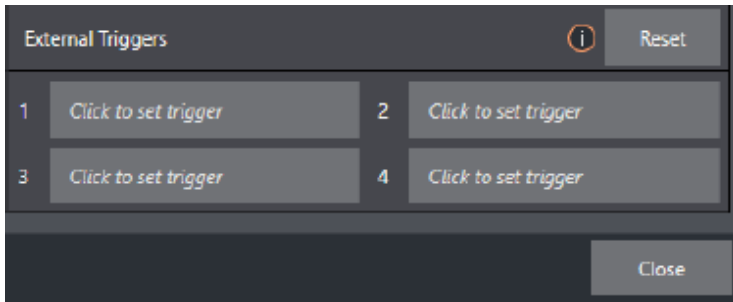
#### Snapshot

When you choose *Snapshot* as the macro's speed, you essentially force it to jump to its end result as fast as the system can get there.

Snapshot mode is very useful for macros that configure the system to a particular state.

As an example, you might want to quickly disable LiveMatte for all media players at once. The possibilities are endless.

## 15.1.4 Triggers

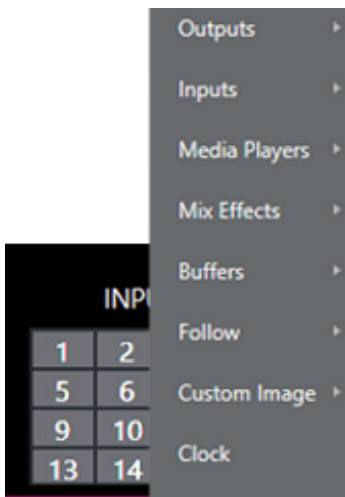


The **External Triggers** control located near the bottom of the **Macro Configuration** panel allow you to configure one or more ways to launch macros.

For example, select a macro, click in one of the Trigger boxes, and then press a suitable keyboard shortcut to assign it to that macro.

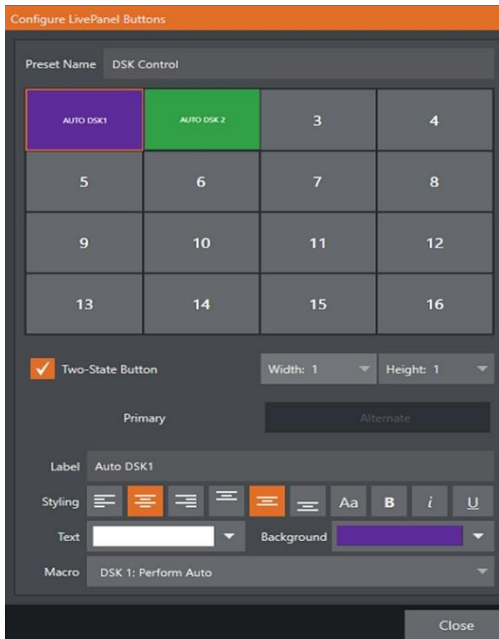
## 15.1.5 LivePanel Builder

The LivePanel Buttons add both the convenience of presetting macros and ease of editing, without leaving the user interface.



- **Right click** your mouse over any viewport to display the context menu.
- Hover your mouse over LivePanel and eight preset options appear.

## Configuring LivePanel Buttons



To configure Live Panel buttons

1. Right-mouse click over the viewport showing the preset buttons.
2. From the context menu, select **Configure**.
3. Edit the size of the buttons, styling properties, the color of the buttons and/or text as required.

### Usage Notes

- You can select the *Width* and *Height* of your buttons.
- Changing the size will 'absorb' other buttons, but they will not lose their properties.
- The Two-State Toggle Button checkbox enables toggling on/off your macro with a single button push.
- The Label and Styling options provide many background color choices.
- A Choose Image option can be a helpful to remind yourself of what is on your viewport.
- In the Macro field, you have the option of using System Commands or Application Desktop Macros from the pull down menu.

For further details, see section [LivePanel](#).

### 15.1.6 Managing Macros

The **Macro Configuration** panel contains management features for *Folders*, *Rename*, *Clone*, and *Hotkey* assignment, as well as *Import* and *Export* (use these last two to copy macros to other units, and for backup).

- Tip:** Viz Vectar Plus features unlock additional and very useful import/export file format options for macros, including JSON, Excel (.xlsx), and even a working Javascript (.js) example.



## 15.1.7 Automation

Macro triggering and automation features are also described in sections [Input Configuration](#), [Media Players](#), and [Advanced Configuration](#).

## 15.1.8 Session Macros

It's easy to keep macros designed for use with a specific production organized and accessible, thanks to the *Session Macros* folder in the **Macro Configuration** panel. Macros in this group are exposed within that session only (or new ones based on it, if the operator uses template sessions).

## 15.1.9 Macro Calls to Integrated Systems

You can use macros to send commands to external systems.

### Sample Setup: Viz Vectar Plus to Viz Trio

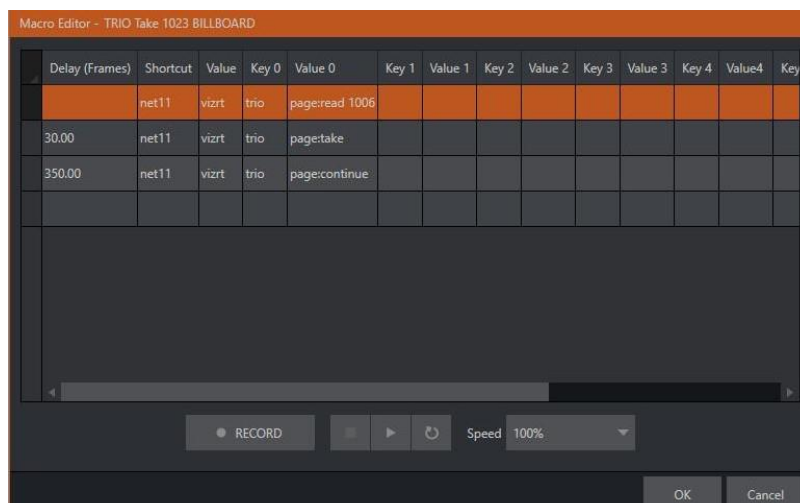
Viz Vectar Plus can connect to a Viz Trio system, to control CG graphics. Viz Vectar Plus communicates with Viz Trio through commands over NDI.

**Tip:** For some general background on how to integrate with external system through NDI, refer to the NewTek publication [Automation & Integration Guide](#).

1. Most setup is performed on the Viz Trio side.

For details on how Viz Trio handles macros, please refer to the [Viz Trio User Guide](#). Specifically section [Working with Macro Commands over a Socket Connection](#).

2. The *net* shortcut entry in Viz Vectar Plus macros can be used to send commands over a specific NDI input. The workflow is:
  - a. A Viz Engine (either Program or Viz Trio Preview) is set up to output NDI.
  - b. In Viz Vectar Plus, the NDI output from the Viz Engine is assigned as one of the inputs.
  - c. The Macro system in Viz Vectar Plus can be used to send commands via the NDI streams of the inputs.
3. As an example, if the NDI output from the Viz Engine is on input number #11 in Viz Vectar Plus, the shortcut *entry net11* can be used to address this NDI stream.
  - a. **Value:** *vizrt*
  - b. **Key:** *trio*
4. The value of the key is the command to send to Trio.



5. On the Viz Engine side, the Viz Trio commands are forwarded to a Viz Trio client on localhost (or to the one specified in configuration).

### Viz Engine configuration

- If the Viz Engine receiving the macro commands is the Viz Trio local Preview engine, no configuration is needed.
- If another Viz Engine (for example, on Program) is receiving the macro commands from Viz Vectar Plus and these commands will be sent to a Viz Trio client on another host, the configuration on this Engine must specify the host address of the Viz Trio client:

```
180  smm_master_eng_port = NONE
181  smm_thread_count = 1
182  ## smm content will be send from spec
183  smm_enable_master_poll = 0
184  trio_address = 10.0.101.98
185  trio_tcp_port = 6200
186  MulticastIp = 224.1.1.1
187  EnableUdpAndMulticast = 0
```

The relevant config settings in the \*.cfg config file for the Viz Engine are:

- trio\_address = 127.0.0.1
- trio\_tcp\_port = 6200

**Note:** Viz Trio requires an additional license.

## 16 Stream/Encode

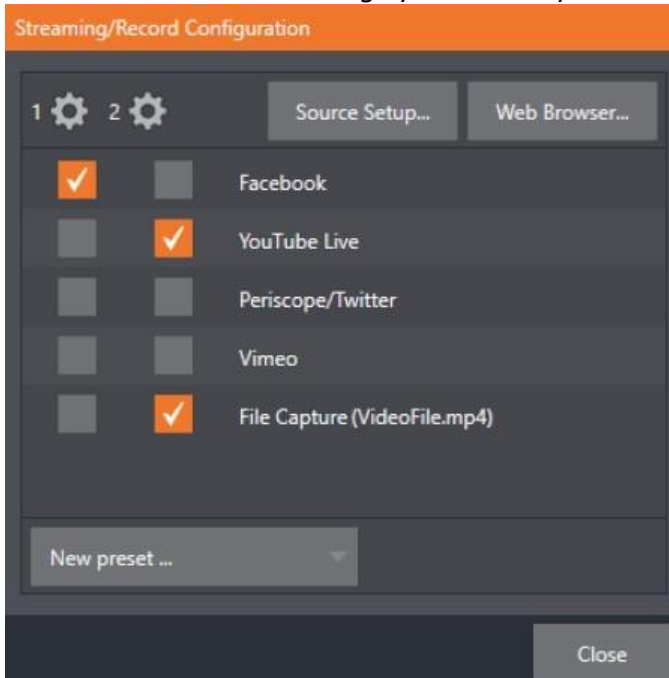
Live webcasting has dramatically altered the broadcast landscape. Information can now be shared among audiences around the world with very small transmission costs. The live streaming market provides many creative and profitable opportunities. When it comes to taking advantage of this new medium, Viz Vectar Plus places you in the forefront of these developments.

Encoding for A/V streaming and other purposes involves a wide variety of attributes.

- You can maintain multiple streaming service accounts for different purposes.
- Captured encoded video files can be repurposed.

**Note:** Your account login details may be required for your streaming service or CDN (Content Delivery Network).

The Viz Vectar Plus **Streaming Configuration** panel supports the creation and configuration of all of the information and settings you are likely to need in this context.



This section presents these Stream/Encode topics and procedures:

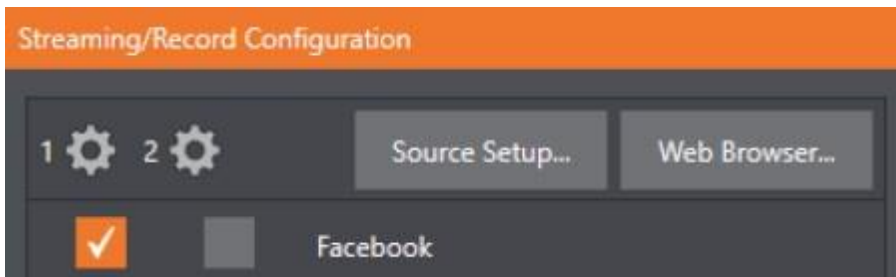
- [Configuring Streaming](#)
- [Working with a Stream](#)
- [Diagnostics and Troubleshooting](#)

### 16.1 Configuring Streaming

- [Setting Up Streaming](#)
  - [Source Setup](#)
  - [The Web Browser](#)
  - [Configuring Encoders](#)
- [Presets](#)
  - [Creating a Preset](#)
  - [Custom Presets](#)

## 16.1.1 Setting Up Streaming

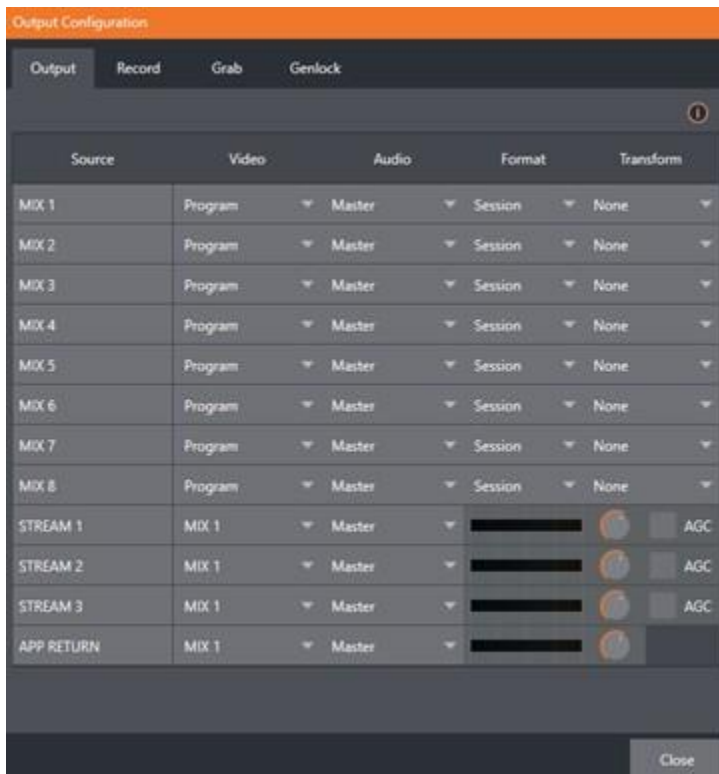
- On the Dashboard's menu bar, select **STREAM/ENCODE** > **Streaming/Record Configuration** > Configure (gear) button.



### Source Setup

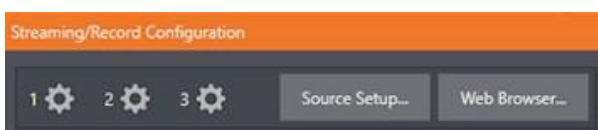
- To assign video and audio sources to any of the three streaming encoders, click **Source Setup** button at the top of the **Streaming/Record Configuration** panel.

This opens the Output Configuration dialog, where you can continue to choose audio and video sources, and adjust audio volume.



### The Web Browser

The **Web Browser** button opens a web browser.



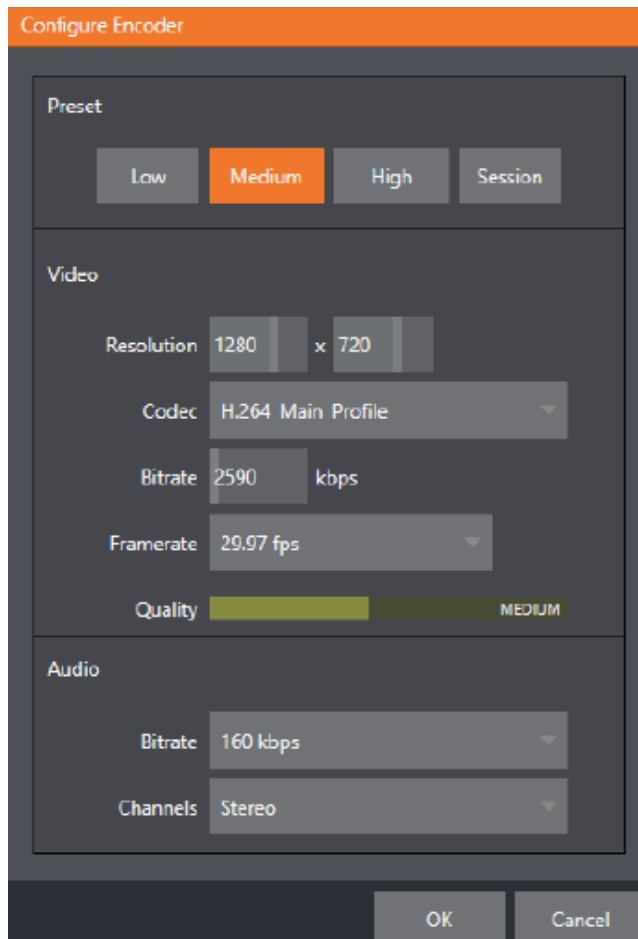
This feature is provided for your convenience when working with web streams or your content delivery network account. It is *not* recommended to web surf during live operations.

- ❑ **Tip:** If the web browser is hidden from view because a Live Desktop operation took precedence, you can reuse this button to bring the browser window to the front again.

## Configuring Encoders

Settings for encoders are configured in the **Configure Encoder** dialog.

1. Open this dialog by clicking the **Configuration** (gear) icon for an encoder, on the top left of the **Streaming/Record Configuration** panel.



2. Select an encoder Preset (for example *Medium* or *High*), or manually configure custom settings using controls in the **Video and Audio** control groups below.
3. To save, click **OK**.

- ❑ **Note:** The **Codec** selector in this panel allows you to select from a number of H.264 profiles as well as HEVC

### 16.1.2 Presets

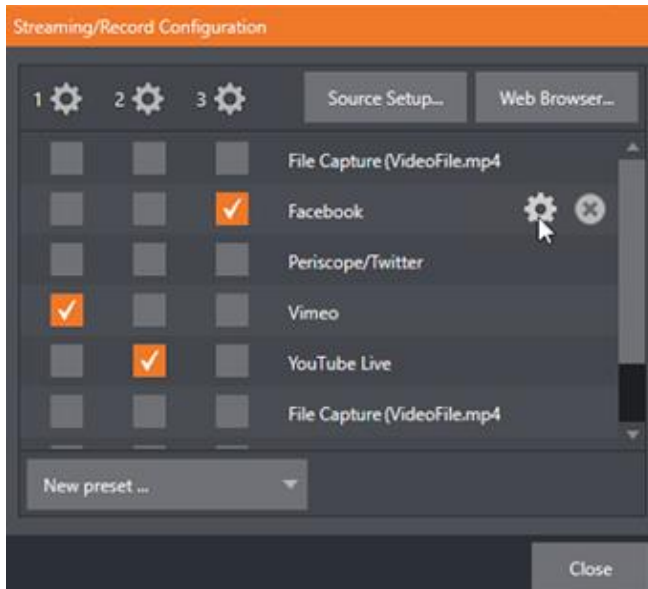
Details about a given CDN or other encoder target are retained in a preset (for example, Facebook, YouTube Live, etc.)

- You can add new presets to the **Streaming/Record Configuration** panel with the **New preset** menu, bottom left of the panel.

**Tip:** A default *File Capture* preset allows you to capture output from either encoder to a file.

## Creating a Preset

There are two columns of checkboxes that enable sending of output from one of the encoders to the presets displayed on the right.



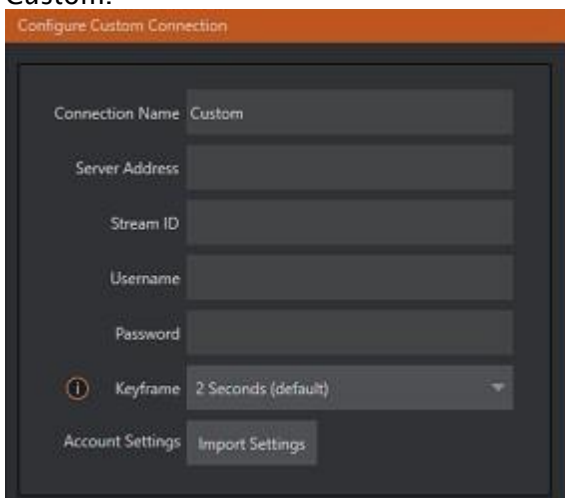
Move the mouse pointer over a preset to display two new gadgets.

1. Click the **Configure** (gear) icon to open a suitable dialog.
2. You may need to enter your account credentials for a site and log in, or provide suitable controls for other relevant settings that are required.
3. For a *File Capture* preset, choose the path for encoded file output.

Clicking the **X** deletes the Preset.

## Custom Presets

In addition to the many recognizable names listed in **New preset**, there is a menu item labeled **Custom**.



- The dialog this selection opens allows you to enter the details typically required by generic streaming services.

- If your CDN (Content Delivery Network) service provides an XML file containing the recommended configuration settings related to your streaming account, click Import Settings to navigate and load this file.

The file typically automatically provides all necessary values for streaming via their service.

---

## 16.2 Working With a Stream

- [Initiating a Stream](#)
- [Capturing a Stream](#)
  - [Production and Capture Considerations](#)
  - [Other Parameters](#)
- [Streaming Strategies](#)
  - [On Demand or Live Streaming](#)
  - [Bandwidth Considerations](#)
  - [Streaming Media Providers](#)

### 16.2.1 Initiating a Stream

- When ready, initiate streaming to the Preset targets you have check-marked in the Streaming Configuration panel, by clicking the STREAM/ENCODE button in the menu bar at the top of the Live Desktop panel.
- The button displays elapsed time during streaming/encoding.
- Once streaming has started, clicking the presets start or stop that individual preset independently from the others.

**Note:** You cannot click a Preset streaming on one encoder and expect it to switch to the other encoder. You must stop the first encoder, then select the other encoder.

### 16.2.2 Capturing a Stream

To archive a live stream file as it is created by an encoder, configure and check a **File Capture** preset for that encoder.

#### Production and Capture Considerations

If you're not intent on live streaming, but wish to capture a live switching session, you would likely record at full resolution using the Record button (rather than Stream). The high quality captured files can then be used later in a DDR, or perhaps be transferred to another computer (even on a different platform) for external processing or editing.

**Tip:** Use an external hard drive to transfer the files between systems, or transfer them across a local network.

You can always convert these files to a streaming file format if you later decide you'd like to supply them for on demand Internet viewing. This lets you retain best quality right through to final output.

When you eventually encode for streaming, you can choose settings that best suit the intended audience and streaming environment. At the very least, if (perhaps to save conversion time) you capture video for web distribution, it's best to capture it at least at the size that you intend for final output. This helps ensure satisfactory video quality for your viewers. When video is compressed (as it invariably is for web viewing) you can lose important details.

## Other Parameters

Other variables to keep in mind when you're creating video for the web are *contrast* and *motion*. During video encoding for web distribution, a fair amount of video information and detail can be lost. For this reason, good lighting of your source video is essential.

Also, web streaming doesn't handle detail, transitions, and motion all that well. So, your best shots should be close-up, and without a lot of movement. Too, audio from cameras and camcorders is rarely as good as that from external microphones. You should at least use a clip-on lavalier microphone, if not a directional or shotgun microphone to be sure you record only the audio you really want. Finally, for high quality streaming, consider using a 720p session, even when your cameras may be SD and interlaced (there is no particular benefit to working in SD when your goal is a smaller streaming output).

## 16.2.3 Streaming Strategies

One of the best approaches when beginning (to stream your productions) is to establish a relationship with a commercial streaming media provider. A good provider can guide you past firewalls, provide public addresses for everyone to view your stream, and provide no end of valuable guidance.

And it may not be as expensive as you think (costs vary based on considerations such as how many viewers you expect, how much web bandwidth you use each month, and so-on). Some services based on an advertising model will even host your stream free.

## On Demand or Live Streaming

Not all streaming is live streaming. The difference is similar to watching a television program you previously recorded at a time convenient for you versus watching a live event. On demand streams are stored on a server (often supplied by an external service provider), ready to be transmitted whenever a viewer wishes. Live streams are available at the time they are broadcast, such as during a live concert or event.

## On Demand Hosting

The Record module permits you to capture your productions to a local hard drive. The resulting files can be hosted on a network later, so viewers can connect whenever they like. If you have the resources available, you can host the video yourself - but if many people will likely want to view your production, you will likely avail yourself of a service to stream it on your behalf.

Ideally, on demand streaming video begins to play on request after a few moments (letting the stream get a bit ahead of the client playback device is called 'buffering', and helps ensure smooth playback). This stands in contrast to other types of online video distribution which requires the viewer to completely download the video file before he can begin play. Given a sufficiently high speed connection between host and viewer, they may well be able to enjoy a seamless viewing experience without stuttering or other issues.



## Live Streaming

Live streaming is a growing international market, and one you may well wish to serve. This form of streaming is a somewhat more demanding implementation. Rather than record a file and deal with it later, live video is transmitted over the network (effectively in real-time, give or take a little time in the pipe).

Delivering a good quality stream requires that you consider both your network connection capabilities and that of your viewers. Also, to ensure reliable delivery, you will ideally have some idea of the size of your audience. Streaming video is highly compressed to reduce bandwidth demands and make it available to a wider group. The decision as to which encoding format to use for your live stream is up to you or – in some cases – your client.

Here are some things to consider:

- Some corporate and institutional network administrators opt to support one or another format exclusively. (Check with your IT department to find out if this affects your decision).
- RTMP and RTSP combined have a very wide installed user base, and work well across multiple platforms (PCs, Macs, Linux, etc.).
- SRT is an open source protocol that is managed by the SRT Alliance. It can be used to send media over unpredictable networks, like the Internet. More information about SRT can be found at [srtalliance.org](http://srtalliance.org).

## RTSP Stream Decoding

The processing demands from high-quality video applications and devices have increased in the last few years. As video content continues ever-expanding, technology evolves to handle the demand. Vizrt takes advantage of GPU hardware acceleration for all stream decoding.

Unfortunately, some streams are simply incompatible with the GPU decoder. We recommend that the originating stream vendors look to solve the compatibility and take advantage of modern GPU decoding. We also understand that Vizrt users of may not have that option and must wait for vendor development cycles.

As a workaround, if a stream is found to be incompatible, you can append the URL with a command that instructs Viz Vectar Plus to not use hardware acceleration.

```
(optional components are enclosed in square brackets)
rtsp://\[username\[:password\]\@\]ip\_address\[:rtsp\_port\]/server\_URL\[?
param1=val1\[&param2=val2\]...\[&hw\_accel=false\]\]
```

For example, the original URL of:

```
rtsp:// http://stream_IP_address.com">stream_IP_address.com :554/myStreamserver
```

would change to: `rtsp://stream_IP_address.com:554/myStreamserver?hw_accel=false">rtsp://stream_IP_address.com:554/myStreamserver?hw_accel=false`

## Bandwidth Considerations

You'll often hear the term 'bitrate' in connection with streaming. This expression refers to data throughput per second (generally measured in Kilobits per second, or Kbps.) You could think of this as being like water flowing through a hose. You control the 'faucet', because you get to choose the streaming Profile setting in the system's Configuration panels. However, you don't own the 'hose' – or, at least, not the entire hose.

Once the stream leaves your immediate environment, even if you can supply good throughput locally, bandwidth may be constricted elsewhere along the transmission path. The level of Internet traffic can impose limits, but another major factor is the sort of connections your viewing audience may have. Consider an example scenario: Even though you know that most of your audience is going to connect to your program using (relatively slow) wireless devices, you use a very high outgoing bitrate – thinking that this will surely be enough to fill the need. The fact is, though, a high bitrate actually ensures their experience will be poor. The client player tries to play at the specified bitrate, but (in this example) the wireless bottleneck impedes flow. It is as if you connected a fire hose on your end, giving them a suitable high capacity nozzle for their end – but in the last stage of flow, the stream must pass through a small garden hose. Sadly, the stream will be quite insufficient, and output from the ‘nozzle’ (the client player) will falter badly.

□ **Tip:** Consider an example scenario.

Even though you know that most of your audience is going to connect to your program using (relatively slow) wireless devices, you use a very high outgoing bitrate – thinking that this will surely be enough to fill the need. However, a high bitrate actually ensures their experience will be poor. The client player tries to play at the specified bitrate, but the wireless bottleneck impedes flow. This is analogous to connecting a fire hose on your end, giving them a suitable high capacity nozzle for their end, yet in the last stage of flow, the stream must pass through a small garden hose. The stream will be insufficient, and output from the ‘nozzle’ (the client player) will falter badly

For reliable performance, try to ensure the potential upload bandwidth from your system to the net is around twice the bitrate you choose. You can broadcast at a rate closer to your actual ceiling, but reliable performance cherishes headroom.

Also consider the expected download abilities of your viewers. Ideally, a safety margin 1.5 times the stream’s bitrate is desirable. This may mean you need to consider using a lower resolution, or lower framerate for your stream. Doing this when required will generally deliver a smooth result, and is the recommended course.

See *Speed Tests* in section [Diagnostics and Troubleshooting](#).

## Streaming Media Providers

Using a commercial streaming media provider (Content Delivery Network, CDN) bypasses otherwise high-bandwidth requirements for the encoding computer. When you have made arrangements for a streaming media provider to distribute your stream, the encoder only needs enough bandwidth to get a single a/v stream to the provider. All end users connect to the *provider* to view the stream.

Most streaming providers have access to massive bandwidth (and often, with very little notice, they can scale up your allotment to meet a temporary need.) Since your local bandwidth is really only used for uploading a single stream, you can send a high quality stream, secure in the knowledge that it will not degrade as soon as a second viewer attempts to see it.

## 16.3 Diagnostics And Troubleshooting

- [Testing your Stream](#)
  - [Testing with Ping](#)
  - [Speed Tests](#)
- [Where is the Problem?](#)

## 16.3.1 Testing your Stream

When it comes to using your system in a professional live production environment, failure to test beforehand is unwise and unprofessional.

Be aware of the need for redundancy in a professional environment.

Perform onsite testing, to ensure your live stream is working well before zero hour.

1. Set up and enable a test stream.
2. You can use the integrated web browser to scrutinize the stream, but ideally confirm using an external system too.

Success at this point does not necessarily mean you're done. You may be able to see the stream locally, but can someone outside the local environment connect to it over the Internet? The best way to find out is to have someone at a remote location verify that your stream is streaming properly.

### Testing with Ping

Before your stream can be seen - whether on a local intranet or the Internet - client computers (or your service provider) need to be able to establish a network connection with your local system and its encoder.

Ping is an effective tool to ensure the basic connection exists, thus it can help you with streaming, NDI® connection issues, too (and it works just fine in a multi-platform environment).

Ping sends a small set of data packets to the target host (IP number), then listens for an echo response in return. Ping estimates the round-trip time in milliseconds, records any data losses, and displays a summary when finished. Bottom line, if you can't ping your target, your connection has problems (the problem might be as simple as a bad cable connection).

- To issue a ping, you need know the IP number of the target computer.

### Finding the Target IP Number

#### For Windows®

1. Type run into the Search field, then press **ENTER** on the keyboard.
2. Type cmd into the dialog, and press **ENTER** on the keyboard.
3. In the command shell that opens, type ipconfig and press **ENTER** again.
4. The IP Address for the system is reported in the window (listed next to IPv4 Address), along with other data.

#### To Find The IP Address For A System Running MacOS®

1. Click the **Apple** icon at upper left on the Desktop, and select **About This Mac**.
2. Click **More info** in the panel which opens.
3. Click **Network** in the **Contents** column at left.
4. The IP number for the is listed in the right hand pane.

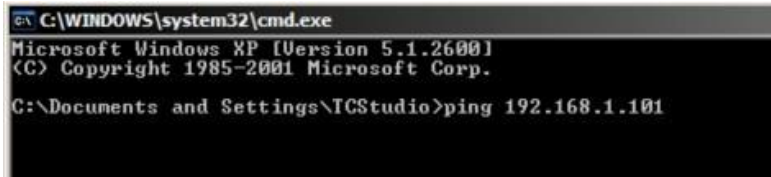
### Issuing a Ping

Ping is a command line program, run from a command shell on the issuing computer.

To open a command shell and send a ping:

## Windows®

1. Repeat the steps you performed above to re-open a command shell.
2. Type ping followed by a space and the target IP number, as in the image below:



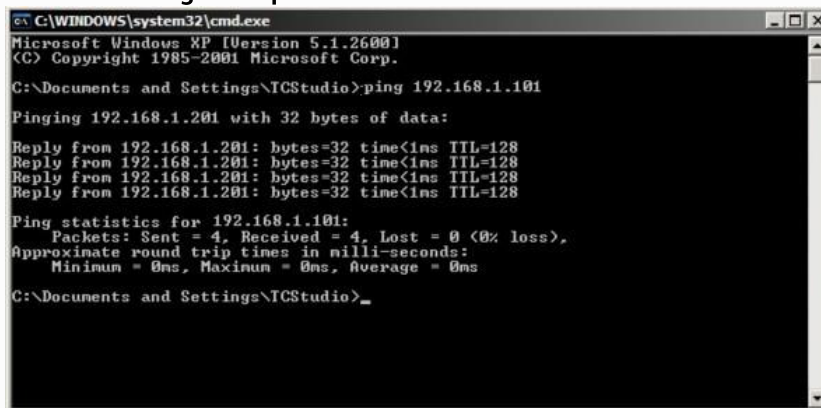
```

C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\TCStudio>ping 192.168.1.101
  
```

3. Press ENTER
4. After a moment or two report results begin.

### □ Successful Ping Example:



```

C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\TCStudio>ping 192.168.1.101

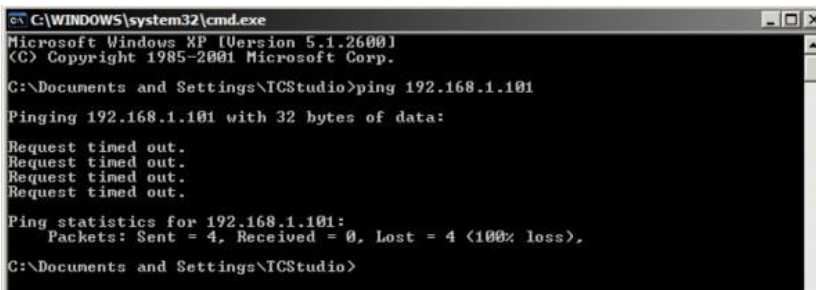
Pinging 192.168.1.201 with 32 bytes of data:

Reply from 192.168.1.201: bytes=32 time<1ms TTL=128
Reply from 192.168.1.201: bytes=32 time<1ms TTL=128
Reply from 192.168.1.201: bytes=32 time<1ms TTL=128
Reply from 192.168.1.201: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.101:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Documents and Settings\TCStudio>_
  
```

### □ Ping Failure Example (indicating a network problem):



```

C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\TCStudio>ping 192.168.1.101

Pinging 192.168.1.101 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.1.101:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\Documents and Settings\TCStudio>
  
```

## Apple MacOS®

1. Double-click **Terminal** in the *Applications\Utilities* folder.
2. Type the following command into the Terminal and then add the IP number, and : `ping -c 4 <ipnumber>` (for example, you might type: `ping -c 4 192.168.1.101`).
3. Press **ENTER**. The response is similar to the Windows example described above. A ping failure indicates a problem with the network connection.

## Speed Tests

Are you sure your upload bandwidth is adequate to the bitrate you've set for your stream? Test and make sure. Again, a number of websites provide free speed testing. These will give you a basic idea of what your local bandwidth really is. One site which provides a list of online speed test resources is: <http://www.dslreports.com/speedtest?more=1>

### 16.3.2 Where is the Problem?

With regard to streaming issues, don't overlook the fact that your Viz Vectar Plus system is just one of the pieces of the puzzle. There are many others that are just as important.

One useful thing to try is to check the streaming file:

- Archive the streaming output file locally, and then examine it to see if it has any problems.
- This file corresponds exactly to what the encoder is sending the downstream server. In cases of sync problems, low frame-rate problems, audio popping problems, etc., if it's an encoding issue, the problem will be seen in this file. On the other hand (if the file looks good), then the issue has to be after the encoder (perhaps a network problem or CDN configuration mismatch).

## 17 Export

In today's broadcasting world, a single program feed may be inadequate or inappropriate. Viewers consume media from multiple sources, often simultaneously. A live online presence is critical for many productions with little or no traditional broadcast following.

Publishing supplemental content such as backstage feeds, locker room interviews, pre and post-game chatter), through Internet sites like Facebook®, YouTube®, Twitter® provides further opportunities for brand extension and monetization.

- The Export feature enables a broadcaster, networks and corporate users to publish clips and stills from ongoing events like syndicated sports, entertainment or news programming direct to social media.
- Presets for your social media accounts and other publishing targets simplify distribution of selected content to multiple sites, even while production and recording is still underway. Ideal for concerts, galas and sport events.
- The Export feature supports both transcoding and distribution to local or networked storage for archival or post production purposes.

This section contains the following Export topics:

- [Setting Up Export](#)
- [Exporting Media](#)

The Export feature is similar to [Streaming](#).

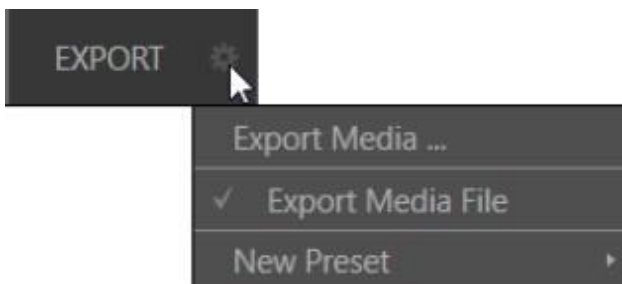
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### 17.1 Setting Up Export

- [Export Presets](#)
- [Preset List](#)
- [Transcode, SMTP, and FTP](#)
- [Watermarking](#)

#### 17.1.1 Export Presets

On the menu bar at the top of the screen, click the **Configure** gear next to the **EXPORT** button.



## 17.1.2 Preset List

Below **Export Media** is a list of any presets configured as export targets (initially this list shows only the default *Export Media File* entry, a transcoding preset which cannot be deleted).

Each preset listed in the menu can be checked or unchecked. When you add media files to the Export bin, the check-marked entries determine which Export targets are automatically assigned to them. You can manually modify the presets for each item in the Export bin.

**Tip:** When the mouse pointer is over a preset in the Export menu, two gadgets are shown at right; the **Configuration** (gear) icon allows you to modify the preset, and the **X** removes it from the list.

### To create an Export preset

1. Click **New Preset** to display a sub-menu listing various supported export targets (for example, Twitter or Facebook).
2. Select an item to open a dialog menu.
3. Create a custom preset.  
For most external sites (social media sites or FTP sites), the dialog requires you to enter account credentials.  
Typically, a user name and password for your social media accounts, as well as FTP servers.
4. Credentials are tested when you press **OK**, and report an error if not OK.
5. Your new preset appears in the **Preset** list.

## 17.1.3 Social Media Sites

Export can publish media to Facebook, Twitter, YouTube, and many more sites and services. Other connections will be continually added.

## 17.1.4 Transcode, SMTP, and FTP

- The options Transcode, FTP and SMTP handle various file conversions and publishing to local (or networked) storage volumes, or as email.
- These are useful output alternatives, effectively providing live export methods that do not force you to wait until production ends.
- This can be invaluable for collaboration, whether local or remote.
- Transcode exports provide options to re-encode video in different formats before sharing. Select suitable options for your target device or application.
- For SMTP, replace the dummy email server entries with those of your own mail service.

## 17.1.5 Watermarking

To avoid unauthorized use of private or copyrighted media, you can add a watermark before exporting it to public sites.

### To create a watermark

1. Click **Watermark** in the footer of the various Export preset configuration panels.
2. Select a suitable overlay image.
3. The image you select is composited onto exported video or still image files.

It should normally be a 32-bit still image file (supported formats include popular formats such as PNG and Targa) that positions the watermark correctly in the frame, taking into account the resolution and aspect of exported files.

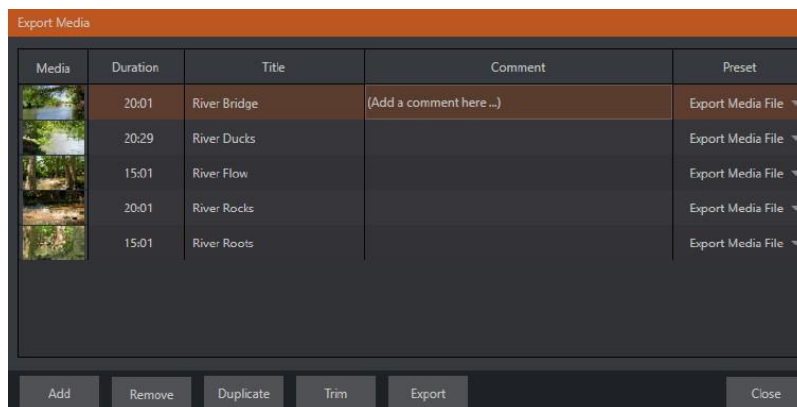
## 17.2 Exporting Media

- [Metadata](#)
- [Presets](#)
- [List Management](#)
- [Other Add-to Methods](#)

Here you manage the list of clips and still images you wish to export.

### 17.2.1 To export media

1. From the Dashboard, select **File > Export Media**.



2. Click the **Add** button in the footer to open a Media Browser.
3. Select (and multi-select) content you wish to export.

You can choose items from your current session or another location. These files are added to the bin, but they are not exported at this point.

**Tip:** You can add and upload files that you are currently recording (before pressing **Stop**). These files are in the virtual *Session Recordings* folder that the media browser displays for the session.

### 17.2.2 Metadata

Media	Duration	Title	Comment	Preset
	20:01	River Bridge	(Add a comment here ...)	Export Media File ▾

- Information is displayed for each media file added. This included:
  - File name (or alias, in the case of files added from a media player playlist)
  - Duration
  - Preset (depending on settings, multiple entries pointed at different destinations may be added in one operation).
  - The Comment column allows you to add remarks that are sent along with the upload to sites that support this.

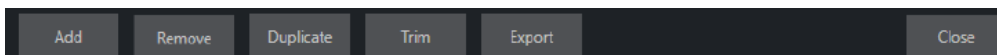


- Click in this column to enable keyboard entry, or navigate to it and start typing. Press ENTER or click elsewhere to end editing.
- Type in the Title column entry to change the title supplied for the file to social media accounts, but note that this has no effect on *FTP* or *Transcode* preset operations.

### 17.2.3 Presets

- The **Preset** column provides a menu allowing you to change the export preset or add multiple targets for each individual item in the Export bin.
- A checkmark beside a preset indicates the target is active.
- Preset selections can vary from one item in the Export bin to the next.
- If no checkmarks appear here, the entry on that row is not fully configured, and are ignored by the Export processor.

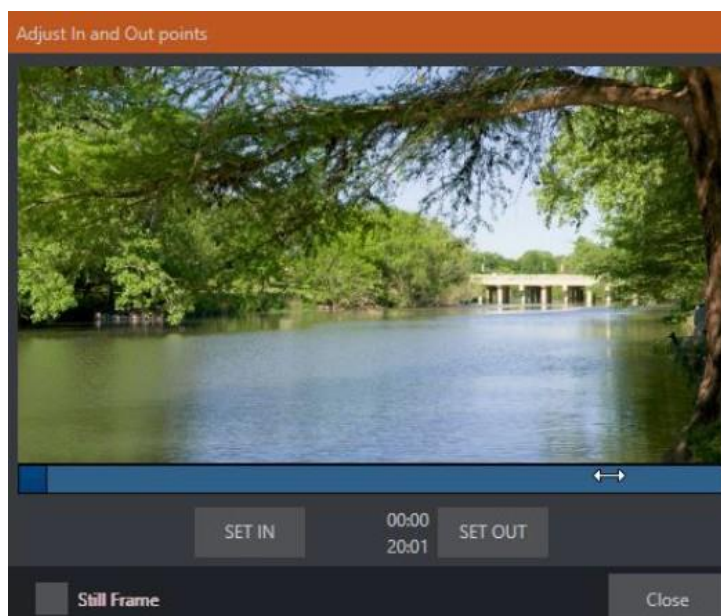
### 17.2.4 List Management



- **Remove:** Deletes entries from the Export bin, without affecting the source files.
- **Duplicate:** Clones selected entries. You may prefer this way of publishing an item to multiple targets (over adding multiple checkmarks to the Preset column for a single entry) at times.

For example, the encoding settings for one target may involve longer processing than you want to allow just at the moment. Using a duplicate entry, you can defer processing that entry until a more convenient opportunity.

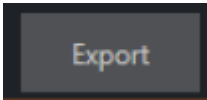
- **Trim:** Opens a trimmer pane for adjusting In and Out points for clips you plan to share (some file formats do not support trimming).



Clips that are added while still being captured can be retrimmed while still growing.

**Tip:** Checkmark **Still Frame** selects a frame as a thumbnail, converting it to a JPEG image file on upload.

- **Export:** An *On* and *Off* pilot light. When lit, the Export processor is activated, and is either watching for qualifying Export bin entries ready for exporting, or actively processing those that are ready to go.



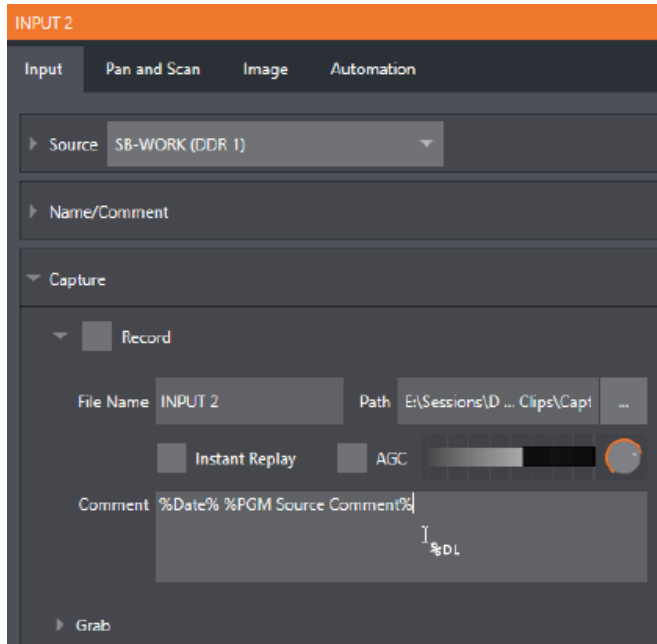
**Note:** The **Export** button is linked to the larger **Dashboard Export** button, which performs the same action.

## 17.2.5 Other Add-to Methods

Once you have configured your Export presets, check-marked one or more in the **Export** menu, and decided whether to add checks to *Stills*, *Clips*, or both in the **Auto Queue** menu, you have configured a typical preset. However, there are additional sources you can add:

- You can add either stills or clips to the Export bin from the playlist of a media player.
- You can automate adding custom titles and comments.

Grab, Record as well as the Media Players all support individual custom *Names* and *Comments*, which supplies the corresponding metadata for your Export Media additions.



- The *Name* and *Comment* fields for Grab and Record features also support DataLink.

This lets you automatically supply unique and meaningful information to social media sites along with your Export uploads.

You can also mix DataLink keys with literal text, to produce comments that embed things like the current time, the current score of a game, or the name of the person on camera at the moment into coherent sentences.

## 18 Record, Grab And Replay

You will often want to capture video clips from external sources, as well as to record your own live productions. Similarly, it can be quite useful to be able to grab stills from Program output for use in the current production.

This section contains information on the following topics:

- [Record](#)
- [Replay](#)
- [Grab](#)

### 18.1 Record

Vizrt live production systems provide a great deal of flexibility when it comes to capturing your program, selected elements of it, and a wide array of internal and external sources (with embedded timecode). Using IsoCorder™ technology, Viz Vectar Plus delivers powerful recording capabilities.

As Viz Vectar Plus' primary outputs are configurable, you can use them to capture Program, Program (Clean), individual Switcher sources, M/Es, and more.



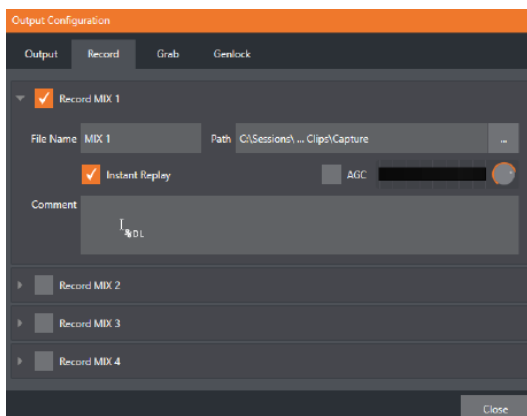
Recording is easily enabled and disabled by clicking the large **RECORD** button in the Dashboard. During capture, a nearby time counter tracks the length of clips recorded with the current base filename, and a horizontal VU meter beneath the button assures you that you are capturing audio.

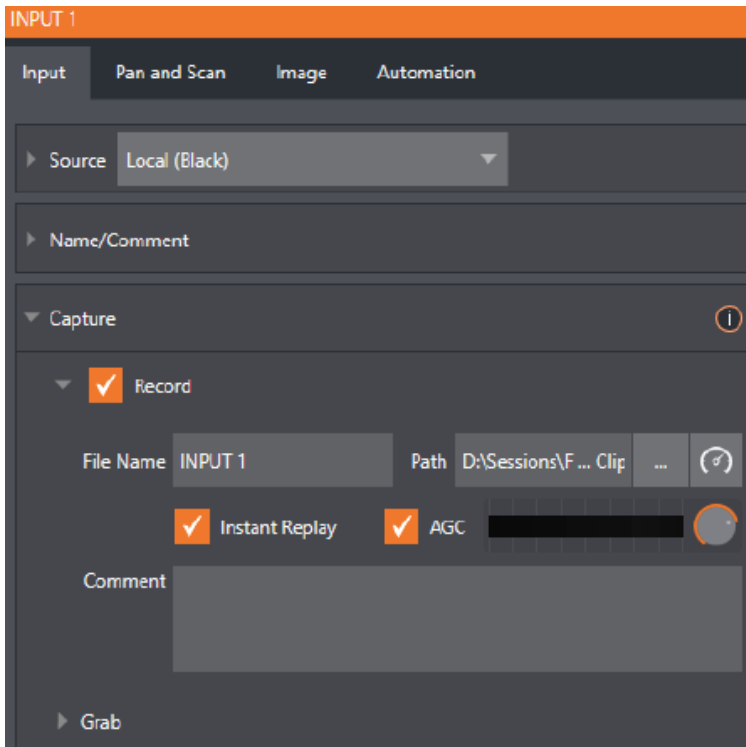
- Note:** It is not necessary to interrupt recording to add a clip that is being captured to a DDR playlist or the Publish Bin. Clip icons show a red recording indicator on clips currently being captured in playlists, the Publish Bin, and in the Media Browser.

#### 18.1.1 Record Configuration

Before you begin recording, you will want to determine what to record, where to record it to, and so on. To support IsoCorder's flexible ability to capture almost anything, settings and controls for recording are provided in the individual Input Configuration panels as well as the Output Configuration pane. Click the **Configure** button (gear) for the control panel of the source you wish to configure to access these settings.

#### 18.1.2 Capture Controls





Whether you are setting up a recorder for a video input or output Mix, the Capture control group features are the same.

- A switch at the top is used to enable or disable the recorder.
- Filename and path text boxes appear just below.
- A convenient **Drive Speed Test** button appears to the right of the Path field. Click it to open a utility that lets you evaluate the speed and capacity of your storage volumes.

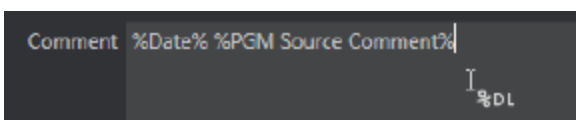
**Note:** The same source cannot be selected for multiple recordings. For example: *IN 1* cannot be selected as the source for two recorders.

## Filename and Comment

IsoCorder uses the source name to supply the default filename for each recording (names are numerically incremented automatically as well), but these can be edited. Conveniently, DataLink key system allows you to insert dynamic values from real-time production sources into the filename.

For example, every recorded or grabbed file can automatically incorporate a date stamp, identify the input selected on the Program row at the time of capture, and so on. This is useful not only in locating files from specific sources later, but also when posting media to social media services using the Export feature.

**Note:** IsoCorder captures a low resolution preview file along with the high-quality recording. We do not recommend deleting or moving these supplemental files when using the recordings on a Vizrt product, as doing so results in higher resource usage during live production.



The Comment entry can likewise use DataLink values, and in turn can be used to provide metadata to title pages that refer to the captured clip's comment.

## Path

Click the three dots at right beside the Path field to select from available storage volumes as targets for the recording.

- Caution:** It is recommended that any single drive be tasked to capture one or two video sources at most. A warning message is displayed if you exceed this number when assigning Destination settings. You are allowed to exceed this limit, however, when you are confident that very fast volumes are capable of handling the load.

## Audio Level

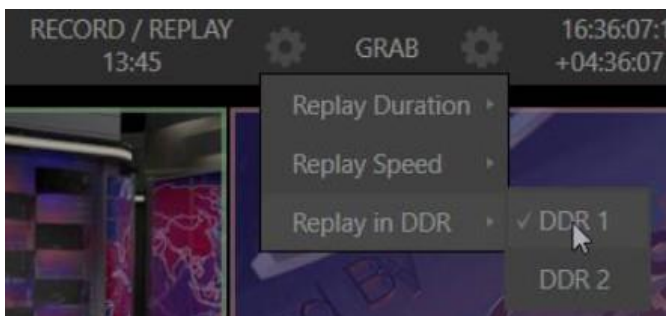
The Audio Level control lets you set the volume independently for each source you capture, and feature a convenient AGC option (Automatic Gain Control).

## File Format

IsoCorder records a high-quality Quicktime file (you can use the Transcode function in Export to supply files in a number of different formats, when necessary).

## 18.2 Replay

The Replay switch in each Capture control group enables instant replay features for individual recorders.



- **Replay Duration:** Determines the length of replay clips added to the DDRs.
- **Replay Speed:** Sets the playback speed for clips added to the DDR using the replay workflow.
- **Replay in DDR:** Selects a DDR as the target for replay clip playback.

### 18.2.1 Instant and Deferred Replays

The method of triggering a replay varies depending on whether you want to replay a clip captured from a Mix (output) or directly from a Switcher input.

## 18.2.2 Switcher Source

When the Record and Replay switches in the Capture control group for a Switcher source are both enabled, special replay controls are shown beneath its buttons on the Program and Preview rows of the Switcher.



Click the **Replay** button beneath the Program row to trigger an instant replay using the DDR's Show On (PGM) feature and settings (or, hold down **CTRL** and click the larger Switcher button itself to do the same thing).

The similar button beneath the Preview row is even more useful, it adds the replay clip to the DDR, and leaves it selected, but does not play it on Program Out immediately.

When you are ready to insert the replay clip into your program, press the keyboard **CTRL** key and the **SPACEBAR**. This triggers the Show On (PGM) feature for the DDR currently assigned to replay duties. This workflow lets you defer replay playback until a more appropriate moment.

## 18.2.3 Mixed Output

Since outputs do not appear on the Switcher rows, the methods above do not apply. Instead, press a number pad key from 1-4 to trigger an instant replay from the corresponding output (Mix 1-4) recorder.

- Note:** It is possible to assign an NDI output from the system to one of its own inputs if you prefer to use the same method as described earlier for your output replays.

## 18.3 Grab

The purpose of the Grab function is to capture a still image from the current Program Output video stream or an input.

Grab is represented by a large button in the Dashboard at the top of the screen, and smaller grab (camera) icons which appear at upper-right on Switcher source viewports. The former grabs stills from MIX outputs (when enabled individually), while the latter grabs an image from specific Switcher sources.

### 18.3.1 The Grab Menu

Click the **Configure** button (gear) next to Grab in the Dashboard at the top of the Live Desktop to choose a target Media Player for grabs. Otherwise, input and output grab configuration options are very similar to those described above for recording.

- Note:** De-Interlacing is automatically applied to avoid a comb effect caused by inter-frame motion in fielded sessions.

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## 19 Control Panels

This section introduces the Viz Vectar Plus control surfaces, describing how they complement your system's production setup and how to connect your live production system to a control surface. Viz Vectar Plus provides unrivaled live production power. With a matching control surface, all that power is right at your fingertips.

### 19.1 2/4 Stripe Control Panel

These two control surfaces have been prepared for separate requirements. Whilst they vary in complexity, the production workflows that they support are similar.

- Vizrt *quad row* panel is a large and powerful four-stripe unit, delivering precise control over your programming.
- Vizrt *dual row* panel is its more compact offering.

This section contains information on the following topics:

- [Connection and Configuration](#)
- [Control Schema](#)
- [Primary Command Group](#)
- [Secondary Command Group](#)
- [Layers and Effects](#)
- [Media Players](#)
- [Buffers and Titles](#)
- [Joystick](#)

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#### 19.1.1 Connection And Configuration

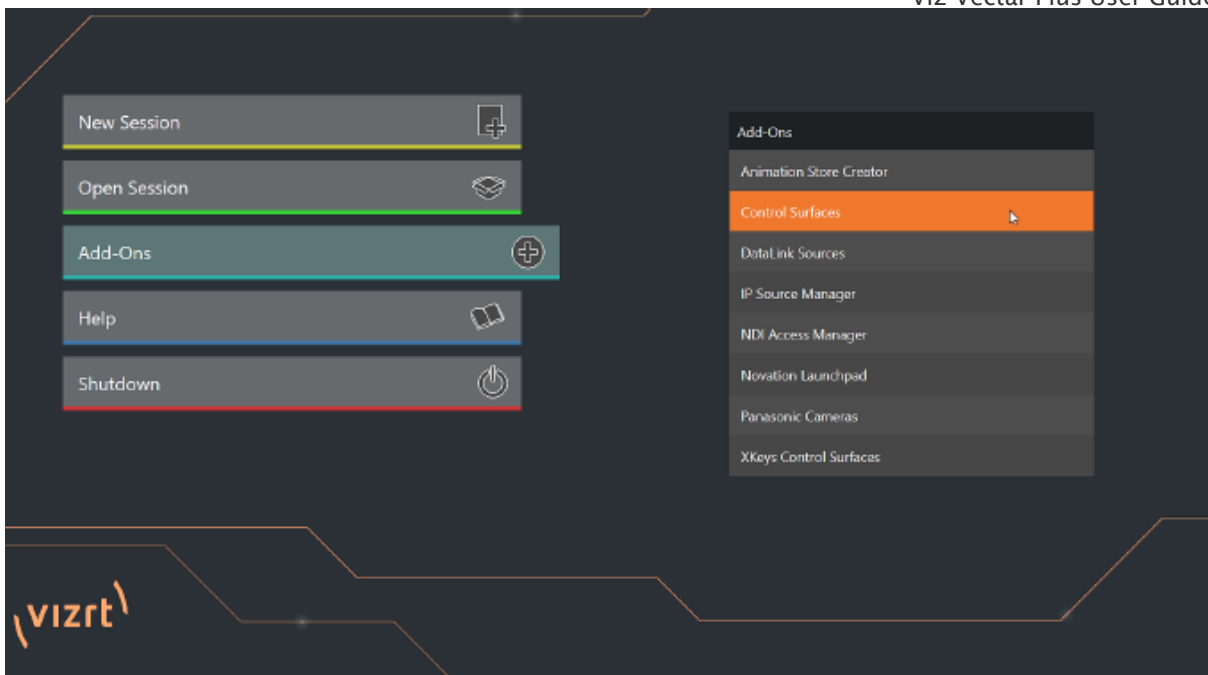
Connect the control surface unit to the same network your Vizrt live production system is on. Both Viz Vectar Plus control surfaces require a standard, 3-prong AC power connection.

You need to pair a control surface with a specific live production unit to control, as described next.

- Note:** The control surface and your Viz Vectar Plus should be connected to the same subnet.

#### Pairing Systems and Surfaces

Viz Vectar Plus auto-detects compatible control surfaces on the same network. Often there is only one such surface, which makes setup easy. At other times, though, you may be in an environment with more than one surface, more than one live production system, or both.



## Control Surfaces Utility

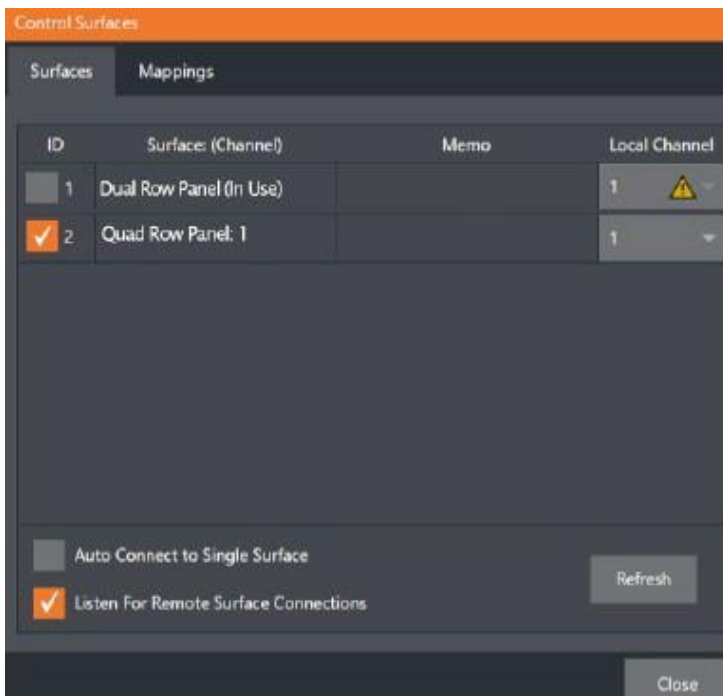
To help you manage these control connections, the **Control Surfaces** configuration utility is included in the Launch panel's **Add-Ons** menu.

1. Click the Add-Ons button on the main menu on the Home page in the Launch pane to show the list of installed add-on applications.
2. The utility automatically identifies and lists qualified control surfaces it finds on the network.
3. Each surface discovered is listed in a numbered row. The ID number for the row is not permanently associated with a particular surface, and may change as surfaces are added to or removed from the network. The ID number serves a very useful purpose. If you look at the top-left LCD display panel of an un-paired control surface when this utility is open, its ID number is temporarily shown. This makes it easy to match an entry in the panel with a specific physical surface.
4. Once you identify the surface you want to use, check it in the list to claim it for the local system (the steps in Setting the Channel complete the communication connection to the surface).
5. You can also enter a brief description (*Master Control CS*) into the Memo field, for later reference.

## Setting the Channel

A Local Channel menu is provided for each surface: More accurately, for each echelon, or two stripe pair on the surface (see [Control Schema](#)).





The **Channel** menu controls just one of two related channel settings – this one (on the local host), and another channel used by the control surface itself. These combine to let you connect to and control alternate live production systems.

- **Tip:** You might think of the control and system channels as being like the channel settings of two walkie talkies (2-way radios). For two-way radios to connect, both units must be on the same channel. Similarly, the channel selection displayed in this software pane tells the local unit to communicate with the selected (check-marked) control surface on the channel you choose. Of course, the control surface must also be set to the same channel for successful communication.

The **Control Surface** utility identifies the channel each control surface is on by a number from 1-8 after the colon in the Surface: (Channel) column. Normally, you can set the Local Channel to match this value (a Warning is shown if the channel the surface is set to does not match the Local Channel).

If you find it necessary to modify the channel the control surface is set to, proceed as follows:

Hold down the **SHIFT**, **CTRL** and **ALT** buttons on the control surface at the same time for a couple of seconds to enable channel select mode. The left-most LCD display in the first stripe in the echelon updates to show channel selections, and a button in the PGM/A row lights to show the current channel. Tap another button in the row to change the selection.

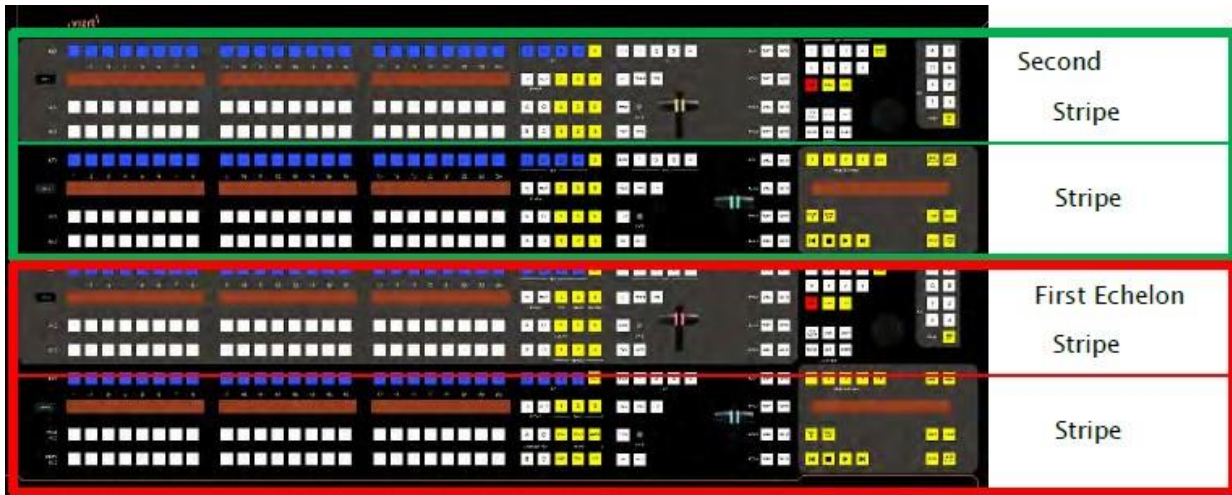
- **Note:** For the four-stripe Viz Vectar Plus L panel, you must repeat this operation in order to match the second echelon's channel setting to that of the first. Press and hold the number pad buttons labeled 1, 2 and 3 in the third stripe (rather than **SHIFT**, **CTRL** and **ALT**) in this case; then make your channel selection using the A button in the PGM/A row of the third stripe. With these settings you can, for example, set one system to listen a certain control

surface on channel 1, and set a different unit to listen to the same control surface on channel 2 – then easily go from controlling one system to controlling the other by updating the surface channel setting.

## Button Backlighting

Press the LAYER SELECT B and D buttons together, and keep them pressed down.

### 19.1.2 Control Schema



Generally, you can think of the various control groups provided as being organized into horizontal stripes. In turn, two stripes are paired together in upper and lower echelons, as shown above.

#### Control Groups

- [Stripes and Echelons](#)
- [Control Columns](#)
- [Displays](#)

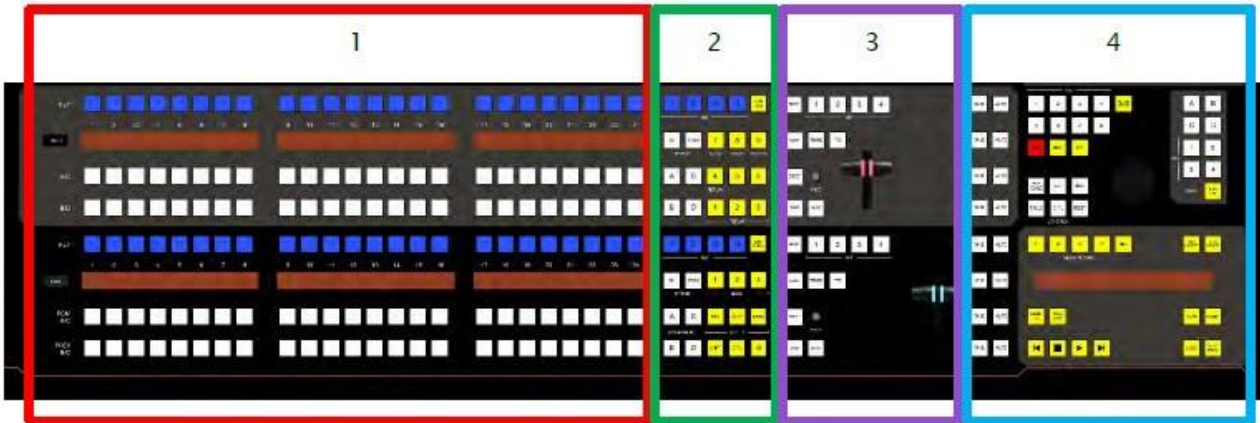
#### Stripes and Echelons



The control layout of all stripes is quite similar, and the second echelon is nearly identical to the first. However, the first echelon is unique in providing several common controls (for example *SHIFT*, *ALT*, *BANK*) conveniently locating these just below your hands at rest.

The first echelon, nearest the operator, is primary; the second echelon plays a supporting role.

## Control Columns

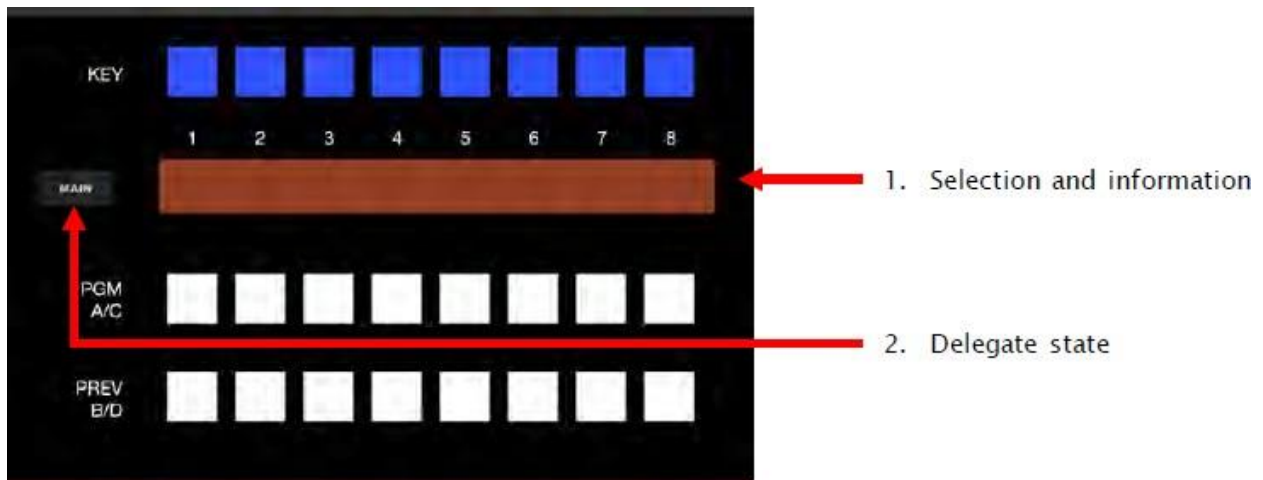


Controls in each horizontal stripe can be grouped into the following four columns:

1. **Selection:** Video sources.
2. **Command:** Control operations and options.
3. **Layers & Effects:** Transitions and layer visibility.
4. **Joystick & Media:** Layer position and PTZ control, plus Media Player control.

In the sections that follow, we'll look at each of the functions of controls in each of these columns more closely, but first, let's sidestep briefly to talk about displays.

## Displays



Both Viz Vectar Plus control surfaces feature helpful indicators and system feedback by means of illuminated displays.

1. An OLED display positioned just left of each stripe normally shows the delegate state for the associated stripe.

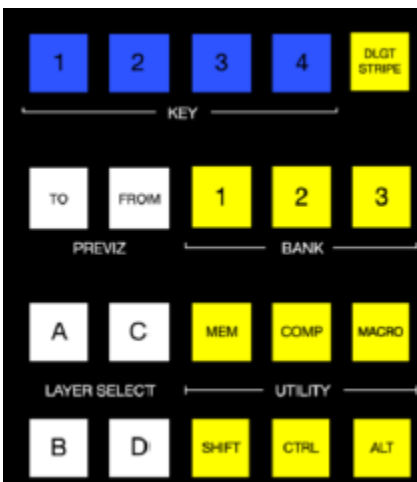
For example, it may show that the stripe has been delegated (or assigned) to control the Main switcher, one or more M/Es, or for one of Viz Vectar Plus' supplementary routed outputs.

**Tip:** The numbers 1-24 are silkscreened above the LCD panels as a further aid when making selections.



2. The blue LCD panels spanning each stripe just below the KEY row show labels identifying the selection that would result from pressing a button in the same column.
3. Another LCD strip appears in the Media Players group at right in the first stripe, and third for the four-stripe surface.

### 19.1.3 Primary Command Group



The second column of buttons in each stripe provides access to important control operations and options.

#### Command Group

The Command group in the first stripe (nearest the operator) has some unique features that actually govern other sections of the overall control surface. The primary Command group. Among these special controls are several that we can describe as delegate buttons.

- KEY
- DLGT STRIPE
- BANK
- PREVIZ
- UTILITY
- LAYER SELECT (A/C, B/D)

For example, consider the four buttons labeled KEY in the top row of this group.

## KEY

**Tip:** Delegate buttons usually, though not always, support multi-selection.

Pressing one of these buttons, labeled 1-4, delegates or assigns the buttons in the 24-button KEY selection row at left in the same stripe to govern the active source assigned to one or more KEY (or DSK) layers.



### Delegating KEY to UTILITY (Macro triggers)

Support for single-button macro execution (i.e., triggering a macro without holding the MACRO button down) is provided by allowing you to repurpose KEY rows for one or more stripes as UTILITY rows. In this state, connected Vectar Plus instances detect button presses from that row in the **External Triggers** feature of the Live Desktop's **Macro Configuration** pane.

Each switcher bus supports four banks of UTILITY row buttons. To convert a KEY row to UTILITY row mode, double-punch an already lit DSK/KEY button (1-4), or triple-punch a different KEY delegate. This assigns the corresponding UTILITY bank (1-4) to the KEY row. While in UTILITY row mode, the KEY delegate button for the active UTILITY bank will blink.

To revert from UTILITY mode to normal KEY row usage, delegate one or more KEYS again (by punching a KEY delegate).

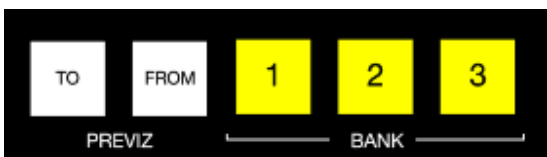
It's helpful to remember that each primary Switcher bus (MAIN, M/E 1, M/E 2, etc.) has its own independent UTILITY banks. This means that if you assign a set of macros to UTILITY row Bank 2 in M/E 3, these macro assignments are retained should you later delegate M/E 3 to a different Stripe.

## DLGT STRIPE

The remaining button on the topmost row of the primary Command group is labeled DLGT STRIPE, which is an abbreviation of delegate stripe.



When you press and hold DLGT STRIPE, the LCD displays in each stripe update to show the names of the available switcher busses (MAIN, M/E 1, 2, etc.) and MIX 1-4. In this state, press one or more buttons in the PGM/A row beneath and release the DLGT STRIPE button to assign the stripe to the designated bus or busses.



**Hint:** The QuickSelect button (marked with an 'eye' icon to associate it with visibility) is located in between BKGD and FTB. Clicking it updates the Switcher's T-Bar delegate and transition states so that the next TAKE or AUTO operation will remove all visible DSK or KEY layers from output. (On supporting control surfaces, press ALT & BKGD to trigger the QuickSelect feature.)

## BANK

Another set of delegate buttons sits in the second row (counting from the top) of the primary Command group. This group is labeled BANK. As you know by now, the Switcher crosspoints of Viz Vectar Plus systems are organized in banks comprising 24 columns.

Similarly, Switcher sources are presented in banks on Viz Vectar Plus control surfaces.

Press the desired **BANK** button – 1, 2 or 3 – to determine which group of sources is currently delegated to the Switcher rows in all stripes. The displays above the selection rows update accordingly.

**Note:** BANK buttons do not support multi-selection.

## Split Banks

Ordinarily, the Switcher and M/E row bank assignments for all stripes on the surface match. So, for example, if the Main Switcher shows Bank 1, all other stripes likewise display Bank 1 as well. It is possible, however, to lock individual stripes to specified Banks.

To do so, hold down the **ALT** and **CTRL** buttons on the surface together, which causes the LCD displays to list Banks 1, 2, and 3 in the first three Switcher columns. Press the **KEY** row button above the display for the desired stripe to select the Bank it presents thereafter.

Stripes delegated to a particular Bank in this manner do not update when you press the Bank (1-3) buttons in the Primary Command Group. To restore normal behavior, hold down **ALT** and **CTRL** again, and notice that the KEY row button for the currently assigned bank lights. Press this button again to extinguish it, and the stripe once again follows the primary Bank button assignment.

## PREVIZ

The control PREVIZ group which is reserved for possible future implementation.

## UTILITY MEM

When the **MEM** button is held down, the first nine columns in the displays of all stripes update to list the names of MEMs for the busses delegated to the individual stripes. Punching a button in the selection row below a MEM name recalls the corresponding preset for the bus assigned to the stripe.

**Note:** For multi-delegated stripes, only the first delegate is affected.

Holding **CTRL+MEM** then pressing and releasing a button in the PGM/A row beneath stores it into the corresponding MEM for the bus assigned to the stripe.

## COMP

When the **COMP** button is held down, the first 16 columns in the displays of all stripes update to list the names of COMPs for the busses delegated to the individual stripes. Punching a button in the selection row below a COMP name applies the corresponding preset to the bus assigned to the stripe.

**Note:** In the case of multi-delegated stripes the COMP names displayed represent the first delegate only.

To store or update a COMP, hold down **CTRL + COMP**, then press a button in the selection row below the display for the desired stripe. To clear a COMP, hold down **ALT + COMP**, then press a button in the same selection row.

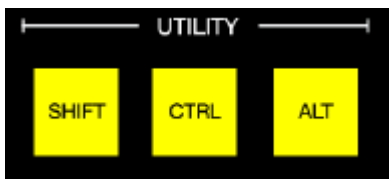
## MACRO

To assign a macro to any button, first select the desired macro in the Macro Configuration pane in the user interface. Click a box in the External Triggers control group at the bottom of the panel, to enable Listen mode, then hold down the **MACRO** button, punch the control surface button you want to use for the macro, and release the **MACRO** button. (See also Delegating KEY to UTILITY (Macro triggers))

When the **MACRO** button is held down, the names for any macros assigned to buttons in the (PGM/A/C) row immediately beneath the selection area displays are shown. Punching the button below a macro name triggers the corresponding macro.

- **Tip:** To clear an assigned macro from a button, hold down **CTRL** with the Macro button, the press the (lit) button you wish to clear.

## SHIFT, CTRL, ALT



These buttons provide support for extended features and future expansion.

- **Note:** Among other things, **CTRL** and **SHIFT** are used in connection with instant replays. See section *Replay* in [Secondary Command Group](#) and *Buffers* in section [Buffers and Titles](#).

## LAYER SELECT (A/C, B/D)

Some Viz Vectar Plus models let you configure M/Es with effects supporting up to four primary sources (along with KEY layers). The control surfaces, however, offers just two primary source selection rows, PGM A/C and PREV B/D.



In cases where more than two selection rows are required for a given M/E, use the **LAYER SELECT** buttons to delegate the upper or lower selection rows to the layers you wish to control.

- **Tip:** If you reduce the number of layers required by an M/E (by loading a different effect) the control surface automatically revises the **LAYER SELECT** delegate state to match.

### 19.1.4 Secondary Command Group

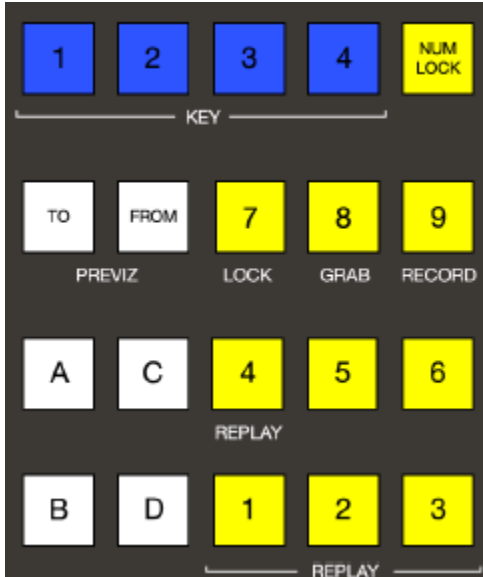
The Command control group in the second stripe (counting from the stripe nearest the operator) also has unique functions, which is why we refer to it as the Secondary Command group.



## Secondary Command Group Items

- NUMBERPAD
  - NUM LOCK
  - LOCK (7)
  - GRAB (8)
  - RECORD (9)
  - REPLAY (1, 2, 3, 4)
  - NUMBERPAD (NUM LOCK ON)

### NUMBERPAD



Unlike the primary Command group, the secondary Command group includes a number pad. We'll discuss basic number input functions soon but, first, observe that certain buttons in the number pads have labels below them identifying alternate functions.

### NUM LOCK

This is why (in contrast to additional number pads provided on the four stripe surface in particular), the **0** button in this number pad is replaced by **NUM LOCK**.

Not surprisingly, when **NUM LOCK** is lit, all number pad buttons perform simple numeric input. When **NUM LOCK** is off, however (as it is by default) number buttons with alternate labels perform their secondary operation. Let's discuss these now.

### LOCK (7)

With **NUM LOCK** off, this button lets you lock or unlock other control surface buttons. Pressing **LOCK** lights all currently locked buttons. While the **LOCK** button is lit, pressing any other control surface button toggles its locked/unlocked state, preventing unintentional changes.

### GRAB (8)

Pressing this button (with **NUM LOCK** off) triggers the software's main Dashboard **GRAB** button.

- **Tip:** The main GRAB feature grabs stills from selected primary (MIX) outputs, as configured in the interface. To grab other Switcher sources (excluding M/Es), hold down the **CTRL** button on the control surface while pressing any KEY row button for the desired source.



## RECORD (9)

Pressing this button (with **NUM LOCK** off) triggers the main Dashboard RECORD function. You should be aware that, to prevent unintended interruptions in recordings, you must hold **SHIFT** while pressing **RECORD** on the control surface to stop recording.

- ❑ **Tip:** To alert you to this safety measure, **SHIFT** flashes if you press **RECORD** alone during capture.

## REPLAY (1, 2, 3, 4)



Viz Vectar Plus provides powerful instant replay workflow for any video source having a recorder assigned to it.

When a Recorder is assigned to a source in its Input Configuration panel, and you also enable the associated Instant Replay switch, special replay buttons appear below the corresponding Program and Preview row buttons in the Live Desktop Switcher. Viz Vectar Plus control surfaces provide the same functionality as follows:

- To perform an instant replay from a Switcher source, hold down the **CTRL** button while pressing the PGM A/C row button for the source. Double the length of the replay by holding down **SHIFT** along with **CTRL**.
- Or, defer playback of the instant replay as follows:
  - Add the replay clip to the DDR playlist by clicking the source's PREV B/D row button (rather than the PGM row button) with CTRL (or CTRL + SHIFT) held down.
  - Then, when you're ready to trigger the instant replay, press CTRL + AUTO to initiate the DDR's Show On operation.

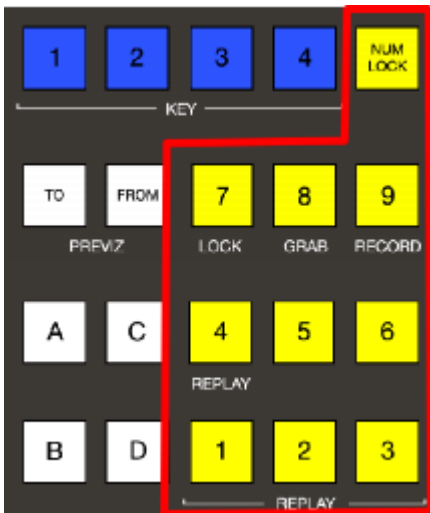
This powerful workflow is ideal for replays from individual Switcher inputs. However, the four MIX outputs (which typically includes Program output as MIX 1) do not appear on the Switcher button rows – so another method is required in this case:

- Press a button numbered 1-4 in the Secondary Command Group (with **NUM LOCK** off) to trigger a replay from the corresponding (MIX 1-4) recorder.
- Hold down **CTRL** when doing the above to defer playback of the replay clip.
- Add **SHIFT** to either of the above to double the length of the replay clip.

- ❑ **Tip:** If you execute an instant replay operation while another replay is incomplete, the newer replay angle replaces the former one on output and the duration of the replay is extended.

## NUMBERPAD (NUM LOCK ON)

Having covered the alternate (**NUM LOCK** off) number pad button functions, let's consider the value of the Number pad in connection with running macros.



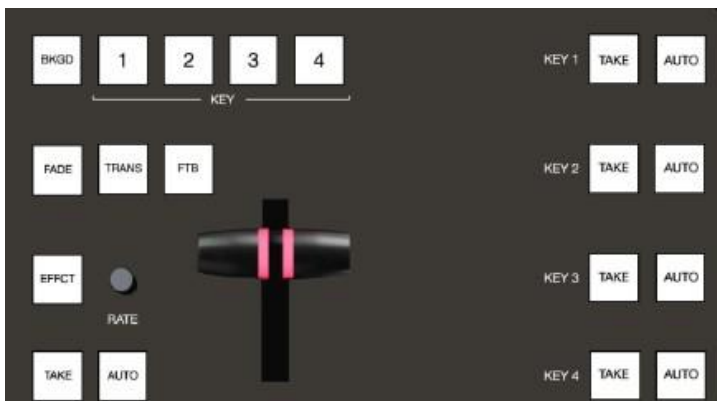
Any macro can be triggered by pressing a three-digit number sequence on any of NUMBERPAD on the control surface. Open the **Macro Configuration** panel in the Viz Vectar Plus Live Desktop, and select a macro from the list; click a Listen box at the bottom of the panel, then type a three digit number, such as *123*.

Each Number pad on the control surface is treated independently. Thus the very same numeric entry can trigger different macros from the number pads in different stripes.

**Tip:** If you start to enter a number, then change your mind, press any button outside the number pad to cancel the entry.

### 19.1.5 Layers And Effects

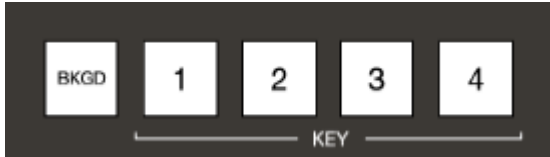
The controls in third column (all stripes) govern transitions and layer visibility for the various video busses.



## Transitions and Layer Visibility

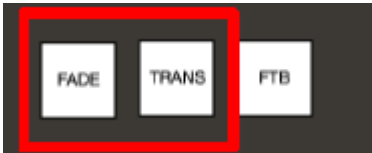
- BKGD and KEY 1-4
- FADE & TRANS
- FTB
- EFFCT (Effect)
- Rate
- TAKE & AUTO
- T-Bar

### BKGD and KEY 1-4



These delegate buttons determine what video layers the main controls directly below (TAKE, AUTO, T-Bar, etc.) affect. Multi-selection is supported, so, for example, if you select both BKGD (Background) and KEY 1, then press **AUTO** for a stripe delegated to the Main Switcher, a transition is applied to both the Background layer and DSK 1.

### FADE & TRANS



These two buttons provide a quick way to control the Transition Bin selection for the delegated switcher layer(s).

- Pushing **FADE** offers a quick and convenient way to select the standard Crossfade transition.
- Push the **TRANS** button to activate the last-used transition for a video layer (or layers).

**Tip:** For new sessions, **TRANS** jumps to the transition following Fade in the effect preset bin.

The **FADE** and **TRANS** (Transition) buttons are mutually exclusive; selecting either cancels the other, and only the currently active button remains lit.

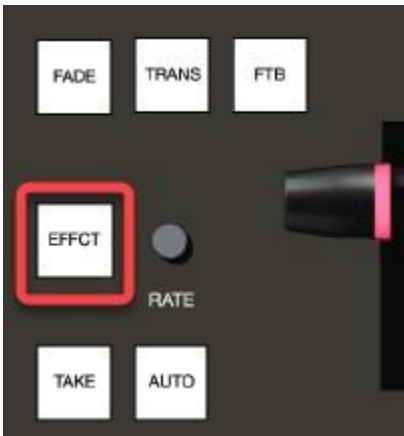
### FTB

To perform a Fade to Black operation, press **SHIFT + FTB** (the **SHIFT** button is required as a safety measure, since FTB is a somewhat dangerous operation). Revert to normal output by pressing FTB alone.

**Tip:** The duration of the transition to and from black is derived from the BKGD transition duration setting.

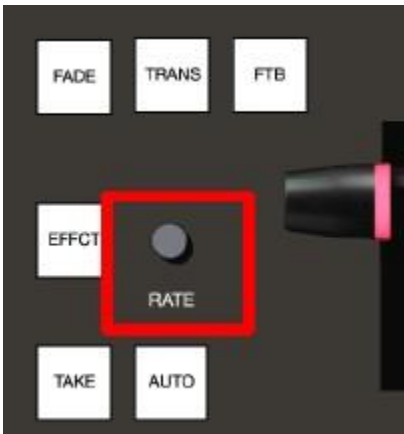
### EFFCT (Effect)

Hold down the **EFFCT** button to cause LED display columns at left to show the names of effects currently assigned to presets in effect bin for the currently delegated layer of the Switcher bus assigned to the stripe.



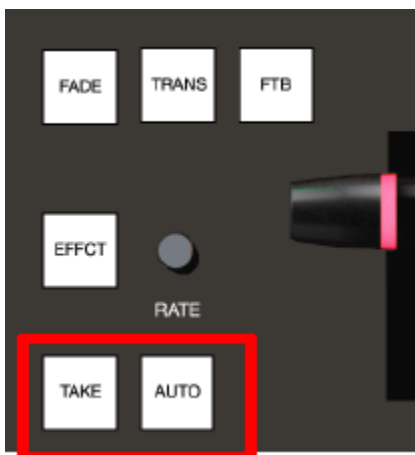
In the case of multi-delegated busses or layers, the display lists the content of the first effect preset bin only, and selection only affect that delegated layer.

### Rate



Rotate the nearby **RATE** knob to modify the transition timing for delegated layers. Or press the knob to cycle through the standard Slow, Medium and Fast presets.

### TAKE & AUTO



The **TAKE** and **AUTO** buttons perform a cut or transition respectively, affecting only the currently delegated video layers.

## T-Bar

The T-Bar is perhaps the most recognizable component of a professional video control surface, and arguably one of the most important. Viz Vectar Plus surfaces provide standard functionality by this means, along with exceptional system feedback.

Pull the T-Bar to manually modify the progress of a transition between delegated video layers.

### Illumination

The T-Bar employs colorful illumination to provide feedback and status updates based on your control surface selections and operations. The lighting schemes applied to T-Bars controlling both M/Es and MAIN video layers reinforce traditional button illumination in a way that soon becomes instinctive, and which provides unparalleled confidence in use.

The following tables provide a color code for your convenience.

### M/E Transitions

1. For an M/E with a transition assigned as the Background effect, control surface T-Bar illumination conforms to the color scheme of the M/E tabs on the Live Desktop.

M/E 1	M/E 2	M/E 3	M/E 4	M/E 5	M/E 6	M/E 7	M/E 8
Turquoise	Teal	Blush	Apricot	Sky Blue	Pink	Chartreuse	Hot Pink

2. If BKGD is delegated alone, the T-Bar color is as shown in the table above, identifying which M/E is delegated to the stripe. (When multiple M/Es are delegated, the first selected delegate determines the color.)
3. This color is at its brightest when the PGM/A source (effectively the Program row for a transition type effect) is fully displayed. As the T-Bar is moved (or AUTO is pressed) to begin a transition, the color gradually dims until the effect is complete. At that point, it pops back to full brightness, just as the onscreen T-Bar returns to the top of its stroke.
4. In a mixed delegate situation (BKGD along with one or more KEY layers) the T-Bar is lit medium blue, and conforms to the BKGD behavior described above.
5. If one or more KEY layers are delegated without BKGD, the T-Bar color is purple. When the KEY layer (or, for multi-KEY selections, the first KEY layer) is fully displayed, T-Bar lighting is at its brightest. Removing the layer dims the illumination.

### Main Transitions

1. The T-Bar uses industry-standard red/green color coding for Program and Preview rows.
2. DSK-only operations result in the T-Bar being lit in purple, similar to M/Es.
3. Mixed mode (BKGD plus DSK delegates) result in blue illumination, after the fashion of T-Bar behavior previously described for M/Es.

## 19.1.6 Media Players

This section presents the MEDIA PLAYER control group. Depending on which control panel model you have, there may be one or two such control groups.

- [Delegates](#)
- [PREV PRESET/NEXT PRESET](#)
- [DISPLAY](#)
- [MARK IN/OUT](#)
- [LOOP and PLYLIST](#)
- [Transport Control](#)
- [SHOW and AUTOPLAY](#)

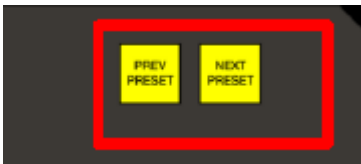
## MEDIA PLAYERS



### Delegates

The **MEDIA PLAYERS** buttons determine which players are governed by operations in this group. Multi-selection is supported.

### PREV PRESET/NEXT PRESET



These two buttons let you cycle backwards or forwards respectively through existing presets for the delegated Media Player.

### DISPLAY

The top line of the Media Player display shows the filename, countdown timer and if available, timecode for the current playlist selection. The lower line contains any comments you have attached to the file (using the clip context menu item, **Properties**).

### MARK IN/OUT



Click these buttons to set the In point or Out point for the current playlist item in delegated players to the current frame.

**Tip:** Press **SHIFT** with the button to reset the specified end point to its full limit.

### LOOP and PLYLIST



Click these buttons to toggle the Loop and Playlist modes for the delegated players.

## Transport Control



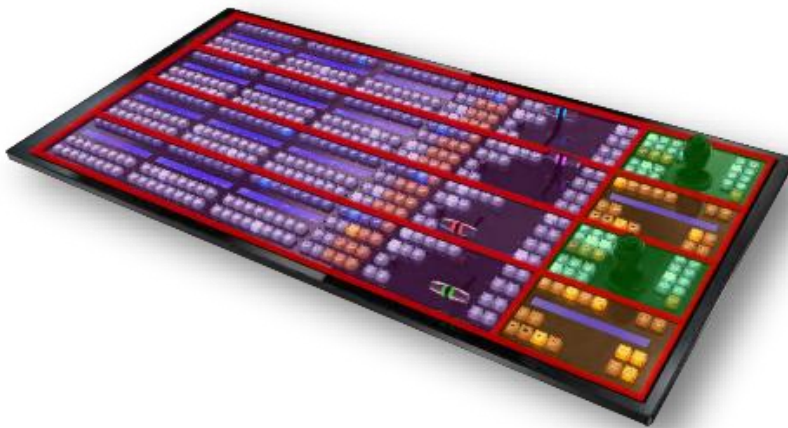
- **◀ Previous Item:** Goes to the previous playlist entry in delegated Media Players (The selection cycles to the last playlist entry when necessary).
- **■ Stop**
  - **Push once:** Ends playback for delegated Media Players
  - **Push twice:** Returns to the start position (this operation respects the Single setting for individual Media Players).
- **▶ Play:** Initiates playback for delegated Media Players.
- **▶| Next Item:** Goes to the next playlist entry in delegated Media Players. (The selection cycles to the first playlist entry when necessary.)

### SHOW and AUTOPLAY

The **SHOW** button triggers the matching SHOW ON feature in the footer of the Viz Vectar Plus **Media Players**. Likewise, the **AUTOPLAY** button toggles the eponymous Media Player option.

## 19.1.7 Buffers And Titles

Data Presets store text strings and image file links, allowing you to quickly update those aspects of a title page on demand.



To access Buffers from your control surface:

1. Delegate a specific Buffer slot containing the target graphic you wish to control. Hold down **SHIFT + MEM**
2. Press the button on the PGM A/C row at left corresponding to the desired Buffer.
3. Hold down **SHIFT + MACRO** and punch the button on the PGM A/C row at left that corresponds to the Data Preset you wish to recall.

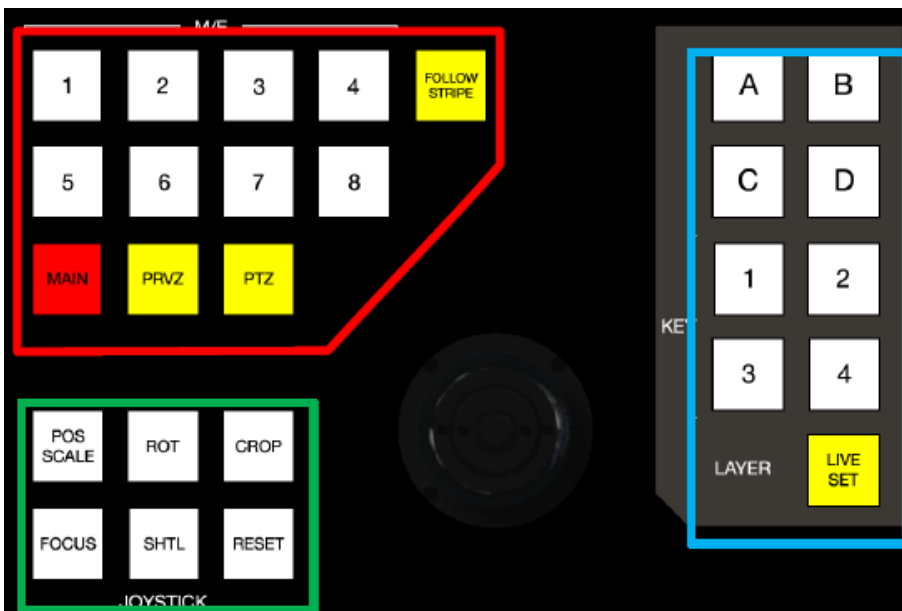
## 19.1.8 Joystick

The Viz Vectar Plus control surface joystick provides a very versatile input mechanism.

- Primary Delegates
  - Follow Preview
  - FOLLOW STRIPE
  - M/E 1 – M/E 8
  - MAIN
  - PRVZ
  - PTZ
- LAYER Delegates
- Control Mode
  - POS/SCALE
  - ROT (Rotate)
  - CROP
  - FOCUS
  - SHTL (Shuttle)
  - RESET

In considering its applications it is important to realize that, unlike the Layers and Effects control groups at left, the Joystick(s) located in the surface's right-most column can optionally operate completely independently from the stripes at left.

Thus, while T-Bar operations (for example) are always directed to the video busses delegated to the stripe they are in, Joystick manipulations can affect any M/E, a PTZ (Pan, Tilt & Zoom) camera, or even a Media Player.



- The specific target of Joystick operations at any moment is determined by a set of Joystick delegate buttons, outlined in red above.
- As appropriate, this selection is further refined by buttons in the Layer group at right, outlined in blue above.
- Finally, the nature of the operation performed on the target is determined by a set of Control Mode buttons at lower left, outlined in green above.



## Primary Delegates

### Follow Preview

Probably the most useful joystick delegate mode is Follow Preview. You won't be surprised to learn that, when enabled (as is the default in new sessions) the joystick assignment tracks your **Main > Preview (PREV)** row selection.

Since the Live Desktop normally displays a large Preview monitor, this makes setting up exactly the shot you want for the upcoming source queued on Preview the proverbial no-brainer. Or, to quickly modify the framing of a bunch of PTZ cameras, or a series of M/Es, just select them one after another on the PREV row and adjust to taste.

**Tip:** To open the Input Configuration panel for the source currently selected on the Preview row to adjust its settings, tap the \* (asterisk) key in the keyboard numberpad.

Of course, the joystick has several other delegate modes, discussed next; but the default Follow Preview mode is very useful, and can be easily restored from any other mode by pressing the **PTZ** and **RESET** buttons together.

### FOLLOW STRIPE

Pressing this Joystick delegate button restricts the behavior of the Joystick in a manner many are used to from using traditional control surfaces. That is to say, Joystick operations are always directed to the video bus(es) assigned to the same stripe. As mentioned though, Viz Vectar Plus surfaces offer greater versatility and control options. It's possible to quickly redirect control to any suitable target without interrupting Switcher operations on neighboring stripes.

### M/E 1 – M/E 8

These buttons provide a quick and convenient way to delegate Joystick operations to one or more selected M/Es (the number of M/Es varies by Viz Vectar Plus model).

### MAIN

Press **MAIN** to direct delegate Joystick operations to the Main Switcher.

### PRVZ

PREVIZ controls are currently not in use.

### PTZ

#### Source Select

Depending on the Viz Vectar Plus model and feature set, PTZ (pan-tilt-zoom) style joystick operations are not limited to real PTZ cameras. Static cameras, Media Players, and Buffers are among the different source types that may benefit from virtual PTZ functionality. And of course M/Es have similar capabilities courtesy of COMP and Positioner features.

For this reason, you can delegate any source that is qualified for Joystick control on your system as follows: Hold down the **PTZ** button and press the desired **KEY** row button at left in the same stripe as the Joystick.

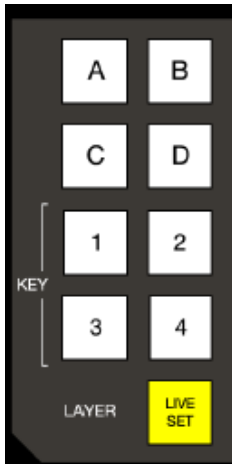
Press an **M/E** button (1-8), **MAIN**, or **FOLLOW STRIPE** to reset the Joystick to the corresponding operating mode.

## Presets

In addition to manually controlling the PTZ camera with the Joystick, of course, you often want to store and recall PTZ presets.

- To store a new preset for the currently delegated camera, or to update an existing preset, hold down the **PTZ** button and press a button numbered from 1-16 in the A/C row at left in the same stripe.
- To recall a preset, hold down the **PTZ** button and press a button numbered from 1-16 in the B/D row at left in the same stripe.

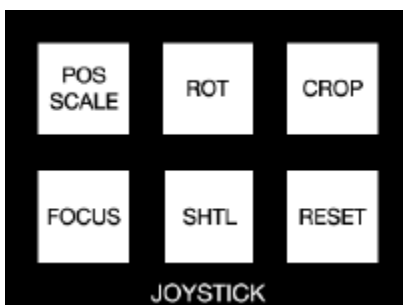
## LAYER Delegates



As mentioned above, some Joystick delegate modes let you further refine the target for your manipulations. For example, when your primary delegate is MAIN, joystick operations can be applied to the DSK 1, DSK 2, DSK 3 or DSK 4 video layers. The LAYER delegate group determines which one is affected.

Specifically, the **KEY** buttons labeled 1-4 direct joystick control to DSK 1-4 when MAIN is selected as the primary delegate, or KEY 1-4 for an M/E. Similarly, when an M/E with a compositing effect selected as the Background effect is delegated, the **A**, **B**, **C** and **D** buttons allow you to target the individual Positioners for the main M/E layers (A-D).

## Control Mode



Let's turn now to buttons that govern the Joystick operating mode.

### POS/SCALE

- Move the joystick horizontally, vertically or diagonally (as viewed from above) to move delegated video source(s) on its X and Y axes.
- Twist the joystick clockwise to scale delegated source(s) up, or counter-clockwise to scale down.

- **Tip:** When multi-delegate selections are active for the Positioner, adjustments are generally relative to the current state for individual delegates, as opposed to absolute.

## ROT (Rotate)

- Move the joystick horizontally (as viewed from above) to rotate delegated sources on the Y axis.
- Move the joystick vertically to rotate delegated sources on the X axis.
- Twist the joystick clockwise/counter-clockwise to rotate delegated sources on the Z axis.

## CROP

- Twist the joystick clockwise (as viewed from above) to crop delegated sources inward on all four edges, maintaining the original aspect ratio.
- Twist the joystick counter-clockwise to reduce cropping of delegated sources on all four edges.
- Move the joystick horizontally to crop only the left edge of delegated sources.
- Move the joystick horizontally with the joystick button pressed to crop only the right edge of delegated sources.
- Move the joystick vertically to crop only the top edge of delegated sources.
- Move the joystick vertically with the joystick button pressed to crop only the bottom edge of delegated sources.

## FOCUS

When the primary Joystick Delegate is PTZ, enable FOCUS to modify Joystick operations as follows:

- Pressing the Joystick button enables Autofocus.
- Rotate the joystick to adjust the camera's focus setting (which naturally disables Autofocus).

## SHTL (Shuttle)

Push **SHTL** (Shuttle) to delegate the joystick to shuttle the Media Player(s) currently selected in the **MEDIA PLAYERS > DELEGATE** group (again, the other joystick mode buttons cannot be multi-selected with **SHTL**).

- To shuttle delegated Media Players, move the joystick horizontally (as viewed from above).

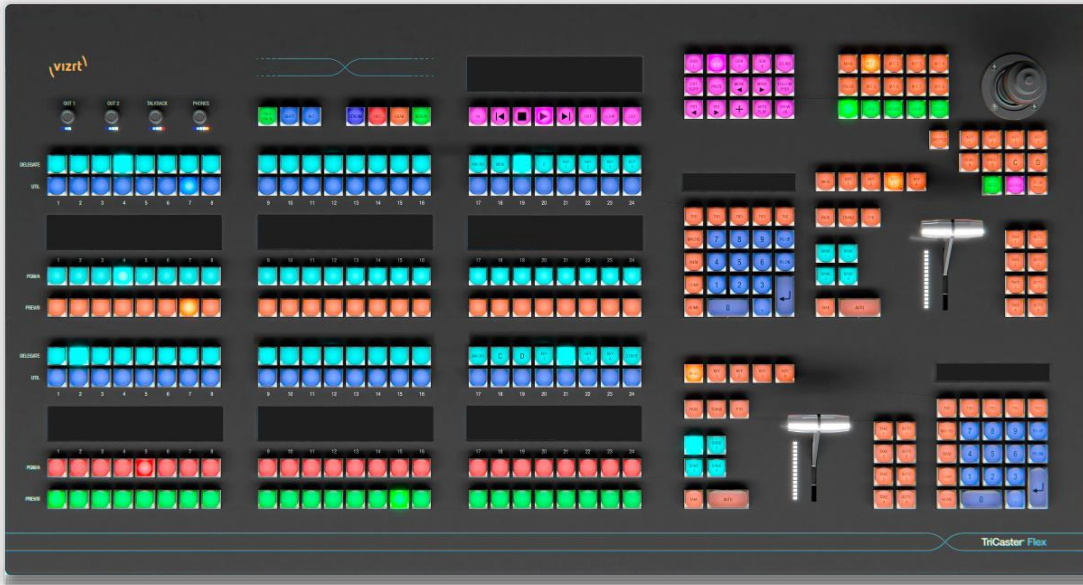
- **Note:** You can zoom multiple LiveSets simultaneously when these are delegated together, just as you can also shuttle several delegated Media Players.

## RESET

Despite its location, **RESET** is really an action button (not a Joystick mode). Press it to restore all position settings for currently delegated source(s) to their defaults. This is also why **RESET** does not stay selected when pressed, nor does it change the current Joystick mode.

- **Tip:** When SHUTTLE is delegated, delegated Media Players are reset to the starting point of the current item (or playlist). And when delegated to an M/E with LIVE SET enabled in the LAYERS group, the LiveSet is reset to its default positioning.

## 19.2 TriCaster Flex Dual



TriCaster Flex Dual is everything its smaller sibling is but much more yet doing so with a relatively compact physical footprint suitable to many environments. More powerful and sophisticated shows call for the increased capacity provided by a somewhat less space-constrained two-stripe surface. The TriCaster Flex Dual offers that and more, including standard joystick control and extensive integrated configuration features.

### 19.2.1 Connection and Configuration

Here are the basic steps needed to get you up and running with your new control panel.

- Connect the Flex control panel to your local network.
- Connect AC power to the control panel.
- Find the Flex control panel's IP address.
- Enter the Flex unit's IP address into the URL field of a web browser of another a device on your network to access the configuration webpage.
- Check that the most recent firmware is installed.
- Confirm that your live production system software version includes Flex support.
- Choose a target system to control and connect to it.

For some people, the bullet points above will suffice. For the rest of us, though, this section will now continue with more elaborate details about each step.

**Note:** This equipment must be powered using a 3-prong connection

#### Safety

**Warning:** Risk of Electrical shock. Disconnect all power sources before servicing



This Protective Earth (ground) symbol identifies terminal which is intended for connection to an external conductor for protection against electric shock in case of a fault, or terminal of protective earth (ground) electrode.



This indicates that the equipment must be powered using 100 to 240 Volt Alternating Current.

- ❑ **Note:** Replacement fuse: 3A 250 V AC DC Fuse Cartridge, Glass Holder 5mm x 20mm, Slow Blow

## Cable Connections

To begin, please connect your Flex control panel unit to your local network. In normal operation, this would be the network your live production system is connected to, but this isn't a requirement for initial setup (such as updating firmware or similar administrative tasks).

- ❑ **Tip:** In normal use, the control panel and target live production system should be on the same subnet. Otherwise, for more sophisticated network environments, note that Flex also supports NDI Discovery Server.

Afterward, supply power to the TriCaster Flex Dual unit using the AC cord provided. After a few moments, Flex will complete its boot process, and briefly display the currently installed firmware version number.

## Flex Configuration Webpage

Your Flex panel has a built-in webserver, which it uses to provide additional configuration settings and tools you can access in the web browser of another device (such as a laptop or tablet) on the same network.

- ❑ **Tip:** Together, the webpage described here and the panel's integrated control features host all necessary Flex configuration. (The control panel utility provided in the Add-Ons menu described in other sections of the User Guide does not support Flex.)

To access this webpage press the INFO button *with* SHIFT, the INFO button is the top-left button on the multipad for Stripe 1 and the SHIFT button is the second-left button on the top row. In the same LCD display above the multipad, the IP address of the control panel will appear along with the latest firmware. Press the HOME button to clear this information.



The first time you visit this webpage you'll be guided to create User and Password credentials to continue. Having done that, it's a good idea to check whether newer firmware has been released before continuing. On the Flex webpage's Administration tab, expand the Firmware control group to locate the Current Firmware Version number.

## Latest Versions

Then, visit Vizrt's Support>Downloads page to see whether a newer Flex Dual firmware version is available. If so, download the update and then click Update Firmware on the Flex webpage to install it. (The webpage provides instructions and status messages to guide you during the process, which can take several minutes.) You will receive a pop-up confirmation message once firmware has updated successfully.

With current firmware installed, the Flex Dual panel is ready to connect – but there’s one more consideration: Obviously, your live production system must be compatible with Flex Dual, and needs to have a software version that includes Flex Dual support installed (TriCaster version 8-2, or newer). As required, update your system in the usual manner.

### Choosing a Live Production System

To connect TriCaster Flex Dual to a live production system, let’s first discuss the UTIL (Utility) button features. The UTIL button is located on the top-left button in the multi-pad for [Stripe 2](#). Press the UTIL button *with* SHIFT and the second line of the LCD updates to show UTIL menu options for the top-row buttons as follows:

- CONN (Connect) – The LCD lists detected systems or “Not Connect”
- RSTR (Restore) – To restore the local control panel unit to factory defaults
- REBT (Reboot) – To reboot the local control panel unit
- To navigate through a list of qualified and connected systems, press PgUP/Dn and to locate the unit you wish to control, and press ENTER to select it (and close the Utility menu).

**Tip:** Flex Dual cannot connect to more than one live production system at a time.



Once you have selected your live production system, Flex Dual updates to show the button names of any switcher inputs you have configured in your live production system. If you wish, you can continue to use the tools provided on the Mapping tab of the Flex Dual webpage to customize the order of source buttons in different banks on the Flex Dual panel.

### 19.2.2 TriCaster Flex Dual Webpage

We briefly touched on the Flex Dual configuration webpage when discussing initial setup and configuration. In this section, we’ll take a more in-depth look at its features.

## Administration Tab

The screenshot shows the 'Administration' tab selected. Under the 'NDI' section, the 'Name' field is set to 'flexcontrolpanel-e164202a'. The 'Discovery Server' section has the 'Use Discovery Server' checkbox checked. The 'Send Group' section has a 'Group Name(s)' field with a note: 'For multiple groups, comma separate the names'. The 'Receive Mode' dropdown is set to 'Auto'. A 'Save Network' button is visible at the bottom of the NDI section. Below the NDI section are expandable sections for 'Network', 'Password', 'Date and Time', and 'Firmware'.

The Administration tab contains all necessary network settings grouped and nested under collapsible ‘accordion’ widgets. The Control Panel Name field initially shows your unit’s Serial Number, but you can replace this a name of your choosing (the serial number remains visible at the top of the TriCaster Flex Dual webpage).

To connect via an NDI Discovery server, checkmark the Use Discover Server simply box, and add your server’s IP address in the provided field. For additional measure, a Send Group (or groups) option has been added so you have more control of who can connect to the audio output from TriCaster Flex units.

Additional Network settings, such as IP Address, Static IP Address, Net Mask, Gateway, and Mac Address are provided in this control group, too.

**Tip:** If no DHCP server is detected when Flex Dual is connected, it automatically fails over to a default static IP address. After a restart, Flex Dual will attempt to search for DHCP again.

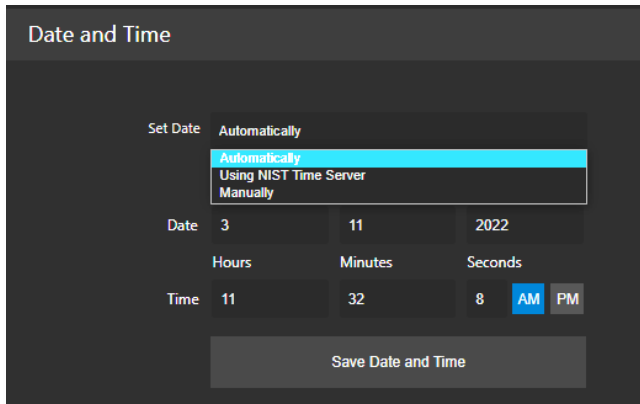
Change the IP Address Mode in the Network setting group to supply a ‘permanent’ static IP address if this is needed. Click the button below to Save Network. A pop-up message will appear to confirm network changes.



## Password

Expand the *Password* control group to enter the password of your choice (twice). Click *Update Password* to confirm your choice.

## Date and Time



The *Date and Time* controls allow you to choose from several different methods for setting the date and time, using the combo box widget. Click on the *Set Date* drop-down menu to choose between *Automatically*, *Using NIST Time Server*, or *Manually*.

The default option is **Automatically**, will allow the system to set the time. Be sure to click *Save Date and Time*.

Using **NIST Time Server** uses the complex suite of algorithms that is defined in the NTP (Network Time Protocol) specifications to ensure that clocks on computers

throughout a network are as accurate as possible. Once complete, click *Save Date and Time*.

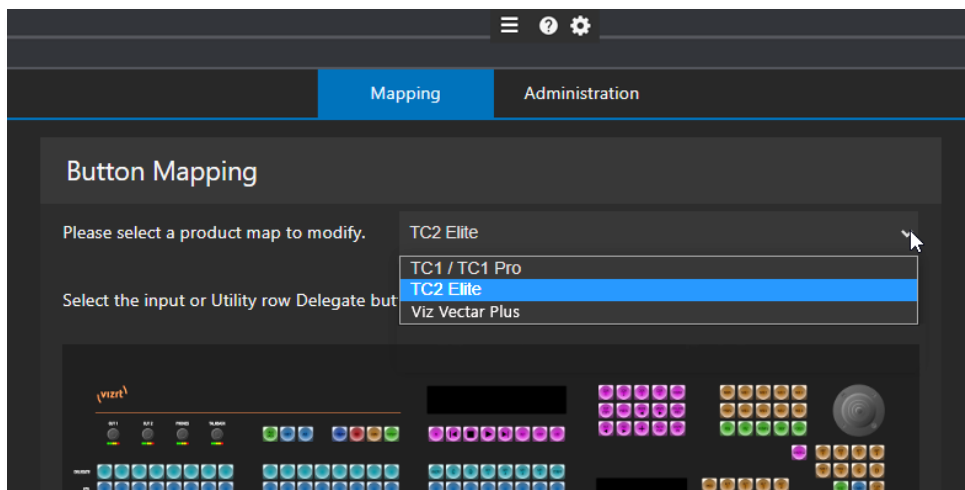
A **Manual** option is offered for those who need it. Once completing your entry, click *Save Date and Time*.

## Firmware

In the *Firmware* panel, the *Current Firmware Version* is displayed with options to *Choose Firmware File* and *Update Firmware* under Latest Versions.

## TriCaster Product Selection

The Mapping webpage tab is ‘product agnostic,’ allowing you to create and store mapping configurations for various TriCaster models.

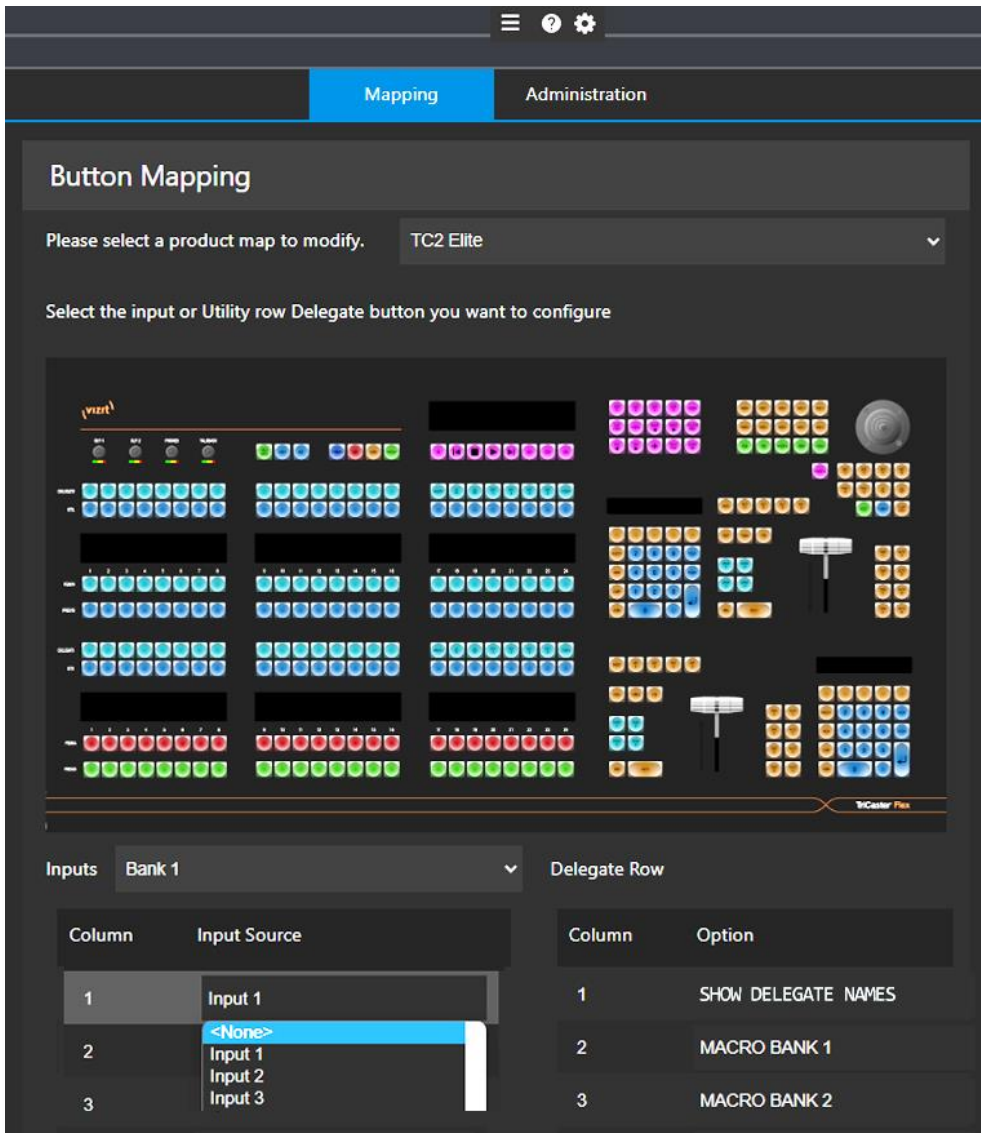




## Mapping Tab

The *Button Mapping* configuration panel displays a graphic of the Control Panel you are editing. The mapping tab shows a graphic representation of both stripes on the control surface.

Below this, the webpage hosts two tabular configuration panes. The control panel image and settings tables are interactive, as described next.



The screenshot shows the 'Button Mapping' configuration panel for the 'TC2 Elite' product. The interface includes a navigation bar with 'Mapping' and 'Administration' tabs. Below the navigation bar, there is a dropdown menu to select a product map to modify, currently set to 'TC2 Elite'. A prompt asks the user to 'Select the input or Utility row Delegate button you want to configure'. The main area displays a graphical representation of the control panel with various buttons and controls. At the bottom, there are two tables for configuration:

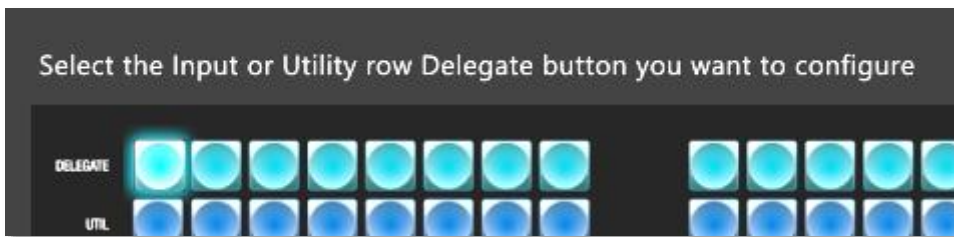
Column	Input Source	Column	Option
1	Input 1	1	SHOW DELEGATE NAMES
2	<None>	2	MACRO BANK 1
3	Input 2	3	MACRO BANK 2
	Input 3		

## Editing Delegate Buttons

- Delegate row buttons govern the assignment of the UTIL(ity) row buttons beneath it.
  - Delegate row *mapping* for both control panel stripes is always identical.
  - But *selection state* of the Delegate row in each stripe is independent, allowing UTIL row assignments to differ.



- Buttons 17-24 of the Delegate rows are pre-assigned and cannot be edited. Simply enable 'Delegate button edit mode' to set the other Delegate row button assignments for the currently selected product type by:
  - Clicking a (Utility row) Delegate button in the CS image.
    - The selected Delegate button 'lights' to show its selection state.



- Or by clicking the Delegate Row control on the webpage.
- In 'Delegate button edit mode', the Delegate Row (right-hand) table below is enabled, and the 'Inputs' table is disabled.
- The Delegate Row table entry corresponding to the selected Delegate button in the control panel image is highlighted, and its Option menu gadget is presented.
  - Conversely, clicking a different entry in the Delegate row lister updates the Delegate Row table selection as well as the button selection state shown in the image above.
- Making a selection in the Options column assigns that Utility > Delegate option to the selected button.

**Tip:** The Options available for selection will vary according to the feature set of the TriCaster model group selected.

### Editing Inputs

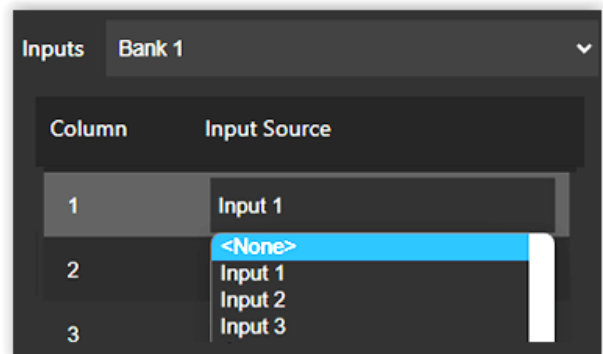


- To edit switcher Input assignments for the currently selected product type, the user enables 'Inputs edit mode' by one of the following means:
  - Clicking a Bank button in the control panel image to designate a switcher input Bank to edit,
  - Or, by clicking a button in either the PGM/A or PREV/B rows in the cs image,

- Or, by clicking the Bank *menu*, located just above the Inputs table to activate it, then (if necessary) selecting a Bank to edit (the menu and control panel image sync, so either method can be used to select a Bank to edit).

□ **Tip:** The number of Banks available in this menu varies by product group selection.

- Or, by clicking the Inputs table itself
- Clicking an entry in the Inputs menu likewise updates the control panel image selection state.
- Clicking the menu gadget in the ‘Input Source’ column opens a popup menu listing the inputs available for the selected TriCaster model group.
- Making a selection updates the corresponding Input row button mapping.
- The “<None>” option is to assign/map to the controls surface column. Once assigned, these columns will not trigger anything when hit. This feature can be helpful to create a safety area to allow more space in between buttons.

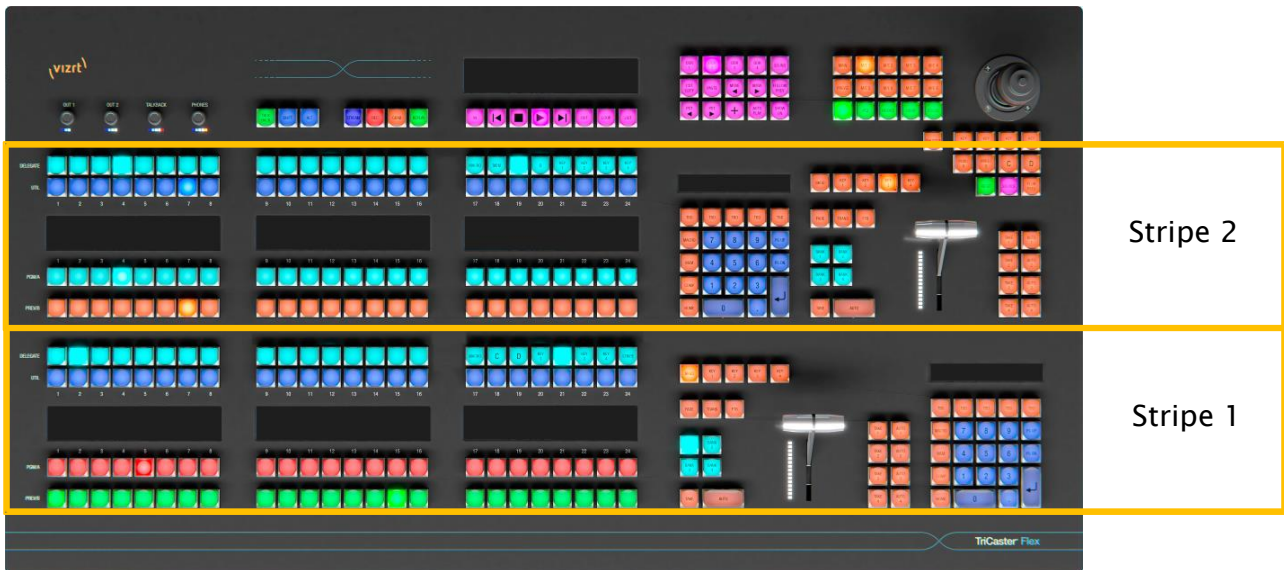


When your Mapping selections have been made, click *Apply and Save*; a pop-up will appear to confirm success.

Mapping tab footer buttons, *Import/Export Map*, and *Restore Defaults* perform just as you would expect by importing/exporting map configurations and resetting to default. In this manner, you can easily switch between mapping configurations you have prepared in advance and stored for different productions or other purposes.



## 19.2.3 Control Layout



Flex Dual features include:

- 24 assignable crosspoints in 4 Banks
- fully independent stripes
- Assignable UTILITY rows
- 4-Line LCD displays
- 2x T-Bars
- 2x Multi-pads (with individual 2-line LCD displays)
- Full size joystick
- Extended Media Player controls with 4-line LCD display
- 4x rotary knobs for local audio level control



The various control groups are organized into groups as the following:

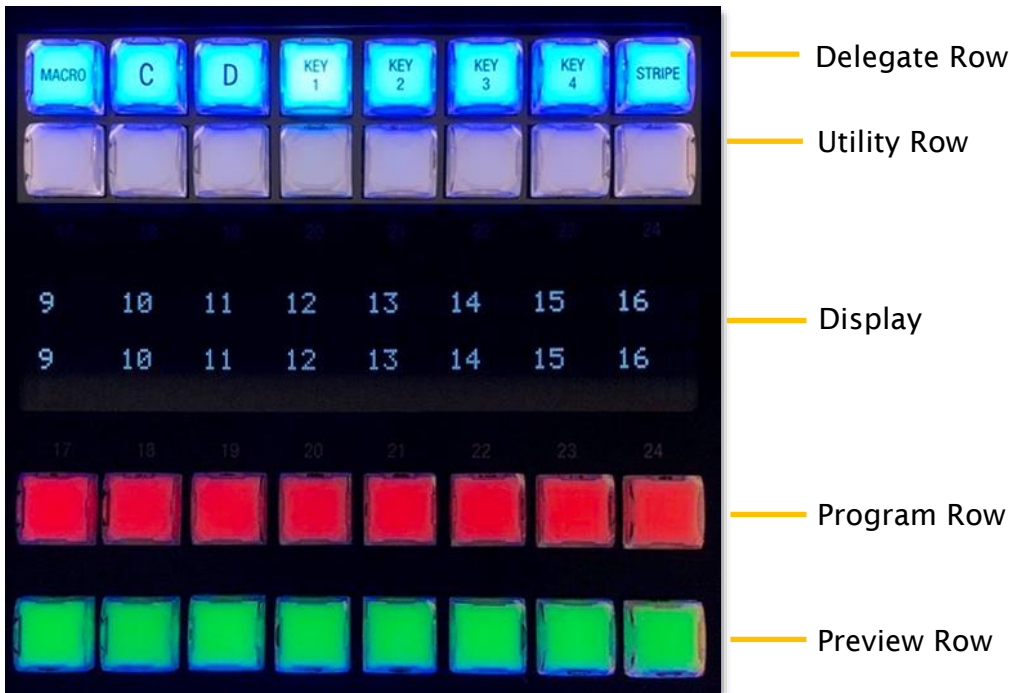
- |                                 |                                   |
|---------------------------------|-----------------------------------|
| 1 - A&B - Switcher              | 6 - Audio                         |
| 2 - Media Group                 | 7 - Talkback                      |
| 3 - A&B - Transition Groups     | 8 - Qualifiers                    |
| 4 - A&B - Multi-Purpose Buttons | 9 - Stream, Record, Grab & Replay |
| 5 - Joystick                    |                                   |

## Displays

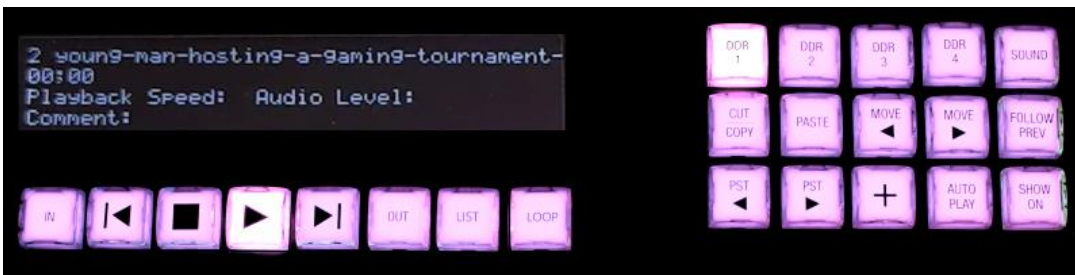
TriCaster Flex Dual control panel features helpful indicators and system feedback by means of illuminated displays.

- The LCD panel (shown on following page) just below the UTIL row shows labels identifying the currently delegated UTIL row button labels above Switcher source selections that result from pressing a button in the same column.
- PGM/PREV - A/B row lighting color follows the UI colors for the delegated bus (Switcher or M/E).





Another LCD strip appears in the *Media Player* group, displaying the filename, countdown timer and if available, timecode for the current playlist selection. The lower line contains any comments you have attached to the file (using the clip context menu item, *Properties*).



## 19.2.4 Switcher

### Crosspoint Banks

A set of delegate buttons sit left of the T-Bar, this group is labeled *BANK*. The *Switcher* crosspoints are organized in banks comprising columns. These buttons determine which crosspoint bank is active.

Similarly, *Switcher* sources are presented in banks on Flex Dual’s control panel. Press the desired *BANK* button – 1, 2, 3 or 4 – to determine which group of sources is currently delegated to the *Switcher* rows in both stripes. The displays above the selection rows will update accordingly.



**Tip:** For reasons that should be obvious, Bank buttons do not support multi-selection.

- Bank buttons support both momentary (long press and release) and latching (punch) methods.
- When the current selection in any row is not in the active Bank, the corresponding crosspoint and Bank buttons pulse.
- BANK buttons are distinguishable by touch by virtue of ‘extra-concave’ button caps.

❑ **Tip:** For models with 3 or 4 BANKS, double punching repeatedly to advance can be tedious. As an alternative, press ALT + BANK to pick a Bank directly using the Program row.

The default Switcher mapping by model is shown below:

TriCaster Model	Bank 1	Bank 2	Bank 3	Bank 4
TC1/ TC1 Pro	Input 1-8, DDR 1-2, GFX 1-2, M/E 1-4	Input 9-16, DDR 1-2, GFX 1-2, M/E 1-4	Buffer 1-15, BLACK	
TC2 Elite	Input 1-12, DDR 1-4, M/E 1-8	Input 13-24, DDR 1-4, M/E 1-8	Input 25-32, Buffer 1-15, BLACK	
Viz Vector Plus	Input 1-12, DDR 1-4, M/E 1-8	Input 13-36	Input 37-44, Buffer 1-15, BLACK	

## Macros: Overview

It's helpful to have a good understanding of how Flex Dual organizes macro triggers.

- **Local (Switcher bus) triggers:** Each bus (MAIN, M/E 1, etc.) has a unique set of macro triggers that is assigned to the UTIL row buttons when the MACRO delegate is lit.
- **Global triggers:**
  - **Number Pad:** Numeric entries of one, two or three digits (confirmed by pressing ENTER) in either number pad can trigger a macro; and more than that, the two numberpads are independent – so if you assign a macro to one number pad, the same numeric entry can be re-used in the other to trigger a different macro.
  - **BANKS:** Flex Dual allows the 24 buttons in either UTIL row to serve as one-button macro triggers (as discussed in the next section). These triggers are arranged in 8 Banks.

This allows you, for example, to delegate the UTIL row in one Stripe to one Macro Bank, and the other UTIL row to a different MACRO Bank (or, of course, something else entirely). And since you can assign different Macro Banks to DELEGATE row buttons, it's easy to recall the exact set of macros you need at any time.

## Utility and Delegate Rows

The UTIL (Utility) row sits above the LCD display in each stripe. Using buttons in the DLGT (Delegate) row immediately above UTIL, you can assign this row to numerous duties.

Pressing Delegate buttons labeled KEY 1-4, ‘delegates’ or assigns the buttons in the 24-button UTIL button row below to select the source assigned to one or more KEY (or DSK) layers.



Delegate buttons may be either Static (fixed) or custom as follows:

- **Static DLGT buttons (17-24)** – assign the UTIL row to one of the following *modes*:
  - The MACRO button assigns UTIL row buttons to serve as a set of per-Switcher bus (Main, M/E 1, etc.) macro triggers corresponding to the current stripe assignment. For example, there is one set of 24 triggers ‘attached’ to Main, another to M/E 1, and so on. When MACRO is selected, the set matching the currently stripe delegate is assigned to the UTIL row.
  - Row C or D source selection for an M/E currently delegated to the Stripe.
  - KEY 1, 2, 3 or 4 source selection (for the bus currently assigned to the associated Stripe).
  - STRIPE delegate (Default) – UTIL buttons 15-24 list MAIN, M/E 1-8, and PREVIZ options; a selection delegates the Stripe to the designated bus.
- **Mappable UTIL>DLGT buttons (1-16)**
  - These buttons can be mapped to various purposes using the mapping webpage.
  - Buttons 9-16 default to: OUT 1, 2, 3, 4, 5, 6, 7 & 8 (NDI Output Routers, when supported by the connected TC).
  - Assign delegate row buttons to directly set the Stripe to a designated Switcher bus such as: MAIN, M/E 1-8 and PREVIZ.

**Tip:** This operation does NOT affect the current UTIL row assignments (with one exception, if the UTIL row delegate is MACRO); rather, it treats this Delegate button as an action button.

- Momentary: Hold down a DLGT button (e.g., “STRIPE”) to make a quick selection in the UTIL row; the delegate selection reverts to the previous DLGT mode on release following a long press.
- Or simply punch a DLGT row button (e.g., MACRO) to latch the UTIL row.

### Mappable Delegate Options

As discussed above (and earlier in the context of the Mapping Tab of the TriCaster Flex Dual Webpage), the first 16 buttons in the Delegate row can be assigned to many different options – in turn controlling the functions controlled by the Utility row buttons beneath.

Here is a list of the optional assignments of Delegate buttons as provided in the Mapping tab of the webpage, the short name shown on the LCD for that button, and a description of the Utility row features that Delegate option invokes.



**SHOW DELEGATE NAMES (Display: SHOW NAME)**

Show mapped delegate button function labels on the LCD below. This option, which is mapped to the first button in the Utility row by default, is for information purposes; utility row functions are unavailable in this state.

**DELEGATE ROW BANKS (Display: BANK)**

Assign Delegates options to any of 8 Delegate Row Banks. Independently assign any Delegate row Banks to each Stripe (for example, when the Delegate row in the first Stripe is on Bank 1, the second Stripe could be hosting Delegate row Bank 7).

**DELEGATE BANK 1 (Display: BANK 1)**

- Assign Delegates options to any of 8 Delegate Row Banks.

**DELEGATE BANK 2 (Display: BANK 2)**

- Assign Delegates options to any of 8 Delegate Row Banks.

**DELEGATE BANK 3 (Display: BANK #)**

- Same as above ...

**MACRO BANK 1 (Display: MCRO BNK1)**

- Assign the Utility row buttons to serve as triggers for the first of 8 global Macro banks.

**Tip:** Global macro banks are not bound to a specific Switcher bus. For example, if a Delegate row button is assigned to MACRO BANK 7, macros configured in Bank 7 will be assigned to the Utility row in that Stripe when it is active - irrespective of which M/E is currently delegated to that Stripe.

In contrast, if either Stripe is assigned to M/E 2, when the permanent MACRO Delegate row button is lit, the 24 Utility row buttons in that Stripe trigger macros associated with M/E 2

**MACRO BANK 2 (Display: MCRO BNK2)**

- Assign the Utility row buttons to serve as triggers for the second of 8 global Macro banks.

**MACRO BANK 3–8, etc. (Display: MCRO BNK#)**

- As above ...

**MEDIA PRESET (Display: PLYR PST)**

- Assigns Utility row buttons to call Media Player presets.
- When enabled, the first 5 buttons on the Utility row act as 'sub-delegates'. Use these to determine which Media Player to address.
- Press another button at right in the same row to load the associated Media Player preset.

**M/E MEM (Display: M/E MEM)**

- Assigns Utility row buttons to call a Switcher or M/E MEM
- When enabled, the first 10 buttons on the Utility row act as 'sub-delegates'. Use these to determine which Switcher bus (MAIN, M/E1-8, or PRE VIZ) to address.
- Press another button at right in the same row to load a MEM for that bus.

**M/E 1–4 COMP (Display: M/E COMP)**

- Assigns Utility row buttons to apply a Switcher or M/E Comps
- When enabled, the first 4 buttons on the Utility row act as 'sub-delegates'. Use these to determine which Switcher bus (M/E1-4) to address.
- Press another button at right in the same row to apply a Comp to that bus.

**M/E 5–8 COMP (Display: M/E COMP)**

- Assigns Utility row buttons to apply a Switcher or M/E Comps
- When enabled, the first 5 buttons on the Utility row act as ‘sub-delegates’. Use these to determine which Switcher bus (M/E 5-8 plus PREVIZ) to address.
- Press another button at right in the same row to apply a Comp to that bus.

**Mix 1 (Display: Mix 1)**

- Assigns Utility row buttons to select a source for the routed Switcher output labeled MIX 1 in TriCaster’s user interface (Utility row button assignments follow the current Switcher BANK delegate, just as in the user interface).

**Mix 2 (Display: Mix 2)**

- As above..

**Mix ALL (Display: MIX ALL)**

- Assigns Utility row buttons to bring up each MIX output 1-8 (varies by model) and its available sources. Selecting a source from the Utility row changes the video source for the MIX. (Utility row button assignments follow the current Switcher BANK delegate, just as in the user interface).

**OUT 1 (Display: OUT 1)**

- Assigns Utility row buttons to select a source for the routed Switcher output labeled OUT 1 in TriCaster’s user interface (Utility row button assignments follow the current Switcher BANK delegate, just as in the user interface)

**OUT 2–8 (Display: OUT 2, etc.)**

- As above

**OUT ALL (Display: OUT ALL)**

- Assigns Utility row buttons to all sources for the routed Switcher output labeled OUT 1-8 (varies by model) in TriCaster’s user interface (Utility row button assignments follow the current Switcher BANK delegate, just as in the user interface).

**BFR 1–5 LAYER PST (Display: BFR LAYR)**

- Assigns Utility row buttons to call Layer presets for a specific Buffer.
- When enabled, the first 5 buttons on the Utility row act as ‘sub-delegates’. Use these to determine which Buffer to address.
- Press another button at right in the same row to load the associated Buffer preset.

**BFR 6–10 LAYER PST (Display: BFR LAYR)**

- As above ...

**BFR 11–15 LAYER PST (Display: BFR LAYR)**

- As above ...

**BFR 1–5 DATA PST (Display: BFR DATA)**

- Assigns Utility row buttons to call Data presets for a specific Buffer.
- When enabled, the first 5 buttons on the Utility row act as ‘sub-delegates’. Use these to determine which Buffer to address.
- Press another button at right in the same row to load the associated Buffer preset.

**BFR 6–10 DATA PST (Display: BFR DATA)**

- As above ...

**BFR 11–15 DATA PST (Display: BFR DATA)**

- As above ...

**TELEPROMPTER (Display: See Below)**

- Assigns Utility row buttons to function as Teleprompter controls such as PREV, STOP, PLAY, NEXT, SPD Dn (Speed Down) and SPD Up (Speed Up).

**TOGGLE FEATURE (Display: CRMA, PROC, CROP)**

- Assigns DELEGATE row buttons to easily toggle features per crosspoint: Chroma Key, Proc Amp, and Crop.

**TOGGLE RECORDER (Display: See Below)**

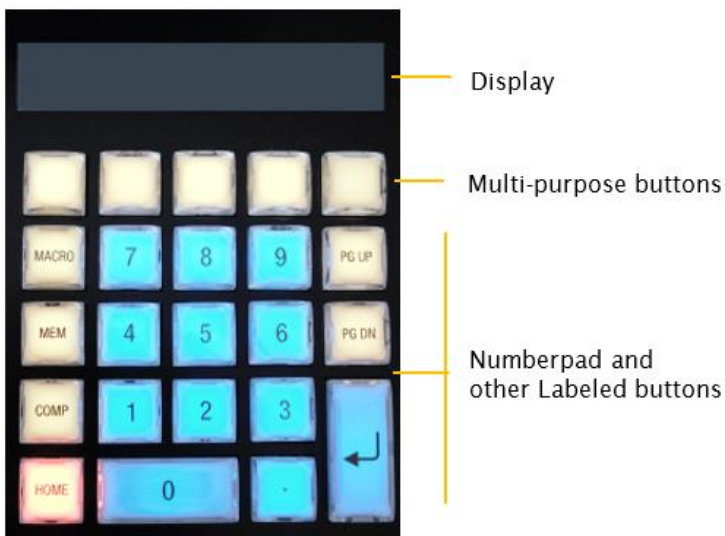
- Assign DELEGATE row buttons to toggle RECORD ON/OFF.

**Tip:** Selecting REC > ALL toggles recording of all qualified sources (local Record toggle for the source is ON), just like TriCaster's titlebar RECORD button.

**TOGGLE MUTE (Display: See Below)**

- Assigns DELEGATE row buttons to easily toggle MUTE feature to MSTR (Master), Aux 1-3 and TALKBACK.

## 19.2.5 Multipad



A Multipad is provided in each stripe on your TriCaster Flex Dual. Each Multipad features:

### Numberpad Entries

- Are shown on the second line of the display as they are typed.
- *Most* numeric entries require the ENTER key to confirm/apply.
  - e.g., when COMP is pressed that button fully lights, and waits for a number pad entry. Typing "12" + ENTER executes the twelfth COMP stored for the bus currently assigned to the associated Stripe.

- Pressing any button *other than a number, the decimal, or ENTER* drops (clears) the current numeric entry.
- The 5-key is distinguishable by touch by virtue of ‘extra-concave’ button cap.

## Mode Buttons

- MACRO, MEM, COMP are radio buttons (i.e., only one can be selected at any time).
  - The active Mode button is fully lit.
  - These buttons determine what subsequent number pad operations do.
  - MACRO, MEM, COMP each take number pad entries as arguments, and do not \*require supplemental selections.
- The five buttons in the upper-most row:
  - Are multi-purpose buttons.
  - Are not *physically* labeled; their current function is identified by short labels on line 2 of the LCD.
  - All HOME options that can be assigned to multi-purpose buttons are treated as radio buttons in the Multipad Mode group – like MACRO, MEM, and COMP.
    - e.g., pressing MEM delegates the Multipad to MEM operation, deselecting any other active Multipad Mode button.

## MACRO

Flex Dual’s Macro features vastly surpass earlier control surfaces. Whereas the latter only supports using buttons as macro triggers with the MACRO button pressed simultaneously, Flex Dual supports both numberpad and one-button macro triggers using the two Utility rows.

**Tip:** The Triggers display in the TriCaster’s Macro Configuration pane shows which number pad was used to send the trigger as well as the numeric entry.

- Each Numberpad on the control surface is treated independently. Thus, the number pad in the second stripe issues a different trigger than the same digits in the first stripe’s number pad.
- Flex Dual supports single, double, or triple-digit entries, the value being confirmed and applied using the ENTER key (this allows entries to be cued in advance).

**Tip:** With a number pad in Macro mode, the top-right number pad menu button performs a ‘continue\_pausedmacro’ operation.

## MEM

Unlike entries for macro triggering or to call a Comp, any given stripe only supports 9 MEM slots. Thus, ENTER is not required to confirm a numeric entry to call a MEM.

## COMP

The COMP workflow is like MEMs but because each Stripe supports 16 Comps, the ENTER key is required to confirm and apply entries of both 1 and 2 two digits.

## HOME, Pg Up, Pg Dn

- Pressing HOME will return the top menu level, dropping any incomplete operations and/or numeric entries.
- “Pg Up” and “Pg Dn” buttons traverse menu tiers (one level at a time). This allows for:
  - Selections from options lists
  - Allows the option to ‘go back’ using PgUp (drops any value from the original menu tier that has not yet been acted upon).

## 19.2.6 Multi-Purpose Buttons

The top-level row of buttons in the Multipad are Multi-Purpose buttons that with the associated LCD, comprise a multi-level menu system.

### LCD Display

- Before the surface is connected to a TriCaster, the display is blank.
- When connected to a TriCaster:
  - The top line of the LCD shows the current stripe delegate. As button selections are made, the top line also shows menu ‘breadcrumbs’.
  - The second line shows the HOME menu for the multi-purpose buttons.



### UTIL/INFO Buttons



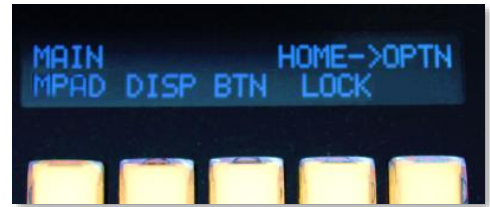
As mentioned back in the Configuration Webpage section, when the INFO button (top-left button in the multipad for Stripe 1) is pressed with SHIFT, the LCD updates to show the surface’s own IP address and firmware version. Press the HOME button (bottom-left button in multipad) to go back to the previous display.

### OPTN (Option Menu)



Under the **OPTN** (Option) button there are four menu choices that appear in the LCD display. MPAD (Multipad), DISP (Display), BTN (Button) and LOCK.

When **MPAD** (Multipad) is selected, the current Switcher bus label will show on the display. To allow the Multipad to be retargeted to a selected Switcher bus, push “PgUp /PgDn” to scroll through a list of options including; STRIPE (the default), Main, M/E 1, etc. Press ENTER to set.



❑ **Tip:** The top right of the LCD display are “Breadcrumbs” that show where you are in the menu.

**DISP** (Display) or **BTN** (Button) provides three menu choices that appear in the LCD display. Here you can set the illumination to your desired effect.

The fourth option **LOCK** is to lock/unlock the buttons on the control panel. Selecting **LOCK** lights all currently locked buttons. While **LOCK** is lit, pressing any control surface button toggles its locked/unlocked state, preventing unintentional changes.

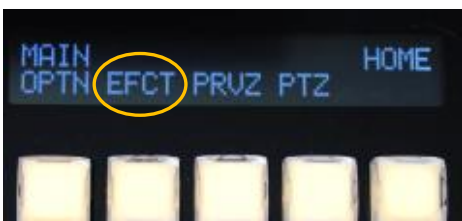
Another option under **LOCK** is to **LOCK ALL**. When selected in either multipad, the button label above changes to **UNLK** (Unlocked), with the message “Panel locked - press to UNLK”. The button under **UNLK** will pulse. All other buttons are de-lit (similar to when disconnected, but the connection state remains unchanged). All control panel input other than pressing the pulsing **UNLK** button is ignored. Press the **UNLK** button to restore full functionality and returns the Multipad to **HOME**.



❑ **Tip:** The **LOCK ALL** state is not serialized. On booting/powering the control panel, the unlocked state is always applied.

When the **LOCK ALL** is on, the entire second Multipad is included among the locked controls. Only the first Multipad hosts the **UNLK** button.

### EFCT (Effect Menu)



The second option in the Home menu is the **EFCT** (Effect) button. In this menu you can configure the Transition or LiveSet effect for a layer of the bus assigned to the associated Stripe. After pressing the button below **EFCT**, press **BKGD** (Background) to select which layer to modify.



Press **SLCT** (Select) to choose an effect. Press PgUP/pgDOWN to scroll through the nine options listed as follows:

- Cut
- Twirl
- Circle (H)
- Noise
- Clouds
- Flash
- Non Additive Fade
- Additive Fade



Press **ENTER** to confirm selection; to escape, press **HOME** on the Multipad.

Press **RATE** (from EFCT menu) to set effect speed (not available for LiveSet effects). Once you have formatted the rate, press to enter a custom rate.



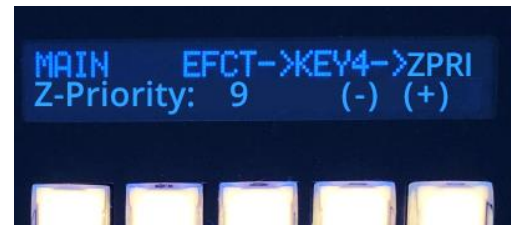
Press **OPTN** (from EFCT ->BKGD menu) to toggle **REV** (Reverse) and/or **PPNG** (PingPong) (not available for LiveSet effects).



Press **OPTN** (from EFECT ->KEY1->OPTN menu) to toggle with **wBKG** (Background Mode).

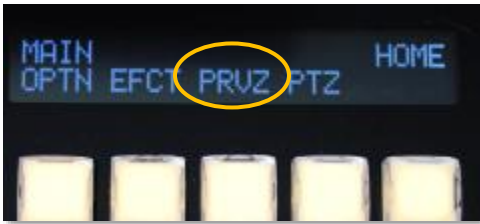


Press **ZPRI** (from EFECT ->BKGD menu) to bring up the Z-Priority menu. The range of the Priority settings runs from -10 to +10; the default is 0. Press the button below the plus or minus, enter the number on the key pad, followed by the enter button to confirm.





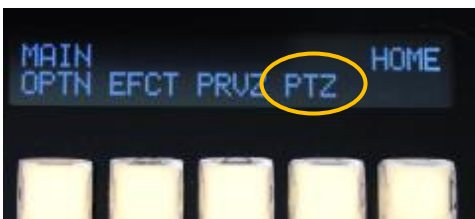
### PRVZ (PREVIZ Menu)



Copy the current state of the associated Stripe to **PREVIZ** or PASTE the PREVIZ state to the bus assigned to the Stripe.



### PTZ (PTZ/Pan & Scan Menu)



The last button option in the HOME menu is **PTZ** (PTZ/Pan & Scan). Press **FPVW** (Follow Preview row) or **FJOY** (Folly Joystick source).



Press **LOAD** to call a preset to apply, **SAVE** to store or overwrite a preset, or **CLR** (Clear) to clear a preset.



Whichever you've chosen **LOAD**, **SAVE** or **CLR**, you will enter number (1-16) and press **ENTER**.



The last option in the PTZ menu is **RATE** to set speed (where supported), choose **SLOW**, **MED**, **FAST**, or **SET** (to set custom speed).





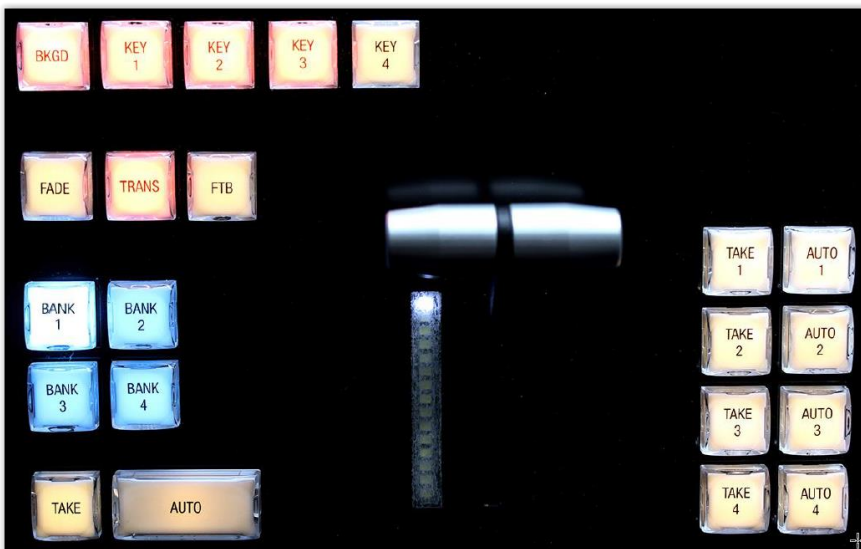
Press **SET** to format rate entries as percentage (1-100) and press **ENTER**.



## 19.2.7 Transition Group

### T-Bar

The T-Bar is perhaps the most recognizable component of a professional video control panel, and arguably one of the most important. The T-Bar can manually be pulled to modify the progress of a transition between delegated video layers. An LED in the nearby vertical row displays the percent of completion of the current effect.



These delegate buttons determine what video layers the main controls directly below (TAKE, AUTO, T-Bar, etc.) will effect. Multi-selection is supported, so, for example, if you select both *BKGD* (Background) and *KEY 1*, then press *AUTO* for a stripe delegated to the *Main Switcher*, a transition is applied to both the *Background* layer and *DSK 1*.

- **Note:** Double-punch any delegate button to remove perform an *AUTO* on the corresponding layer. (To perform a *TAKE* instead, assign *CUT* as the layer's transition effect.)

### FADE & TRANS

These two buttons provide a quick way to control the *Transition Bin* selection for the delegated switcher layer(s).

- Pushing *FADE* assigns Crossfade as the effect for the currently delegated layers.
- Push the *TRANS* button to activate the last-used (non-Fade) Transition effect to the currently delegated layers.

- **Note:** For new sessions, *TRANS* jumps to the transition following *Fade* in the effect preset bin.

The *FADE* and *TRANS* (Transition) buttons are mutually exclusive; selecting either cancels the other, and only the currently active button remains lit.

## FTB

To perform a *Fade to Black* operation, press *SHIFT* + the *FTB* button (the *SHIFT* button is required as a safety measure, since *FTB* is a somewhat dangerous operation). Revert to normal output by pressing *FTB* alone.

- *SHIFT* flashes if *FTB* is pressed without it.
- *SHIFT* is not required to remove *FTB*, but using it is supported anyway.
- *FTB* pulses slowly while on.

## TAKE & AUTO

The *TAKE* and *AUTO* buttons perform a cut or transition respectively, affecting only the currently delegated video layers.

**Note:** To quickly *TAKE/ AUTO* any individual layer, double punch its *Layer Delegate* button.

Double-punch BKGD-> auto Background

- Double-punch 1 -> auto DSK 1
- Double-punch 2 -> auto DSK 2
- Shift + double-punch 1 -> auto DSK 3
- Shift + double-punch 2 -> auto DSK 4
- For an individual Take, set the layer's effect to CUT (effect bin slot 1)

## 19.2.8 Media Players

This control group provides convenient control over TriCaster's most important Media Player functions and configuration options



## Transport, Trim and Modes

- IN, OUT - Set the In point or Out point for the current playlist item in delegated players to the current frame.
- ◀ (Previous Item) - Press this button to go to the previous playlist entry in delegated Media Players. (The selection cycles to the last playlist entry when necessary.)
- ▶ (Next Item) - Push this button to go to the next playlist entry in delegated *Media Players*. (The selection cycles to the first playlist entry when necessary.)
- ■ (Stop) - Push once to end playback for delegated *Media Players*; push a second time to return to the start position (this operation respects the *Single* setting for individual *Media Players*).
- ▶ (Play) - Push to initiate playback for delegated *Media Players*.
- LOOP, LIST - Click these buttons to toggle the Loop and List (Playlist) modes for the delegated players.

## Delegates

The Delegate buttons (labeled DDR 1-4 plus SOUND) determine the following:

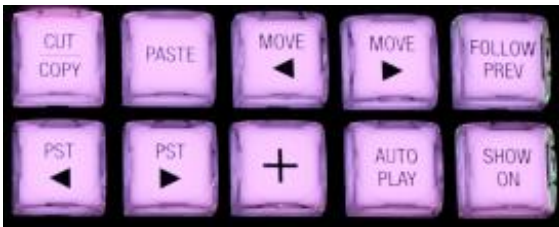


- Which Media Player is being controlled and also
- Which Media Player is the Joystick controls when in SHUTTLE mode.
- Multi-selection of Delegates is supported.

## FOLLW PREV

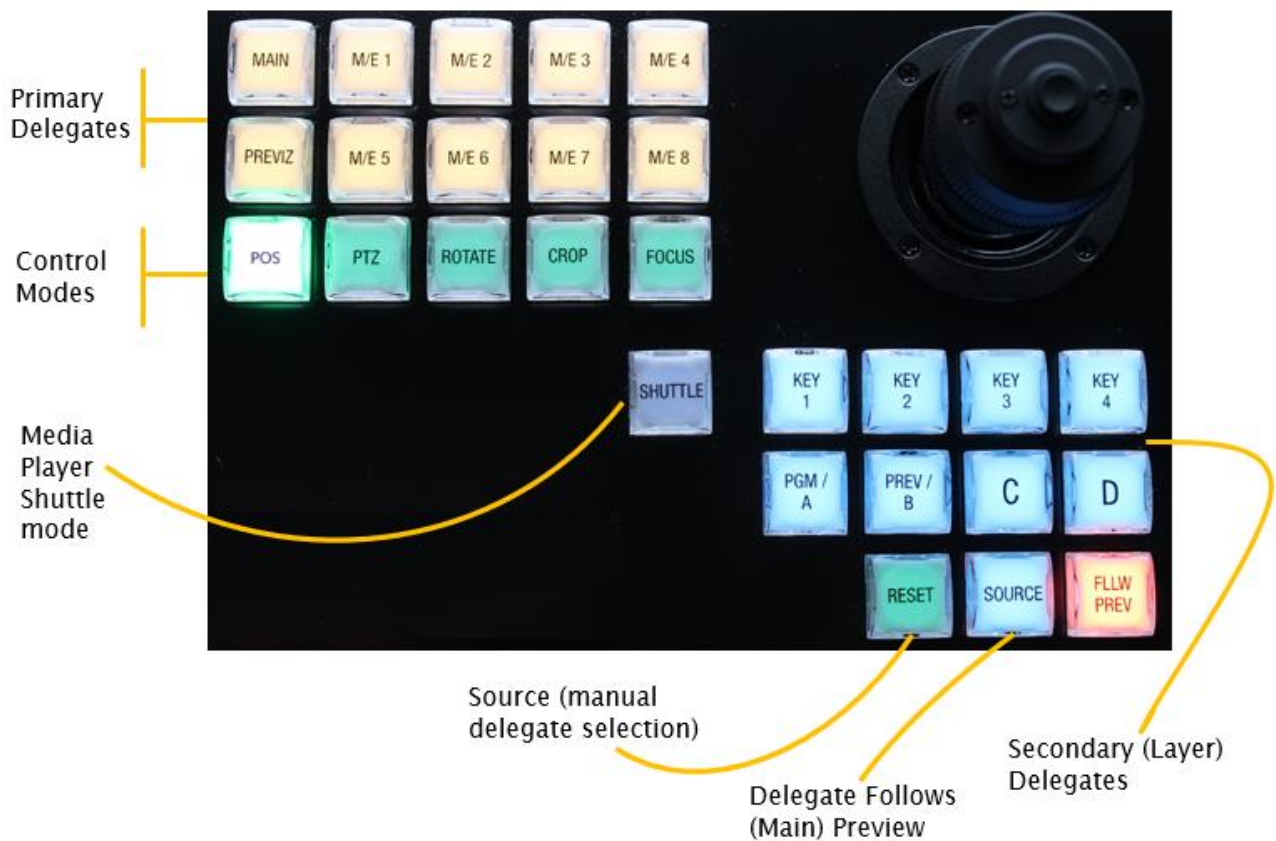
- This delegate follows the current (Main) Preview selection.
- If the current Preview row selection is NOT a Media Player, the last valid Media Player delegate state is used.
- When FOLLW PREV is ON, the button for the currently delegated Player is also lit.
- (FOLLW PREV can be toggled OFF, leaving the current delegate active.)

## Utilities



- CUT|COPY – Push to copy currently selected playlist items into the Paste buffer (note that CUT requires SHIFT).
- PASTE – Push to insert Paste buffer content into the playlist of the delegated DDR.
- Move ► and Move ◀ – Move the currently selected Playlist entry on slot backward or forward in the list.
- PST ► and PST ◀ - Previous and Next Preset.
- AUTO PLAY – Toggles Autoplay mode for the currently delegated players.
- SHOW ON – Triggers Autoplay for the currently delegated players.

## 19.2.9 Joystick



PTZ (pan-tilt-zoom) style joystick operations are not limited to ‘real’ PTZ cameras. Static cameras, *Media Players*, and *Buffers* are among the different source types that may benefit from ‘virtual PTZ’ functionality.

In considering its applications it is important to realize that, unlike the *Layers and Effects* control groups at left, the *Joystick(s)* located in the surface’s right-most column can optionally operate completely independently from the stripes at left.

Thus, while *T-Bar* operations (for example) are always directed to the video busses delegated to the stripe they are in, *Joystick* manipulations can affect any *M/E*, a *PTZ* (Pan, Tilt & Zoom) camera, or even a *Media Player*.

- TriCaster treats almost all Switcher sources in similar fashion whether they are real PTZ cameras or not (the former offer “PTZ” controls, while the latter have “Pan and Scan” controls)
- The PTZ mode button delegates the Joystick to controls these parameters (“PTZ” and “Pan and Scan”)
- The neighboring POS (Position) mode delegates the Joystick to control the separate layer position settings for individual layers in multi-layer LiveSet effects, or DSK/KEY layers.

## Delegates

### M/E1 – M/E8

These buttons provide a quick and convenient way to delegate *Joystick* operations to one or more selected *M/Es*.



### MAIN

Punch *MAIN* to direct delegate *Joystick* operations to the *Main Switcher*.

### PREVIZ

This button delegates *Joystick* operations to TriCaster's convenient *PREVIZ* video bus.

### Follow Preview



*FLLW PREV (Follow Preview)* is probably the most useful joystick delegate mode. You will likely not be surprised to learn that, when enabled (as is the default in new sessions), the Zoom/Joystick delegate state tracks your current *PREV* row selection.

Of course, the joystick has several other delegate modes, discussed next, but the default *Follow Preview* mode is very useful, and can be easily restored from any other mode by pressing the *PTZ* and *RESET* buttons together.

### SOURCE

This button is an alternative to *Follow Preview*. While *SOURCE* is pressed, the *PGM* row button for the current selection is lit (only sources in the current Bank are shown; change banks if necessary to access other sources). Naturally, pressing a different button delegates the Zoom/Joystick controls to control the new source.

### RESET

Despite its location, *RESET* is really an action button (not a *Joystick* mode). Press it to restore all position settings for currently delegated source(s) to their defaults. (This is also why *RESET* does not stay selected when pressed, nor does it change the current *Joystick mode*.)

- **Note:** When *SHUTTLE* is delegated, delegated Media Players are reset to the starting point of the current item (or playlist). And when delegated to an *M/E* with *LIVE SET* enabled in the *LAYERS* group, the *LiveSet* is reset to its default positioning.

When the *MEM* button is held down, pressing a button between 1 and 9 in the selection rows at left causes corresponding operation in the *MEM* bin for the delegated *M/E* as follows:

- Pressing a button in the *DSK/KEY* row recalls the corresponding *MEM*.
- Pressing a button in the *PGM/A* row stores or updates the corresponding *MEM*.
- Pressing a button in the *PREV/B* row clears the corresponding *MEM*.

## Layer Delegates



As mentioned above, some *Joystick* delegate modes let you further refine the target for your manipulations. For example, when your primary delegate is *MAIN*, joystick operations can be applied to the *DSK 1*, *DSK 2*, *DSK 3* or *DSK 4* video layers. The *LAYER* delegate group determines which one will be affected.

Specifically, the *KEY* buttons labeled *1-4* direct joystick control to *DSK 1-4* when *MAIN* is selected as the primary delegate, or *KEY 1-4* for an *M/E*. Similarly, when an *M/E* with a *LiveSet* selected as the *Background effect* is delegated, the *A*, *B*, *C* and *D* buttons allow you to target the individual *Positioners* for the main *M/E* layers (*A-D*).

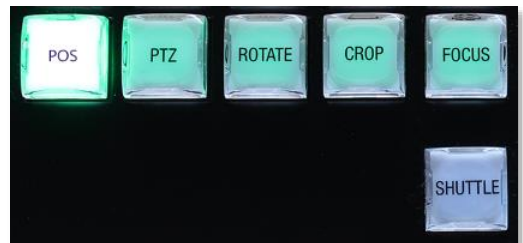
- Tip:** Joystick delegates – By default, the Joystick is in PTZ mode and delegated to BKDG/LIVESET for the current bus unless a layer (DSK/KEY 1-4, or A-D) is delegated. When a layer delegate is active its button is lit, but it can be toggled off; otherwise, the operator can reset to the default state (BKGD delegated) by pressing any button in the primary Delegate group (Main, M/E1-8, or PREviz). There is no BKGD or LIVESET delegate button.

## Control Mode

Let's turn now to buttons that govern the *Joystick* operating mode.

### POS

- Move the *joystick* horizontally, vertically or diagonally (as viewed from above) to move delegated video source(s) on its X and Y axes.
- Twist the *joystick* clockwise to scale delegated source(s) up, or counter-clockwise to scale down.



### PTZ

- TriCaster treats almost all Switcher sources in similar fashion whether they are real PTZ cameras or not (the former offer "PTZ" controls, while the latter have "Pan and Scan" controls).
- The PTZ mode button delegates the Joystick to controls these parameters ("PTZ" and "Pan and Scan")
- The neighboring POS (Position) mode delegates the Joystick to control the separate layer position settings for individual layers in multi-layer LiveSet effects, or DSK/KEY layers.

### ROTATE

- Move the joystick horizontally (as viewed from above) to rotate delegated sources on the Y axis.
- Move the joystick vertically to rotate delegated sources on the X axis.
- Twist the joystick clockwise/counter-clockwise to rotate delegated sources on the Z axis.



## CROP

- Twist the *joystick* clockwise (as viewed from above) to crop delegated sources inward on all four edges, maintaining the original aspect ratio.
- Twist the *joystick* counter-clockwise to reduce cropping of delegated sources on all 4 edges.
- Move the *joystick* horizontally to crop only the left edge of delegated sources.
- Move the *joystick* horizontally with the *joystick button* pressed to crop only the right edge of delegated sources.
- Move the *joystick* vertically to crop only the top edge of delegated sources.
- Move the *joystick* vertically with the *joystick button* pressed to crop only the bottom edge of delegated sources.

## FOCUS

When the primary *Joystick Delegate* is *PTZ*, enable *FOCUS* to modify *Joystick* operations as follows:

- Pressing the *Joystick button* enables *Autofocus*.
- Rotate the joystick to adjust the camera's focus setting (which will naturally disable Autofocus).

## SHUTTLE

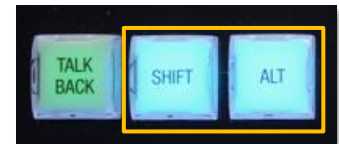
Push *SHTL* (Shuttle) to delegate the *joystick* to shuttle the *Media Player(s)* currently selected in the *MEDIA PLAYERS > DELEGATE* group. (Again, the other joystick mode buttons cannot be multi-selected with *SHTL*.)

- To *shuttle* delegated *Media Players*, move the joystick horizontally (as viewed from above).

**Note:** You can zoom multiple LiveSets simultaneously when these are delegated together, just as you can also shuttle several delegated Media Players.

## Qualifiers

SHIFT & ALT are what are termed 'qualifiers buttons', in that (like their keyboard equivalents) they qualify or modify the outcome of operating some other control.



## 19.2.10 Audio

### Backplane Connections



FIGURE 1

From left to right you will find ports for DISPLAY, 2 USB, and the ETHERNET port. These are followed by line level inputs for TALKBACK, MIC, and PHONES (headphones). Lastly, two pairs of line level AUDIO IN and two pairs of AUDIO OUT connectors are provided.

## Volume knobs



In most control panels, operating the audio mixer requires you to access the UI in your live production system. *Volume Knobs* on TriCaster Flex (top left of the control panel) give you fingertip access to control audio levels for *Audio Mixer* output busses. In addition to adjusting the volume levels, push a *Volume Knob* to toggle mute/ unmute the channel.

- OUT 1 & 2
  - Govern *local* output levels from the two pairs of AUDIO OUT connectors (labeled 1 and 2) on the backplane.
- TALKBACK and PHONES- control faders in TriCaster's Audio Mixer UI.

## TALKBACK Button

The button input labeled TALKBACK (to the right of the volume knobs) serves a special purpose, providing a way to converse with remote callers off-air (i.e., without intruding into your live program).

- *TALKBACK* is a PTT button (Push-to-Talk)
  - Hold it down to activate the *TALKBACK* feature, sending the audio source designated in the UI to all Mixer connections with *TALKBACK* capability.
  - Double-punch *TALK BACK* to lock it ON (the button will pulse light in this state).

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## 19.2.11 STREAM, REC, GRAB and REPLAY

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### STREAM & RECORD

- *STREAM* - Push to enable or disable TriCaster's live streaming feature.
- *RECORD* - Pressing this button enables TriCaster's *Record* feature.

□ **Note:** As a safety measure, pressing the REC button when recording is underway does not stop recording. Instead, the SHIFT button flashes to reminds you that you must hold it down at the same time as pushing REC to end recording.

### GRAB

GRAB is a qualifier button:

- Hold down GRAB and punch a PGM row button to grab the associated source.
- To grab from Mix 1 -(4 or 8, varies by model), punch the corresponding numbered button in the PREV row.

### REPLAY

Hold down REPLAY to list Instant Replay enabled sources by name on the LCD display.

- The LCD(s) will list the enabled *Switcher* sources starting from the left, followed by any recorders enabled in the *Record* tab in Output Configuration panel.



- Punch the PGM row button for the desired recorder source you wish to show on as an instant replay.

**Note:** Instant Replay uses the Show On feature of the DDR designated in the Replay Configuration menu. As such, the replay clip can be shown on PGM or an M/E, or even an M/E on PGM.

- Or defer playback of the instant replay as follows:
  - Add the replay clip to the DDR playlist without playing it by clicking the source's PREV B/D row button (with REPLAY held down).
  - When you're ready to trigger the instant replay, press SHIFT + AUTO to initiate the replay DDR's 'Show On' operation.
  - In either case above (instant or deferred replay), double the length of the replay by double-punching the recorder's button.

## 20 Live Production Features

Viz Vector Plus is your backstage pass to the latest power user tools and features from Vizrt's industry-leading developers. The benefits of Viz Vector Plus are already substantial and continue to accrue as further innovations are added to super-charge your workflow and take your productions to new heights of visual excellence.

- [Live Call Connect](#)
- [Live Story Creator](#)
- [Format Independent Production](#)
- [LiveGraphics](#)
- [LivePanel](#)
- [Advanced Audio I/O](#)
- [NDI KVM](#)
- [Virtual PTZ](#)
- [Virtual Set Library](#)
- [Sound and Music](#)

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### 20.1 Live Call Connect

Conduct live video calls from virtually anywhere using the Viz Vector Plus *Live Call Connect* functionality. This capability enhances your productions with high-quality video and audio, allowing you to flexibly present remote conversations, interviews, reports, and more—regardless of the caller's device.

#### 20.1.1 Supported Applications

Microsoft® Edge Chromium is pre-installed on your Viz Vector Plus system. However, if you prefer a different web browser, Google Chrome (or another Chromium™ based browser) can be installed. A number of popular video conferencing applications are also supported, for example:

- Microsoft® Teams
- Facebook Messenger
- WhatsApp, FaceTime
- VooV™ Meeting
- Slack®
- Discord
- Zoom

□ **Note:**

- Exit the Viz Vectar Plus software to download and install the supported applications you wish to use.
- To use FaceTime and Messenger please click the link below and install the WebView2 runtime using the x64 Evergreen StandAlone Installer.

<https://developer.microsoft.com/en-us/microsoft-edge/webview2/#download-section>

## 20.1.2 Working with Live Call Connect

- [Deployment Platforms](#)
- [Application Desktop Widget](#)
- [Setting Up A Call](#)
- [Input Configuration](#)
- [Audio Configuration](#)
- [A/V Return to Caller](#)
- [Green Room Method](#)

### Deployment Platforms

Viz Vectar Plus is designed to take advantage of the hardware accelerated capabilities of the latest versions of Windows. Because of this, the Live Call Connect feature requires Windows Build 19041 or later.

There are some cloud platforms like AWS on which this might not currently be available in the current default configurations although this is of course very likely to change over time. In most cases you can work around this by bringing your own Windows 10 version and deploying that manually in the cloud platform.

This may have implications on cost, technical complexity and licensing agreements with Microsoft. this manual process is not something Vizrt can support installing, however, we do support our software.

### Application Desktop Widget

A special Live Call Connect widget pins itself to the title bar of your browser or conferencing app window when it has focus. The widget has the following components:

- The hamburger icon at left side collapses the widget to a tiny size, reducing the possibility of unintentionally obscuring any of the application's video sources.
- The LIVE button performs several tasks, including detecting the caller's video viewports, beginning video capture, auto maximizes the application screen, and locking the mouse out of the application to prevent it intruding (the LIVE button is highlighted in orange when active).





The gear on the right side of the widget opens a menu listing with the following options:

- **Color Group:** After choosing a color corresponding to a color group in Viz Vector Plus Switcher, you can click a caller's video viewport in the conferencing application to assign that caller to the color-linked Switcher channel.
- **Relearn caller positions:** This selection triggers the relearn algorithm, including re-detecting the caller's screens (useful if things change unexpectedly in ways that can't be automatically detected).
- **Assign callers to inputs:** Automatically assigns caller video output from an application to Switcher inputs 9-17.
- **Help:** Opens a convenient Help applet to walk through the use of the feature.

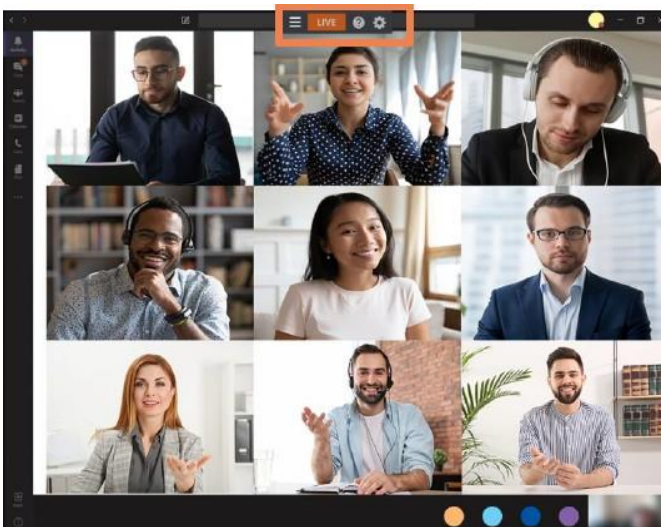
## Setting Up A Call

You need at least one secondary monitor to access the Application Desktop you assign to it using the Workspaces menu (as discussed in the earlier section on Workspaces). Once you have selected the App Desktop from the Workspaces menu, the Live Desktop will appear on your secondary monitor.

Your video conferencing application(s) and the system default browser will appear in your task bar. Click on your preferred app's icon, and join a meeting or display a web page in the usual manner for that application.

**Note:** Viz Vector Plus does not support "High Contrast" mode within any video application.

In our example we are using Microsoft® Teams Application for a Live Call Connect walk-through. Notice the widget in the application's titlebar (highlighted in orange). You can either host or join a meeting.



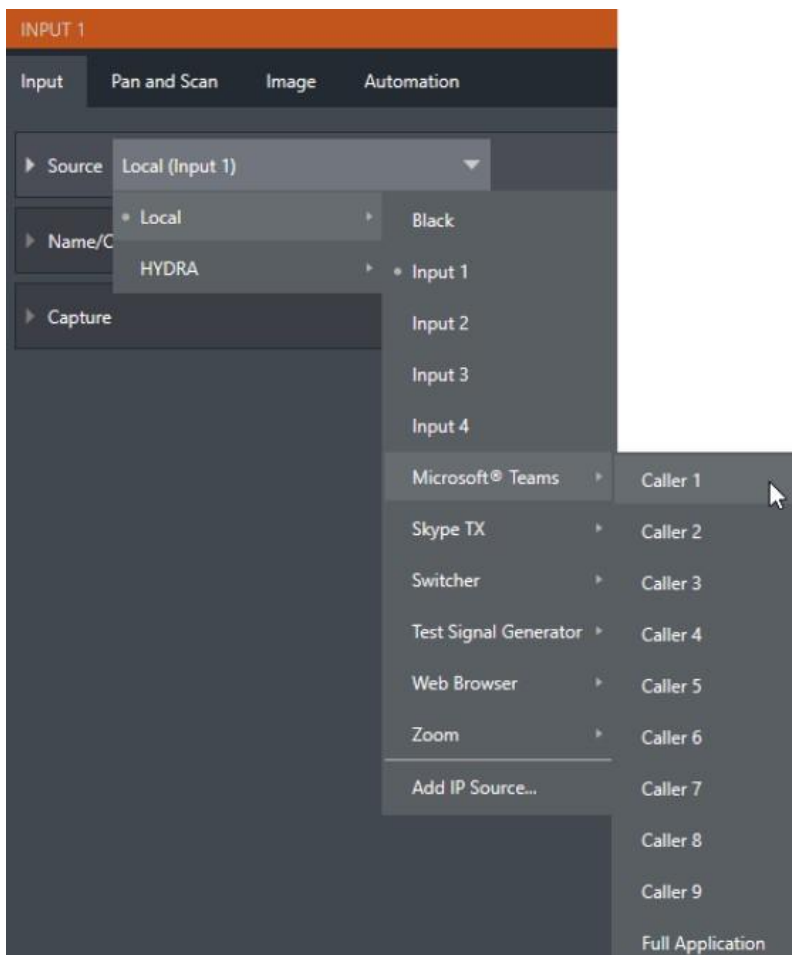
- ❑ **Note:** When using the Teams application, we suggest using *Fit to Frame* (Microsoft Teams 1.4.00.4167 or higher) by right clicking the individual caller feeds.

Once all callers have joined, you can use the **Assign Callers to Inputs** menu item to automatically assign the number of inputs starting from input 9. Or you can manually assign the callers to Switcher inputs using Viz Vectar Plus standard **Input Configuration** dialog. After that is complete, it's time to take it live (by pressing the **LIVE** button).

Live Call Connect attempts to maintain callers at the Switcher input you assign them to, but should the need arise you can turn off *LIVE* and apply the *Relearn Caller Layout* menu option. Live Call Connect crops out static application tools and borders, and supplies the callers' video to Viz Vectar Plus Switcher as potential sources.

- ❑ **Note:** Recording Switcher Inputs assigned to output from Live Call Connect is not supported.

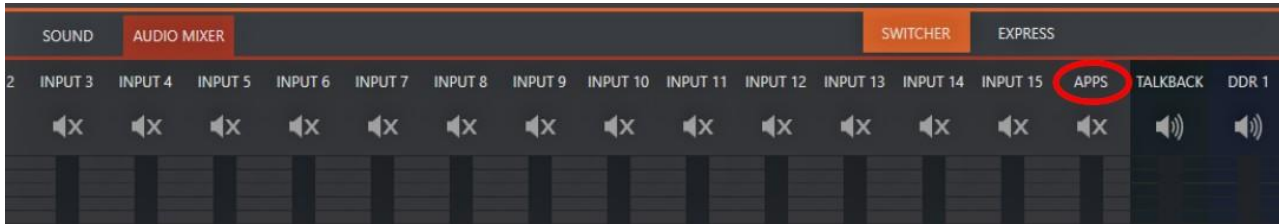
## Input Configuration



In the input configuration panel, the conferencing or browser applications appear along with other local sources. Each application supports up to a nine-user configuration in each applications layout.

Should you wish to capture the entire application interface, select Full Application. Web browsers offer two options, Full Application and Page Area (which crops the browser's toolbar at the top).

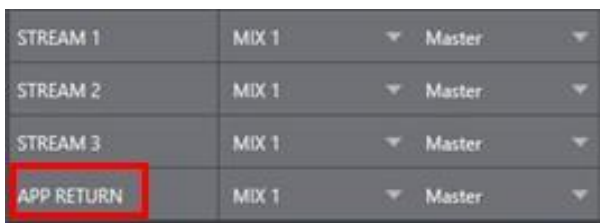
## Audio Configuration



Viz Vector Plus takes the system audio output for the supported applications and makes it available as an input in Viz Vector Plus' Audio Mixer (labeled APPS, by default). You find System Audio listed as an optional selection in the Mixer's Input Configuration Panel's Connection options.

## A/V Return to Caller

Viz Vector Plus main video Mix 1 output is returned to the conferencing application, and passed to remote callers so those calling into the meeting can see it.



The audio return is configurable in the **Output Configuration** panel and corresponds to a mix minus of the Master and AUX busses, or any input.

## Green Room Method

Zoom permits the meeting host to create “Breakout Rooms” to split your Zoom meeting into separate sessions. This feature, supported by Live Call Connect, provides a path to “Green Room” functionality. Examples where this feature is useful are helping to prepare callers before a live show or splitting-up the participants of a large class or meetings.

Steps to use Zoom’s “Breakout Rooms” as a “Green Room” with your Viz Vector Plus are below, but first be sure to enable the Breakout Room setting, in the account, group or user settings.

## Setup

1. External meeting host system (for example, laptop):
  - a. Launch NDI Webcam Input.
    - i. Select Viz Vector Plus Mix 1 as the NDI source.
    - ii. Set Webcam Input's Audio Level to +20dB.
  - b. Zoom Preparations:
    - i. Set Zoom's camera and microphone to *NewTek NDI Video* and *Line (NewTek NDI Audio)*.
    - ii. Start your meeting.
    - iii. Name the local Host connection `Program` *potlight* the connection (this is your show).
    - iv. Open a breakout room and name it `Green Room`.

2. Viz Vectar Plus:
  - a. Launch Zoom on the App Desktop.
  - b. Connect to the meeting.
3. Zoom configuration (meeting host laptop):
  - a. Give the Viz Vectar Plus connection a suitable Zoom name (for example, `Operator`).
  - b. Make *Operator* a co-host (provides the ability to mute/unmute callers in the Green Room).
  - c. Assign program participants and “Operator” to the “Green Room” (using the Breakout Room option that moves them automatically).

## Different Rooms for Different Purposes

- Callers in the main meeting see Viz Vectar Plus program (Mix 1) from Webcam Input.
- Callers in the Green Room see and hear each other and Program output.
- As a co-host, the *Operator* can selectively mute/unmute any caller in the Green Room.

**Note:** Zoom has a “pre-approved consent to be unmuted” feature (**Meeting Options > Request permission to unmute participants**). When enabled, callers are prompted to let the host mute/unmute them. Permission persists for any future meeting with the same ID, and is particularly useful for callers in the Green Room.

## Displaying a Caller in Your Show

- Either the Host or Viz Vectar Plus *Operator* can assign program participants to the Green Room.
- The *Operator* can selectively mute/unmute callers in the “Green Room”, and use TalkBack to address them without disrupting program audio.
- The *Operator* assigns callers in the Green Room to Viz Vectar Plus Switcher inputs and can display them in the program, and mix Green Room caller sound into the show.

**Note:** Adding or removing a caller to/from the Green Room may require a relearn operation, so changes to Green Room assignments should not be performed when a caller is On Air.

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## 20.2 Live Story Creator

Live Story is a powerful and flexible natural language automation system.

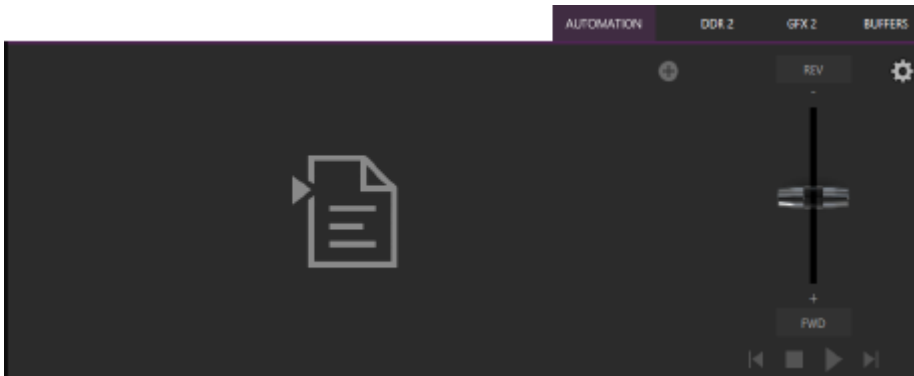
You can use it for simple tasks like a convenient teleprompter for your show’s talent. Coupled with the NDI Studio Monitor included in the free NDI Tools bundle; this is a great feature.

However, the feature set offers more complex controls, like automating an entire show.

- [Style-based Operations](#)
- [Comment-based Commands](#)
- [Fuzzy Logic](#)
- [Live Story Creator VS. Macros](#)
- [Live Updates](#)
- [Default Behaviors](#)
- [Additional Comment Commands](#)
- [Teleprompter Output](#)

## 20.2.1 Overview

When you first open the new **Automation** tab, located at right below the main Switcher (near Buffers), there is an empty script pane and some controls.



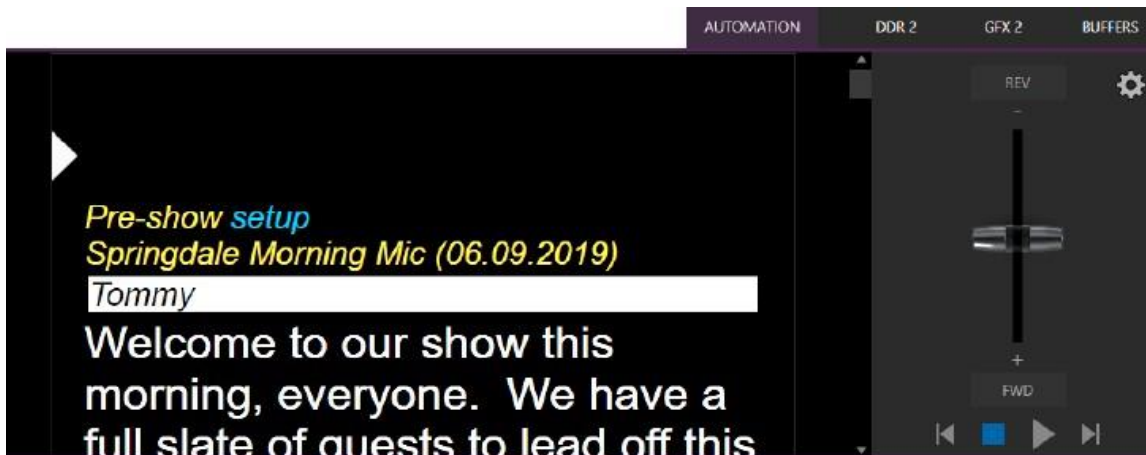
Click or tap the + (plus sign) gadget below and to the right of the tab to open a File Explorer. Here you can navigate to a location where you have previously stored a *.docx* file such as those created in Microsoft Word (or compatible software with similar features).

Examining the tabbed Live Story panel from left to right, you'll see:

- An (x) gadget at upper-left. Click this to unload the current script (*.docx* file).
- The eyeline control is a white caret (triangle) control that can be dragged up and down to adjust the position of the similar eyeline indicator on a teleprompter display.
- The script pane, or canvas, displays the content of the *.docx* document, as interpreted by Live Story.

Colors and font styles have special meaning:

- Generally, text shown as yellow and italicized is not meant to be read aloud.



- For example, in the image above, the first line (“Pre-show setup”) is used to issue a command to place Black on output before the show begins.

The line has Word’s Subtitle style applied to it, indicating it is not intended to be read aloud. Live Story shows this in yellow italics.

- The word “setup” is blue in the script pane, despite also being in Subtitle style in the document. This is because the command we inserted to cause black to be shown on output is in a comment applied to this word in the document.



- Blue identifies commented text in the document, and comments can be used to issue commands.

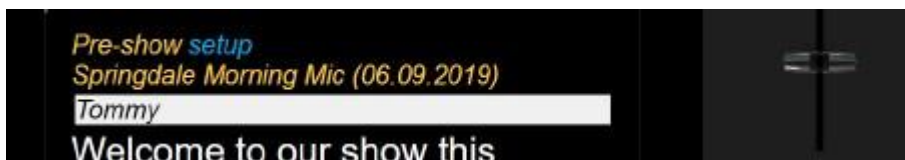
□ **Tip:** Move the mouse pointer over the blue text in the script pane to see a tooltip showing how Live Story Creator has interpreted your comment.

- Notice that the show's title ("Springdale Morning Mic") is displayed in yellow, too. Live Story recognized this as the SHOW TITLE because the Title style is applied to this text in the document.

Document styles can trigger corresponding actions, too. For example:

- The Title style can automatically display a specially prepared LiveGraphic™ animation to introduce your show, all without any manual intervention.

□ **Note:** The SHOW TITLE animations require the latest LiveGraphics content to be installed. The Broadcast templates in the updated content include a special Show Open preset specially prepared for this purpose.



- In similar fashion, the document style Heading 3 denotes a CUE, used to introduce someone speaking next. CUES are shown in inverted color, black text on a white background.

Like the Title Style, CUES can also automatically trigger operations. For example:

- If a Switcher input name matches a name in the CUE, that source is placed on output, and a title identifying the newly introduced talent is shown (after a few moments, the title is automatically removed).
- Text meant to be read aloud is shown in a large white typeface.

Live Story's operating controls are located in a small panel just right of the script pane.



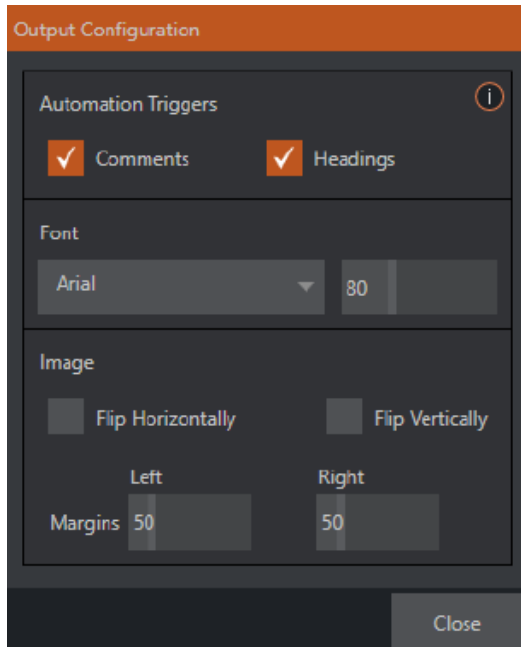
This Control Panel is dominated by a vertical Speed control. You can modify the scroll rate during playback or traverse the script backward or forward by dragging the Speed bar up or down.

Transport controls below the Speed bar include Stop and Play, as well as Previous and Next Segment buttons.



- Tip:** Divide your show into different segments identified by applying the Heading 2 style to lines in your *.docx* file.

Click the familiar gear gadget in the upper-right corner of the Control Panel to open Live Story's configuration panel.



- The two switches in the Automation Triggers toggle automation in response to Comments or Headings (styles) applied in the *.docx* document.
- When both switches are off, Live Story does not process automation commands, and is operates as a simple teleprompter.
- Font controls let you adjust text display for legibility when you are using an external teleprompter device.
- The Flip switches in the Image group likewise allow you to conform the teleprompter output to match your local devices, while the margin sliders let you move text confine teleprompter output to best suit your preference.

## Style-based Operations

Various styles applied in the *.docx* document serve different purposes in the Live Story Creator context, and some styles can even trigger automatic operation.

Document Style	Applies to	Displayed on output	Description	Sets value for DataLink key	Description
Title	Show Title	No	e.g., "State of the Union Address"	%SCRIPT_Show Title%	Main show title
Heading 1	Show Descriptor	No	Sets value for a DataLink key	%SCRIPT_Show Description%	Main show descriptor
Heading 2	Segment	No	e.g., "Intro Package", "Welcome Monologue"	%SCRIPT_Show Segment%	Current show segment
Heading 3	Cue	Yes (inverse)	e.g., talent name: "Billy Bob"	%SCRIPT_CueName%	Name of speaker
Subtitle	Information text	Yes (yellow, italics)	Displayed but not meant to be read (e.g., "walk behind desk")	%SCRIPT_Info%	Current/Last information text
Normal	Body text	Yes (white)	Text to be read by On Air talent.	N/A	N/A

The following styles automatically trigger Viz Vectar Plus operations when the Headings switch is enabled:

- **Title:** Triggers automatic display of a LiveGraphics show opening title animation. This title uses the text from the Title-style line to populate the first line of the animated title, and takes (hidden) text from a line entered using the Heading 1 style for its second line (when used).
- **Heading 3:** Identifies a CUE. When the Headings switch is enabled, a lower-third title is automatically displayed for a short duration when the eyeline reaches a CUE for the first time in a segment. The first line of the title shows the full Switcher input name set in Input Configuration for that source. The second line of the title is drawn from the (Input Configuration) Comment entry for the source.

□ **Note:** Titles as discussed above default to a pre-selected LiveGraphics title, and transition in and out automatically. To display a different title page, preload the desired title into Buffer 1 beforehand. This can be done using a command entered as a Comment in the *.docx* file. You can also use Comments to change the title's transition effect, display duration, and so on.)

## Comment-based Commands

While heading styles provide some useful automation possibilities, the use of Comments in the `.docx` file provide much more powerful and detailed options.



- ❑ **Note:** The Comment inserted into the text has two lines. The first is simply “Black”, which tells Viz Vector Plus to select the input named “Black” on its Program row.

## Fuzzy Logic

The very same thing would occur if the command entered in the Comment had instead said “Show black”, “Put black on program”, “Send Black to Program”, or “Output black”. Live Story uses “fuzzy logic” to try to find the best match to your entry.

- ❑ **Note:** Extraneous text is typically ignored so, for example, you could instead write “Put black on program while I have lunch” and still be successful (assuming your lunch was satisfactory).

We mentioned earlier that you can move the mouse pointer over blue text in the script pane to see a tooltip showing how Live Story interprets your comment. It is helpful to know that Live Story determines the probability that the interpretation is correct. If the wording of a Comment entry is ambiguous, and could be interpreted differently, the text color in the script pane is red rather than blue.

- ❑ **Note:** If a comment has multiple lines in it, Live Story adds an asterisk to any ambiguous lines in the tooltip. The entry “Output black” would trigger this behavior, even though it is correctly interpreted, with the result that black is shown on output.

## Live Story Creator VS. Macros

Like Live Story commands, a macro shortcut is entered on a single line, and may support arguments, or parameters. Macro shortcuts, however, require you to use very specific syntax. By contrast, though, Live Story commands are entered using ‘natural language’, the way you might normally speak or write. A macro shortcut generally fails with an error if your syntax isn’t perfect, while Live Story uses fuzzy logic to try to find the best match for your command, and only fails ‘reluctantly’.

- ❑ **Note:** Live Story documents are evaluated on loading. When Live Story determines its evaluation of a specific command in a Comment could be incorrect, it posts a message to Viz Vectar Plus' Notification panel to note the ambiguity, in addition to marking the commented text in red in the script pane.

Additionally, a single Comment command can do things that would otherwise require multiple commands entered on separate lines in a macro. Consider for example, when Live Story encounters the simple Comment entry “fade tom slow”, it results in the following steps:

1. Select an input named “Tom” (or “tom”, or with a similar string, such as “Tommy” in the input Comment box) on the Switcher’s Preview row.
2. Set the Switcher’s Background transition effect to Fade
3. Set the effect speed to Slow
4. Perform an Auto

To do something similar using a macro, you’d need to enter four separate lines, getting the syntax correct for each macro shortcut, and since macro commands require an input index parameter rather than a name, you’d need to know in advance which camera would be pointing. If a person was moved to a different chair on your set at the last minute, the macro would need to be modified. Using Live Story Creator, you could simply rename the camera.

Rather than naming an input “Tom”, you prepared a PTZ preset (or Pan and Scan preset, for a non-PTZ source) and named it “Tom”, Viz Vectar Plus would automatically select that preset at step 1 above.

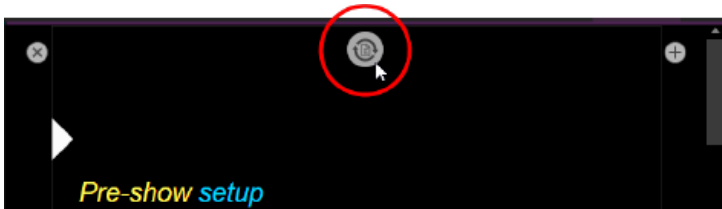
- ❑ **Tip:** If you are using a few PTZ cameras to cover a city council meeting, with PTZ presets prepared for different participants. If two people change seats at the last minute, all you need to do is update the PTZ presets and Live Story Creator takes care of everything else.

So, not only are Live Story Comment commands easier to write, often performing multiple operations with a single entry, but they are “smarter”, and easier to maintain and update.

## Live Updates

As mentioned, you don’t need to press Play to test modifications, you can reload the *.docx* file and hover the mouse over commented text to see the way the embedded commands have been evaluated.

Live Story Creator has a built-in Update feature, and monitors changes to the script file you loaded.



If you use a laptop to edit your script in Microsoft Word, you might opt to save the file across a network connection (for example, the shared Public\Documents folder on your Viz Vectar Plus).

Then, when you modify the document and save it (which typically requires just a quick keyboard operation to perform - **CTRL + S**), Live Story immediately shows an Update icon at the top of the script pane. Click this to reload the *.docx* file with the changes you made.

- ❑ **Note:** This resets Live Story’s eyeline indicator to the top of the script, so don’t do update when your talent is reading from the teleprompter you are quite confident that they will miss you with whatever they throw!

## Default Behaviors

Live Story's Comment commands can perform compound operations, and are simpler to use than macros. They are designed to provide a useful result even when you don't supply complete information.



The first picture illustrates the result of the Comment command "Fade Football Star on in PiP" (the simpler entry "PiP football star" would have produced the same result). Live Story produced a 'default' picture in picture effect, as shown.

In the next image, the Comment command was edited to read "PiP Football Star large top right", achieving a better result.

The Comment command "title" provides another example of default operation. Add the simple entry "title brackets lower third" to a comment. Live Story evaluates the comment when the eyeline indicator reaches it, and the predetermined defaults are used so you may not even need to add any more detail. The designated title page (Brackets Lower Third) is automatically:

- Loaded into a Buffer
- Assigned to a DSK
- Faded on
- Held briefly, and then
- Faded off.

In this example, you can change the effect used to introduce the title page. The Comment command "Show Title brackets lower third Edge LtoR(H)" works quite nicely for this purpose.

**Tip:** You might want a title to remain in view longer than the default time. To do this, add the word "hold" to the command you use to display the title. Then insert a new comment into your script at the point where you want to remove the title from view and enter the command "title off".

You can also change effect speed (Fast, Medium, Slow), specify the DSK to use, and so on.

## Additional Comment Commands

Identified below, are the main Viz Vectar Plus features Live Story currently supports, with some examples and a few alternatives that work just as well.

### Audio Mixer

- "Set input 2 Volume to -5"; "volume input 2 5dB"; "input 2 9dB"; "Set volume for input 2 to -20"
- "volume master 5dB"; "Set Saster Volume to 5"; "set volume to 5"
- "mute"; "mute on" – mute master output
- "unmute"; "mute off" – unmute master output
- "mute out 2"; "mute out 2"; "mute aux 2"; "mute aux 2 on"; "aux 2 mute on" – mute named output
- "aux 2 mute on"; (etc.)

- “mute input 3”; “mute input 3 on” – mute the named input
- “mute input 3 off”
- “solo input 6”; “solo input 6 on” – solo the named input
- “solo input 6 off”
- “unsolo input 6”; “solo input 6 off” – disable solo for the named input
- “follow input 6”; “follow input 6 on” – solo the named input
- “follow input 6 off”
- “input 4 eq”; “input 4 eq on”; “input 4 enable equalizer”
- “input 4 eq off”; “input 4 disable equalizer”; (etc.)
- “input 5 compressor on”; “input 5 enable compressor”
- “input 5 compressor off”; “input 5 disable compressor”; (etc.)
- “AudioMemName”; “select AudioMemName”; “recall AudioMemName”; “mixer AudioMemName”; “audio AudioMemName”; “audio select AudioMemName”; “audio recall AudioMemName”
- “audio select MEM 3”; “audio select 3”; “audio recall 3”; “audio recall mem 3”; “mixer select 3”; “mixer select mem 3”; “mixer recall 3”; “mixer recall mem 3”

### Comps

- “load MyComp”; “select MyComp”; “myComp” – loads the named main Switcher Comp.
- “comp 3”; “load Comp 3”; “select comp 3”; “go to comp 3”
- “m/e 1 comp 2”; “me1 comp 2”; “select comp 2”; “load main comp 2”; “go to myMENAME myCompName”; (etc.) – loads the designated Comp into the main Switcher (default) or named M/E.
- “myComp medium”; “myComp normal”; “myComp 1.0”; “go to myComp slow”; (etc.) – loads a Comp using the designated speed.

### Media Players

- “play lion”; “play lion on main”; “take lion on me1”; “cut to lion on m/e 1”; (etc.) – locates, loads and plays a clip named “lion” on the main Switcher (default) or named M/E; performs an auto or take when playback ends. The scrolling of the script pauses until playback is complete.
- “circle(h) lion” works as above but uses a Circle wipe to display and remove the clip.
- “play lion ddr2” forces the operation to use DDR 2 (rather than selecting a default DDR)
- “add lion to ddr 2”; “load lion ddr 2” – adds the clip without displaying it
- “play lion at 9 db”;
- “play lion voiceover”; “play lion vo” – the script continues to scroll during playback
- “play lion at 5 db”; “play lion 5db”; “lion 5 db”
- “DDR 1 stop”
- “DDR 1 Next”; “DDR 1 Previous” DSKs

### DSKs

- “Toggle DSK 1” “toggle DSK 1 slow”
- “auto on dsk 2 slow”; “auto on M/E 2 key 2 slow”; “Fade M/E 2 keyer 1 slow”;
- “fast auto off dsk3”
- “Set main dsk 1 as input 1”; “Set input 1 on main dsk 1”; “set DSK 1 to GFX 1”; “set M/E 1 Keyer 1 to GFX 1”; “assign GFX 1 to Me2 key 2”; (etc.)
- “Play lion in dsk2”; “Play lion on dsk2”; “Show lion in dsk2” – plays a clip named lion in DSK2, fading on and holding the last frame.
- “Play lion on key 2 in M/E 1 with slow circle(h)” – as above but uses a slow Circle wipe in M/E 1.
- “Show lion on dsk 3 with fast auto”; “Show lion on dsk 3 with take”
- “set main DSK 3 transition to circle(h)”; “set circle(h) Me2 key 1”; “change transition on me4 for key 2 to circle(h)”; (etc.)
- (etc.)
- See also dedicated PiP (Picture in Picture) commands

## Buffers

- "Add globe to buffer 6"; "buffer 6 load globe" – loads the Globe Frame Buffer Animation effect to the target buffer
- "Add Hexagon lower third to buffer 6" – loads the named static title page into the target buffer
- "buffer 3 load Hexagon Broadcast" - loads the named LiveGraphic into the target buffer ▪ "Buffer 1 set speed medium"
- "Buffer 1 speed 2"; "Buffer 1 set speed 2x"; "Buffer 6 globe 200%" – set speed to 2x the default (Medium).
- "set buffer 1 to layer preset 2"; "set buffer 1 to index 2"; "set buffer 1 to preset 2"; "buffer 1 select preset 2"; "buffer 1 preset 2"; select buffer 1 index 2 (etc.) – select the designated Layer Preset for a LiveGraphics title page loaded in the buffer slot specified.
- "set buffer 1 to data preset 2"; etc.– select the designated Data Preset for a LiveGraphics title page loaded in the buffer slot specified.

## Macros

To run a more complex macro from within a script, you can use the commands below:

- "macro\_name"; "macro macro\_name"; "run macro\_name"; "play macro macro\_name"; etc.
- "stop macro\_name"; "stop macro macro\_name"; macro macro\_name halt"; macro\_name end";
- etc.
- "stop all macros"; "stop macros"; "halt macros"; etc.
- "Continue Paused Macro"

## PiP (Picture in Picture)

- "Input 5 pip"; "pip input 5"; "ots input 5" – assign input 5 to a default DSK and display it
- using default options
- "pip globe" – show the matching file (in the example, a Framebuffer Animation) using default PiP settings
- "pip globe center large"; "pip globe middle large"
- "pip me1 key 2 globe small bottom right"
- "pip input 5 large center" – assign input 5 to an unused DSK and display it large size at center screen
- "pip main dsk 3 input 5" – assign input 5 to DSK3 and display it using default options
- "pip me1 dsk 1 input 2" – assign input 2 to DSK1 in M/E 1, and display it using default options
- "pip input 5 fly in L" – assign input 5 to an unused DSK and fly it in from left
- "fade pip off"; "ots off" – remove the default PiP from output using a fade effect
- "pip main dsk 2 off" – remove the PiP in DSK 2 from output
- "pip myPtzPreset" – recall the named PTZ preset and show that source in a PiP
- "pip dsk1 myPtzPreset "; "pip me1 key1 myPtzPreset"; "take pip myPtzPreset "; (etc.)

## PTZ

- "myPtzPreset "; " myPtzPreset on program"; "put myPtzPreset on program"; "take myPtzPreset on program"; "select myPtzPreset on program"; "take to myPtzPreset "; (etc.) – locate a PTZ preset named "myPtzPreset" and display it on Program output.
- "put myPtzPreset on preview"; "select myPtzPreset on preview"; etc.
- " myPtzPreset on M/E 1 b row"; "me1 put myPtzPreset on b row"; "me1 select myPtzPreset on b row"; "set me1 b row to myPtzPreset"
- See also PiP-related PTZ preset commands.

## Record, Grab

- "record"; "record on"; "recording on"; "start record"; "begin record"; "start recording"; etc.
- "record off"; "recording off"; "stop recording"; "end recording"; etc.
- "Grab still"

## Stream

- "stream"; "stream on"; "streaming on"; "start stream"; "begin streaming"; etc.
- "stream off"; "streaming off"; "stop streaming"; "end stream"; etc.

## Switcher

- "auto"; "transition" – perform a Background transition on the main Switcher
- "take"; "cut"
- "fade"; "crossfade"; fade slow; etc.
- "input 4"; "input 4 on program"; "put input 4 on program"
- "bob"; "take to Bob"; "take Bob on program"; "fade to Bob"– perform a Background (Take or Fade, respectively) transition to show a source (or PTZ preset) named "Bob" on the main Switcher.
- "input 4 on preview"; "put input 4 on preview"; "set preview to input4"; "input 4 on b row";
- "set layer b to input 4"; etc.
- "me1 put input 4 on preview"; "set M/E 1 preview to input 4"; etc.
- "set M/E 1 b row to input 6"; "set me1 layer b to input 6"; "input 6 on me1 b row"; etc.
- "auto to input 4"; "transition to input 4" etc.
- "fast auto to input 4"; etc.
- "auto to input 4"; "transition to input 4" etc.
- "M/E 3 bob"; me3 auto to input 4"; "transition me3 to input 4"; etc.
- "ftb"; "fade to black"; "ftb off"; etc.

## DSK

- "DSK1 Auto"; "dsk 1 perform auto"; etc.
- "dsk2 take"; etc.

## DataLink

- "set datalink key myVar to I'm a Yankee Doodle Dandy"
- "datalink key myVar equals 12"; "set datalink key myVar to value 12"; "set datalink myVar to 12"; "set myVar to 12"; "myVar equals 12"

## Titles

- "Aero Broadcast"; "Title Aero Broadcast" – for a LiveGraphic title, sets the default layer preset (10), then transitions the designated title in a default buffer assigned to a default DSK, removing it after 8 seconds;
- "Aero Broadcast hold"; "title Aero Broadcast hold" – as above but does not automatically removed the title
- "title Aero Broadcast Fly In L medium"; etc. – as above using the designated transition and speed
- See also title-related commands listed in the Buffers subheading.

## Aliases and Comments

- You can use these comment commands to eliminate the need to pre-configure Switcher source names. Instead, you can set them right in the .docx script. This also allows you to change the metadata associated with a Switcher inputs at various points in your show as you wish.



- "Sam Smith is on input 4"; "assign input 4 to Sam Smith"; "set input 4 to Sam Smith" - set an alias for the designated input's name value Hint: You'll likely want to use the full name here, for use in connection with titling.
- "input 4's description is CEO of Megadyne Inc."; "Input 4 memo is CEO of Megadyne Inc."; etc. - sets the descriptor for the input, which is used as the value for the second line of default lower third titles

## Teleprompter Output

Live Story Creator can be useful as a native teleprompter. Coupled with file watcher functionality to easily update your script right up to air-time, this feature saves setup time, expense, and provides exceptional output flexibility.



## Control

For live use, most prefer a dedicated physical controller device, whether for use by the talent or another teleprompter operator in the studio. Live Story natively supports the ShuttleXpress USB controller by Contour Design Inc.

You will find this device provides common teleprompter controls in an easy to use and affordable manner.



## Output

In order to support a wide array of external teleprompter hardware, Live Story assigns the scrolling text output to the highest numbered Switcher output by default. You can then assign this signal to a video Mix output supplying a physical video output connector to feed an external device.

In an NDI® environment, you have other powerful options. Viz Vectar Plus automatically supplies the teleprompter output to your network as an NDI stream, offering many display options (for example, the Studio Monitor application included with the free NDI Tools bundle (found at [ndi.video/tools/](http://ndi.video/tools/)) can be used to display your teleprompter output on Windows® and OS X® platforms).

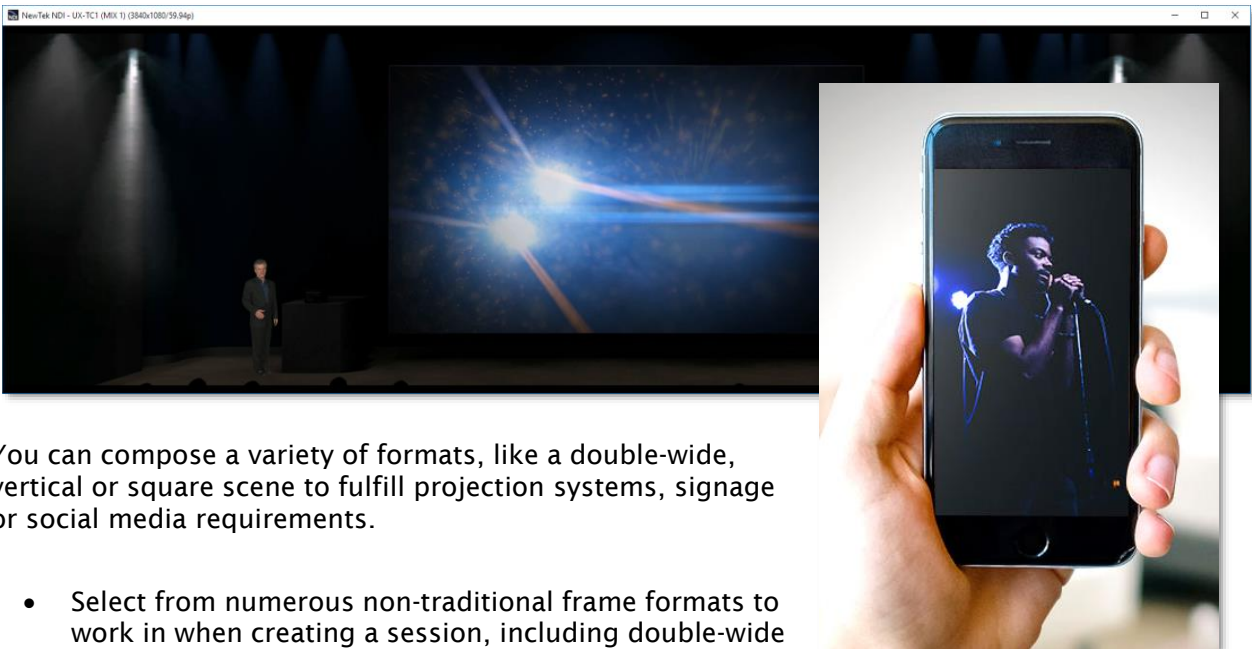
## 20.3 Format Independent Production

### 20.3.1 Working with Formats and Aspect Ratios

#### Session Options

#### Input Rotation

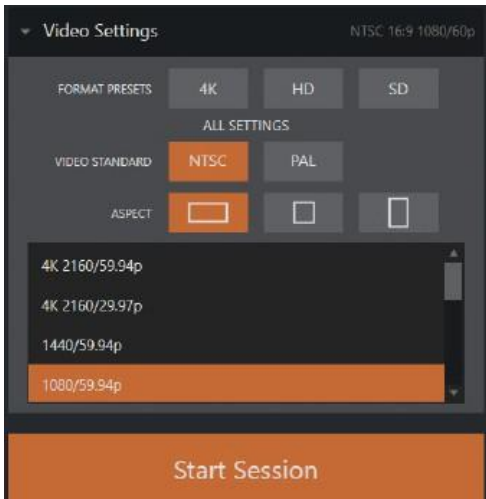
#### Output Rotation



You can compose a variety of formats, like a double-wide, vertical or square scene to fulfill projection systems, signage or social media requirements.

- Select from numerous non-traditional frame formats to work in when creating a session, including double-wide and many more.
- Flip, rotate, scale and crop individual inputs.
- Flip, rotate, and choose the resolution for individual outputs. You can even send left/right or quarter screen segments, and optionally enable automatically blended Overlap.

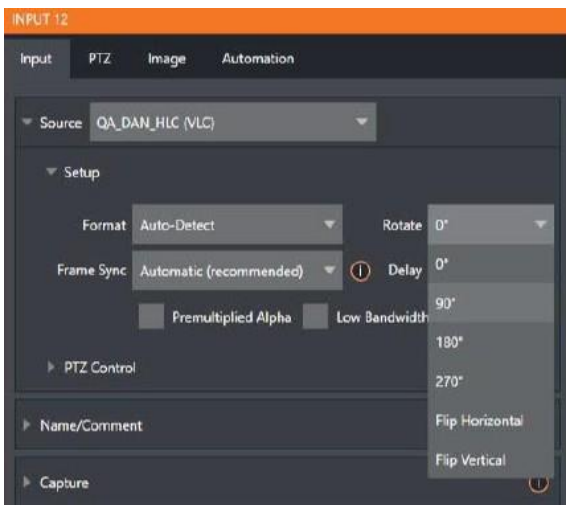
## Session Options



These features are on the Home page of the **Launch** screen, where a group of buttons labeled Aspect allow you to choose between landscape (horizontal), square, or portrait (vertical) aspect modes.

In the resolution selector, traditional video formats have been complemented by appropriate non-standard options including, for example, portrait aspect 1080x1920 and 1080x3840 options, and so on.

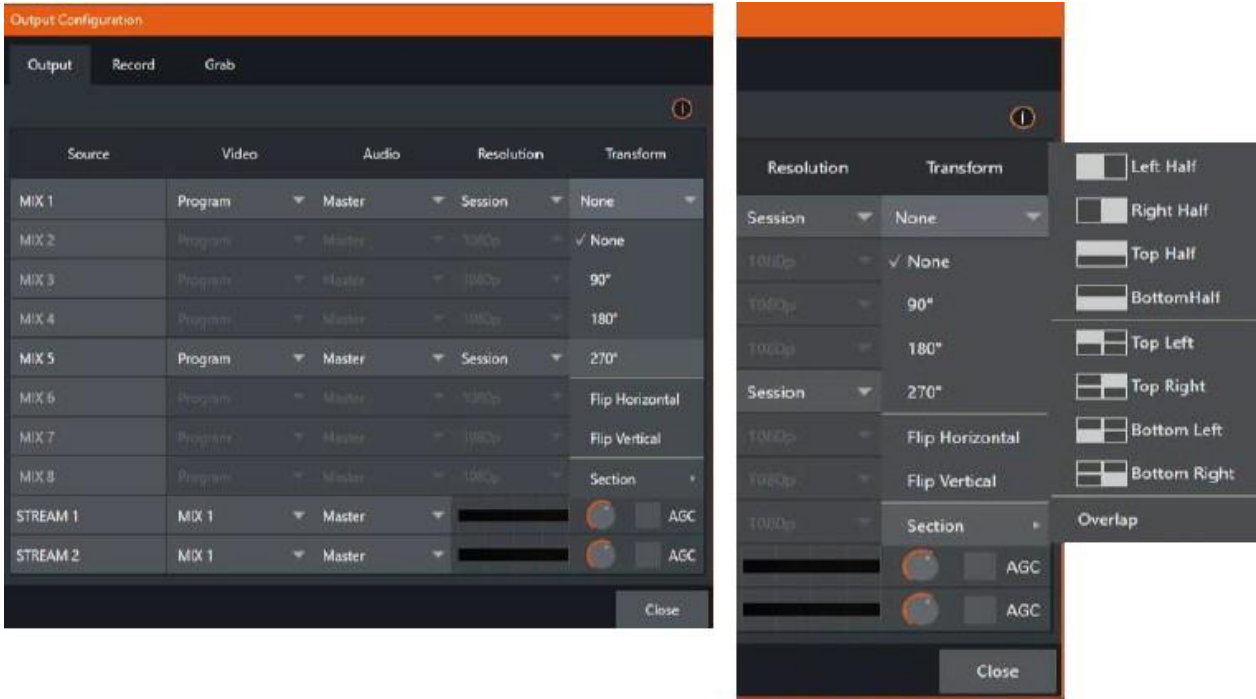
## Input Rotation



To complement non-traditional sessions and handle unusual Switcher sources (for example, non-landscape mobile device output) each input has a *Rotate* menu, which also includes *Flip* options.

## Output Rotation

All Mix outputs support independent resolution selection, rotation and flip control, as well as Section options.



## 20.4 LiveGraphics

LiveGraphics® represents a groundbreaking approach to title and CG page creation, combining the power of the most complete production systems on the planet with Adobe® Creative Cloud®.



Viz Vectar Plus LiveGraphics can noticeably improve your productions and gain the attention of your viewers.

- Use Layered PSD Files
- Animate in After Effects
- Title Editor for Buffers
- LiveGraphics and DataLink

## 20.4.1 Working with LiveGraphics

LiveGraphics comprises several key elements.

- An extensive set of professionally prepared animated title templates and the interface to control and update these in your Viz Vector Plus system.
- Ability to designing animated titles, motion graphics, and looping effects using popular Adobe® Creative Cloud® tools— then importing them directly into your Viz Vector Plus live production system, enabling both dynamic animate and update.
- The LiveGraphics *Creator* plugin simplifies authoring in After Effects CC for users of all experience levels.
- Enhanced real-time system functionality allowing powerful customization, playback, and even automation options.



LiveGraphics lets you produce and present spectacular live graphics faster and easier.

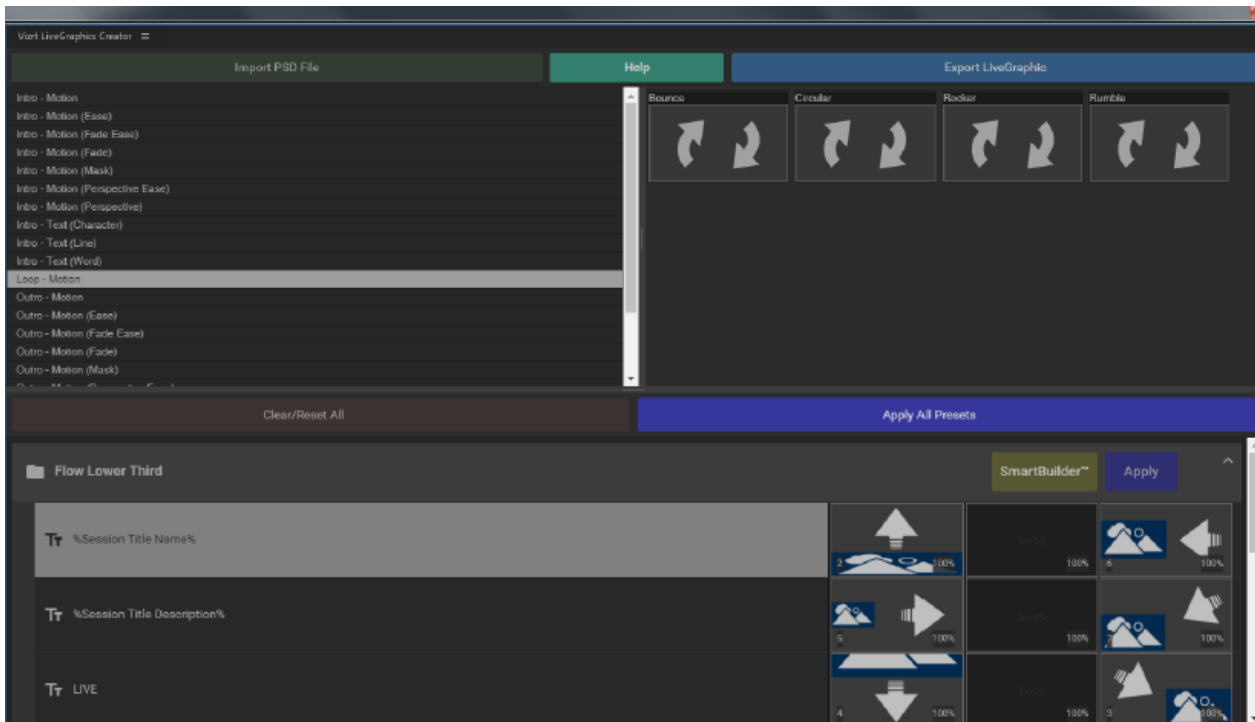
### Use Layered PSD Files

Create individual graphics or an entire package in Adobe Photoshop CC, then bring the PSD files directly into your Viz Vector Plus live production system.

LiveGraphics recognizes the layers automatically, allowing you to manage elements independently and store up to 16 macro-ready variations per system buffer.

### Animate in After Effects

Animate graphics faster and easily, with the included LiveGraphics Creator plugin for Adobe® After Effects CC.



AE novices can simply import a layered Photoshop® PSD file, drag and drop presets to apply motion to its different layers, then export the result ready for live use.

Or, use the included SmartBuilder™ to have LiveGraphics analyze your content and add animations for you with a single click. Advanced users can refine their creations using standard methods in After Effects.

**Hint:** Viz Vectar Plus LiveGraphics Creator is documented in its own manual, installed with the plugin.

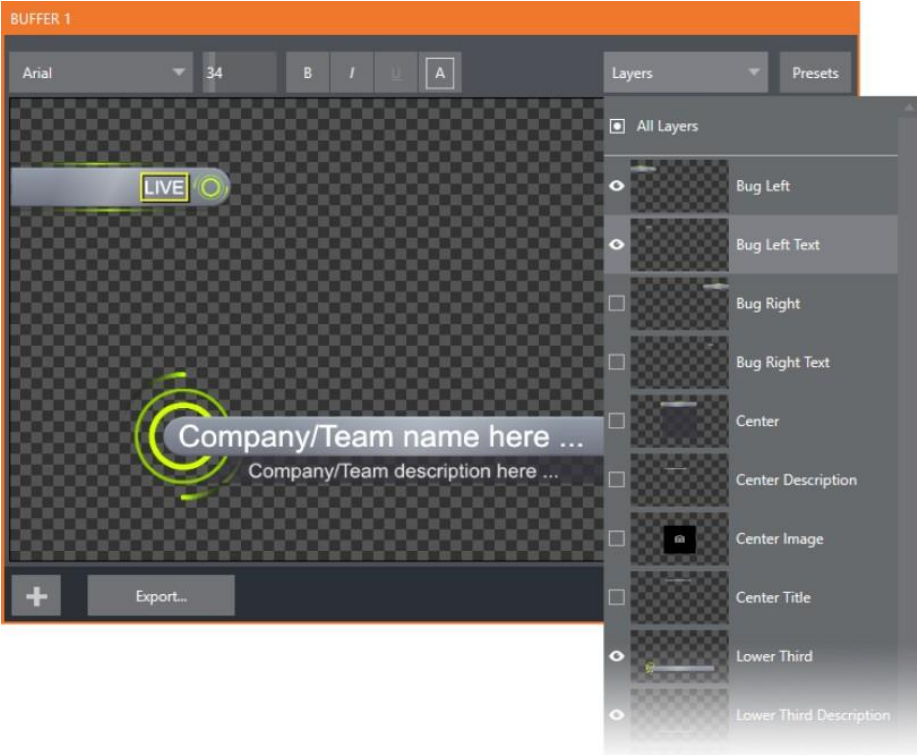
## Title Editor for Buffers

You can load any of the 100+ production-ready LiveGraphics templates supplied with LiveGraphics into your system's Buffer slots and get started right away.

The **Title Editor** lets you change text and images on the Title pages, and hide or show layers using the **Layers** menu. Layers animate into place as you do so.

Store the results as presets, then display the **Layer** preset bin by clicking the **Preset** button at upper right.





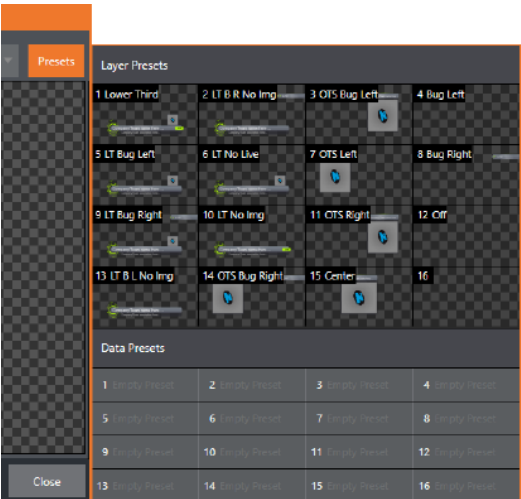
### To preserve the Layer and Data presets

You can preserve the Layer and Data presets that you generate for your LiveGraphics pages outside of the current live session.

- 1. Click the **Export** button in the Title Editor.
- 2. Load your creation into a Buffer slot.
- 3. Use its preset bin to animate from one state to another.

See [Buffer Presets](#) for more detail.

### LiveGraphics and DataLink



LiveGraphics supports Viz Vectar Plus DataLink™ system for dynamically updating title page details even during live display. DataLink technology lets you use external hardware scoreboards, spreadsheets, and other remote data sources to populate and update your graphics automatically.

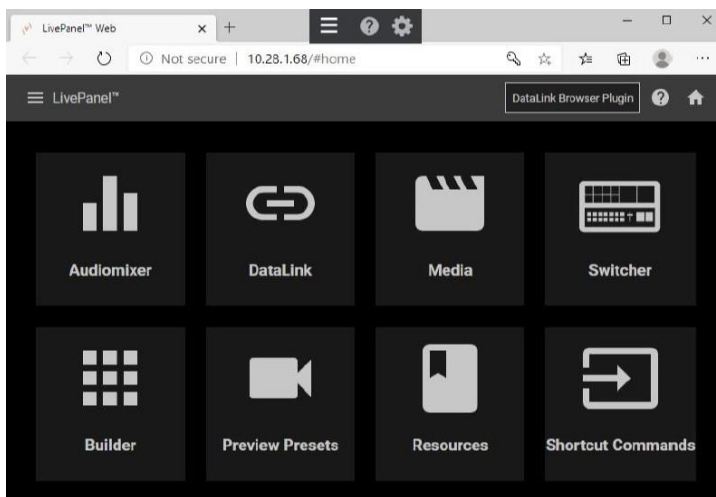
LiveGraphics templates support text and images direct from the Web when combined with the *DataLink Web Browser* extension. **LivePanel™** provides several powerful ways to update DataLink key value (for example as integrated Scoreboard control pages for various sports). With the **Builder web app**, you can even build custom control pages capable of driving your motion graphics from any device on your network with a web browser.

## 20.5 LivePanel

LivePanel™, an extensive toolset for extending your production workflow, is included in your system. The LivePanel offers:

- [Home Page](#)
- [Audio Mixer](#)
- [DataLink](#)
- [Media](#)
- [Switcher](#)
- [Builder](#)
- [Scoreboard](#)

### 20.5.1 Working with LivePanel



LivePanel helps you create custom control panels for your system, that are accessible from web browser of a device on your network.

LivePanel also provides several production-ready tools for remote video mixing, media playback, audio mixing, and macro automation.

- ❑ LivePanel is designed by the Vizrt Group company, NewTek. When accessing some web-based resources, some resources or features will be labeled for the TriCaster family of NewTek switchers. These are fully compatible with Viz Vector Plus.

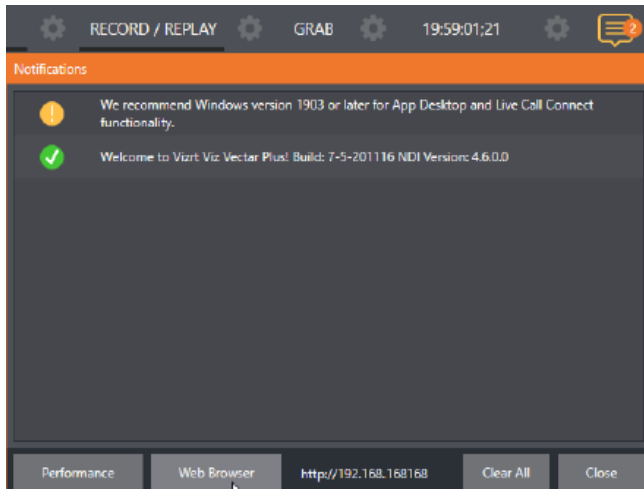
### 20.5.2 Access to LivePanel

All LivePanel tools are accessed from the Home page.



## To access LivePanel

1. Click the **Notification** icon upper-right, to open the **Notifications** panel.

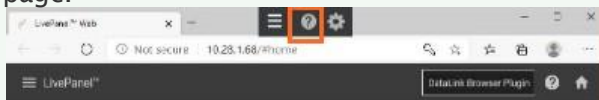


2. Copy the URL shown beside the **Web Browser** button at the foot of the **Notifications** panel.
3. Enter this address in a web browser on another device on the same network.

**Note:** You may be asked for a username and password to access LivePanel. This is set in Viz Vectar Plus **Administrator Mode** under **System Utilities > Set LivePanel Password**. Default: U: *admin*, P: *admin*

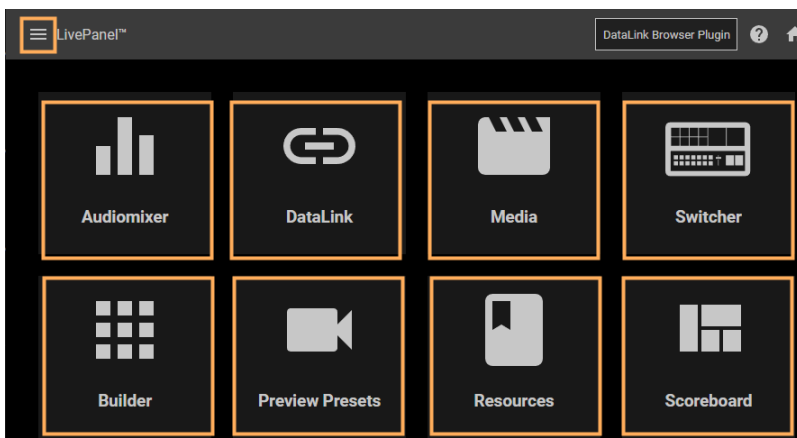
4. The LivePanel landing page displays in your web browser.

**Hint:** Click the (?) icon the title bar for Help about LivePanel tools on the current page.

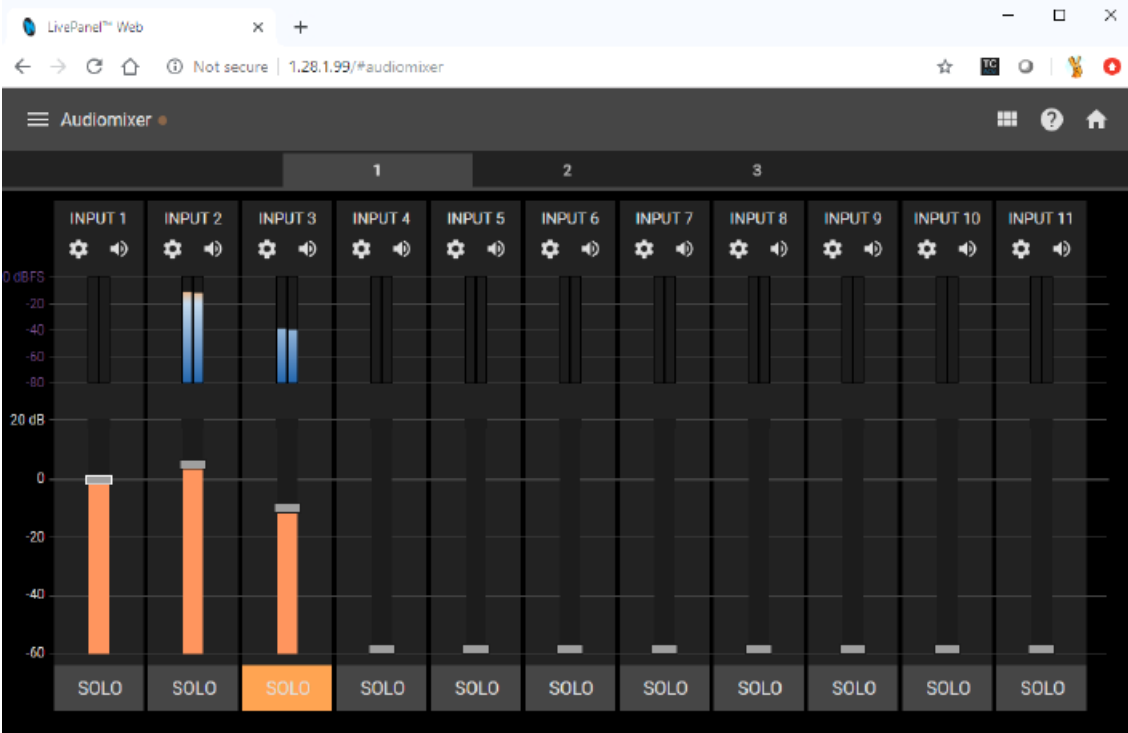


## Home Page

All LivePanel tools are accessed from the ‘hamburger’ menu at left in the LivePanel menu bar, or by clicking the large icons.

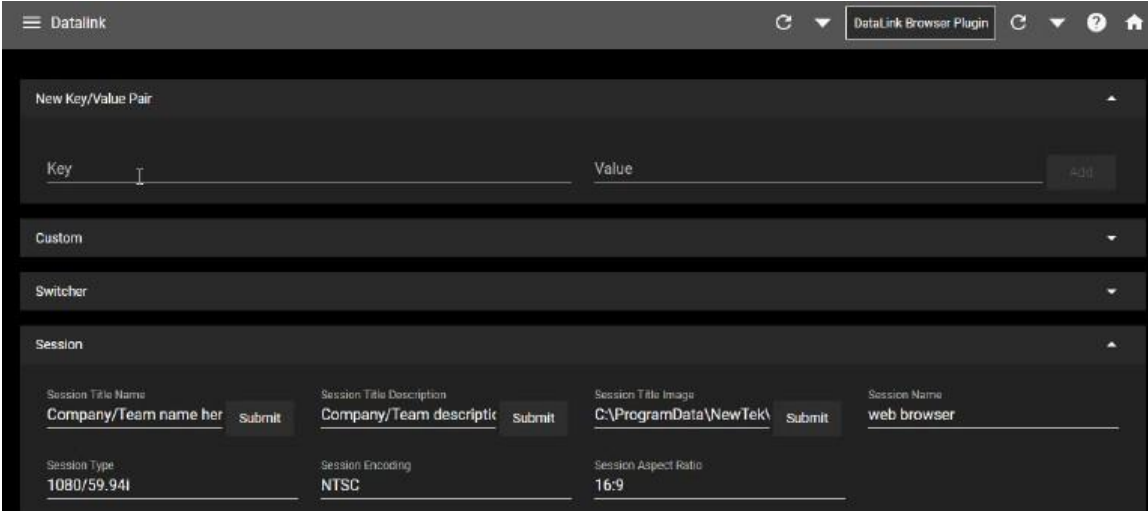


## Audio Mixer



LivePanel’s prepared panels (web applets) are easy to use. In many cases the controls mimic similar items in the main interface for your system in LivePanel’s Audio Mixer applet.

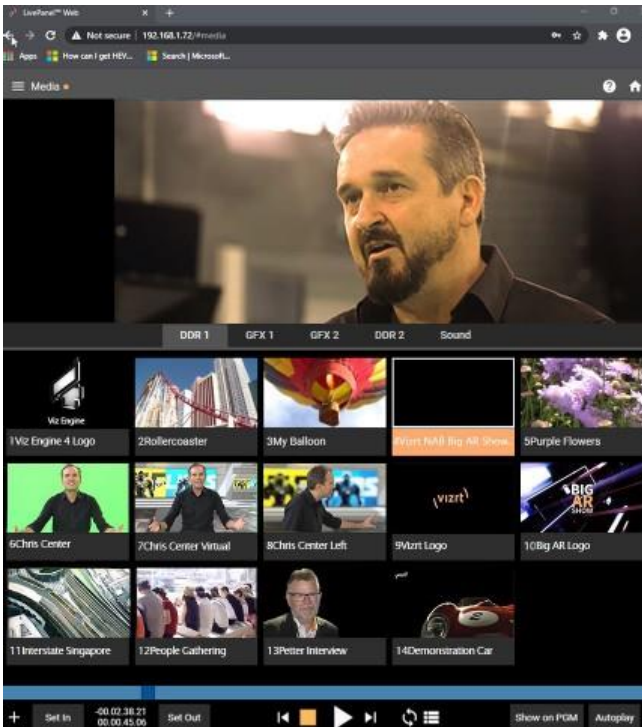
## DataLink



The DataLink page lets you selectively review and edit the values for all current DataLink keys. You can also generate new key-value pairs.

- Follow the online help resources for DataLink usage instructions.

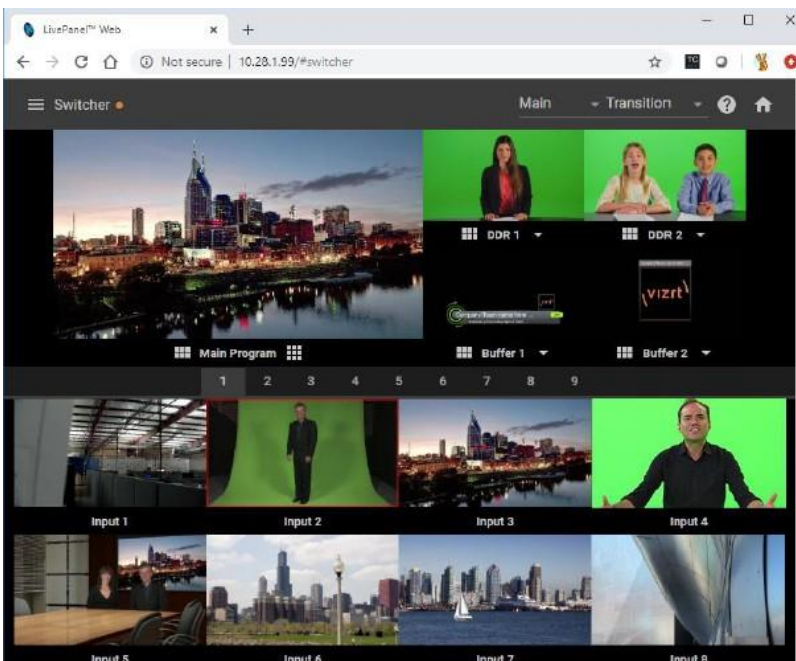
## Media



The **Media** page provides remote access to your system’s Media Players. You can:

- Play, trim, add and remove media files in the playlist.
- Toggle the Media Player *Autoplay* and *List/Single* playback modes.
- Trigger the *Show On* feature to push Media Player output to Program output or in a designated M/E.
- Upload images from a local host device (such as a tablet or smart phone) to a Viz Vectar Plus playlist.

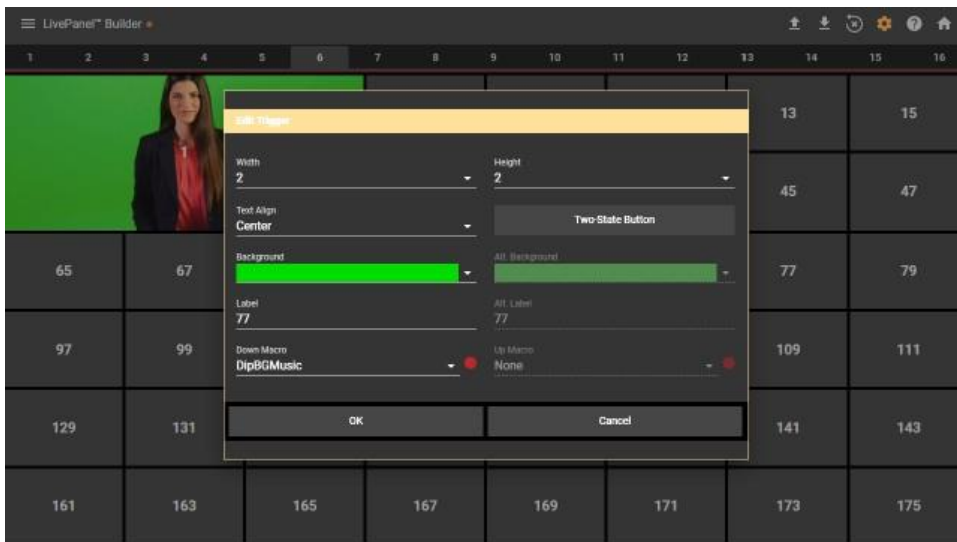
## Switcher



LivePanel **Switcher** presenting a basic user interface for switching less-demanding productions. You can:

- Tap a viewport for a video input.
- Take the input to Program output, or swipe it horizontally to take with a transition.
- Select transition effects for the switcher, an M/E, DSK, or KEY layer.
- Select a *Comp* to completely change your composition, with a single tap.

## Builder

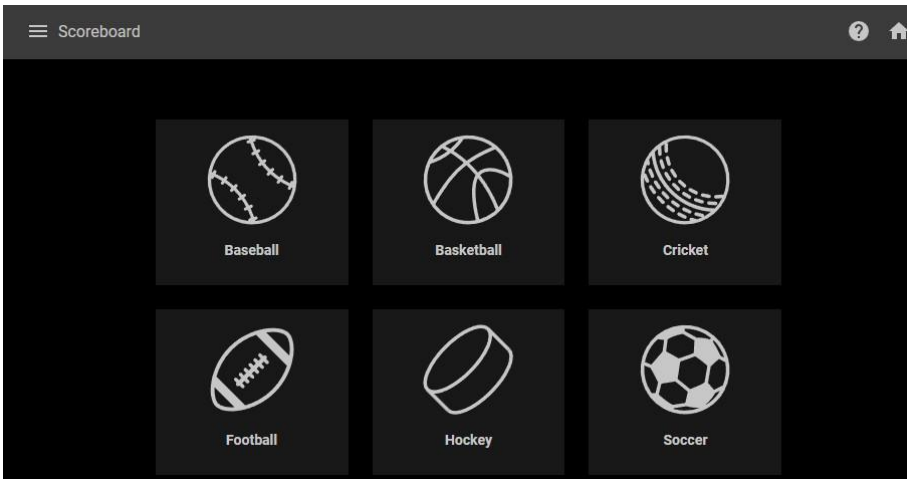


With the **Builder** you create your own switcher interface, a custom control panel that meets your individual needs. You can:

- Flexibly assign macros to buttons
- Give the button a color or personalized still image.
- Group buttons together to make them more accessible.
- Assign moving video from an external switcher input, Media Player or output to a button. This effectively turns it into a monitor.

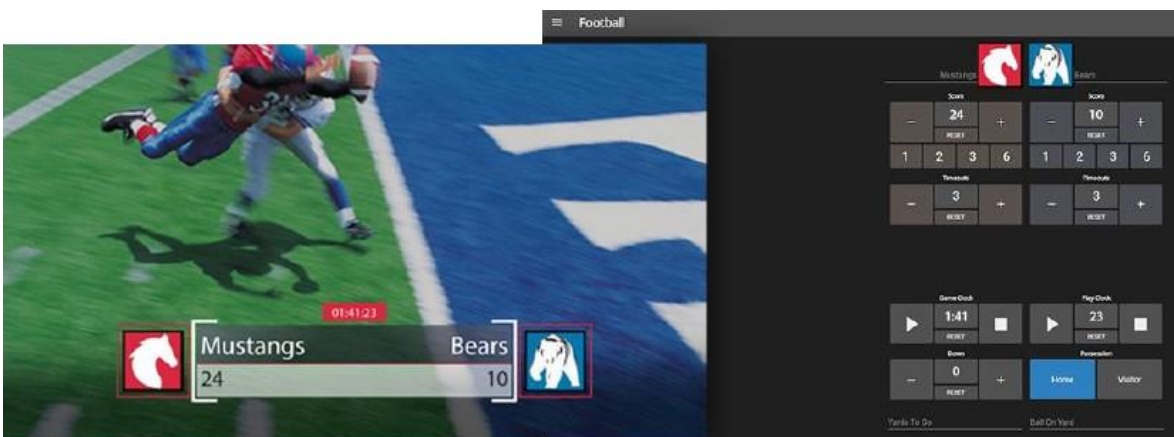
**Tip:** Each Live production system hosts its own LivePanel instance. You can *export* a Builder definition to additional systems.

## Scoreboard



DataLink can be directly connected to a number of popular scoreboard systems. You can:

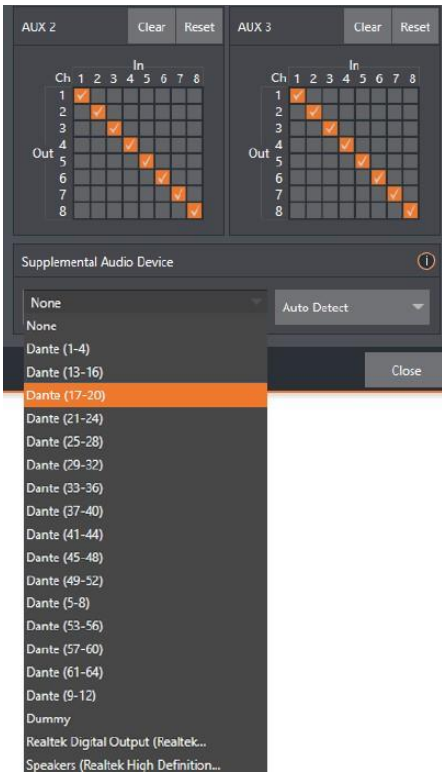
- Be your own scorekeeper using the web browser in virtually any laptop or tablet.
- Use motion LiveGraphics scoreboard pages already configured to work with the Scoreboard.
- Having chosen the Scoreboard for your sport, and a matching scoreboard title page, set team names, individual team logos, track goals, penalties and more, as play proceeds.



- Hint:** You can open the LivePanel **Switcher** (or a custom **Builder** page) in a separate browser tab (or on another device) to modify the various elements of your animated LiveGraphics scoreboard.

## 20.6 Advanced Audio I/O

Viz Vectar Plus Advanced Audio support for ASIO drivers allows you to easily transmit or receive audio using popular audio over IP protocols.



Viz Vectar Plus software provides our most complete support for audio solutions such as Audinate’s Dante and AES-67 implementations (with required third-party drivers).

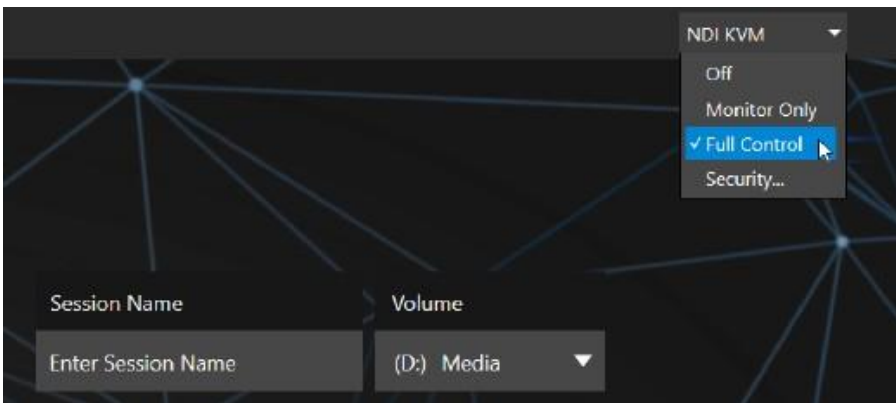
Send selected channels from any Mixer input, Media Player or output bus and channels you wish to send and match these to the transmit channels provided by your third-party driver.

You can, for example, send your Media Player output to an external hardware mixer supporting the same protocol, and route that mixer’s out back into your Viz system for output with your video.

**Hint:** Viz Vectar Plus also provides independent per input delays for both audio and video, for a perfect match every time.

## 20.7 NDI KVM

KVM refers to controlling your production with **Keyboard**, **Video** (monitor) and **Mouse**.



## 20.7.1 To enable NDI KVM

1. Navigate to the Launch screen's Home page.
2. From the title bar, click **NDI KVM**.
3. Select your desired operating mode
  - Monitor Only
  - Full Control (passes mouse and keyboard operations to the remote system).

## 20.7.2 To limit network access of NDI KVM output

With the **Security** option in the NDI KVM menu you can apply NDI Group control to limit who on your network can view the NDI KVM output from the host system.

1. To view the output from the remote system and control it, select the machine's NDI output in the Studio Monitor application supplied with the free NDI Tool pack.
2. Enable the **KVM** button overlaid at upper-left when you move the mouse pointer over the screen.

**Tip:** Studio Monitor's **KVM** toggle button can be relocated to a more convenient spot by dragging.

3. Select to view or control the User Interface or another Multiview, or both with multiple instances of Studio Monitor open on the receiving unit.



**Note:**

- This feature enables distribution of your Multiviews around your studio or campus.
- You can also use these displays as video sources for another NDI-enabled system.
- System audio also passes to the receiver.
- You can copy and paste text between the two systems.
- With the User Interface running full-screen in Studio Monitor on a receiving system, most features are available.

For example, *touch* is supported, meaning you can run the User Interface output on a Microsoft Surface™ system for portable touch control over your production

## 20.8 Virtual PTZ

Virtual PTZ (Pan, Tilt, Zoom), also referred to as pan and scan, is a unique Switcher input feature applied to standard video sources (those which are not actually connected to physical PTZ



cameras). Real PTZ cameras, when connected and configured, show Pan, Tilt, and Zoom controls in their Input tab of the corresponding Input Configuration panels.

- The Virtual PTZ feature adds similar controls to all Switcher sources (except M/Es, which already have similar capabilities thanks to Comps). This includes Media Players and Buffers.
- Virtual PTZ includes Presets and Speed controls, you can zoom in/out and pan around within the frame supplied by any source.
- These features are useful with UHD video sources and can also be used to mimic the *Ken Burns effect* (pan and scan) when applied to imagery in Media Players.

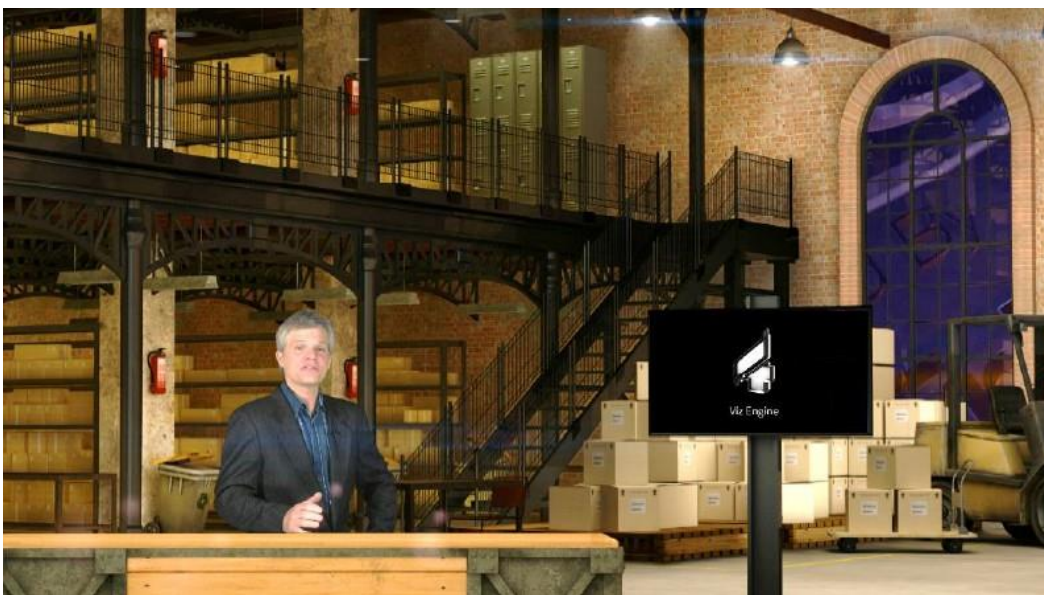


## 20.9 Virtual Set Library

Viz Vectar Plus features also provide you with the use of the entire collection of LiveSet™ virtual sets, covering an array of useful broadcast, business, and industrial applications. A small sampling from this collection is shown below.







The collection includes thirteen professionally designed multi-camera virtual set environments ready-to-use for your productions.

## 20.10 Sound And Music

This 100-track bundle of songs includes a variety of license-free, full-length audio tracks to engage your audience and give you plenty of soundtrack options. The multiple musical genres in this bundle allow you to develop a theme or evoke specific emotions with background music for live content or edit these unlimited-use music clips into pre- and post-production content.

## 21 Skype And Skype TX

Viz Vectar Plus provides optional approaches to working with Skype, the app desktop and the related feature *Live Call Connect*, support running a Skype client directly within a live environment.

Many people use Microsoft Skype™, a technology suited to extending your production to remote participants.

### 21.1 Working With Skype Connections

There are two alternatives, Microsoft's professional level Skype TX™ platform and the standard Skype client.

SkypeTX™ and Skype™ each deliver specific capabilities, and their connection and configuration details differ. This section helps you understand the distinctions, so you can take full advantage of these important connection options.

- [Skype TX Controller](#)
- [Skype TX Caller](#)
- [Audio and Video Connections](#)
- [Skype for Content Creators](#)

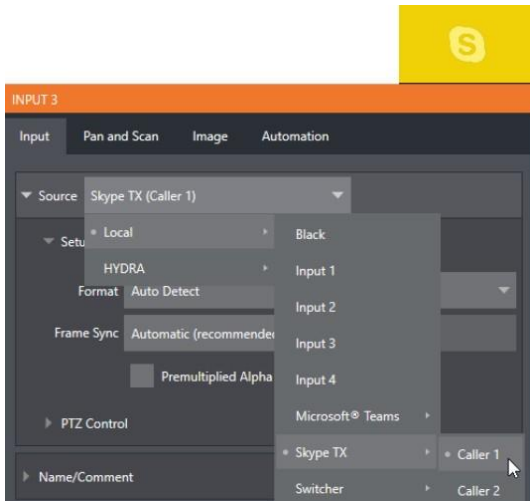
#### 21.1.1 Skype TX Controller

Microsoft introduced its SkypeTX platform, comprising purposed-designed hardware, software, and control room tools, to link the two worlds.



A vital part of the Skype TX™ platform is the call-center application referred to as Skype TX Controller (available at <http://skype.com> for free). You might think of Skype TX Controller as the 'switchboard' for your calls. The operator can initiate outgoing calls, answer incoming calls, and more. The Skype TX Controller console provides numerous professional conveniences, including contact and call management tools, auto-answer, detailed call quality metrics, and fallback images to be displayed automatically should network conditions for a remote caller fall below designated minimums.

## 21.1.2 Skype TX Caller



Viz Vectar Plus also features native Skype TX capabilities. This unique support lets you directly connect Skype™ calls from anywhere in the world to either of two special Switcher inputs by leveraging the Skype TX Controller.

All you need to use this feature is a network connection between your Viz Vectar Plus system and the computer running the (free) Skype TX Controller application that provides call management.

## 21.1.3 Audio and Video Connections

To assign a Skype TX Caller to a selected video Switcher input, refer to section [Input Configuration](#).

It is not necessary to manually create a special mix minus audio return feed to send to the remote caller(s). You will find details on the special ‘mix minus’ that is automatically supplied in section [Audio](#).

In addition, you will find it worth reading the section on the TalkBack feature provided in the Audio Mixer to let the production system operator talk ‘offline’ with selected callers, without fear of the conversation being overheard on program audio output.

**Hint:** The return video sent to remote Skype callers can show a tally overlay. The overlay image is named *SkypeTally.png*, and is located in the file folder at: *C:\ProgramData\Vizrt\VectarPlus\Configuration\Skype\*. This image can be deleted to disable the feature, or replaced to modify it.

## 21.1.4 Skype for Content Creators

Microsoft offers several variants of Skype. The Desktop version of Skype provides new possibilities for Skype users including broadcasters, streamers, and vloggers. including output using NDI® protocol. This support for NDI provides yet another way to bring Skype calls into NDI-enabled software and systems, including Viz Vectar Plus.

Input setup for Skype A/V output is similar to connecting any other NDI source. The Skype client does not directly support NDI input from you to remote callers, but you can use the NDI Webcam Input application (included with the free NDI Tools pack) to connect program video output and a mix minus audio return feed prepared

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## 22 Video Calibration

It is important to control the visual quality of your work all the way through the production pipeline. Adequate lighting, good cameras, and high-quality connections are critical, but there are other things to consider.

This section discusses the following topics and procedures:

- [What to Calibrate](#)
  - [Calibrating Video Sources](#)
  - [Calibrating Monitors](#)
- 

### 22.1 What To Calibrate

Lighting, set design, and countless other factors have an impact on the video attributes our cameras see.

As a first step, cameras need to be properly calibrated. Ideally, this is done right at the camera. Corrective measures taken downstream never fully compensate for problems at the first link in the chain. Most cameras, even inexpensive consumer models, provide adequate controls for this purpose. Some other video sources do not offer much if anything in the way of adjustment, however. You may need to adjust the Proc Amp settings to improve previously recorded video played from a DVD player, or a networked 'video chat' system.

In both cases above, the Waveform and Vectorscope monitors help. We also need to give consideration to downstream devices, though.

Computer displays are inherently different than television sets. Therefore, the video you see on your computer interface can vary quite a bit from what your viewers see on their televisions. Too, you want to be able to correctly judge colors when preparing titles and graphics. It helps you a great deal if your downstream video monitors are properly set up to allow you to make these judgments.

---

### 22.2 Calibrating Video Sources

The obvious disparity between neighboring televisions on display in a store amply demonstrates that even identical (and brand-new) video devices can differ dramatically. When mixing multiple cameras, we need to ensure that their output matches. Switching to a camera with obviously different color characteristics will be seen as a glaring error by your viewers.

Even when we restrict matters to a single unit, color characteristics can change as the system warms up, and as it ages. For this reason, it's important to allow a device to warm up before attempting to calibrate it.

#### 22.2.1 Setting Black and White

Naturally, the color range available for transmission and recording is bounded at the upper level by white and at the lower level by black. Anything else falls somewhere in-between.

Consider what happens if you gradually raise the brightness control on your television. Beyond a certain point (and unlike claims made for laundry detergent) your whites do not become whiter. They can't - the upper limit (white) is firmly fixed. Instead, parts of the image that are nearly white are boosted, eventually also becoming white. Meanwhile, black portions of the picture are tending towards gray. Since white cannot become whiter, and black has become gray, we could say that the dynamic range of the image has been narrowed. The net result is a less vibrant image.



The same thing is true for video from your cameras. If the black and white levels from the camera are incorrect, you are effectively losing either shadow or highlight detail. For this reason, the first thing many do is calibrate their camera for correct levels.

## Waveform Monitor

From days of old, for video engineering purposes the scale between black and white was defined in IRE units (IRE being an acronym for “Institute of Radio Engineers”). White was pegged at 100 IRE. For PAL (and NTSC-J) countries, black was defined as 0 IRE. For NTSC lands, black properly sat at 7.5 IRE.

Thankfully, the day of strict adherence to these analog video concepts has virtually disappeared. Today, confirming that the black and white levels your camera is sending are correct is as simple as sending first black, and then white (or the brightest part of your scene, and reading values from the scale alongside the Waveform scope.

**Tip:** Your system automatically compensates for the traditional 7.5 IRE black (also known as “setup” and “pedestal”) in SD format NTSC sessions.

Connect your camera to the correct input, block the lens so it receives no illumination, and check the level shown in the Waveform monitor. Generally, it should be 16 on the 8-bit scale.

To check white, use either the brightest part of your scene or a white card, ensuring that it is evenly illuminated with the same lighting your main subject will receive. Move in or zoom to fill the viewfinder with this, and confirm that the Waveform monitor is showing 235 on the same scale. Otherwise, you might try using your camera’s Auto White Balance feature with the white card – your camera manual will provide instructions. Afterwards, check the black level again.

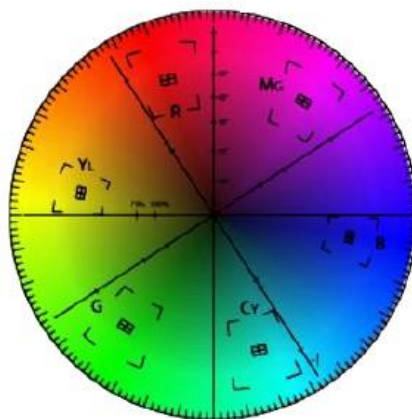
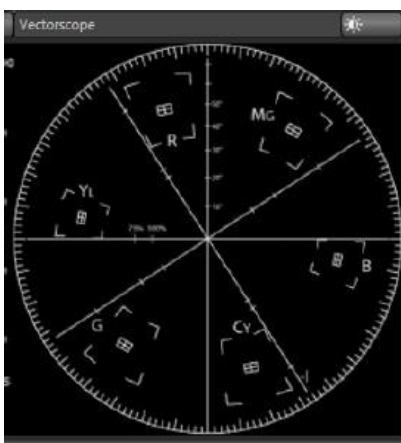
Some professional cameras offer full manual controls for white balance and/or black level. Use these as instructed to ensure your camera is providing the correct white and black levels.

If you cannot make source adjustments, or can’t get it quite right by these means alone, you can use the Brightness and Contrast controls in the Proc Amp for that input to tweak black and white levels (It is best to perform adjustments at the source if possible).

## Adjusting Color

We’re going to move into color calibration next, but first we can actually use our black and white signals for some further tests.

## Vectorscope



While we’re still working with black and white levels, we can introduce the Vectorscope, and perform an initial test of the camera’s color balance.

A vectorscope can be likened to the familiar ‘color wheel’ which sweeps radially through the colors of the spectrum – yellow, red, magenta, and so-on, around the arc of a circle. Colors are more progressively intense (saturated) towards the outside of the circle, while color saturation is zero at its center.

As it happens, from the vectorscope point of view, neither black nor white properly have any color saturation. Thus, with the lens cap on (or with a white card filling the viewfinder), the vectorscope should show only a small fuzzy trace at its center. If the fuzzy dot is off-center horizontally or vertically, this would indicate that the camera is incorrectly calibrated, actually tinting gray areas.

When the trace is off center, the direction and distance of the offset tells us what sort of tint (and how much) is represented by the deviation. You may be able to use the color controls at your camera to correct for this offset, or you can use the Proc Amp’s U Offset and V Offset controls to do so (as always, source controls are best). Adjustments to U Offset move the trace left or right, while V Offset changes adjust its vertical position.

## Color Metrics

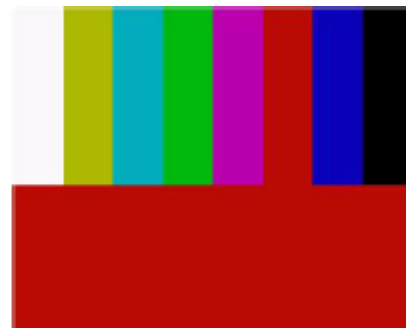
At this point, we’ve assured ourselves that the signal from the camera is neither too bright nor too dark, that its output falls within broadcast legal luminance limits, and that the black & white part of the signal does not have an unwanted color cast. We haven’t done anything yet to assure our reds are red, not slightly brown, or that our blues are not slightly green or magenta, etc. The Vectorscope can provide much more specific information about your camera’s color signal. Let’s see how it can assist you to ensure your colors are accurate.

## Using Color Bars

You’ll no doubt have seen the familiar color bars used as a standard reference for video signal calibration. Two examples are shown here: NTSC is an example of the color bars used in NTSC countries, while PAL is common throughout European nations.



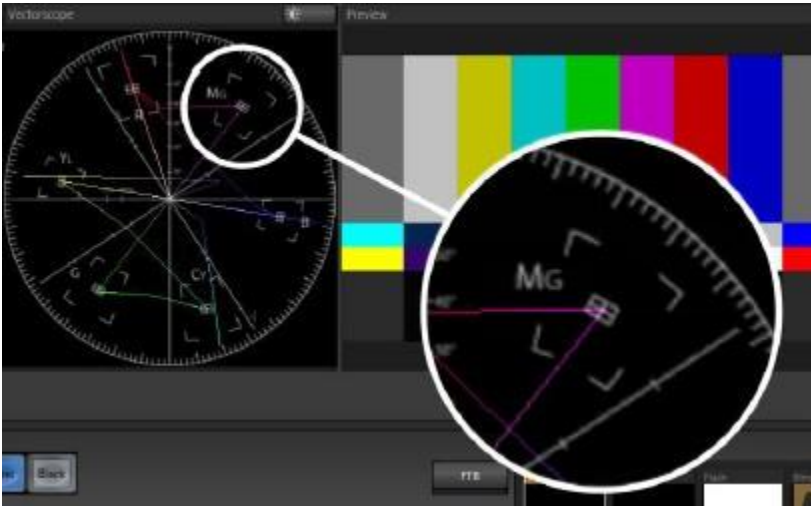
(NTSC)



(PAL)

You can use color bars in conjunction with Waveform and Vectorscopes to make sure the video supplied to is consistent, accurate and broadcast legal. Most video cameras are capable of displaying color bars. Check your camera manual to see how to display these (given a choice, use 75% bars). Then look at the Vectorscope to see how it traces the individual colors comprising the image.

The Vectorscope graticule has six distinct rectangular targets, one each for Yellow, Red, Magenta, Cyan, Blue, and Green. The targets are small rectangles with a cross-hair superimposed on them. When a source is properly calibrated, the trace from the different colored segments of the color bars displayed will fall right inside their individual targets.



If the trace vectors do not line up as they should even after performing a white balance at the camera, you can use Proc Amp controls to tweak the signal.

Adjust the Hue control to rotate the vectors around the center point to line them up correctly on their respective targets. Increasing Saturation will move the trace further out towards the edge of the scope. Decreasing Saturation lowers color intensity, bringing the trace back closer to the center.

**Hint:** You should repeat the steps above for each connected source, to ensure a perfect match when switching from camera to camera during your live productions.

At this point, your video signal should be reasonably accurate, and broadcast legal. Naturally, there are other devices between that signal, you, and your viewers. Let's discuss ways to calibrate downstream video monitors to ensure that you see your video at its best.

## 22.3 Calibrating Monitors

In most cases, you will use a computer monitor of one type or another to display your system's controls – the user interface. Even though the television monitors you likely use for final program output may look somewhat similar to your computer monitor, they do differ in a number of important respects. For this reason, we will approach their calibration separately.

### 22.3.1 Computer Monitor

It may not be quite as important to achieve spot-on color calibration for the monitor used for the user interface. Not surprisingly, video output color is best judged on larger downstream video monitors.

Nevertheless, you may find a trip to one of any number of websites providing test imagery and calibration hints useful. A search for “computer monitor calibration” will yield an endless list, along with some commercial utilities for those who feel the need. Here are links to several such sites:

<https://www.epaperpress.com/monitorcal/>

<http://www.lagom.nl/lcd-test/>

<https://www.photofriday.com/info/calibrate>

[https://www.onecomputerguy.com/windows7/windows7\\_calibrate\\_color.htm](https://www.onecomputerguy.com/windows7/windows7_calibrate_color.htm)

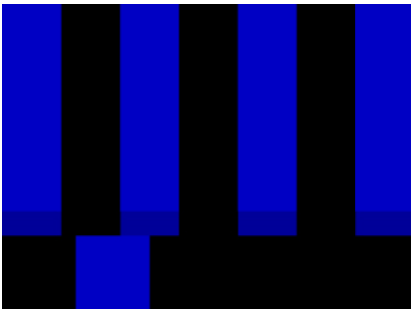


## 22.3.2 Program Output Monitor

Again, a search of the Internet for *video monitor calibration* yields a large number of resources, both free and commercial. If you have television monitors connected to your outputs, though, you can make further use of the color bars. The approach is somewhat similar to what we did for our video sources, in that the first adjustments are to ensure that black and white levels are correct. Color calibration is performed afterward.

First, warm up your monitor for at least ten minutes (some sources recommend a half-hour), to stabilize its output. Dim room lights and window lights, to eliminate light sources that might skew your color perception. Pass the color bars from your camera through to program output (or use a color bars image in one of the Media Players for this purpose).

## 22.3.3 Color Adjustments



### NTSC

1. If your monitor has a “Blue-gun only” setting, enable it. Depending on the brand of your monitor, the alternating bars will appear either as light gray and black, or blue and black.
2. If the monitor lacks a “Blue-gun only” feature, you can obtain a colored filter such as a Kodak Wratten #47B gel, and hold that between your eyes and the monitor for a similar result.
3. Tweak the Color (or Saturation) knob until the small rectangular patches at very bottom of the tall upper bars on the extreme right and left of your screen merge with the tall bars above.
4. Tweak the monitor’s Hue control until the small rectangles beneath the third and fifth tall upper bars likewise blend into bar above.
5. You may need to redo the last two steps several times, balancing the adjustments of these two controls until all four of the lighter bars evenly match the smaller rectangles just beneath them. (Note that a perfect match simply may not be possible on some monitors.)
6. Check your results with some familiar imagery, and make any further tweaks you feel are required.

### PAL

1. If your monitor has a “Blue-gun only” setting, enable it. Raise the Color or Saturation setting until the three right hand bars all appear to be the same shade.
2. If the monitor lacks a “Blue-gun only” feature, you can obtain a colored filter such as a Kodak Wratten #47B gel, and hold that between your eyes and the monitor for a similar result.
3. Turn off the “Blue-gun only” feature (or dispense with the filter if you used one), and examine the red bar. It should appear not be so vivid that it bleeds onto the nearby bars
4. Check your results with some known familiar imagery, and make any further tweaks you feel are required.

## 23 Keyboard Shortcuts

- [Switcher](#)
- [T-Bar](#)
- [Record, Grab, and Stream](#)
- [Tabs](#)
- [Workspace](#)
- [Media Players](#)
- [General](#)
  - [Edit Title Pane](#)
  - [Selection and Navigation](#)
  - [Miscellaneous](#)

### 23.1 Switcher

Shortcut	Action
<b>F1 - F12</b> and <b>SHIFT + F1 - 12</b>	Program Row, Inputs 1 to 24
<b>1 - 0, -, =, and</b> <b>SHIFT + 1-0, SHIFT + -, SHIFT + =</b>	Preview Row, Inputs 1 to 24
<b>[</b>	Transition Delegate - select BKGD
<b>SHIFT + [</b>	Transition Delegate - multi-select BKGD
<b>]</b>	Transition Delegate - select DSK 1
<b>SHIFT + ]</b>	Transition Delegate - multi-select DSK 1
<b>\</b>	Transition Delegate - select DSK 2
<b>SHIFT + \</b>	Transition Delegate - multi-select DSK 2
<b>BACKSPACE</b>	Transition Delegate - select DSK 3
<b>SHIFT + BACKSPACE</b>	Transition Delegate - multi-select DSK 3
<b>INSERT</b>	Transition Delegate - select DSK 4
<b>SHIFT + INSERT</b>	Transition Delegate - multi-select DSK 4

<b>Shortcut</b>	<b>Action</b>
<b>B</b>	Transition Delegate – select FTB
<b>CTRL + B</b>	Select FTB Delegate and perform Fade
<b>A</b>	Auto DSK 1 On/Off
<b>S</b>	Auto DSK 2 On/Off
<b>D</b>	Auto DSK 3 On/Off
<b>F</b>	Auto DSK 4 On/Off
<b>SHIFT + A</b>	Take DSK 1 On/Off
<b>SHIFT + S</b>	Take DSK 2 On/Off
<b>SHIFT + D</b>	Take DSK 3 On/Off
<b>SHIFT + F</b>	Take DSK 4 On/Off
<b>, and .</b>	Select Transition (prev/next)
<b>CTRL + F</b>	Select Fade Transition
<b>SHIFT + CTRL + F</b>	Restore Last Transition
<b>Z</b>	Slow Transition – Slow ... Medium ... Fast
<b>X</b>	Medium Transition
<b>C</b>	Fast Transition
<b>SHIFT + C</b>	Transition – Increase Speed
<b>SHIFT + Z</b>	Transition – Decrease Speed
<b>E</b>	Toggle Reverse Transition On/Off
<b>ALT + E</b>	Ping Pong Transition (off/on)

## 23.2 T-Bar

Shortcut	Action
ENTER	Take
SHIFT + ENTER	Take T-bar Back to Top
SPACE	Transition ... Go/Pause
SHIFT + SPACE	Auto Reverse
T / SHIFT + T (faster add CTRL)	Adjust T-bar... Down/Up
H	Halfway T-bar... Take

## 23.3 Record, Grab, And Stream

Shortcut	Action
R / SHIFT + R	Record on/off
P	Grab (still image) p
CTRL + /	Stream Start
CTRL + ALT + /	Stream Stop

## 23.4 Tabs

Shortcut	Action
CTRL + (F1 to Fn)	Show (DDR, PTZ, Mixer, etc.) tab
CTRL + SHIFT + F1-F8	Select M/E 1- 8
CTRL + M	Show M/E pane
ALT + M	Hide M/E pane

Shortcut	Action
M	Toggle M/E pane

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## 23.5 Workspace

Shortcut	Action
ALT + Numpad 0	Show Interface A
ALT + Numpad 1	Show Interface B
ALT + Numpad 2	Show Interface C
ALT + Numpad 3	Show Interface D
CTRL + Numpad 0	Show Multiview A
CTRL + Numpad 1	Show Multiview B
CTRL + Numpad 2	Show Multiview C
CTRL + Numpad 3	Show Multiview D

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## 23.6 Media Players

Shortcut	Action
K	Stop
L	Play
J	Go to previous playlist item
;	Go to next playlist item
U	Autoplay On/Off
'	Loop On/Off

Shortcut	Action
Q	Single On/Off
UP/DOWN/LEFT/RIGHT	Navigate through Playlist items
I	Set In Point for current Playlist Item (Clip or Audio file)
O	Set Out Point for current Playlist Item (Clip or Audio file)
G	Split clip at current frame / Reset In and Out Point to the file's first and last frame

## 23.7 General

### 23.7.1 Edit Title Pane

Shortcut	Action
CTRL + SHIFT + S	Save the current title page
CTRL + SHIFT + S	Save the current title page, and duplicate it in the playlist
PAGE UP	Save the page and move to the previous playlist item
PAGE DOWN	Save the page and move to the next playlist item

### 23.7.2 Selection and Navigation

Shortcut	Action
CTRL + A	Select All
Home/End	First/Last Item
UP/DOWN/LEFT/RIGHT	Navigate through Playlist items
SHIFT + HOME/END	Select All Previous/Following Items
SHIFT + HOME/END	Playlist - select to Top/Bottom

Shortcut	Action
SHIFT + UP/DOWN	Playlist - add to selection (Up/Down)

### 23.7.3 Miscellaneous

Shortcut	Action
CTRL + X	Cut
CTRL + C	Copy
CTRL + V	Paste
DELETE	Delete
ALT + B	Show version

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## 24 Performance Considerations

In this section, we'll consider the most common questions you may have (and of course we'll provide the answer, too). Answers are intentionally brief – perhaps just a reminder of one or two steps required to perform some operation. For this reason, we'll also point you to explanatory information elsewhere in this manual whenever that would be useful.

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### 24.1 Testing, One Two

Professionals do not leap into new environments blindly. They prepare, plan, plan some more, and then (most importantly) they test. This allows them to tackle the really tough jobs with confidence.

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### 24.2 IMAG And Latency

What's IMAG? It's a compression of the expression *Image MAGnification*. Typically in modern IMAG applications, video cameras supply live imagery to projection systems, magnifying speakers and performers so that audience members further back in large venues can still see what's going on.

IMAG is a very tricky task at the best of times, one that calls for excellent planning, and where possible, testing. Those designing an IMAG installation have, not just one, but two inter-related broadcasts to consider – in the form of the audio and video streams.

#### 24.2.1 Relativity and the Speed of Light

Wouldn't it be nice if audio and video travelled from their respective broadcast devices at the same speed? Then, wherever you were seated in the audience, the sound from hypothetically perfect speakers and the video image from huge video displays co-located at the front of the auditorium would reach your ears and your retinas at precisely the same moment!

This is not the case, however. Sound travels quite slowly – so slow, in fact, that even in relatively small venues it reaches those in the rear of the audience noticeably later than those in the front.

In loose terms, for a mid-size auditorium 600 feet long, it takes around a half-second for the audio to reach those in the back. For this reason, audio engineers often position speakers throughout the house, then introduce carefully considered delays by electronic means – to ensure late sound from front speakers does not arrive after sound from the nearest speaker to those further back.

Light, on the other hand, travels so much faster that for all intents transmission can be considered instantaneous in the same setting. So a person in the rear sees the image on a screen at the front long before sound from a co-located speaker arrives.

If transmission of the video signal from the camera lens right through to the projection screen were instantaneous (it's not, mind you), we'd likely need to find a way to delay it. Viewed in this light, a certain amount of latency is actually a good thing!

#### 24.2.2 Latency and Your Audience

*Latency*. What's that you ask? In this context, latency refers to the time it takes for the video signal to transit one part of the IMAG path, from camera lens to final display. Latency is usually expressed either in milliseconds or in video frames (typically either 25 or 29.97 to the second).

As we said above, really a little video latency is not a bad thing as viewed from a surprisingly short distance back into the audience. This is just as well, since for all practical purposes a little latency is also unavoidable. Even so, as long as audio and video are in sync at your seat, only a rather significant degree of latency is objectionable, unless you happen to be very near the stage.



For those in the front rows, a few extra frames of latency may be rather disconcerting. (It's true that IMAG was conceived primarily for the benefit of those further back, but if the latency is too obvious for those nearest the front it can be disconcerting distraction).

For this reason, it's desirable to keep video latency to an agreeable minimum – but put away any notion of zero latency. Not only would this require bending the laws of physics, it would be a bad idea.

Even before considering minimizing latency in the device chain, acknowledging that there is always going to be some latency calls for some creative thinking with regard to practical staging. For example, if you design your IMAG layout in such a fashion that those in the front row are unlikely to be able to see the screen(s) without lifting their eyes from the onstage talent, they are extremely unlikely to notice a small amount of latency.

## 24.3 Latency And Your System

Vizrt systems excel at IMAG, but inevitably constitute just one (albeit critical) link in a chain of devices. It is common for each device to contribute a little to the combined total latency for the system.

Your Vizrt system's portion of the total latency is well within acceptable standards for devices of this sort – roughly between 1 and 2.5 frames (the actual amount can vary slightly within this range, depending on several factors).

For example, suppose a video frame supplied by a camera arrives at an input one millisecond after a different frame has been sent to the output. Obviously the new arrival must wait its turn; it can't be transmitted until the correct duration for its predecessor has elapsed. Thus the newly arrived frame must wait almost one entire frame, until its turn comes.

**Tip:** You can actually assess the latency of your pipeline fairly easily. Run timecode directly to 1) a monitor and at the same time 2) through the switcher to a second (identical) monitor. Take a photograph that encompasses both monitors, and compare the timecode shown.

## 24.4 Other Sources Of Latency

More often than not, significant latency is added by other devices in the IMAG chain that come after the switcher. Projectors are a common contributor, but at times the cameras themselves are a factor.

Here are some helpful points to consider when designing and connecting your system:

- If you use Multiview output from the switcher to the projector – if at all possible, match the resolution sent from the switcher to the native resolution of the projector. (On some projectors this allows the unit to avoid using its own internal scaling, which is often a significant factor in unwanted latency.)
- When possible, try supplying the projector with analog video. This can eliminate a lot of the complexity from the process (of course, this is not always possible.)
- Certain projectors provide a low latency mode to disable features of the unit that carry a heavy toll in latency. Enabling this mode can make positioning the projector slightly more challenging (as you may sacrifice some ability to position and scale the image using projector menu functions), but the latency reduction can be very worthwhile.
- Some cameras include features that add more latency than you would expect. For instance, image stabilization (by definition) adds one field of latency and sometimes more. Disable anything of that sort that you can.

## 25 Third Party Licenses

This product uses a number of third-party software libraries under license. Related license requirements are defined in documentation installed on the product.

- To view these licenses, please click **Help > Additional Licenses** in the Startup page when initially launching the product.

