CARBONITE
HyperMax

HyperMax
User Manual

v11.0

ROSS

Thank You For Choosing Ross

You've made a great choice. We expect you will be very happy with your purchase of Ross Technology.

Our mission is to:

1. Provide a Superior Customer Experience
   - offer the best product quality and support

2. Make Cool Practical Technology
   - develop great products that customers love

Ross has become well known for the Ross Video Code of Ethics. It guides our interactions and empowers our employees. I hope you enjoy reading it below.

If anything at all with your Ross experience does not live up to your expectations be sure to reach out to us at *solutions@rossvideo.com*.

David Ross
CEO, Ross Video
david.ross@rossvideo.com

Ross Video Code of Ethics

Any company is the sum total of the people that make things happen. At Ross, our employees are a special group. Our employees truly care about doing a great job and delivering a high quality customer experience every day. This code of ethics hangs on the wall of all Ross Video locations to guide our behavior:

1. We will always act in our customers' best interest.
2. We will do our best to understand our customers' requirements.
3. We will not ship crap.
4. We will be great to work with.
5. We will do something extra for our customers, as an apology, when something big goes wrong and it's our fault.
6. We will keep our promises.
7. We will treat the competition with respect.
8. We will cooperate with and help other friendly companies.
9. We will go above and beyond in times of crisis. *If there's no one to authorize the required action in times of company or customer crisis - do what you know in your heart is right. (You may rent helicopters if necessary.)*

Document Information

- Ross Part Number: **4846DR-110-11.0**
- Release Date: July, 2025.

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Patents

Patent numbers US 7,034,886; US 7,508,455; US 7,602,446; US 7,802,802 B2; US 7,834,886; US 7,914,332; US 8,307,284; US 8,407,374 B2; US 8,499,019 B2; US 8,519,949 B2; US 8,743,292 B2; US D752,530 S; GB 2,419,119 B; GB 2,447,380 B; and other patents pending.

Software Licenses

This product may use one or more software components subject to licenses. Refer to *Third-party Licenses* on page 184 for a complete list of licenses that apply to this product.

Important Regulatory and Safety Notices to Service Personnel

Before using this product and any associated equipment, refer to the "**Important Safety Instructions**" listed in the front of this manual to avoid personnel injury and to prevent product damage.

Product may require specific equipment, and/or installation procedures to be carried out to satisfy certain regulatory compliance requirements. Notices have been included in this publication to call attention to these specific requirements.

Symbol Meanings

Protective Earth: This symbol identifies a Protective Earth (PE) terminal, which is provided for connection of the supply system's protective earth (green or green/yellow) conductor.

Important: This symbol on the equipment refers you to important operating and maintenance (servicing) instructions within the Product Manual Documentation. Failure to heed this information may present a major risk of damage or injury to persons or equipment.

Warning: The symbol with the word "Warning" within the equipment manual indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION: The symbol with the word "Caution" within the equipment manual indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

Warning Hazardous Voltages: This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product enclosure that may be of sufficient magnitude to constitute a risk of shock to persons.

ESD Susceptibility: This symbol is used to alert the user that an electrical or electronic device or assembly is susceptible to damage from an ESD event.

Important Safety Instructions

General Safety Instructions

1. *Warning:* Read these instructions.

2. Keep these instructions.

3. Heed all warnings.

4. Follow all instructions.

5. Do not use this apparatus near water.

6. Clean only with a dry cloth.

7. Do not block any ventilation openings. Install in accordance with manufacturer's instructions.

8. Do not install near heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

11. Only use attachments/accessories specified by the manufacturer.

12. Unplug this apparatus during lightning storms or when unused for long periods of time.

13. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when the power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

14. Do not expose this apparatus to dripping or splashing, and ensure that no objects filled with liquids, such as vases, are placed on the apparatus.

15. To completely disconnect this apparatus from the AC Mains, disconnect the power supply cord plug from the AC receptacle.

16. The mains plug of the power supply cord shall remain readily operable.

17. ⚠ *Warning:* *Indoor Use: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.*

18. The safe operation of this product requires that a protective earth connection be provided. A grounding conductor in the equipment's supply cord provides this protective earth. To reduce the risk of electrical shock to the operator and service personnel, this ground conductor must be connected to an earthed ground.

19. ⚠ *Warning:* *This apparatus, when equipped with multiple power supplies, can generate high leakage currents. To reduce the risk of electric shock, ensure that each individual supply cord is connected to its own separate branch circuit with an earth connection.*

20. ⚠ *CAUTION:* *These service instructions are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.*

21. Service barriers within this product are intended to protect the operator and service personnel from hazardous voltages. For continued safety, replace all barriers after servicing.

22. Certain parts of this equipment still present a safety hazard with the power switch in the OFF position. To avoid electrical shock, disconnect all A/C power cords from the chassis' rear appliance connectors before servicing.

23. This product contains safety critical parts, which, if incorrectly replaced, may present a risk of fire or electrical shock. Components contained within the product's power supplies and power supply area are not intended to be customer-serviced and should be returned to the factory for repair.

24. To reduce the risk of fire, replacement fuses must be the same type and rating.

25. Use only power cords specified for this product and certified for the country of use.

26. The safe operation of this equipment requires that the user heed and adhere to all installation and servicing instruction contained within the equipment's Setup Manuals.

27. ⚠ *Warning:* *This product includes "Ethernet Ports" which allow this product to be connected to local area networks (LAN). Only connect to networks that remain inside the building. Do not connect to networks that go outside the building.*

28. ⚠ *CAUTION: This apparatus contains a Lithium battery, which if replaced incorrectly, or with an incorrect type, may cause an explosion. Replace only with a CR2032 coin type lithium battery. Dispose of used batteries according to the manufacturer's instruction by qualified service personnel.*

29. ⚠ *CAUTION: Only instructed persons may change or service the lithium coin batteries used in these apparatus.*

30. For use at altitude 2000m or lower.

31. For use in non-tropical locations.

32. ⚠ *CAUTION: Do not make mechanical or electrical modifications to the equipment or add metallic items, such as metallic foil labels, to the printed circuit boards. Modifications can impair regulatory compliance, or performance and may void your warranty.*

33. ⚠ *CAUTION: Only use an approved power supply (PN:70-00824) with the Software Defined Production Engine (SDPE) blades.*

34. ⚠ *CAUTION: Risk of electrical shock. Enclosure shall be connected to earth ground via protective earth stud and 18AWG conductor or larger.*

35. ⚠ *CAUTION: RISK OF ABNORMAL SUPPLY LOADING: USB connected accessory loading not to exceed 5 USB unit loads. Each USB unit Load on Rear panel is limited to 250mA max.*

EMC Notices

United States of America — FCC Part 15

This equipment has been tested and found to comply with the limits for a class A Digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

🛈 *Important: Changes or modifications to this equipment not expressly approved by Ross Video Limited could void the user's authority to operate this equipment.*

Canada

This Class "A" digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe "A" est conforme a la norme NMB-003 du Canada.

Korea — Class A Statement

이 기기는 업무용 환경에서 사용할 목적으로 적합성 평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

This device has been evaluated for conformity for use in a business environment. When used in a home environment, there is a danger of interference.

Europe

This equipment is in compliance with the essential requirements and other relevant provisions of **CE Directive 93/68/EEC**.

International

This equipment has been tested to **CISPR 32:2015** along with amendment **AMD1:2019**, and found to comply with the limits for a Class A Digital device.

🛈 *Important: This is a Class A product. In domestic environments, this product may cause radio interference, in which case the user may have to take adequate measures.*

General Handling Guidelines

- Careful handling, using proper ESD precautions, must be observed.
- Power down the system before PCB removal.

A Word About Static Discharge

Throughout the many procedures in this manual, please observe all static discharge precautions.

⚠ *CAUTION: Avoid handling the switcher circuit boards in high static environments such as carpeted areas, and when synthetic fiber clothing is worn. Touch the frame to dissipate static charge before removing boards from the frame, and exercise proper grounding precautions when working on circuit boards. Exercise proper grounding precautions when working on circuit boards.*

Warranty and Repair Policy

Ross Video Limited (Ross) warrants its switchers and related options, to be free from defects under normal use and service for a period of ONE YEAR from the date of shipment. Fader handle assemblies are warranted for the life of the product. If an item becomes defective within the warranty period Ross will repair or replace the defective item, as determined solely by Ross.

Warranty repairs will be conducted at Ross, with all shipping FOB Ross dock. If repairs are conducted at the customer site, reasonable out-of-pocket charges will apply. At the discretion of Ross, and on a temporary loan basis, plug in circuit boards or other replacement parts may be supplied free of charge while defective items undergo repair. Return packing, shipping, and special handling costs are the responsibility of the customer.

Software upgrades for switchers may occur from time to time, and are determined by Ross Video. The upgrades are posted on the Ross Video website, and are free of charge for the life of the switcher.

This warranty is void if products are subjected to misuse, neglect, accident, improper installation or application, or unauthorized modification.

In no event shall Ross Video Limited be liable for direct, indirect, special, incidental, or consequential damages (including loss of profit). Implied warranties, including that of merchantability and fitness for a particular purpose, are expressly limited to the duration of this warranty.

This warranty is TRANSFERABLE to subsequent owners, subject to Ross Video's notification of change of ownership.

Environmental Information

Waste Electrical and Electronic Equipment Directive (WEEE Directive)

The equipment that you purchased required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.

To avoid the potential release of those substances into the environment and to diminish the need for the extraction of natural resources, Ross Video encourages you to use the appropriate take-back systems. These systems will reuse or recycle most of the materials from your end-of-life equipment in an environmentally friendly and health conscious manner.

The crossed-out wheeled bin symbol invites you to use these systems.

If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration.

You can also contact Ross Video for more information on the environmental performances of our products.

Use of Hazardous Substances in Electrical and Electronic Products (China RoHS)

Ross Video Limited has reviewed all components and processes for compliance to:

" Management Methods for the Restriction of the Use of Hazardous Substances in Electrical and Electronic Products " also known as China RoHS.

The " Environmentally Friendly Use Period " (EFUP) and Hazardous Substance Tables have been established for all products. We are currently updating all of our Product Manuals.

The Hazardous substances tables are available on our website at: *http://www.rossvideo.com/about-ross/company-profile/green-practices/china-rohs.html*

电器电子产品中有害物质的使用

Ross Video Limited 按照以下的标准对所有组件和流程进行了审查：

"电器电子产品有害物质限制使用管理办法" 也被称为中国RoHS。

所有产品都具有 "环保使用期限" (EFUP）和有害物质表。目前，我们正在 更新我们所有的产品手册。

有害物质表在我们的网站：
http://www.rossvideo.com/about-ross/company-profile/green-practices/china-rohs.html

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Technical Support

At Ross Video, we take pride in the quality of our products, but if a problem does occur, help is as close as the nearest telephone.

Our 24-Hour Hot Line service ensures you have access to technical expertise around the clock. After-sales service and technical support are provided directly by Ross Video personnel. During business hours (eastern standard time), technical support personnel are available by telephone. Outside of normal business hours and on weekends, a direct emergency technical support phone line is available. If the technical support personnel who is on call does not answer this line immediately, a voice message can be left and the call will be returned shortly. Our Technical support staff are available to react to any problem and to do whatever is necessary to ensure customer satisfaction.

Supporting Documentation

Ross Video provides a wide variety of helpful documentation for the setup and support of your equipment. Most of this documentation can be found either on the Product Resources disk that came with your equipment, on the Ross Video website (*www.rossvideo.com*), or on the Ross Video Community site (*discussions.rossvideo.com/*)

- **Software Licenses (4841DR-502)** — third-party software licences.
- **Carbonite Multilingual Safety Information (4802DR-503)** — translated product safety information

Contents

Features

Thank you for buying a Ross Video HyperMax Multi-Definition Live Production Switcher. The HyperMax builds on the Ross Video reputation for designing switchers that fit the needs of any production environment.

Clean Feed Output

Clean feed is typically used for bilingual and live-to-tape productions. It allows you to assign keys to the Background or CLEAN output of an ME independent from transitions. A frequent application is the recording of shows for later airing without call-in phone numbers inserted.

The background and clean feed for an ME can be set to include or exclude any keys. This allows to essentially have two program outputs for a single ME that can include different keys. For example, in the illustration below the Program Feed for the ME has keys 1, 2, and 3 and the Clean Feed for the ME has keys 4, 5, and 6. These keys can be transitioned on or off-air for the ME but will not impact the feed they are not assigned to.

Video I/O

Video signals come into the router through the IO blades of the router and are available to the switcher as inputs. Any source available to the router is available to the switcher. Outputs from each SDPE blade of the switcher are available to be routed to any router destination.

The additional HD-BNCs on the SDPE blades are not used at this time.
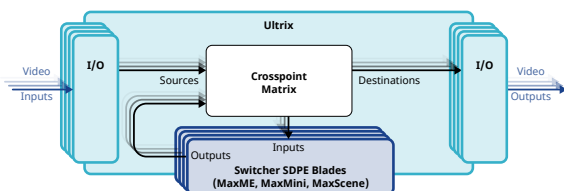
Custom Controls

This feature brings the power of macros to the switcher operator. Button presses, menu selections, event commands, or even the switcher state can be recorded to a custom control with pauses or holds between the events. A simple button press can play these events back again. Step through complex show openings as easily as pressing Custom Control buttons 1, 2, then 3.

Sequencer

The switcher has 5 Sequencers that allow you to create a playlist or rundown of custom events, much like custom controls. Each Sequencer can be run independently or linked to other Sequencers so that they all advance together. The Sequencer uses sequences to store the rundown of events. These sequence files can be loaded into one or multiple Sequencers.

> **Tip:** *You can link multiple Sequencers together so that as you advance though one, the other Sequencers will advance.*

Device Control

The switcher can control a number of external devices, such as video servers and robotic cameras. For a complete list of supported devices, and information on how to set up and control these devices, visit the Ross Video website (*rossvideo.com/production-switchers/carbonite/interface-list*).

DVE (Fly Key)

The advanced DVE engine comes standard with each switcher and can be used for performing over the shoulder, or picture in picture, shots with 3D borders and lighting effects.

2D DVE Keys

All key types can be zoomed, cropped, and repositioned horizontally and vertically to create the look you want, or you can use one of the useful pre-built 2D effects to perform 2D background transitions.

3D DVE Keys

All key types can be zoomed, cropped, and repositioned in X, Y,and Z space to create the look you want.

3D Borders

Flat or bevelled borders with independent inner and outer shaping and Y-axis perspective, or skew, can be applied to any 2D DVE key.

Lighting/Drop Shadow

A single directional light with optional drop shadow can be applied to the 2D DVE key and border. The bevel lighting of the border and shadow changes as the position of the light is moved.

DVE Key Combiner

Use both channels of the 2D or 3D DVE keyer to fly 2 boxes in the same key, effectively doubling the layer count.

Effects Dissolve

The Effects Dissolve feature allows you to interpolate from one memory to another using a memory recall. The switcher will interpolate from the starting memory to the destination memory, creating a smooth, two key frame effect.
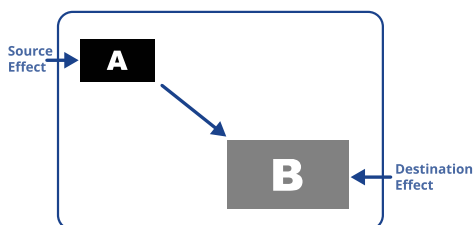
Only elements such as clip level and pattern position can be interpolated in the effects dissolve. Other elements, such as crosspoint selection, pattern, and next transition data are recalled first, and then the switcher will slew to the recalled memory.

An effects dissolve can be performed on as many elements and MEs as required, based on the memory that is being recalled.

General Purpose Interface (GPI)

The switcher is equipped with 24 GPI I/Os per SDPE blade that can be assigned as either an input or output independently.

The GPI inputs allow the switcher to interface with peripheral equipment such as editors. Each GPI input can be used to perform simple editing and switcher functions such as fade to black or an auto transition.

LiveEDL

Edit Decision Lists (EDL) are files used by non-linear editing (NLE) suites to aid in post-production. Your switcher can capture EDL data in a file that you load into your NLE suite.

For information on using the LiveEDL feature, visit the Ross Video Website (*rossvideo.com*).

Matte Generator

A matte generator per ME comes standard. Any one of the color generators can be assigned to MATTE. An additional simple color generator is available for an Aux Bus.

ME Effect System

The ME (Multi-level Effect) systems are standard. A HyperMax system can have between 1 and 8 MEs. Each SDPE blade provides the resources for a single ME, set of MiniME™ engines, or MaxScene outputs.

Each ME provides independent keyers supporting pattern mask, box mask, self-key, linear key.

Media-Store

Each channel of Media-Store provides a combined video with alpha for playout of stills and animations that are available switcher-wide, allowing for thousands of full screen stills and logos that can be cached and used on the switcher.

Each SDPE blade in the switcher assigned as a MaxME, MaxMini, or MaxScene provides multiple channels of Media-Store.

- 4 Channels × ME
- 4 Channels × MiniME™
- 8 Channels × MaxScene

Note: *The MaxScene Media-Store channels are only available to that SDPE blade. All other Media-Store channels are global.*

MediaManager

The MediaManager allows you to easily manage stills and animations on the switcher in a graphics interface.

MediaWipe

A MediaWipe allows you to use an animation, with audio, from the Media-Store to play over a background or key transition. This adds the equivalent of 2 keyers per ME as the MediaWipe do not use keyers to create the effect. When the transition starts, the switcher plays the selected

animation and audio over top of the background and keys that are being transitioned. A cut, dissolve, wipe, or DVE wipe is then performed layered under the animation to bring up the next shot when the animation ends.

Clip Player

The clip player offers a single playout channel for clips in the ITU-T H.264 (MPEG-4 AVC) codec in specific HD formats that can be assigned as a source on any bus in the switcher. Basic transport controls can be performed manually from the **Clip Player** page, using custom controls, or through AMP commands.

MemoryAI Recall Mode

We take the guessing out of memory recalls by ensuring that a memory recall will not affect what is currently on-air. MemoryAI uses the content of the memory to configure the Next Transition area and Preview bus for the background and keyers so that the next transition takes the same sources on-air that were on-air in the memory.

For example, store a memory that has a key on-air with CAM1 and CAM2 selected on the background. When this memory is recalled normally, it pops the same key on-air with CAM1 and CAM2 on the background. When the memory is recalled with MemoryAI turned on, CAM1 is selected on the preset bus, and CAM2 is selected on a key that is not on-air. The transition area is then set up for a background transition to bring CAM2 onto the background, take any on-air keys off, and take a key on-air with CAM1.

Memory System

Storage for 100 complete switcher snapshots per ME, MiniME™, and Canvas comes standard with all switchers. All of these memories can be stored and recalled to a drive, providing custom tailored memories for every operator and every show.

Each memory has an independent set of Store and Recall Attributes that can be used to specify what elements are stored or recalled with a memory, as well as adding effects to memory recalls. This allows you to store a set of attributes with a memory and then recall it as stored, or override the attributes stored in the memory and apply different ones when the memory is recalled. A memory attribute does not need to be stored in the memory to be recalled.

MiniME™

The MiniME™ is an additional ME that is provided with the switcher to perform basic dissolves and cuts. Each MiniME™ has keyer, background, and preset buses. Unlike a full ME, the MiniME™ only supports dissolves and cuts. The MiniME™ shares all the same sources as the ME.

> **Note:** An SDPE blade must be configured as a MaxMini to provide MiniME™ resources.

MaxScene

MaxScene provides a simplified interface for creating a show with multiple key layers and basic transitions. MaxScene consists of 8 scenes that share 8 layers. Each layer is set up like a keyer with a video source, alpha, and key type. Each layer can also be turned on or off to cut the video source on or off-air. A background source is also available over which the layers are keyed, or the scene can be taken as a source on bus.

> **Note:** An SDPE blade must be configured as a MaxScene to provide MaxScene resources.

MultiViewer

Each MultiViewer allows you to view up to 16 video sources (32 with Shift), in 51 different layouts, from a single output. All boxes on the MultiViewer output include mnemonic source names and red and green tallies.

Each SDPE blade has a dedicated MultiViewer output that can display any output from that SDPE blade, or follow the source assignments of any bus on that blade.

The MultiViewer Shift features allows you to access a shifted set of sources for the MultiViewer by pressing the **SHIFT** button on a control panel or in ViewControl. The MultiViewer Shift functionality can only be assigned to a single panel at a time.

Each MultiViewer head supports an integrated clock that can display time of day, or a countdown timer. The position, size, and color of the clock can be adjusted.
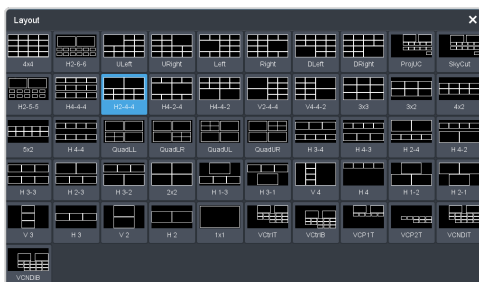
Figure 1: HD Layouts
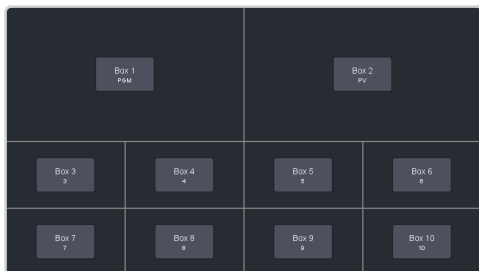
Figure 2: MultiViewer Grid

OverDrive® Caprica Support

HyperMax can be controlled from OverDrive® using the Caprica interface. This interface allows OverDrive® to perform memory recalls, transitions, and run custom controls on the switcher. For information on setting up Caprica to interface with the switcher, refer to the documentation that came with your Caprica server.

Pattern and Matte Generators

A single pattern generator dedicated to wipes comes standard, and is equipped with 10 classic wipes. Most wipes can be rotated, bordered, multiplied, aspectized, and repositioned.

Tally Outputs

The switcher has 24 assignable tally transistors per SDPE blade assigned to the switcher. Each tally can be assigned to any number of combinations of input and output or bus.

UltraChrome

The UltraChrome 2 chroma keyer uses independent chroma key engines to produce the video and alpha components of the key. These internal video streams can be composited in a keyer, or fed out two separate video streams to an external device, such as a video server.

Ross Platform Manager Licensing

RPM licenses are issued by the Ross Activation Server under a Customer Product Key. The Product Key is then added to a Ross Platform Manager that multiple switchers can access to request software licenses. Each switcher must request and release licenses from/to the Ross Platform Manager.

RPM licenses can easily be requested or released from a switcher to a pool of licenses on the Ross Platform Manager. This allows you to move licenses between different studios depending on production needs by releasing licenses from one switcher and requesting them by another.

> *Note:* A network connection to the Ross Platform Manager is required to request or release RPM licenses.

> *Note:* Ross Keys licenses are not impacted by RPM licenses. All licenses are cumulative and can be combined on the same switcher.

> *Tip:* A new switcher set register has been added to store RPM license requests.

XPression Live CG

Seamlessly combine the creative power of the Ross® XPression Designer software with the ease of use of your Ross® switcher. Create stunning still graphics using XPression Designer, and transfer them directly to an media-store channel on the switcher using the RossLinq interface. Up to 4 channels with dedicated alpha can be controlled from the XPression Software Client. This feature supports still images only.

Each switcher comes with a single license of XPression. Additional licenses can be ordered.

> *Note:* A separate Windows® PC with an NVIDIA® graphics card is required to use this option. PC no provided.

DashBoard

DashBoard provides the main menu system to the switcher.

Download and install the latest version of DashBoard from *http://www.opengear.tv/*. Review the documentation that comes with DashBoard for information on installing and launching DashBoard.

> ❗ **Important:** *Do not run real-time or on access file scanning programs on HyperMax, TouchDrive or other supporting systems. Ross Video does not support any type of real-time or on access file scanning programs running on HyperMax, TouchDrive or other supporting systems. Real-time or on access file scanning can cause lagging, disconnects, and timeouts between the HyperMax, TouchDrive and other supporting systems.*

> **Note:** *HyperMax requires the DashBoard 64-bit v9.14, or higher. The 32-bit versions of DashBoard are not supported.*

> **Tip:** *You can also connect to the switcher from an Ultritouch using DashBoard. Refer to Ultritouch on page 22 for more information.*

> **Tip:** *If DashBoard is having connection issues you can force DashBoard to reconnect to all devices from the 3-knob menu of TouchDrive or SoftPanel (Press **MENU** > **Reset** > **NEXT** > **NEXT** > **NEXT** > **NEXT** > **NEXT** > **DashBoard Reboot**).*

Switcher Status in DashBoard

The DashBoard control system allows you to connect to the switcher and view status information for various components of the frame.
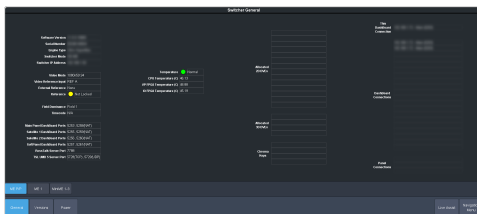
> **Note:** *Each SDPE blade assigned to the switcher has a status tab indicated by the role that blade has been assigned in the switcher.*

> **Tip:** *The icons in the DashBoard Tree View will alert you if there is an alert condition. Green for normal, amber for alert, and red for alarm.*

Configuration

The Configuration node provides access to switcher settings such as Reference, Inputs, Outputs, and MultiViewer. You can switch between the different configurations by selecting the pages at the bottom of the DashBoard window.
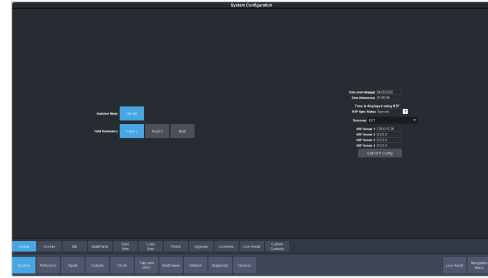
Devices

The Devices page on the Configuration node allows you to configure external devices to be controlled by the switcher.
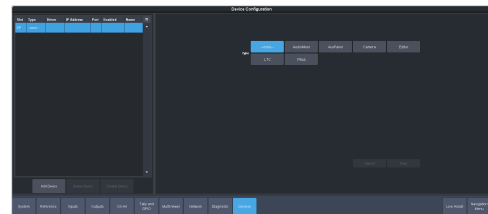
> **Note:** *HyperMax does not support serial (SP) devices at this time.*

> **Tip:** *Click **Disable Device** to disable the selected device (does not apply to Audio Mixers).*

> **Tip:** *You can apply a custom name to each device in the **Name** field. This name appears on the menus and allows you to quickly differentiate different devices of the same type, like cameras.*

Live Assist

The Live Assist node provides access to operational functions such as keying, transition, and memory settings of the switcher. You can switch between the different settings by selecting the tabs at the bottom of the DashBoard window.
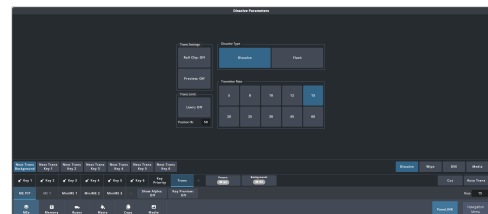
> **Tip:** *The **Custom View** button on the **Live Assist** page opens a separate page where you can set up custom DashBoard pages. These custom pages can also be set to auto follow specific video sources. This allows you to have Live Assist show a specific custom page when a video source is selected.*
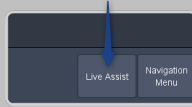
PaneLINK

PaneLink allows Live Assist to follow the button presses on the control panel and display the relevant tabs. For example, with **PaneLINK** turned on, press **SEL** for any keyer and Live Assist shows the settings for that keyer. Press the **WIPE** buttons and Live Assist shows the transitions settings for a wipe. With **PaneLINK** turned off, Live Assist does not switch between tabs.

Custom Controls

The Custom Control provides access to recording, editing, and running custom controls, as well as setting up the mnemonics for custom control on the TouchDrive control panel.
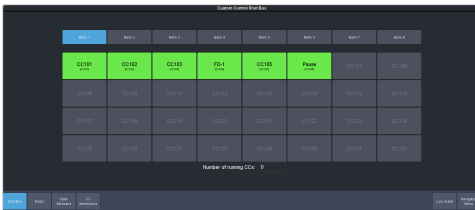
Personality

The Personality node provides the switcher personality settings.
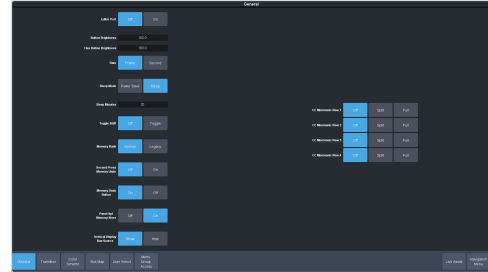
Help

The help node in DashBoard launches the integrated help system with full search capability.

Menu Group Access

Disable certain menu groups to improve DashBoard performance.

Menu group access disables certain DashBoard menu groups for the DashBoard port (5253, 5255, 5256, or 5257) that you are using. When a menu group is disabled, the data for those menus are not sent to that port. Without the data the menus are grayed out and the nodes do not appear in the DashBoard tree view.

Keep the following in mind:

Keep the following in mind when working with the menu group access:

- When you disable a menu group, the data for those menus are no longer sent to any DashBoard on the same port as you. This can greatly speed up DashBoard connection times.
- When you change a menu access setting, all DashBoard connections, on all ports, to that frame are reset and reconnect.
- If you disable a menu group, any controls on a CustomPanel that were added from that port will no longer function.
- If you are connecting to the switcher using Caprica or Lightning you should set all menu groups to **On** for the port they are connecting on.
- You cannot disable the Personality menu.
- The menu access settings are not stored with Personality in a switcher set.
- Menu access settings are persistent after a factory default.
- Any change to the menu access resets all DashBoard connections to the frame on all ports.

- A list of all DashBoard connection to the frame and the ports they are using is shown on the **Status** menu.

To Set the Menu Access

Set menu access for all DashBoard connections on the same port.

> **Important:** *Any change to the menu group access is applied to all DashBoard connections that are using that same port.*

> **Important:** *If you change a menu group setting, all DashBoard connections to that frame, on all ports, are reset.*

1. Click **Navigation Menu** > **Personality** > **Menu Group Access**.
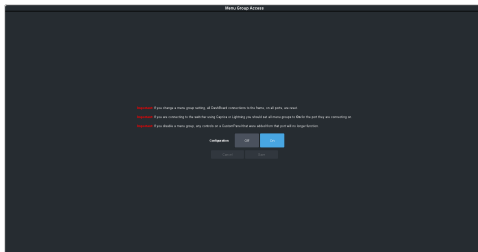
2. Click a button next to the Menu Group item to enable (**On**) or disable (**Off**) that menu group.

   > **Important:** *If you are connecting to the switcher using Caprica or Lightning you should set all menu groups to **On** for the port they are connecting on.*

   - **Configuration** — turn the **Configuration** menus on or off.

3. Click **Save** to apply the changes to all DashBoard connections using the same port.

4. Click **OK**.

Role Based Access Control

The Ross Platform Manager allows for user authentication and role based access through DashBoard. Once set up in DashBoard, Ross Platform Manager allows for control over who can control HyperMax based on the roles individual users are assigned to.

> **Note:** Ross Platform Manager does not apply to operation of the switcher from a control panel.

> **Tip:** For information on setting up a Ross Platform Manager server and creating user accounts, refer to the documentation that came with your Ross Platform Manager.

To Turn on Role Based Access Control for Ross Platform Manager

From DashBoard you can select whether the Role Based Access Control (RBAC) of Ross Platform Manager is applied to HyperMax.

> **Important:** Changing the RBAC mode may restrict access to the switcher if your account is not assigned to a role that has the required permission.

> **Note:** RBAC settings are not stored in switcher sets or changed with a factory default.

1. Click **Navigation Menu** > **Configuration** > **System** > **Access**

2. Click the **Pre-Authorized Connections** button and enter the IP address of any trusted DashBoard systems that you want to allow access to the switcher without RBAC permissions.

> **Tip:** A common trusted system would be a TouchDrive control panel. This allows the control panel with a DashBoard interface to continue to control the switcher without the need for a user to log in.
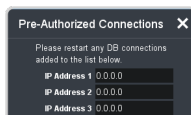
3. Click a **Role Based Access Control** button to apply access control to the switcher.

    • **Authorization not Required** — RBAC is applied to the switcher, but not enforced. Anyone can control the switcher through DashBoard.

    • **Authorization Required** — RBAC is applied to the switcher and enforced. Only users with permission can control the switcher through DashBoard.

4. Click **OK** to reboot the switcher using RBAC permissions from Ross Platform Manager.

> **Tip:** You may have to close and re-launch DashBoard to apply the access control.

SoftPanel

SoftPanel provides you with a graphical interface to the menu system and control surfaces of the switcher. This allows you to setup and control the switcher without a control panel.

> **Important:** *SoftPanel is a separate panel connection to the frame. Refer to MultiPanel on page 126 for information on setting up SoftPanel.*

The screen can be broken up into several different functional areas. Each of these areas allows you to interact with different aspects of the switcher interface.

Menu Area

The menu area provides a graphic representation of the menu system on a Carbonite Black control panel. The **Select**, **Up**, and **Down** buttons represent the actions of turning and pressing the knobs on the panel. The buttons in the top right corner allow you to navigate around in the menu tree, and the stylized mnemonic buttons at the bottom allow you to access different menus.

User Area

The user area allows you to select what the bus area is assigned to, or interact with a virtual positioner. Press the **ME/Key**, **Aux Bus**, or **Positioner** button to a select how the user area appears.

The **ME/Key** button allows you to select what the bus area is assigned to. Click **ME *X***, **MiniME *X***, **Canvas *X***, or **CK** (chroma key) to assign the bus area to that output. Click one of the **Key *X* Sel** buttons to assign the key bus in the bus area to that key.
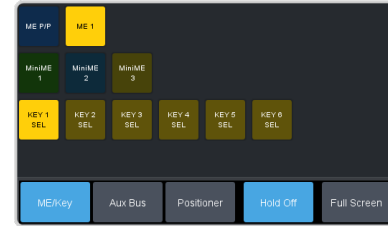
The **Aux Bus** button allows you to select one of the aux buses that the key bus row in the bus area is assigned to.

> **Note:** *The selection of one of the aux bus or key select buttons indicated what the key bus in the bus area is assigned to. You may have to switch between the ME/Key and Aux Bus buttons to see where the bus is assigned.*
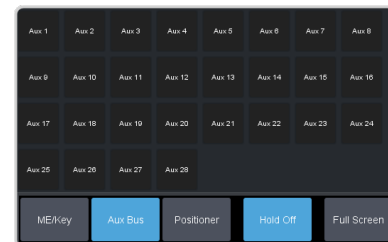
The **Positioner** button provides a virtual interface to the positioner. The positioner is used in device bus, or to move keys or masks around. Click and hold the positioner and move it around to emulate moving the positioner around. The slider to the right of the positioner emulated twisting the positioner knob on the panel. The button to the left of the positioner emulates the button on the top of the positioner knob on the panel.

Control Area

The control area (the upper right of the screen) contains the main DashBoard interface to the switcher. Click **Navigation Menu** and select the menu you want to navigate to. When the **Live Assist** menu is selected, the sub-menus will follow actions in the bus area when **PaneLINK** is on.

Bus Area

The bus area provides a graphic representation of the panel row on the switcher. Use the user area buttons to assign the bus area to an ME, key, and aux bus. Sources are then selected on the key, program, and preset buses, and transitions are set up and performed with the transition buttons to the right of the source selection buttons.

Tip: *Use the **Hold On** or **2Press** buttons to emulate a press and hold of a button. This allows you to press and hold one button and then press another.*

Ultritouch

The 2RU rack mountable Ultritouch adaptable system control panel allows you to control some aspects of switcher operation using a DashBoard interface.

The DashBoard interface on Ultritouch provides status, buses, and custom control tabs. You must connect to the switcher from Ultritouch to be able to control the switcher functions. Refer to the Ultritouch documentation for information on navigating the Ultritouch menu and manually connecting to a device.

Once you are connected to the switcher, tap the **Connected Devices** button and select the switcher you want to control from the list and tap **Carbonite**. The available tabs for the switcher are listed. Tap one of the available tabs to open it.
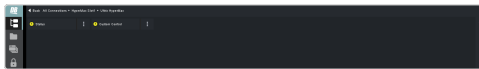
Navigation Menu

Tap the **>** button on the left and tap the tab you want to navigate to.

Status

This tab allows you to view status information for various switcher components. These tabs are the same as the **Switcher Status** tab from a DashBoard computer.

> *Tip:* *View the hardware status of each SDPE blade assigned to the switcher by clicking on the button indicating the role that blade is performing in the switcher.*
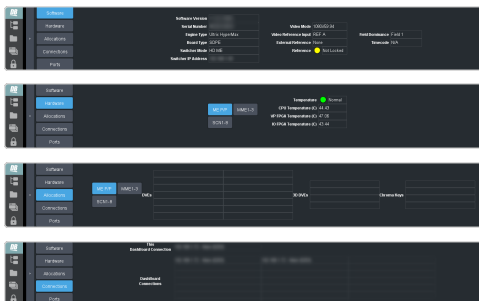
Custom Control

This tab allows you to run custom controls on the switcher. This tab is this same as the **Custom**

Control ShotBox tab from a DashBoard computer. You cannot edit a custom control from this tab.

1. Tap the bank for the custom control you want to run.
2. Tap the custom control on the selected bank that you want to run.
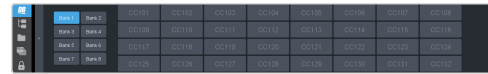
Safe Power Down/Restart

Safely shut down the switcher application so that it can be powered off or restarted.

The switcher application needs to be properly shut down before the hardware can be powered off.

> **Notice:** *Failure to properly shut down the application before powering off the hardware could corrupt the software.*

To Shut Down the Switcher

Shutdown the switcher application in preparation for powering the system off.

1. Click **Navigation Menu** > **Status / Power** > **Power**

2. Click **Prepare to Shutdown**.
3. Click **OK**.

    The switcher will safely shut down the applications in preparation for powering off.

4. Wait for 20 seconds before powering the switcher off.

To Restart the Switcher

Restart the switcher application.

> **Note:** *Restarting the switcher application does not restart the hardware and is not the same as powering the system off and on again.*

1. Click **Navigation Menu** > **Status / Power** > **Power**

2. Click **Restart Switcher**.
3. Click **OK**.

    The switcher application will restart.

Audio and Video Processing

Video and audio signals are processed and passed through the switcher in different ways, depending on how the switcher is being used or is set up. A better understanding of how the switcher is processing these signals help you to achieve the production you want.

Video Processing and Flow

The router crosspoint handles passing all video to and from the various SDPE blades that make up the switcher. Each SDPE blade is that makes up the switcher is assigned a role and the licenses to fulfill that role.

> **Tip:** Refer to *HyperMax Video Flow* on page 82 for more information on how the router crosspoint and switcher crosspoint interact.
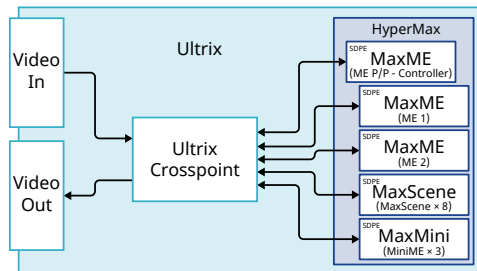
Figure 3: Video Flow Through the Switcher

Audio Processing and Flow

> **Important:** Embedded audio is not available to the switcher at this time. Audio can be embedded in the outputs from the router if required. Refer to the documentation that came with your router for information on audio routing.

Video Sources

The switcher has access to three basic types of video sources, external, internal, and follows.

All video sources can be assigned to video source buttons. By pressing a video source button on a bus, the video source assigned to that button is selected on that bus.

- **External** — External video sources come from cameras, video servers, character generators, or other external devices into the switcher.
- **Internal** — Internal video sources come from internally generated video, such as Media-Store channels, matte color, and black.
- **Follows** — Follow video sources allow you to have one bus follow what is selected on another bus. For example, you can assign an Aux Bus to follow an MiniME™ Background so that a source selected on the background bus of that MiniME™ is also selected on the Aux Bus.

To Select a Source on a Bus from DashBoard

To select a video source on a bus, you must identify the bus you want to assign a video source to, and then press the source button you want to select on that bus.

1. Click **Navigation Menu** > **Live Assist** > **Buses**.
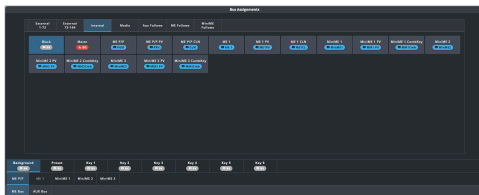
2. Click **ME Bus** or **Aux Bus** to select the area that you want to select a source on. As you select different areas, the buses for that area are listed on the row above.

3. Click **ME**X, **MiniME**X, or **Aux**X to select the specific bus or area you want to select a source on. With an ME, MiniME™ there is an additional selection of the keyer, background, or preset bus that you want to select a source on. The aux buses do not have these selections.

4. Select the background, preset, or keyer bus that you want to select a source on. (ME and MiniME™ only)

    > **Note:** *Ensure that the source selected on the bus you want to enter is valid for that destination. For example, you cannot select* **MM1Bg** *as the source for* **MiniME1 Background**. *If the source is not valid, you will not be able to select it.*

5. Select the type of source you want to assign to the bus and then select the source.

    - **External** *X-Y* — the sources from the router that are external to the switcher. The number of sources depends on the size of the router.
    - **Internal** — internally generated sources, including re-entries.
    - **Media** — Media-Store video and alpha sources.
    - **Aux Follows** — use the source that is active on selected aux bus.
    - **ME Follows** — use the source that is active on selected ME bus.
    - **MiniME Follows** — use the source that is active on selected MiniME™ bus.

    > **Important:** *Some* **External** *sources are outputs from the switcher and many not be valid for the bus you are selecting them on.*

Video Layering

How video is layered in the output of the switcher depends on how an ME is re-entered onto the other, what keyers are on-air for the ME, and what order the keys are in.

If we assume that each ME has all keyers on-air and that ME 2 is re-entered into ME 1 and ME 1 is re-entered into ME P/P, the layering will start with ME 2 Background and progress to the highest ME and keyer.
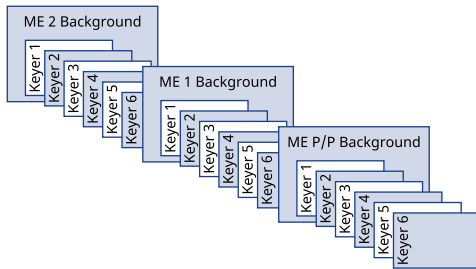
Figure 4: Video Layering

> **Tip:** *You can select a MiniME™ on an ME or different MiniME™ to re-enter it.*

> **Note:** *Key priority can be changed for each ME allowing for keys to appear in a different order. Refer to Key Priority on page 105 for information on setting up key priority.*

Re-entry Timing

There are 8 timing zones in UHDTV1 and 1080 HD that are used for video re-entry. Any ME or MiniME™ can occupy any of the timing zones allowing for ME and MiniME™ to be re-entered into each other in any order. Re-entering an ME or MiniME™ into itself is not allowed.

> **Note:** *MaxScene scenes exist in a separate timing zone and can only be re-entered into an ME or MiniME™. You cannot re-enter a scene into another scene or re-enter an ME or MiniME™ into a scene.*
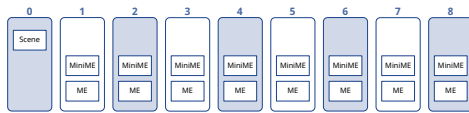
Figure 5: R-entry Timing Zones in UHDTV1 and 1080 HD

When the switcher is operating in a 720p video format, the system is limited to 5 timing zones. All the same timing zone restriction apply.
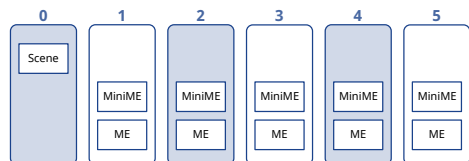
Figure 6: R-entry Timing Zones in 720p HD

Re-Entry

Re-entry is the term used to describe the process of selecting another ME on an ME. For example, if you select ME 1 on ME P/P, ME 1 is said to be re-entered onto ME P/P. Re-entry takes the output of an ME and uses it as the background or key on the other ME. If you select an ME on the background bus, the ME becomes background video source of the other ME. If you select an ME on a Key Bus, the ME becomes the key source of the other ME.

Keep the following in mind:

Keep the following in mind when working with re-entries:

- You cannot re-enter an ME, or the Clean Feed of an ME, into itself.
- Re-entry chains of more that 8 ME and/or MiniME™ outputs can cause line drops. Any combination of ME and MiniME™ outputs can be re-entered safely, as long as there are 8 or fewer elements in the chain.

To Re-Enter an ME

The process to re-enter any bus onto another is the same as re-entering an ME onto another ME.

1. Set up ME 1 with a background and a key.
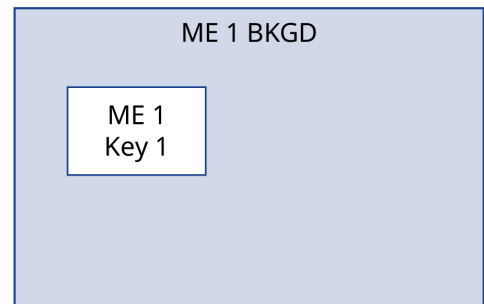
2. Set up ME P/P with a key.
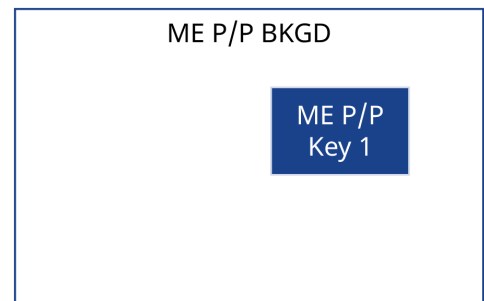
3. Select ME 1 as a source on the Background Bus of ME P/P. Notice that the output of ME

1 is now being used as the background of ME P/P.
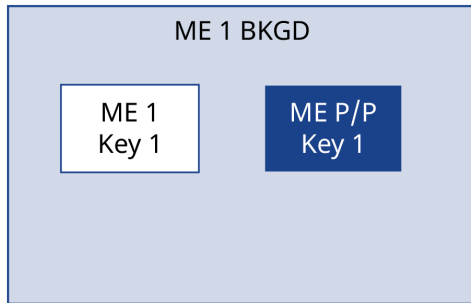
FlexiClean Clean Feed

FlexiClean provides a second program output that can exclude keys that are included in the standard program output. A frequent application is the recording of shows for later airing without call-in phone numbers inserted.

The clean feed output can include any combination of keyers.

Refer to *FlexiClean Clean Feed* on page 105 for information on setting up a clean feed.

Matte Source

Matte color backgrounds (**BG**) are color signals that can be applied to backgrounds and keys. Color selection is done either by picking a preset color, or by adjusted hue, saturation, and luminance to create a custom color.

Select the matte generator (**BG**) on a background or key bus. The full region of the background or key is filled with the selected color.

To Set Up a Matte Color

1. Click **Navigation Menu** > **Live Assist** > **Matte**.
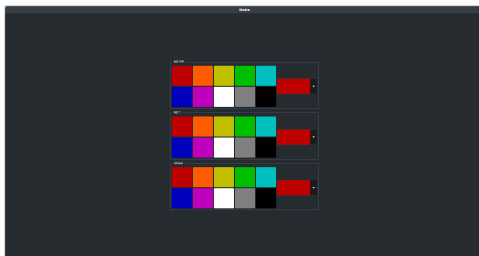
2. Select the matte generator that you want to set the color for.
   - **ME *X*** — set the color for the color background source on the selected ME.
   - **Global** — set the color for the global matte generator.

3. Click one of the preset colors to assign that color to the selected matte generator or click on the color drop-down to pick a custom color.
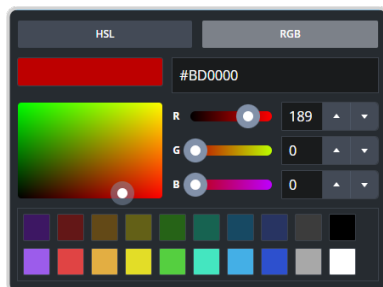
Copying

You can copy the content of an ME or keyer to another ME or keyer.

ME Copy

You can copy the entire contents of an ME, MiniME™, or scene to another ME, MiniME™, or scene. The entire contents of the destination is replaced with the contents of the source.

When you copy an ME, the switcher tries to assign resources to the destination ME to match the source ME. If these resources are not available, the switcher may need to steal resources.

To Copy an ME

Copy the contents of an ME to another.

1. Click **Navigation Menu** > **Live Assist** > **Copy** > **ME Copy**.
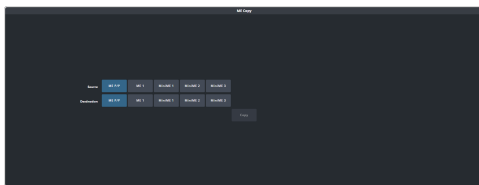
2. Click a **Destination** button to select the destination that you want to copy to.
3. Click a **Source** button to select the source you want to copy.
4. Click **Copy**.

Key Copy

You can copy the entire contents of a keyer or layer to another keyer or layer in the same, or a different ME. The entire contents of the destination keyer are replaced with the contents of the source keyer.

When you copy a key or layer, the switcher tries to assign resources to the destination key to match the source key. If these resources are not available, the switcher steals resources from the highest numbered key that isn't on-air. If all the resources are used by on-air keys, the copy will not take the resource.

> **Note:** If you copy a key being used for a DVE Key Combiner, both channels of the combined key are copied with the key. You cannot copy an individual channel from a combined key.

To Copy a Key

Copy the contents of a keyer or layer to another.

1. Click **Navigation Menu** > **Live Assist** > **Copy** > **Key Copy**.
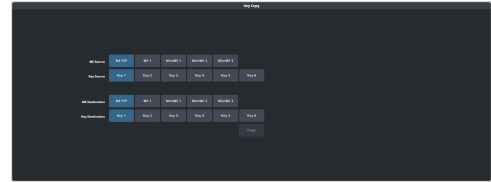
2. Click an **ME Destination** and **Key Destination** button to select the destination that you want to copy to.
3. Click an **ME Source** and **Key Source** button to select the source you want to copy.
4. Click **Copy**.

Bus Copy

You can copy the entire contents of an background or key bus to another bus. The entire contents of the destination is replaced with the contents of the source.

When you copy a bus, the switcher tries to assign resources to the destination bus to match the source bus. If these resources are not available, the switcher may need to steal resources.

To Copy a Bus

Copy the contents of a bus to another.

1. Click **Navigation Menu** > **Live Assist** > **Copy** > **Bus Copy**.
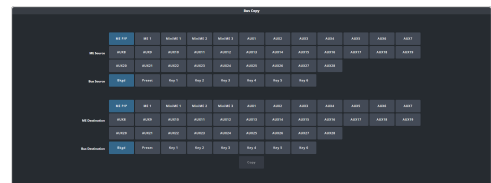
2. Click an **ME Source** button to select the ME, MiniME™, or AUX that contains the bus you want to copy.
3. Click a **Bus Source** button to select the bus you want to copy from.
4. Click an **ME Destination** button to select the ME, MiniME™, or AUX that contains the bus you want to copy to.
5. Click a **Bus Destination** button to select the bus you want to copy to.
6. Click **Copy**.

Key Swap

You can swap the entire contents of any two keyers in the same, or different MEs. The video source, position, and key type are all swapped between keyers. This allows you to change the apparent key priority, or layering, of the keys in the video output. For example, key 3 appears over key 2. If you perform a swap between key 3 and key 2, it appears as if key 2 is now over key 3.

Keep the following in mind:

Keep the following in mind when performing a key swap:

- Key swap does not change the on-air status of a keyer.
- A key swap can be recorded as part of a custom control.

To Perform a Key Swap

This procedure swaps the contents of Key 2 and Key 3 as an example. Use the same procedure for any key combination.

> **!** *Important:* *A control panel is required to perform this procedure. If you do not have access to a physical control panel, the SoftPanel can be used. The position of items on the menus on the SoftPanel may not match those of a physical panel.*

1. Press and hold the **KEY 2 SEL** button.
2. Press the **KEY 3** button in the transition area.

Transitions

Transitions are used to change the background video and take keys on and off-air. A transition can include any combinations of background and keyers. The background and each keyer can be transitioned independently.

Performing Transitions

What you can include in the transition, and the type of transition you can perform, depend on the number of resources you have, and if you are performing a background and keyer transition at the same time.

Keep the following in mind:

Keep the following in mind when performing transitions:

- If any of the sources going on-air have an assigned GPI output, the GPI output is triggered and the switcher then waits the configured pre-delay interval before performing the transition. If you perform a transition with the fader handle, the GPI output is triggered but the pre-delay interval is ignored.
- If any of the sources going on-air are assigned to a video server, you can have the video server play when the source is taken on-air by toggling **Roll Clip** on.
- If any of the sources going on-air are assigned to a video server, the switcher waits for the configured pre-delay interval before performing the transition. If you perform a transition with the fader handle, the pre-delay interval is ignored.
- If the fader is moved during an auto transition, control of the transition is passed to the fader. You must complete the transition with the fader. This allows you to override any auto transition in progress with the fader.
- The **Cut** and **Auto** buttons can be used to transition keys independently.
- You can pause an auto transition by pressing the **Auto Trans** button during the transition. Press the button again to continue the transition.
- If you turn the Transition Limit off when the transition has stopped at the transition limit point, the next transition starts from the transition limit point and goes forward to

complete the transition, instead of going back to the start.

To Perform a Transition

All transitions, with the exception of cuts on the background or key bus, have the same basic setup. The touchscreen menu system offers the touchscreen interface to setup and perform the transition.

1. Click **Navigation Menu** > **Live Assist** > **MEs**.
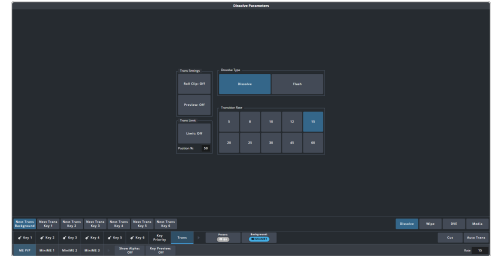
2. Click the **ME X**, or **MiniME X** for the area you want to perform the transition on.

3. Select the video sources you want to take on-air on each bus. Background and keys are set up slightly differently but can be performed with the same transition.

   - **Background** — click **Trans** > **Preset** and select the new background source.
   - **Key On-Air** — click the **Key X** > **Key Fill** button for the key you want to take on-air and select the new source. Repeat this for each key you want to take on-air.
   - **Key Off-Air** — you don't need to select the keys at this point.

   > **Tip:** Refer to *To Select a Source on a Bus from DashBoard* on page 25 for information on selecting sources.

4. Click **Trans**.

5. In the Next Transition area, select the elements (Background and Keys) you want to include in the next transition. You can include any combination of background and keys, but at least one element must be selected.
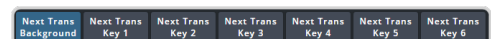
6. In the **Rate** field, enter the rate that you want the transition performed at. This is the speed, in frames, that it takes for the transition to complete. A Cut or manual fader transitions do not use the transition rate.

- **Background** — enter a new ME transition rate, in frames, in the **Trans Rate** field.
- **Key Only** — enter a new key transition rate, in frames, in the **Key X Rate** for the key you want to transition.

> **Note:** *The key rate is only used for key only transitions. Keys included in with the background are transitioned a the ME Rate.*
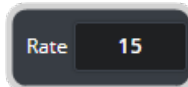
7. In the Transition area, select the type of auto transition you want to perform. If you want to perform a cut you do not need to select a transition type and can move to the next step.
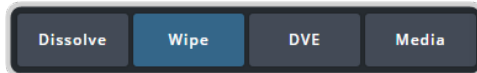
- **Dissolve** — perform a dissolve or WhiteFlash auto transition. Refer to *To Set Up a Dissolve* on page 36 or *To Set Up a WhiteFlash* on page 36 for more information.
- **Wipe** — perform a wipe auto transition. Refer to *To Set Up a Wipe* on page 37 for more information.
- **DVE** — perform a DVE auto transition. Refer to *To Set Up a DVE Transition* on page 38 for more information.
- **Media** — perform a MediaWipe auto transition. Refer to *To Set Up a MediaWipe* on page 39 for more information.

8. Click a **Trans Settings** button to turn the setting on or off. The options available depend on the type of transition selected.
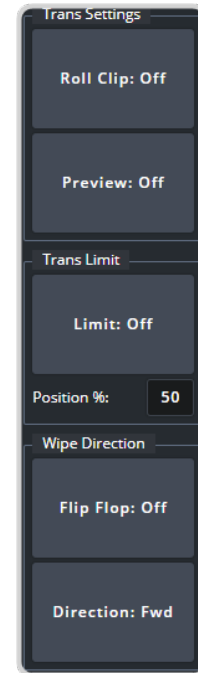
- **Roll Clip** — select whether you want any video server clips assigned to a source being taken on-air to play with the transition (**On**), or not (**Off**).
- **Preview** — preview the transition on the preview output **On**. You cannot preview the independent key-only transitions or a MiniME™ transition.
- **Flip Flop** — select whether the wipe runs forward during the first transition and then reverse during the second (**On**), or if it always runs in the same direction (**Off**).
- **Direction** — select the direction that the wipe travels.

9. Click **Limit** to turn trans limit **On** or **Off**. Enter a value for the trans limit in the **Position** field to set the point in a transition where an auto transition stops. When active, the point in the transition where the auto transition will stop is indicated by a flashing segment on the transition progress bar next to the fader handle on the control panel. The auto transition proceeds to this point and stops. The second auto transition starts from the transition limit point and goes back to where the first transition started.
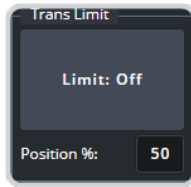
*Tip: The **Limit Position** is a percentage with 0 being the starting point of the transition and 100 being the ending point of the transition.*

10. Perform the transition.

> ❗ ***Important:*** *The **Cut** and **Auto** buttons trigger a transition on what has been selected. If **Trans** is selected a normal background transition is performed. If one of the keyers is selected (**Key X**) a key-only transition is performed on the selected key.*

- **Auto Trans** — click **Auto Trans**
- **Cut** — click **Cut**

*Tip: During an auto trans, press **Auto Trans** again to hold the transition at the current position or press **Cut** to abort the transition and return to the original source.*

11. If a pre-delay has been set, and **Roll Clip** is active, the switcher will apply the pre-delay interval before performing the transition.

To Perform a Transition on TouchDrive (Memory Area)

All transitions, with the exception of cuts on the background or key bus, have the same basic setup. The control panel offers physical buttons and mnemonics to setup and perform the transition. Some panels have a memory area that can be used to set the transition rates.

Note: Carbonite button configuration and menus shown.

1. Select the preset or key sources that you want to transition to on the buses.

Tip: You can perform a quick, or hot, cut on the background bus by simply selecting a different source.

2. In the **Transition** area, select the elements you want to include with the transition. If you are including multiple elements, press and hold the first button and press the other buttons to include them in the same transition.

*Note: A key should be included in the transition if it is going on-air or off-air. The transition changes the on-air state of the keyer. If a key is on-air, a red indicator is visible on the display just above the key and the **CUT**button for that key is red in the **Keyer** area.*

3. In the **Transition** area, select the type of auto transition you want to perform. Refer to the manual that came with your switcher for information on setting up these transitions.

- **DISS** — perform a dissolve or WhiteFlash transition
- **WIPE** — perform a wipe transition
- **DVE** — perform a DVE transition
- **MEDIA WIPE** — perform a MediaWipe transition (Carbonite only)

*Note: The **TRANS X** buttons are configurable and can be assigned different functions.*

*Tip: Press and hold **DISS** and press **Flash** on the row control menu to select a WhiteFlash transition.*

4. The display in the **Transition** area shows the current setting for the transition type. Tap one of theses settings to show additional options.

Tip: Live Assist follows the transition type selection and shows the settings for that transition type.

- **Left** — the left button shows the current pattern for the wipe or DVE transition. Tap the button and swipe left or right on the display to select a different pattern. For a MediaWipe the button shows the name of the media item being used for the transition.
- **Center** — the center button shows the current direction for the wipe, DVE, or MediaWipe transition. Tap the button and select a different direction for the transition to be performed in.
- **Right** — the right button shows the current position of the pattern for the wipe transition or the settings for the MediaWipe transition. Tap the button to have the 3-knob display show the

position setting of the pattern and use the positioner to move the pattern around.

5. In the **Memory** area, enter the rate that you want the transition performed at. This is the speed, in frames, that it takes for the transition to complete. A Cut or manual fader transition does not use the transition rate.
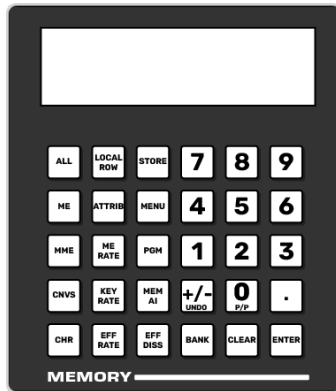
- **Background** — press **ME RATE** and use the keypad to enter a new rate, in frames, and press **ENTER**. The rate is shown on the display on the **Transition** area.
- **Key Only** — press **KEY RATE** and use the keypad to enter a new rate, in frames, and press **ENTER**. The rate is shown on the **Keyer** area for each individual key.

Note: The KEY RATE is only used for key only transitions. Keys included in with the background are transitioned a the ME Rate.

6. Perform the transition.
- **Auto Transition** — press **AUTO**. The transition is performed at the set transition rate.
- **Cut** — press **CUT**.
- **Fader** — move the fader from one limit to the other. The rate at which you push the fader determines the speed of the transition.

7. If a pre-delay has been set, and the **ROLL CLIP** button is active, the switcher will apply the pre-delay interval before performing the transition.

To Perform a Transition on TouchDrive (No Memory Area)

All transitions, with the exception of cuts on the background or key bus, have the same basic setup. The control panel offers physical buttons and mnemonics to setup and perform the transition.

Note: Carbonite button configuration and menus shown.

1. Select the preset or key sources that you want to transition to on the buses.

Tip: You can perform a quick, or hot, cut on the background bus by simply selecting a different source.

2. In the **Transition** area, select the elements you want to include with the transition. If you are including multiple elements, press and hold the first button and press the other buttons to include them in the same transition.

Note: A key should be included in the transition if it is going on-air or off-air. The transition changes the on-air state of the keyer. If a key is on-air, a red indicator is visible on the display just above the key and the CUTbutton for that key is red in the Keyer area.

3. In the **Transition** area, select the type of auto transition you want to perform. Refer to the manual that came with your switcher for information on setting up these transitions.
- **DISS** — perform a dissolve or WhiteFlash transition
- **WIPE** — perform a wipe transition
- **DVE** — perform a DVE transition
- **MEDIA WIPE** — perform a MediaWipe transition (Carbonite only)

Note: The TRANS X buttons are configurable and can be assigned different functions.

Tip: Press and hold DISS and press Flash on the row control menu to select a WhiteFlash transition.

4. The display in the **Transition** area shows the current setting for the transition type. Tap one of theses settings to show additional options.

Tip: Live Assist follows the transition type selection and shows the settings for that transition type.

Wipe		Rate:015
→	Forward	X:50.0% Y:50.0%

- **Left** — the left button shows the current pattern for the wipe or DVE transition. Tap the button and swipe left or right on the display to select a different pattern. For a MediaWipe the button shows the name of the media item being used for the transition.
- **Center** — the center button shows the current direction for the wipe, DVE, or MediaWipe transition. Tap the button and select a different direction for the transition to be performed in.
- **Right** — the right button shows the current position of the pattern for the wipe transition or the settings for the MediaWipe transition. Tap the button to have the 3-knob display show the position setting of the pattern and use the positioner to move the pattern around.

5. Set the rate for the transition you want to perform.
   - **Background**
     a. On the Transition area tap **Rate** and use the 3-knob menu to enter the new rate.

Wipe		Rate:015
→	Forward	X:50.0% Y:50.0%
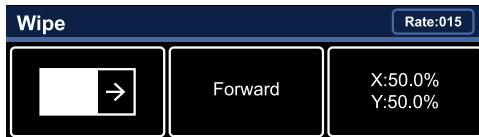
   - **Key Only**

     > **Note:** *The KEY RATE is only used for key only transitions. Keys included in with the background are transitioned a the ME Rate.*

     a. On the Keyer area tap the key you want to set the rate for.

⌃ Key 3 • Auto • CAM 1		Rate:005
Clip: 50.0% Gain: 50.0% Transp: 0.0%	Invert: Off Mode: Normal	Show Alpha: Off Key PV: Off Mask: Off
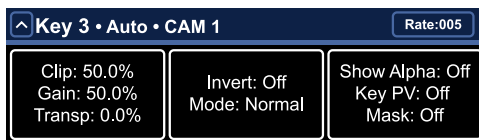
     b. Tap **Rate** and use the 3-knob menu to enter the new rate.

6. Perform the transition.

- **Auto Transition** — press **AUTO**. The transition is performed at the set transition rate.
- **Cut** — press **CUT**.
- **Fader** — move the fader from one limit to the other. The rate at which you push the fader determines the speed of the transition.

7. If a pre-delay has been set, and the **ROLL CLIP** button is active, the switcher will apply the pre-delay interval before performing the transition.

To Perform a Transition on Carbonite Black

All transitions, with the exception of cuts on the background or key bus, have the same basic setup. The control panel offers physical buttons and mnemonics to setup and perform the transition.

1. Select the preset or key sources that you want to transition to on the buses.

   > **Tip:** *You can perform a quick, or hot, cut on the background bus by simply selecting a different source.*

2. In the **Transition** area, select the elements you want to include with the transition. If you are including multiple elements, press and hold the first button and press the other buttons to include them in the same transition.

   > **Note:** *A key should be included in the transition if it is going on-air or off-air. The transition changes the on-air state of the keyer. If a key is on-air, a red indicator is visible just above the include button for that key and the **CUT**button for that key is red in the **Keyer** area.*

3. In the **Transition** area, select the type of auto transition you want to perform. Refer to the manual that came with your switcher for information on setting up these transitions.
   - **DISS** — perform a dissolve or WhiteFlash transition
   - **WIPE** — perform a wipe transition
   - **DVE** — perform a DVE transition
   - **MEDIA WIPE** — perform a MediaWipe transition

   > **Note:** *The **USER** button is configurable and can be assigned different functions.*

4. In the **Memory** area, enter the rate that you want the transition performed at. This is the

speed, in frames, that it takes for the transition to complete. A Cut or manual fader transition does not use the transition rate.

*Note: If your control panel does not have a memory area, you can use the **Time** knob on the 3-knob menu, or DashBoard, to set the background transition rate.*

- **Background** — press **ME RATE** and use the keypad to enter a new rate, in frames, and press **ENTER**.
- **Key Only** — press **KEY RATE** and use the keypad to enter a new rate, in frames, and press **ENTER**.

Note: The KEY RATE is only used for key only transitions. Keys included in with the background are transitioned a the ME Rate.

5. Perform the transition.
   - **Auto Transition** — press **AUTO**. The transition is performed at the set transition rate.
   - **Cut** — press **CUT**.
   - **Fader** — move the fader from one limit to the other. The rate at which you push the fader determines the speed of the transition.
6. If a pre-delay has been set, and the **ROLL CLIP** button is active, the switcher will apply the pre-delay interval before performing the transition.

Cut Transitions

A Cut is an instantaneous transition between video sources. Unlike all the other transition types, there are no intermediate steps between the video source that is on-air, and the video source you are transitioning to.

A cut is performed either by selecting different sources on a background or key bus, or by pressing a **Cut** button.

Dissolve Transitions

A Dissolve is a gradual fade between video sources. For a Background transition, the video signal on the Background bus and the video signal on the Preset bus are mixed together until the Preset bus video signal completely replaces the Background bus video signal.

To Set Up a Dissolve

A dissolve transition requires that you set a background and key transition rate for the auto transition. A fader transition does not use the transition rate.

1. Click **Navigation Menu** > **Live Assist** > **MEs** and select the ME that you want to perform the transition on.

   Tip: You can use the same procedure for a MiniME™.

2. Click **Trans** > **Dissolve**, or press **DISS** in the **Transition** area on the control panel.
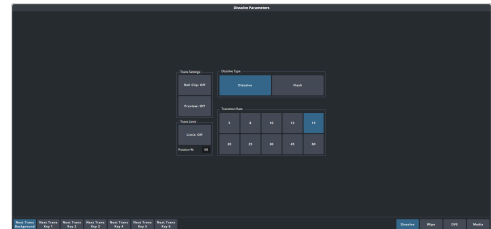
3. Click **Dissolve**.

WhiteFlash

Perform a two-step transition where a dissolve to and from white, or other selected color, is performed in the middle of the transition. The video signal on the Background bus is transitioned to a color background of the selected WhiteFlash color. The color background is then transitioned to the preset bus. WhiteFlash consumes a pattern generator for the transition.

Each ME has a separate WhiteFlash generator.

To Set Up a WhiteFlash

A WhiteFlash transition is performed just like a normal dissolve except that you must set the color for the flash and the rates for the onset, hold, and fade.

1. Click **Navigation Menu** > **Live Assist** > **MEs** and select the ME that you want to perform the transition on.

   Note: A WhiteFlash can only be performed on an ME.

2. Click **Trans** > **Dissolve**, or press **DISS** in the **Transition** area on the control panel.

3. Click **Flash**.

> *Tip:* *The **DISS** button on the control panel flashes indicating a WhiteFlash transition has been selected.*
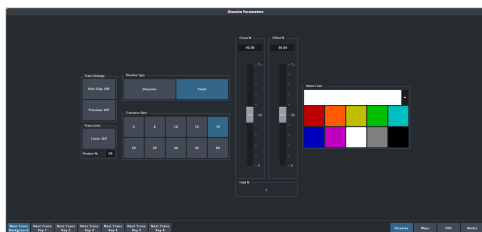
4. Use the **Onset %** and **Offset %** sliders to select the percentage of the transition that each phase of the WhiteFlash takes.

- **Onset** — duration of the dissolve to the WhiteFlash color.
- **Offset** — duration of the dissolve to the preset video source.
- **Hold** — duration of the dissolve that the WhiteFlash color is held. This value is the residual of entire duration minus the onset and offset.

5. Select a default or custom color for the WhiteFlash.

- **Default** — click one of the preset matte colors.
- **Custom** — click the arrow to the right of the **Matte Color** area and use the **Hue**, **Saturation**, and **Lightness** sliders to select your own color. Click **OK** to apply the color or **Live** to apply it in real-time.

Wipe Transitions

A Wipe is a gradual transition where one video signal is replaced with another according to a wipe pattern. In the example below, a line wipe is being used.

For Key transitions, the key is wiped on or off-air with the transition and the background remains untouched. The duration of a wipe transition depends on either the transition rate for the ME, or the rate at which the fader is moved.

To Set Up a Wipe

A wipe transition requires that you select a wipe pattern, set the direction and number/size of wipe pattern, as well as set a background and

key transition rate for the auto transition. A fader transition does not use the transition rate.

1. Click **Navigation Menu** > **Live Assist** > **MEs** and select the ME that you want to perform the transition on.

> *Note:* *A wipe can only be performed on an ME.*

2. Click **Trans** > **Wipe**, or press **WIPE** in the **Transition** area on the control panel.

3. In the **Wipe Pattern** area, select the pattern that you want to use for the wipe.

4. Set up the wipe pattern as required.

- **Wipe Aspect** — adjust the aspect ratio of the wipe pattern. Not all patterns can be adjusted.
- **H-Multiply** — multiply the pattern horizontally.
- **V-Multiply** — multiply the pattern vertically.
- **X-Position** — position the pattern on the x-axis.
- **Y-Position** — position the pattern on the y-axis.
- **Rotation** — rotate the pattern. Not all pattern can be rotated.
- **Border Size** — apply a border to the pattern and adjust the size. At size 0 the border is off.
- **Border Softness** — apply softness to the border.
- **Border Color** — select a color for the border. You can choose between the predefined colors or use the color picker to select a custom color.

> *Note:* *The pattern adjustments that are available depend on the pattern you selected.*

DVE Transitions

A DVE transition is a gradual transition where one video signal is replaced with another according to a 2D DVE pattern.

Keep the following in mind:

Keep the following in mind when performing DVE transitions:

- You must include the background when performing a DVE transition on a Chroma Key, Self Key, or Auto-Select Key. If you do not include the background, a dissolve transition is performed.
- Performing a DVE transition on a DVE Key without including the background scales the transition effect to the size of the DVE Key. This transition does not consume an additional DVE resource.
- Performing a DVE transition on a DVE Key with the background included does not scale the transition effect. This transition consumes the second DVE resource.
- You can only perform a DVE transition on a DVE key on a MiniME™. If the transition includes the Background, or a keyer that is not set as a DVE, the transition is switched to a dissolve.

To Set Up a DVE Transition

A DVE transition requires that you select the DVE pattern and duration for the transition.

1. Click **Navigation Menu** > **Live Assist** > **MEs** and select the ME that you want to perform the transition on.

2. Click **Trans** > **DVE**, or press **DVE** in the **Transition** area on the control panel.
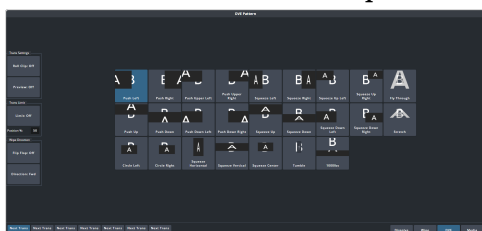
3. Click a **DVE Pattern** button to select the DVE wipe pattern you want to use.

MediaWipe Transitions

A MediaWipe allows you to use an animation to cover a transition. When the transition starts, the switcher plays the selected animation over top of the background and keys that are being transitioned. A MediaWipe can be used to cover a cut, dissolve, wipe, or DVE transition.

For a cut MediaWipe, the transition is performed when the cut point is reached. It is important to use a full-screen image in the animation at the cut point so that the cut is not visible on-air.

Keep the following in mind:

Keep the following in mind when performing MediaWipe:

- Although you can select a still image for a media transition, it is not recommended.
- Only Auto Transition should be used for Media transitions. Using the fader to perform the transition manually could result in jumps in the animation.
- The duration of the transition (Time) is set by the length of the animation and the play speed of the animation.
- The audio associated with a MediaWipe is only available on the AES outputs.
- You cannot perform a MediaWipe transition on a MiniME™.
- Only Media-Store channels 1 and 2 can be used for a MediaWipe.
- The MediaWipe can be set to occur between any of the keys or the background. When you set the layer to a specific key, the MediaWipe animation will cover that key, even if the key is not part of the transition. The animation plays over the key, but the key remains after the animation is finished. Any keys above the MediaWipe layer remain on top of the animation.

To Assign an Animation to a Media Selection Button

To be able to select an animation for a media-wipe, you must assign animation to the boxes in the **Media Selection** area of DashBoard. Animation are assigned by their media number.

1. Click **Trans** > **Media**, or press **MEDIA** in the **Transition** area on the control panel.
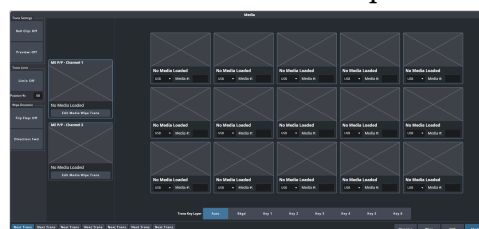
2. Click the **USB** dropdown list below the thumbnail you want to assign to a media item and select the source of the media item.

- **USB** — the contents of the USB drive installed in ME P/P.
- **NFS** — the contents of the network file system.

3. Enter the **Media Number** for a media item you want to assign to the button in the field bellow the thumbnail.

To Set Up a MediaWipe

A MediaWipe requires that you select the animation you want to use and then set up how you want to transition performed under the animation. This information is stored with the media item when you press save.

1. Click **Navigation Menu** > **Live Assist** > **MEs** and select the ME that you want to perform the transition on.

2. Click **Trans** > **Media**, or press **MEDIA** in the **Transition** area on the control panel.
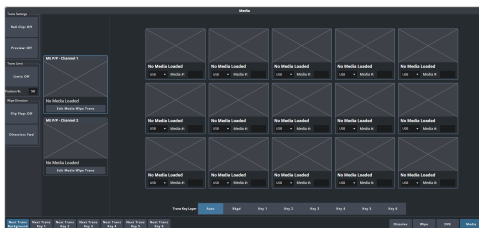
3. On the left, click a **Channel X** button to select the Media-Store channel you want to assign an animation to.

4. Click the button for the animation you want to assign to the Media-Store channel.

5. In the **Trans Key Layer** area, select where the MediaWipe will occur.

   - **Auto** — MediaWipe occurs over highest number key in the transition.
   - **Bkgd** — MediaWipe occurs over the background, but under all keys.
   - **Key1** — MediaWipe occurs over the background and key 1, but under remaining keys.
   - **Key2** — MediaWipe occurs over the background and key 1 and 2, but under remaining keys.
   - **Key3** — MediaWipe occurs over the background and key 1-3, but under key 4.
   - **Key4** — MediaWipe occurs over the background and key 1-4, but under key 5.

- **Key5** — MediaWipe occurs over the background and key 1-5, but under key 6.
- **Key6** — MediaWipe occurs over the background and all keys.

> **❶ Important:** *If a key is above the MediaWipe layer and included in the MediaWipe transition, it will cut off-air with the transition. This is normally covered by the animation when the layer is above the key.*

6. Click **Edit MediaWipe Trans** for the channel you want to edit.
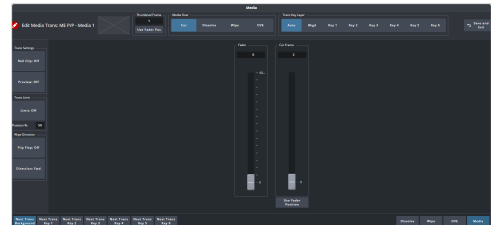
7. In the **Media Over** area, select the type of transition you want to use under the MediaWipe. This also allows you to set up the transition parameters for wipes and DVE transitions.

8. Use the **Fader** slider or fader in the **Transition** area on the control panel to set the start and end of the transition under the MediaWipe.

   - (Cut only) Use the **Cut Frame** slider to select the point for the cut, or move the fader to the point in the animation where you want the cut to happen and click **Cut at Fader Position**.
   - Use the **Start** slider to select the point where the transition starts, or move the fader to the point in the animation where you want the transition to start and click **Use Fader Position**.
   - Use the **Trans Rate** slider to select the duration of the dissolve, or move the fader to the point where you want the transition to end and click **Use Fader Position**.

> **Tip:** *If you select a negative start point for the transition, the transition will start first and then the animation will play after the start point duration has passed.*

> **Tip:** *Select a new thumbnail for the MediaWipe be entering enter the number of the frame in the media item you want to use, or by moving the fader to the frame and clicking **Use Fader Pos**.*

9. Click **Save and Exit** to save the new setting to the selected media item.

Keying

Keying is the term used to describe when you insert (or electronically cut) portions of one scene into another, or place titles over background images. Keys are made up of two basic components, an alpha, that cuts the hole in the background video, and a fill, that fills the hole with different video.

Keys, like MEs, are layered onto the background video signal from the lowest numbered key to the highest on an ME.

> **Note:** DashBoard Live Assist will not notify you of error messages or if a confirmation is required. For example, if there are no available resources for the DVE Key you are trying to create, the switcher will not create the key and no notification will be shown.
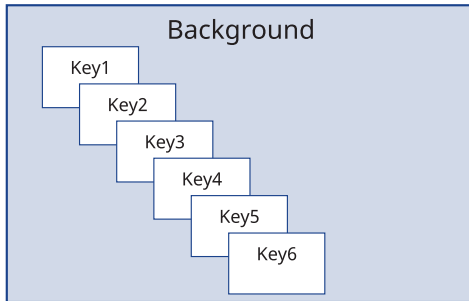
Figure 7: Key Priority

> **Tip:** The Key Preview (**KEY PV**) button allows you to temporarily force the program output of the selected keyer to the preview output of the switcher. The ME remains in the key preview state for as long as you hold the **KEY PV** button, and returns to normal as soon as you release the button. You can also double-press the **KEY PV** button to latch the ME in the key preview state until the button is pressed again.

> **Tip:** You can change the priority, or order, of the keys in an ME. Refer to for more information.

Self Keys

A Self Key is a key in which the luminance, or brightness, values of the key source are used as the alpha for the key.

To Set Up a Self Key

A self key is set up by selecting the keyer and video source you want to use, and adjusting the key parameters.

1. Click **Navigation Menu** > **Live Assist** > **MEs** and select the ME and key that you want to set up.

   > **Tip:** You can use the same procedure for a MiniME™.

2. Click **Channel 1 Video** and select the video signal you want to use for the key.

3. Click **Self Key**.

> **Tip:** Click **Show Alpha** to have the preview output of the current ME switch to the alpha signal that is being used by the selected keyer. Show alpha is not available for MiniME™ outputs.

> **Tip:** Click **Key Preview** to force the program output of the selected keyer to the preview output of the switcher.

> **Tip:** Click **Make Linear** to return the clip and gain values to the default settings.

4. Use the **Clip** slider to remove lower-saturated colors from the video image.

5. Use the **Gain** slider to adjust the transition between the video image and the parts of the video image that are removed.

6. Use the **Transparency** knob to adjust the transparency of the key from opaque (**0**) to fully transparent (**100**).

7. Click a **Keyer Mode** button to override the shaped setting for the key.
   - **Normal** — set to a linear keyer for an unshaped source.
   - **Additive** — set to an additive keyer for a shaped source. The **Key Invert** function is disabled in this mode.
   - **Full** — set the alpha to fully opaque (white). The **Clip**, **Gain**, **Make Linear**, and **Key Invert** functions are disabled in this mode.

8. Click **Mask** to apply a mask to the key.

Auto Select Keys

An Auto Select key is a key in which two video signals are required to make the key. The alpha is used to cut the hole in the video and the fill is used to fill the hole. These signals often originate from external devices such as character generators, external still stores, or other graphics systems.

To Set Up an Auto Select Key

An auto select key is set up by selecting the keyer and video source you want to use, and adjusting the key parameters. The pairing of the video and alpha video signals is done when configuring video inputs. Refer to the Setup Manual that came with your switcher for information on setting up Auto Keys.

1. Click **Navigation Menu** > **Live Assist** > **MEs** and select the ME and key that you want to set up.

    > **Tip:** *You can use the same procedure for a MiniME™.*

2. Click **Channel 1 Video** and select the video signal you want to use for the key.

3. Click **Auto Select**.

    > **Tip:** *Click **Show Alpha** to have the preview output of the current ME switch to the alpha signal that is being used by the selected keyer. Show alpha is not available for MiniME™ outputs.*

    > **Tip:** *Click **Key Preview** to force the program output of the selected keyer to the preview output of the switcher.*

    > **Tip:** *Click **Make Linear** to return the clip and gain values to the default settings.*

4. Use the **Clip** slider to remove lower-saturated colors from the video image.

5. Use the **Gain** slider to adjust the transition between the video image and the parts of the video image that are removed.

6. Use the **Transparency** knob to adjust the transparency of the key from opaque (**0**) to fully transparent (**100**).

7. Click **Key Invert** to reverse the polarity of the key alpha so that the holes in the background are cut by dark areas of the key alpha instead of bright areas.

8. Click a **Keyer Mode** button to override the shaped setting for the key.

    *   **Normal** — set to a linear keyer for an unshaped source.

    *   **Additive** — set to an additive keyer for a shaped source. The **Key Invert** function is disabled in this mode.

    *   **Full** — set the alpha to fully opaque (white). The **Clip**, **Gain**, **Make Linear**, and **Key Invert** functions are disabled in this mode.

9. Click **Mask** to apply a mask to the key.

UltraChrome 2 Chroma Key

An UltraChrome Chroma Key is a key in which the hole is cut based on a color value, or hue, rather than a luminance value or alpha signal. The color is removed and replaced with background video from another source. The default color is blue.

UltraChrome 2 can work in two modes, depending on the lighting conditions and subject matter used for the chroma key.

*   **Wedge Key** — Based on the standard chroma keyer and discriminates between the color vector angle and level of the background color vs the color vectors and levels in the foreground components. This produces very good results under ideal conditions. However, if the scene includes high detail luma content in edge regions, these may not be included in the output.

*   **Detail Key** — Differs from the standard chroma keyer in that it adds luminance dependency to a three-dimensional spherical color discriminator. This chroma keyer can develop subtle video and alpha shapes and discriminate high detail luma content in edge transition areas. However, this design may have problems with content where background and foreground levels are similar within the video itself.

> **Tip:** *UltraChrome 2 also offers the option to combine these two modes to offer good capture of high luma detail in the edge regions as well as compensation for similar foreground and background levels.*

UltraChrome 2 includes unique **Automatic Background Analysis** that can develop key edges with luma values consistent with those of the new background - eliminating the light or dark key halos. In addition, background color values are averaged and can be applied to spill areas to add lighting realism to the final composition.

To Set Up a Chroma Key

Set up the chroma key with the source you want to use and adjust the parameters. Ensure that the chroma key output has been selected on a keyer so that you can view the output as you adjust the parameters.

1. Click **Navigation Menu** > **Live Assist** > **MEs** and select the ME and key that you want to set up.

   > *Tip:* *You can use the same procedure for a MiniME™.*

2. Click **Channel 1 Video** and select the video signal you want to use for the key.

3. Click **Chroma**.
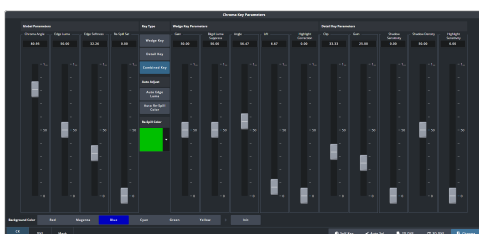
   > *Tip:* *Click **Show Alpha** to have the preview output of the current ME switch to the alpha signal that is being used by the selected keyer. Show alpha is not available for MiniME™ outputs.*

   > *Tip:* *Click **Key Preview** to force the program output of the selected keyer to the preview output of the switcher.*

4. Click the **Background Color** button for the color of the background you are using for your chroma key.

5. Click **Init**.

   The chroma key engine initializes and attempts to remove the selected background color from the video. Any further adjust is only required if you want to adjust aspects of the key.

6. Click the **Key Type** button for the chroma key mode you want to use.

   - **Wedge Key** — Based on the standard chroma keyer and discriminates between the color vector angle and level of the background color vs the color vectors and levels in the foreground components.
   - **Detail Key** — Differs from the standard chroma keyer in that it adds luminance dependency to a three-dimensional spherical color discriminator.
   - **Combination Key** — Combine the two modes to offer good capture of high luma detail in the edge regions as well as

compensation for similar foreground and background levels.

> *Note:* *All adjustments are always available, even if they are not applied by the selected mode.*

> *Tip:* *Although adjustment can be made to either key type while the combined output is selected, it is recommended that adjustments of either key type be conducted with only that key type selected. This eliminates the possibility of the combined key type hiding or concealing the result of adjustments.*

7. Click **Detail Key** and adjust the **Detail Key Parameters** as follows:

   > *Tip:* *The Detail key type is layered over the Wedge key type and has the largest contribution to the final key-edge quality.*

   - **Clip** — use this setting to clip between the foreground and background. You are looking to achieve complete background removal.

     > *Tip:* *Clip should be set to the point where the background is just removed. Setting it too high will reduce edge quality.*

   - **Gain** — use this setting to lift the fill image. You are looking to achieve solid fill content.

     > *Tip:* *Setting the gain too high may introduce dark boundaries.*

   - **Shadow Sensitivity** — use this setting to adjust the level of dark image areas, particularly in cast shadow areas.
   - **Shadow Density** — use this setting to adjust the apparent lightness of the dark / shadow areas in conjunction with the **Shadow Sensitivity**.
   - **Highlight Sensitivity** — use this setting to fill areas with specular highlights, such as reflective surfaces, that can show through to the background.

8. Click **Wedge Key** and adjust the **Wedge Key Parameters** as follows:

   - **Gain** — use this setting to set the **Angle Control** to 100 and the **Lift** to 0 and then adjust this setting until the background is fully removed, leaving a reasonable edge to the key. Too much gain will produce hard and undesirable edges.

     > *Tip:* *Adjust the **Gain** with the **Bkgd Luma Suppress** to balance between background removal and edge quality.*

- **Bkgd Luma Suppress** — use this setting to compensate for uneven color or lighting in the shot to ensure the chroma background is fully suppressed.

  > *Tip:* *Turn on a box mask in the keyer you are using to view the chroma key output to compare the backgrounds. The masked area shows the background source without the key settings applied.*

- **Angle** — use this setting to change the color wedge angle (wedge shape) that is used to detect areas of foreground (fill) and background (alpha) based on the chosen color vector. This can help fill in areas of heavy spill without hardening edge detail.
- **Lift** — use this setting to amplify the generated alpha signal to fill in areas of transparency.
- **Highlight Correction** — use this setting to lift areas of the image might contain high luminance levels at edge boundaries. This could be due to lighting conditions, camera setup, or subject.

9. Adjust the **Global Parameters** as follows:

   - **Chroma Angle** — use this setting to select the fill color that has been detected as color spill. You should not have to adjust this setting.
   - **Edge Luma** — use this setting to offset the detected level of the chroma background and allow for fine tuning.

     > *Tip:* *Click **Auto Edge Luma** to have the switcher automatically adjust the edge luminance.*

     > *Tip:* *If the subject image contains fine detail such as fine hair with a luminance level that is close in value to the chroma set color background level – it may be difficult to provide good separation between background and foreground elements.*

   - **Edge Softness** — use this setting to filter the edges to eliminate undesirable hard edges and add realism to a scene by simulating depth of field characteristics.
   - **Re-Spill** — use the **Re-Spill Color** and **Re-Spill Sat** settings to select a color that is near the average color of the background/lighting that needs to be added into those areas of the fill that contain the spill from the chroma set.

     > *Tip:* *Click **Auto Re-Spill Color** to have the switcher automatically adjust the re-spill colors based on the **Measurement Src** selection.*

10. Use the automatic adjustments as follows:

    > *Tip:* *The **Auto Adjust** allows you to have the chroma keyer continuously measure the replacement background, the background you are keying the subject onto, used in the final composite.*

    - Click **Auto Edge Luma** to have the edge luminance automatically adjusted, based on the replacement background.
    - Click **Auto Re-Spill Color** to have the re-spill color automatically adjusted, based on the replacement background.

UltraChrome Best Practices

High-quality chroma keying with a natural look is fully-achievable with the UltraChrome 2 keying system. However, as with any chroma key system, careful attention should be paid to the chroma key environment.

Keep the following in mind when working with a chroma key:

- The set should be evenly-lit, with a reasonable level of brightness, too bright or too dark will compromise the ability to produce a great result. High brightness generates high levels of reflected color background (Spill) into the foreground subject. When the camera output is viewed on a waveform monitor, the background set level should read between 50-75% of the overall image level. The foreground subject(s) should be separately lit.
- Adjust camera shading using appropriate charts, ensuring that grey scale, lens flare, gamma, and white/black balance correctly set. If using the AC-H200-UCHR camera, it is recommended it be set in HDR mode - HLG1200. This mode is compatible with standard (non-HDR) signals and the wider dynamic range allows greater image separation in lower-light regions. Also, the camera should be set at its minimum gain to ensure the lowest noise levels, and detail levels should be kept at minimum to avoid sharp edge transitions.
- Real elements, presenters, and props should not contain colors similar to the background. Clothing or props with high reflectivity should also be avoided to minimize color spill (colored light reflected from set onto foreground subject).

The Four Chroma Key Commandments

1. **A Great Chroma Key is Made from a Great Original Source** — Before attempting to set up the chroma keyer, make sure lighting, background, and talent all look great on the camera; and that camera Gain and Detail have been reduced to a necessary minimum.

2. **No Chroma Key is Ever the Same, Start Fresh with Init** — Every set has its own lighting conditions, camera and lens setups, CK wall-quality, consistency of paint, foreground talent clothing, colors, and skin tones. The UltraChrome automatic initialization (**Init**) does not require color pickers or hue controls; once the general color vector has been selected, it will analyze the entire frame and determine the exact chroma vector and angle of the color background to be removed.

3. **Init, Try, Re-Init and Try Again** — The fine-tuning required to get a great result is often minimal and frequently hinges on the adjustment of a single parameter. Changing the value of the wrong parameter can make it impossible to then make corrections with other controls. When learning the nuances of this chroma key, re-**Init** after making a change that does not achieve the desired result and then try another. Also, all chroma key parameters are saved in the memory system, so you can save a setup and then start over if necessary.

4. **No Last Minute Changes** — Once the chroma set, lighting, and cameras are tuned for best performance - don't change anything! On a normal set, it is common to make last minute tweaks and changes to lighting, iris settings, and even talent/wardrobe. When chroma keying, these changes will require the key to be reset and adjusted - which is fine if you have the time. Avoid change if you can, especially at the last minute, it can substantially lower operator blood pressure.

Chroma Key Tips and Tricks

Some useful tips for how to get your production ready for a flawless chroma key, and some tricks for how to deal with difficult shadows.

The Set

In every set design, care must be taken to ensure there are no visible seams, joints or hard corners that will appear on camera. Paint should be chosen that is a close as possible to the exact color vector that will be used, typically Green or Blue. If the paint pigment is not precise and several batches of paint or repaint are required, the uneven color result will make the perfect key impossible. There are several vendors of chroma key specific paints and set materials you can work with. Ross Video works closely with ProCyc (*www.procyc.com*) in the USA, we whole-heartedly recommend their products.

The set should be sized to allow ample separation between foreground talent and the chroma background wall; ideally at least 6-to-8 feet of separation. The further the distance, the easier it is to reduce unwanted color spill and achieve good lighting separation.

Lighting

Lighting configuration will naturally vary with set design and choice of lighting equipment, but there are some simple rules that will help achieve the best results:

- Light the chroma set independent of the talent: light the walls and floor to achieve flat, even illumination.
- Light the talent independently: use back and side lighting to minimize color spill from the walls and floor. Use floor or stand mounted front fill lights to eliminate areas of spill reflected from the floor.
- Don't light the background too brightly: it should ideally be half a stop or more below the level of the foreground subject (about 50 - 75% of the foreground on a waveform monitor).
- Don't rely on eyesight: when assessing the set lighting and background quality and finish - eyesight will mislead you. Look at the camera output on a waveform/vectorscope and ensure that the chroma background reads as an even signal without variation.

Camera and Lenses

Resolution: Cameras naturally vary in performance; the ideal camera has a high-resolution imager with very low noise. This is critical for an excellent final result. Medium resolution imagers can produce great results in normal video productions, but rely on relatively high-detail settings to enhance image edges. Detail-enhanced edges are undesirable in

chroma keying. These edges will appear as bright or dark key halos, which cannot be removed without compromising overall key quality.

Imager/Sensor Noise: Noise is always present in the video image but can be minimized by choice of sensor type and gain settings. Image noise has a significant effect on chroma keying as the chroma levels in a normal video image are much lower than the luma levels - as a result, the chroma information contains proportionately more noise. High noise-levels will be most obvious in dark areas of a developed chroma key and can be very difficult to remove without compromising key quality. The better the noise performance of the camera - the better the end result.

Lens: Select a camera lens based on the set size and production needs. Some lower-cost lenses can exhibit chromatic aberration - colored halos - around edge transitions in certain lens regions. This has a highly undesirable effect on edge quality.

Detail: Avoid high levels of detail regardless of camera type; if detail is necessary to achieve the image quality desired, then the best choice is to use the chroma key Edge Softness control to soften the edge and conceal the aberrations caused by detail setting.

Shadow Tricks

Developing a shadow from the chroma key set can give you a more realistic final output, but this is very difficult to do. As previously mentioned, noise lurks in the shadows and can look quite nasty. But all is not lost, very acceptable shadows are achievable with a nifty keying trick.

1. Setup the chroma key as usual; don't worry about resolving the shadow, just make the best key you can. Assign the key to an ME or MiniME™ keyer, with an empty keyer below it (Example: chroma key on Key 2, with Key 1 unassigned).

    > **Tip:** *No attempt is made to resolve any shadows as they are weak and indistinct. Raising the shadow sensitivity would bring up other set errors.*

2. Set Key 1 type as Auto Select then select Black as the Key Fill and the chroma key source camera (in this example: Media Store 1) as the Key Alpha source. Turn on Key Invert and leave the keyer in Normal Mode.

3. Now adjust the key Clip and Gain until the shadow area has the look you desire (you can ignore the rest of the image as it will be concealed by the chroma key above it).
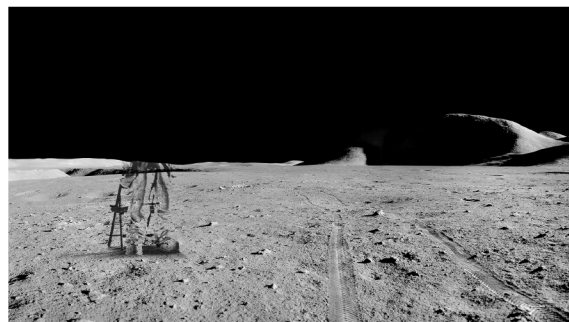
4. Now adjust Key Transparency for the most realistic shadow look.
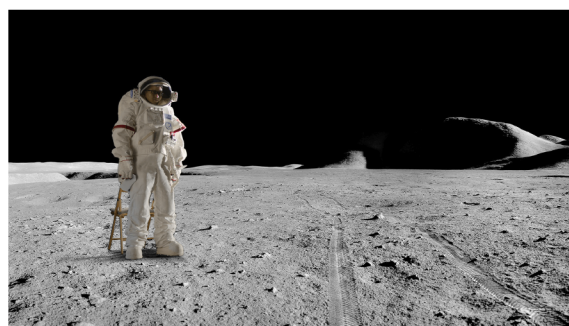
5. Turn on the chroma key in Key 2 - Voila! Great looking shadow from a poor image. Good trick!

DVE Keys

A DVE key allows you to apply digital video effects, such as scale, crop, aspect ratio, position, rotation and border to a video image or another key type in either 2D or 3D space. When a DVE is applied to another key type, it is said to be flying (Fly Key).

> **Tip:** *You can see where 2D and 3D DVE channels are allocated from the **Status** page.*

Table 1: Feature Supported by DVE Mode (2D/3D)

Feature	2D	3D
Size	0-500%	0-500%
Aspect Ratio	0-96%	0-96%
Position	X/Y	X/Y/Z
Crop	Left/Right/Top/Bottom	Left/Right/Top/Bottom
Freeze	Yes	No
Anti-Aliasing	No	Yes
Rotation	No	X/Y/Z

Feature	2D	3D
Border	Advanced	Simple
Border Color	Yes	Yes
Border Type	Flat/Bevel	No
Border Perspective	Yes	No
Lighting	Yes	No
Shadow	Yes	No
Mask	Box/Pattern	Box/Pattern
Split DVE	2 Channels	2 Channels

Keep the following in mind:

Keep the following in mind when working with a Fly Key:

- The Fly Key feature consumes a single DVE channel for self keys, but two DVE channels for an auto select and chroma keys.
- The Fly Key feature cannot be applied to a DVE key.
- The Key Invert feature is not available for a Fly Key.
- A chroma key should be initialized and adjusted before the DVE (Fly Key) is applied to it.
- A DVE key will unfreeze when it is copied or swapped.

2D DVE

The 2D DVE keys support size, aspect, X/Y position, and crop along with the effects like advanced borders and lighting/shadow.

To Set Up a 2D DVE Key

The 2D DVE engine allows you to apply digital video effects, such as scale, crop, aspect ratio, position, and border to a video image in 2D space.

The DVE resources for this key may not be available. Depending on how your switcher is configured, you may be asked to steal the resources from another element, or be prevented from using the resources.

> *Note: The DVE Freeze feature is only available in HD video modes.*

1. Click **Navigation Menu** > **Live Assist** > **MEs** and select the ME and key that you want to set up.

> *Tip: You can use the same procedure for a MiniME™.*

2. Click **Channel 1 Video** and select the video signal you want to use for the key.

> *Tip: If you are using Key Combiner, you can select sources for **Channel 1 Video** and **Channel 2 Video**.*

3. Click **2D DVE** > **Position / Crop**.

> *Tip: Click **Show Alpha** to have the preview output of the current ME switch to the alpha signal that is being used by the selected keyer. Show alpha is not available for MiniME™ outputs.*

> *Tip: Click **Key Preview** to force the program output of the selected keyer to the preview output of the switcher.*

> *Tip: If you are using Key Combiner, click **Channel 1** and select the channel (**Channel 1** or **Channel 2**) that you want to control.*

4. Use the **X-Position**, **Y-Position**, and **Size** sliders to position and size the key.
5. Use the **Aspect Ratio** slider to adjust the aspect ratio of the key.
6. Use the **Crop Left** and **Crop Right** sliders to crop the left and right sides of the key.
7. Use the **Crop Top** and **Crop Bottom** sliders to crop the upper and lower sides of the key.
8. Click a **Freeze** button (HD only) to freeze the video and appearance of the key (**On**). When a key is frozen, the DVE attributes are disabled and you can not move the key.
9. Click **Mask** to apply a mask to the key.

To Apply a 2D DVE to a Key (Fly Key)

The 2D Fly key is when the 2D DVE engine is applied to another key type.

The DVE resources for this key may not be available. Depending on how your switcher is configured, you may be asked to steal the resources from another element, or be prevented from using the resources.

You should set up your key as you want it before applying the Fly Key.

1. Click **Navigation Menu** > **Live Assist** > **MEs** and select the ME and key that you want to set up.
2. Click **DVE** and then click **2D DVE**.
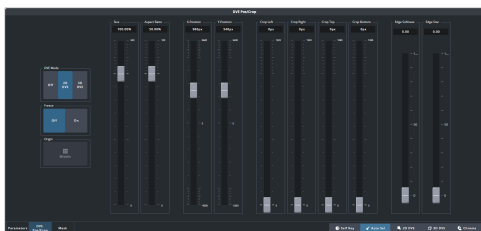
3. Use the **X-Position**, **Y-Position**, and **Size** sliders to position and size the key.

4. Use the **Aspect Ratio** slider to adjust the aspect ratio of the key.

5. Use the **Edge Size** and **Edge Softness** sliders to apply softness to the edges of to the key.

   Refer to *To Apply a Border/Edge Softness to a 2D DVE Key* on page 48 for more information on borders.

6. Use the **Crop Left** and **Crop Right** sliders to crop the left and right sides of the key.

7. Use the **Crop Top** and **Crop Bottom** sliders to crop the upper and lower sides of the key.

8. Click a **Freeze** button (HD only) to freeze the video and appearance of the key (**On**). When a key is frozen, the DVE attributes are disabled and you can not move the key.

To Apply a Border/Edge Softness to a 2D DVE Key

A 2D DVE border or edge softness is applied to the edges of the 2D DVE key and is manipulated as part of the key.

Note: *You can only apply a border to a DVE key. Fly Keys, such as chroma keys or auto select keys with DVE applied to them cannot have a border applied to them. Instead, the selection is Edge Softness and is used to soften the edges of the key without any color.*

1. Click **Navigation Menu** > **Live Assist** > **MEs** and select the ME and key that you want to set up.

   Tip: *You can use the same procedure for a MiniME™.*

2. Click **2D DVE** > **Border**.
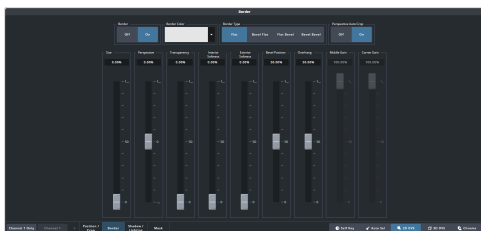
3. In the **Border** area, click **On** to apply the border to the key or **Off** to have it not

visible. The border setting are not changed when the border is turned off.

Tip: *To seamlessly apply a border with a custom control or memory, recall the border settings with the border turned off and then turn the border on with another CC event or memory. Remember to insert a pause between the border settings and turning the border on to allow for the border settings to be applied.*

4. In the **Border Type** area, select the type of border you want to apply.

   • **Flat** — border with no bevel appearance on the outside or inside of the border.
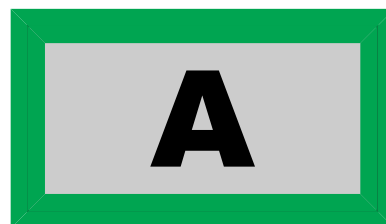
   • **Bevel Flat** — border that appears bevelled on the outside and flat on the inside.

   • **Flat Bevel** — border that appears flat on the outside and bevelled on the inside.
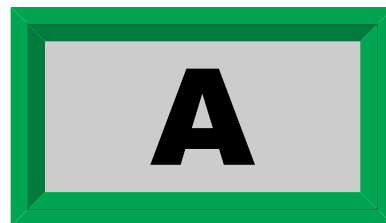
   • **Bevel Bevel** — border that appears bevelled on both the outside and inside.
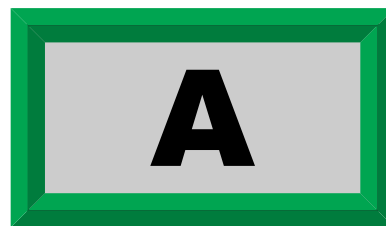
5. Use the **Size** slider to adjust the size of the border.

6. Use the **Perspective** slider to adjust the viewing angle of the border. This gives the

key the appearance of being rotated in 3D space. Use **Border Lighting** to further enhance this look.

> *Tip: Perspective is applied to the border of the key and not to the video inside the key. This can result in a black bar on the side of the key video. Apply a larger border or manually crop the key to remove the bar. Use **Perspective Auto Crop** to automatically crop the key when perspective is applied.*

7. Click on the **Border Color** area and select the color you want to use for the border. You can select in the **HSL** or **RGB** color space, or select one of the default colors at the bottom of the dialog box.

8. Use the **Transparency** slider to adjust the transparency of the inner and outer border.

9. Use the **Interior Softness** and **Exterior Softness** sliders to adjust the softness of the inner and outer border.

   • **Interior Softness** — adjust the softness of the interior edge of the inner border.

   • **Exterior Softness** — adjust the softness of the exterior edge of the outer border.

10. Use the **Bevel Position** slider to adjust the transition point of the inner and outer border. This is the point where the inner and outer border meet.

11. Use the **Overhang** slider to adjust the position of the border relative to the edges of the key.

> *Tip: At **50** the middle of the border is at the edge of the key. As you increase the overhang the border moves further to the outside of the key, revealing more of the video in the key.*

12. Use the **Middle Gain** and **Corner Gain** to adjust the brightness of the corners or center of the bevelled border (does not apply to flat border).

   • **Middle Gain** — adjust the brightness of the center portions of the border. These are the sections of the border that are not in the corners.

   • **Corner Gain** — adjust the brightness of the corners of the border.

To Apply Lighting to the 2D DVE Border
Apply a drop shadow and lighting effect to the 2D DVE Key and border.

1. Click **Navigation Menu** > **Live Assist** > **MEs** and select the ME and key that you want to set up.

> *Tip: You can use the same procedure for a MiniME™.*

2. Click **2D DVE** > **Shadow / Lighting**

3. Click a **Drop Shadow** button to turn the shadow on (**On**) or off (**Off**).

   The drop shadow is semi-transparent and appears behind the key on top of the background. The position of the shadow is adjusted using the border lighting settings. Effects that are applied to the exterior border are also shown on the drop shadow.

4. Use the **Shadow Transparency** slider to adjust the amount of the background that is visible through the drop shadow.

5. Use the **Shadow Softness** slider to adjust the sharpness of the edges of the drop shadow.

6. Use the **Shadow Depth** slider to adjust the apparent distance of the shadow from the key.

7. Use the **Brightness** slider to adjust the brightness of the light.

8. Use the **Horizontal Lighting** and **Vertical Lighting** slider to adjust the position of the lighting.

> *Tip: As you change the position of the light, the brightness of the bevel on the inner and outer border changes to match the shadow created by the light.*

3D DVE
The 3D DVE keys support size, aspect, X/Y/Z position, crop, and rotation along with the addition of effects like simple borders.

The 3D DVE operates by manipulating DVE keys, or individual channels, in 3-dimensional space. This allows you to position keys in front of, or behind, other keys, and make keys appear larger (closer to you) or smaller (further from you) than they are.

A 3D DVE key can be positioned anywhere in the virtual 3D world; however, it is only visible on screen if it is within the visible area. This allows you to perform transition effects where

the key appears to fly in from one side. The key is being taken from a position outside of the visible area into the visible area.
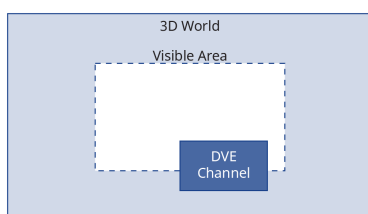
> **Tip:** *Size and Z-Position will appear similar but are performing different functions. Use Z-Position to move the key towards or away from the screen. Use Size to make the key bigger or smaller at the current z-position. When using a key combiner, this allows you to place a key in front of the other and adjust the size without changing the overlap position. Refer to DVE Key Combiner on page 52 for more information on combining keys.*

To Set Up a 3D DVE Key

The 3D DVE engine allows you to apply digital video effects, such as scale, crop, aspect ratio, position, and border to a video image in 3D space.

The DVE resources for this key may not be available. Depending on how your switcher is configured, you may be asked to steal the resources from another element, or be prevented from using the resources.

> **Note:** *The DVE Freeze feature is only available in HD video modes.*

1. Click **Navigation Menu** > **Live Assist** > **MEs** and select the ME and key that you want to set up.

   > **Tip:** *You can use the same procedure for a MiniME™.*

2. Click **Channel 1 Video** and select the video signal you want to use for the key.

3. Click **3D DVE** > **Position / Crop**.
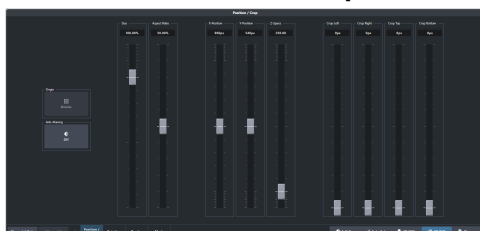
> **Tip:** *Click Show Alpha to have the preview output of the current ME switch to the alpha signal that is being used by the selected keyer. Show alpha is not available for MiniME™ outputs.*

> **Tip:** *Click Key Preview to force the program output of the selected keyer to the preview output of the switcher.*

4. Use the **X-Position**, **Y-Position**, and **Z-Space** sliders to position the key in 3D space.
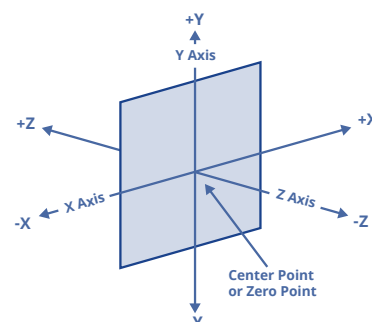
5. Use the **Size** slider to adjust the size of the key.

> **Tip:** *Size and Z-Position will appear similar but are performing different functions. Use Z-Position to move the key towards or away from the screen. Use Size to make the key bigger or smaller at the current z-position. When using a key combiner, this allows you to place a key in front of the other and adjust the size without changing the overlap position. Refer to DVE Key Combiner on page 52 for more information on combining keys.*
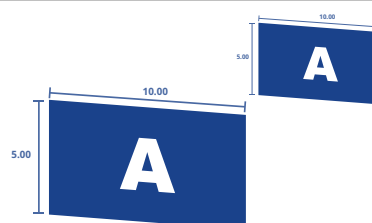
6. Use the **Aspect Ratio** slider to adjust the aspect ratio of the key.

7. Use the **Crop Left** and **Crop Right** sliders to crop the left and right sides of the key.

8. Use the **Crop Top** and **Crop Bottom** sliders to crop the upper and lower sides of the key.

9. Click **Mask** to apply a mask to the key.

To Apply a 3D DVE to a Key (Fly Key)

The 3D Fly key is when the 3D DVE engine is applied to another key type.

The DVE resources for this key may not be available. Depending on how your switcher is configured, you may be asked to steal the resources from another element, or be prevented from using the resources.

You should set up your key as you want it before applying the Fly Key.

1. Click **Navigation Menu** > **Live Assist** > **MEs** and select the ME and key that you want to set up.

2. Click **DVE** and then click **3D DVE**.
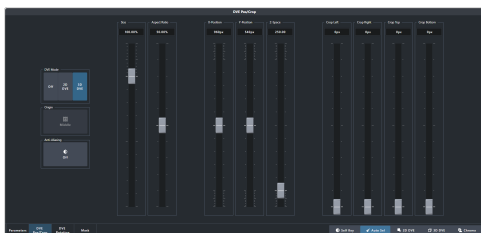
3. Use the **X-Position**, **Y-Position**, and **Z-Space** sliders to position the key in 3D space.
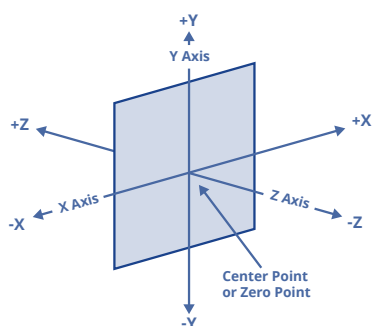
4. Use the **Aspect Ratio** slider to adjust the aspect ratio of the key.

5. Use the **Edge Size** and **Edge Softness** sliders to apply softness to the edges of to the key.

Refer to *To Apply a Border/Edge Softness to a 3D DVE Key* on page 52 for more information on borders.

6. Use the **Crop Left** and **Crop Right** sliders to crop the left and right sides of the key.

7. Use the **Crop Top** and **Crop Bottom** sliders to crop the upper and lower sides of the key.

8. Click **DVE Rotation** and use the Position and Pivot sliders to rotate the key. Refer to *To Apply Rotation to the 3D DVE Key* on page 51 for information on 3D DVE Rotation.

To Apply Rotation to the 3D DVE Key

Apply a rotation to the key in any direction.

1. Click **Navigation Menu** > **Live Assist** > **MEs** and select the ME and key that you want to set up.

> **Tip:** *You can use the same procedure for a MiniME™.*

2. Click **3D DVE** > **Rotation**
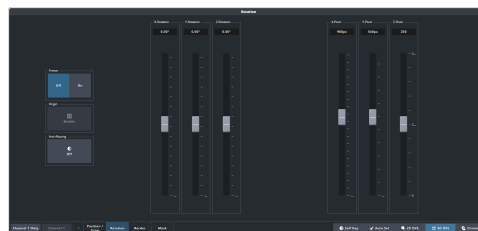
3. Use the **X-Pivot**, **Y-Pivot**, and **Z-Pivot** sliders to adjust the location of the pivot point used for rotation.

- **X-Pivot** — move the pivot point from side to side.
- **Y-Pivot** — move the pivot point up or down.
- **Z-Pivot** — move the pivot point towards or away from you.

The pivot point in is the point in 3D space where the key rotates around when a rotation is applied. The pivot point is unique to for each key.
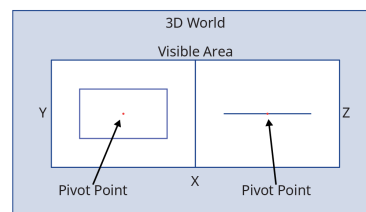
4. Use the **X-Rotation**, **Y-Rotation**, and **Z-Rotation** sliders to rotation of the key around the pivot point.

X-Rotation	Rotate the key from side to side around the Y-axis.	
Y-Rotation	Rotate the key up or down around the X-axis.	
Z-Rotation	Rotate the key clockwise, or counter-clockwise around the Z-axis.	

> **Tip:** *If you rotate the key in the X or Y plane past 90 degrees in either direction, the back-side of the key is visible. This is the reverse image of the front-side.*

To Apply a Border/Edge Softness to a 3D DVE Key

A 3D DVE border or edge softness is applied to the edges of the 3D DVE key and is manipulated as part of the key.

> **Note:** *You can only apply a border to a DVE key. Fly Keys, such as chroma keys or auto select keys with DVE applied to them cannot have a border applied to them. Instead, the selection is Edge Softness and is used to soften the edges of the key without any color.*

1. Click **Navigation Menu** > **Live Assist** > **MEs** and select the ME and key that you want to set up.

   > **Tip:** *You can use the same procedure for a MiniME™.*

2. Click **3D DVE** > **Border**.
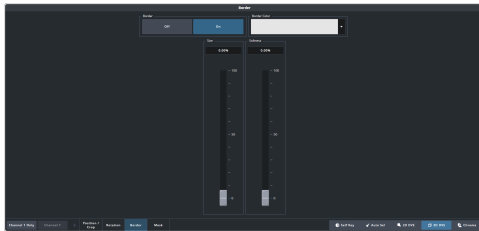
3. In the **Border** area, click **On** to apply the border to the key or **Off** to have it not visible. The border setting are not changed when the border is turned off.

   > **Tip:** *To seamlessly apply a border with a custom control or memory, recall the border settings with the border turned off and then turn the border on with another CC event or memory. Remember to insert a pause between the border settings and turning the border on to allow for the border settings to be applied.*

4. Use the **Size** slider to adjust the size of the border.

5. Use the **Softness** slider to adjust the softness of the edges of the key and border.

6. Click on the **Border Color** area and select the color you want to use for the border. You can select in the **HSL** or **RGB** color space, or select one of the default colors at the bottom of the dialog box.

DVE Key Combiner

Combine two channels from the same 2D or 3D DVE keyer to make independent keys that can be layered or intersected.

The key combiner allows two independent DVE channels to operate in the same 2D or 3D DVE keyer. These channels can have different video sources and can be moved, cropped, and sized

independently of each other. As both channel exist in the same keyer they cannot be transitioned independently and are both transitioned on-air or off-air together.

Combined keys allow you to control how the channels interact with each other. You can control which channel is on top of the other or, in 3D, you can intersect the channels.
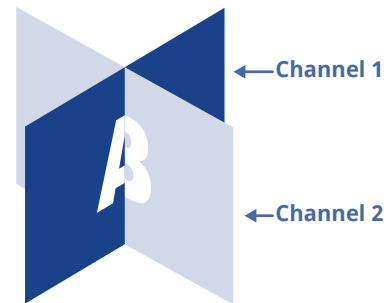
Keep the following in mind:

Keep the following in mind when working with the key combiner:

- The key combiner uses both the video and alpha channels of the key. The channel that is on top is routed to the alpha and the channel that is on the bottom is routed to the video. These correspond to the Key Video and Key Alpha outputs.

To Configure the Key Combiner

Set how the DVE channel interact with each other.

1. Click **Navigation Menu** > **Live Assist** > **MEs** and select the ME and key that you want to set up.

2. Click **Channel 1 Video** and select the video signal you want to use for the key.

3. Click **2D DVE** or **3D DVE**, depending on the type of key you want to use.

4. Click **Channel 1 Only**. If the key combiner has already been set up, this button shows the current state of the combiner.
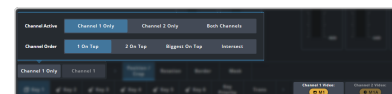
5. Click a **Channel Active** button to select which channel you want to be active.

   - **Channel 1 Only** — channel 1 is active in the keyer.
   - **Channel 2 Only** — channel 2 is active in the keyer.

- **Both Channels** — both channel 1 and 2 are active in the keyer.
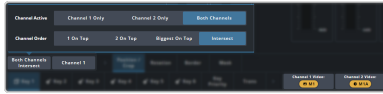
6. Click a **Channel Order** button to select which order you want the channels to appear in the keyer.

    - **1 On Top** — channel 1 always appears over top of channel 2.
    - **2 On Top** — channel 2 always appears over top of channel 1.
    - **Biggest On Top** — the largest channel (**Size**) always appears on top.
    - **Intersecting** (3D Only) — the channel that is closer to the origin point on the z-axis is on top.

    Tip: *If the channels are rotated in the X or Y axis, the channels can intersect and partially cover each other as they move through the Z-axis.*

7. If **Both Channels** is active, click the **Channel x** button and select the channel (**Channel 1** or **Channel 2**) that you want to control.

Show Alpha

You to route the processed alpha for the selected keyer to the preview output for the ME you are working on.

Show alpha is not available on a MiniME™.

- Select the keyer that you want to show the alpha for and press and hold the **SHOW ALPHA** button on the control panel. The preview output of the ME shows the processed alpha of the selected key until the button is released.
- Select the keyer that you want to show the alpha for and double-press the **SHOW ALPHA** button. The preview output of the ME shows the processed alpha of the selected key until the button is pressed again.
- Toggle the **Show Alpha** button on from the Live Assist.

Masks

A Mask is a technique in which a pattern is combined with the key source to block out unwanted portions of the key source.

Two types of masks are available, Box masks and Pattern masks. All key types can be masked.

- **Box Mask** — uses a simple box shape to mask out a portion of the key
- **Pattern Mask** — uses a pattern from the pattern generator to mask out a portion of the key

Note: *Pattern masks are not supported in UHDTV1.*

Note: *Pattern masks are not supported for Chroma Keys on a MaxScene.*

To Pattern Mask a Key (HD Only)

Pattern masks can be adjusted for size, location, rotation, and multiplication.

1. Click **Navigation Menu** > **Live Assist** > **MEs** and select the ME and key that you want to set up.

   *Tip:* *You can use the same procedure for a MiniME™.*

2. Click **Mask** > **Pattern**.
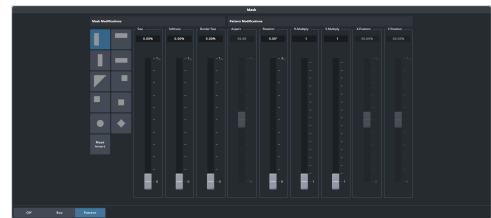
3. Select the pattern you want to use for the mask.
4. Click **Mask Invert** to invert the masked area with the unmasked area.
5. Set up the mask pattern as required.

    - **Size** — adjust the size of the mask region.
    - **Softness** — apply softness to the edges of the mask region.
    - **Border Size** — apply a border to the mask region and adjust the size. At size 0 the border is off.
    - **Aspect** — adjust the aspect ratio of the mask. Not all patterns allow you to adjust the aspect.
    - **Rotation** — rotate the mask pattern. Not all patterns can be rotated
    - **H-Multiply** — multiply the mask pattern horizontally.
    - **V-Multiply** — multiply the mask pattern vertically.
    - **X-Position** — position the mask on the x-axis.

- **Y-Position** — position the mask on the y-axis.

To Box Mask a Key

Box masks can be adjusted for size, location, rotation, and multiplication.

1. Click **Navigation Menu** > **Live Assist** > **MEs** and select the ME and key that you want to set up.

   > *Tip:* *You can use the same procedure for a MiniME™.*

2. Click **Mask** > **Box**.
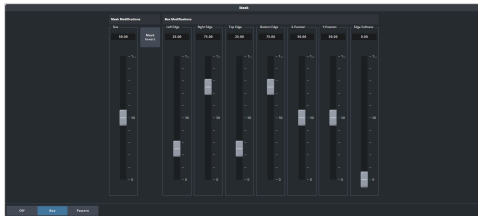
3. Click **Mask Invert** to invert the masked area with the unmasked area.
4. Set up the mask as required.
   - **Size** — adjust the size of the mask region.
   - **Left Edge** — adjust the position of the left edge of the mask region.
   - **Right Edge** — adjust the position of the right edge of the mask region.
   - **Top Edge** — adjust the position of the top edge of the mask region.
   - **Bottom Edge** — adjust the position of the bottom edge of the mask region.
   - **X-Position** — position the mask on the x-axis. This adjust both the left and right edges at the same time.
   - **Y-Position** — position the mask on the y-axis. This adjusts both the top and bottom edges at the same time.

   > *Tip:* *You can use the Positioner to adjust the size and position of the box mask.*

Split Keys

A Split key allows you to assign a different alpha source for a key than the fill/alpha associations that are set up during configuration, or to use a separate alpha source for a Self key.

A split key can be applied to an auto select, or self key.

To Set Up a Split Key

A split key works on an **Auto Select** or **Self Key** that has been set up and you want to apply a different alpha to.

1. Set up your key with the video source you want to use.
2. Click **Navigation Menu** > **Live Assist** and select the key you want split.

   > *Tip:* *From the control panel, press and hold the **SELF** or **AUTO** (depending on the type of key you are splitting) and press the source button for the new alpha you want to use.*

3. Click **Key Alpha** and select the new alpha you want to use.

Memory Functions

A memory register is a snapshot of the current state of the switcher that can include one or multiple ME, MiniME™, or scenes. Up to 100 memory registers per ME, MiniME™, or scene can be stored and recalled on the switcher. Each of these memory registers can store as little as the information of one ME, or as much as the current state of the entire switcher, including all ME, MiniME™, scenes, Aux Buses, and DVE settings.

Storing Memories

When you store a memory, you are storing the complete state of that panel row. This includes the current state of all the areas on the ME, including keyer settings, transition rates, wipe and pattern selections, and source selections. In addition to the current state of the panel, the current settings for the various keyers, such as chroma key settings, and clip and gain settings, are also stored.

To Store a Memory

How to store a memory.

1. Click **Navigation Menu** > **Live Assist** > **Memory** > **Store**.
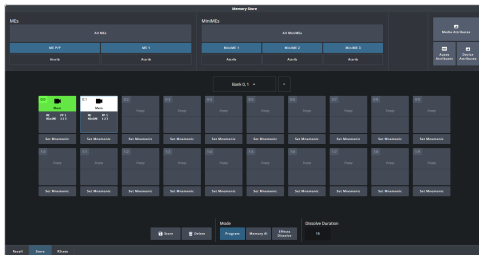
> *Note: Depending on the configuration of your switcher, you may have more ME, MiniME™, or MaxScene selections.*

2. Select the ME, MiniME™, and MaxScene that you want to store the memory for. When you include an area in a memory, the current state of that area is stored in the memory and will be recalled with the memory.

3. Click the **Bank 0, 1** button and select the bank you want to store the memory to.

> *Tip: The menu shows two banks of memories at a time. One bank on top and the next bank on the bottom. You can click the **Bank** button to select the bank directly, or click the **<** and **>** arrows you jump to the next pair of banks.*

4. Click the button for the memory register you want to store the memory to.

> *Tip: The Bank and Register are shown in the upper left corner of the memory buttons. For example memory **0:0** is Bank 0 Register 0, and **3:5** is Bank 3 Register 5.*

> *Tip: If a memory register already contains memory information, the button shows the inclusions that are currently stored for that memory.*

5. Select the recall mode for the memory. This is the mode that is stored in the memory, but can be overridden when the memory is recalled.

    *   **Program** — all elements are recalled as stored (default).
    *   **MemoryAI** — current on-air elements are unchanged and the transition area is configured to take the on-air elements of the memory on-air with the next transition.
    *   **Effects Dissolve** — on-air elements listed below are transitioned to the elements stored in the memory. The time it takes to go from the current elements to the elements in the memory is set in the **Effects Duration** field.
        *   Matte colors (background, wash or borders)
        *   Keyer settings like clip, gain, transparency
        *   Mask position and size
        *   Pattern settings like size, position, aspect, border, softness, rotation
        *   DVE settings like size, position, aspect, border, softness, cropping
        *   Media-Store x/y position
        *   Transition Progress

6. Set the memory attributes that you want recalled with the memory. Refer to *Memory Attributes* on page 57 for information on memory attributes.

> *Tip: All attributes are stored in the memory. Turning individual attributes on or off sets whether that item is included with the memory recall. Individual attributes can be turned on or off when the memory is recalled.*

7. Click **Store** to store the memory.

Recalling Memories

When you recall a memory, the existing configuration of that ME is replaced with the settings stored in the memory.

Keep the following in mind:

Keep the following in mind when recalling memories:
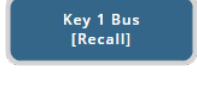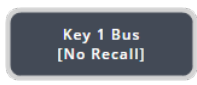
- How a memory is recalled depends on the how the Memory Attributes are set.
- Recalling a memory that includes a source assigned to a camera also recalls the shot stored in the memory for that camera if the **CamRcl** memory attribute is set to **Recall**. There is no delay in the memory recall so camera movement may be visible while the shot is recalled.
- You can override the video source stored in a memory by pressing and holding a source button and recalling the memory (Bus Hold). The held source button overrides the source that is recalled with the memory for that bus. The memory is not affected by a Bus Hold and will recall properly without the Bus Hold.
- Enabling Memory AI mode changes the way key elements are recalled. If a key is currently on-air, the element for that key is recalled in the next available off-air key. If there is no available off-air keys, the element is not recalled.

Related information
Memory Attributes on page 57

Memory Attribute Color Coding

For a memory recall you can set individual attributes to be recalled or not, regardless of how they were stored. How the attribute is recalled is indicated by the color of the attribute button.

Color	Description
Key 1 Bus [As Stored]	**As Stored** — the memory attribute is recalled exactly as it was stored in the memory.
Key 1 Bus [Recall]	**Recall** — the memory attribute is recalled with the memory, even if the attribute was not set to be stored with the memory.
Key 1 Bus [No Recall]	**No Recall** — the memory attribute is not recalled with the memory, even is the attribute was set to be stored with the memory.

To Recall a Memory

How to recall a memory using DashBoard.

1. Click **Navigation Menu** > **Live Assist** > **Memory** > **Recall**.
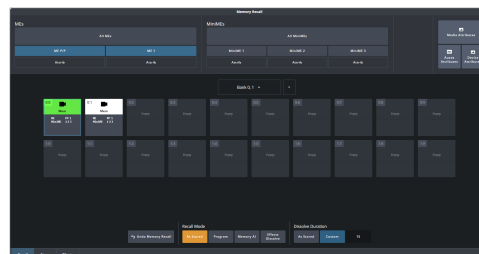
2. Select the ME, MiniME™, and MaxScene that you want to recall the memory for.

3. Click the **Bank 0, 1** button and select the bank you want to store the memory to.

> *Tip: The menu shows two banks of memories at a time. One bank on top and the next bank on the bottom. You can click the **Bank** button to select the bank directly, or click the **<** and **>** arrows you jump to the next pair of banks.*

4. Click the button for the memory register you want to store the memory to.

> *Tip: The Bank and Register are shown in the upper left corner of the memory buttons. For example memory **0:0** is Bank 0 Register 0, and **3:5** is Bank 3 Register 5.*

> *Tip: If a memory register already contains memory information, the button shows the inclusions that are currently stored for that memory.*

5. Select the recall mode for the memory.

> *Note: Recall attributes are color-coded for how they are going to be recalled. Refer to Memory Attribute Color Coding on page 56 for information on the color meaning.*

- **As Stored** — recall the memory with the same attributes that it was stored with.
- **Program** — all elements are recalled as stored (default).
- **MemoryAI** — current on-air elements are unchanged and the transition area is configured to take the on-air elements of the memory on-air with the next transition.
- **Effects Dissolve** — recall the memory with an effects dissolve to the new memory elements. The time it takes to go from the current elements to the elements in the memory is set in the **Effects Duration** field or using the **Effect Duration From Memory**.

6. Set the memory attributes that you want recalled with the memory. Refer to *Memory Attributes* on page 57 for information on memory attributes.

7. Click the *X:Mem* button to recall the memory.

Memory Attributes

Memory Attributes allow you to specify what elements are recalled with a memory, as well as adding effects to memory recalls. These elements include the background/preset buses, keyer bus, Aux bus, and Media-Store selections, as well as keyer on-air status, and transition selections.

In addition to setting which sources to recall with the memory, effects such as performing an auto transition after the memory recall or running a custom control after the memory recall, can also be included.

Memory attributes can be set both when the memory is stored, and when it is recalled. This allows you to store a set of attributes with a memory and then recall it as stored, or override the attributes stored in the memory and apply different ones when the memory is recalled. A memory attribute does not need to be stored in the memory to be recalled.

To Set the Memory Attributes

Memory attributes can be set when the memory is stored or when it is recalled. This procedure sets the store attributes, but the information applies to both.

1. Click **Navigation Menu** > **Live Assist** > **Memory** > **Store**.

2. Click **Device Attributes** and select the attributes.

- **Roll Clip** — set whether a play command is triggered when a source that is assigned to a video server is recalled.
- **Camera** — set whether camera shots are recalled.

3. Click **Media Attributes** and select the Media-Store attributes.

- **Media***X* — set whether Media-Store items and settings for the selected channel are recalled.

4. Click the **Attrib** button for the ME you want to set the attributes for.

- **Trans Area** — set how the next transition type and parameters are recalled.
- **Next Trans** — set how the next transition area is recalled.
- **Run Auto** — set whether a transition is performed after the memory is recalled. (Not available during Effects Dissolve transitions.)
- **Background Bus** — set how the sources selected on the background bus are recalled.
- **PST Bus** — set how the sources selected on the preset bus are recalled.
- **Shared Pattern** — set whether the settings for the shared Key Mask/Wash pattern generator is recalled.
- **Key Priority** — set whether the key priority is recalled.
- **Key *X* Bus** — set whether the source selected on the key bus is recalled.
- **Key *X* Active** — set whether the on-air status of the key is recalled.
- **Key *X* Type** — set whether the key type is recalled.
- **Key *X* Mask** — set whether mask settings for the key are recalled.

5. Click the **Attrib** button for the MiniME™ you want to set the attributes for.
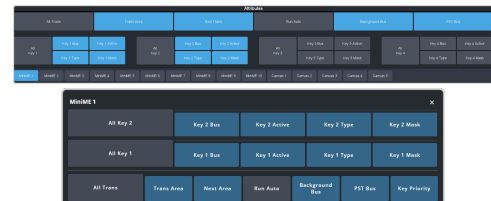
- **Trans Area** — set how the next transition type and parameters are recalled.
- **Next Trans** — set how the next transition area is recalled.

- **Run Auto** — set whether a transition is performed after the memory is recalled. (Not available during Effects Dissolve transitions.)
- **Background Bus** — set how the sources selected on the background bus are recalled.
- **PST Bus** — set how the sources selected on the preset bus are recalled.
- **Key Priority** — set whether the key priority is recalled.
- **Key *X* Bus** — set whether the source selected on the key bus is recalled.
- **Key *X* Active** — set whether the on-air status of the key is recalled.
- **Key *X* Type** — set whether the key type is recalled.
- **Key *X* Mask** — set whether mask settings for the key are recalled.

6. Click **Aux Bus Attributes**.

- **Aux *X*** — set whether the source selected on the aux bus is recalled.

Deleting a Memory

You can delete the contents of a single memory. Only one memory can be cleared at a time, and you cannot undo the deletion.

Tip: *You can clear all memories from the switcher from the control panel. (Press MENU > Reset > NEXT > NEXT.)*

To Delete a Memory

Delete an individual memory or bank.

1. Click **Navigation Menu** > **Live Assist** > **Memory** > **Store**.
2. Select the memory you want to delete. You can use the **Bank 0,1** button to select a different Bank.
3. Click **Delete**.

Memory Names and Mnemonics (TouchDrive only)

Assign custom mnemonic colors and names to individual memories. These are only visible on

the TouchDrive panel when the user select bus is assigned to a memory bank,

To Assign a Name to a Memory

Memories can have custom names and colors on the TouchDrive control panel.

1. Click **Navigation Menu** > **Live Assist** > **Memory** > **Store**.
2. Click **Set Mnemonic** below the memory you want to name.
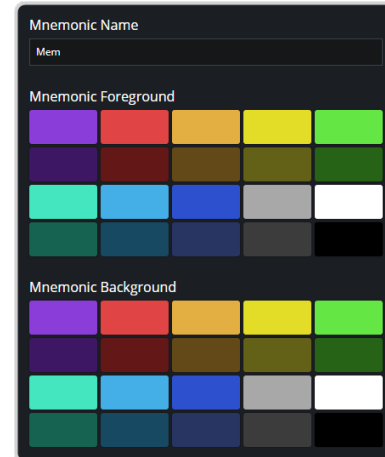
Setting	Description
Name	Enter a new name for the selected memory.
Foreground	Click a **Foreground** button to select the color you want to apply to the text on the mnemonic.
Background	Click a **Background** button to select the color you want to apply to the background on the mnemonic.

Switcher Sets

The switcher stores configuration and operation data in a number of registers that contain the individual entries for items such as memories or personality settings. These registers can be stored as a single archive file, or as a register set that contains all the individual register of that type; all memories for example. These files are stored into Sets on USB drive. Different Sets can be created for different shows or applications, allowing you to quickly locate and recall the switcher configurations.

The switcher stores information in the following registers:

- **Memory** — contains all the memories for ME, MiniME™, and RState.
- **Custom Control** — contains all the custom control banks and macros.
- **Sequences** — contains of all the sequences created in the sequencer.
- **MaxScene** — contains all of the MaxScene memories.
- **Installation** — contains all the external device setup, and software settings for the switcher.
- **Personality** — contains all the user interface settings, such as transition rates, that are stored under the **Personality** menu. Some personality settings are specific to the control panel and can be stored independently if you are working with a MultiPanel system.
- **RPM Licensing** — contains all the licenses that have been requested from the Ross Platform Manager. When this set it recalled, the switcher will request or release the current RPM licenses to match those in the set.

Tip: Sets are stored differently if they are stored directly to the USB or exported. Sets stored directly to the USB are located in folders, but sets that are exported are archived in a TAR file. To interchange between the two you will need an archive program, such as 7-Zip, to extract the files from the TAR file or archive the files into a TAR file. Inside the TAR is the Set folder (named how you want the set named on the switcher) and component sub folders.

Note: If you are switching between switcher modes, you should save a separate switcher set for each mode. This ensures that settings that apply to a particular mode are properly stored and recalled for that mode.

To Store a Set

Store the switcher set to retain a copy of the current configuration of the switcher.

Note: If you are updating an older setup file, you must perform a Recall All followed by a Store All. This updates the setup files the latest format. You can then make changes and store to individual registers if needed.

Tip: The switcher provides 10 empty sets by default. Additional sets can be created if you rename the sets on the USB from a separate computer.

1. Insert a USB drive into the USB Port on the SDPE blade assigned as ME P/P. You must wait 5 seconds for the switcher to recognise the USB drive.

   Tip: If you do not have a USB drive, you can store the working set to temporary internal storage. This set will be lost when the switcher restarts, but can be exported to an external computer.

2. Click **Navigation Menu** > **Configuration** > **System** > **Save Sets**.

   *Tip: Click **Refresh Sets** to update the list of available sets on the USB.*
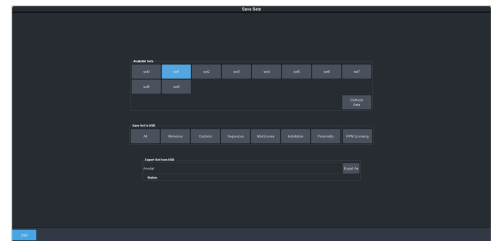
   *Note: Only the registers that are supported by your current configuration are shown. For example, if you do not have an SDPE blade assigned as a MaxScene, the **MaxScenes** register is not shown. The MaxScene register will not be shown even if it is present in the set.*

3. Click an **Available Sets** button for the set you want to store the switcher registers to.

4. Click a **Save Set to** button to save that register to the selected set on the USB or internal drive. If the button is shown in brown, that register already exists in the set and will be overwritten.

   - **All** — store all registers to the set. RPM Licensing is not included.
   - **Memories** — store only the memory registers to the set.
   - **Customs** — store only the custom control registers to the set.
   - **Sequences** — store only the Sequencer registers to the set.

- **MaxScenes** — store only the MaxScene registers to the set.
- **Installation** — store only the installation registers to the set.
- **Personality** — store only the personality registers to the set.
- **RPM Licensing** — store software licenses requested from Ross Platform Manager.

5. Click **Yes**.

The registers are stored to the set on the USB or internal drive.

To Load a Set

Load the switcher set to restore a copy of the previous configuration of the switcher.

Note: If you are updating an older setup file, you must perform a Recall All followed by a Store All. This updates the setup files the latest format. You can then make changes and store to individual registers if needed.

1. Insert a USB drive into the USB Port on the SDPE blade assigned as ME P/P. You must wait 5 seconds for the switcher to recognise the USB drive.

   Tip: If you do not have a USB drive, you can recall the set from temporary storage. This set will be lost when the switcher restarts. Importing a set from an external computer will be stored in the temporary storage.

2. Click **Navigation Menu** > **Configuration** > **System** > **Load Sets**.

   Tip: Click Refresh Sets to update the list of available sets on the USB.
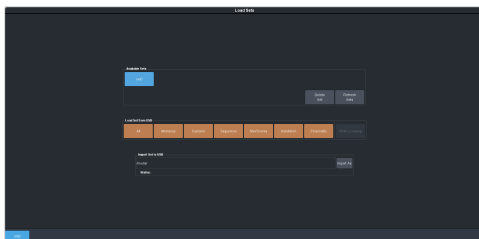
   Note: Only the registers that are supported by your current configuration are shown. For example, if you do not have an SDPE blade assigned as a MaxScene, the MaxScenes register is not shown. The MaxScene register will not be shown even if it is present in the set.

   Tip: You can import a switcher set from your local computer in the Import Set to Available Sets area.

Click Import As and navigate to the folder where the set is stored and click Open. It may take several minutes for the set to upload to the switcher.

Tip: You can delete a set you no longer want by selecting the set and clicking Delete Set.

3. Click an **Available Sets** button to select the set you want to load the switcher register from.

4. Click a **Load Set from USB** button to load that register. Only those registers that are present in the set are shown.
   - **All** — recall all registers from the set. RPM Licensing is not included.
   - **Memories** — recall only the memory registers from the set.
   - **Customs** — recall only the custom control registers from the set.
   - **Sequences** — recall only the Sequencer registers from the set.
   - **MaxScenes** — recall only the MaxScene registers to the set.
   - **Installation** — recall only the installation registers from the set.
   - **Personality** — recall only the personality registers from the set.
   - **RPM Licensing** — recall only the software licenses requested from Ross Platform Manager.

   Note: Recalling an RPM Licensing set that requests or releases RPM licenses may require the restart of the switcher to apply the licenses.

5. Click **Yes**.

Importing a Set

Import a switcher set from another Ultra or Ultrix Carbonite.

When you import a set, the switcher attempts to apply all the configurations in that set. If the set contains features or resources that the switcher does not have, those settings are ignored.

Importing a Set from Carbonite

Import a switcher set from a Carbonite family of switcher.

🛈 *Important: This feature is only available with sets exported from Carbonite version 15.6.0 or higher.*

When you export the working set from Carbonite it is converted into a format that is

compatible with HyperMax. Not all setting can be converted and should be reviewed after the set is imported.

Keep the following in mind:

Keep the following in mind when importing a set from Carbonite Black:

- Modified color schemes in Carbonite cannot be imported into Ultra, Ultrix Carbonite, or HyperMax.
- If a video source used in a set (custom control, bus map, or GPI) does not exist in the switcher it is imported to, black will be selected instead.
- When a set is imported to HyperMax from Carbonite the ME numbering will be different. In Carbonite the highest numbered ME is the program ME. In HyperMax ME P/P is the program ME.
  - ME 1 -> ME P/P
  - ME 2 -> ME 1
  - ME 3 -> ME 2
- When a Memory is imported to Ultra or Ultrix Carbonite from Carbonite the ME numbering will be different. Only memories are mapping in this way.
  - ME 1 -> ME 2
  - ME 2 -> ME 1
  - ME 3 -> ME P/P
- When a set is imported to HyperMax from Carbonite some outputs (such as PGM, PRV, and CLN) are not available and must be re-assigned. For example, ME P/P replaces PGM.
- Custom controls imported to HyperMax from Carbonite cannot have memory recall events. These custom controls will not be imported.
- When exporting memories or custom controls that load Media-Store media items, the media item IDs and attributes must match between the switchers you are exporting from and importing to. This information is not included is the sets. If the media items do not match, the memories and custom controls may load the wrong media items or with the wrong attributes.
- When loading exported memories or custom controls that load Media-Store media items with an alpha, the alpha will be loaded twice. Carbonite uses one of the other Media-Store channels to load the alpha. HyperMax has

dedicated alpha channels for each Media -Store channel. When the exported memory or custom control is loaded in HyperMax the alpha is loaded in the correct alpha channel as well as the channel that Carbonite was using for the alpha.

- If you do not have a USB drive, the set is imported to the temporary storage set. Temporary storage is cleared when the switcher reboots.

To Import a Set

Importing a set from your computer to the switcher.

1. Insert a USB drive into the USB Port on the SDPE blade assigned as ME P/P. You must wait 5 seconds for the switcher to recognise the USB drive.

2. Click **Navigation Menu** > **Configuration** > **System** > **Load Sets**.
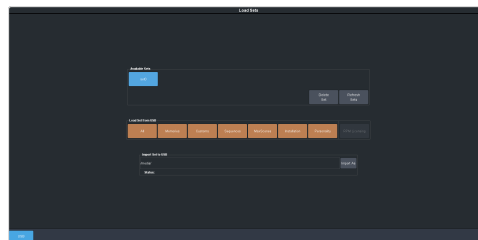
3. In the **Import Set to...** area, click **Import As** and navigate to the folder on your computer where the set is stored and click **Open**.

   It may take several minutes for the set to upload to the switcher.

4. Click the **Available Sets** button for the set you just imported.

   > **Tip:** Click **Refresh Sets** if the imported set does not appear on the list.

With the new set imported onto the switcher, you can load it just as you would any other set.

Exporting a Sets

Export a switcher set to the DashBoard computer.

When you export the working set from Carbonite it is converted into a format that is compatible with HyperMax. Not all setting can be converted and should be reviewed after the set is imported.

To Export a Set

Exporting a set to your computer from the switcher.

1. Insert a USB drive into the USB Port on the SDPE blade assigned as ME P/P. You must wait 5 seconds for the switcher to recognise the USB drive.

2. Click **Navigation Menu** > **Configuration** > **System** > **Save Sets**.
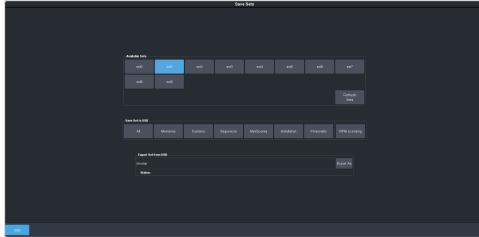
3. Click the **Available Sets** button for the set you want to export.

4. In the **Export Set from...** area, click **Export As** and navigate to the folder on your computer where you want to store the exported set and click **Save**.

    It may take several minutes for the set to download from the switcher.

Media-Store

The MediaManager interface to the Media-Store allows you to load stills, animations, or audio files. Each ME, MiniME™, and MaxScene have their own Media-Store channels.

Keep the following in mind:

Keep the following in mind when working with Media-Store:

- A still, animation, or audio can be loaded either by browsing the file system, or by entering the still number using the pattern buttons.
- You can clear a Media-Store channel by loading media number 000.
- If you are loading an Auto Key into a Media-Store channel, you must have another Media-Store channel associated with the current one to load the alpha into.
- An FTP connection using RossLinq can be created from an external device directly to a Media-Store channel on the switcher.
- If you delete a media item from the disk, you may have to load that media item into a Media-Store channel for the switcher to prompt you to delete the media item from the database.
- Media items must be created in the same color gamut and dynamic range that they are intended to be used in on the switcher. If a media item is created in one color space and the switcher is operating in another, the media item may not appear correctly.
- If you delete or rename a media item using the file system, you must attempt to load the old file to clear that entry from the database.
- Media-Store attributes are stored in the database for a media item. These are the default settings that will be used every time that media item is loaded into a media channel. When a media item is loaded into a channel you can override the database settings. These override settings are only applied to the media item while it is loaded into the media channel and are not stored to the database entry.
- You can only change the X and Y position of a media item that is smaller than the full size of the screen.
- Media-Store channels from the SDPE blade assigned as a MaxScene are only available

to that SDPE blade. Media-Store channels from any ME or MiniME™ can be used anywhere.

Working With Media-Store Animations

Media-Store animations can be used for animated backgrounds, branding "bugs", or media transitions. You can set up an animation to loop, play automatically when taken on-air, play in reverse, or even play at different speeds.

> **Tip:** *You can play an animation manually from a control panel by selecting the source button for the Media-Store channel with the animation you want to play, and pressing **Run** on the3-knob menu. The knob changes to **Stop** as the animation is playing.*

Keep the following in mind:

Keep the following in mind when working with Media-Store animations:

- When you load an animation to an off-air Media-Store channel, or the animation goes off-air with a transition, the preview shows the cut point (**CutFr**) for that animation, and not the first frame of the video.
- You can manually cycle through frames by turning the **Run** knob while the animation is stopped.
- Double-pressing the **Run** knob stops playback and re-cues the animation to the first frame.
- You can shuttle forwards and backwards through the animation by turning the positioner clockwise or anti-clockwise when the animation is stopped, if your control panel has a positioner with a z-axis. Shuttle speed is increased and decreased by turning the positioner more or less in each direction.
- You can run or stop an animation by pressing the positioner button, if your control panel has a positioner with a button.

Working With Media-Store Audio

Audio can be added to the playout of a Media-Store channel either by loading the file directly, or by naming the audio file the same as the animation or still you want it to play out with. When you load the still or animation, the switcher will automatically load the audio file of the same name.

Keep the following in mind:

Keep the following in mind when working with Media-Store audio:

- Audio files must be 20-bit or 24-bit wav files at a 48kHz sample rate.
- Audio files must be in the same folder and have the same name as the still or animation they are to be associated with.
- An audio file does not need to be of the same length as the animation it is associated with.
- A still with audio or audio only have the Auto Play and Looping attributes. These apply to the audio playout.
- The looping time of an animation with audio is the length of the animation.
- A Media-Store channel can be loaded with Audio only.

Media-Store Cache Manager

View all the media that is loaded into a Media-Store cache and remove unused items.

The cache manager allows you to review the media that is currently loaded into each cache, including name, id, size in cache, and frames, as well as remove items to free up space. The current amount of free space in the selected cache is shown at the bottom left.

The cache for each SDPE is broken up into RAM blocks. Each block of RAM provides the temporary storage for the media items for a set of channels. The size of the cache and the size of each media item are shown on the cache manager.

Tip: *To remove an item from the cache, select the item you want to remove and click* **Remove**.

Note: *A media item can only be removed from the cache if it is not currently loaded into a Media-Store channel.*

Media-Store File Specifications

Media items can be in TGA, PNG, or JPG file formats. For animations, the files must be numbered to indicate the order they go in, and

the name and the number must be separated with an underscore. For audio, 20-bit or 24-bit WAV files of the same name as the still or animation are used to associate audio with a still or animation.

For example, the following files are treated as a single animation named Anim that is 100 frames long:

- Anim_001.tga
- Anim_002.tga
- Anim_003.tga
- ...
- Anim_100.tga

Note: *Media items must be created in the same color gamut and dynamic range that they are intended to be used in on the switcher. If a media item is created in one color space and the switcher is operating in another, the media item may not appear correctly.*

Note: *An animation must start with* _001 *at the end of the name of the first frame.*

! *Important:* *File or folder names cannot contain symbols such as* ! @ # & * ( ) / , ? \ ' " *and cannot start with an underscore (_). Files or folders that start with a period (.) are hidden.*

Animation File Size

The number of frames that an animation can have depends on the raster size of the frames in the animations. Compressed image formats are uncompressed inside the switcher and an alpha is applied when the file is loaded into the Media-Store.

Note: *Media-Store channels share blocks of RAM on each SDPE assigned as a ME, MiniME™, or MaxScene. As you load an animation into one channel in the block, the amount of RAM available to the other channels is reduced.*

Table 2: ME and MiniME™ RAM Blocks

Raster	M1	M3	M2	M4
3840×2160 (UHDTV1)	112		112	
1920×1080 (1080p)	320		320	
1280×720 (720p)	725		725	

Media-Store Overview

The **Overview** menu allows you to view all the Media-Store channels across all SDPE blades in the switcher. All the basic commands are

available for each channel, but you cannot load a media item into a channel from this menu.

* Click **Navigation Menu** > **Live Assist** > **Media** > **Overview**
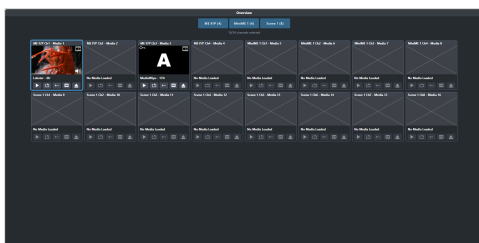
The number of Media-Store channels that are available depend on the role the SDPE blade has been assigned and the video mode the switcher is operating in.

Table 3: Media-Store Channels per SDPE Blade

SDPE Role	HD	UHDTV1
MaxME	4	4
MaxMini	4	4
MaxScene	8	4

Loading Stills or Animations

Stills or animations can be loaded into Media-Store channels by navigating to the file in MediaManager. MediaManager creates and maintains a database of the media items on the drive where the media items are stored, as well as the setting for each media item and a thumbnail.

Note: The internal cache is used for sample images only and cannot be used to store user stills or animations.

To Load a Media Item

Media items are loaded into a Media-Store channel from MediaManager

Note: Media items must be created in the same color gamut and dynamic range that they are intended to be used in on the switcher. If a media item is created in one color space and the switcher is operating in another, the media item may not appear correctly.

1. If the media items are located on a USB, insert your USB drive into the USB Port on the switcher. You must wait 5 seconds for the switcher to recognise the USB drive.

If the files on your USB are new, it takes about 2 seconds per file for the switcher to generate the thumbnail for the MediaManager. Once all the thumbnails are generated, they are displayed in the MediaManager window.
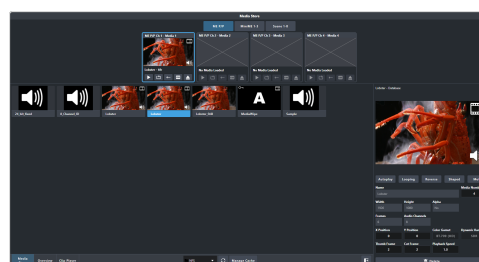
2. Click **Navigation Menu** > **Live Assist** > **Media** > **Media-Store**

3. Click the **Folder** list and navigate to the folder containing the media item you want to load into a Media-Store channel.

Note: The first time you navigate to a folder it may take a few moments for the Media-Store to scan the files and build the database entries.

*Tip: If you have added media items to a folder but they do not appear on the menu, click **Refresh** to scan the folder for any new files.*

All the media items in that folder are shown in the center area of the page.

4. Drag the media item onto the Media-Store channel you want to load it in.

Tip: The film-strip symbol (⬚) indicates that the media item is an animation, the key symbol (⊶) indicates that the media item has an alpha, and the speaker symbol (🔊) indicates that the media item has audio associated with it, or is audio only.

Deleting a Media Item

Delete media items to remove them from the folder and database.

To Delete A Media Item

Delete a media item. You can only delete a single item at a time and you cannot delete the internal sample items.

1. Click **Navigation Menu** > **Live Assist** > **Media** > **Media-Store**
2. Click the **Folder** list and navigate to the folder containing the media item you want

to delete and select the media item that you want to delete.

3. In the **Item Details** area, scroll to the bottom.
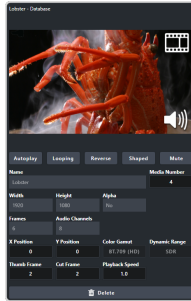
4. Click **Delete File** and **OK**.

MediaManager Channel Control

Once a media item is loaded into a channel you can control the playout for the media item from MediaManager.

> *Note: Playlists are not supported by MediaManager in DashBoard at this time.*

> *Tip: The background of the channel areas tallies the on-air status of the Media-Store channel. Red for on-air and green for on-preview.*

The label below the thumbnail of the media item shows the name of the file, the number of frames in the animation, and the media ID. In this example, the name of the media item is **Lobster**, it is **5** frames long, it is located on the USB (**U1**) and has a media ID of **001**.

The controls below the name allow you to set how the animation plays out as well as eject the current media item.

- **Play** — play the animation.
- **Loop** — set the animation to start playing again from the beginning when it reaches the last frame.
- **Play Direction** — set the animation to play in the forward or reverse direction.
- **Re-cue** — re-cue the animation to the first playout frame.
- **Eject** — eject the current media item from the channel.

Media-Store Attributes

Attributes are applied to the media item in the database and in each Media-Store channel. Where the attributes are being applied is shown in the upper left corner of the area. If you adjust the attributes of the media item in one channel, these settings are not applied back to the database or to other channel if the same media item is loaded into more than one channel.
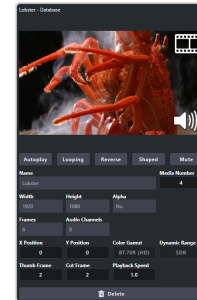
> *Note: At the top of the **Item Details** frame the title indicates if the information shown applies to the media item loaded into the media channel (**Media Channel X**), or is from the media item in the database (**Database**). Adjustments made to the media item in the database are stored in the database. Adjustments made to the media item in a channel are not stored and are only applied as long as the media item is loaded into the channel.*

Buttons:
- **Autoplay** — play the animation automatically when the Media-Store channel is taken on-air.
- **Reverse** — set the animation to play in the forward or reverse direction.
- **Mute** — mute the audio associated with the media item.
- **Looping** — set the animation to start playing again from the beginning when it reaches the last frame.
- **Shaped** — set the alpha to be shaped, or unshaped when not selected.

Fields:
- **Name** — the name of the media item as taken from the file name.
- **Width** — the width of the media item raster.
- **Height** — the height of the media item raster.
- **Alpha** — shows whether there is an associated alpha with the media item.
- **Number of Frames** — the number of frames in the animation.
- **Audio Channels** — the number of audio channels in the associated audio.

- **Media Number** — the media number of the media item.
- **X-Position** — set the horizontal position of the media item. Can only be applied if the media item is smaller than full screen.
- **Y-Position** — set the vertical position of the media item. Can only be applied if the media item is smaller than full screen.
- **Color Gamut** — shows the color mode that the switcher was operating in when the media item was added.
- **Dynamic Range** — shows the dynamic range that the switcher was operating in when the media item was added.
- **Cut Frame** — set the frame of the animation when used as part of a MediaWipe.
- **Thumb Frame** — set the frame of the animation that is used for the thumbnail.
- **Play Speed** — set the playout speed for the animation.

Tip: Click **Delete File** to delete the selected media item.

Clip Player

The clip player offers a single playout channel for clips in the ITU-T H.264 (MPEG-4 AVC) codec in specific HD formats that can be assigned as a source on any bus in the switcher. Basic transport controls can be performed manually from the **Clip Player** page, using custom controls, or through AMP commands.

Keep the following in mind:

Keep the following in mind when working with the clip player:

* The HD clip player is available in UHDTV1 using a dedicated FSFC to up-convert the video signal.
* Media items must be created in the same color gamut and dynamic range that they are intended to be used in on the switcher. If a media item is created in one color space and the switcher is operating in another, the media item may not appear correctly.

Clip Specifications

Clip codecs, formats, switcher formats, and clip names.

The clip player supports clips in the ITU-T H.264 (MPEG-4 AVC) codec in specific HD video formats.

Codecs

* ITU-T H.264 (MPEG-4 AVC)
    * **Profile** — Baseline, Constrained Baseline, Main, or High
    * **Level** — 4.1 or lower

> **Important:** It is recommended to always confirm clip performance before using it in a production.

Clip and Video Formats

Only clip formats for 1280×720 are supported by the clip player. The clip frame rates that are supported by the clip player depend on the video format that the switcher is operating in.

> **Note:** The clip player does not support clips with a bit rate of 400Mbps or higher. Clips with a higher bit rate than supported are marked with ⚠ over their thumbnail. Higher bit rate clips can be played, but will be ejected if they threaten system stability.

> **Note:** Other clip and video format combinations may work in some applications, but playout quality cannot be guaranteed.

> **Note:** The clip player does not support playing clips when the switcher is operating in a pSF video format.

Table 4: Supported Switcher Video Formats and Clip Resolution and Frame Rates

Vid Format	1280×720 25FPS	1280×720 29.97FPS	1280×720 50FPS	1280×720 59.94FPS	1920×1080 59.94FPS	1920×1080 29.97FPS	1920×1080 30FPS
1080p 60Hz							
1080p 59.94Hz				✓	✓		
1080p 50Hz	✓		✓				
1080p 30Hz							✓
1080p 29.97Hz		✓				✓	
1080p 25Hz	✓		✓				
1080p 24Hz							
1080p 23.98Hz							
1080pSF 30Hz							
1080pSF 29.97Hz							
1080pSF 25Hz							
1080pSF 24Hz							
1080pSF 23.98Hz							
1080i 59.94Hz		✓					
1080i 50Hz	✓						
720p 59.94Hz				✓			
720p 50Hz			✓				

Clip Names

The name can contain letters, numbers, spaces, dashes, underscores, and, periods, but should not contain symbols.

> **Tip:** A maximum of 255 clip names can be displayed.

Audio

The clip player supports playout of the first two channels of embedded audio on the AES outputs. Audio can be embedded in the video playout and must be 24-bit at 48kHz.

The clip player audio must be assigned to the AES port for audio playout.

Clip Player Interface

The clip player interface (Click **Navigation Menu** > **Live Assist** > **Media** > **Clip Player**) provides basic transport controls and clip management.
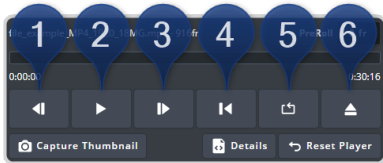
Transport Controls

1. **Step Back** — Step backwards by 1/10 second.
2. **Play/Pause** — Play the current clip forward at 1-times normal speed.
3. **Step Forward** — Step forward by 1/10 second.
4. **Re-cue** — Re-cue the current clip to the first frame.
5. **Loop** — Toggle loop mode on where the clip starts playing again from the start after it reaches the end.
6. **Eject** — Eject the current clip from the clip player channel. The thumbnail preview shows `no clip selected` and the output is black.

The progress bar below the transport control buttons shows the progress of the playout of the clip. The number at the left of the progress bar is clip timecode, and the number at the right is the time remaining. You can click on any point on the progress bar to jump to that point in the clip.

> **Tip:** Click **Capture Thumbnail** to use the current frame of the clip as the thumbnail for the clip in the clip player.

Clip Control

Below the transport controls are a number of buttons for managing clip lists and setting the pre-roll time.

- **Refresh Clip List** — Refreshes the list of clips found on the USB. If you add a clip directly to the USB via FTP, you must refresh the list for the new clip(s) to appear in the list.
- **Capture Thumbnail** — Captures the current frame of the clip for use as a thumbnail of the clip. You can use the progress bar to jump to the frame you want to use.

- **Clip Details** — Displays a popup with details on the video and audio properties of the clip that is currently loaded.
- **AMP PreRoll** — Enter the pre-delay (pre-roll) interval (in frames) that the switcher waits after the clip player starts playing and before taking the input source on-air. Depending on the clip you are playing, you may have to increase this value to ensure that your clip is playing just as it is transitioned on-air. This value is used with the **Roll Clip** transition functionality.

Panel Control

When you select the clip player on a bus on the control panel, the menu follows and allows you to select and cue a clip. Press **NEXT** to access the additional commands.

1. Use the **Clips** knob to select the clip you want to load into the clip player.

   > **Tip:** Press the **Clips** knob to refresh the clip list and jump to the first clip in the list. This is useful when you add or delete a clip from the directory.

2. Press the **Cue** knob to cue the selected clip.
3. Press the **Play** knob to play the cued clip.
4. Press the **Stop** knob to stop the clip.
5. Press the **Lp On** knob to turn looping on.
6. Press the **Lp Off** knob to turn looping off.

Custom Control

The Video Server custom controls can be used to control the clip player. When you are creating the custom control, select the **ClipPlyr** video server as the target device.

To Load a Clip

> **!** **Important:** Do not copy a clip to the drive while a clip is playing. Copying a clip to the drive while the Clip Player is playing a clip can cause the clip to stutter or stop.

1. Click **Navigation Menu** > **Live Assist** > **Media** > **Clip Player**.
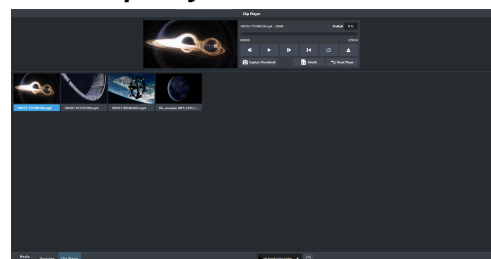
2. Click on the clip you want to load.

> **Note:** *The clips is loaded into the channel as soon as you click on it. If a clip is already playing it is ejected and the new clips is loaded.*

> **Tip:** *If the clip you want to load does not appear in the list, click **Refresh Clip List**. The switcher re-scans the folder and updates the clip list.*

> **Tip:** *You can use FTP to copy a clip to the switcher. Refer to To Create an FTP Connection on page 93 for information on creating an FTP connection.*

The clip is loaded and queued into the clip player.

3. Click **Clip Details** to view general, video, and audio information on the currently loaded clip.

Custom Controls

Once programmed, a custom control (CC) can be played back by pressing a button. The custom control can be as simple as triggering an output GPI pulse, or as complex as recalling a specific memory register on an ME, performing a switcher transition, and selecting a group of keys.

You can record, edit, and run custom controls from the Custom Control node in DashBoard.

> **Tip:** *You can also access the Custom Control menus from Live Assist.*

Refer to *Custom Control Events* on page 136 for information on available events.

Recording/Editing Custom Controls

When you create a custom control, you record a series of events and special functions that are played back when you run the custom control. The process for creating a new cc and editing an existing one are the same, except when editing you have the option to insert events at different points in the existing cc.

Almost any action or setting can be stored in a custom control, with the following exceptions:

- Diagnostic Functions
- Confirmation Dialogs
- Panel-Specific Functions

> **Note:** *It is recommended that you use a control panel for recording custom controls.*

Keep the following in mind:

Keep the following in mind when recording custom controls:

- Some functions take time to perform and a pause should be added after the function to ensure that the command is completed before moving on to the next command.
- If you are recording a custom control from DashBoard, only new settings are recorded. If the current setting in DashBoard is the value you want to record, you need to select a different value and then select the value you want to use.

To Record a Custom Control

A basic custom control records a series of events that are played out in the same order they are recorded.

1. Click **Navigation Menu** > **Custom Control** > **Editor**.
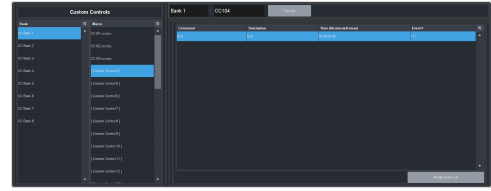
2. Click a **Bank** list item to select the bank that the custom control you want to record will be stored on.

3. Click a **Macro** list item to select the custom control that you want to record to. If the custom control already has a macro recorded, the name of the custom control is shown in the list.

> **Tip:** *You can rename both the custom control and the bank by entering a new name in the field next to the record button.*

4. Click **Record**.

> **Tip:** *The switcher can be set so that each command is automatically separated from the previous command by a pause equal to the real-time delay between you entering commands. Refer to To Set the CC Pause Mode on page 72 for more information.*

The **CC/UP** button on the control panel, as well as the button assigned to the CC on the bus, flash red when the CC is recording.

5. Insert the events you want to record. Events can be entered from the menu or from actions directly on the control panel.

Each custom control can have a maximum of 998 events, plus the End event.

> **Note:** *When the switcher runs a custom control, it attempts to execute each event in the custom control as quickly as possible. If an event takes time to complete, the event may not be complete before the switcher attempts to execute the next event. For example, if your custom control has a memory recall followed by a transition, a pause should be added between the memory recall and the transition to ensure that the memory is fully recalled before the transition is performed. The same applies if you want to add events after a transition.*

6. Click **Stop Recording** to finish recording.

> **Tip:** *Click Cancel if you do not want to store your events to the custom control.*

To Edit a Custom Control

When editing a custom control, you can delete and insert events at any point in the custom control, or append events to the end.

1. Click **Navigation Menu** > **Custom Control** > **Editor**.

2. Click a **Bank *X*** list item to select the bank that the custom control you want to edit is on.

3. Click the custom control that you want to edit.

4. Click the event that you want to edit or insert an event before.

   Refer to *Custom Control Events* on page 136 for information on available events.

5. Edit the custom control or event.
   - **Append (Record)** — start inserting events to the end of the custom control.
   - **Append** — insert a new event at the end of the custom control.
   - **Copy** — copy the entire custom control.
   - **Delete** — delete the entire custom control.
   - **Delete Event** — delete the currently selected event.
   - **Edit Event** — edit the parameters of the currently selected event.
   - **Insert (Record)** — start insert events before the currently selected event.
   - **Insert** — insert a new event before the currently selected event.
   - **Record** — start recording a new custom control over the existing one.
   - **Replace** — replace the currently selected event with the new event.
   - **Run Event** — run the currently selected event.

Custom Control Pause Mode

The switcher can be set so that each command is automatically separated from the previous

command by a pause equal to the real-time delay between events as you enter them.

When you are entering events into the custom control, the length of time between you entering the events is recorded as a pause between the events. This allows you to perform a set of actions as you normally would and have the custom control play those events back with the same pauses and 'rhythm' that you would normally have.

To Set the CC Pause Mode

The CC Pause Mode must be set before recording a custom control and does now change how a custom control plays out.

1. Click **Navigation Menu** > **Configuration** > **System** > **Custom Controls**.

2. Click a **Pause Mode** button to select how the switcher inserts pauses into a custom control.
   - **Manual Pause** — no pauses are added. You must manually add pauses to the custom control.
   - **Record Pause** — pauses are entered automatically as you enter events. For example, if you pause for 30 seconds between selecting a key and performing a transition, a 30 second pause is inserted between those events in the custom control.

Running a Custom Control

Once a custom control has been programmed, you can run that custom control by pressing the button that the custom control was recorded to.

Keep the following in mind:

Keep the following in mind when running custom controls:
- A custom control will continue to run until it reaches a hold event, is stopped by another custom control, you edit a custom control, or the custom control reaches the end.
- When a custom control is running, the button on the custom control bus is red, a red border

is applied to the custom control on the Shot Box page in DashBoard, and the word `Running` is shown below the name.

- When a custom control is held (at a Hold event), the button on the custom control bus flashes white, a grey border is applied to the custom control button on the Shot Box page in DashBoard, and the word `Held` is shown below the name.
- You can run multiple custom controls at the same time. The number of running custom controls is shown on the display when in custom control mode.
- You can stop a running custom control by pressing the red custom control button on the custom control bank.
- You can stop all running custom controls by selecting a custom control with no events recorded to it.
- A maximum of 128 custom controls can be run at the same time.
- The name of a custom control is highlighted in red if it contains events that are no longer supported. The unsupported events in the custom control are also highlighted in red.

To Run a Custom Control

Once a custom control has been recorded, you can run that custom control at any time.

1. Click **Navigation Menu** > **Custom Control** > **Shot Box**.
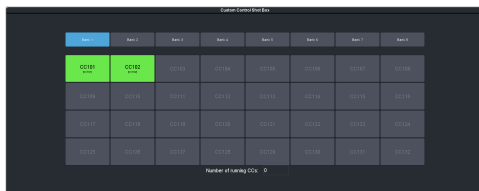
> **Tip:** *You can also run a custom control directly from the control panel.*

> **Tip:** *The number of custom controls that are currently running is shown at the bottom of the page.*

2. Click **Bank *X*** to select the bank that the custom control you want to run is on.
3. Click a custom control button to run that specific custom control.
   The custom control starts to play immediately.

Custom Control Names and Mnemonics

Each custom control can be given a unique name and mnemonic color. The name and color are shown on the custom control button.

To Name a Custom Control

The procedure to name or rename a custom control is the same.

> **Tip:** *You can also name a custom control and bank from the **Editor** page.*

> **Tip:** *Refer to General Settings on page 114 for information setting how the custom control names are shown on the control panel mnemonics.*

1. Click **Navigation Menu** > **Custom Control** > .
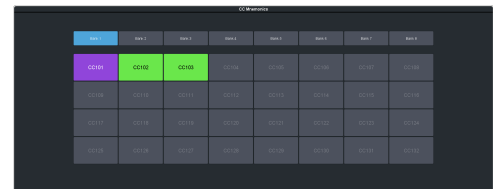
2. Click **Bank *X*** to select the bank that the custom control you want to name is on.
3. Click the custom control that you want to name.
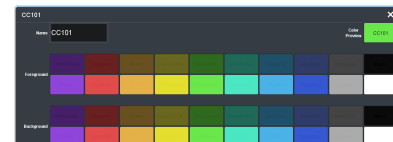
> **Note:** *Is it not recommended to use black text on a white background for cc names. This color is used to indicate the last custom control that was run or a flashing for a custom control that is at a hold event.*

Setting	Description
Name	Enter a new name for the selected custom control. Names are limited to 12 characters.
Foreground	Click a **Foreground** button to select the color you want to apply to the text on the mnemonic.
Background	Click a **Background** button to select the color you want to apply to the background on the mnemonic.

Deleting a Custom Control

Any custom control on the switcher can be deleted to remove unused customs to free up space for new custom controls.

To Delete a Custom Control

Deleting a custom control from the switcher.

There is no undo for this delete function.

1. Click **Navigation Menu** > **Custom Control** > **Editor**.
2. Click **Bank *X*** to select the bank that the custom control you want to delete is on.
3. Click the custom control button that you want to delete.
4. Click **Delete**.
5. Click **Delete** to delete the custom control.

Copying and Pasting a Custom Control

The contents, or events, of a custom control can be copied from one custom control and pasted to another. Along with the events, the name and mnemonic settings are also copied.

To Copy and Paste a Custom Control

Copy the contents of a custom control from one button to another.

1. Click **Navigation Menu** > **Custom Control** > **Editor**.
2. Click **Bank *X*** to select the bank that the custom control you want to copy is on.
3. Click the custom control that you want to copy.
4. Click **Copy**.
5. Select the custom control that you want to paste into.
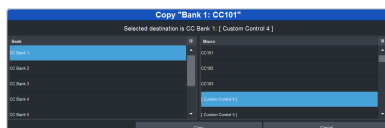
6. Click **Copy**.

Sequencer

The Sequencer allows you to create a playlist of custom control events.

The switcher supports 5 Sequencers, each with an independent rundown of events. The Sequencer uses sequences to store the rundown of events. These sequence files can be loaded into one or multiple Sequencers.

> **Tip:** *You can link multiple Sequencers together so that as you advance though one, the other Sequencers will advance.*

Keep the following in mind:

Keep the following in mind when working with a Sequencer:

- Unlike a Custom Control, a Sequence only runs a single event at a time. You must advance to the next event in the sequence to run that event.
- If you a run a Play CC event in a sequence, the Sequencer does not indicate when the CC event has completed.
- Only a subset of CC events can be run directly in the a sequence. You can use the Play CC event to run a custom control that contains any other events.
- If you edit a sequence that is already loaded into a Sequencer, you must **Reload** the sequence to update the event in the Sequencer.
- There is only one linked group. When **Linked** is toggled on for a Sequencer it is tied to all other Sequencers with **Linked** turned on.
- Linking only affects the operation of the **Next** button.
- Memories cannot be used to load a sequence into a Sequencer.

Creating/Editing Sequences

When you create a sequence, you record a series of events and special functions that are played back as you step through the sequence. The process for creating a new sequence and editing an existing one are the same, except when editing you have the option to insert events at different points in the existing sequence.

> **Tip:** *Remember that sequences run one event at a time. Use the Memory Recall or Transition Action events to perform complex actions.*

To Create/Edit a Sequence

Editing a sequence is similar to creating or editing a custom control. A series of events are added to a list in the order you want the events to be run.

1. Click **Navigation Menu** > **Live Assist** > **Sequencer** > **Editor**.
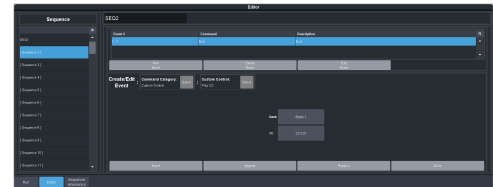
2. Click a **Sequence** list item to select the sequence that you want to create or edit. If the sequence already has events, the name of the sequence is shown in the list and events are shown on the right.

   > **Tip:** *You can rename the sequence by entering a new name in the field at the top.*

3. Click **Modify Event List**.
4. Click the **Create/Edit Event** buttons to navigate to and select the event you want to add to the sequence. Refer to *Custom Control Events* on page 136 for information on the events.

   > **Tip:** *The Sequencer only supports a subset of the possible CC events. If you want to run a custom control event that is not listed for the sequencer, you can create a CC with that event in it and then use the Play CC event in the sequence to run that custom control.*

   > **Tip:** *If you want to edit an existing event, select the event you want to edit and click **Edit Event**.*

5. Add or edit an event in the sequence.
   - **Append** — insert the new event at the end of the sequence.
   - **Delete Event** — delete the currently selected event.
   - **Insert** — insert the new event before the currently selected event.
   - **Replace** — replace the currently selected even with the new event.
   - **Run Event** — run only the currently selected event.

6. Click **Done** when you are finished editing the sequence.

Loading and Running a Sequence

Once a sequence has been created, you can load that sequence into a Sequencer and run each event.

To Load a Sequence

A sequence must be loaded into the Sequencer before it can be run.

1. Click **Navigation Menu** > **Live Assist** > **Sequencer** > **Run**.
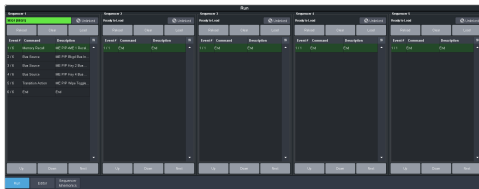
2. Click **Load** on the Sequencer you want to load a sequence into.

3. Click the **SEQ** button for the sequence you want to load.

   > *Tip:* Click **Clear** to unload the sequence from the Sequencer.

   > *Tip:* Click **Reload** to load the sequence into the Sequencer again. This can be useful if you have edited the sequence.

To Run a Sequence

A sequence is run one event at a time. Events can be skipped over by selecting a different event in the sequence as the next event.

1. Click **Navigation Menu** > **Live Assist** > **Sequencer** > **Run**.
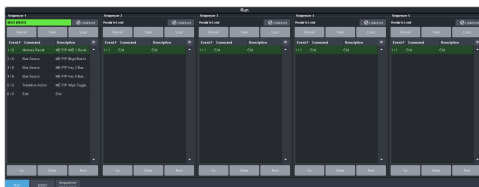
2. Use the **Up**, **Down**, and **Next** buttons to run through the sequence.

#	Function
1	The currently loaded sequence. This uses the mnemonic name and color.
2	Multiple Sequencers can be linked together. This only affects the **Next** button and allows clicking **Next** on any of the linked Sequencers to advance all the linked Sequencers. There is only one linked group.
3	The **Reload**, **Clear**, and **Load** buttons allow you to populate or clear the Sequencer. • **Load** — load a different sequence into the Sequencer. • **Clear** — unload the current sequence from the Sequencer. • **Reload** — reload or update the current sequence in the Sequencer.
4	The red highlight shows the last run (current) sequence event.
5	The green highlight shows the next event to be run. Click on a different event, or use the **Up** or **Down** buttons to select a different event to be run next.
6	The **Up** and **Down** buttons move the green (run next) highlight up and down in the sequence.
7	The **Next** button runs the event that is currently highlighted in green.

Sequence Names and Mnemonics

Each sequence can be given a unique name and mnemonic color. The name and color are shown on the Sequencer.

To Name a Sequence

> *Tip:* You can also name a sequence from the **Editor** page.

1. Click **Navigation Menu** > **Live Assist** > **Sequencer** > **Sequencer Mnemonics**.
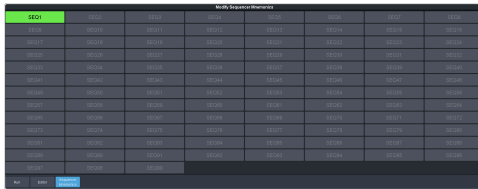
2. Click the sequence that you want to name.
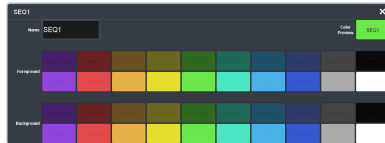
Setting	Description
Name	Enter a new name for the selected sequence. Names are limited to 8 characters.
Foreground	Click a **Foreground** button to select the color you want to apply to the text on the mnemonic.
Background	Click a **Background** button to select the color you want to apply to the background on the mnemonic.
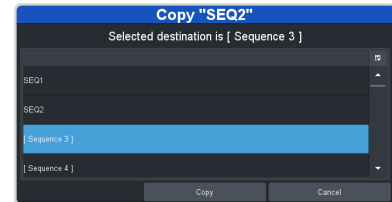
Deleting a Sequence

Any sequence can be deleted to remove unused sequences to free up space for new sequences.

To Delete a Sequence

There is no undo for this delete function.

1. Click **Navigation Menu** > **Live Assist** > **Sequencer** > **Editor**.

2. Click the sequence that you want to delete.

3. Click **Delete**.

4. Click **Delete** to delete the sequence.

Copying and Pasting a Sequence

The contents, or events, of a sequence can be copied from one sequence and pasted to another. Along with the events, the name and mnemonic settings are also copied.

To Copy and Paste a Sequence

1. Click **Navigation Menu** > **Live Assist** > **Sequencer** > **Editor**.

2. Click the sequence that you want to copy.

3. Click **Copy**.

4. Select the sequence that you want to paste into.

5. Click **Copy**.

MaxScene

MaxScene provides a simplified interface for creating a show with multiple key layers and basic transitions.

MaxScene consists of 8 scenes that share 8 layers. Each layer is set up like a keyer with a video source, alpha, and key type. Each layer can also be turned on or off to cut the video source on or off-air a well as moved up or down in the stack to change the priority. A background source is also available over which the layers are keyed.

Keep the following in mind:

Keep the following in mind when working with MaxScene:

- A scene can be used as a source on an ME, MiniME™, or aux, or assigned directly to an output.
- You cannot store or recall a single scene. All scenes are stored and recalled together.
- Layers can be included in switcher memories. The memory stores and recalls the contents of the layer, but not the number or position of layers in the scene.
- DVE resources used for layers can only be taken from the MaxScene blade the scene is on.
- Layers can only be turned on or off from the MaxScene menu one at a time.
- You can change the order of the layers by dragging and dropping from one layer position to another. This does not change the layer position, but moves the contents of that layer to a new layer position. As you drag the layer a blue line shows the location where the layer can be inserted.
- As you drag a layer from a lower layer position to a higher position, all the layers below the higher position shift down to fill the layer position of the layer you are moving.
- If you remove all the layers from a scene the output of that scene goes black and does not show the background source.
- Scenes can only use physical inputs, mattes, Media-Store channel on the same blade, clip player on the same blade, and aux bus follows as sources.

- If an aux follow is used as a source in a scene the aux is restricted to valid sources for the scene.
- Only Media-Store channels from ME, MiniME™, and the MaxScene blade the scene is on can be used as sources. Media-Store channels from another MaxScene blade are not available.
- Scenes are not retained with a power cycle.
- The background of the scene must be black if the scene is selected on a key bus. If you want to have a background for the scene, set up layer 1 with the background video as a self or auto key and set the **Keyer Mode** to **Full**.

Scene Overview

A scene is made up of layers that are located in layer positions. These positions set the order of the video elements on top of the background. A layer position that is higher (larger number) than another layer position will appear visually on top of the layer positions below it. Layers can be moved or copied from layer position to layer position.
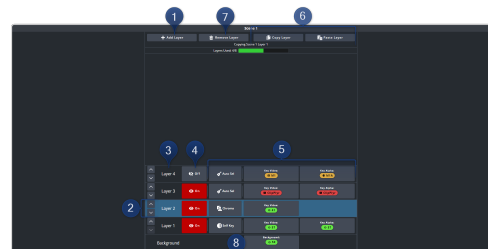
1. **Add Layer** — Layers are added to a scene starting with layer positions 1 and 2. As you add layers to a scene, the counter at the top indicates the total number of layers used and the number of resources remaining in the pool. If you use all the layers in one scene there are no resources available for the other scenes.
2. **Layer** — The layer contains the video source that you want to appear in the scene. The position that the layer is placed determines if it appears on top or underneath the other layers. For each layer you can set whether it is on or off-air, the video fill and alpha, and the type of key you want to use. These setting move with the layer as you drag or copy it to a new layer position.
3. **Layer Position** — The layer position sets whether a layer is on top or underneath other layers. The layer 1 position is always

the lowest position with layer 2 position appearing over layer 1, and layer 3 appearing over layers 1 and 2. A layer can be dragged from one layer position to another or copied and pasted into several layer positions. Drag and drop places a layer between two exiting layers and paste places the layer over the existing layer in that layer position. The position of a layer only applies to layers that are on-air at the same time. If you do not intend to have multiple layers on-air at the same time, or the video of the layers will not cover each other, the order of the layers does not matter.

> *Tip:* *If you drag a layer from a lower layer position to a higher layer position, the layers below the point you want to insert the layer shift down a layer position to fill the empty layer position left by the layer you dragged. A blue line shows the position that the layer can be inserted in. For example, if you drag the layer from the Layer 1 position to between the Layer 3 and 4 positions, the layer in the layer 2 position will shift down to the layer 1 position, layer 3 shifts to the layer 2 position, and the layer you dragged is inserted into the layer 3 position.*

4. **On/Off** — Select whether the layer is on-air (**On**) or off-air (**Off**). Toggle the button to cut the layer on or off-air. The on-air setting is moved or copied with the layer.

5. **Layer Settings** — Select the video fill (**Fill Source**) and alpha (**Alpha Source**) for the key type you are assigning to the layer. When you click the key type button you can adjust the key type parameters. Refer to *Keying* on page 41 for information on setting up the different key types.

6. **Layer Copy/Paste** — Copy and paste one layer over another layer. You cannot add a layer position or layer with a copy and paste. A copy does not include the on/off status of the layer.

7. **Remove Layer** — Remove a layer to return the resources to the pool. This does not remove the layer position, but removes the layer from that position and returns the resources to the pool. Like dragging and dropping, if you remove the layer from a lower layer position, the layer above that position drop down to fill the empty layer position. Layer position 8 is always the last to be added and first to be removed.

8. **Background** — Apply a video source as the background for the scene. This is the video source that the layers appear over top of. If

the scene is used as a key source the background is ignored.

Keep the following in mind:

Keep the following in mind when working with scenes:

- A layer is cut on or off-air with the On/Off button. Scenes do not support other transition types.
- The MaxScene recall does not have a transition effect like the Effects Dissolve in switcher memories.

To Create a Scene

1. Click **Navigation Menu** > **Live Assist** > **MaxScene** > **Scenes x-y** > **Scene *X*** for the scene you want to use.
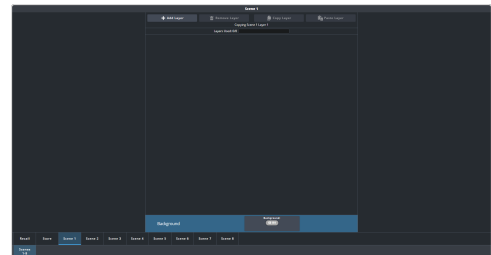
2. Click the **Add Layer** button to add as many layers as you need for your show.
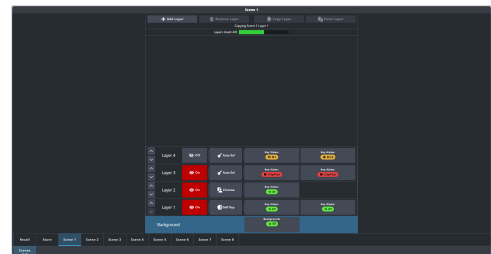
3. Click the **Key Video** button for the layer you want to set up and select the source you want to use for the layer.

> *Tip:* *If you want to use a different alpha for the key, click **Key Alpha** and select the alpha source you want to use.*
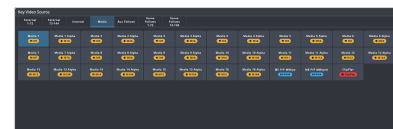
4. Click the **Auto Sel** (key type) button and select the type of keying you want to use for the layer. Layer types are set up in same way at key types. Refer to *Keying* on page 41 for information on setting up different key types.
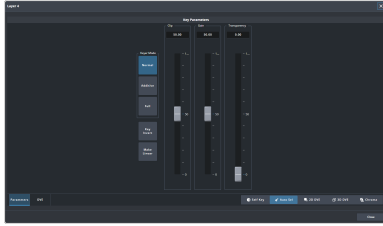
*Tip: If **PaneLINK** is active, the 3-knob menu will jump to the menus for the layer you are setting up.*

5. Click the **On/Off** button to select whether the layer is on-air (**On**) or off-air (**Off**).

6. Set up the remaining layers as required.

*Tip: If you want to change the order of the layers, click and hold on the name of the layer position (**Layer 1** for example) and drag it to the new position you want it to be and release. The new position is always between two existing layers or at the top or bottom. When you move the layer the other lays will shift to fill in the gap.*

*Tip: You can copy a layer (**Copy Layer**) and paste it (**Paste Layer**) over any other position on the same or a different scene on the same SDPE blade. You cannot copy a layer from a scene on one blade and paste it to a scene on a different blade.*

7. Click the **Background** button and select the source you want to use on the background. If you are using the scene as a key you can leave the background as black (**BK**).

MaxScene Memories

The MaxScene has an independent memory system that allows you to store and recall all the scenes, including layer assignments, video sources, and on-air status. This memory system is not tied to the switcher memory system that can also be used to store and recall the video assigned to each layer.

To Store an MaxScene

1. Set up the scenes as you want them to be recalled.

2. Click **Navigation Menu** > **Live Assist** > **MaxScene** > **Scenes x-y** > **Store**.
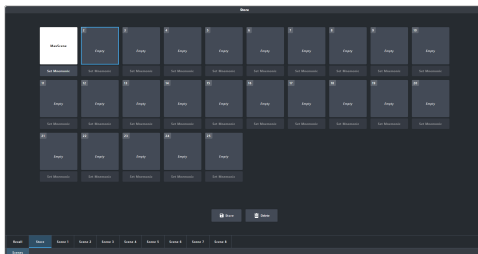
3. Click the button for the memory location you want to use.

*Tip: To clear a memory register, click on the memory you want to delete and click **Delete**.*

4. Click **Store**.

5. Click the **Set Mnemonics** button for the MaxScene memory you want to customize the name and mnemonic for.

Tip: If you want to set a name and mnemonic color for the Scene, you must go the Inputs menu.
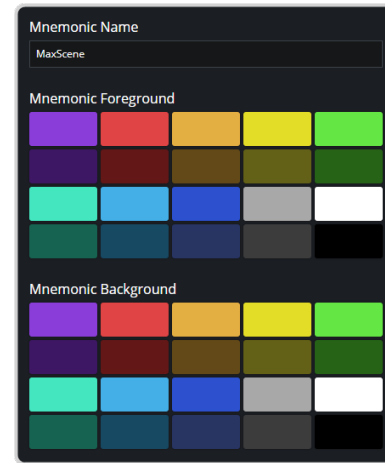
Setting	Description
Name	Enter a new name for the memory in the **Name** field. Names are limited to 16 characters.
Foreground	Click a **Foreground** button to select the color you want to apply to the text on the mnemonic.
Background	Click a **Background** button to select the color you want to apply to the background on the mnemonic.

To Recall an MaxScene

1. Click **Navigation Menu** > **Live Assist** > **MaxScene** > **Scenes x-y** > **Recall**.
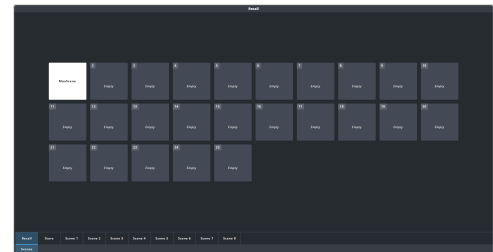
2. Click the button for the MaxScene you want to recall.

HyperMax Setup

The Ultrix™ router must be set up to support the HyperMax on the Software Defined Production Engine (SWR-SDPE) blade. This includes setup of the Ultripower units, DashBoard connections, the matrix database, and the Ultriscape Multi-Viewer.

> **Notice:** *Refer to the Ultrix™ documentation for information on setting up and operating your router.*

> **Notice:** *The Ultrix™ frame and SDPE blades do not have power switches. Ensure that the Ultripower is not connected to mains power before connecting the power cables from the Ultripower to the other components. If the Ultripower is energized as you connect the power cables to the Ultrix™ and SDPE, the system could start to power up before it has enough power to operate and could damage the equipment.*

Ensure that Ultrix™ is operating properly before setting up HyperMax. The following sections provide information for setting up the DashBoard connection to Ultrix™, and source and destination routing to the switcher.

HyperMax Hardware Setup

The router and switcher components of HyperMax must be set up separately before they can work together.

> **Important:** *Refer to the documentation that came with your Ultrix™ router for cabling and power procedures. The SDPE blades do not need independent power connections in the Ultrix FR5-NS or Ultrix FR12 frames.*

The switcher consists of the CPU and up to 8 SDPE blades that can each be configured as a MaxME, MaxMini, or MaxScene. The switcher must contain at least one MaxME configured as ME P/P. The ME P/P blade is the main controller of the switcher and the blade you will interface with to control the switcher. Identifying what blade is in each slot will help when you are working with the router database.

> **Note:** *Refer to the Ultripower documentation for information on using the Ultripower Manager to power up a multiple Ultripower units at the same time.*

> **Tip:** *Even though Slot 1 is the second slot in the router, the database will start counting destinations and sources starting with the Flex Slot.*
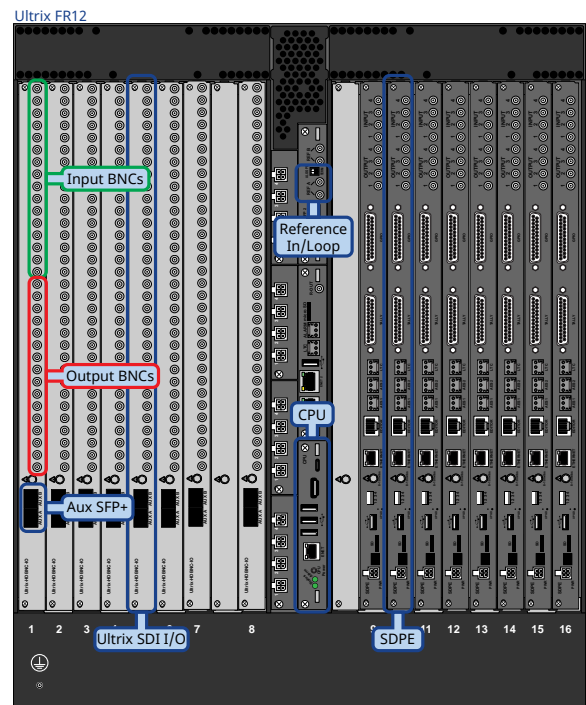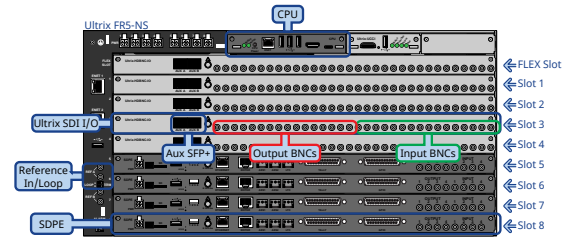
DashBoard Connection

Ultrix™ has a separate ethernet connection to DashBoard and appears as a separate node in the DashBoard tree view.

> **Note:** *Refer to the documentation that came with your Ultrix™ router for information on connecting it to DashBoard.*

To Assign an IP Address to Ultrix™ and Ultripower

Use DashBoard Walkabout to assign an initial IP address to Ultrix™.

> **Note:** *DashBoard must be running on a computer on the same subnet as the frame to connect.*

1. Click **File** > **Show Walkabout**.
2. Click **Refresh** to update the list.
3. Locate the entry for the devices you want to locate on the network.
   - Ultrix™
   - Ultripower

- Ultricool(optional for FR5)

> *Note:* *The number of Ultripower units will depend on your configuration.*

> *Tip:* *Ultrix™ has a primary and secondary network connection for redundancy. You can connect one or both network connections.*

4. Update the network information for your device as required.
   - **Name** — enter a new name for the device as you want it to appear in DashBoard.
   - **Address** — enter a new IP address for the device.
   - **Netmask** — enter a new network mask value for your device.
   - **Gateway** — enter a new gateway value for your device.

5. Wait for a minute for the new data to be saved.

6. Click **Reboot** for the device you are updating to send the new information to the device and have it reboot with the new settings.

To Connect to Ultrix™ from DashBoard

DashBoard connects to each device separately. You must create a new connection for Ultrix™, the Ultripower units, and Ultricool.

> *Note:* *DashBoard must be running on a computer on the same subnet as the frame to connect.*

You need the IP address of each device to connect to it from DashBoard.

1. Click **File** > **New** > **TCP/IP DashBoard Connect or openGear Device**.
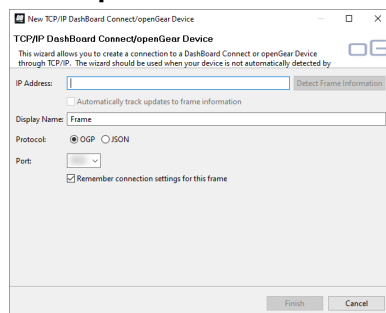
2. In the **IP Address** field, enter the IP address of the device you are connecting to. The default IP addresses are listed below:
   - Ultrix™ — 192.168.20.140
   - Ultricore BCS — 192.168.20.160
   - Ultripower — 192.168.20.123
   - Ultricool — 192.168.20.125

3. In the **Display Name** field, enter the name you want to use to identify the device in DashBoard. This should be a unique name for the device you are setting up.

4. Select the protocol for the device you are connecting to.
   - **Ultrix™ — JSON**
   - **Ultricore BCS — JSON**
   - **Ultripower — OGP**
   - **Ultricool — OGP**

5. In the **Port** field, select the protocol for your device.
   - **Ultrix™** — 5254
   - **Ultricore BCS** — 5254
   - **Ultripower** — 5253
   - **Ultricool** — 5253

6. Click **Finish**.
   The device appears in the **Tree View**.

Video Routing in Ultrix

Sources and destinations in the router must be connected to the inputs and outputs of the switcher.

Ultrix™ uses a database to assign inputs and outputs, as well as define levels and matrices. The switcher has access to any destination in the router, but switcher outputs must be assigned to router outputs from the router. For more information on setting up levels and matrices, refer the Ultrix™ User Guide.

HyperMax Video Flow

Video signals come into the router through the SDI IO blades and are passed from the router crosspoint as destinations that are available to the switcher as inputs. All inputs to the router are available to the each bus in the switcher. Video outputs from the switcher are then made available to the router as sources that can be routed to destinations. Unlike the inputs, the switcher cannot control which output on the router a video signal from the switcher is sent to. This routing is done by the router matrix.
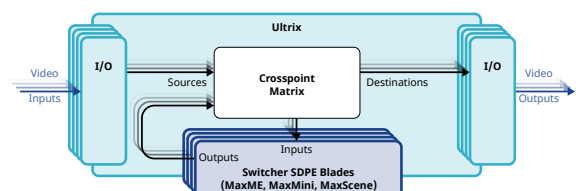
Ultrix™ Database Setup

The router database is used to map switcher inputs and output to router sources and destinations. Each SDPE blade (ME) has dedicated input and outputs that must be added to the database so that they can be used by the router.

For detailed information on creating and maintaining a router database, refer to the **Ultrix and Ultricore Database Guide (2201DR-109)**.

The switcher does require specific settings in the router database setup to operate properly.

> **Note:** Ensure that you have the Ultrimix option installed. This is needed to properly route audio. Refer to the documentation that came with your router for information on installing options.

Database Builder

Keep the following in mind when building the database for the switcher:

- **Disconnect Sources** — The disconnect source is used to mute audio channels as well as provide black for switcher aux buses.
- **Virtual Ports** — Virtual ports are used for Aux buses and patchbay, as well as audio meters and mixers.
- **Ultriscape** — Ultriscape provides the MultiViewer for all router sources as well as the outputs from the switcher.
- **MultiViewer** — each SDPE blade has a MultiViewer that can show all the buses from that blade, as well as any sources that are unique to that blade.
- **Audio Mixer I/O Map** — The audio mixer I/O map allows the switcher to properly route audio from the switcher.

Destinations

Keep the following in mind when working with the router destinations manager:

- The destinations are the outputs from the crosspoint matrix that can be assigned to outs as well as are the inputs to the switcher. You can change the **Name** for any destination on the list. The destination names are use on the **Soft Panel** to assign sources to destinations.>
- The switcher **Inputs** page handles the assigning of router sources to switcher inputs.

- The format of the VID designation is *frame.slot*.out[*number*].sdi.ch1. For example, **DST7** is mapped to `Ultrix-5ru.flex.out[7].sdi.ch1` which is the SDI signal on HD-BNC output 7 of the blade in the FLEX slot. Your destinations will vary depending on the configuration of your system.

Sources

Keep the following in mind when working with the router sources manager:

- The sources are the inputs to the crosspoint matrix from the input BNCs as well as outputs from the switcher. You should change the **Name** of the sources from the switcher to the actual video output signal that is coming from the switcher.
- An ME, MiniME™, or MaxScene can be assigned to an SDPE blade installed in any slot. Refer to *MaxConfig Switcher Configurator* on page 88 for information on assigning SDPE blades to a switcher.
- Only the first 8 switcher outputs (in[1] to in[8]) on an SDPE blade can be assigned to Ultriscape PiPs.

> **Note:** In the following tables the frame and slot numbers shown is just to demonstrate the syntax. The actual frame name and slot will depend on the configuration of your router and the slot that the SDPE blade is installed in.

Table 5: Default ME Switcher Video Output Mapping

VID	Switcher Output
Ultrix-5ru.slot8.in[1].sdi.ch1	ME Program
Ultrix-5ru.slot8.in[2].sdi.ch1	ME Preview
Ultrix-5ru.slot8.in[3].sdi.ch1	ME Clean
Ultrix-5ru.slot8.in[4].sdi.ch1	User Out 1
Ultrix-5ru.slot8.in[5].sdi.ch1	User Out 2
Ultrix-5ru.slot8.in[6].sdi.ch1	User Out 3
Ultrix-5ru.slot8.in[7].sdi.ch1	User Out 4
Ultrix-5ru.slot8.in[8].sdi.ch1	User Out 5
Ultrix-5ru.slot8.in[9].sdi.ch1	Clip Player
Ultrix-5ru.slot8.in[10].sdi.ch1	MultiViewer
Ultrix-5ru.slot8.in[11].sdi.ch1	Media-Store Channel 1 Video
Ultrix-5ru.slot8.in[12].sdi.ch1	Media-Store Channel 1 Alpha
Ultrix-5ru.slot8.in[13].sdi.ch1	Media-Store Channel 2 Video

VID	Switcher Output
Ultrix-5ru.slot8.in[14].sdi.ch1	Media-Store Channel 2 Alpha
Ultrix-5ru.slot8.in[15].sdi.ch1	Media-Store Channel 3 Video
Ultrix-5ru.slot8.in[16].sdi.ch1	Media-Store Channel 3 Alpha
Ultrix-5ru.slot8.AUXA-in[1].sdi.ch1	Media-Store Channel 4 Video
Ultrix-5ru.slot8.AUXB-in[1].sdi.ch1	Media-Store Channel 4 Alpha

Table 6: Default MiniME™ Switcher Video Output Mapping

VID	Switcher Output
Ultrix-5ru.slot7.in[1].sdi.ch1	MiniME 1 Program
Ultrix-5ru.slot7.in[2].sdi.ch1	MiniME 1 Preview
Ultrix-5ru.slot7.in[3].sdi.ch1	MiniME 1 Combined Key
Ultrix-5ru.slot7.in[4].sdi.ch1	MiniME 2 Program
Ultrix-5ru.slot7.in[5].sdi.ch1	MiniME 2 Preview
Ultrix-5ru.slot7.in[6].sdi.ch1	MiniME 2 Combined Key
Ultrix-5ru.slot7.in[7].sdi.ch1	MiniME 3 Program
Ultrix-5ru.slot7.in[8].sdi.ch1	MiniME 3 Preview
Ultrix-5ru.slot7.in[9].sdi.ch1	MiniME 3 Combined Key
Ultrix-5ru.slot7.in[10].sdi.ch1	MultiViewer
Ultrix-5ru.slot7.in[11].sdi.ch1	Media-Store Channel 1 Video
Ultrix-5ru.slot7.in[12].sdi.ch1	Media-Store Channel 1 Alpha
Ultrix-5ru.slot7.in[13].sdi.ch1	Media-Store Channel 2 Video
Ultrix-5ru.slot7.in[14].sdi.ch1	Media-Store Channel 2 Alpha
Ultrix-5ru.slot7.in[15].sdi.ch1	Media-Store Channel 3 Video
Ultrix-5ru.slot7.in[16].sdi.ch1	Media-Store Channel 3 Alpha
Ultrix-5ru.slot7.AUXA-in[1].sdi.ch1	Media-Store Channel 4 Video
Ultrix-5ru.slot7.AUXB-in[1].sdi.ch1	Media-Store Channel 4 Alpha

Table 7: Default MaxScene Switcher Video Output Mapping

VID	Switcher Output
Ultrix-5ru.slot6.in[1].sdi.ch1	MultiViewer

VID	Switcher Output
Ultrix-5ru.slot6.in[2].sdi.ch1	Black
Ultrix-5ru.slot6.in[3].sdi.ch1	Scene 1 Video
Ultrix-5ru.slot6.in[4].sdi.ch1	Scene 2 Video
Ultrix-5ru.slot6.in[5].sdi.ch1	Scene 3 Video
Ultrix-5ru.slot6.in[6].sdi.ch1	Scene 4 Video
Ultrix-5ru.slot6.in[7].sdi.ch1	Scene 5 Video
Ultrix-5ru.slot6.in[8].sdi.ch1	Scene 6 Video
Ultrix-5ru.slot6.in[9].sdi.ch1	Scene 7 Video
Ultrix-5ru.slot6.in[10].sdi.ch1	Scene 8 Video
Ultrix-5ru.slot6.in[11].sdi.ch1	Scene 1 Alpha
Ultrix-5ru.slot6.in[12].sdi.ch1	Scene 2 Alpha
Ultrix-5ru.slot6.in[13].sdi.ch1	Scene 3 Alpha
Ultrix-5ru.slot6.in[14].sdi.ch1	Scene 4 Alpha
Ultrix-5ru.slot6.in[15].sdi.ch1	Scene 5 Alpha
Ultrix-5ru.slot6.in[16].sdi.ch1	Scene 6 Alpha
Ultrix-5ru.slot6.AUXA-in[1].sdi.ch1	Scene 7 Alpha
Ultrix-5ru.slot6.AUXB-in[1].sdi.ch1	Scene 8 Alpha

Table 8: Default ME Switcher Audio Output Mapping

AUD	Switcher Output
Ultrix-5ru.slot8.AUXA-in[1].audio.ch1	Media-Store Audio Channel 1 (left)
Ultrix-5ru.slot8.AUXA-in[1].audio.ch2	Media-Store Audio Channel 1 (right)
Ultrix-5ru.slot8.AUXA-in[1].audio.ch3	Media-Store Audio Channel 2 (left)
Ultrix-5ru.slot8.AUXA-in[1].audio.ch4	Media-Store Audio Channel 2 (right)
Ultrix-5ru.slot8.AUXA-in[1].audio.ch5	Clip Player Audio Channel 1 (left)
Ultrix-5ru.slot8.AUXA-in[1].audio.ch6	Clip Player Audio Channel 2 (right)

Clean Switch

The Ultriclean feature allows the router to delay each video output. The switcher introduces a delay in the video path relative to rest of the router. The Clean Switch line buffer must be set for every output used for switcher outputs to properly time them with the rest of the router sources.

Clean Switch must be enabled for all switcher outputs from the router with the following parameters:

- **Clean Switch Mode** — select **Reference**.
- **Clean Switch Delay** — select **Full Line**. This does not impose a delay but allows the router to delay the video up to a line.

Tallies

The switcher uses TSL to pass tally information back and forth between the switcher and the router. This allows the switcher to tally sources on the Ultriscape Multi-Viewer.

Keep the following in mind when working with the router sources manager:

- You must select **Enable Tally** on the **Database Configuration** tab to allow tallies from the switcher.
- On the **Sources** node, for each source, enter the corresponding TSL ID for the switcher in the **Tally** column, starting with tally ID **0** for input 1. The switcher supports up to 4000 (0-3999) tally IDs.

> **Note:** Refer to https://help.rossvideo.com/carbonite-device-db/Topics/Devices/UMD/TSL.html for a list of TSL IDs and the corresponding HyperMax source.

Audio Routing in Ultrix™

Audio is handled independently in the router and is separate from the switcher. You can output Media-Store and Clip Player audio.

In the router, audio is de-embedded from video and is routed independently. The Ultrimix option allows you to assign audio channels to different levels that are routed on the Ultrix™ SoftPanel.

Only audio signals from the Media-Store and Clip Player are available to the router from the switcher. All other audio inputs and outputs are not available to the switcher.
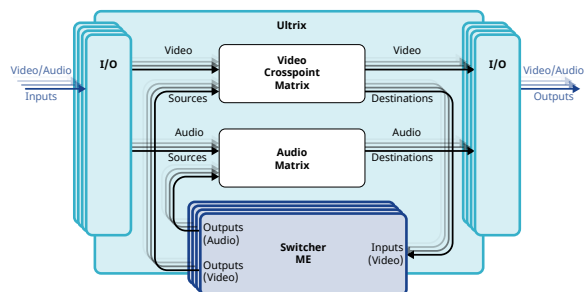
Switcher audio signals are available on the AUX-A source for the SDPE blade:

- Media-Store Channel 1 Audio — audio channels 1 and 2.
- Media-Store Channel 2 Audio — audio channels 3 and 4.
- Clip Player Audio — audio channels 5 and 6.

> **Tip:** These audio signals can also be assigned to the AES ports on the SDPE blade.

Aux Bus Router Sources

Switcher aux buses need to be mapped to router sources and destinations so that video can be assigned to them.

Aux bus routing is done virtually within the router. When a source is selected on an aux bus in the switcher, the switcher tells the router to connect a video source to an aux bus destination. The video does not pass through the switcher.

> **Note:** An aux bus source must be assigned to a destination for that video stream to be available on an output.

To Create Router Aux Sources

1. From the DashBoard tree view for the router, expand the **Ultrix** > **Database** node.
2. Double-click **Sources**.

3. Go to the end of the table and select the last item in the list.
4. Click **Edit** > **Insert**.

5. Enter the following information in the dialog box.
   - **Prefix** — enter `SRC AUX1-` or how you want the name for the aux bus to appear.

The AUX1 represents Aux Bus 1. You can change the name later.

- **Starting** — select 1.
- **Count** — select 8. This creates the series of 1-8 for Aux Bank 1.

6. Click **Apply**.

7. For each of the new sources you need to add a custom **VID**. The VIDs must follow the format *<router-name>*.slot0.virt-in[*aux*].sdi.ch1. For example, aux 3 on bank 2 for the router being used for this example would be Ultrix-5ru.slot0.virt-in[11].sdi.ch1.

8. Repeat this procedure to add all 28 aux bus banks.

> **Tip:** *As you are adding the aux buses, don't forget to add the tally ID numbers to each new source.*

9. Insert a single row to the list. This is for the disconnect source on the aux bus which is used to select black on an aux bus from the switcher.

10. Set the name to Disconnect and the VID to *<router-name>*.slot0.disconnect[1].sdi.ch1.

11. Click **Apply**.

To Create Router Aux Destinations

1. From the DashBoard tree view for the router, expand the **Ultrix** > **Database** node.

2. Double-click **Destinations**.

3. Go to the end of the table and select the last item in the list.

4. Click **Edit** > **Insert**.

5. Enter the following information in the dialog box.

- **Prefix** — enter DST AUX1- or how you want the name for the aux bus to appear. The AUX1 represents Aux Bus 1.
- **Starting** — select 1.
- **Count** — select 8. This creates the series of 1-8 for Aux Bank 1.

6. Click **Apply**.

7. For each of the new sources you need to add a custom **VID**. The VIDs must follow the format *<router-name>*.slot0.virt-out[*aux*].sdi.ch1. For example, aux 7 on bank 4 for the router being used for this example would be Ultrix-5ru.slot0.virt-out[31].sdi.ch1.

8. Repeat this procedure to add all 28 aux bus banks.

9. Click **Apply**.

Ultriscape Multi-Viewer

Some of the outputs from each ME are available as PiPs for the software defined Ultriscape MultiViewer in the router.

> **Note:** *Refer to the documentation that came with your router for information on licensing and setting up Ultriscape.*

Depending on the sources you want to monitor, you can either use a HyperMax MultiViewer, or the Ultrix™ Ultriscape. Ultriscape has access to all the sources available to the router, and the switcher MultiViewers have access to all the buses or internal sources for that SDPE blade.

Ultrix™ Ultricore BCS Setup

If your router ecosystem uses an Ultricore BCS, the switcher requires the IP address of the Ultricore BCS to communicate with the router to switch aux buses.

> **Note:** *The Ultrix FR12 requires the Ultricore BCS for configuration and operation.*

To Connect to the Ultricore BCS

1. Open a web browser and navigate to the IP address of the CPU. You are prompted to enter a user name and password. The defaults are user and password..

2. Click **Other...** > **Ultricore BCS IP**.

3. Enter the IP addresses of the primary and redundant Ultricore BCS.

- **Primary IP Address** — enter the IP address of the primary Ultricore BCS.

- **Redundant IP Address** — enter the IP address of the redundant Ultricore BCS.

4. Select whether you want to connect to the primary (**Primary**) or redundant (**Redundant**) Ultricore BCS.

5. Click **Save** to have the switcher use the selected Ultricore BCS to communicate with the router.

MaxConfig Switcher Configurator

MaxConfig creates the switchers, assigns SDPE blades to them, sets what roles each blade perform in the switcher, and sets the video mode that each switcher is operating in.

MaxConfig has access to every SDPE blade in the router and can add or remove blades from an existing switcher, or create a new switcher from unassigned blades.

Note: *SDPE blades running Ultrix Carbonite 9.10 or lower, Mosaic 2.0 or lower, Acuity®, or SDxE blades are not supported at this time.*
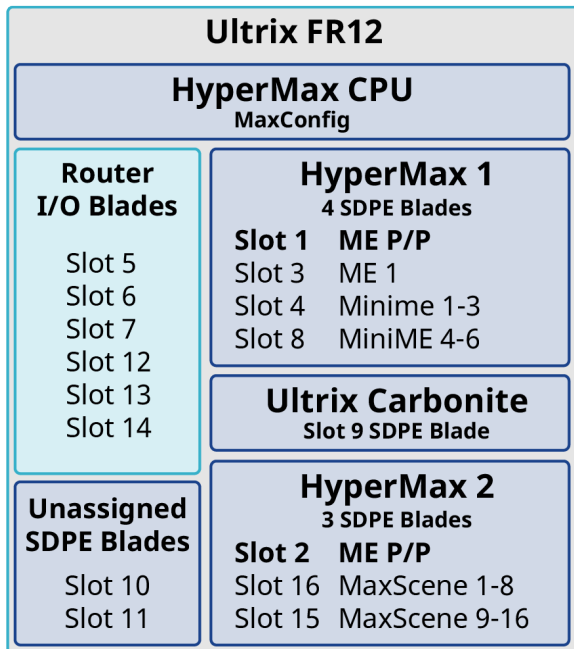
Figure 8: HyperMax Functional Blocks

Contained within the Ultrix™ router there is a single CPU that handles upgrades and supports the MaxConfig Configurator. MaxConfig allows you to take the SDPE blades in the router and assign them to one or several routers, depending on your production needs. Both HyperMax and Ultrix Carbonite switcher can operate in the same router at the same time. Each HyperMax switcher must contain an ME P/P that provides local control for that switcher. The ME P/P is where DashBoard connects to and controls all the other SDPE blades assigned to that HyperMax switcher.

To Create a Switcher

Create a switcher and assign SDPE blades to it.

1. Open a web browser and navigate to the IP address of the CPU. You are prompted to enter a user name and password. The defaults are `user` and `password`.
2. Click **MaxConfig**.
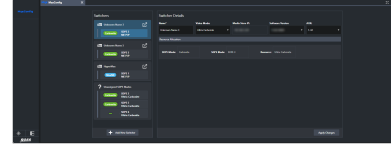
3. Click **+ Add New Switcher** and configure ME P/P for the new switcher.
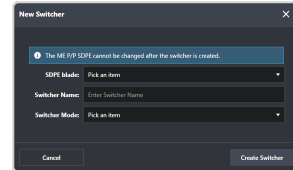
   - **SDPE Blade** — select an unassigned SDPE blade to be used as ME P/P for the new switcher.
   - **Switcher Name** — enter a name for the switcher. The name is only shown in the configurator.
   - **Switcher Mode** — select **HyperMax**.
4. Click **Create Switcher**.
   You can now select the newly created switcher and add SDPE blades to it.

To Edit a Switcher Configuration

Assign a new role to the SDPE blades in a switcher.

1. Open a web browser and navigate to the IP address of the CPU. You are prompted to enter a user name and password. The defaults are `user` and `password`.
2. Click **MaxConfig**.
3. Select the HyperMax switcher you want to edit.
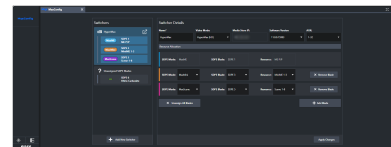
Tip: *Any existing HyperMax switchers are listed in the **Switchers** section. If you select a switcher, the details for that switcher are shown in the **Switcher Details** section. Unassigned SDPE blades are also listed in this section.*

4. Configure the system parameters of the new switcher.
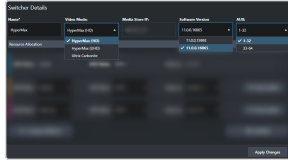
- **Video Mode** — select the video mode, HD or UHDTV1 for the switcher.

  ❗ **Important:** Do not select **Ultrix Carbonite** at this time. This option will convert the new HyperMax ME P/P to an Ultrix Carbonite.

- **Software Version** — select the version of software you want to load on to the switcher. Only software versions that has already been loaded onto the switcher can appear on this list.
- **AUX** — select the set of router aux buses you want to use for the switcher. If you are configuring multiple HyperMax switcher in the same router you must assign the Auxes **1-32** to one switcher and Auxes **33-64** to the other.

5. Click **+ Add Blade** to add a blank slot to the switcher.

6. Change the role of an existing, or newly added, blade used in a switcher. You can change the role of any SDPE blade in the switcher except ME P/P. The role is not changed until you click **Apply Changes**.

- **SDPE Mode** — select the role you want the blade to fill in the switcher. This can be a ME, MiniME™, or MaxScene.
- **SDPE Blade** — select which SDPE blade you want to fill the selected role. SDPE blades are selected by the slot they are installed into in the frame.

  Note: If you select a blade that is already assigned to a role, the blades will be swapped and both will update when you apply the changes.

- **Resource** — if there is more than one SDPE blade assigned to the same role, you can select which set of resources are provided by the selected blade. For example, if you have two blades assigned to the MiniME™ role, then one provides MiniME™ outputs 1-3 and the other 4-6.

7. Remove a blade from the switcher by clicking **× Remove Blade** for the SDPE blade you want to remove. The blade will be removed from the **Switcher Details** but will not appear as unassigned until you click **Apply Changes**.
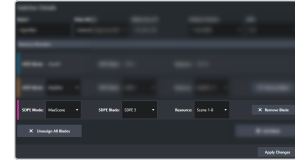
Tip: Click **× Unassign All Blades** to remove all blades except ME P/P from the switcher.

8. Add a blade to the switcher by clicking **+ Add Blade**. You must assign a role and which blade you want to use.

- **SDPE Mode** — select the role you want the blade to fill in the switcher. This can be a ME, MiniME™, or MaxScene.
- **SDPE Blade** — select which SDPE blade you want to fill the selected role. SDPE blades are selected by the slot they are installed into in the frame.

  Note: If you select a blade that is already assigned to a role, the blades will be swapped and both will update when you apply the changes.

- **Resource** — if there is more than one SDPE blade assigned to the same role, you can select which set of resources are provided by the selected blade. For example, if you have two blades assigned to the MiniME™ role, then one provides MiniME™ outputs 1-3 and the other 4-6.

9. Click **Apply Changes**.

  ❗ **Important:** When you click **Apply Changes**, the configurator will update the software on all the SDPE blades you selected a change for. Do NOT attempt to make additional changes to the configuration until all the blades are back up and running as you assigned them.

To Set a Switcher Video Mode

Each HyperMax switcher can operate in a different video mode (HD/UHDTV1).

1. Open a web browser and navigate to the IP address of the CPU. You are prompted to enter a user name and password. The defaults are `user` and `password`.

2. Click **MaxConfig**.

3. Select the HyperMax switcher you want to set the video mode for and click **Video Mode**.
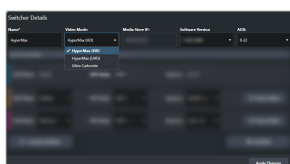
4. Select the video mode you want the switcher to operate in.

   • **HyperMax (HD)** — set the selected switcher to operate in an HD video format.

   • **HyperMax (UHD)** — set the selected switcher to operate in an UHDTV1 video format.

   > **Note:** Do not select **Ultrix Carbonite** unless instructed to do so by Ross Technical Support.

5. Click **Apply Changes**.

   > **Important:** When you click **Apply Changes**, the configurator will update the software on all the SDPE blades you selected a change for. Do NOT attempt to make additional changes to the configuration until all the blades are back up and running as you assigned them.

Switcher Mode Video Formats

The switcher is restricted to specific video formats when operating in each Switcher Mode.

	HD Modes	UHD Modes
720p 50Hz	✓	
720p 59.94Hz	✓	
1080i 50Hz	✓	
1080i 59.94Hz	✓	
1080pSF 23.98Hz	✓	
1080pSF 24Hz	✓	
1080pSF 25Hz	✓	
1080pSF 29.97Hz	✓	
1080pSF 30Hz	✓	
1080p 23.98Hz	✓	
1080p 24Hz	✓	

	HD Modes	UHD Modes
1080p 25Hz	✓	
1080p 29.97Hz	✓	
1080p 30Hz	✓	
1080p 50Hz	✓	
1080p 59.94Hz	✓	
1080p 60Hz	✓	
UHDTV1 23.98Hz		✓
UHDTV1 24Hz		✓
UHDTV1 25Hz		✓
UHDTV1 29.97Hz		✓
UHDTV1 30Hz		✓
UHDTV1 50Hz		✓
UHDTV1 59.94Hz		✓
UHDTV1 60Hz		✓

Network Connections

Setting up network connections to the switcher, as well as network storage and file transfers.

! **Important:** *Do not run real-time or on access file scanning programs on HyperMax, TouchDrive or other supporting systems. Ross Video does not support any type of real-time or on access file scanning programs running on HyperMax, TouchDrive or other supporting systems. Real-time or on access file scanning can cause lagging, disconnects, and timeouts between the HyperMax, TouchDrive and other supporting systems.*

HyperMax is controlled and configured using DashBoard and a web interface. Each of these connections is used for specific functions and is required to configure and operate.

Addition network connection are required for file transfers and remote licensing servers.

The switcher uses the following network ports:

- DashBoard Main — 5253
- DashBoard Sat 1 — 5255
- DashBoard Sat 2 — 5256
- DashBoard SoftPanel — 5257
- SFTP — 2222
- RossTalk — 7788
- SSH — 22
- TFTP — 69
- TSL 3.1 (TCP, Carbonite) — 5727
- TSL 3.1 (TCP, Ultrix™) — 5727
- TSL 3.1 (UDP, Ultrix™) — 4490
- TSL 5.0 (TCP, Carbonite) — 5728
- TSL 5.0 (TCP, Ultrix™) — 5729
- TSL 5.0 (UDP, Ultrix™) — 4492

DashBoard Network Settings

HyperMax requires a network connection to the CPU as well as each SDPE. The CPU and SDPE blades all come from the factory set with a static IP address but can be set to a different static IP address.

- CPU —192.168.0.125
- SDPE — 192.168.0.123

Note: *The primary DashBoard connection for the switcher is to the SDPE blade that is assigned as ME P/P for that switcher. Network connections to the other SDPE blades in the system are for diagnostics, file transfer, and if you want to assign one of them as a separate switcher.*

Note: *If you are using Caprica, or have multiple DashBoard connections to the switcher, you should use a DashBoard Proxy Server to manage the connection traffic to the switcher.*

Refer to the DashBoard documentation for information on setting up a Proxy Server.

To Change the CPU IP Address

Change the IP address of the Frame CPU.

1. Open a web browser and navigate to the IP address of the CPU. You are prompted to enter a user name and password. The defaults are `user` and `password`. The default IP address is 192.168.0.125.

Note: *This is the IP address of the CPU, not the SDPE blades or Ultrix™.*

Tip: *If you do not know the IP address of the CPU, you can find it in DashBoard under the Ultrix™ node (Devices > Controllers/Matrices > Ultrix) on the image of the Frame CPU.*

2. Click **Other...** > **Network**.

This page allows you to change the network configuration of the network ports, as well as enter the current IP Address of the main panel, and satellite panels.

3. In the LAN1 section, enter the **IP Address** and **Subnet Mask** for the switcher.

Note: *You cannot set the switcher to an IP Address in the range of 192.168.12.xx. This is used internally and will cause interference. The Subnet Mask should be set to 255.255.255.0.*

4. Optional: Enter the **Default Gateway** for the frame.
5. Click **Change and Reboot**.

To Connect DashBoard to the Switcher

DashBoard connects to the switcher as the main panel, or as a satellite panel. Connecting as a main or satellite panel is selected by the port used to connect to the switcher. All DashBoard connections and physical panels that connect on the same port mirror each other.

Note: *The primary DashBoard connection for the switcher is to the SDPE blade that is assigned as ME P/P for that switcher. Network connections to the other SDPE blades in the system are for diagnostics, file transfer, and if you want to assign one of them as a separate switcher.*

Note: *The switcher supports a maximum of 20 DashBoard connections at any one time. If there are already the maximum number of connections to a switcher you will not be able to connect to it.*

You need the IP address of SDPE to connect to it from DashBoard.

1. Click **File** > **New** > **TCP/IP DashBoard Connect or openGear Device**.
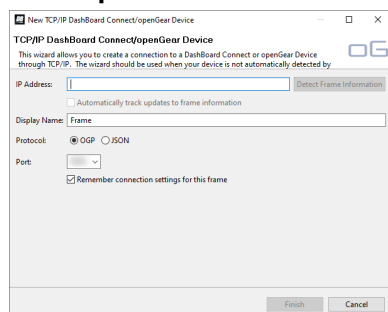
2. In the **IP Address** field, enter the IP address of the frame. The default IP address is 192.168.0.123.

   *Note: If you are connecting through a Network Address Translator (NAT), the **Detect Frame Information** button may return the wrong IP address. We recommend to not use this function.*

3. In the **Display Name** field, enter the name you want to use to identify the frame in DashBoard. This should be a unique name for the frame you are setting up.

4. Select **OGP**.

5. In the **Port** field, enter the port you want to connect to on the frame. The port you connect to assigns the relationship the DashBoard connection has to the frame.

   Tip: Multiple DashBoard connections can use the same port, but they will mirror each other. For example, you can connect a control panel and a separate DashBoard computer to the Main Panel port to give control from the panel and DashBoard.

   • **Main Panel** — 5253
   • **Satellite 1** — 5255
   • **Satellite 2** — 5256
   • **Satellite 3/SoftPanel** — 5257

   Tip: Refer to MultiPanel on page 126 for information on setting up a MultiPanel system.

6. Click **Finish**.
   The frame appears in the **Tree View**.

To Change the SDPE IP Address

Change the IP address of an SDPE for from DashBoard.

1. Click **Navigation Menu** > **Configuration** > **Network**.

2. Enter a name in the **Switcher Name** field. This is the name that appears in the tree view in DashBoard.

3. Click an **Automatic Discovery** button to have the switcher automatically discoverable by DashBoard (**On**), or not (**Off**). Automatic Discovery allows you to automatically find this device from any DashBoard running on your subnet.

4. Click **Edit**.
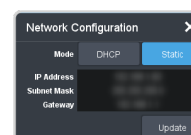
5. Click a **Mode** button to use DHCP (**DHCP**), or a static IP address (**Static**).

6. Enter the IP address (**IP Address**), subnet mask (**Subnet Mask**), and gateway (**Gateway**) you want to use.

7. Click **Update**.

DashBoard Proxy Server Minimum Requirements

The switcher passes a lot of messages to and from the DashBoard client. Additional features like the RAVE audio mixer can increase this messaging significantly. If the machine being used for the Proxy Server does not have enough resources to handle the messaging, the DashBoard connection to the switcher can become unstable.

🛈 *Important: If you are using Caprica to control your switcher, additional DashBoard connections can cause performance issues. It is highly recommended to use a DashBoard Proxy Server to reduce the load on the switcher.*

To properly support multiple connections to the switcher, the Proxy Server should have the following resources:

• **Cores** — 8
• **RAM** — 8GB

Note: Other software applications, such as TeamViewer, or services running on the server can lower performance.

Ross Platform Manager Connections

Ross Platform Manager can store and load configurations onto your switcher remotely, as well as provide software licenses. This allows for a centralized management of system configurations and software options.

A Ross Platform Manager (RPM) server can connect to the switcher over ethernet to download the working set or upload a new working set over FTP, as well as allow the switcher to request software licenses. An uploaded working set is immediately applied to the switcher when it is detected.

Note: *RPM cannot recall the **RPM Licensing** set to request or release RPM Licenses on the switcher.*

Refer to the RPM documentation for more information on orchestration.

FTP Connection

You can create a File Transfer Protocol (FTP) connection from a computer to your switcher. You can use the FTP connection to copy still images and animations to and from your switcher as well as copy Edit Decision List (EDL) files from your switcher.

The procedure for creating an SFTP connection from a computer varies between operating systems and client software. Consult with the documentation that came with your computer for assistance with creating an FTP connection.

Note: *The FTP connection to the frame can be disabled. Refer to System Access on page 94 for more information.*

Tip: *The FTP connection can be used to copy media items onto the NFS storage in the Frame CPU or to the USB drive in each SDPE blade.*

To Create an FTP Connection

Use an FTP client such as FileZilla® to create a connection to the switcher.

Note: *FTP must be **Enabled** (Click **Navigation Menu** > **Configuration** > **System** > **Access**) to connect to the frame over FTP. If FTP is disabled SFTP will be used. Refer to System Access on page 94 for more information.*

1. On your computer launch your FTP client.
2. Open an FTP connection to the switcher using the following settings.
   - **Protocol** — `FTP`.

- **Host** — the IP address of the Frame CPU or SDPE.
- **User** — the user name depends on the folder you want to access.
- **Password** — `password`.

User Name	Description
`user` (CPU)	Used to create a connection to the NFS storage of the system. **Tip:** *The NFS storage is available to all switchers created in the router.* • `/logs` — system logs are stored in this folder. • `/media` — media items for the Media-Store are stored in this folder. • `/media/switcher/set/hypermax` — switcher sets are stored in this folder. • `/upgrade` — HyperMax upgrade files are stored in this folder. Upgrade files can only be stored in this folder. Sub-folders are not supported.
`user` (SDPE)	Used to create a connection to the USB storage of the individual SDPE. **❶ Important:** *Do not copy a clip to the drive while a clip is playing. Copying a clip to the drive while the Clip Player is playing a clip can cause the clip to stutter or stop.* **Note:** *Files stored on the local USB are only available to SDPE that the USB is installed in.* • `/usb` — media items for the Media-Store are stored in this folder, as well an local upgrade files. • `/ubs/clips/video` — Clip Player clips are stored in this folder. • `/usb/switcher/set/hypermax` — switcher sets are stored in this folder.

System Access

Enable or disable system access and control methods such as RossTalk and FTP.

To Enable/Disable a System Access Method

1. Click **Navigation Menu** > **Configuration** > **System** > **Access**.

2. Configure the access method as required.

Method	Description
FTP	Disable FTP connections to the frame. This prevents all FTP connections. If FTP is disabled SFTP is used. Refer to *FTP Connection* on page 93 for information on used FTP to connect to the frame.
Role Based Access Control	Ross Platform Manager allows for user authentication and role based access through DashBoard. Refer to *To Turn on Role Based Access Control for Ross Platform Manager* on page 19 for more information.
RossTalk	Disable RossTalk connections to the switcher. The switcher refuses connections on port 7788.

3. The switcher must be re-started for the change to be applied.

Video Reference

The switcher uses the REF A or B input reference signal on the router directly as a reference clock. The switcher does not rely on the reference settings in Ultrix™ for a reference signal.

Supported Reference Formats

The switcher supports a number of reference modes for both internal and external reference signals. References to 1080p 59.94Hz (A) and 1080p 50Hz (A) refer to 1080p Level A only.

UHD-QSD is not supported at this time.

The switcher allows you to use any interlaced video format to operate the switcher in any format of the same frequency.

The use of composite sync reference formats is recommended for Standard Definition video modes, as well as fully supported for High Definition video modes, and provides stable outputs with jitter performance in compliance with SMPTE-259M specifications. SMPTE does not recommend using a composite sync reference for HD video.

Reference and Video Mode Setup

The switcher uses the REF A or B input reference signal on the router directly as a reference clock.

The switcher only shows the video modes that you can operate the switcher in that are supported for that reference format that being received on the REF A or B input.

To Set a Video Mode

The Vid Mode is the video format that the switcher is operating in.

1. Click **Navigation Menu** > **Configuration** > **Reference**.

Note: Extra setting may be shown on the menu if you are operating in a UHDTV1 mode.

2. Click the **Video Mode** button and select the video format you want to use.

   The available video modes depends on the reference format coming into the switcher.

3. Click the **Reference Input** button and select the reference input (**REF A** or **REF B**) on the router you want to use.

To Set the Switcher Dynamic Range and Color Gamut

Set the color gamut and dynamic range that the switcher is operating on.

1. Click **Navigation Menu** > **Configuration** > **Reference**.

2. Click a **Dynamic Range** button to select the range you want the switcher to operate in.
   - **SDR** — Standard Dynamic Range.
   - **HLG** — Hybrid Log Gamma.
   - **PQ** — Perceptual Quantizer.
   - **SLOG3** — Sony® S-Log3.

3. Click a **Color Gamut** button to select the color gamut you want the switcher to operate in.
   - **BT.709 (HD)** — color gamut recommended for HD video signals.
   - **BT.2020 (UHD)** — wide color gamut recommended for UHDTV1 video signals.

Switching Field (HD Only)

The switching field is the field in an interlaced video format that the switcher uses to transition from one video source to another. An interlaced video format is made up of two fields, field 1 (odd lines) and field 2 (even lines).

> *Note:* *If you are running in a progressive video format, selecting an even or odd fields will cause the switcher to only allow transitions on every second frame.*

To Set the Switching Field

Set the field that transitions are performed on when operating in an HD video format.

1. Click **Navigation Menu** > **Configuration** > **System** > **Global**.
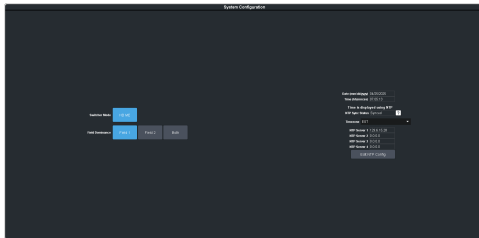
2. Click a **Field Dominance** button to select which field video transitions occur on.

    *   **Field 1** — transitions occur on the odd field
    *   **Field 2** — transitions occur on the even field
    *   **Both** — transitions occur on the current field, either even or odd

Video Inputs

Video sources come into the switcher from the router matrix. Depending on how you want to use these video sources, or where they come from, you may want the switcher to pair them together, or associate an external device with them. Pairing two video sources together is usually used for an auto select key where an external device, such as a character generator, outputs both a key video and key alpha. Associating a video source with an external device allows special control over that device to become active when you select the source on a bus.

The switcher has access to every source from every blade in the router.

> **Note:** *In the router, Switcher Outputs are Sources for the slot the SDPE is installed in. These sources will show up on the switcher inputs list, but should not be used for re-entry.*

Video Input Setup

Video inputs are separated into external sources and internal sources. The external sources are the video inputs coming in on the HD-BNC at the back of the frame and the internal sources are generated internally either from re-entries or follows, or from media generators.

To Set up an External Video Input

External sources come into the switcher from other devices, such as cameras, video servers, or character generators.

Click **Navigation Menu** > **Configuration** > **Inputs** > **External**.

The physical inputs are listed along the side and the various settings are listed across the top. Click the setting button for the source you want to set up to view the available settings.

Setting	Description
Text	Apply a custom name to the source. Enter a new name for each input you want to identify differently. Names are limited to 12 characters plus the | symbol. The name is used to identify the input on the panel mnemonics and well as on menus. If TSL id is associated with the input, the switcher will use the router mnemonic name over the internal one. *Tip: A line break can be added to the name by entering a vertical bar, or pipe, symbol (|) where you want the break. For example, entering CAM | 1 would be CAM and then 1 on a separate line.* *Tip: If you clear the **Text** field (delete all characters) the switcher will use the router name for the source.*
Ultrix Source	Select the Ultrix™ source that you want to assign to the selected switcher input. Router sources are identified by the slot and source name that is assigned in the router database.
TouchDrive Icon	Set up the mnemonic appearance of the source for the control panel you are using. Refer to your control panel documentation for more information on setting up mnemonics.
Alpha	Link an alpha video feed to the video. If the input is the video or fill for an auto key, click the **Alpha** button and select the video source you want to use as the alpha. Refer to *To Set Up an Auto Key Association* on page 100 for information on setting up an auto key.
Device	Link an external device to a video input to allow remote control for that device.
Audio Mixer	Link an external audio mixer to a video input. Select the audio mixer and audio channels on the mixer that you want to associate with the video. Associating audio channels with video sources allows for Audio Follow Video (AFV) control from the switcher where the audio channel is brought up when the video it taken on-air.
TSL	Assign a TSL id to the input and set the tally state. Refer to *To Assign a TSL ID to a Video Input* on page 98 for information on assigning a TSL id to an input.
Panel Follow	Select one of the custom panels to be shown on Live Assist when the source is selected. This can be used to have the DashBoard page for a camera control unit displayed when the camera source is selected. Refer to *Custom Page Auto Follow* on page 102 for information on setting up custom panels.

To Set up an Internal Video Input

Internal sources are generated inside the switcher, such as matte backgrounds, Media-Store channels, and ME re-entries.

Click **Navigation Menu** > **Configuration** > **Inputs** > **Internal**.

The internal sources are listed along the side and the various settings are listed across the top. Click the setting button for the source you want to set up to view the available settings.

Setting	Description
Text	Apply a custom name to the source. Enter a new name for each input you want to identify differently. Names are limited to 12 characters plus the | symbol. The name is used to identify the input on the panel mnemonics and well as on menus.
	Tip: *A line break can be added to the name by entering a vertical bar, or pipe, symbol (|) where you want the break. For example, entering CAM | 1 would be CAM and then 1 on a separate line.*
TouchDrive	Set up the mnemonic appearance of the source for the control panel you are using. Refer to your control panel documentation for more information on setting up mnemonics.
Icon	
Alpha	Link an alpha video signal to the video. The Media-Store channels have dedicated alpha channels that cannot be changed. Refer to *To Set Up an Auto Key Association* on page 100 for information on setting up an auto key.
Device	Link an external device to a video input to allow remote control for that device.
Audio Mixer	Link an external audio mixer to a video input. Select the audio mixer and audio channels on the mixer that you want to associate with the video. Associating audio channels with video sources allows for Audio Follow Video (AFV) control from the switcher where the audio channel is brought up when the video it taken on-air.

Setting	Description
Panel Follow	Select one of the custom panels to be shown on Live Assist when the source is selected. The pages for MediaManager are assigned to the Media-Store sources. Refer to *Custom Page Auto Follow* on page 102 for information on setting up custom panels.

Source Names

Each video source in the switcher can be given a unique name. These names can be customized for how they appear on the mnemonics by adjusting the size or the font and the background color.

Note: *If a TSL ID is assigned to a source, the switcher overwrites the source name on the MultiViewer and mnemonics with the TSL name. If there is no TSL name, or it has not been received yet, the source name is blank. For the labels on the MultiViewer, a combination of the TSL name and switcher source name are used. The new TSL name is passed from the switcher to any downstream TSL devices.*

To Set Up a Source Name

Source names appear on mnemonics, menus, and on the MultiViewer.

Note: *Source names are restricted to eight characters in length.*

1. Click **Navigation Menu** > **Configuration** > **Inputs** > **External** if you are setting up a physical input, or **Internal** if you are setting up an internal input.

2. Enter a new name in the **Text** field for the video input that you want to name. Names are limited to 12 characters plus the \| symbol.

   Tip: *A line break can be added to the name by entering a vertical bar, or pipe, symbol (\|) where you want the break. For example, entering CAM \| 1 would be CAM and then 1 on a separate line.*

   Tip: *If you clear the **Text** field (delete all characters) the switcher will use the router name for the source.*

To Assign a TSL ID to a Video Input

Pass router mnemonic names to the switcher with TSL ID 5 data.

The switcher accepts incoming TSL 5 data on TCP port 5728.

Note: *The router will send TSL information to the switcher automatically. It is important to match the TSL IDs on the switcher with those on the router.*

1. Click **Navigation Menu** > **Configuration** > **Inputs** > **External**.

2. Click the **TSL** button for the input you want to assign a TSL ID to.
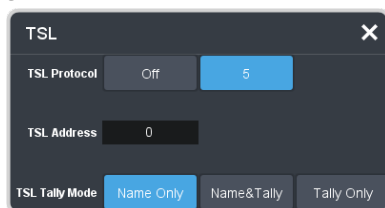
3. Click a **TSL Protocol** button to select the TSL protocol version the input is listening for.

   • **Off** — TSL is off for this input.
   • **5** — the selected input is listening for TSL 5 messages.

4. In the **TSL Address** field, enter the TSL ID that applies to the selected input.

5. Click the **TSL Tally Mode** button and select how the source is tallied and which mnemonic name is use.

   • **Name Only** — TSL tally information for the selected ID is ignored. TSL mnemonic source names are used.
   • **Name&Tally** — source tallied on the MultiViewer based on the TSL input. TSL mnemonic source names are used.
   • **Tally Only** — source tallied on the MultiViewer based on the TSL input. TSL mnemonic source names are not used.

> *Note: If a TSL ID is assigned to a source, the switcher overwrites the source name on the MultiViewer and mnemonics with the TSL name. If there is no TSL name, or it has not been received yet, the source name is blank. For the labels on the MultiViewer, a combination of the TSL name and switcher source name are used. The new TSL name is passed from the switcher to any downstream TSL devices.*

Mnemonics

The mnemonic displays on the control panel show the name of the video source and can be customized for font size, color, and in some cases icons can be added. The customization that is available depends on the control panel you are using.

> *Note: The SoftPanel uses the Carbonite settings.*

To Customize Mnemonics for TouchDrive

The TouchDrive control panels support RGB color mnemonics and icons.

1. Click **Navigation Menu** > **Configuration** > **Inputs** > **External** if you are setting up a physical input, or **Internal** if you are setting up an internal input.

2. Click the **TouchDrive** button for the source you want to customize the mnemonics for.
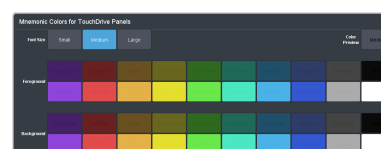
Setting	Description
Font Size	Click **Small**, **Medium**, or **Large** to select the size of the font used on the mnemonic display. The larger the font, the fewer characters that are visible on the mnemonic.
Foreground	Click a **Foreground** button to select the color you want to apply to the text and icon on the mnemonic.
Background	Click a **Background** button to select the color you want to apply to the background on the mnemonic.

3. Click the **Icon** button for the source you want to customize the mnemonics for and click the icon you want to use.
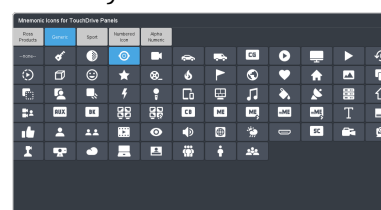
Auto Key Setup

An auto key allows you to associate a key alpha with a key video source in the switcher. When the video source is selected as a keyer, the key alpha is automatically used.

> *Note: Some internal sources, like Media-Store, Chroma Key, MiniME™, and MaxScene outputs, are hard-coded to their alpha signals.*

To Set Up an Auto Key Association

As well as input sources, internally generated sources, such as media-stores and color backgrounds, can be set up as an auto key.

1. Click **Navigation Menu** > **Configuration** > **Inputs** > **External** if you are setting up a physical input, or **Internal** if you are setting up an internal input.

2. Click the **Alpha** button for the key video source that you want to assign an alpha to.
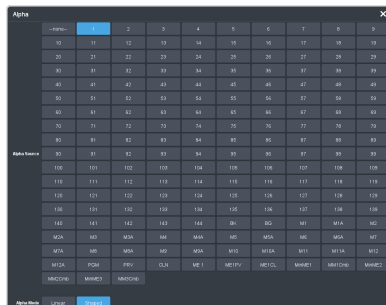
3. Click the **Alpha Source** button for the source that you want to assign to the key video.

> **Note:** The available sources depends on the configuration of your switcher.

> **Tip:** Some internal sources have alpha signals hard coded to them and others do no support an alpha signal.

- **--none--** — no alpha
- **XX** — assign the source on the selected input as a key alpha
- **BK** — assign internal black as a key alpha
- **BG** — assign the matte generator as a key alpha
- **M*X*** — assign the video on Media-Store *X* as a key alpha
- **M*X*A** — assign the alpha on Media-Store *X* as a key alpha
- **PGM** — assign the main program output as the key alpha
- **PRV** — assign the main preview output as the key alpha
- **CLN** — assign the main clean feed output as the key alpha
- **ME*X*** — assign the program output of ME *X* as the key alpha
- **ME*X* PV** — assign the preview output of ME *X* as the key alpha
- **ME*X* CL** — assign the clean feed output of ME *X* as the key alpha
- **MiniME*X*** — assign the output of MiniME™ *X* as the key alpha

- **MM*X*Cmb** — assign the combined alpha of MiniME™ *X* as the key alpha

4. Click an **Alpha Mode** button to select the alpha mode for the key alpha.

- **Linear** — switcher performs a multiplicative key. The key alpha cuts a hole based on the gradient values of the alpha. Shades of gray are translated into transparency levels, giving the key a soft edge. Unshaped key alphas can also be considered true linear alphas.
- **Shaped** — switcher perform an additive key. With shaped keys, the key alpha cuts a hole based on the monochrome value of the alpha. Shades of gray are translated into either white or black, giving the key a hard edge. Shaped Key alphas are sometimes used with Character Generators to cut very precise holes for the fill.

GPI Device Control

You can assign a GPI output to a video source for basic external device control. When a video source is taken on-air, the switcher can be set to trigger a GPI output, with a pre-delay. The external device can be set up to cue a clip, or load a page when it receives the GPI input trigger.

> **Note:** The Next Button Secondary Function must be set to GPO to be able to trigger a GPI output manually using the **NEXT** button on the control panel.

Keep the following in mind:

Keep the following in mind when working with GPI output triggers:

- The **Roll Clip** must be set to **On** to trigger a GPI output with a transition.
- Edge triggered GPI outputs remain triggered for the configured duration.
- Level triggered GPI outputs toggle between high and low each time they are triggered.
- You can manually trigger a GPI output from the GPIO Configuration page (Click **Navigation Menu** > **Configuration** > **Tally and GPIO** > **GPIO**). Refer to *GPI Control* on page 122 for more information.

To Assign a GPI Output to a Video Source

Assign a GPI output to an external video source to trigger events on external devices.

1. Click **Navigation Menu** > **Configuration** > **Tally and GPIO** and click **External Tally** or **Internal Tally**, depending on the video source you want to apply the GPI to.
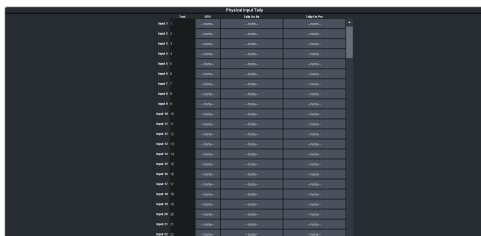
2. Click the **GPO** button for the video source that you want to assign a GPI output to.

   If you are using the GPI to control the device, the video source should be the video output coming from the device.

3. Click the GPI output that you want to assign to the video source.
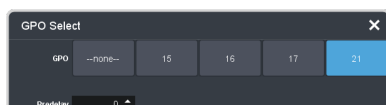
> **Note:** *You must have GPIs set as outputs to be able to assign them to the video source.*

4. In the **Predelay** field, enter the pre-delay time, in frames, you want to use with the GPI output.

   When you transition a video source with a GPI assigned to it, and the Roll Clip feature is active, the switcher triggers the GPI output, and then waits the pre-delay time before performing the transition. The length of the pre-delay is usually the length of time your video server requires to start playing a clip or your character generator requires to load a page.

Tallies Setup

Tallies are simple contact closure relays that the switcher uses to signal other devices, and users, that a particular video source is on-air. Typically, tallies are used to light a red light on a camera to show people that they are on-air and what camera they should be looking at.

> **Note:** *Tallies are tied to the On-Air setting for the bus the source is selected on. If the bus is not set to be tallied as on-air, the tallies for the sources selected on that bus do not trigger. Refer to On-Air Setting on page 107 for information on setting the on-air status.*

To Assign a Tally to a Video Source

Tallies are assigned to video sources and are trigged when that input is selected on a bus that is on-air or is going on-air.

1. Click **Navigation Menu** > **Configuration** > **Tally and GPIO** and click **External Tally** or **Internal Tally**, depending on the video source you want to apply the tally to.
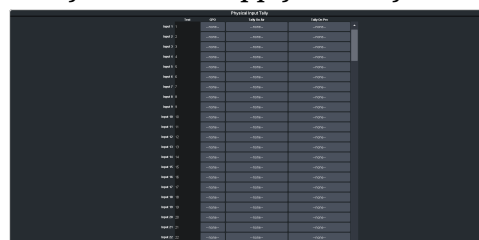
2. Click the **Tally On Air** or **Tally on Prv** button for the source you want to assign a tally to.
   • **Tally On Air** — tally the selected source when it is on-air.
   • **Tally On Prv** — tally the selected source when it is going to be taken on-air with the next transition.
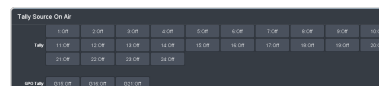
> **Note:** *Only the DB25 Tally port located on the blade assigned as ME P/P is supported at this time.*

3. Click the **Tally** and/or **GPO Tally** buttons for the tallies you want to assign to the source.

> **Tip:** *You can assign multiple tallies to the same source, and you can assign the same tallies to multiple sources.*

TSL 5 Tallies

Use incoming TSL 5 signals to trigger tallies or GPI outputs on the switcher.

Using the Index and Control bits in the TSL 5 protocol messages the switcher can trigger tallies and GPI outputs on the switcher.

• **Index** — the base address from 0 to 65534.
• **Control** — the control data using bits 0-5. The bit-pairs for tally color are not supported. Only a single bit can be assigned.

To Map a TSL 5 Input Signal to a Switcher Tally or GPI.

Use the TSL input address and control bits to trigger a switcher tally or GPI.

1. Click **Navigation Menu** > **Configuration** > **Tally and GPIO** > **TSL 5 Tally**.
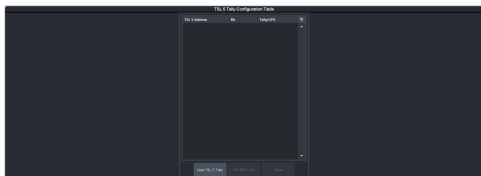
2. Click **New TSL 5 Tally** and map how the switcher will respond to a TSL 5 message.

> **Tip:** *You can edit or delete and existing mapping by selecting the row and clicking* ***Edit TSL 5 Tally*** *or* ***Delete****.*
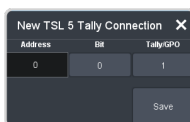
Data	Description
Address	The TSL 5 Index that you want to listen for. When the switcher receives this index it will look to match the control bit in the message.
Bit	Select the TSL 5 Control bit that you want to listen for. If this bit is set in the message the selected tally or GPI is triggered. The switcher will not recognise bit-pairs set for tally colors.
Tally/GPO	Select the tally or GPI that you want to trigger when the selected ID and Control but are received. Only GPI outputs that have been configured as tallies can be triggered.

3. Add additional tally mappings as required.
4. Click **Save**.

Custom Page Auto Follow

DashBoard pages can be assigned to custom page buttons in Live Assist. These custom pages can then be assigned to video inputs allowing Live Assist to auto follow to these pages when that video input is selected. For example, you can assign a custom page to the DashBoard page that controls a robotic camera. You can then set that custom page to follow the input from that camera. Whenever you select that camera as a source, Live Assist will jump to the custom page for that camera.

> **Note:** *PaneLink must be active in Live Assist for auto follow to function.*

> **Tip:** *Press Click* ***Navigation Menu*** > ***Live Assist*** > ***Custom Views*** *to view the current custom view pages.*

To Assign a Page to a Custom Page Button

The custom page buttons on the Live Assist page can be assigned any custom page or node in DashBoard. This allows you to quickly access controls from another device on DashBoard from Live Assist on your current device.

1. Click **Navigation Menu** > **Configuration** > **System** > **Live Assist**.

2. Click on the **Address** drop-down list for the custom page button you want to assign to a page.
3. Select the connection or custom panel that you want to assign to the custom page button.
   - **All Connections** — expand the list and select the device and node that you want to assign to the custom page button. Some older DashBoard nodes from plug-ins may not display properly on the Live Assist buttons.

   > **Note:** *Do not assign the Live Assist page to a custom page. A custom page will not display Live Assist from any switcher.*

   - **Open Panels** — expand the list and select the open custom panel you want to assign to the list. You must have the custom panel running on DashBoard for it to appear in the list.

   > **Tip:** *Click* ***Clear*** *to remove the custom page and name assigned to that button.*

4. Click on the name field for the custom page button you are assigning a page to and enter a descriptive name for the custom page. The name appears on the button in Live Assist.

To Assign a Custom Page to Follow an Input

Assign a Live Assist custom page to follow a physical or internal video source.

1. Click **Navigation Menu** > **Configuration** > **Inputs** > **External** if you are setting up a physical input, or **Internal** if you are setting up an internal input.

2. Click the **Panel Follow** button for the input you want to assign a custom page to.
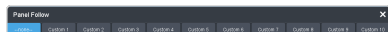
3. Click the custom page you want to assign to the input or click **none**.

Substitution Table

A substitution table allows you to specify a different source that will be taken on a bus when a specific source is selected on that bus. The substitution table requires either a MultiScreen or ME follow to be set up between the buses to trigger the substitution.

The substitution table can be used with the ME follows feature to create multilingual production feeds. For example, you can have ME 2 follow ME 1 to simultaneous produce multiple feeds. When a source is selected on ME 1, the same source is selected on ME 2. With the substitution table you can have it that when camera 1 is selected on ME 1 the follow will select camera 1 on ME 2 but the substitution table substitutes camera 4 for camera 1 on ME 2. Refer to *ME Follows* on page 106 for information on setting up ME follows.

When working with a MultiScreen setup, the substitution tables allow you to take pre-tiled sources from a CG or video server and have the switcher treat them as a single source across multiple areas or buses. When the first tile is selected on MiniME™ 1, the substitution table also selects the second tile on MiniME™ 2.

Keep the following in mind:

Keep the following in mind when working with substitution tables:

- When working with a MultiScreen, the bezel compensation and data doubling setting should be set up on the source generator.
- If you want to create a substitution for an auto-select key, you must set up a substitution for both the fill and the alpha.
- Selecting a crosspoint directly on a bus that has a substitution set up for it overrides the substitution. The substitution continues when a new source is selected on the leading bus.

To Set Up a Pre-Tiled Source

The substitution table is a single table that allows you to specify a different source that should be taken when a specific source is

selected on a bus. The substitution table requires either a Canvas or ME follow to be set up between the buses to trigger the substitution.

Tip: When you select the Source on the ME/Bus, the Substitution source is taken instead.

1. Click **Navigation Menu** > **Configuration** > **Inputs** > .
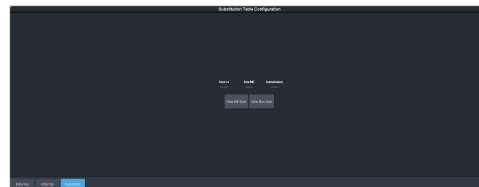
2. Click **New ME Sub** or **New Bus Sub** to select the type of substitution table you want to set up.

- **New ME Sub** — create a substitution on an ME or MiniME™.
- **New Bus Sub** — create a substitution on a key bus of an ME or MiniME™, or an aux bus.

3. Click the **Source** button and select the source that you want to substitute with another source.

4. Click the **ME** or **Bus** button and select the area that you want the substitution to occur on.

5. Click the **Substitution** button and select source you want to substitute for the selected one. Repeat for any addition substitutions you want to create.

6. Click **Save**.

Video Outputs

Switcher outputs are routed to destinations in the router matrix.

Each SDPE blade has specific output to the router depending on the role that blade has been assigned.

Tip: *In the router, Switcher Outputs are Sources for the slot the SDPE is installed in. You must route these sources to Destinations in the Ultrix™ matrix.*

Switcher Output	Video Signals per SDPE Role		
	ME	MiniME™	MaxScene
1	ME Program	MiniME 1 Program	MultiViewer
2	ME Preview	MiniME 1 Preview	Black
3	ME Clean	MiniME 1 Combined Key	Scene 1 Video
4	User Out 1	MiniME 2 Program	Scene 2 Video
5	User Out 2	MiniME 2 Preview	Scene 3 Video
6	User Out 3	MiniME 2 Combined Key	Scene 4 Video
7	User Out 4	MiniME 3 Program	Scene 5 Video
8	User Out 5	MiniME 3 Preview	Scene 6 Video
9	Clip Player	MiniME 3 Combined Key	Scene 7 Video
10	MultiViewer	MultiViewer	Scene 8 Video
11	Media-Store Channel 1 Video	Media-Store Channel 1 Video	Scene 1 Alpha
12	Media-Store Channel 1 Alpha	Media-Store Channel 1 Alpha	Scene 2 Alpha
13	Media-Store Channel 2 Video	Media-Store Channel 2 Video	Scene 3 Alpha
14	Media-Store Channel 2 Alpha	Media-Store Channel 2 Alpha	Scene 4 Alpha
15	Media-Store Channel 3 Video	Media-Store Channel 3 Video	Scene 5 Alpha
16	Media-Store Channel 3 Alpha	Media-Store Channel 3 Alpha	Scene 6 Alpha

Switcher Output	Video Signals per SDPE Role		
	ME	MiniME™	MaxScene
17	Media-Store Channel 4 Video	Media-Store Channel 4 Video	Scene 7 Alpha
18	Media-Store Channel 4 Alpha	Media-Store Channel 4 Alpha	Scene 8 Alpha

Video Output Setup

You can assign a video source or bus to an output BNC. Some outputs can only be used for certain features

To Set up a Video Output

Assign video sources or buses to the output HD-BNCs on the back of the switcher. Some outputs are fixed to a specific video signal.

1. Click **Navigation Menu** > **Configuration** > **Outputs**.
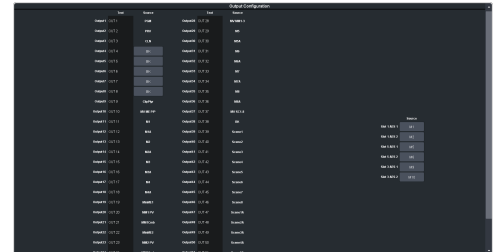
2. Click on the **Source** button for the output that you want to assign a source to.
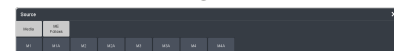
3. Click the video source that you want to assign to the output.

    *   **Media** — the Media-Store and MediaWipe sources.

        *   **M***X* — Media-Store video channel *X*
        *   **M***X***A** — Media-Store alpha channel *X*

    *   **ME Follows** — the background, preset, and key buses of each ME.

        *   **ME***X***Bg** — source on background of ME *X* (if installed)
        *   **ME***X***Pst** — source on preset output of ME *X* (if installed)
        *   **ME***X***K***Y***V** — key *Y* video of ME *X* (if installed)
        *   **ME***X***K***Y***A** — key *Y* alpha of ME *X* (if installed)

4. In the **Text** column, enter a new name for each output you want to identify differently. The name is used to identify the output on the panel mnemonics as well as on menus.

Ancillary Data

Ancillary data is information such as closed captioning or embedded audio that is included in the non-active video portions of the video signal. These portions include the Horizontal Ancillary Data Space (HANC) and Vertical Ancillary Data Space (VANC).

> ⓘ **Important:** *The switcher does not pass ancillary data. Ancillary data is handled by Ultrix™ and inserted after the switcher. Refer to the documentation that came with your router for information on ancillary data handling.*

FlexiClean Clean Feed

FlexiClean clean feed provides an additional output per ME that can show different keys than the program output.

Clean feed is typically used for bilingual and live-to-tape productions. It allows you to assign keys to the Background or CLEAN output of an ME independent from transitions. A frequent application is the recording of shows for later airing without call-in phone numbers inserted.

The background and clean feed for an ME can be set to include or exclude any keys. This allows to essentially have two program outputs for a single ME that can include different keys. For example, in the illustration below the Program Feed for the ME has keys 1, 2, and 3 and the Clean Feed for the ME has keys 4, 5, and 6. These keys can be transitioned on or off-air for the ME but will not impact the feed they are not assigned to.

Keep the following in mind:

Keep the following in mind when working with clean feeds:

- Recalling a memory register using MemoryAI may cause the clean feed output to look different than expected. MemoryAI allows key elements to be recalled to other keys than originally resulting in different key layering.

- Including a key in the clean feed does not force the key on-air. If a key is off-air, it will not appear on the clean feed even if it is included.

To Set Up Clean Feed

1. Click **Navigation Menu** > **Configuration** > **System** > **ME**.
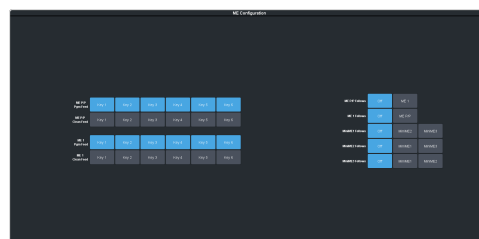
2. Click an **ME *X* Pgm Feed** or **ME *X* Clean Feed** button to select the which keys can be included in that feed.

- **Pgm Feed** — the selected keys can be present on the program output of that ME.
- **Clean Feed** — the selected keys can be present on the clean feed output of that ME.

> **Note:** *The on-air status of the key does not change the inclusion of that key on the Program or Clean output. If a key has been excluded from the Program output of an ME then it cannot be taken on-air on that program output.*

Key Priority

Change the order in which keys appear relative to each other.

Key priority allows you to change the layering order of the keys on the output. Keyers are normally layered with the first key on the bottom and last key on the top, or on top of all the other keys. Keys can now be placed in any order.

To Set the Key Priority

Set the key priority for keys on ME and MiniME™ outputs.

1. Click **Navigation Menu** > **Live Assist** > **MEs** and select the ME or MiniME™ you want to set the key priority on.

2. Click **Key Priority**.
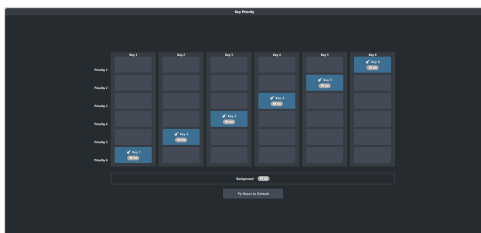
3. In the **Key *x*** column for the key you want to adjust the priority for, click the **Priority** button for the new priority you want to set for that key.

The lowest priority (highest priority number) is directly on top of the Background and all other keys are layered on top in order to the highest priority (Priority 1). Multiple keys cannot be set to the same priority level.

> *Tip:* *The other keys will maintain there existing relative priority. This may result in all the other keys shifting up or down.*

> *Tip:* *Click* ***Reset to Default*** *to return all keys to their default priority.*

External Layer Mode

The clean feed for an ME is used to create a composite alpha from the keyers on that ME that is then available as a single alpha source. This allows you to output both the video and alpha from an ME to an external switcher. The key video comes from the output of the ME and the key alpha comes from the clean feed of the ME.

The alphas that are included in the layer mode output are set with the keyer buttons in the next transition area. Toggle a keyer button on to include the alpha from that keyer in the layer mode output.

When layer mode is turned on for an ME, you are restricted to cut, dissolve, and wipe transitions. MediaWipe and DVE transitions are not available.

> *Tip:* *To use layer mode internally, select the clean feed for the ME that is set to layer mode as the alpha for an auto key on another ME or a MiniME™.*

To Set Up Layer Mode

Use the clean feed to output a composite alpha of the keys on that bus.

1. Click **Navigation Menu** > **Configuration** > **System** > **ME**.

> *Note:* *The number of MEs depends on the number of SDPE blades assigned as ME.*
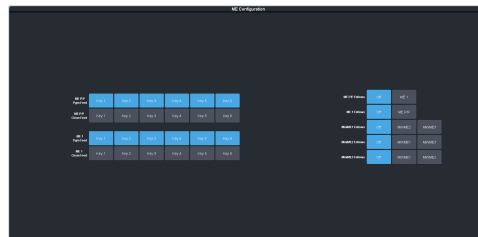
2. Click an **ME *X* Layer Mode** button to turn layer mode on (**On**), or (**Off**) for that ME.

ME Follows

An ME or MiniME™ can be linked to another ME or MiniME™ so that actions performed on the first are duplicated on the following. Linking can only be set between areas of the same type. You cannot have a MiniME™ follow an ME.

> *Tip:* *The ME follows can also be used with the substitution table feature to create multilingual production feeds. For example, you can have ME 2 follow ME 1 to simultaneous produce multiple feeds. When a source is selected on ME 1, the same source is selected on ME 2. With the substitution table you can have it that when camera 1 is selected on ME 1 the follow will select camera 1 on ME 2 but the substitution table substitutes camera 4 for camera 1 on ME 2.*

Keep the following in mind:

Keep the following in mind when working with ME Follows:

- You cannot have a MiniME™ follow an ME.
- There must be available resources for the following ME or MiniME™.
- Memories and resets are also performed on the following ME or MiniME™.
- Chroma Key initialization is only performed on the leading ME or MiniME™. The following ME or MiniME™ get the same chroma key parameters as the leading ME or MiniME™. If you are substituting the source on the following ME or MiniME™ the chroma key will not be initialized properly for that source.
- You must turn the MultiScreen off to be able to set the follows for the MiniME™.
- You cannot cascade/re-enter follows. For example, if MiniME™ 1 is following MiniME™ 2, MiniME™ 2 cannot be set to following anything and no other MiniME™ can follow MiniME™ 1.

To Set Up an ME Follow

1. Click **Navigation Menu** > **Configuration** > **System** > **ME**.
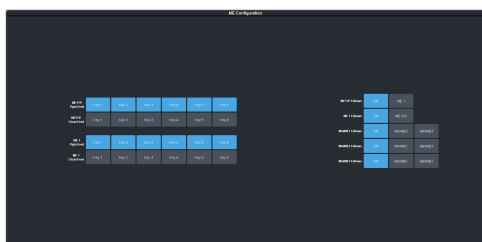
2. For example, click **MiniME 2** in the **MiniME 1 Follow** row to have actions performed on MiniME™ 2 duplicated on MiniME™ 1.

> *Note:* The MiniME™ follows are only available if the MiniME™ is not being used for a MultiScreen. You must turn the MultiScreen off to be able to set the follows for the MiniME™.

> *Tip:* Select **Off** to have the ME or MiniME™ not follow anything.

On-Air Setting

Some switcher outputs can be set to be considered on-air or not. This allows you to set which outputs are tallied, how resource allocation is divided, and how the Roll Clip feature works.

To Set the On-Air Status for an Output

Set an output to be on-air to tally sources that are selected on that bus.

1. Click **Navigation Menu** > **Configuration** > **On Air**.
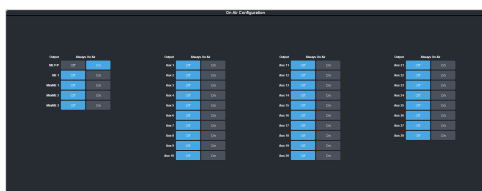
2. Click an **Always OnAir** button for a output to select whether the output is considered on-air (**On**) or not (**Off**).

> *Tip:* Setting an output to be always on-air tallies sources that are selected on that bus, or are going to be taken on-air with the next transition.

MultiViewer

The MultiViewer allows you to view multiple video sources from a single output BNC. Video inputs or outputs on the switcher, including Program, Preview, and Media-Store channels, can be assigned to any box on the MultiViewer.

A time-clock can be added as an overlay to the MultiViewer showing either system time or time code.

Keep the following in mind:

Keep the following in mind when working with a MultiViewer:

* The layout is configured independently for each MultiViewer.
* Inputs are displayed with a red tally box when they are on-air. A green tally box is displayed when the input is selected on the Preset bus.
* All ancillary data is stripped from the MultiViewer outputs.
* Each SDPE blade has a single MultiViewer output that is dedicated to the sources generated by that blade.
* Router sources, or sources from a different SDPE blade cannot be viewed on the MultiViewer. Only sources generated on same SDPE blade can be viewed.

MultiViewer Output Formats

The output of the MultiViewer for each switcher format.

The switcher changes for the format of the output of the MultiViewer depending on the video format the switcher is operating in.

Switcher Video Format	MultiViewer Format
720p 50Hz	720p 50Hz
720p 59.94Hz	720p 59.94Hz
1080i 50Hz	1080i 50Hz
1080i 59.94Hz	1080i 59.94Hz
1080pSF 23.98Hz	1080pSF 23.98Hz
1080pSF 24Hz	1080pSF 24Hz
1080pSF 30Hz	1080pSF 30Hz
1080p 23.98Hz	1080p 23.98Hz
1080p 24Hz	1080p 24Hz
1080p 25Hz	1080p 25Hz

Switcher Video Format	MultiViewer Format
1080p 29.97Hz	1080p 29.97Hz
1080p 30Hz	1080p 30Hz
1080p 50Hz	1080p 50Hz
1080p 59.94Hz	1080p 59.94Hz
1080p 60Hz	1080p 60Hz
UHDTV1 23.98Hz	1080p 23.98Hz
UHDTV1 24Hz	1080p 24Hz
UHDTV1 25Hz	1080p 25Hz
UHDTV1 29.97Hz	1080p 29.97Hz
UHDTV1 30Hz	1080p 30Hz
UHDTV1 50Hz	1080p 50Hz
UHDTV1 59.94Hz	1080p 59.94Hz
UHDTV1 60Hz	1080p 60Hz

To Set Up a Video Processor MultiViewer

Select a layout for the Video Processor MultiViewer, assign sources to the boxes, and configure mnemonic names and tallies.

1. Click **Navigation Menu** > **Configuration** > **MultiViewers** and click the **ME**, **MiniME**, or **Scene** for the SDPE blade you want to set up the MultiViewer for.
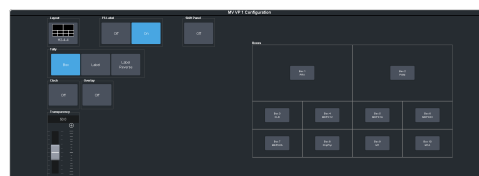
2. Click the **Layout** button and select the arrangement of the boxes that you want to use for the selected Video Processor MultiViewer.

3. Use the **Transparency** slider to adjust the transparency of the background behind the source label for the selected Video Processor MultiViewer.

4. Apply an overlay to the Video Processor MultiViewer as follows:

   a) Click the **Overlay** button and click **On** to turn the overlay on, or **Off** to turn it off.
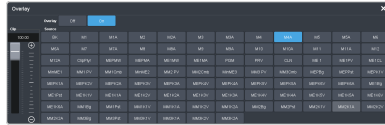
   Note: *The overlay feature is only available when a layout of less than 16 boxes is used.*

   Tip: *The overlay can be used to overlay a camera shot of a shot-clock over the MultiViewer output.*

   b) Click the **Source** button for the video source that you want to overlay over the Video Processor MultiViewer output.

   c) Use the **Clip** slider to adjust the clipping of the overlay source.

      At **0%** the overlay source is completely opaque, and at **100%** it is completely transparent.

5. Click a **Tally** button to select how boxes on the Video Processor MultiViewer are tallied.

   - **Box** — red or green border is shown around the outside of the Video Processor MultiViewer box
   - **Label** — red or green boxes are shown inside the label area of the Video Processor MultiViewer box
   - **Label Reverse** — the same as Label, but the placement of the tally boxes is swapped

6. Click an **FS Label** button to select whether FSFC is shown on the source labels (**On**) or not (**Off**) when a FSFC is applied to the source.

7. Click **Shift Panel** and select the panel that you want the MultiViewer shift to be active on. When the **Shift** button is pressed on the assigned control panel the MultiViewer shows the shifted sources.

   Note: *The shift function can only be assigned to a single panel at a time.*
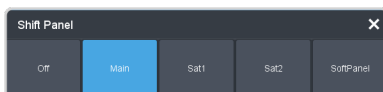
   Tip: *When the MultiViewer Shift is active, the box buttons on the layout show the shifted source in brackets.*

8. Click on one of the **Boxes** buttons and set up how that box appears on the Video Processor MultiViewer in the standard and shifted configuration. Select the shift level (**Main**, **Shift X**) you want to assign a source to and then select the source.
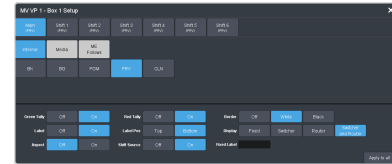
   Note: *The Follows selections are only available for the role that the SDPE has been assigned. For example, **MiniME Follows** are only available on blades assigned as MaxMini.*

   - **Internal** — the internally generated sources of the selected SDPE.
   - **Media** — the Media-Store and MediaWipe sources.
   - **ME Follows** — the background, preset, and key buses of each ME.
   - **MiniME Follows** — the background, preset, and key buses of each MiniME™.
   - **Scene Follows** — the background and scenes of each MaxScene.

9. Select how you want that box to appear on the Video Processor MultiViewer.

   Tip: *Click **Apply to All** to have the settings for the current box applied to all boxes in MultiViewer. This does not include what video source is assigned to the box.*

Option	Description
Green Tally	Turn the preview (green) tally for the Video Processor MultiViewer box on or off.
Red Tally	Turn the program (red) tally for the Video Processor MultiViewer box on or off.
Border	Turn the border around the Video Processor MultiViewer box off (**Off**), white (**White**), or black (**Black**). When the border is turned off, some distortion may be visible around the edges of the box.
Label	Turn source labels for the Video Processor MultiViewer box off, or on in a selected position.
Label Pos	Select a position for the source label for the Video Processor MultiViewer box (**Bottom** or **Top**).

Option	Description
Display	Select what name is shows on the label. • **Fixed** — show only the text entered in the **Fixed Label** field as the name. • **Switcher** — show only the internal mnemonic name. • **Router** — show only the TSL UMD name. • **Switcher and Router** — show both the internal and TSL UMD name *Tip: If you select a source on an aux bus that does not have a TSL UMD name, the mnemonic name is used instead on the MultiViewer.*
Aspect	Turn aspect ratio markers for the Video Processor MultiViewer box on (**Aspect**) or off (**Off**).
Shift Source	Turn the shifted source on (**On**) or off (**Off**) for the selected box. When the MultiViewer is shifted, the source in this box will not change.

MultiViewer Clock

The clock can show the current system time, LTC data being sent to the switcher, or a countdown timer. The clock can only operate in a single mode at one time.

To Set Up a MultiViewer Timecode Clock

The timecode clock uses LTC data being sent to the switcher and displays it as (hh:mm:ss:ff).

1. Click **Navigation Menu** > **Configuration** > **MultiViewers** and select the MultiViewer that you want to apply the clock overlay to.
2. Click **Clock** > **Timecode**.
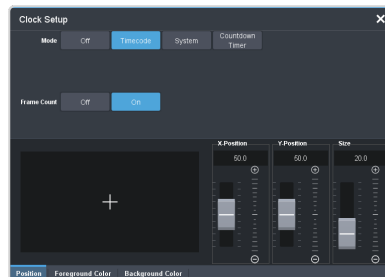
3. Click a **Frame Count** button to select whether the number of frames for a timecode is displayed (**On**) or not (**Off**).
4. Click the **Position** tab.
5. Use the **X Position**, **Y Position**, and **Size** sliders to position the clock and change the size.

6. Click the **Foreground Color** tab and select the color and transparency you want to use for the text of the clock.
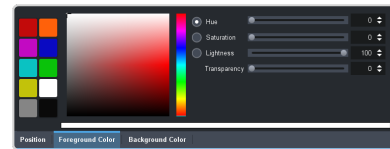
7. Click the **Background Color** tab and select the color and transparency you want to use for the background of the clock.

To Set Up a MultiViewer System Clock

The clock can show the current system time in 12-hour or 24-hour format (hh:mm:ss).

1. Click **Navigation Menu** > **Configuration** > **MultiViewers** and select the MultiViewer that you want to apply the clock overlay to.
2. Click **Clock** > **System**.
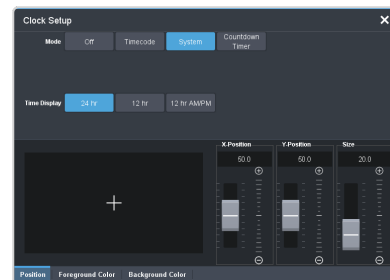
3. Click a **Time Display** button to set how the time is displayed.
   • **24 hr** — time is displayed in 24-hour format.
   • **12 hr** — time is displayed in 12-hour format without am/pm.
   • **12 hr AM/PM** — time is displayed in 12-hour format with am/pm.
4. Click the **Position** tab.
5. Use the **X Position**, **Y Position**, and **Size** sliders to position the clock and change the size.
6. Click the **Foreground Color** tab and select the color and transparency you want to use for the text of the clock.

7. Click the **Background Color** tab and select the color and transparency you want to use for the background of the clock.

To Set Up a MultiViewer Countdown Timer

The clock can show a countdown timer that will count down from a set time to 0, up from 0, or down from a set time to 0 and then up.

1. Click **Navigation Menu** > **Configuration** > **MultiViewers** and select the MultiViewer that you want to apply the clock overlay to.

2. Click **Clock** > **Countdown Timer**.
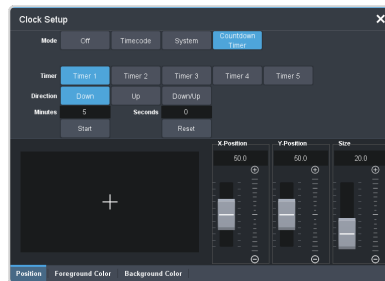
3. Click a **Timer** button to select which countdown timer you want to use. Each timer can be set up differently.

> *Note:* *Timers are shared across all MultiViewers.*

4. Click a **Direction** button to select the direction that the times counts in.

- **Down** — enter a time in the **Minutes** and **Seconds** field that the timer will start counting down from. The timer stops when it reaches 0.
- **Up** — the timer counts up from 0 until stopped.
- **Down/Up** — enter a time in the **Minutes** and **Seconds** field that the timer will start counting down from. The timer counts down to 0 and then starts counting up until stopped.

> *Tip:* *You can manually control the countdown timer using the* ***Start*** *and* ***Reset*** *buttons, or assign these commands to custom controls.*

5. Click the **Position** tab.

6. Use the **X Position**, **Y Position**, and **Size** sliders to position the clock and change the size.

7. Click the **Foreground Color** tab and select the color and transparency you want to use for the text of the clock.

8. Click the **Background Color** tab and select the color and transparency you want to use for the background of the clock.

System Real-Time Clock/Date
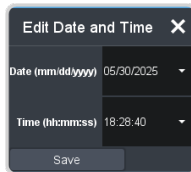
The switcher uses an internal clock to generate the time for the clock overlay for the MultiViewer.

System time can be set manually or from a Network Time server. You can set up between 1 and 4 NTP server IP addresses for the switcher to connect to. The system time is synchronized across all SDPE blades in the switcher.

To Set the System Real-Time Time and Date

1. Click **Navigation Menu** > **Configuration** > **System** > **Global**.
2. Click **Edit Date and Time**.

   > **Note:** *If an NTP server is being used to provide the system time the option to set the time manually will not be available. You must set the NTP servers IP addresses to 0.0.0.0 to be able to set the time manually.*

3. Click on the **Date** field and select the current date.
4. Click on the **Time** field and select the current time.
5. Click **Save**.
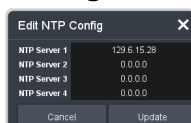
To Set the NTP Server IP Address

The IP addresses the switcher will use to connect to the NTP severs.

> **Important:** *Setting an NTP server IP address will cause the switcher to restart.*

1. Click **Navigation Menu** > **Configuration** > **System** > **Global**.
2. Click **Edit NTP Config**.

3. In the **NTP Server 1** field, enter the IP address of the Network Time Protocol server you want to use to set the system time.

4. Enter the IP addresses of backup NTP servers in the **NTP Server 2-4** fields if required.
5. Click the **Timezone** list and select the timezone the switcher is currently in.

When the switcher has established a connection with the NTP server the **NTP Syn Status** will show Synced.

Audio Output

Audio sources from the Media-Store can be sent out the AES outputs on each of the SDPE blades.

To Assign Audio to an AES Output

Assign an audio source to one of the AES outputs.

1. Click **Navigation Menu** > **Configuration** > **Outputs**.
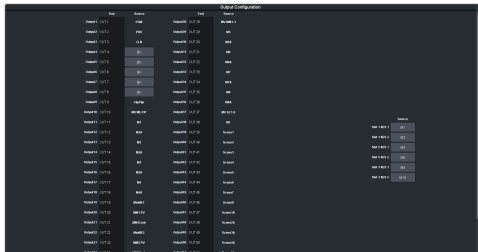
2. Click the **Source** button for the **Slot *x* AES *y*** output you want to assign an audio source to.

3. Click the audio source to want to assign to the AES output.

   > *Note:* *The audio sources that are available to an AES output depend on the role the SDPE blade has been assigned. Only audio from the first 2 Media-Store channels on an SDPE blade can be assigned to an AES output.*

   * **NoSrc** — no audio source is assigned to the AES output.
   * **M*X*** — the audio from Media-Store *X* is assigned to the AES output.
   * **ME*X*MW** — the audio from the MediaWipe on ME *X* is assigned to the AES output.
   * **ClipPlyr** — clip player audio.

Personality

Personality settings allow you to configure how you interact with the control panel and switcher, as well as how the buttons on the control panel appear. All of these settings are stored in the Personality register.

Personality Settings

There are a number of settings for how the switcher will react to different situations, or how switcher elements appear to the operator. All these settings are grouped together into the Switcher Personality. These settings include double-press rates and sleep time, among others.

General Settings

• Click **Navigation Menu** > **Personality** > **General**.

Personality	Description
Editor Port	Allow the switcher to be controlled by an external editor. The external editor can control the switcher to perform transitions, or recall memories, among the supported commands. This setting is for the frame. • **On** — allow the switcher to be controlled by an external editor. • **Off** — switcher ignores editor commands.
Button Brightness	Set the overall brightness (0-100%) of all the buttons on any physical control panel connected to the switcher. This setting is unique to the control panel.
Flex Button Brightness	Set the overall brightness (0-100%) of all the buttons on the Flex Control modules of the TD control panels. This setting is unique to the control panel.
Rate	Have the switcher use frames or seconds for transition rates. Rates are entered and displayed in the select selected values. This setting is unique to the control panel. • **Frames** — transition rates are in frames. • **Seconds** — transition rates are in seconds.

Personality	Description
Sleep Mode	Have the switcher go into a sleep mode after a user-defined amount of time (**Sleep Minutes**) without user interaction. Touching any button, knob, or fader will wake the switcher. The switcher does not act on the button, knob, or fader control that wakes it from sleep mode. During sleep mode, video related hardware is not affected and video signals still pass through the switcher. This setting is unique to the control panel. • **Power Save** — all buttons and displays are turned off and as much power is conserved as possible. • **Sleep** — displays are turned off and buttons light in raindrop pattern.
Sleep Minutes	The amount of time that the switcher waits without user input before going into sleep mode. Setting the value to 0 (Off) prevents the switcher from entering sleep mode. This setting is unique to the control panel.
Toggle Shift	Have the **Shift** buttons either be latching (toggle) or momentary (off). When in toggle mode, you can press a shift button and then select a source on the shifted bus without having to hold down the shift button. This only affects the bus the shift button is on. This setting is unique to the control panel. • **Off** — **Shift** buttons only stay on as long as you are holding them down. • **Toggle** — when you press a **Shift** button it stays on until you press a source button on that bus.
Memory Bank	Allows you to set how the **BANK** button behaves when pressed and released. This setting is unique to the control panel. • **Normal** — the keypad is used to enter the bank number directly, followed by the memory (For example, to access memory 3 on bank 2, press **BANK** > **2** > **3**.) • **Legacy** — the next bank is selected every time the button is pressed, cycling through all banks (For example, to access bank 5, press **BANK** repeatedly until bank 5 is selected.)
Second Press Memory Undo	A memory recall can be reversed by pressing the memory number a second time after a memory is recalled. This is the same as pressing the **UNDO** button, if present on your control panel. This setting is unique to the control panel. • **Off** — pressing the memory number again does not undo the recall. • **On** — pressing the memory number again undoes the last memory recall.

Personality	Description
Memory Undo Button	Allows you to enable or disable the **UNDO** button on the memory area of the control panel. • **Enable** — you can use the **UNDO** button to reverse the recall of a memory. • **Disable** — the **UNDO** button does not function.
Panel Xpt Store	Allows you to lock out the ability to store memories from the source bus of the TouchDrive control panel. This does not change the functionality of the Memory area. • **On** — the source buttons on the control panel can be used to store memories. • **Off** — the source buttons on the control cannot be used to store memories.
Vertical Display Bus Source	Have the switcher show the mnemonic names for the sources selected on a bus on the vertical **Row Control** display. • **Show** — show the mnemonic names (up to 10 characters) for the source selected on the bus shown on the vertical display at the end of the row. • **Hide** — don't show the mnemonic names on the vertical display.
CC Mnemonic Row	How you want the mnemonics on each panel row to display the mnemonics for custom controls. • **Off** — the mnemonics don't change when the row is assigned to a custom control bank. • **Split** — the mnemonics are split (top to cc name and bottom to bus sources) when the row is assigned to a custom control bank. • **Full** — the mnemonics are show only the names of the custom controls when the row is assigned to a custom control bank. *Note: This setting is not available on the TDx Series control panels.*

Personality	Description
Transition	Have the next transition reset to a default background dissolve after each transition. This allows you to prevent the selections from the last transition from being accidentally included with the next transition. This setting is for the frame. • **No Reset** — the next transition settings are not changed after a transition. • **Reset** — the next transition is reset to a background only transition after a transition.
Next Transition	Have the next transition buttons on the control panel latch when pressed (toggle). This setting is unique to the control panel. • **Off** — press and hold all the buttons you want included in the next transition. All buttons must be pressed at the same time. • **Toggle** — press a button to toggle it on or off as being included in the next transition.
Remove Keys	Have a key removed from the next transition after it has been transitioned off-air using key Cut or Trans buttons. This allows you to transition a key off-air in an emergency and not have it accidentally transitioned back on-air with the next transition. This setting is for the frame. • **Off** — key can remain part of the next transition when it is independently transitioned off-air. • **On** — key is removed as part of the next transition when it is independently transitioned off-air.
Background Double Press	Have a double-press of the next transition background button select the background and all on-air keys as part of the next transition. This setting is unique to the control panel. • **Ignore** — ignore the double-press of the next transition background button. • **Transition Clear** — set the next transition to include the background and only the on-air keys. If an off-key is selected as part of the next transition it is deselected.

Transition Settings

• Click **Navigation Menu** > **Personality** > **Transition**.

Personality	Description
ME Auto Trans Double Press	Set what action is performed when the auto transition button is pressed again during a transition. This setting is for the frame. • **Halt Forward** — the transition is halted and then continues in the same direction when the transition button is pressed again. • **Reverse** — the transition immediately reverses directions when the transition button is pressed. • **Halt Reverse** — the transition is halted and then reverses directions when the transition button is pressed again. • **Cut** — the transition immediately cuts back to the initial state when the transition button is pressed. • **Ignore** — the button press is ignored and the transition continues.
Key Auto Trans Double Press	Set what action is performed when the independent key auto transition button is pressed again during a transition. This setting is for the frame. • **Halt Forward** — the transition is halted and then continues in the same direction when the transition button is pressed again. • **Reverse** — the transition immediately reverses directions when the transition button is pressed. • **Halt Reverse** — the transition is halted and then reverses directions when the transition button is pressed again. • **Cut** — the transition immediately cuts back to the initial state when the transition button is pressed. • **Ignore** — the button press is ignored and the transition continues.
Roll Clip	Set whether the roll clip feature is always on, or must be turned on manually. This setting is for the frame. • **User** — the roll clip feature must be turned on manually. • **Force** — the roll clip feature is always on.

Color Schemes

The buttons on the control panel glow with different colors specific to their state, function, and assignment. This color can be selected from a list of pre-set color schemes, or a custom color can be selected. Up to four (4) custom color schemes can be saved on the switcher.

To Select a Color Scheme

ME, MiniME™, aux buses, and keyers can be set to different colors by loading one of the pre-installed color scheme. This setting is unique to the control panel.

1. Click **Navigation Menu** > **Personality** > **Color Scheme**.
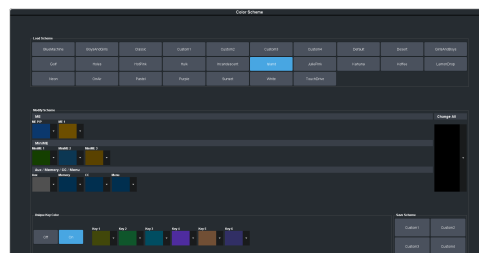
2. In the **Load Scheme** area, select the color scheme you want to use on the control panel.

> **Tip:** You can load a pre-loaded color scheme and then modify the colors and save it as a custom color scheme. You cannot save your modifications back to the pre-loaded color scheme.

To Create a Custom Color Scheme

A custom color scheme can be created and used instead of one of the pre-loaded color schemes. This setting is unique to the control panel.

1. Click **Navigation Menu** > **Personality** > **Color Scheme**.
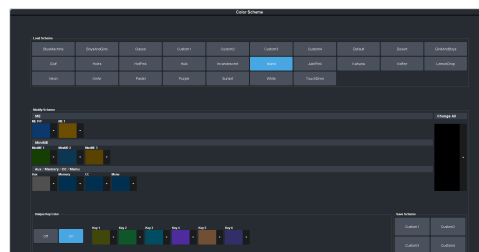
2. In the **Modify Scheme** area, click the ME, MiniME™, or aux that you want to change the color for.

> **Tip:** Click **Change All** to change the color of all the areas at once. They will all use the selected color.

3. Use the color picker to select the new color you want to use and click **Ok**.
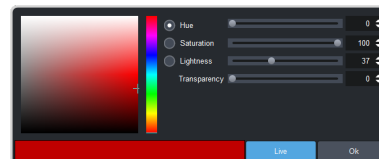
> **Tip:** Click **Live** to have the color changes update in real time on the control panel.

4. In the **Unique Key Color** area select how you want the keyer buttons on the control panel to be colored.

- **Off** — the keyer buttons use the same color as their ME or MiniME™.
- **On** — the keyer buttons use the unique colors assigned to each key. Click the key that you want to change the color for and use the color picker to change the color.

5. Click a **Custom *X*** button to store your color scheme to that location.

6. Click **Yes**.

Bus Maps

Any video input can be mapped to any source button on the control panel using a bus map. Each source button can have multiple inputs assigned (a main source and shifted sources). You can have up to 6 shifted buses.

To Create a Bus Map

The bus map assigns video sources to the buttons on the control panel.

1. Click **Navigation Menu** > **Personality** > **Bus Map**.
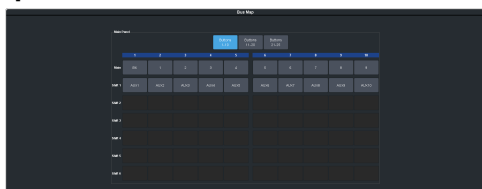
2. Depending on the size of your panel, click a **Buttons *X-Y*** button to view the source buttons in that range.

3. Click the source button you want to use for a Shift function and click **Other** and select the shift level you want to assign to that source button.
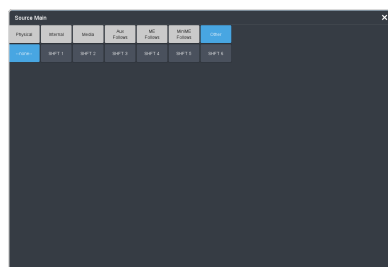
*Note: You can have up to 6 shifted buses. All Shift buttons must be assigned to the **Main** bus.*

*Tip: You can rename the shift button, and other internal sources, from the **Internal Input Configuration** menu.*

4. Click the source button on the main or shifted bus that you want to assign a source to and select the source you want to assign to that button.
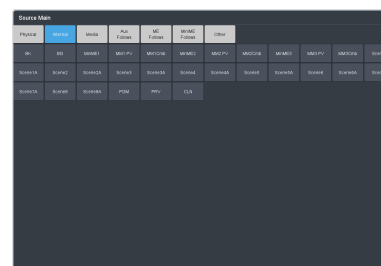
Note: If a button is assigned to a source that is not valid for the area the bus is assigned to, the button will not be lit up on the bus.

User Buttons

These buttons can be assigned to a number of functions, including ME and key selections, custom control, and memories. The number and position of the buttons on the control panel depend on the model of your control panel.

If a button is assigned to an ME, aux bus, or MiniME™, you can press and hold the button to be able to select a different ME, aux bus, or MiniME™ from the key bus. If the user button is assigned to an Aux, it will allow you to select a different Aux.

To Set A User Button

1. Click **Navigation Menu** > **Personality** > **User Select** and select the area you want to set up the user select buttons on. Not all control panels have the same types of modules.

- **User Select** — the assignable row of buttons at the top of each panel row.
- **Positioner Module** — the mnemonic buttons on the Positioner module of the TD 3/x3 and TD 4/x4.
- **Flex Module 1/2** — the mnemonic buttons on the Flex Control of the TD 3/x3 and TD 4/x4.

Note: The menu only shows the user buttons that are available on your control panel.

2. Click the user button that you want to assign a function to and select the function you want to assign to that button.

> **Tip:** *Each row on your control panel can have a separate set of user button assignment. These settings are tied to the row, and not the ME that is assigned to that row.*

> **Tip:** *The **Trans** buttons are located on the Transition area of the TouchDrive control panel.*
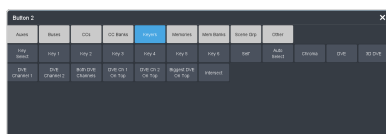
> **Note:** *The functions that are available on your switcher may differ depending on the options you have installed and how your switcher is configured.*

Licenses

Software options allows you to expand the functionality or resources available to the switcher as well as operate in UHDTV1. These options can either be licensed at the time you purchase your switcher, purchased and installed later on, or temporarily licensed through the Ross Platform Manager (RPM).

Software options or licenses can be assigned either through Ross Keys or by using a Ross Platform Manager.

Software Licenses and Resources

Each software license provides the switcher with additional resources, depending on the mode the switcher is operating in.

HyperMax License

Role	Resource	HD	UHDTV1
MaxME	ME	1	1
	Keyers	6	6
	2D DVE Channels	14	6
	3D DVE Channels	4	1
	Chroma Keys	4	2
	Media-Store Channels	4	4
	MultiViewer Outputs	1	1
MaxMini	MiniME™	3	3
	Keyers	2	2
	2D DVE Channels	14	6
	3D DVE Channels	4	1
	Chroma Keys	1	1
	Media-Store Channels	4	4
	MultiViewer Outputs	1	1

Role	Resource	HD	UHDTV1
MaxScene	MaxScene	8	8
	Keyers	8	8
	2D DVE Channels	16	8
	3D DVE Channels	4	1
	Chroma Keys	4	2
	Media-Store Channels	8	4
	MultiViewer Outputs	1	1

Ross Keys Licensing

Ross Keys are fixed software licenses issued by a Ross representative for your system. They consist of a Request Code that Ross Keys uses to generate a License Key. The License Key is entered into your system to unlock the license. A single License Key can add one or multiple options to a system, depending on the type of license. For example, a single License Key can add one or two MEs to system, depending on the number or ME options that were purchased.

Tip: License Keys can be used to add or remove software options from a system, depending on the number of options that were requested.

To Add a License Using Ross Keys

The license menu lists available and installed options, as well as allows you to copy and paste codes for installing new options.

Tip: Software options can be reduced or removed by contacting Ross Video and getting a License Key for the new number.

1. Contact your Ross Video sales representative to purchase a license for the option you want to install.

   Tip: You can also email (solutions@rossvideo.com) or call (+1-613-652-4886) for sales options.

2. Click **Navigation Menu** > **Configuration** > **System** > **Licenses**.
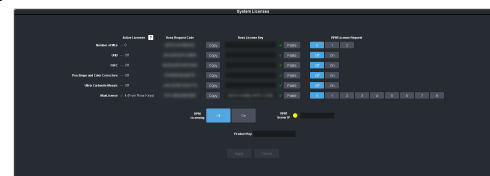
   *Tip: Click **Details** to get more information on what is provided by each license.*

3. Click the **Ross Request Code Copy** button for the option type(s) you have purchased.

4. Send the **Request Codes** to the Ross Video contact you were given when you purchased the options and they will send you the **License Keys** for the options.

5. Click the **Ross License Key Paste** button to paste the key into the field.

> *Note: If you paste the license key into the field using a keyboard, you must click away from the field for the key to be validated and the **Apply** button to function.*

6. Click **Apply**.

Ross Platform Manager Licensing

RPM licenses are issued by the Ross Activation Server under a Customer Product Key. The Product Key is then added to a Ross Platform Manager that multiple switchers can access to request software licenses. Each switcher must request and release licenses from/to the Ross Platform Manager.

Keep the following in mind:

Keep the following in mind when working with RPM Licensing:

- RPM Licensing and RPM Orchestration are not connected; however, you can use Orchestration to recall the **RPM Licensing** switcher sets.
- Ross Keys and RPM Licenses are pooled. For example, if you already have 1 MaxLicense from Ross Keys and request 2 MaxLicenses from RPM, the system will recognise that you already have that 1 MaxLicense and will only request 1 MaxLicense from RPM.
- RPM Licenses can only be requested or released from the switcher.
- The switcher must be connected to an Ross Platform Manager to request or release a license. If you release a license from the switcher, but are not connected to an Ross Platform Manager, the switcher loses that license but the license is not returned to the pool on the Ross Platform Manager.
- If the connection to the Ross Platform Manager is lost, the switcher retains the existing licenses.
- If theRoss Platform Manager does not have enough licenses to fill a request, the switcher will only get the licenses that are available.

- If you **Disable RPM Licensing** the switcher releases all RPM Licenses it has. These licenses are released even if the switcher has lost connection to the Ross Platform Manager.
- Recalling a switcher set with **RPM Licensing** does not guarantee those licenses. When the set is recalled the switcher requests those licenses from the Ross Platform Manager.
- Every time a license is requested or released, the switcher must restart to apply those changes.

To Request/Release an RPM License

RPM Licenses are requested or released from the switcher when it is connected to the Ross Platform Manager.

1. Click **Navigation Menu** > **Configuration** > **System** > **Licenses**.
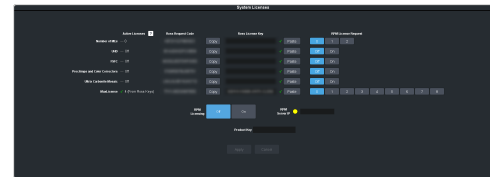
> *Tip: Next to each license description is shown the number of licenses that the switcher is getting from Ross Keys and how many from RPM.*

> *Tip: Click on the **?** button next to **Active Licenses** to view a breakdown the resources the licenses provide.*

2. Click **On** for **RPM Licensing** to enable the RPM licensing.

> 🛈 *Important: If you click **Off** when RPM licenses have already been acquired, the switcher will release all of the RPM licenses and reboot with only the Ross Keys licenses.*

3. In the **RPM Server IP** field, enter the IP address of the RPM server you want to get licenses from. You can only connect to a single RPM server at a time.

> *Tip: The status indicator next to **RPM Server IP** shows the status of the connection to the Ross Platform Manager.*
> - *Green — successfully communicating with RPM.*
> - *Yellow — invalid IP address listed for RPM or RPM Licensing is turned off.*
> - *Red — failed to communicate with RPM.*

4. Open a web browser and navigate to the Ross Platform Manager that you want to use to get licenses from.

> **Important:** You must be able to connect to the Ross Platform Manager from the switcher over the network to be able to request licenses.

> **Note:** The Ross Platform Manager only manages the licenses authorized by the Ross Activation Server. Refer to the Ross Platform Manager documentation for information on obtaining a Product Key.
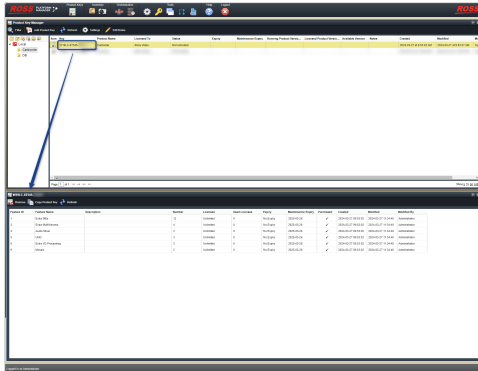
5. Copy the **Product Key** from the Ross Platform Manager to the **Product Key** field on the DashBoard page.

> **Tip:** If you accessing Ross Platform Manager on the same computer that is running DashBoard to connect to the switcher, you can click **Copy Product Key** in Ross Platform Manager and past it into the field in DashBoard.

6. Click **Apply**.

> **Note:** The switcher must reboot to apply RPM licensing changes.

7. Request or release licenses from the Ross Platform Manager by clicking the corresponding **RPM License Request** buttons.

8. Click **Apply**.

> **Important:** Depending on the network connection it may take time for the switcher to acquire licences from the Ross Platform Manager. When the switcher has acquired all the requested RPM licenses it will reboot to apply the changes.

GPI Control
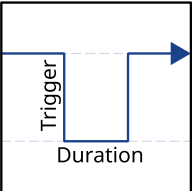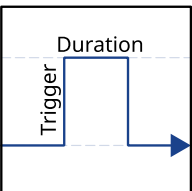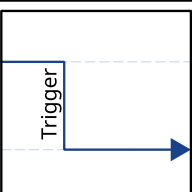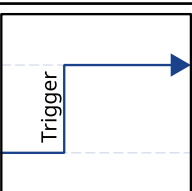
General Purpose Interface (GPI) is a high/low voltage signalling protocol that allows the switcher to send simple commands to an external device, or receive commands from a device. Each pin on the GPI is set as either high (+5 Volts), or low (0 Volts), and it is the switching between high and low that sends commands to the external device, or to the switcher.

Refer to *GPI Device Control* on page 100 for information on assigning a GPI to a video input.

GPI Trigger Types

There are four trigger types supported by the switcher. These can be either output triggers, or input triggers.

Table 9: Trigger Types

Trigger	Description	
Low Edge	The output level is set high, and momentarily goes low for the trigger.	
High Edge	The output level is set low, and momentarily goes high for the trigger.	
Low Level	The output level toggles from the base high level to the low level. The output signal remains at this level until reset.	
High Level	The output toggles from the base low level to the high level. The output signal remains at this level until reset.	

GPI Setup

Each GPI pin on the switcher can be configured as either an input, or an output. By default, all GPIs are set as inputs.

Keep the following in mind:

Keep the following in mind when working with GPI output triggers:

- Edge triggered GPI outputs remain triggered for the configured duration.
- Level triggered GPI outputs toggle between high and low each time they are triggered.

To Set Up a GPI Input

The switcher requires a Low Edge GPI input trigger.

1. Click **Navigation Menu** > **Configuration** > **Tally and GPIO** > **GPIO** and click the **Slot *x*** button for the SDPE blade that you want to set up the GPIs on.
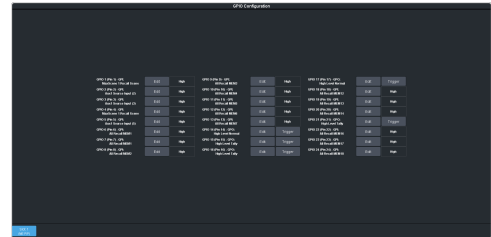
> *Tip:* The field next to the **Edit** button shows the current state of the GPI input (**High/Low**). High is the resting state. The GPI input must be taken low to trigger.

> *Tip:* Next the GPIO number is the pin on the DB25 GPIO port that the GPIO is assigned to.

2. Click **Edit** for the GPI that you want to configure as an input.

3. Click **GPI**.

4. Click the **Event** button for the action you want to assign to the selected GPI input pin.

Setting	Description
--none--	No action is taken
CC	Run a specific custom control: **a.** Enter the custom control bank in the **Bank** field. **b.** Enter the custom control in the **CC** field.
Mem Recall	Recall a memory on all MEs: • Enter the memory to recall in the **Mem** field.
MaxScene	Recall an MaxScene memory: • Enter the MaxScene memory to recall in the **MaxScene** field.

Setting	Description
FTB	Perform a transition to black on the program ME that also takes all keys off-air. The source originally selected on program is selected on preset
ME Cut	Perform a background cut on the selected ME: • Click an **ME** button to select the ME, MiniME™, or Canvas.
ME Auto	Perform a background auto transition on the selected ME: • Click an **ME** button to select the ME, MiniME™, or Canvas.
Key Cut	Perform a key cut on the selected ME and key: **a.** Click an **ME** button to select the ME, MiniME™, or Canvas. **b.** Click a **Key** button to select the keyer.
Key Auto	Perform a key auto transition on the selected ME, MiniME™, or Canvas and key: **a.** Click an **ME** button to select the ME, MiniME™, or Canvas. **b.** Click a **Key** to select the keyer number.
Aux Xpt	Select a video source on an aux bus: **a.** Click the **Aux** button and select the aux bus. **b.** Click the **Source** button and select the video source.

To Set Up a GPI Output

A GPI output can be set as a Normal GPI output, or as a Tally output. As a tally output, the GPI output must be assigned to a video source. A GPI output in tally mode can still be used as a normal GPI output.

1. Click **Navigation Menu** > **Configuration** > **Tally and GPIO** > **GPIO**.

2. Click **Edit** for the GPI that you want to configure as an output.

3. Click **GPO**.

4. Click a **Level** button to select whether you want the GPI to trigger low (**Low**), or high (**High**).

5. Click a **Trigger** button to select whether you want to use an edge trigger (**Edge**), or a level trigger (**Level**).

6. For edge triggers, use the **Duration (fr)** slider to set the length of time (in frames) that the GPI edge output remains triggered.

7. For level triggers, click a **Mode** button to select how you want to GPI output to act.

   • **Normal** — when assigned to a video source and RollClip is active, will trigger with the source going on-air, and back with the source going off-air (pre-delay values are only used when the source is going on-air)

   • **Tally** — when assigned to a video source, will trigger with the source going on-air, and back with the source going off-air (RollClip and pre-delay values are ignored)

Live Edit Decision Lists (LiveEDL)

Edit Decision Lists are files used by non-linear editing (NLE) suites to aid in post-production. Your switcher can capture EDL data in a file that you load into your NLE suite.

LiveEDL Setup

You can configure your switcher to trigger multiple GPI outputs at the start, end, or both, of an EDL data capture to trigger video servers that are recording the feeds coming into the switcher. The EDL data from the switcher can then be paired with the feeds from the video servers, using the timecode data, in the NLE suite to edit or re-cut the show.

> **❶ Important:** *A control panel is required to configure this feature. If you do not have access to a physical control panel, the SoftPanel can be used.*

You can also set a pre-delay for each GPI output. EDL data capture does not begin until the highest pre-delay has passed. This is useful when the switcher needs to wait for external equipment to become ready. The example below shows the effects of various triggering and pre-delay settings.

To Set the LiveEDL Behavior

> **❶ Important:** *A control panel is required to perform this procedure. If you do not have access to a physical control panel, the SoftPanel can be used. The position of items on the menus on the SoftPanel may not match those of a physical panel.*

1. Press **MENU** > **System** > **NEXT** > **NEXT** > **NEXT** > **LivEDL Config**.

2. Use the **GPO** knob to select the GPI output that is connected to your video server.

   The GPI must be configured as a GPI output before it can be selected.

3. Use the **Triggr** knob to select when the GPI output is triggered.

   - **Off** — GPI is not triggered
   - **Start** — GPI output is triggered at the beginning of the EDL capture
   - **Stop** — GPI output is triggered at the end of the EDL capture

- **Both** — GPI output is triggered at the beginning and end of the EDL capture

   If Start or Both is selected, you must set the pre-delay for the GPI.

4. Use the **PreDly** knob to select the pre-delay interval (in frames) that the switcher waits after the GPI output is triggered before starting to capture EDL data.

Timecode Setup

The switcher uses timecode data to mark the EDL file so that it can be used in the non-linear editing suite along with the feeds from the video servers. The timecode data can be either from an external timecode generator, or internally generated. An offset can be applied to both timecode sources.

For an external timecode, an LTC generator must be connected to the LTC port on the SDPE assigned as ME P/P.

To Confirm External LTC Signal

If you have an external linear timecode generator connected to the switcher, you can confirm that the switcher is receiving timecode data.

> **❶ Important:** *A control panel is required to perform this procedure. If you do not have access to a physical control panel, the SoftPanel can be used. The position of items on the menus on the SoftPanel may not match those of a physical panel.*

1. Click **Navigation Menu** > **Status / Power**

2. Confirm that the information shown in the **Timecode** field matches the timecode from the timecode generator.

If required, an offset can be applied to the incoming timecode data.

To Set the LTC Timecode Source

If you are using an external timecode generator, an offset, or delay, is applied to the incoming timecode signal before it is stored in the LiveEDL data file. If you are using an internal timecode, the offset is the starting time that the switcher uses for the timecode that is stored in the LiveEDL file.

> **❶ Important:** *A control panel is required to perform this procedure. If you do not have access to a physical control panel, the SoftPanel can be used. The position of items on the menus on the SoftPanel may not match those of a physical panel.*

1. Press **MENU** > **System** > **NEXT** > **NEXT** > **NEXT** > **LivEDL Config** > **NEXT**.

2. Use the **Offset** knob to select the source of the timecode data you want to use.

   • **Ext.** — the timecode data received on the LTC port is used
   • **Int.** — an internal timecode is generated

3. Set the timecode offset for an External timecode as follows:

   a) Use the **LTCOff** knob to select the offset, in frames, that you want to delay the incoming timecode signal by.

4. Set the starting time for an Internal timecode as follows:

   a) Use the **Field** knob to select the hours, minutes, or seconds that you want to adjust.

      The timecode is shown in the `[HH:MM:SS]` format.

   b) Use the **Value** knob to set the starting time in the selected field.

LiveEDL Data Capture

Capturing EDL data is manually started and stopped from the switcher. When you select to start capturing EDL data, and GPI outputs set to trigger on start are triggered. If a pre-delay has been set for the GPIs, the switcher does not start capturing EDL data until the pre-delay time has finished.

When you stop capturing EDL data, you have the option to delete the data, or save it to a USB drive. You can also connect to the switcher via FTP and download the files directly to your editing suite. Use the username `liveedl` and password `password` to create the FTP connection to the switcher.

Keep the following in mind:

Keep the following in mind when reviewing the EDL data from the switcher:

• When a MediaWipe is selected as the transition type, the switcher records the transition duration as the cut point frame multiplied by two (2). This is to ensure that the cut point is recorded accurately.

• If you used more than one ME, or Aux bus, in your shot, a separate EDL file is saved for each ME and Aux bus. The ME re-entry is shown as being selected on the first ME, and the source selections on the second ME are saved to the separate LiveEDL file.

To Start Capturing EDL Data

The EDL data can be stored to one of 1000 LiveEDL files stored on the switcher. A separate file is created for each ME when the additional MEs are used.

> **Important:** *A control panel is required to perform this procedure. If you do not have access to a physical control panel, the SoftPanel can be used. The position of items on the menus on the SoftPanel may not match those of a physical panel.*

1. Press **MENU** > **User** > **LiveEDL**.

2. Use the **Start** knob to select the LiveEDL file on the switcher that you want to store the EDL data to.

   If the LiveEDL file already contains data, you are given the option to delete the data, or save it to a USB.

3. Press the **Start** knob to start recording.

To Stop Capturing and Save EDL Data

> **Important:** *A control panel is required to perform this procedure. If you do not have access to a physical control panel, the SoftPanel can be used. The position of items on the menus on the SoftPanel may not match those of a physical panel.*

1. Press **MENU** > **User** > **LiveEDL**.

2. Press the **Stop** knob to stop recording.

3. Save the EDL data to a USB as follows:

   a) Insert your USB drive into the USB Port on the switcher. You must wait 5 seconds for the switcher to recognise the USB drive.

   b) Press the **Save** knob.

   c) Press the **Confrm** knob to store the LiveEDL file to the USB drive.

MultiPanel

Each frame supports up to 3 independent control connections (Main, Satellite 1, and Satellite 2) as well as Satellite 3/SoftPanel. Each connection, with the exception of SoftPanel, can be from a control panel, DashBoard, or a combination of the two. All devices on the same control connection mirror each other.

The independent control connections are selected by the port you connect to on the frame. Multiple panels and DashBoard connections can connect on the same port, but they will all share the same permissions and mirror each other for control.

- **Main Panel** — 5253
- **Satellite 1** — 5255
- **Satellite 2** — 5256
- **Satellite 3/SoftPanel** — 5257

Keep the following in mind:

Keep the following in mind when working with MultiPanel:

- SoftPanel shares the permissions of the Main Panel.
- The assignment of the panel ID is done from the control panel.
- Control panel specific personality settings are stored on the frame for the panel ID and are not tied to the control panel.
- DashBoard automatically follows the main panel but will ignore permissions set for the main panel.
- If you change switcher modes, the MultiPanel permissions may have to be set again.
- An undo of a memory recall ignores panel permissions and will undo the last memory recalled from any panel.
- Bus maps are specific to each control panel. Creating or updating a bus map for one control panel does not change the bus map on another control panel.
- Custom controls ignore control panel permissions and will run events on an ME, MiniME™, or other resources that the control panel does not have permission for.

To Set Up MultiPanel Permissions

> **Tip:** *MultiPanel permissions can also be set from the Ultritouch.*

1. Click **Navigation Menu** > **Configuration** > **System** > **MultiPanel**.
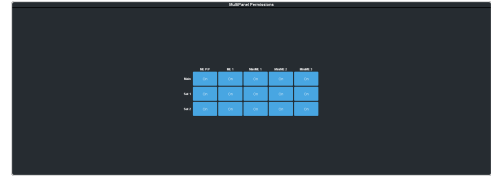
2. Click a **Main**, **Sat 1**, or **Sat 2** button to select whether that control connection has access to that resource.

> **Note:** *SoftPanel and Main share the same permissions.*

> **Note:** *A control panel must have permission to at least one ME or MiniME™.*

Diagnostics and Maintenance

Switcher status menus and error conditions, installed options, calibration, diagnostics, and logs.

Switcher Status

The status menus show information for various components of the frame.

General

- Click **Navigation Menu** > **Status / Power** > **General**

> *Note: The **ME P/P** selection provides the primary status of the switcher and available resources. The other tabs provide diagnostic information on the other SDPE blades assigned to the switcher.*
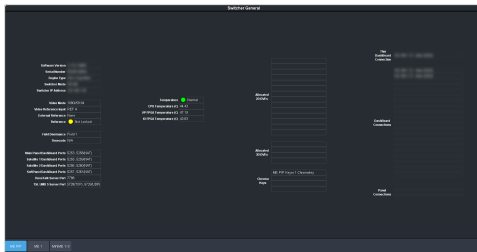
- **Software Version** — the current version of the software running on the switcher.
- **Serial Number** — the serial number of the SDPE blade.
- **Engine Type** — the model of switcher.
- **Switcher Mode** — the current mode the switcher is operating in.
- **Switcher IP Address** — the IP address of the SDPE blade assigned as ME P/P.
- **Video Mode** — the video format that the switcher is operating in.
- **External Reference** — the video format of the external reference, if connected.
- **Reference** — status of whether the switcher has locked to the reference format.
- **Field Dominance** — the switching field.
- **Timecode** — the current timecode being received by the switcher.
- **Main Panel DashBoard Port** — the local and NAT network port that the switcher is listening on for the main panel.
- **Satellite 1 DashBoard Port** — the local and NAT network port that the switcher is listening on for the satellite 1 panel.

- **Satellite 2 DashBoard Port** — the local and NAT network port that the switcher is listening on for the satellite 2 panel.
- **SoftPanel DashBoard Port** — the local and NAT network port that the switcher is listening on for the SoftPanel.
- **RossTalk Server Port** — the network port that the switcher is listening on for RossTalk commands.

> *Note: You can disable RossTalk control from the **Global** page (Click **Navigation Menu** > **Configuration** > **System** > **Global**). Click **Disable** for **RossTalk**.*

- **TSL UMD 5 Server Port** — the network port that the switcher is listening on for TSL 5 UMD commands.
- **Temperature** — status of the ambient temperature in the frame.
- **CPU Temperature (C)** — the temperature of the frame CPU in degrees Celsius.
- **VP FPGA Temperature (C)** — the temperature of the frame video processor FPGA in degrees Celsius.
- **IO FPGA Temperature (C)** — the temperature of the frame I/O processor FPGA in degrees Celsius.
- **Allocated 2D DVEs** — where 2D DVE channels are allocated in the switcher.
- **Allocated 3D DVEs** — where 3D DVE channels are allocated in the switcher.
- **Allocated Chroma Keys** — where the chroma keys are allocated in the switcher.
- **This DashBoard Connection** — the IP address of the DashBoard system you are currently using to connect to the switcher. The text after the IP address indicates whether the connection is as Main, Satellite, or SoftPanel and the port being used.
- **DashBoard Connections** — the IP addresses of all the DashBoard connections to the switcher, including panels. The text after the IP address indicates whether the connection is as Main, Satellite, or SoftPanel and the port being used. Refer to *MultiPanel* on page 126 for more information.

> *Note: The frame supports a maximum of 20 DashBoard connections at any one time. If there are already the maximum number of connections to a frame you will not be able to connect to it.*

- **Panel Connections** — The role, IP address, and model of all the physical panels connected to the switcher.

Versions

- Click **Navigation Menu** > **Status / Power** > **Versions**
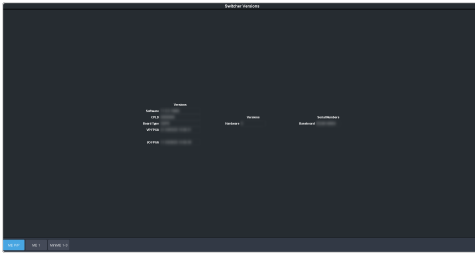
Software Versions:

- **Software** — the current version of the software running on the switcher.
- **CPLD** — the current version of the firmware on the CPLD logic device.
- **VP FPGA** — the current version of software running on the video processor FPGA.
- **I/O FPGA** — the current version of software running on the I/O processor FPGA.

Hardware Revisions:

- **Hardware** — the hardware revision of the frame.

Serial Numbers:

- **Baseboard** — serial number of the baseboard in slot 1.

Switcher Information Text File

The switcher information file contains the software version and IP address of the switcher.

When you plug a USB drive into the USB port on the switcher, a `swInfo.txt` file is created at the root directory of the USB. This text file contains the current software version number and IP address of the switcher, as well as other helpful information:

- `SW Version` — the current software version installed on the switcher.
- `IP Address` — the local IP address of the switcher. This will not include any external NAT IP addresses.
- `MicroSD Card Installed` — shows whether the microSD™ card is installed in the switcher.

The last line in the file is the date and time that the file was last created on the USB.

Switcher Logs

Switcher logs can be used to identify and diagnose problems with the switcher. Use this information when contacting Ross Video Technical Support.

A copy of the working set from the switcher is also included with the logs to assist in diagnosing problems.

To Copy Logs To Disk

Switcher logs can be stored onto a USB drive installed in the ME P/P SDPE blade or the NFS drive in the CPU so that they can be collected and sent to technical support to diagnose problems with your switcher.

> *Tip:* *Logs can also be exported to your DashBoard computer instead of saving them to the USB. Click **Export As...** in the **Export Logs From Frame** area and select the location on your computer to save the logs file.*

> *Note:* *Logs must be copied before a reboot or power-cycle of the switcher, or the information in them will be lost.*

1. Insert USB drive into the USB port on the SDPE blade. Wait 5 seconds after inserting the USB drive before using it.

2. Click **Navigation Menu** > **Configuration** > **Diagnostics**.
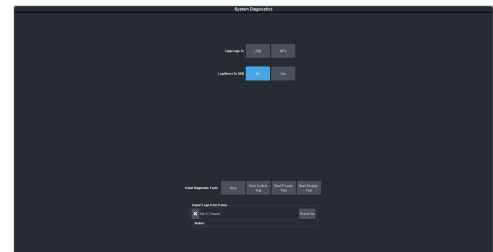
3. Click a **Copy Logs To** button to copy the switcher logs.

   - **USB** — copy logs to the USB drive.
   - **NFS** — copy logs to the NFS drive.

> *Tip:* *You can have logs stored directly to the USB drive. Click a **Logs Direct to USB** button to select **Yes**.*

The logs have been copied into the `\switcher` directory on the USB drive.

Diagnostic Tests

Diagnostics consist of a number of tests that are used to confirm the functionality of your equipment.

To Run the Tally Test

The Tally Test turns all tallies off, and then turns each tally on consecutively. There is a three (3) second delay between each tally being toggled on. Once the last tally has been turned on, all the tallies blink on and off three times.

> **Important:** *A control panel is required to perform this procedure. If you do not have access to a physical control panel, the SoftPanel can be used. The position of items on the menus on the SoftPanel may not match those of a physical panel.*

1. Press **MENU** > **System** > **NEXT** > **NEXT** > **Diagnostic Tests** (**Diag Tests** on Carbonite Black) > **NEXT** > **Tally Test**.
   All tallies are turned off, and then each tally is turned on consecutively. There is a three (3) second delay between each tally being toggled on. Once the last tally has been turned on, all the tallies blink on and off three times.

2. Press **MENU** to end the test.

To Run the GPI Input Test

> **Important:** *A control panel is required to perform this procedure. If you do not have access to a physical control panel, the SoftPanel can be used. The position of items on the menus on the SoftPanel may not match those of a physical panel.*

1. Press **MENU** > **System** > **NEXT** > **NEXT** > **Diagnostic Tests** (**Diag Tests** on Carbonite Black) > **NEXT** > **GPI Test**.
   The second line of the menu show the state of all GPI input pins as High or Low.

2. Press **MENU** to end the test.

To Run the GPI Output Test

> **Important:** *A control panel is required to perform this procedure. If you do not have access to a physical control panel, the SoftPanel can be used. The position of items on the menus on the SoftPanel may not match those of a physical panel.*

1. Press **MENU** > **System** > **NEXT** > **NEXT** > **Diagnostic Tests** (**Diag Tests** on Carbonite Black) > **NEXT** > **GPO Test**.
   All GPI outputs are turned off, and then each one is turned on consecutively. There is a three (3) second delay between each GPI output being triggered. Once the last tally has been triggered, all the GPI outputs blink on and off three times.

2. Press **MENU** to end the test.

To Run the Control Panel Test

Test the functionality of any of the buttons, knobs or fader and positioner on the control panel.

> **Important:** *This test disrupts the functionality of the control panel. If you are running this test from a remote computer, ensure that the control panel is available before performing the test.*

1. Click **Navigation Menu** > **Configuration** > **Diagnostics**.
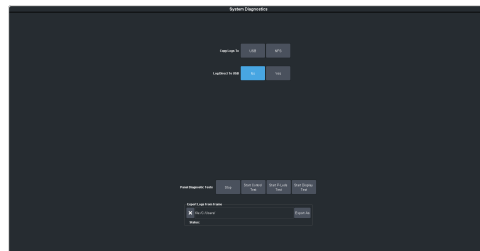
2. Click **Start Control Test**.

   The button shows `Running` and the 3-knob menu of the control panel shows the current button, knob, positioner, or fader being used.

3. Test the button, knob, positioner, and fader you want to check.

   > **Note:** *On the TouchDrive control panel the displays show a touch pattern. Tap on the happy face to test the touch sensitivity and calibration. If the tap registers on the happy face, the happy face disappears. If the tap does not register on the happy face, a green X is shown where the tap was registered.*

4. Click **Stop** or press **MENU** and **NEXT** on the control panel to end the test.

To Run the LED Test

Test the color range of all the LEDs on the control panel.

> **Important:** *This test disrupts the functionality of the control panel. If you are running this test from a remote computer, ensure that the control panel is available before performing the test.*

1. Click **Navigation Menu** > **Configuration** > **Diagnostics**.
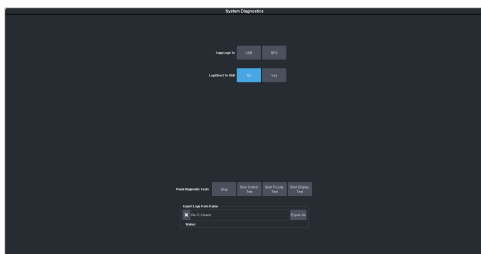
2. Click **Start P-LEDs Test**.

The button shows Running and all the buttons and indicators on the control panel cycle through different colors.

3. Click **Stop** or press **MENU** on the control panel to end the test.

To Run the Display Test

Test the displays on the control panel.

> ❗ *Important:* *This test disrupts the functionality of the control panel. If you are running this test from a remote computer, ensure that the control panel is available before performing the test.*

1. Click **Navigation Menu** > **Configuration** > **Diagnostics**.
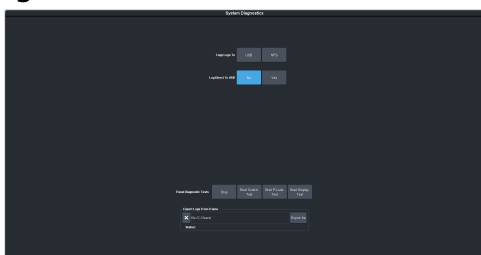
2. Click **Start Display Test**.

The button shows Running and on the TouchDrive the displays and the mnemonics cycle colors.

On the Carbonite Black a series of letters, numbers, and symbols scroll across the displays and the mnemonics cycle colors.

3. Click **Stop** or press **MENU** on the control panel to end the test.

Error Messages

The switcher will show an error message on the control panel display when a problem is detected.

The following error messages may appear when starting your switcher.

Table 10: Switcher Error Messages

Error	Description	Solution
DDR 0 Not Found; DDR 1 Not Found; or DDR 0 & 1 Not Found	There is a problem with the switcher DDR memory. The switcher may be used but many features will be limited or disabled.	Re-start your switcher. If the problem persists, contact Ross Video Technical Support for assistance.
Panel/Frame Mismatch	Your switcher control panel is connected to the wrong frame type.	Connect your switcher control panel to the proper frame and re-start the switcher.
Upgrade PMC?	Your switcher requires a Panel Module Controller (PMC) upgrade as part of a software upgrade. The switcher may be used without the PMC upgrade but may respond in an unpredictable manner.	Allow the PMC upgrade to proceed. Contact Ross Video Technical Support for assistance if you are unsure about upgrading your switcher.
Unknown panel type Please upgrade	The frame does not recognise the control panel. This could be caused by an unsupported panel being connected to the frame, or a problem with the panel module controlled or the configuration files.	Ensure that you have the correct control panel connected to the frame. If the problem persists, download the latest upgrade file from and force an upgrade of the switcher. Contact Ross Video Technical Support for assistance if you are unsure about upgrading your switcher.

Switcher Reset

If required, the switcher can be reset to return it to a user-defined default setting (RState), or the factory default state. A reset can be performed for the entire switcher, or individual components, such as keys.

Custom Reset Settings (RState)

You can customize many of the default switcher parameters and save them as a user-defined reset settings. These custom reset settings can then be recalled when you want to return the switcher to a previous state.

To Save a Custom Reset Setting (RState)

The Custom Reset Setting, or RState, saves how you want the switcher to be configured when it

powers up, or when you recall the RState manually.

1. Click **Navigation Menu** > **Live Assist** > **Memory** > **RState**.
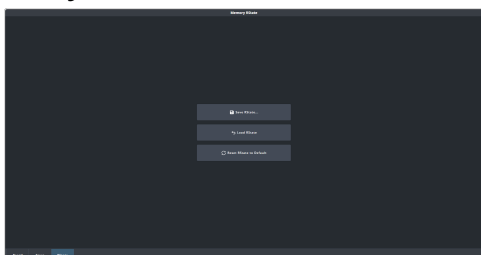
2. Click **Save RState**.
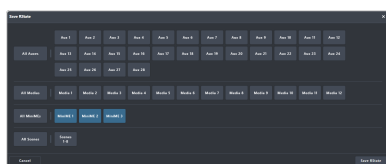
3. Click the elements you want reset with a switcher reset.

   • **Aux*X*** — select the aux buses you want reset.
   • **Media*X*** — select the Media-Store channels you want reset.
   • **MiniME*X*** — select the MiniME™ outputs you want reset.
   • **MaxScene** — select the MaxScene outputs you want reset.

   > *Note: If **Disable Audio Memories** is set to **On** (Click **Navigation Menu** > **Configuration** > **System** > **Global**) the audio attributes are disabled.*

   > *Tip: Click the **All** button to select or de-select all the items in that category.*

4. Click **Save RState** and **Yes**.

To Load a Custom Reset Setting (RState)

The Custom Reset Setting, or RState, is recalled every time the switcher is powered on, or it can be recalled manually.

1. Click **Navigation Menu** > **Live Assist** > **Memory** > **RState**.

2. Click **Load RState** and **Yes**.

   > *Tip: Click **Default RState** to load the default RState settings.*

Factory Default Settings

You can restore all or part of the switcher to the factory default state. A factory default returns all installation and personality settings are reset.

To Factory Reset the Switcher

Return the switcher to the factory default settings.

1. Click **Navigation Menu** > **Configuration** > **System** > **Reset**.

2. Click a reset or clear button to return that feature to the factory default sate.

   • **Clear Memories** — clear all memory registers on the switcher.
   • **Clear CCs** — clear all custom controls on the switcher.
   • **Clear Sequences** — clear all Sequencers on the switcher.
   • **Clear MaxScenes** — clear all MaxScenes on the switcher.
   • **Default Bus Map** — return the bus map to the default mapping.
   • **Factory Reset** — return the installation and personality registers to the default settings.

Frame DIP Switches

The DIP switches allow you to set default IP address and other diagnostic states.

There are a number of DIP switches on the SDPE blade that are used to diagnose the operation of the switcher.

Table 11: Ultrix Carbonite Frame DIP Switches

DIP	Description
1	This DIP switch is used to set the IP address of ethernet port on the frame to the default value (192.168.0.123). It must be in the up (off) position to set another IP address for the frame.
2	Reset the root password.
3	Enables the micro switch (on) that can be used to power cycle the SDPE blade. This functionality is intended to be used with DIP 4 to force a recovery upgrade. A recovery upgrade is only to be used when advised by Ross Video Technical Support.
4	Force the switcher to perform an upgrade (on) from the USB the next time it boots up. This is intended to be used as a recovery upgrade if you cannot connect to the switcher to perform a normal upgrade.

Specifications

Switcher resources, video specifications, power rating, and port pinouts.

Resources

The number of resources specific to your switcher depends on the options installed.

Resource	HD	UHDTV1
Base System		
SDPE Blades (max)	8[1]	
SDPE Blades as MEs	8	
SDPE Blades as MiniME™ engines	7	
SDPE Blades as MaxScenes	7	
Aux Buses	28	
Custom Controls	256 (8 Banks × 32 CCs)	
Max Events per CC	998	
GPI I/Os per SDPE	24	
Tallies per SDPE	24	
SDPE IP (default)	192.168.0.123	
CPU IP (default)	192.168.0.125	
Panel IP (default)	192.168.0.129	
MaxME		
MEs per SDPE	1	
Keyers per ME	6 +2 (for MediaWipe)	6 +2 (for MediaWipe)
2D DVE Channels per ME	14	6
2D DVE Keys (max)	6	3
2D DVE Boxes with Key Combiner (2 channels per key)	12	6
2D DVE Key Combiner Box Layering	1 On Top, 2 On Top, Biggest On Top	
3D DVE Channels per ME	4	1
3D DVE Keys (max)	4	1
3D DVE Boxes with Key Combiner (2 channels per key)	4	1
3D DVE Key Combiner Box Layering	1 On Top, 2 On Top, Biggest On Top, Intersect	
Chroma Keys per ME	4	2
Media-Store Channels per ME (Video + Alpha)	4	4
Media-Store Cache per ME	8 GB	

Resource	HD	UHDTV1
MultiViewer Outputs per ME	1	1
MultiViewer Boxes	16	
MultiViewer Layouts	44	
Memories per ME	100	
Pattern Generators per ME	2	
Matte Generators per ME	1 + Global	
Sequencers (Max)	5	
MaxMini		
MiniME™ Engines per SDPE	3	
Keyers per MiniME™	2	2
2D DVE Channels per MiniME™	14	6
2D DVE Keys (max)	2	2
2D DVE Boxes with Key Combiner (2 channels per key)	4	4
2D DVE Key Combiner Box Layering	1 On Top, 2 On Top, Biggest On Top	
3D DVE Channels per MiniME™	4	1
3D DVE Keys (max)	2	1
3D DVE Boxes with Key Combiner (2 channels per key)	4	1
3D DVE Key Combiner Box Layering	1 On Top, 2 On Top, Biggest On Top, Intersect	
Chroma Keys per MiniME™	1	1
Media-Store Channels per MiniME™ (Video + Alpha)	4	4
Media-Store Cache per MiniME™	8 GB	
MultiViewer Outputs per MiniME™	1	1
Memories per MiniME™	100	
MaxScene		
Scenes per SDPE	8	
Layers per MaxScene Blade	8[2]	8[2]
2D DVE Channels per MaxScene	16	8
2D DVE Keys (max)	8	8
2D DVE Boxes with Key Combiner (2 channels per key)	16	16
2D DVE Key Combiner Box Layering	1 On Top, 2 On Top, Biggest On Top	
3D DVE Channels per MaxScene	4	1
3D DVE Keys (max)	4	1
3D DVE Boxes with Key Combiner (2 channels per key)	4	1

Resource	HD	UHDTV1
3D DVE Key Combiner Box Layering	1 On Top, 2 On Top, Biggest On Top, Intersect	
Chroma Keys per MaxScene	4	2
Media-Store Channels per MaxScene	8	4
Media-Store Cache per MaxScene	8 GB	
MultiViewer Outputs per MaxScene	1	1
Memories per MaxScene	100	

Notes:

1 A switcher can be configured with a maximum of 8 SDPE blades. Each SDPE blade can be a ME, MiniME™, or MaxScene. There must be at least one ME P/P in the switcher.

2 Each MaxScene blade provides a total of 8 Layers, or keys.

Network Ports

The following network ports are used:

- DashBoard Main — 5253
- DashBoard Sat 1 — 5255
- DashBoard Sat 2 — 5256
- DashBoard SoftPanel — 5257
- SFTP — 2222
- RossTalk — 7788
- SSH — 22
- TFTP — 69
- TSL 3.1 (TCP, Carbonite) — 5727
- TSL 3.1 (TCP, Ultrix™) — 5727
- TSL 3.1 (UDP, Ultrix™) — 4490
- TSL 5.0 (TCP, Carbonite) — 5728
- TSL 5.0 (TCP, Ultrix™) — 5729
- TSL 5.0 (UDP, Ultrix™) — 4492

Frame Ports
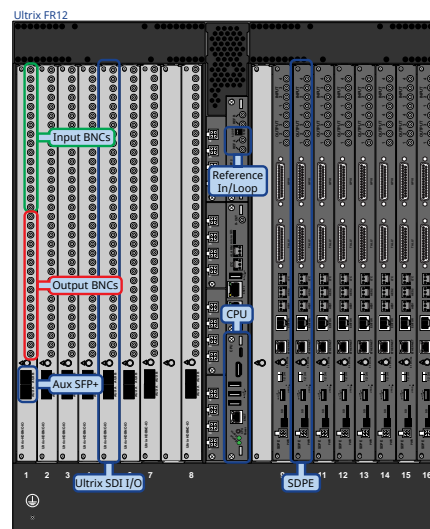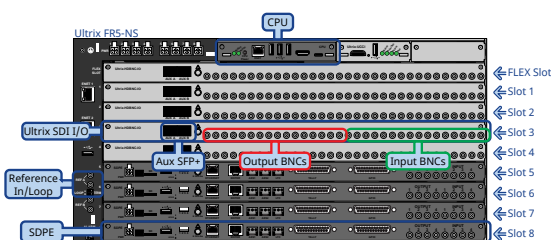
Serial Port

The serial port supports the RS-422 transmission standard in the following format:

- 38.4k Baud
- 8 bits
- 1 stop bit
- Odd Parity

The serial ports use a female RJ-45 connector.
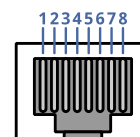
Table 12: Serial Port Pinouts

Pin	Signal
1	Tx+
2	Tx-
3	Rx+
4	n/c
5	n/c
6	Rx-
7	Ground
8	Ground

GPI Port

The switcher supports 24 GPI I/Os on each female DB25 connector.

Note: Each SDPE blade has a single DB25 GPI connector providing 24 GPI pins. Each connector has the same pinouts.
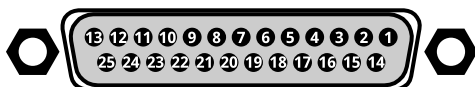
Table 13: GPI I/O Pinouts

Pin	Signal
1	GPI I/O 1
2	GPI I/O 2
3	GPI I/O 3
4	GPI I/O 4
5	GPI I/O 5
6	GPI I/O 6
7	GPI I/O 7
8	GPI I/O 8
9	GPI I/O 9
10	GPI I/O 10
11	GPI I/O 11
12	GPI I/O 12
13	GPI I/O 13
14	GPI I/O 14
15	GPI I/O 15
16	GPI I/O 16
17	GPI I/O 17
18	GPI I/O 18
19	GPI I/O 19
20	GPI I/O 20
21	GPI I/O 21
22	GPI I/O 22
23	GPI I/O 23
24	GPI I/O 24
25	Ground

Tally Port

The switcher supports 24 fixed tallies on each female DB25 connector. Each tally is fully configurable.

Note: Each SDPE blade has a single DB25 tally connector providing 24 tally pins. Each connector has the same pinouts.
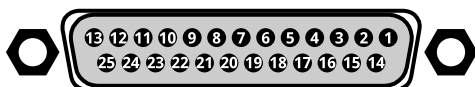
Table 14: Tally Rating

Specification	Value
Input Voltage	24VAC(rms)/40VDC
Maximum Current	120mA
Impedance	<15 ohm

Table 15: Tally Pinouts

Pin	Tally #
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	Common

AES Port

The AES ports on the back of the frame each support a single 24-bit (20-bit in SD) stereo pair.

AES- ⟹ [AES port] ⟸ AES+

GND
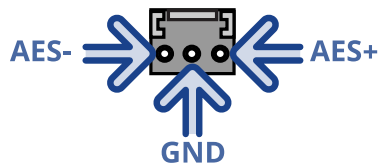
LTC Port

The LTC port on the back of the frame supports a single LTC connection.

LTC- ⟹ [LTC port] ⟸ LTC-

LTC+
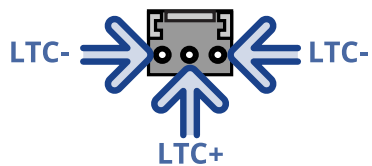
Custom Control Events

The Custom Control editor in DashBoard allows you to add or edit events in custom controls.

Note: *Not all custom control events may be supported by your hardware or switcher mode. Unsupported custom control events are not shown on the menus.*

Operations Custom Controls

Canvas (BKGD DVE)

Event	Location	Description
BKGD DVE Size	**Switcher** > **Bkgd DVE** > **Bkgd DVE Crop Param**	Set the size of the background DVE for the selected Canvas. 1. Click the **ME** button for the Canvas that you want to perform the event on. 2. Click the **Parameter** button and select **Size** 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. In the **Value (%)** field, enter the size you want to apply to the Background DVE.
BKGD DVE X-Position	**Switcher** > **Bkgd DVE** > **Bkgd DVE Crop Param**	Set the X-Position of the background DVE for the selected Canvas. 1. Click the **ME** button for the Canvas that you want to perform the event on. 2. Click the **Parameter** button and select **X-Position** 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. In the **Value (%)** field, enter the position on the X-axis you want to apply to the Background DVE.
BKGD DVE Y-Position	**Switcher** > **Bkgd DVE** > **Bkgd DVE Crop Param**	Set the Y-Position of the background DVE for the selected Canvas. 1. Click the **ME** button for the Canvas that you want to perform the event on. 2. Click the **Parameter** button and select **Y-Position** 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. In the **Value (%)** field, enter the position on the Y-axis you want to apply to the Background DVE.
BKGD DVE Aspect	**Switcher** > **Bkgd DVE** > **Bkgd DVE Crop Param**	Set the aspect ratio of the background DVE for the selected Canvas. 1. Click the **ME** button for the Canvas that you want to perform the event on. 2. Click the **Parameter** button and select **Aspect** 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. In the **Value (%)** field, enter the aspect ratio you want to apply to the Background DVE.

Event	Location	Description
BKGD DVE Border Size	**Switcher** > **Bkgd DVE** > **Bkgd DVE Crop Param**	Set the size of the border of the background DVE for the selected Canvas. 1. Click the **ME** button for the Canvas that you want to perform the event on. 2. Click the **Parameter** button and select **Edge Size** 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. In the **Value (%)** field, enter the size of the border you want to apply to the Background DVE. When a border is set to 0 the border is not visible.
BKGD DVE Edge Softness	**Switcher** > **Bkgd DVE** > **Bkgd DVE Crop Param**	Set the softness of the edge of the background DVE for the selected Canvas. 1. Click the **ME** button for the Canvas that you want to perform the event on. 2. Click the **Parameter** button and select **Edge Softness** 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. In the **Value (%)** field, enter the amount of softness to apply to the edge of the Background DVE.
BKGD DVE Crop	**Switcher** > **Bkgd DVE** > **Bkgd DVE Crop Param**	Set the amount of cropping you want to apply to each edge of the background DVE for the selected Canvas. 1. Click the **ME** button for the Canvas that you want to perform the event on. 2. Click the **Parameter** button and select the edge you want to crop. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. In the **Value (%)** field, enter the amount of cropping you want to apply to the selected edge of the Background DVE.

Custom Control Events

Event	Location	Description
Cancel All CC	**Custom Control** > **Cancel All**	Stop all running custom controls.
Cancel CC	**Custom Control** > **Cancel CC**	Stop a particular custom control. The specific custom control is set when the cancel is inserted. 1. Click the **Bank** button and select the custom control bank you want to cancel a custom control on. 2. Click the **CC** button and select the custom control you want to cancel.
Hold CC	**Custom Control** > **Hold**	Insert a command in a custom control that will stop the custom control at the hold event. You must press the custom control button again, or use a GPI trigger, to continue the custom control.
Loop CC	**Custom Control** > **Loop**	Have a custom control run continuously until stopped, or a Cancel/Cancel All custom control command is executed from another custom control.
Pause CC	**Custom Control** > **Hold**	Insert a command in a custom control that will stop a custom control at the pause event. The length of the pause is set when the pause is inserted. 1. Enter the length of the pause in the **Pause (fr)** field.

Event	Location	Description
Play CC	**Custom Control** > **Play CC**	Play a custom control. **Note:** The Play CC command applies to a target custom control button only. If you move the contents of the custom control from the button selected in the Play CC to another button, the Play CC command will not follow and will continue to play the custom control assigned to the original button. 1. Click the **Bank** button and select the custom control bank you want to play a custom control on. 2. Click the **CC** button and select the custom control you want to play.
Resume CC	**Custom Control** > **Resume CC**	Resume a particular custom control that is at a hold. The specific custom control is set when the resume is inserted. If the target custom control is not at a hold event, the resume command will not start the target custom control. 1. Click the **Bank** button and select the custom control bank you want to resume a custom control on. 2. Click the **CC** button and select the custom control you want to resume.
Resume All CCs	**Custom Control** > **Resume All**	Resume all custom control that are at hold. The specific custom control is set when the resume is inserted. If a custom control is not at a hold event, the resume command will not start the a custom control.
State, Insert	**Custom Control** > **State**	Embed the state of the switcher into a custom control. A state in a custom control behaves just like a memory. 1. Click **State Attributes** and select the elements that you want to include in the state of the switcher when it is stored to the custom control. If **Disable Audio Memories** is set to **On** (Click **Navigation Menu** > **Configuration** > **System** > **Global**) the audio attributes are disabled.

Keyer

Event	Location	Description
Key Only Transition	**Switcher** > **Keyer** > **Keyer Trans**	Perform a key only transition for the selected area. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Action** button and select the type of transition to perform. • **Cut** — cut transition • **Auto** — auto transition • **Reset Rate** — reset the transition rate to default • **Cut On** — cut the key on-air • **Cut Off** — cut the key off-air • **Auto Trans On** — auto transition the key on-air • **Auto Trans Off** — auto transition the key off-air
Key Trans Rate	**Switcher** > **Keyer** > **Keyer Trans Rate**	Set or reset the keyer transition rate of the selected area. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Enter a new transition rate, in frames, for the key in the **Value (fr)** field.
Chroma Key, Initialize	**Switcher** > **Keyer** > **Chroma Key Init**	Initialize a chroma key for the selected key for the selected area. 1. Click the **ME** button and select the area that you want to perform the event on.

Event	Location	Description
Chroma Key Auto Adjust	**Switcher** > **Keyer** > **CK Auto Adjust**	Select the chroma key auto adjustments that you want to turn on. **1.** Click the **ME** button and select the area that you want to perform the event on. **2.** Click a **Parameter** button to select whether to toggle **Auto Re-Spill Color** or **Auto Edge Luma**. **3.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **4.** Click the **Value** button and select whether to turn the parameter **On** or **Off**.
Chroma Key Color	**Switcher** > **Keyer** > **Chroma Key Color**	Select the color you want to key out for the selected key for the selected area. **1.** Click the **ME** button and select the area that you want to perform the event on. **2.** Click **Color** and select the color you want to key out.
Chroma Key Measurement Source	**Switcher** > **Keyer** > **CK Measurement Source**	Select the video source that you want to use for the automatic adjustment of the chroma key. **1.** Click the **ME** button and select the area that you want to perform the event on. **2.** Click the **Value** button and select video source you want to use.
Chroma Key Re-spill Color	**Switcher** > **Keyer** > **CK Color (Preset Color)**	Select the re-spill color for the chroma key. **1.** Click the **ME** button and select the area that you want to perform the event on. **2.** Click the **Color** button and select the re-spill color.
Chroma Key Re-spill Saturation	**Switcher** > **Keyer** > **CK Color (HSL Color)**	Select the re-spill saturation for the chroma key. **1.** Click the **ME** button and select the area that you want to perform the event on. **2.** Click the **Component** button and select **Sat**. **3.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **4.** Click the **Value** button and select the new value you want to enter for the selected component.
Chroma Key Setup	**Switcher** > **Keyer** > **UCHR Param**	Select the various advanced chroma key settings for the selected key for the selected area. **1.** Click the **ME** button and select the area that you want to perform the event on. **2.** Click the **UCHR Controls** button and select the parameter you want to adjust. **3.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **4.** Click the **Value** button and select the new value you want to enter for the selected parameter.

Event	Location	Description
DVE Freeze	**Switcher** > **Keyer** > **DVE Freeze**	Turn the DVE freeze feature on or off for the selected key for the selected ME, MiniME™, or Canvas. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Click the **Value** button and select whether to freeze the video and appearance of a key (**On**) or not (**Off**). When a key is frozen, the DVE attribute are disabled and you can not move the key.
DVE Key Aspect	**Switcher** > **Keyer** > **DVE Param**	Select the aspect ratio for the DVE key on the selected key for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Parameter** button and select **Aspect**. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. Enter an aspect ratio in the **Value (%)** field.
DVE Key Border Color (HSL)	**Switcher** > **Keyer** > **DVE Border Color (HSL)**	Select the custom color you want to apply to the border of the DVE key of the selected area. Each component of the HSL color must be inserted individually. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Click the **Component** button and select the HSL component you want to assign a value to. A value should be applied to all three components. 5. Enter a value for the selected component in the **Value (%)** field.
DVE Key Border Color (Preset)	**Switcher** > **Keyer** > **DVE Border Color (Preset)**	Select the preset color you want to apply to the border of the DVE key of the selected key for the selected area. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Color** button and select the preset color you want to apply to the border.
DVE Key Border	**Switcher** > **Keyer** > **DVE Param**	Select the size of border for the DVE key on the selected key for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Parameter** button and select **Edge Size**. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. Enter a size for the border in the **Value (%)** field.

Event	Location	Description
DVE Key Crop (Bottom Edge)	**Switcher** > **Keyer** > **DVE Param**	Select the amount of cropping on the bottom edge of the DVE key on the selected key for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Parameter** button and select **Bottom Edge**. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. Enter the amount of cropping in the **Value (%)** field.
DVE Key Crop (Dual Edge)	**Switcher** > **Keyer** > **DVE Crop Param**	Select the amount of cropping on both horizontal or vertical edges of the DVE key of the selected key for the selected area. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Click the **Parameter** button and select the edges you want to crop. 5. Enter the amount of Left or Top cropping you want to apply in the **Value %** field. 6. Enter the amount of Right or Bottom cropping you want to apply in the **Other Value %** field.
DVE Key Crop (Left Edge)	**Switcher** > **Keyer** > **DVE Param**	Select the amount of cropping on the left edge of the DVE key on the selected key for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Parameter** button and select **Left Edge**. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. Enter the amount of cropping in the **Value (%)** field.
DVE Key Crop (Right Edge)	**Switcher** > **Keyer** > **DVE Param**	Select the amount of cropping on the right edge of the DVE key on the selected key for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Parameter** button and select **Right Edge**. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. Enter the amount of cropping in the **Value (%)** field.
DVE Key Crop (Top Edge)	**Switcher** > **Keyer** > **DVE Param**	Select the amount of cropping on the top edge of the DVE key on the selected key for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Parameter** button and select **Top Edge**. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. Enter the amount of cropping in the **Value (%)** field.

Event	Location	Description
DVE Key Edge Softness	**Switcher** > **Keyer** > **DVE Param**	Select the amount of softness to apply to the edge of the DVE key on the selected key for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Parameter** button and select **Edge Softness**. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. Enter an amount of softness for the DVE key or border in the **Value (%)** field.
DVE Key Size	**Switcher** > **Keyer** > **DVE Param**	Select the size of the DVE key on the selected key for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Parameter** button and select **Size**. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. Enter a new size in the **Value (%)** field.
DVE Key X-Position	**Switcher** > **Keyer** > **DVE Param**	Select the x-axis position of the DVE key on the selected key for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Parameter** button and select **X-Pos**. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. Enter a new position in the **Value (%)** field.
DVE Key Y-Position	**Switcher** > **Keyer** > **DVE Param**	Select the y-axis position for the DVE key on the selected key for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Parameter** button and select **Y-Pos**. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. Enter a new position in the **Value (%)** field.
Fly Key (DVE)	**Switcher** > **Keyer** > **Keyer Fly**	Assign DVE resources (Fly) to the selected key for the selected area. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Click the **Value** button and select whether DVE resources are assigned to the key (**On**) or not (**Off**).
Key, Make Linear	**Switcher** > **Keyer** > **Keyer Make Linear**	Make the selected key linear on the selected area. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Keyer** button for the key you want to make linear.

Event	Location	Description
Key Active	**Switcher** > **Keyer** > **Keyer Active**	Transition a key (or include it in the next transition) on or off-air for the selected area. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Click the **Parameter** button and select a cut (**Cut Key**) or auto transition (**Trans Key**) for the key, or have to key included in the next transition (**Include Key**). 5. Click the **Value** button to select whether the key is transitioned on-air / included in the next transition to go on-air (**On**) or off-air / included in the next transition to go off-air (**Off**).
Key Copy	**Switcher** > **Keyer** > **Keyer Copy**	Copy the contents of one key to another key the same or a different area. 1. Click the **Target ME** button and select where you want to copy the key to. 2. Click the **Target Keyer** button for the key you want to copy to. 3. Click the **Source ME** button and select where you want to copy the key from. 4. Click the **Source Keyer** button for the key you want to copy from.
Key Invert	**Switcher** > **Keyer** > **Keyer Invert**	Turn the key invert feature on or off for the selected key for the selected area. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Keyer** button for the key you want to reverse the polarity of the key alpha so that the holes in the background are cut by dark areas of the key alpha instead of bright areas. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Click a **Value** button to turn key invert on (**On**) or off (**Off**).
Key Mode	**Switcher** > **Keyer** > **Keyer Mode**	Select the mode for the selected key for the selected area. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click a **Mode** button to have the key set as shaped/unshaped from the key (**Normal**), as additive for a shaped source (**Additive**), or alpha to fully opaque/white (**Full**).
Key Reset	**Switcher** > **Keyer** > **Keyer Reset Params**	Reset the parameters for the selected key for the selected area. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Keyer** button for the key you want to reset the clip, gain, transparency, invert, and mask for.
Key Settings (Clip, Gain, Transparency)	**Switcher** > **Keyer** > **Keyer Settings**	Select clip, gain, and transparency settings for the selected key for the selected area. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Enter a value for the clip, gain, or transparency for the key in the **Value** field.

Event	Location	Description
Key Swap	**Switcher** > **Keyer** > **Keyer Swap**	Swap the contents of one key with another key the same or a different area. 1. Click the **1st ME** button and select where the first key you want to swap is. 2. Click the **1st Keyer** button for the first key you want to swap. 3. Click the **2nd ME** button and select where the second key you want to swap is. 4. Click the **2nd Keyer** button for the second key you want to swap.
Key Type	**Switcher** > **Keyer** > **Keyer Type**	Assign a key type for a key for the selected area. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click a **Type** button to assign the key type to the selected key.
Mask, Invert	**Switcher** > **Keyer** > **Mask Invert**	Invert the mask of the selected key for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Click the **Value** button and select whether to invert the masked area with the unmasked area (**On**) or not (**Off**).
Mask (Box) — Bottom Edge Position	**Switcher** > **Keyer** > **Box Mask Param**	Select the position for the bottom edge of the box mask on the selected key for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Parameter** button and select **Bottom Edge**. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. Enter a new position in the **Value (%)** field.
Mask (Box) — Edge Softness	**Switcher** > **Keyer** > **Box Mask Param**	Select the amount of softness to apply to the edges of the box mask on the selected key for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Parameter** button and select **Edge Softness**. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. Enter a new softness amount in the **Value (%)** field.
Mask (Box) — Left Edge Position	**Switcher** > **Keyer** > **Box Mask Param**	Select the position for the left edge of the box mask on the selected key for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Parameter** button and select **Left Edge**. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. Enter a new position in the **Value (%)** field.

Event	Location	Description
Mask (Box) — Right Edge Position	**Switcher** > **Keyer** > **Box Mask Param**	Select the position for the right edge of the box mask on the selected key for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Parameter** button and select **Right Edge**. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. Enter a new position in the **Value (%)** field.
Mask (Box) — Size	**Switcher** > **Keyer** > **Box Mask Param**	Select the size of the box mask on the selected key for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Parameter** button and select **Size**. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. Enter a new size in the **Value (%)** field.
Mask (Box) — Top Edge Position	**Switcher** > **Keyer** > **Box Mask Param**	Select the position for the top edge of the box mask on the selected key for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Parameter** button and select **Top Edge**. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. Enter a new position in the **Value (%)** field.
Mask (Box) — X-Position	**Switcher** > **Keyer** > **Box Mask Param**	Select the x-axis position of the box mask on the selected key for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Parameter** button and select **X-Pos**. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. Enter a new position in the **Value (%)** field.
Mask (Box) — Y-Position	**Switcher** > **Keyer** > **Box Mask Param**	Select the y-axis position for the box mask on the selected key for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click the **Parameter** button and select **Y-Pos**. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. Enter a new position in the **Value (%)** field.
Mask (Pattern) — Aspect Ratio	**Switcher** > **Keyer** > **Pattern Mask Param**	Select the aspect ratio for the pattern mask for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Parameter** button and select **Aspect**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Enter an aspect ratio in the **Value (%)** field.

Event	Location	Description
Mask (Pattern) — Border Size	**Switcher** > **Keyer** > **Pattern Mask Param**	Select the size of border for the pattern mask on the selected key for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Parameter** button and select **Border Size**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Enter a size for the border in the **Value (%)** field.
Mask (Pattern) — Edge Softness	**Switcher** > **Keyer** > **Pattern Mask Param**	Select the amount of softness to apply to the edge of the mask for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Parameter** button and select **Softness**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Enter an amount of softness for the pattern or border in the **Value (%)** field.
Mask (Pattern) — Horizontal Multiplication	**Switcher** > **Keyer** > **Pattern Mask Param**	Select the number of times you want to multiply the pattern mask horizontally for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Parameter** button and select **Horizontal Mult**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Enter the number of times the pattern is multiplied in the **Value** field.
Mask (Pattern) — Reset	**Switcher** > **Keyer** > **Pattern Mask Reset**	Reset the mask for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click **Reset Params**.
Mask (Pattern) — Rotation	**Switcher** > **Keyer** > **Pattern Mask Param**	Select the rotation for the pattern mask for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Parameter** button and select **Rotation**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Enter a rotation in the **Value (%)** field.
Mask (Pattern) — Size	**Switcher** > **Keyer** > **Pattern Mask Param**	Select the size of the pattern mask for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Parameter** button and select **Size**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Enter a new size in the **Value (%)** field.
Mask (Pattern) — Vertical Multiplication	**Switcher** > **Keyer** > **Pattern Mask Param**	Select the number of times you want to multiply the pattern mask vertically for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Parameter** button and select **Vertical Mult**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Enter the number of times the pattern is multiplied in the **Value** field.

Event	Location	Description
Mask (Pattern) — X-Position	**Switcher** > **Keyer** > **Pattern Mask Param**	Select the x-axis position of the pattern mask for the selected ME. **1.** Click the **ME** button for the ME that you want to perform the event on. **2.** Click the **Parameter** button and select **X-Pos**. **3.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **4.** Enter a new position in the **Value (%)** field.
Mask (Pattern) — Y-Position	**Switcher** > **Keyer** > **Pattern Mask Param**	Select the y-axis position for the pattern mask for the selected ME. **1.** Click the **ME** button for the ME that you want to perform the event on. **2.** Click the **Parameter** button and select **Y-Pos**. **3.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **4.** Enter a new position in the **Value (%)** field.
Mask	**Switcher** > **Keyer** > **Mask Type**	Apply a mask to the selected key for the selected ME. **1.** Click the **ME** button for the ME that you want to perform the event on. **2.** Click the **Keyer** button for the key you want to perform the event on. **3.** Click a **Mask Type** button to apply a pattern mask (**Pattern**), box mask (**Box**, or turn the mask off (**Off**).

Media-Store

Event	Location	Description
Auto Play	**Switcher** > **Media-Store** > **Attributes**	Select whether an animation plays automatically when taken on-air for the selected Media-Store channel. **1.** Click the **MediaStore Channel** button for the Media-Store channel you want to perform the event on. **2.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **3.** Click the **Parameter** button and select **Auto Play**. **4.** Click the **Value** button and select whether the animation plays automatically (**On**) or not (**Off**).
Capture Alpha	**Switcher** > **Media-Store** > **Capture Alpha**	Select whether to include the alpha with a capture on the selected Media-Store channel. **1.** Click the **MediaStore Channel** button for the Media-Store channel you want to perform the event on. **2.** Click the **Capture Alpha** button and select whether the alpha is captured with the source (**Yes**) or not (**No**).
Capture Alpha Source	**Switcher** > **Media-Store** > **Capture Alpha Source**	Select the alpha source you want to capture for the selected Media-Store channel. **1.** Click the **MediaStore Channel** button for the Media-Store channel you want to perform the event on. **2.** Click **Source** and select the alpha source that you want to capture.

Event	Location	Description
Capture	**Switcher** > **Media-Store** > **Capture**	Capture a still to the selected Media-Store channel. 1. Click the **MediaStore Channel** button for the Media-Store channel you want to perform the event on. 2. Click a **Capture Type** button to select whether the Media-Store captures the media to a file name (**Capture**) or the next available capture number (**Capture+**). 3. If you selected **Capture**, enter the name you want use for the capture file in the **Capture File Name** field. If a file with the same name exists it will be overwritten.
Capture Mode	**Switcher** > **Media-Store** > **Capture Display**	Select the capture mode for the selected Media-Store channel. 1. Click the **MediaStore Channel** button for the Media-Store channel you want to perform the event on. 2. Click a **Capture Display** button to select whether the capture is in electronic-to-electronic "E/E" (**End to End**) or playback "P/B" (**Playback**) mode.
Capture Source	**Switcher** > **Media-Store** > **Capture Source**	Select the video source you want to capture for the selected Media-Store channel. 1. Click the **MediaStore Channel** button for the Media-Store channel you want to perform the event on. 2. Click **Source** and select the video source that you want to capture.
Clear Channel	**Switcher** > **Media-Store** > **Channel Action**	Clear the selected Media-Store channel. 1. Click the **MediaStore Channel** button for the Media-Store channel you want to perform the event on. 2. Click **Clear Channel**.
Cut Frame	**Switcher** > **Media-Store** > **Attributes**	Select the point, in frames, from the start of the media item that the MediaWipe background cut occurs for the selected Media-Store channel. 1. Click the **MediaStore Channel** button for the Media-Store channel you want to perform the event on. 2. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 3. Click the **Parameter** button and select **Cut Frame**. 4. Enter the frame in the media item that you want to cut to occur for the MediaWipe in the **Value** field.
Delete Capture	**Switcher** > **Media-Store** > **Delete Media Capture**	Delete a captured still. 1. Enter the number of the capture file you want to delete in the **Capture File** field.
Media-Store Load	**Switcher** > **Media-Store** > **Load**	Load a media item into the selected Media-Store channel. 1. Click the **MediaStore Channel** button for the Media-Store channel you want to perform the event on. 2. Click the **Location** button to select whether the media item you want to load is located on the internal storage (**Internal**) or on the USB (**USB**). 3. Enter the number of the media item you want to load in the **Media Number** field.

Event	Location	Description
Looping	**Switcher** > **Media-Store** > **Attributes**	Select whether an animation will loop at the end for the selected Media-Store channel.
		1. Click the **MediaStore Channel** button for the Media-Store channel you want to perform the event on.
		2. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter.
		3. Click the **Parameter** button and select **Looping**.
		4. Click the **Value** button and select whether the animation loops at the end (**On**) or not (**Off**).
Move To Frame	**Switcher** > **Media-Store** > **Attributes**	Move to a specific frame in the media item for the selected Media-Store channel.
		1. Click the **MediaStore Channel** button for the Media-Store channel you want to perform the event on.
		2. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter.
		3. Click the **Parameter** button and select **Move To Frame**.
		4. Enter the frame that you want to jump to in the media item in the **Value** field.
Mute	**Switcher** > **Media-Store** > **Attributes**	Select whether the associated audio is turned on or off during playback for the selected Media-Store channel.
		1. Click the **MediaStore Channel** button for the Media-Store channel you want to perform the event on.
		2. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter.
		3. Click the **Parameter** button and select **Mute**.
		4. Click the **Value** button and select whether the audio plays (**On**) or not (**Off**).
Play	**Switcher** > **Media-Store** > **Channel Action**	Start an animation playing for the selected Media-Store channel.
		1. Click the **MediaStore Channel** button for the Media-Store channel you want to perform the event on.
		2. Click **Toggle Play**.
Play Speed	**Switcher** > **Media-Store** > **Playback Speed**	Select the speed for an animation to play at on the selected Media-Store channel.
		1. Click the **MediaStore Channel** button for the Media-Store channel you want to perform the event on.
		2. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter.
		3. Click the **Parameter** button and select **Playback Speed**.
		4. Enter the speed, faster or slower than 100%, that you want the animation to play at in the **Value (%)** field.
Reset Media	**Switcher** > **Media-Store** > **Channel Action**	Reset the selected Media-Store channel.
		1. Click the **MediaStore Channel** button for the Media-Store channel you want to perform the event on.
		2. Click **Reset Media**.

Event	Location	Description
Reverse	**Switcher** > **Media-Store** > **Attributes**	Select whether an animation plays in reverse for the selected Media-Store channel. 1. Click the **MediaStore Channel** button for the Media-Store channel you want to perform the event on. 2. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 3. Click the **Parameter** button and select **Reverse**. 4. Click the **Value** button and select whether the animation plays in reverse (**On**) or not (**Off**).
Rewind	**Switcher** > **Media-Store** > **Channel Action**	Rewind an animation to the first frame for the selected Media-Store channel. 1. Click the **MediaStore Channel** button for the Media-Store channel you want to perform the event on. 2. Click **Move to Frame 1**.
Shaped	**Switcher** > **Media-Store** > **Attributes**	Select whether the alpha of the media item should be shaped or ushaped for the selected Media-Store channel. 1. Click the **MediaStore Channel** button for the Media-Store channel you want to perform the event on. 2. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 3. Click the **Parameter** button and select **Shaped**. 4. Click the **Value** button and select whether the alpha of the media item is shaped (**On**) or not (**Off**).
Thumb Frame	**Switcher** > **Media-Store** > **Attributes**	Select the point, in frames, from the start of the animation that is used as the thumbnail for the media item. 1. Click the **MediaStore Channel** button for the Media-Store channel you want to perform the event on. 2. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 3. Click the **Parameter** button and select **Thumb Frame**. 4. Enter the frame in the media item that you want to use as the thumbnail.
X-Position	**Switcher** > **Media-Store** > **Attributes**	Select the x-axis position for the media item for the selected Media-Store channel. 1. Click the **MediaStore Channel** button for the Media-Store channel you want to perform the event on. 2. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 3. Click the **Parameter** button and select **X-Pos**. 4. Enter a new position in the **Value** field.
Y-Position	**Switcher** > **Media-Store** > **Attributes**	Select the y-axis position for the media item for the selected Media-Store channel. 1. Click the **MediaStore Channel** button for the Media-Store channel you want to perform the event on. 2. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 3. Click the **Parameter** button and select **Y-Pos**. 4. Enter a new position in the **Value** field.

Matte

Event	Location	Description
Matte Color, Reset	**Switcher** > **Matte** > **Matte Color Reset**	Reset the matte color for the selected ME or aux. 1. Click the **ME/Matte** button for the ME or aux that you want to perform the event on. 2. For an ME, click the **Matte** button and select **Matte**.
Matte Color (HSL)	>**Switcher** > **Matte** > **Matte Color (HSL)**	Select the custom matte color for the selected ME or aux. Each component of the HSL color must be inserted individually. 1. Click the **ME/Matte** button for the ME or aux that you want to perform the event on. 2. Click the **Matte** button and select **Matte**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Click the **Component** button and select the HSL component you want to assign a value to. A value should be applied to all three components. 5. Enter a value for the selected component in the **Value (%)** field.
Matte Color (Preset)	>**Switcher** > **Matte** > **Matte Color (Preset)**	Select a preset matte color for the selected ME or aux. 1. Click the **Matte** button and select **Matte**. 2. Click the **Color** button and select the color you want to use.

Sequencer

Event	Location	Description
Load	**Sequencer** > **Load**	Load a sequence into the selected Sequencer. 1. Click the **Sequencer** button and select the Sequencer you want to perform the event on. 2. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 3. In the **Value** field, enter the sequence number for the sequence you want to load in the selected Sequencer.
Reload	**Sequencer** > **Reload**	Reload the sequence currently loaded into the selected Sequencer. 1. Click the **Sequencer** button and select the Sequencer you want to perform the event on.
Clear	**Sequencer** > **Clear**	Unload the sequence currently loaded into the selected Sequencer. 1. Click the **Sequencer** button and select the Sequencer you want to perform the event on.
Next	**Sequencer** > **Next**	Run the next event in the selected Sequencer. 1. Click the **Sequencer** button and select the Sequencer you want to perform the event on.
Up	**Sequencer** > **Up**	Move the next event highlight (green) up one event in the sequence loaded into the selected Sequencer. 1. Click the **Sequencer** button and select the Sequencer you want to perform the event on.
Down	**Sequencer** > **Down**	Move the next event highlight (green) down one event in the sequence loaded into the selected Sequencer. 1. Click the **Sequencer** button and select the Sequencer you want to perform the event on.

Event	Location	Description
Link	**Sequencer** > **Link**	Turn Link on or off for the selected Sequencer. 1. Click the **Sequencer** button and select the Sequencer you want to perform the event on. 2. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 3. Click a **Value** button to turn link **On** or **Off**.

Special

Event	Location	Description
Row ME Assignment	**Special** > **Row ME Assignment**	Assign a control panel row to an ME, MiniME™, or Canvas on a particular panel. 1. Click the **Panel** button for the control panel that you want to assign a row from. 2. Click the **Row** button for the row on the control panel that you want to assign to an ME. 3. Click the **ME** button as select the area that you want to assign the control panel row to.

Switcher Operation

Event	Location	Description
Bus Source Copy	**Switcher** > **Bus Source Copy**	Copy the source on the selected bus to another bus. 1. Click the **Source ME** button and select the area that you want to copy from. 2. Click the **Source Bus/Keyer** button and select the bus that you want to copy from. 3. Click the **Source Bus** button and select whether you want to copy the **Video** (fill) or **Alpha** of the source. 4. Click the **Destination ME** button and select the area that you want to copy to. 5. Click the **Destination Bus/Keyer** button and select the bus that you want to copy to. 6. Click the **Destination Bus** button and select whether you want to copy to the **Video** (fill) or **Alpha**.
Bus Source Select	**Switcher** > **Bus Source**	Select a source on the selected bus for the selected area. 1. Click the **ME** button and select the area that you want to select a bus on. 2. Click the **Bus/Keyer** button and select the bus that you want to select a source on. 3. If you selected a key bus, click a **Bus** button to select whether you are selecting a source for the fill (**Video**) or the alpha (**Alpha**) of the key. 4. Click the **Source** button and select the source that you want on the selected bus.
ME Copy	**Switcher** > **ME Copy**	Copy the contents of one area to another. 1. Click the **Target ME** button and select the location that you want to copy to. 2. Click the **Source ME** button and select the location that you want to copy from.

Event	Location	Description
Memory Recall	**Switcher** > **Memory Recall**	Recall a memory for the selected area. 1. Click the **Include** button and select all the locations that you want to perform the memory recall on. 2. Click the **Bank** button and select the bank that you want to recall the memory on. 3. Click the **Memory** button and select the memory that you want to recall.
Memory Recall	**Switcher** > **Memory Recall**	Recall a memory for the selected area. 1. Click the **Include** button and select all the locations that you want to perform the memory recall on. 2. Click the **Bank** button and select the bank that you want to recall the memory on. 3. Click the **Memory** button and select the memory that you want to recall.
RState, Load	**Switcher** > **Load RState**	Load the custom reset settings for the selected area. 1. Click the **Include** button and select all the locations that you want to recall the custom reset settings on.

Transitions

Event	Location	Description
Combined Transition Event		

Transition Action - Dissolve	**Switcher** > **Transition** > **Transition Action**	Set up a dissolve transition with a single custom control event.
		1. Click the **ME** button and select the area that you want to perform the event on.
		2. Click **Dissolve**.
		3. Click the **Toggle**, **Include On**, and **Include Off** buttons to set up what is included with the next transition. Something must always be selected for the toggle inclusion. Key toggle and on/off inclusions are mutually exclusive.
		  • **Toggle** — select the background and any keys that you want included with the transition. This is the same as using the next trans buttons on the Transition area of a control panel.
		  • **Include On** — select that keys that you want to transition on-air with the next transition. If a key is already on-air it is ignored.
		  • **Include Off** — select that keys that you want to transition off-air with the next transition. If a key is already off-air it is ignored.
		4. Click an **Auto Trans** button to select whether the transition is performed with the custom control (**On**) or if the custom control only sets up the next transition but does not perform it (**Off**).
		5. Enter a rate for transition in the **Trans Rate (fr)** field. A rate of 0 is performed as a cut.
		6. Click a **Diss/Flash** button to select whether the transition is performed as a dissolve (**Dissolve**) or a WhiteFlash (**Flash**). The existing onset, offset, and color values for the ME are used for the WhiteFlash.

Event	Location	Description
Transition Action - Wipe	**Switcher** > **Transition** > **Transition Action**	Set up a wipe transition with a single custom control event.
		1. Click the **ME** button and select the area that you want to perform the event on.
		2. Click **Wipe**.
		3. Click the **Toggle**, **Include On**, and **Include Off** buttons to set up what is included with the next transition. Something must always be selected for the toggle inclusion. Key toggle and on/off inclusions are mutually exclusive.
		• **Toggle** — select the background and any keys that you want included with the transition. This is the same as using the next trans buttons on the Transition area of a control panel.
		• **Include On** — select that keys that you want to transition on-air with the next transition. If a key is already on-air it is ignored.
		• **Include Off** — select that keys that you want to transition off-air with the next transition. If a key is already off-air it is ignored.
		4. Click an **Auto Trans** button to select whether the transition is performed with the custom control (**On**) or if the custom control only sets up the next transition but does not perform it (**Off**).
		5. Enter a rate for transition in the **Trans Rate (fr)** field. A rate of 0 is performed as a cut.
		6. Click the **Pattern** button and select the wipe pattern you want to use for the transition.
Transition Action - DVE	**Switcher** > **Transition** > **Transition Action**	Set up a DVE wipe transition with a single custom control event.
		1. Click the **ME** button and select the area that you want to perform the event on.
		2. Click **DVE**.
		3. Click the **Toggle**, **Include On**, and **Include Off** buttons to set up what is included with the next transition. Something must always be selected for the toggle inclusion. Key toggle and on/off inclusions are mutually exclusive.
		• **Toggle** — select the background and any keys that you want included with the transition. This is the same as using the next trans buttons on the Transition area of a control panel.
		• **Include On** — select that keys that you want to transition on-air with the next transition. If a key is already on-air it is ignored.
		• **Include Off** — select that keys that you want to transition off-air with the next transition. If a key is already off-air it is ignored.
		4. Click an **Auto Trans** button to select whether the transition is performed with the custom control (**On**) or if the custom control only sets up the next transition but does not perform it (**Off**).
		5. Enter a rate for transition in the **Trans Rate (fr)** field. A rate of 0 is performed as a cut.
		6. Click the **DVE Effect** button and select the DVE wipe pattern you want to use for the transition.

Event	Location	Description
Transition Action - MediaWipe	**Switcher** > **Transition** > **Transition Action**	Set up a MediaWipe transition with a single custom control event. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click **MediaWipe**. 3. Click the **Toggle**, **Include On**, and **Include Off** buttons to set up what is included with the next transition. Something must always be selected for the toggle inclusion. Key toggle and on/off inclusions are mutually exclusive. **Toggle** — select the background and any keys that you want included with the transition. This is the same as using the next trans buttons on the Transition area of a control panel. **Include On** — select that keys that you want to transition on-air with the next transition. If a key is already on-air it is ignored. **Include Off** — select that keys that you want to transition off-air with the next transition. If a key is already off-air it is ignored. 4. Click an **Auto Trans** button to select whether the transition is performed with the custom control (**On**) or if the custom control only sets up the next transition but does not perform it (**Off**). 5. Click the **Layer** button to select what the MediaWipe animation covers. 6. Click a **Location** button for the drive that the animation to use for the MediaWipe is stored on. 7. Enter the media number for the animation you want use for the MediaWipe in the **Media Number** field. 8. Click a **Channel** number to select the Media-Store channel you want to use for the MediaWipe.
Individual Transition Events		
Auto Trans	**Switcher** > **Transition** > **ME Trans Action**	Performs an auto transition on the selected area. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Action** button and select **Auto Trans**.
Cut	**Switcher** > **Transition** > **ME Trans Action**	Performs a cut on the selected ME. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Action** button and select **Cut**.
DVE Wipe, Reset	**Switcher** > **Transition** > **DVE Wipe Reset**	Reset the parameters or direction and flip-flop for the DVE wipe transition of the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click **Reset** to reset the DVE wipe parameters.
DVE Wipe Direction (Flip-Flop)	**Switcher** > **Transition** > **DVE Wipe Direction**	Select whether the DVE wipe reverses direction for every second transition of the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 3. Click **Flip-Flip**. 4. Click **On** or **Off** to select whether Flip-Flop is on (**On**) or not (**Off**).

Event	Location	Description
DVE Wipe Direction	**Switcher** > **Transition** > **DVE Wipe Direction**	Select the direction for the DVE wipe transition of the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 3. Click **Direction**. 4. Click **Forward** or **Reverse** to select whether the DVE wipe moves in a forward (**Forward**) or reverse (**Reverse**) direction.
DVE Wipe Pattern	**Switcher** > **Transition** > **DVE Wipe Effect**	Select the pattern you want to use for a DVE wipe transition of the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Effect** button and select the pattern you want to use for the DVE wipe.
MediaWipe — Channel	**Switcher** > **Transition** > **Media Wipe Channel**	Select which Media-Store channel will be used for the MediaWipe transition of the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click **M1** or **M2** to assign that Media-Store channel to the MediaWipe.
MediaWipe Cut Point, Set	**Switcher** > **Transition** > **ME Trans Action**	Sets the cut point for a MediaWipe transition for the selected area. You must select the point in the transition that you want to place the cut before running this event. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Action** button and select **Set Media Cut**.
MediaWipe — Direction, Flip-Flop	**Switcher** > **Transition** > **DVE Wipe Direction**	Select whether the MediaWipe reverses direction for every second transition of the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 3. Click **Flip-Flip**. 4. Click the **Value** button and select whether Flip-Flop is on (**On**) or not (**Off**).
MediaWipe — Direction	**Switcher** > **Transition** > **DVE Wipe Direction**	Select the direction for the MediaWipe transition of the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 3. Click **Direction**. 4. Click the **Value** button and select whether the MediaWipe moves in a forward (**Forward**) or reverse (**Reverse**) direction.
MediaWipe — Layer	**Switcher** > **Transition** > **ME Media Trans Layer**	Select which Media-Store channel will be used for the MediaWipe transition of the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Layer** button to select what the MediaWipe animation covers.
MediaWipe Trans End Point, Set	**Switcher** > **Transition** > **ME Trans Action**	Sets the ending point for a MediaWipe transition for the selected area. Use the fader to move through the animation to the point you want to end the transition and run this CC to save that point. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Action** button and select **Set Media Trans End**.

Event	Location	Description
MediaWipe Trans Start Point, Set	**Switcher** > **Transition** > **ME Trans Action**	Sets the starting point for a MediaWipe transition for the selected area. Use the fader to move through the animation to the point you want to start the transition and run this CC to save that point. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Action** button and select **Set Media Trans Start**.
MediaWipe Trans Thumbnail	**Switcher** > **Transition** > **ME Trans Action**	Sets the starting point for a MediaWipe transition for the selected area. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Action** button and select **Set Media Thumb**.
ME Dissolve Type	**Switcher** > **Transition** > **ME Dissolve Type**	Select the type of dissolve transition (WhiteFlash or Dissolve) you want to use. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click a **Type** button to select a Dissolve (**Dissolve**) or WhiteFlash (**Flash**) transition.
ME Trans Rate	**Switcher** > **Transition** > **ME Trans Parameter**	Set or reset the background transition rate of the selected area. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Parameter** button and select **ME Trans Rate**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Enter a new transition rate, in frames, in the **Value (fr)** field.
ME Trans Type	**Switcher** > **Transition** > **ME Trans Type**	Select the transition type for a background transition of the selected area. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Type** button for the type of transition you want to use.
ME WhiteFlash Color	**Switcher** > **Transition** > **ME Flash Dissolve Color (Preset)**	Select color for the WhiteFlash transition. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Color** button and select the preset color you want to use.
ME WhiteFlash Offset	**Switcher** > **Transition** > **ME Trans Value**	Select time for the offset of the WhiteFlash transition. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click **Flash Offset**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Enter a new offset position in the **Value (%)** field.
ME WhiteFlash Onset	**Switcher** > **Transition** > **ME Trans Value**	Select time for the onset of the WhiteFlash transition. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click **Flash Onset**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Enter a new onset position in the **Value (%)** field.
Reset	**Switcher** > **Transition** > **ME Trans Action**	Resets the transition area of the selected area. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Action** button and select **Reset**.

Event	Location	Description
Roll Clip	**Switcher** > **Transition** > **Roll Clip**	Turn the Roll Clip feature on or off for the selected area. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Value** button and select whether roll clip is on (**On**) or not (**Off**).
Trans Clear	**Switcher** > **Transition** > **ME Trans Action**	Configures the next transition area of the selected area to take all keys off-air with the next transition. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Action** button and select **Trans Clear**.
Trans Delay	**Switcher** > **Transition** > **ME Trans Action**	Applies the pre-delay to the transition. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Action** button and select **Delayed Auto Trans**.
Trans Elements	**Switcher** > **Transition** > **ME Trans Element**	Select the elements to be included in the next transition of the selected area. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Elements** button and select background and/or the keys that you want to include in the next transition.
Trans Limit — On/Off	**Switcher** > **Transition** > **ME Trans Limit**	Turn the transition limit feature on or off for the selected area. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 3. Click the **Value** button and select whether trans limit is on (**On**) or not (**Off**).
Trans Limit — Reset	**Switcher** > **Transition** > **ME Trans Action**	Resets the transition limit point of the selected area. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Action** button and select **Reset Limit**.
Trans Limit — Set	**Switcher** > **Transition** > **ME Trans Action**	Sets the transition limit point of the selected area. You must select the point in the transition that you want to place the limit before running this event. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click the **Action** button and select **Set Limit**.
Trans Limit — Value	**Switcher** > **Transition** > **ME Trans Value**	Select the limit point for the trans limit of the selected area. 1. Click the **ME** button and select the area that you want to perform the event on. 2. Click **Trans Limit**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Enter the point in the transition that you want to place the trans limit in the **Value (%)** field.

Event	Location	Description
Wipe Direction (Flip-Flop)	**Switcher** > **Transition** > **Wipe Direction**	Select whether the wipe reverses direction for every second transition of the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Pattern** button and select **Wipe**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Click the **Parameter** button and select **Flip-Flip**. 5. Click the **Value** button and select whether Flip-Flop is on (**On**) or off (**Off**).
Wipe Direction	**Switcher** > **Transition** > **Wipe Direction**	Select the direction for the wipe transition of the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Pattern** button and select **Wipe**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Click the **Parameter** button and select **Direction**. 5. Click the **Value** button and select whether the wipe moves in a forward (**Forward**) or reverse (**Reverse**) direction.
Wipe Pattern — Aspect Ratio	**Switcher** > **Transition** > **Wipe Param**	Select the aspect ratio for the wipe pattern you want to use for a wipe transition of the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Parameter** button and select **Aspect**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Enter an aspect ratio in the **Value (%)** field.
Wipe Pattern — Border Color (HSL)	**Switcher** > **Transition** > **Wipe Border Color (HSL)**	Select the custom color you want to apply to the border of the pattern for the wipe transition of the selected ME. Each component of the HSL color must be inserted individually. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Matte** button and select **Wipe Border**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Click the **Component** button and select the HSL component you want to assign a value to. A value should be applied to all three components. 5. Enter a value for the selected component in the **Value (%)** field.
Wipe Pattern — Border Color (Preset)	**Switcher** > **Transition** > **Wipe Border Color (Preset)**	Select the preset color you want to apply to the border of the pattern for the wipe transition of the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Matte** button and select **Wipe Border**. 3. Click the **Color** button and select the preset color you want to apply to the border.
Wipe Pattern — Border Size	**Switcher** > **Transition** > **Wipe Param**	Select the size of border for the wipe pattern you want to use for a wipe transition of the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Parameter** button and select **Border Size**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Enter a size for the border in the **Value (%)** field.

Event	Location	Description
Wipe Pattern — Edge Softness	**Switcher** > **Transition** > **Wipe Param**	Select the amount of softness to apply to the edge of the pattern or border for the wipe pattern you want to use for a wipe transition of the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Parameter** button and select **Softness**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Enter an amount of softness for the pattern or border in the **Value (%)** field.
Wipe Pattern — Horizontal Multiplication	**Switcher** > **Transition** > **Wipe Param**	Select the number of times you want to multiply the wipe pattern horizontally for the wipe transition of the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Parameter** button and select **Horizontal Mult**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Enter the number of times the pattern is multiplied in the **Value** field.
Wipe Pattern — Pattern	**Switcher** > **Transition** > **Wipe Effect**	Select the pattern you want to use for a wipe transition of the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Pattern** button and select the pattern you want to use for the wipe.
Wipe Pattern — Rotation	**Switcher** > **Transition** > **Wipe Param**	Select the rotation for the wipe pattern you want to use for a wipe transition of the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Parameter** button and select **Rotation**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Enter a rotation in the **Value (%)** field.
Wipe Pattern — Size	**Switcher** > **Transition** > **Wipe Param**	Select the size for the wipe pattern you want to use for a wipe transition of the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Parameter** button and select **Size**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Enter a new size in the **Value (%)** field.
Wipe Pattern — Vertical Multiplication	**Switcher** > **Transition** > **Wipe Param**	Select the number of times you want to multiply the wipe pattern vertically for the wipe transition of the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Parameter** button and select **Vertical Mult**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Enter the number of times the pattern is multiplied in the **Value** field.

Event	Location	Description
Wipe Pattern — X-Position	**Switcher** > **Transition** > **Wipe Param**	Select the x-axis position for the wipe pattern you want to use for a wipe transition of the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Parameter** button and select **X-Pos**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Enter a new position in the **Value (%)** field.
Wipe Pattern — Y-Position	**Switcher** > **Transition** > **Wipe Param**	Select the y-axis position for the wipe pattern you want to use for a wipe transition of the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Parameter** button and select **Y-Pos**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Enter a new position in the **Value (%)** field.
Wipe Reset	**Switcher** > **Transition** > **Wipe Reset**	Reset the parameters or direction and flip-flop for the wipe transition of the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click **Reset Params** to reset the wipe parameters or **Reset Direction** to reset the wipe direction and flip-flop.

MaxScene

Event	Location	Description
Recall MaxScene	**Switcher** > **Scene** > **Scene Recall/Store**	Recall an MaxScene memory. 1. Click the **Scene** button and select the MaxScene memory you want to recall 2. Click **Recall Memory**.
Store MaxScene	**Switcher** > **Scene** > **Scene Recall/Store**	Store an MaxScene memory. 1. Click the **Scene** button and select the MaxScene memory location you want to store to. 2. Click **Store Memory**.

Personality Custom Controls

Personality

Event	Location	Description
Personality — Auto Remove Key	**Switcher Personality** > **Auto Remove Key**	Have a key removed from the Next Transition area, so that it is not included in the next transition, after it has been transitioned off-air using the **KEY *X* CUT** or **KEY *X* AUTO** buttons. 1. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 2. Click the **Value** button and select whether the personality option is on (**On**) or not (**Off**).

Event	Location	Description

Personality — Auto Trans Second Press (Key)	**Switcher Personality** > **Key Auto Trans 2nd Press**	Select how the switcher reacts when the **KEY AUTO** button is pressed during a transition.
		1. Click the **Second Auto** button and select how the switcher reacts to pressing the button during a transition.
		   • **Ignore** — the buttons are ignored during the transition
		   • **Halt Forward** — halt the transition and move forward through the transition when pressed again
		   • **Halt Reverse** — halt the transition and move backwards through the transition when pressed again
		   • **Reverse** — reverse the transition immediately
		   • **Cut** — cut the transition to the end

Personality — Auto Trans Second Press (ME)	**Switcher Personality** > **ME Auto Trans 2nd Press**	Select how the switcher reacts when the **AUTO TRANS** button is pressed during a transition.
		1. Click the **Second Auto** button and select how the switcher reacts to pressing the button during a transition.
		   • **Ignore** — the buttons are ignored during the transition
		   • **Halt Forward** — halt the transition and move forward through the transition when pressed again
		   • **Halt Reverse** — halt the transition and move backwards through the transition when pressed again
		   • **Reverse** — reverse the transition immediately
		   • **Cut** — cut the transition to the end

Personality — Next Trans Reset	**Switcher Personality** > **Auto Reset Trans**	Have the transition area reset to a default background dissolve after each transition. 1. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 2. Click the **Value** button and select whether the personality option is on (**On**) or not (**Off**).
Personality — Roll Clip	**Switcher Personality** > **Roll Clip Force**	Select whether the Roll Clip functionality is always on. 1. Click the **ME** button and select the area that you want to adjust the roll clip for. 2. Click a **Roll Clip** button to select whether Roll Clip is always on (**Force**) or must be turned on manually (**User**).

Installation Custom Controls

Switcher Installation

Event	Location	Description
AES Output	**Switcher Installation** > **Output** > **AES**	Assign an audio stream to an AES output. 1. Click the **AES** button for the AES output you want to assign an audio stream to. 2. Click the **Value** button and select the audio stream you want to assign to the AES output.
Ancillary Data Mode	**Switcher Installation** > **Ancillary Mode**	Select how the switcher will strip or pass ancillary data. 1. Click a **Value** button to select whether ancillary data is stripped (**Strip**), or passed (**Pass**).

Event	Location	Description
Clean Feed	**Switcher Installation** > **ME** > **ME Clean Feed**	Select the clean feed location for the selected ME. **1.** Click the **ME** button for the ME that you want to perform the event on. **2.** Click the **Before Keyer** button and select the key you want the clean feed output to be taken before.
Color Corrector Color Reset	**Switcher Installation** > **Proc Amp/Color Corrector** > **Color Corrector R/G/B Reset**	Reset the values for the selected color corrector color channel(s). **1.** **2.** Click the **Color** button and select the individual color component (**Red**, **Green**, **Blue**) you want to adjust, or **RGB** for all of them.
Color Corrector Enable	**Switcher Installation** > **Proc Amp/Color Corrector** > **Color Corrector Enable**	Enable a Color Corrector for a video input or output. **1.** **2.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **3.** Click a **Value** button to select whether to enable the color corrector (**On**) or disable the color corrector (**Off**).
Color Corrector Gain	**Switcher Installation** > **Proc Amp/Color Corrector** > **Color Corrector Param**	Adjust the Gain for the selected color corrector. **1.** **2.** Click the **Color** button and select the individual color component (**Red**, **Green**, **Blue**) you want to adjust, or **RGB** for all of them. **3.** Click the **Parameter** button and select **Gain**. **4.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **5.** Enter the new gain value in the **Value** field.
Color Corrector Gamma	**Switcher Installation** > **Proc Amp/Color Corrector** > **Color Corrector Param**	Adjust the Offset for the selected color corrector. **1.** **2.** Click the **Color** button and select the individual color component (**Red**, **Green**, **Blue**) you want to adjust, or **RGB** for all of them. **3.** Click the **Parameter** button and select **Gamma Value**. **4.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **5.** Enter the new gamma value in the **Value** field.
Color Corrector Gamma Offset	**Switcher Installation** > **Proc Amp/Color Corrector** > **Color Corrector Param**	Adjust the Gamma Offset for the selected color corrector. **1.** **2.** Click the **Color** button and select the individual color component (**Red**, **Green**, **Blue**) you want to adjust, or **RGB** for all of them. **3.** Click the **Parameter** button and select **Gamma Offset**. **4.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **5.** Enter the new gamma offset value in the **Value** field.
Color Corrector Lower Offset	**Switcher Installation** > **Proc Amp/Color Corrector** > **Color Corrector Param**	Adjust the Lower Offset for the selected color corrector. **1.** **2.** Click the **Color** button and select the individual color component (**Red**, **Green**, **Blue**) you want to adjust, or **RGB** for all of them. **3.** Click the **Parameter** button and select **Lower Offset**. **4.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **5.** Enter the new lower offset value in the **Value** field.

Event	Location	Description
Color Corrector Offset	**Switcher Installation** > **Proc Amp/Color Corrector** > **Color Corrector Param**	Adjust the Offset for the selected color corrector. **1.** **2.** Click the **Color** button and select the individual color component (**Red**, **Green**, **Blue**) you want to adjust, or **RGB** for all of them. **3.** Click the **Parameter** button and select **Offset**. **4.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **5.** Enter the new offset value in the **Value** field.
Color Corrector Reset	**Switcher Installation** > **Proc Amp/Color Corrector** > **Color Corrector Reset**	Reset the values for the selected color corrector. **1.**
Color Gamut, Input	**Switcher Installation** > **Input** > **Input Color Gamut**	Select the color gamut that video input is in. **1.** Click the **Input** button and select the input BNC that you want to set the color gamut for. **2.** Click a **Value** button to select the whether the input is in BT.709 (**709**) or BT.2020 (**2020**).
Color Gamut, Output	**Switcher Installation** > **Output** > **Output Color Gamut**	Select the color gamut that video output is in. **1.** Click the **Output** button and select the output BNC that you want to set the color gamut for. **2.** Click a **Value** button to select the whether the output is in BT.709 (**709**) or BT.2020 (**2020**).
Color Gamut, Switcher	**Switcher Installation** > **Reference** > **Switcher Color Gamut**	Select the color gamut that the switcher will operate in. **1.** Click a **Gamut** button to select the whether the switcher operates in BT.709 (**709**) or BT.2020 (**2020**).
Disable Audio Memories	**Switcher Installation** > **Disable Audio Memories**	Disable the inclusion of audio attributes in memories. **1.** Click a **Value** button to select whether audio is included with memory recalls (**On**), or not (**Off**).
Dynamic Range, Input	**Switcher Installation** > **Input** > **Input Dynamic Range**	Select the dynamic range that a video input is in. **1.** Click the **Input** button and select the input BNC that you want to set the dynamic range for. **2.** Click a **Value** button to select the dynamic range that the input is in.
Dynamic Range, Output	**Switcher Installation** > **Output** > **Output Dynamic Range**	Select the dynamic range that a video output is in. **1.** Click the **Output** button and select the output BNC that you want to set the dynamic range for. **2.** Click a **Value** button to select the dynamic range that the output is in.
Dynamic Range, Switcher	**Switcher Installation** > **Reference** > **Switcher Dynamic Range**	Select the dynamic range that the switcher will operate in. **1.** Click a **Dynamic Range** button to select the dynamic range that the switcher operates in.
Frame Delay	**Switcher Installation** > **Input** > **Frame Delay**	Assign a Frame Delay to an input. **1.** Click the **Input** button and select the input BNC that you want to assign an frame delay to. **2.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **3.** In the **Value** field, enter the value of the frame delay you want to apply.

Event	Location	Description
FSFC Assignment	**Switcher Installation** > **Input FSFC Assign**	Assign an FSFC to an input BNC. This event is only available if you have fewer FSFCs than inputs. 1. Click the **FSFC** button and select the FSFC resource that you want to assign to an input. 2. Click the **Assignment** button and select the input that you want to assign the selected FSFC to.
Input FSFC Assignment	**Switcher Installation** > **Input** > **Input Type**	Assign an FSFC to an input. 1. Click the **Input** button and select the input BNC that you want to assign an FSFC to. 2. Click a **ValueType** button to assign an FSFC to the input or select (**SDI Off**) to turn the FSFC off.
Input FSFC Framing	**Switcher Installation** > **Input** > **Input Framing**	Select the video framing that is applied to the converted video input. 1. Click the **Input** button and select the input BNC that you want to assign the framing to. 2. Click a **Type** button for the input FSFC that is being used. 3. Click a **Value** button to assign a type of framing to the input.
ME Follow	**Switcher Installation** > **ME** > **ME Follow**	Select whether an ME or MiniME™ follows another ME or MiniME™. 1. Click the **ME** button and select the area you want to have follow another area. 2. Click a **Follow** button to select the ME or MiniME™ that you want to follow the selected area.
Output Assignment	**Switcher Installation** > **Output** > **Output Assignment**	Assign a source to the selected output BNC. 1. Click the **Output** button and select the output BNC that you want to assign a source to. 2. Click the **Source** button and select the source that you want to assign to the selected output BNC.
Proc Amp/Color Corrector Reset	**Switcher Installation** > **Proc Amp/Color Corrector** > **Proc Amp / Color Corrector Reset**	Reset the values for the selected proc amp or color corrector. 1.
Proc Amp Enable	**Switcher Installation** > **Proc Amp/Color Corrector** > **Proc Amp Enable**	Enable a Proc Amp for a video input or output. 1. 2. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 3. Click a **Value** button to select whether to enable the proc amp (**On**) or disable the proc amp (**Off**).
Proc Amp Gain	**Switcher Installation** > **Proc Amp/Color Corrector** > **Proc Amp Param**	Adjust the gain of a color component for the selected proc amp. 1. 2. Click the **Component** button and select the color component you want to adjust the gain for. 3. Click the **Parameter** button and select **Gain**. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. Enter the new gain value in the **Value** field.

Event	Location	Description
Proc Amp Gamma	**Switcher Installation** > **Proc Amp/Color Corrector** > **Proc Amp Param**	Adjust the Gamma for the selected proc amp. **1.** **2.** Click the **Component** button and select **YCrCb**. **3.** Click the **Parameter** button and select **Gamma**. **4.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **5.** Enter the new gamma value in the **Value** field.
Proc Amp Gamma Offset	**Switcher Installation** > **Proc Amp/Color Corrector** > **Proc Amp Param**	Adjust the Gamma for the selected proc amp. **1.** **2.** Click the **Component** button and select **YCrCb**. **3.** Click the **Parameter** button and select **Gamma Offset**. **4.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **5.** Enter the new gamma offset value in the **Value** field.
Proc Amp Hue Rotation	**Switcher Installation** > **Proc Amp/Color Corrector** > **Proc Amp Hue Rot**	Adjust the Hue for the selected proc amp. **1.** **2.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **3.** Enter a new hue rotation value in the **Value** field.
Proc Amp Offset	**Switcher Installation** > **Proc Amp/Color Corrector** > **Proc Amp Param**	Adjust the offset of a color component for the selected proc amp. **1.** **2.** Click the **Component** button and select the color component you want to adjust the offset for. **3.** Click the **Parameter** button and select **Offset**. **4.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **5.** Enter the new offset value in the **Value** field.
Proc Amp Reset	**Switcher Installation** > **Proc Amp/Color Corrector** > **Proc Amp Reset**	Reset the values for the selected proc amp. **1.**
Source Substitution, Bus	**Switcher Installation** > **Source Substitution** > **Source Bus Subst**	Set a bus source substitution for the substitution table. **1.** Click the **Source** button and select the source that you want to set a substitution for. **2.** Click the **ME** button and select the area that the bus you want to set up the substitution for is on. **3.** Click the **Bus/Keyer** button and select the bus (**Background** or **Preset**) or keyer for the substitution. **4.** If you selected **Keyer**, click the **Bus** button and select the video (**Video**) or alpha (**Alpha**) bus that you want to substitute for **5.** Click the **Subst** button and select the source you want to substitute for the selected source.
Source Substitution, Delete	**Switcher Installation** > **Source Substitution** > **Delete Subst Table**	Delete the entire substitution table.

Event	Location	Description
Source Substitution, ME	**Switcher Installation** > **Source Substitution** > **Source ME Subst**	Set an ME source substitution for the substitution table. 1. Click the **Source** button and select the source that you want to set a substitution for. 2. Click the **ME** button and select the ME or MiniME™ that you want to assign a substitution source to. 3. Click the **Subst** button and select the source you want to substitute for the selected source.
Switching Field	**Switcher Installation** > **Field Dominance**	Select the field that a video transition will be performed on. 1. Click a **Switch Field** button to select whether video transitions are performed on field 1 only (**Field 1**), field 2 only (**Field 2**), or the current field (**Both**).
TSL Address	**Switcher Installation** > **Input** > **TSL Address**	Assign a TSL id to an input. 1. Click the **Input** button and select the input BNC that you want to set the TSL id for. 2. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 3. Enter the TSL id in the **Value** field.
TSL Tally MultiViewer Display Mode (Name)	**Switcher Installation** > **Input** > **TSL Tally Mode**	Assign a TSL id to an input. 1. Click the **Input** button and select the input BNC that you want to set the TSL mode for. 2. Click a **TSL Tally** button to select whether the MultiViewer shows the Mnemonic name (**Name Only**), TSL name (**Tally Only**), or both (**Both**).
Video Mode	**Switcher Installation** > **Reference** > **Video Format**	Select the video format that the switcher will operate in. 1. Click the **Video Mode** button and select the video format for the switcher.

MultiViewer

Event	Location	Description
MultiViewer Box — Apply to All	**MultiViewer** > **Box** > **MV Box Apply To All**	Apply the configurations for the selected box to all boxed on the selected MultiViewer. 1. Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. 2. Click the **Box** button and select the box that you want perform the event on. 3. Click **Apply to All**.
MultiViewer Box — Aspect Ratio Markers	**MultiViewer** > **Box** > **MV Box Aspect Ratio**	Select whether aspect ratio markers are shown for the selected box on the selected MultiViewer. 1. Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. 2. Click the **Box** button and select the box that you want perform the event on. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Click a **Value** button and select whether aspect ratio markers are shown (**On**) or not (**Off**).

Event	Location	Description
MultiViewer Box — Border	**MultiViewer** > **Box** > **MV Box Border Mode**	Select the type of border you want to apply to the selected box on the selected MultiViewer. 1. Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. 2. Click the **Box** button and select the box that you want perform the event on. 3. Click a **Border Mode** button and select whether the border around the selected box is white (**White**), black (**Black**), or if there is no border (**Off**).
MultiViewer Box — Green Tally (Preview)	**MultiViewer** > **Box** > **MV Box Preview Tally**	Select whether a green (preview) tally is shown for the selected box on the selected MultiViewer. 1. Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. 2. Click the **Box** button and select the box that you want perform the event on. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Click a **Value** button and select whether a green tally is shown on the selected box (**On**) or not (**Off**).
MultiViewer Box — Label	**MultiViewer** > **Box** > **MV Box Label**	Select whether the source label is on or off for the selected box on the selected MultiViewer. 1. Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. 2. Click the **Box** button and select the box that you want perform the event on. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Click a **Value** button and select whether the label on the selected box is on (**On**) or not (**Off**).
MultiViewer Box — Label Mode	**MultiViewer** > **Box** > **MV Box Label Mode**	Select what source name is shown on the label for the selected box on the selected MultiViewer. This event only applies to the Carbonite eXtreme. 1. Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. 2. Click the **Box** button and select the box that you want perform the event on. 3.
MultiViewer Box — Label Position	**MultiViewer** > **Box** > **MV Box Label Position**	Select the position of the source label for the selected box on the selected MultiViewer. 1. Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. 2. Click the **Box** button and select the box that you want perform the event on. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Click a **Value** button and select whether the label on the selected box is at the top (**Top**) or bottom (**Bottom**).

Event	Location	Description
MultiViewer Box — Label Transparency	**MultiViewer** > **MV Label Transp**	Select transparency for the background behind the source labels on the selected MultiViewer. 1. Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. 2. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 3. Enter the amount of transparency in the **Value (%)** field.
MultiViewer Box — Red Tally (On-Air)	**MultiViewer** > **Box** > **MV Box On-Air Tally**	Select whether a red (on-air) tally is shown for the selected box on the selected MultiViewer. 1. Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. 2. Click the **Box** button and select the box that you want perform the event on. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Click a **Value** button and select whether a red tally is shown on the selected box (**On**) or not (**Off**).
MultiViewer Box — Video Source	**MultiViewer** > **Box** > **MV Box Source**	Assign a source to one of the boxes on the selected MultiViewer. 1. Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. 2. Click the **Box** button and select the box that you want perform the event on. 3. Click the **Value** button and select the source that you want to assign to the box.
MultiViewer — Clip	**MultiViewer** > **MV Keyer Clip**	Select the amount of clipping to be applied to the overlay source on the selected MultiViewer. 1. Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. 2. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 3. Enter the amount of clipping to be applied in the **Value** field.
MultiViewer Clock — Background Color (HSL)	**MultiViewer** > **Clock** > **MV Clock (HSL Color)**	Select the custom color for the background of the clock on the selected MultiViewer. 1. Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. 2. Click the **Clock Area** button and select **Background**. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Click the **Component** button and select the HSL component you want to assign a value to. A value should be applied to all three components. 5. Enter a value for the selected component in the **Value (%)** field.
MultiViewer Clock — Background Color (Preset)	**MultiViewer** > **Clock** > **MV Clock (Preset Color)**	Select a preset color for the background of the clock on the selected MultiViewer. 1. Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. 2. Click **Background**. 3. Click the **Color** button and select the color you want to use.

Event	Location	Description
MultiViewer Clock — Countdown Timer Direction	**MultiViewer** > **Clock** > **Countdown Timer Direction**	Select the direction you want to countdown timer to count in. **1.** Click the **Timer** button and select the timer you want to configure. **2.** Click a **Timer Direction** button to select whether the timer counts down from a preset value (**Down**), up from zero (**Up**), or down from a preset value and then up from zero (**Down > Up**).
MultiViewer Clock — Countdown Timer Reset	**MultiViewer** > **Clock** > **Countdown Timer Reset**	Reset the selected timer. **1.** Click the **Timer Reset** button and select the timer you want to reset.
MultiViewer Clock — Countdown Timer State	**MultiViewer** > **Clock** > **Countdown Timer State**	Select the direction you want to countdown timer to count in. **1.** Click the **Timer** button and select the timer you want to configure. **2.** Click a **Timer State** button to select whether to send the pause (**Pause**), or start (**Run**) command to the timer.
MultiViewer Clock — Foreground Color (HSL)	**MultiViewer** > **Clock** > **MV Clock (HSL Color)**	Select the custom color for the lettering of the clock on the selected MultiViewer. **1.** Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. **2.** Click the **Clock Area** button and select **Foreground**. **3.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **4.** Click the **Component** button and select the HSL component you want to assign a value to. A value should be applied to all three components. **5.** Enter a value for the selected component in the **Value (%)** field.
MultiViewer Clock — Foreground Color (Preset)	**MultiViewer** > **Clock** > **MV Clock (Preset Color)**	Select a preset color for the lettering of the clock on the selected MultiViewer. **1.** Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. **2.** Click **Foreground**. **3.** Click the **Color** button and select the color you want to use.
MultiViewer Clock — Format	**MultiViewer** > **Clock** > **MV Clock Format**	Select the hour format for the clock on the selected MultiViewer. **1.** Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. **2.** Click a **Value** button and select whether the clock shows 24-hour (**24-Hours**), 12-hour with am/pm (**12-Hour AM/PM**), or simple 12-hour (**12-Hour**) clock.
MultiViewer Clock — Mode	**MultiViewer** > **Clock** > **MV Clock Mode**	Select whether the clock shows timecode or system time on the selected MultiViewer. **1.** Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. **2.** Click a **Clock Mode** button and select whether the clock shows timecode (**Timecode**), system time (**System**), a countdown timer (**CountDown**), or is off (**Off**).
MultiViewer Clock — MV Timer	**MultiViewer** > **Clock** > **MV Timer**	Select which countdown timer you want a MultiViewer to use. **1.** Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. **2.** Click the **Timer** button and select the timer (1-5) that you want to assign to the selected MultiViewer.

Event	Location	Description
MultiViewer Clock — Size	**MultiViewer** > **Clock** > **MV Clock Param**	Select the size of the clock on the selected MultiViewer. **1.** Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. **2.** Click **Clock Size**. **3.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **4.** Enter the size of the clock in the **Value (%)** field.
MultiViewer Clock — Timecode Frame Count	**MultiViewer** > **Clock** > **MV Clock Frame Count**	Select whether number of frames for a timecode are shown on the selected MultiViewer. **1.** Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. **2.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **3.** Click a **Value** button and select whether the frame count is shown (**On**) or not (**Off**).
MultiViewer Clock — Timer Set Time (Minutes)	**MultiViewer** > **Clock** > **Timer Set Times**	Set the starting time in minutes for the timer. **1.** Click the **Timer** button and select the timer you want to configure. **2.** Click **Set Time (Minutes)**. **3.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **4.** In the **Value** field, enter the number of minutes that you want to start the timer at.
MultiViewer Clock — Timer Set Time (Seconds)	**MultiViewer** > **Clock** > **Timer Set Times**	Set the starting time in seconds for the timer. **1.** Click the **Timer** button and select the timer you want to configure. **2.** Click **Set Time (Seconds)**. **3.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **4.** In the **Value** field, enter the number of seconds (0-59) that you want to start the timer at. If you want a value that is larger than 59 seconds you must insert a command for minutes and then a command for seconds.
MultiViewer Clock — X-Position	**MultiViewer** > **Clock** > **MV Clock Param**	Select the horizontal position of the clock on the selected MultiViewer. **1.** Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. **2.** Click **Clock X-Pos**. **3.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **4.** Enter the horizontal position of the clock in the **Value (%)** field.
MultiViewer Clock — Y-Position	**MultiViewer** > **Clock** > **MV Clock Param**	Select the vertical position of the clock on the selected MultiViewer. **1.** Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. **2.** Click **Clock Y-Pos**. **3.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **4.** Enter the vertical position of the clock in the **Value (%)** field.

Event	Location	Description
MultiViewer — Follow	**MultiViewer** > **MV Follow**	Select whether a MultiViewer follows the layout of a Canvas. **1.** Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. **2.** Click a **Follow** button to select which Canvas the MultiViewer will follow or select **Off** to have the MultiViewer operate normally.
MultiViewer — FSFC Label	**MultiViewer** > **MV FSFC Label**	Select whether FSFC is shown on the label on the selected MultiViewer when a source has an FSFC applies to it. **1.** Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. **2.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **3.** Click a **Value** button to select whether FSFC is shown on the label (**On**) or not (**Off**).
MultiViewer — Layout	**MultiViewer** > **MV Layout**	Select a layout for the selected MultiViewer. **1.** Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. **2.** Click the **Layout** button and select the layout you want to use.
MultiViewer — Overlay	**MultiViewer** > **MV Overlay**	Select whether the MultiViewer overlay is turned on or not. **1.** Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. **2.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **3.** Click a **Value** button to select whether the overlay is turned on (**On**) or not (**Off**).
MultiViewer — Shift	**MultiViewer** > **MV Shift**	Select whether the sources on the selected MultiViewer are shifted, or not. **1.** Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. **2.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **3.** Click a **Value** button to select whether the MultiViewer shows the shifted sources (**On**) or not (**Off**).
MultiViewer — Shift Panel	**MultiViewer** > **MV Shift Panel**	Select which control panel the MultiViewer shift is following. When **Shift** is press on the selected panel, the selected MultiViewer shifts. **1.** Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. **2.** Click **Panel** and click the control panel you want to shift to follow or click **Off** to have shift not follow any panel.
MultiViewer — Tally Display	**MultiViewer** > **MV Tally Display**	Select how the tallies are shown on the selected MultiViewer. **1.** Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. **2.** Click a **Tally Display** button to select whether tallies are shown as a border around the box (**Box**), as boxes on either side of the label (**Label**), or as boxes on either side of the label but swapped (**Label Reverse**).

Event	Location	Description
MultiViewer — ViewControl Shift	**MultiViewer** > **View Control Shift**	Select whether the ViewControl sources are shifted, or not. **1.** Click a **MultiViewer** button to select which MultiViewer you want to perform the event on. **2.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **3.** Click a **Value** button to select whether ViewControl shows the shifted sources (**On**) or not (**Off**).

Device Custom Controls

Audio Mixer (Device)

Event	Location	Description
Audio Mixer Pan	**Devices** > **Audio Mixer**	Set the pan level for the selected channel on the selected device. **1.** Click **Audio Pan**. **2.** Click the **Audio Mixer** button and select the device you want to send the command to. **3.** Click the **Channel** button and select the channel you want to send the command to. **4.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **5.** Enter the new pan level in the **Pan Left/Right (%)** field.
Audio Mixer Volume	**Devices** > **Audio Mixer**	Set the level for the selected channel on the selected device. **1.** Click **Audio Volume**. **2.** Click the **Audio Mixer** button and select the device you want to send the command to. **3.** Click the **Channel** button and select the channel you want to send the command to. **4.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **5.** Enter the new audio level in the **Volume (%)** field.

Camera

Event	Location	Description
Robotic Camera — Halt All	**Devices** > **Camera**	Send the halt command to the selected camera. **1.** Click **Camera Halt All**. **2.** Click the **Camera** button and select the device you want to send the command to.
Robotic Camera — Recall Shot	**Devices** > **Camera**	Recall a shot on the selected camera at the rate/speed set in the shot. **1.** Click **Recall Shot**. **2.** Click the **Camera** button and select the device you want to send the command to. **3.** Click the **Channel** button and select the channel you want to send the command to. **4.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **5.** Enter the shot number you want to recall from in the **Shot** field.

Event	Location	Description
Robotic Camera — Recall Shot Fast	**Devices** > **Camera**	Recall a shot on the selected camera as quickly as possible. 1. Click **Recall Shot (Fast)**. 2. Click the **Camera** button and select the device you want to send the command to. 3. Click the **Channel** button and select the channel you want to send the command to. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. Enter the shot number you want to recall from in the **Shot** field.
Robotic Camera — Store Shot	**Devices** > **Camera**	Store a shot on the selected camera. 1. Click **Store Shot**. 2. Click the **Camera** button and select the device you want to send the command to. 3. Click the **Channel** button and select the channel you want to send the command to. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. Enter the shot number you want to store to in the **Shot** field.

GPI

Event	Location	Description
GPI Output — Edge Trigger Setup	**Devices** > **GPO**	Set up the type of edge trigger for the GPI output. 1. Click **GPO Edge Duration** 2. Click the **GPO** button and select the GPI output that you want to configure. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Enter the duration of the edge trigger in the **Duration (fr)** field.
GPI Output — Level Trigger Setup	**Devices** > **GPO**	Set up the type of level trigger for the GPI output. 1. Click **GPO Level Config** 2. Click the **GPO** button and select the GPI output that you want to configure. 3. Click a **Level** to select whether the level trigger uses a high (**High**) or low (**Low**) level trigger.
GPI Output — Mode	**Devices** > **GPO**	Select whether the level trigger GPI output act as a tally. 1. Click **GPO Mode** 2. Click the **GPO** button and select the GPI output that you want to configure. 3. Click a **Mode** button to select whether the level trigger GPI output, when assigned to video source, acts as a roll clip (**Normal**) or as a tally (**Tally**) for the selected source.
GPI Output — Trigger	**Devices** > **GPO**	Trigger a GPI output. 1. Click **GPO Trigger** 2. Click the **GPO** button and select the GPI output that you want to trigger.

Event	Location	Description
GPI Output — Trigger Type	**Devices** > **GPO**	Select the type of trigger for the GPI output. 1. Click **GPO Trigger Configuration** 2. Click the **GPO** button and select the GPI output that you want to configure. 3. Click a **Trigger** to select whether the GPI output uses a level (**Level**) or edge (**Edge**) trigger.

PBus II

Event	Location	Description
PBus — Recall	**Devices** > **PBus**	Recall a register on the selected PBus device. 1. Click **PBus Recall Register**. 2. Click the **PBus** button and select the device you want to send the command to. 3. Click the **Device** button and select the channel you want to send the command to. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. Enter number of the register you want to recall in the **Register** field.
PBus — Trigger	**Devices** > **PBus**	Trigger a function on the selected PBus device. 1. Click **PBus Trigger Function**. 2. Click the **PBus** button and select the device you want to send the command to. 3. Click the **Device** button and select the channel you want to send the command to. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. Enter the number of the function you want to trigger in the **Function** field.

RossTalk

Table 16: RossTalk (XPression)

Event	Location	Description
RossTalk CC	**Devices** > **RossTalk (XPression)** > **CC**	Send the simulated custom control to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the bank of the custom control in the **Bank** field. 3. Enter the number of the custom control in the **Custom** field.
RossTalk Clear All	**Devices** > **RossTalk (XPression)** > **Clear All**	Send the Clear All command to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to.
RossTalk Clear Channel	**Devices** > **RossTalk (XPression)** > **Clear Channel**	Send the Clear Framebuffer command to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the framebuffer that you want to perform the action on in the **Channel** field.

Event	Location	Description
RossTalk Clear Layer	**Devices** > **RossTalk (XPression)** > **Clear Layer**	Send the Clear Framebuffer command for a framebuffer and layer to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the framebuffer that you want to perform the action on in the **Channel** field. 3. Enter the layer that you want to perform the action on in the **Layer** field.
RossTalk — Cue Channel	**Devices** > **RossTalk (XPression)** > **Cue (2)**	Send the Cue command for a specific item and framebuffer to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the take item id of the item you want to perform the action on in the **Take ID** field. 3. Enter the framebuffer that you want to perform the action on in the **Channel** field.
RossTalk — Cue Current	**Devices** > **RossTalk (XPression)** > **Cue**	Send the Cue command to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to.
RossTalk — Cue Item	**Devices** > **RossTalk (XPression)** > **Cue (1)**	Send the Cue command for a specific item to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the take item id of the item you want to perform the action on in the **Take ID** field.
RossTalk — Cue Layer	**Devices** > **RossTalk (XPression)** > **Cue (3)**	Send the Cue command for a specific item and location to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the take item id of the item you want to perform the action on in the **Take ID** field. 3. Enter the framebuffer that you want to perform the action on in the **Channel** field. 4. Enter the layer that you want to perform the action on in the **Layer** field.
RossTalk Custom Command	**Devices** > **RossTalk (XPression)** > **RossTalk Custom Cmd(CRLF)**	Send a manual RossTalk string to XPression. Each string has CRLF (carriage return line feed) appended to the end. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the RossTalk string in the **Custom Cmd** field.
RossTalk — Focus	**Devices** > **RossTalk (XPression)** > **Focus**	Send the Focus command for a specific item to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the take item id of the item you want to perform the action on in the **Take ID** field.
RossTalk — GPI	**Devices** > **RossTalk (XPression)** > **GPI**	Send the simulated GPI input to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the GPI you want to simulate triggering in the **GPI** field.
RossTalk — Layer Off	**Devices** > **RossTalk (XPression)** > **layer Off**	Send the Layer Off command for a specific framebuffer and layer to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the framebuffer that you want to perform the action on in the **Channel** field. 3. Enter the layer that you want to perform the action on in the **Layer** field.

Event	Location	Description
RossTalk — Next	**Devices** > **RossTalk (XPression)** > **Next**	Send the Next command to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to.
RossTalk — Read Current	**Devices** > **RossTalk (XPression)** > **Read**	Send the Read command to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to.
RossTalk — Read Item	**Devices** > **RossTalk (XPression)** > **Read (1)**	Send the Read command for a specific item to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the take item id of the item you want to perform the action on in the **Take ID** field.
RossTalk — Read Layer	**Devices** > **RossTalk (XPression)** > **Read (2)**	Send the Read command for a specific item and layer to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the take item id of the item you want to perform the action on in the **Take ID** field. 3. Enter the layer that you want to perform the action on in the **Layer** field.
RossTalk — Resume Channel	**Devices** > **RossTalk (XPression)** > **Resume Channel**	Send the Resume command for a framebuffer to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the framebuffer that you want to perform the action on in the **Channel** field.
RossTalk — Resume Layer	**Devices** > **RossTalk (XPression)** > **Resume Layer**	Send the Resume command for a framebuffer and layer to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the framebuffer that you want to perform the action on in the **Channel** field. 3. Enter the layer that you want to perform the action on in the **Layer** field.
RossTalk — Sequencer Down	**Devices** > **RossTalk (XPression)** > **Sequencer Down**	Send the Sequencer Down command to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to.
RossTalk — Sequencer Up	**Devices** > **RossTalk (XPression)** > **Sequencer Up**	Send the Sequencer Up command to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to.
RossTalk — Swap Channel	**Devices** > **RossTalk (XPression)** > **Swap (1)**	Send the Swap command for a specific framebuffer to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the framebuffer that you want to perform the action on in the **Channel** field.
RossTalk — Swap Current	**Devices** > **RossTalk (XPression)** > **Swap**	Send the Swap command to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to.
RossTalk — Swap Layer	**Devices** > **RossTalk (XPression)** > **Swap (2)**	Send the Swap command for a specific framebuffer and layer to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the framebuffer that you want to perform the action on in the **Channel** field. 3. Enter the layer that you want to perform the action on in the **Layer** field.

Event	Location	Description
RossTalk — Take Channel	**Devices** > **RossTalk (XPression)** > **Take (2)**	Send the Take command for a specific item and framebuffer to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the take item id of the item you want to perform the action on in the **Take ID** field. 3. Enter the framebuffer that you want to perform the action on in the **Channel** field.
RossTalk — Take Item	**Devices** > **RossTalk (XPression)** > **Take (1)**	Send the Take command for a specific item to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the take item id of the item you want to perform the action on in the **Take ID** field.
RossTalk — Take Layer	**Devices** > **RossTalk (XPression)** > **Take (3)**	Send the Take command for a specific item and location to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the take item id of the item you want to perform the action on in the **Take ID** field. 3. Enter the framebuffer that you want to perform the action on in the **Channel** field. 4. Enter the layer that you want to perform the action on in the **Layer** field.
RossTalk — Take Offline	**Devices** > **RossTalk (XPression)** > **Take Offline**	Send the Take Offline command for a specific item to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the take item id of the item you want to perform the action on in the **Take ID** field.
RossTalk — Up Next	**Devices** > **RossTalk (XPression)** > **Up Next**	Send the Next command for a specific item to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the take item id of the item you want to perform the action on in the **Take ID** field.

Table 17: RossTalk (Generic)

Event	Location	Description
RossTalk CC	**Devices** > **RossTalk (Generic)** > **CC**	Send the simulated custom control to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the bank of the custom control in the **Bank** field. 3. Enter the number of the custom control in the **Custom** field.
RossTalk Custom Command (CRLF)	**Devices** > **RossTalk (Generic)** > **RossTalk Custom Cmd(CRLF)**	Send a manual RossTalk string to the selected device. Each string has CRLF (carriage return line feed) appended to the end. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the RossTalk string in the **Custom Cmd** field.
RossTalk Custom Command (LF)	**Devices** > **RossTalk (Generic)** > **RossTalk Custom Cmd(LF)**	Send a manual RossTalk string to the selected device. Each string has LF (line feed) appended to the end. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the RossTalk string in the **Custom Cmd** field.

Event	Location	Description
RossTalk Custom Command (CR)	**Devices** > **RossTalk (Generic)** > **RossTalk Custom Cmd(CR)**	Send a manual RossTalk string to the selected device. Each string has CR (carriage return) appended to the end. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the RossTalk string in the **Custom Cmd** field.
RossTalk Custom Command (no CRLF)	**Devices** > **RossTalk (Generic)** > **RossTalk Custom Cmd(No CRLF)**	Send a manual RossTalk string to the selected device. CRLF (carriage return line feed) is not appended to the end of the string. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the RossTalk string in the **Custom Cmd** field.
RossTalk — GPI	**Devices** > **RossTalk (Generic)** > **GPI**	Send the simulated GPI input to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the GPI you want to simulate triggering in the **GPI** field.

Table 18: RossTalk (Ultrix™)

Event	Location	Description
RossTalk Custom Command	**Devices** > **RossTalk (Ultrix)** > **RossTalk Custom Cmd**	Send a manual RossTalk string to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the RossTalk string in the **Custom Cmd** field.
RossTalk — MV Clock End	**Devices** > **RossTalk (Ultrix)** > **MV Clock End**	Send the end selected clock command to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the number of the clock you want to perform the action on in the **MV Clock** field.
RossTalk — MV Clock Pause	**Devices** > **RossTalk (Ultrix)** > **MV Clock Pause**	Send the pause selected clock command to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the number of the clock you want to perform the action on in the **MV Clock** field.
RossTalk — MV Clock Run	**Devices** > **RossTalk (Ultrix)** > **MV Clock Run**	Send the run selected clock command to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the number of the clock you want to perform the action on in the **MV Clock** field.
RossTalk — MV Clock Stop	**Devices** > **RossTalk (Ultrix)** > **MV Clock Stop**	Send the stop selected clock command to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the number of the clock you want to perform the action on in the **MV Clock** field.
RossTalk — Salvo	**Devices** > **RossTalk (Ultrix)** > **Salvo**	Send the fire salvo command to the selected device. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Enter the salvo you want to fire in the **SALVO** field.

Table 19: RossTalk (Tria)

Event	Location	Description
RossTalk — Angle	**Devices** > **RossTalk (Tria)** > **GoTo/Jog/Angle**	Select the camera angle to use from the ISO clip loaded into the selected channel. 1. Click the **Action** button and click **Angle**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 3. Click the **Channel** button and click the button for the channel that you want to perform the action on. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. In the **Value** field enter the camera angle you want to use from the clip loaded into the selected channel.
RossTalk — Cue Clip	**Devices** > **RossTalk (Tria)** > **Play/Cue Clip**	Cue a specific clip on a selected channel. Clips are identified by file name. 1. Click **Cue**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 3. Click the **Channel** button and click the button for the channel that you want to perform the action on. 4. In the **Clip** field enter the path and name of the clip to be cued. Clip names must include the path relative to the default `H:\video\` directory.
RossTalk — Cue Clip Position	**Devices** > **RossTalk (Tria)** > **Play/Cue Clip From Position**	Cue a specific clip at a specific timecode on a selected channel. Clips are identified by file name. 1. Click the **Action** button and click **Cue**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 3. Click the **Channel** button and click the button for the channel that you want to perform the action on. 4. In the **Clip** field enter the path and name of the clip to be cued. Clip names must include the path relative to the default `H:\video\` directory. 5. In the **Hours**, **Minutes**, **Seconds**, and **Frames** fields, enter the timecode you want to cue the clip at.
RossTalk — Eject	**Devices** > **RossTalk (Tria)** > **Play/Stop/Eject**	Unload the clip currently loaded into the selected channel. 1. Click **Eject**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 3. Click the **Channel** button and click the button for the channel that you want to perform the action on.
RossTalk — Goto	**Devices** > **RossTalk (Tria)** > **GoTo/Jog/Angle**	Send the Goto Position command to jog to a specific position in the clip loaded into the selected channel. 1. Click the **Action** button and click **GoTo**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 3. Click the **Channel** button and click the button for the channel that you want to perform the action on. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. In the **Value** field, enter the timecode (hh:mm:ss:ff) you want to seek to in the clip loaded into the selected channel.

Event	Location	Description
RossTalk — Jog	**Devices** > **RossTalk (Tria)** > **GoTo/Jog/Angle**	Send the command to jog backward or forwards in the clip loaded into channel. 1. Click the **Action** button and click **Jog**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 3. Click the **Channel** button and click the button for the channel that you want to perform the action on. 4. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 5. In the **Value** field, enter the direction **+/-** and amount, in frames, you want to jog in the clip loaded into the selected channel.
RossTalk — Loop Mode	**Devices** > **RossTalk (Tria)** > **Loop Mode**	Set the looping mode for the selected channel transport. 1. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 2. Click the **Channel** button and click the button for the channel that you want to perform the action on. 3. Click the **Value** button as select the looping mode you want to set the selected channel to. The possible modes are **Off**, **Loop**, **Loop To**, **Ping Pong**, and **Ping Pong To**.
RossTalk — Play Clip	**Devices** > **RossTalk (Tria)** > **Play/Cue Clip**	Play a specific clip on a selected channel. Clips are identified by file name. 1. Click **Play**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 3. Click the **Channel** button and click the button for the channel that you want to perform the action on. 4. In the **Clip** field enter the path and name of the clip to be played. Clip names must include the path relative to the default `H:\video\` directory.
RossTalk — Play Clip Position	**Devices** > **RossTalk (Tria)** > **Play/Cue Clip From Position**	Play a specific clip at a specific timecode on a selected channel. Clips are identified by file name. 1. Click the **Action** button and click **Play**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 3. Click the **Channel** button and click the button for the channel that you want to perform the action on. 4. In the **Clip** field enter the path and name of the clip to be cued. Clip names must include the path relative to the default `H:\video\` directory. 5. In the **Hours**, **Minutes**, **Seconds**, and **Frames** fields, enter the timecode you want to play the clip at.
RossTalk — Stop	**Devices** > **RossTalk (Tria)** > **Play/Stop/Eject**	Send the Stop command for a specific channel to the selected device. 1. Click **Stop**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 3. Click the **Channel** button and click the button for the channel that you want to perform the action on.

Video Server

Event	Location	Description
Video Server — Cue	Video Server > **Cue**	Send the Cue command and name of clip to cue to the selected device. **1.** Click the **Video Server** button and select the device you want to send the command to. **2.** Click a **Channel** button to select the channel you want to send the command to. **3.** Enter the identifier of the clip in the **Cue** field. *Tip:* *If you load a clip into a channel on the video server that information is sent to the switcher to be added to the clip list. This allows clips from different folders on the server to be loaded.*
Video Server — Get Clips	Video Server > **Get Clips**	Query the selected device for a list of clips. **1.** Click the **Video Server** button and select the device you want to send the command to. **2.** Click a **Channel** button to select the channel you want to send the command to.
Video Server — Jog	Video Server > **Jog**	Send the jog command to the selected device. The Jog command is not supported by the internal Clip Player at this time. **1.** Click the **Video Server** button and select the device you want to send the command to. **2.** Click a **Channel** button to select the channel you want to send the command to. **3.** Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. **4.** Enter the amount you want to jog in the **Jog** field.
Video Server — Loop Off	Video Server > **Loop Off**	Send the Loop Off command to the selected device. **1.** Click the **Video Server** button and select the device you want to send the command to. **2.** Click a **Channel** button to select the channel you want to send the command to.
Video Server — Loop On	Video Server > **Loop On**	Send the Loop On command to the selected device. **1.** Click the **Video Server** button and select the device you want to send the command to. **2.** Click a **Channel** button to select the channel you want to send the command to.
Video Server — Play	Video Server > **Play**	Send the Play command to the selected device. **1.** Click the **Video Server** button and select the device you want to send the command to. **2.** Click a **Channel** button to select the channel you want to send the command to.
Video Server — Record	Video Server > **Record**	Send the eject command to the device, followed by the record command. The clip is given the name `recording_DATE_TIME`. **1.** Click the **Video Server** button and select the device you want to send the command to. **2.** Click a **Channel** button to select the channel you want to send the command to. **3.** Enter a name for the clip in the **Record** field.

Event	Location	Description
Video Server — Shuttle	Video Server > **Shuttle**	Send the shuttle command to the selected device. The Shuttle command is not supported by the internal Clip Player at this time. 1. Click the **Video Server** button and select the device you want to send the command to. 2. Click a **Channel** button to select the channel you want to send the command to. 3. Click the **Change Type** button and select whether you want to set (**Absolute**) or reset (**Reset**) the parameter. Some selections will not be available when you reset the parameter. 4. Enter the speed you want to shuttle in the **Shuttle** field.
Video Server — Stop	Video Server > **Stop**	Send the Stop command to the selected device. 1. Click the **Video Server** button and select the device you want to send the command to. 2. Click a **Channel** button to select the channel you want to send the command to.

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Our home page can be found at

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FreeType font driver for BDF fonts

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Version 3, 29 June 2007

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Glossary

Interlaced

An Interlaced video format starts at the top of the screen and draws all the odd number scan lines and then all the even number scan lines in sequence. This results in half the image being drawn in one pass and the other half of the image being drawn in the second. These two passes are called Fields, where the first pass is called Field 1 and the second pass is called Field 2. When both Field 1 and Field 2 have been drawn, resulting in a complete image, you have a single Frame.

Progressive

A Progressive scan video format draws each scan line in sequence, starting from the top of the screen and working to the bottom. Unlike Interlaced, with Progressive scan the entire image is drawn at one time, in a single pass. This means that there are no fields in a Progressive scan image.

Auto Key

A pairing of two video signals, a key video and a key alpha, to create a key. In the switcher, you associate the fill and alpha so that the switcher knows which alpha to use when the video is selected.

Auto Transition

An automatic transition in which the manual movement of the fader handle is simulated electronically. The transition starts when the **AUTO TRANS** button is pressed and takes place over a pre-selected time period, measured in frames.

Chroma Key

Chroma Key is a key in which the hole is cut based on a color value, or hue, rather than a luminance value or alpha signal. The color is removed and replaced with background video from another source.

Cut

An instantaneous switch from one video signal to another.

Dissolve

A transition from one video signal to another in which one signal is faded down, while the other is simultaneously faded up. The terms mix or cross-fade are often used interchangeably with dissolve.

Field

One half of a complete picture (or frame) interval containing all of the odd, or all of the even, lines in interlaced scanning. One scan of a TV screen is called a field; two fields are required to make a complete picture (which is a frame).

Force, Mask

An effect that forces the masked region to the foreground but is not bound by the key. For example, if you have a key and apply a mask to it. The masked area is bound by the edges of the key. When force is turned on, the masked area is filled with the video from the key (nothing appears masked) but you can move the mask outside of the key and the key video is still filling the masked region.

Frame

One complete picture consisting of two fields of interlaced scanning lines.

File Transfer Protocol

A network protocol that is used to transfer files from one host computer to another over a TCP-based network.

Gain

Gain represents the range of signal values present in a video signal from a lowest to a highest point (from black to white for example). Increasing gain expands this range, while decreasing gain compresses this range. Clipping occurs if applied gain changes cause output signal values to fall outside the allowable range. Generally, increasing the gain for a specific color component causes the video signal colors to become increasingly saturated with that color. Similarly, decreasing the gain for a specific color component progressively removes that color component from the output video signal.

Gamma

Gamma corrections introduce non-linear corrections to a video signal. A gamma

correction can be described as taking a point on the output versus input video signal line and pulling it perpendicularly away from the line. The result is a Bezier curve between the start, the new point, and the end point. Generally, increasing the gamma value adds more of the component to the video signal in the location of the gamma offset point. Decreasing the gamma value reduces the amount of the component in the video signal in the location of the gamma offset point. Moving the gamma offset point allows you to select which part of the input video signal receives the gamma correction. For example, if you increase the red gamma correction to the part of the video signal that has no red component you will add red to those areas while having little effect on areas that already contain a significant amount of red. This allows you to add a red tint to the image while minimizing the amount of red-clipping that occurs.

General Purpose Interface

A simple high/low signal that is used to trigger an action either on an external device or on the switcher. A GPI can be an input or an output to the switcher.

High Definition

A high definition (720p, 1080i, or 1080p/3G) video signal.

Hue

The characteristic of a color signal that determines whether the color is red, yellow, green, blue, purple, etc. (the three characteristics of a TV color signal are chrominance, luminance, and hue). White, black, and gray are not considered hues.

Hue Rotation

Hue rotate affects the color of the entire video signal by rotating the input video hues. This produces an output video signal with colors that are shifted from their original hues. By rotating colors around the wheel, hue values will shift. For example, a clockwise rotation where yellows become orange, reds become magenta, blues become green. The more rotation applied, the further around the wheel colors are shifted.

Key

An effect produced by cutting a hole in the background video, then filling the hole with video or matte from another source. Key source video cuts the hole, key fill video fills the hole. The video signal used for cut and fill can come from the same, or separate, sources.

Key Alpha

The video signal which cuts a hole in the background video to make a key effect possible. Also called Key Video or Source. In practice, this signal controls when a video mixer circuit will switch from background to key fill video.

Key Invert

An effect that reverses the polarity of the key source so that the holes in the background are cut by dark areas of the key source instead of bright areas.

Key Mask

A keying technique in which a shape is combined with the key source to block out unwanted portions of the key source.

Key Video

A video input which is timed to fill the hole provided by the key source video. An example of key video is the video output of a character generator.

Linear Key

Linear keys make it possible to fully specify the transparency of a key from opaque, through transparent, to fully off. The transparency is specified by the key alpha that is associated with the key video. A keyer capable of a linear key converts the key signal voltage directly to the transparency effect on the screen.

Mnemonics

A green, orange, or yellow display used to show the names of a source above or below the source button or used as a custom command or pattern button.

Offsets

Offsets shift the video signal by a set amount. Depending on the offset applied, different parts or all of the video signal may be affected. Clipping occurs if applied offsets cause output signal values to fall outside the allowable range.

Pre-Delay

A pre-delay is a delay that is inserted into a transition between the triggering of a GPI output and performing the transition. The length of the pre-delay is usually the length of time your video server requires to start playing a clip or your character generator required to load a page.

RossTalk

An ethernet based protocol that allows the control over Ross devices using plain english commands.

Standard-Definition

A standard definition (480i or 576i) video signal.

Self Key

A key effect in which the same video signal serves as both the key signal and key fill.

Shaped Key

An additive key where the Key Alpha cuts a hole based on the monochrome value of the alpha. Shades of gray are translated into either white or black, giving the key a hard edge. Shaped Key alphas are sometimes used with Character Generators to cut very precise holes for the fill.

Split Key

A Split key allows you to assign a different alpha source for a key than the fill/alpha associations that are set up during configuration or to use a separate alpha source for a Self key.

Tally

An indicator which illuminates when the associated button, or control, is selected or is on-air.

Unshaped Key

A multiplicative key where the Key Alpha cuts a hole based on the gradient values of the alpha. Shades of gray are translated into transparency levels, giving the key a soft edge. Unshaped Key alphas can also be considered true linear alphas.

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