MOSAIC

Carbonite Black Mosaic
User Manual

v1.1

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

dross@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: **4807DR-110-01.1A**
- Release Date: January, 2020. Printed in Canada

Copyright

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.

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

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 an " Ethernet Port " which allows this product to be connected to a local area network (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.*

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.

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 22:1997** along with amendments **A1:2000** and **A2:2002**, 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/*)

Contents

DashBoard

The DashBoard control system allows remote access to multiple pieces of Ross Video equipment, including openGear® cards, Carbonite production switchers, BlackStorm video servers, and ACID UltraChromeHR cameras.

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.

Connecting to the Switcher from DashBoard

DashBoard should automatically detect and connect to the frame once it is connected to the same subnet. If you have trouble discovering the switcher frame, or it is located on another subnet, you can manually connect DashBoard to the switcher to establish communications. Once connected, DashBoard will remember the connection until you remove it.

To Connect to the Frame

You need the IP address of the frame to connect to it manually from DashBoard.

1. Click **File** > **New** > **Manual Connection**.
2. In the **IP Address** field, enter the IP address of the switcher frame. The default IP address is 192.168.0.123.
3. Click **Detect Settings**.
4. Click **Finish**.
   The frame appears in the **Tree View**.

Carbonite in DashBoard

In DashBoard, Carbonite has a number of nodes that represent the different areas of functionality of the switcher.

Double-click on any of these nodes to open a window for controlling that specific area of functionality.

- **Status** — provides a read only overview of the state of a number of important switcher components and equipment
- **Configuration** — provides a graphical interface to switcher settings such as Reference, Inputs, Outputs, and MultiViewer
- **Live Assist** — provides a graphical interface to functions such as keying, transition, and memory settings of the switcher

- **Custom Control** — provides a graphics interface for recording, editing, and running custom controls
- **MediaManager** — allows you to connect to the MediaManager web interface from within DashBoard

Tip: Click **Navigation Menu** at the bottom right of the window and select to node you want to view without having to go to the tree view.

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.

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.

Configuration

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

Live Assist

The Live Assist node provides a graphical interface to 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.

PaneLINK

Live Assist can be set to either mirror actions on the switcher control panel, or only show actions on the currently selected ME and Keyer on the current tab. For example, with **PaneLINK** turned on, pressing **KEY 1 SEL**, **WIPE**, and then **SELF KEY** causes Live Assist to show the **Keyers** tab, the **Trans** tab, and then the **Keyers** tab again. With **PaneLINK** turned off, Live Assist does not switch between tabs.

The **PaneLINK** button is located at the bottom right corner of the Live Assist window.

Custom Controls

The Custom Control node provides a graphics interface for recording, editing, and running custom controls.

MediaManager

The MediaManager node allows you to connect to the MediaManager web interface from within DashBoard.

Tip: You can either launch the MediaManager directly using the switcher IP address, or you can access it using the MediaManager node in DashBoard. If you are logging into MediaManager from DashBoard, you must have Microsoft® Internet Explorer® 10, or higher, installed.

Help

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

Panel

The Panel node 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.

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 switcher. 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***, or **MultSc *X*** 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 contains the main DashBoard interface to the switcher. Click **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.

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.

To Perform a Transition

All transitions, with the exception of cuts on the background or key bus, have the same basic setup. To perform a transition, you must select what sources you want to transition on what buses, and how you want the transition to appear.

1. Click **Navigation Menu** > **Live Assist** > **Buses** and select the MiniME™ or Canvas that you want to perform a transition on.

    > *Tip:* You can also select sources from the **Canvas** tab (Click **Navigation Menu** > **Live Assist** > **Canvas**) by clicking **Trans** > **Background** or **Preset** and selecting a source, or **Key X** > **Key Fill** and selecting the source.

2. Select the bus and the source that you want to take on-air on that bus.

    For a background transition you must select the source you want to transition to on the preset bus.

3. Click **Canvas**.

    > *Tip:* If you want to perform a transition on a MiniME™, click **MiniME** instead.

4. Click the **Canvas X** button for the Canvas that you want to perform the transition on.

5. Click **Trans**.

6. In the **Next Transition** area, select the elements (**Background** and **Key X**) you want to include in the next transition.

7. Click **Trans Rate** and enter the length of the background transition in the **Trans Rate** field, or the length of a key transition in the **Key X Rate** field.

8. Select the type of transition you want to perform.

9. Click **Trans Settings** and click a **Roll Clip** button to select whether you want any GPI outputs assigned to a source being taken on-air to trigger with the transition (**On**), or not (**Off**).

10. Perform the transition.

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

    If a pre-delay has been set, 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.
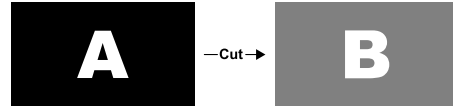
Figure 1: Example Cut Transition

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

Transition Limits

The Transition Limit allows you to set the point in a transition where an auto transition stops. 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:* If you turn 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 Set Up a Transition Limit

> *Note:* The transition limit is specific to the MiniME™ or Canvas it is set on.

1. Set up the transition you want to perform.

2. Click **Navigation Menu** > **Live Assist** > **Canvas**, select the Canvas that you want to perform the transition on, and click **Trans**.

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

3. Click **Trans Limit** and use the **Limit Position** slider to select the position in the transition where you want to set the transition limit point.

4. Click a **Trans Limit** button to select whether the transition stops at the transition limit (**On**), or not (**Off**).

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 are layered onto the background video signal from the lowest numbered key to the highest.
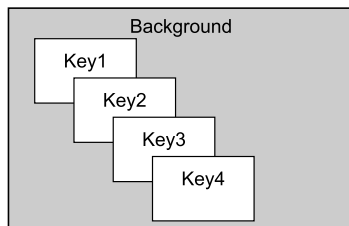
Figure 2: Key Priority

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.

*Tip: You can return the clip and gain values to the default settings by clicking **Make Linear**.*

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

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

2. Click **Self Key**.
3. Click **Key Fill** and select the video signal you want to use for the key.
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 **Make Linear** 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.

   *Note: The mode is reset to **Normal** when a different source is selected on the key bus, the alpha is changed, or a memory is recalled.*

9. 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.

*Tip: You can return the clip and gain values to the default settings by clicking **Make Linear**.*

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

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

2. Click **Auto Select**.
3. Click **Key Fill** and select the video signal you want to use for the key.

   *Tip: To use a different alpha than the one that is assigned to the fill source, click **Key Alpha** and select the new alpha source you want to use.*

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 **Make Linear** 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.

   *Note: The mode is reset to **Normal** when a different source is selected on the key bus or the alpha is changed.*

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

DVE Keys

The DVE key allows you to apply digital video effects, such as scale, crop, aspect ratio, position, and border to video image or another key type. When the DVE is applied to another key type, it is said to be flying (Fly Key).

*Tip: You can see where DVE channels are allocated from the **Status** page in DashBoard.*

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

• The Fly Key feature consumes a single DVE channel for a self key, but two DVE channels for an auto select key.

• When a Fly Key is used on one tile of a canvas, the same number of DVE channels are reserved on every other tile of that canvas. This ensures that the DVE channels are available to move the key around on the canvas.

• The Fly Key feature cannot be applied to a DVE key.

• The Key Invert feature is not available for a Fly Key.

To Set Up a DVE Key

The DVE key can be sized and positioned in 2-dimensional (2D) space to create an over the shoulder box (OTS) or other video effects.

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

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

2. Click **DVE Key**.

3. Click **Key Fill** and select the video signal you want to use for the key.

4. Use the **X-Position**, **Y-Position**, and **Size** sliders in the **Positioning** area to position and size the key.

5. Use the **Aspect** slider to adjust the aspect ration of the key.

6. Use the **Size** and **Softness** sliders in the **Border** area to apply a border to the key.

   Refer to the section *To Apply a Border to a DVE Key* on page 15 for information on borders.

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

8. Use the **Top** and **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 DVE to a Key (Fly Key)

Applying DVE effects to an existing key allows you to size and position an existing key in 2D space. Unlike the DVE key that uses the full raster image, you can fly an auto select key to create a bug or animated logo for branding.

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

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

2. Click **DVE** and click **On**.

3. Use the **X-Position**, **Y-Position**, and **Size** sliders in the **Positioning** area to position and size the key.

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

5. Use the **Size** and **Softness** sliders in the **Border** area to apply a border to the key.

   Refer to the section *To Apply a Border to a DVE Key* on page 15 for information on borders.

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

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

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

To Apply a Border to a DVE Key

A border can be placed around the outside of the DVE key to give a framing effect or soften the edges of the key.

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

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

2. Click **DVE Keys**.

3. Use the **Size** slider in the **Border** area to turn on the border and adjust the size of the border around the key.

4. Use the **Softness** slider to adjust the softness of the border.

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

> *Note: Only a DVE Key can have a custom border color.*

- **Default** — click one of the preset colors.
- **Custom** — click the arrow to the right of the **Border 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.

Masks

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

To Box Mask a Key

The box mask can be sized and shaped to mask out a rectangular area.

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

2. Click **Mask** > **Box**.

3. Click **Mask Force** to force the area inside the mask region to the foreground.

   Force mask is not available for all key types.

4. Click **Mask Invert** to invert the masked area with the unmasked area.

   The portion of the key that was masked out is now visible, and the portion that was visible is masked.

5. Use the **Size** slider to adjust the size of the mask region.

6. Use the **X-Position** and **Y-Position** sliders to position the mask.

7. Use the **Left Edge** and **Right Edge** sliders to adjust the position of the left and right sides of the box mask.

8. Use the **Top Edge** and **Bottom Edge** sliders to adjust the position of the upper and lower sides of the box mask.

9. Use the **Edge Softness** slider to apply softness the to edges of the mask area.

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.

3. Click the **Key Fill** or **Key Alpha** button and select the new source for the key.

- **Key Fill** — select a different source for the key. This will change the alpha selection as well.
- **Key Alpha** — select a different alpha for the key. Selecting the different alpha creates the split key.

Memory Functions

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

Storing Memories

When you store a memory, you are storing the complete state of that MiniME™ or Canvas. This includes keyer settings, transition rates, and source selections.

To Store a Memory

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

2. In the **Inclusions** area, select the MiniME™ and Canvas that you want to store the memory for.

3. In the **Memory Store** area, click the **Bank *X*** and **Mem *X*** button for the bank and memory register that you want to store to.

4. Set any memory attributes that you want to store with the memory. Refer to *Memory Attributes* on page 17 for information on setting memory attributes.

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

Recalling Memories

When you recall a memory, the existing configuration of that MiniME™ or Canvas is replaced with the settings stored in the memory.

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 new Media-Store image to be loaded from a USB drive may result in the currently loaded image to be displayed for a few frames while the new image is loaded.

•   Media-Store contents are not included in memories.

To Recall a Memory

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

2. In the **Inclusions** area, select the MiniME™ and Canvas that you want to perform the memory recall on.

3. In the **Memory Recall** area, click the **Bank *X*** button for the bank you want to recall a memory from.

4. Set any memory attributes that you want to override from the memory. Refer to *Memory Attributes* on page 17 for information on setting memory attributes.

5. Click the **Mem *XX*** button to recall the memory.

> **Tip:** Click **Undo** to undo the last memory recall.

Memory Recall Mode

The Memory Recall mode sets how a memory is recalled. This includes whether a memory is recalled on-air, or only on the program bus, or if effects such as Effects Dissolve or DVE Dissolve are used.

To Set Up the Recall Mode Memory Attribute

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

2. Click a **Recall Mode** button to select the memory recall mode you want to use.

    •   **Memory** — the memory recall mode (**Program** or **Effects Dissolve**) stored with the memory is used

    •   **Program** — all elements are recalled as stored (default)

    •   **Effects Dissolve** — on-air elements listed below are transitioned to the elements stored in the memory

        •   Matte colors (background or borders)
        •   Keyer settings like clip, gain, transparency
        •   Mask position and size
        •   DVE settings like size, position, aspect, border, softness, cropping
        •   Transition Progress

To Set the Effects Duration

Effects duration applies to Effects Dissolves, and sets the length of time that the switcher will use to transition from the on-air scene to the scene stored in the memory.

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

> **Tip:** If you want to store the effects dissolve rate in the memory, click **Store**.

2. Use the **Effects Duration** slider to set a duration in frames, or click **Effects Duration From Memory** (on) to use the duration stored in 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, and Aux bus, 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 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.

Tip: It is recommended that if you are new to working with memories, use the memory store attributes to set how you want a memory to be recalled and set the recall attributes to **Memory**.

To Set the Memory Attributes

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

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

2. In the **Inclusions** area, select the MiniME™ and Canvas that you want to include with the memory recall.

Only those MiniME™s or Canvas that are included with the memory recall are changed when a memory is recalled.

Tip: Click the attribute button multiple times to have that attribute included with the recall (■), not included with the recall (■), or use the setting stored in the memory (■).

3. Click **General** and select the attributes that you want recalled with the memory.

- **Roll Clip** — whether GPI outputs attached to sources are triggered when recalled.

4. Click **MiniME X-y** and select the attributes that you want recalled with the memory.

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

- **Trans Area** — how the next transition type and parameters are recalled.
- **Next Trans** — how the next transition area is recalled.
- **Run Auto** — whether a transition is performed after the memory is recalled.
- **PGM Bus** — how the sources selected on the program bus are recalled.
- **PST Bus** — how the sources selected on the preset bus are recalled.
- **Key*X* Bus** — select whether sources selected on the selected key bus are recalled.
- **Key*X* Active** — whether the selected key is recalled on-air (active) or not.
- **Key*X* Type** — whether the key type is recalled for the selected key.
- **Key*X* Mask** — whether mask settings for the selected key are recalled.

5. Click **Auxes** and select how the sources selected on the aux bus are 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.

To Delete a Memory

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

2. In the **Inclusions** area, select the MiniME™ and Canvas that you want to delete the memory from.

3. In the **Memory Store** area, click the **Bank *X*** and **Mem *X*** button for the memory register that you want to delete.

4. Click **Delete Memory**.

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 the MiniME™, and Canvas.
- **Custom Control** — contains all the custom control banks and macros.
- **Installation** — contains all software settings for the switcher.

To Store a Set

Switcher Sets can only be stored to a USB drive. The USB drive must be present before you try to store the Set. A total of 10 Sets of switcher setup information can be stored onto the same USB drive.

1. Insert a USB drive into the USB Port on the frame or control panel. You must wait 5 seconds for the switcher to recognise the USB drive.

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

3. Click the **Select Set** button for the set (**set0-9**) you want to store the switcher registers to.

4. Click the **Save** button to select the registers you want to store to the selected set.

   - **All** — store all registers to the set.
   - **Mems** — store only the memory registers to the set.
   - **Cust** — store only the custom control registers to the set.
   - **Inst** — store only the installation registers to the set.

5. Press **Ok**.

To Load a Set

Switcher Sets can only be loaded from a USB drive. The USB drive must be present before you try to load the settings.

1. Insert your USB drive into the USB Port on the frame or control panel. You must wait 5 seconds for the switcher to recognise the USB drive.

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

3. Click the **Available Set** button for the set you want to load the switcher registers from.

4. Click the **Load** button to select the registers you want to load from the selected set.

   - **All** — load all registers from the set.
   - **Mems** — load only the memory registers from the set.
   - **Cust** — load only the custom control registers from the set.
   - **Inst** — load only the installation registers from the set.

5. Press **Ok**.

Media-Store

Media-Store allows you to load stills or animations from the USB drive and make them available as a source. To activate a Media-Store channel, you must switch a video input to a still. A video input can be either a Media-Store or a video input.

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

- You must configure a video input as a Media-Store to be able to use that Media-Store channel.
- If you are loading a media file that includes an alpha, you must load it into an odd numbered Media-Store channel. The alpha will automatically be loaded into the next even numbered Media-Store channel.

Working With Media-Store Animations

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

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 (Cut Frame) for that animation, and not the first frame of the video.

Related tasks

To Set Media-Store File Attributes

Loading Media Files

Media files can be loaded into Media-Store channels either from USB or the internal cache using the media number, or by browsing to the file.

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

Media-Store File Specifications

Media-Store images and animations can be 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.

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

- ...
- Anim_100.tga

Together, these files are treated as a single animation named Anim that is 100 frames long.

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

Files names cannot contain symbols such as **! @ # & * ( ) / , ? ' "** and cannot start with an underscore (_).

The maximum number of frames that an animation can have depends on the size of the images and bit depth, as well as how many other media files are loaded into the same cache. Each group of 6 inputs (1-6, 7-12, etc.) share the same cache. If you load media files into any of the Media-Store channels in a group of 6, that will reduce the amount of cache available to the other Media-Store channels in the same group.

Table 1: Animation Frames per Media-Store Cache

Raster Size	Bit Depth	Max Frames
1920 x 1080	24 (no alpha)	68
1920 x 1080	32 (alpha)	46
1280 x 720	24 (no alpha)	156
1280 x 720	32 (alpha)	104

MediaManager

The MediaManager provides a graphical interface to the operation of the Media-Store. The layout of the MediaManager window is stored in Perspectives. The last loaded Perspective is used when the browser is refreshed or opened.

From the Menu Bar at the top of the window you can manage Perspectives.

> **Tip:** You can either launch the MediaManager directly using the switcher IP address, or you can access it using the MediaManager node in DashBoard. If you are logging into MediaManager from DashBoard, you must have Microsoft® Internet Explorer® 10, or higher, installed.

The MediaManager Window

The MediaManager window provides a graphical interface to the Media-Store. From this window, you can load stills or animations from the internal cache or USB into a Media-Store channel or edit the on-air properties. Media-Store channels have a red background when on-air and green when going on-air with the next transition.
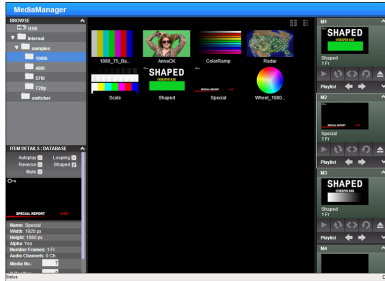
Figure 3: MediaManager Window

> **Tip:** The film-strip symbol (▦) on a thumbnail indicates that the media item is an animation, the key symbol (⚷) indicates that the still or animation has an alpha, and the speaker symbol (🔊)) indicates that the media item has audio associated with it.

Stills and animations can be loaded into a channel by either selecting the channel and double-clicking on the file, or by dragging a file and dropping it onto the channel. When a channel or file is selected, the properties for the animation or still can be viewed in the **ITEM DETAILS** area.

> **Note:** 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.

Animation Controls

The MediaManager interface allows you to manually control the play-out of an animation.
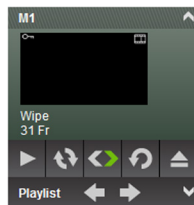
Figure 4: Media-Store Channel — Animation Controls

Table 2: Animation Controls

Icon	Name	Description
▶	Play	Play the animation loaded in the Media-Store channel.
↻	Looping	Turns **Looping** of the animation on or off.
◀▶	Reverse	Toggle the direction that the animation is played in.
↺	Recue	Jumps to the first frame of the animation.

Icon	Name	Description
⏏	Eject	Eject the current still or animation from the Media-Store channel.

Playlists

Playlists allow you to create a rundown of stills or animations that you want to load into a Media-Store channel. Using the left and right arrows, you can advance to the next or previous still or animation in the playlist.

> **Note:** Items on the playlist are not pre-cached. As you advance to the next item in the list, the switcher must load that still or animation. Depending on what you are loading, and if the item has been loaded before, this could take a few seconds.
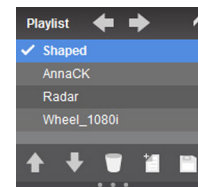
Figure 5: Playlist

Table 3: Playlist Controls

Icon	Name	Description
←	Previous	Advance to the previous item in the playlist. The item in the playlist that is being shown on the Media-Store channel indicated with a check-mark. The playlist does not loop back to the top when it reaches the last item.
→	Next	Advance to the next item in the playlist.
↑	Up and Down	Move the currently selected item up in the playlist.
↓	Up and Down	Move the currently selected item down in the playlist.
🗑	Delete	Delete the selected item from the playlist. This does not delete the item, or clear the Media-Store channel.
🗋	New Playlist	Clears the current playlist.
🖫	Load or Save Playlist	Allows you to load, save, or delete a playlist on the switcher. If you delete a playlist that was loaded into a Media-Store channel, it does not clear that channel.

Icon	Name	Description
⌄ ⌃	**Expand or Collapse**	Expand or Collapse the playlist area for the Media-Store channel.

Attributes

Attributes are applied to the media file directly, regardless of the channels that the media is loaded in. If you adjust the attributes of the media in one channel, these settings are applied to that media in all other channels that the same media item is loaded into.

The attributes for a particular media file depend on the type of media it is. Animations and Stills have different attributes.

Table 4: Attributes

Attribute	Description
Autoplay	Automatically play the animation when it is taken on-air.
Reverse	Play the animation in reverse (backwards), from end to start.
Looping	Automatically play the animation from beginning again when it reaches the end.
Shaped	Apply shaped to the alpha of the animation. Unshaped is applied when this item is not selected.
Name	The name of the media file.
Width	The width of the still or animation (in pixels)
Height	The height of the still or animation (in pixels)
Alpha	Shows if there is an alpha included with the media item.
Number Frames	The number of frames in the media item.
Media No.	Set the media number of this particular media file.
X Position	Set the horizontal position of the still or animation.
Y Position	Set the vertical position of the still or animation.
Cut Frame	Set the point, in frames, from the start of the animation that the background transition occurs in a MediaWipe.
Thumb Frame	Set the frame that is used for the thumbnail graphic of the animation.
Play Speed	Set the speed that the animation plays at (0.1-10).
GPO	Set the GPI output that you want to trigger by a MediaWipe that uses this animation.
GPO Time	Set the time, in frames, from the start of the MediaWipe that the GPI output is triggered.

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.

Refer to *Custom Control Events* on page 47 for information on available events.

Recording Custom Controls

When you create a custom control, you record a series of functions that are played back when you run the custom control.

> **Tip:** *Remember that 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.*

To Record a Custom Control

A basic custom control can perform a series of functions like selecting a source on a key bus and taking that key on-air.

1. Click **Navigation Menu** > **Custom Control** > **Editor**.
2. Click **Bank *X*** to select the bank that the custom control you want to record will be stored on.
3. Click the custom control 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.
4. Click **Record**.
5. Insert the events you want to record. These can include source selections, key types, transitions, and menu selection, for example. Special functions can also be inserted.

   Each custom control can have a maximum of 998 events, plus the End event.
6. Press **Stop Recording** to finish recording.

   > **Tip:** *Press CANCEL if you do not want to store your changes to 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 is assigned to.

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 that the custom control is assigned to is red.
- You can stop all running custom controls by running a custom control with no events recorded to it.
- A maximum of 128 custom controls can be run at the same time.

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**.
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.

Editing a Custom Control

After you have recorded a custom control, you can go back and edit that custom control to add or remove events.

> **Tip:** *Custom controls can also be edited from the **Custom Control** node in DashBoard.*

To Edit a CC From DashBoard

When editing a custom control, you can delete and insert events at any point in the custom control, or append events to the end.

> **Tip:** *When editing a custom control, press **Run Event** to run the currently selected event. This can help you diagnose problems in a custom control.*

1. Click **Navigation Menu** > **Custom Control** > **Editor**.
2. Click **Bank *X*** 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 47 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 the current 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 after the currently selected event
- **Insert** — insert the current event after the currently selected event
- **Record** — start recording a new custom control over the existing one
- **Run Event** — run the currently selected event

Naming Custom Controls

Each custom control can be given a unique name. The name is shown on the custom control button.

To Name a Custom Control

The procedure to name or rename a custom control is the same.

1. Click **Navigation Menu** > **Custom Control** > **Editor**.
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.
4. Enter the new name of the custom control in the name field next to the bank.

Deleting Custom Controls

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

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 Custom Controls

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

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 **Paste**.

Network Connections

The ethernet connection from the frame is used to upload stills to the Media-Store channels, download switcher data files, and control switcher functions using DashBoard.

The switcher uses the following network ports:

* **FTP** — 21
* **SSH** — 21
* **DashBoard** — 5253
* **SLP** — 427
* **Web Server** — 80
* **RossTalk** — 7788

Network Setup

The switcher comes from the factory set with a static IP address (192.168.0.123) but can be set to use DHCP to automatically obtain an IP address.

Note: If you use a DHCP server, it must be set to always give the switcher the same IP address. DashBoardneeds a fixed IP address to connect to.

Tip: If you do not know the IP address of the switcher, you can set DIP switch 3 on the system to lock the IP address to 192.168.0.123. The switcher must be re-started for the new IP address to be applied.

To Change the IP Address

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 **Edit**.
4. Click an **ETH***X* **Mode** button to set that network port to use DHCP (**DHCP**), or a static IP address (**Static**).
5. For a static IP address, enter the IP address (**ETH***X* **IP Address**), subnet mask (**ETH***X* **Subnet Mask**), and gateway (**Gateway**) you want to use.
6. Click **Update**.

FTP Connection (RossLinq)

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 FTP 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.

To Create an FTP Connection with Windows 10

This procedure applies to Microsoft® Windows XP® Professional, Windows® 7, and Windows® 10.

1. On your computer launch **File Explorer**.
2. In the address bar, type `ftp://`*IP Address of your switcher*. You are prompted for a username and password.
3. Type the user name for the application your are creating an FTP connection for. Each application has specific requirements. The switcher will set these requirements automatically based on the username.
   * `xpression` – used when creating a connection from a Ross® XPression Motion Graphics System directly to the Media-Store channels on the switcher, as well as any USB drive installed in the switcher

     Note: You must be using XPression version 9.5 build 4946, or higher, to properly connect to the Media-Store channels directly from XPression.

   * `liveedl` – used to create a connection to the LiveEDL folder on the switcher to download an edit decision list file form the switcher
   * `user` – used to create a connection to the general storage folders on the switcher, as well as any USB drive installed in the switcher
4. Enter the password `password`.

Default IP Addresses

DIP switches on the back of the control panel and frame are used set the IP address to a static default. Once you set the DIP switch, you must restart the control panel or frame to use the new IP address.

Video Reference

The flexible reference system in the switcher allows you to use an Interlaced video format as the reference to operate the switcher in a video format of the same frequency. Choosing a progressive video format as a reference limits you to operating the switcher only in that same video format and frequency. For example, if you have a 1080i 59.94Hz input reference you can operate the switcher in 720p 59.94Hz, but not 1080i 50Hz. However, if you have a 720p 59.94Hz input reference, you can only operate the switcher in 720p 59.94Hz.

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.

Table 5: Supported Reference Formats

Input Reference	Usable Format
480i	720p 59.94Hz
	1080i 59.94Hz
	1080pSF 29.97Hz
	1080p 29.97Hz
	1080p 59.94Hz (A)
576i	720p 50Hz
	1080i 50Hz
	1080pSF 25Hz
	1080p 50Hz (A)
	1080p 25Hz
720p 59.94Hz	720p 59.94Hz
	1080p 59.94Hz (A)
720p 50Hz	720p 50Hz
	1080p 50Hz (A)
1080i 59.94Hz	720p 59.94Hz
	1080i 59.94Hz
	1080pSF 29.97Hz
	1080p 29.97Hz
	1080p 59.94Hz (A)
1080i 50Hz	720p 50Hz
	1080i 50Hz
	1080pSF 25Hz

Input Reference	Usable Format
	1080p 50Hz (A)
	1080p 25Hz
1080pSF 23.98Hz	1080pSF 23.98Hz
1080pSF 29.97Hz	1080pSF 29.97Hz
1080pSF 25Hz	1080pSF 25Hz
1080p 25Hz	1080p 25Hz
	1080p 50Hz

The switcher allows you to use any interlaced video format to operate the switcher in any format of the same frequency; however, the use of 480i or 576i (Composite Sync) reference signals for High Definition (720p, 1080i, or 1080p) video modes is not recommended.

The use of composite sync reference formats is recommended for Standard Definition video modes only, and provides stable outputs with jitter performance in compliance with SMPTE-259M specifications.

Reference and Video Mode Setup

The switcher supports both internal and external references. An external reference is provided by an external device to the switcher through the **REF IN** BNC on the frame. An internal reference is generated by the switcher and can be fed out to other devices.

The switcher automatically detects the reference signal and only shows the video modes that you can operate the switcher in that are supported for that reference format.

To Set a Video Mode

If you are using an external reference, ensure that a proper reference is connected to the **REF IN** input BNC on the frame.

Note: You must use an interlaced reference source to have the switcher operate in an interlaced reference format if you are using an external reference.

1. Click **Navigation Menu** > **Configuration** > **Reference**.
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 Source** button and select an internal or external reference source.

Frame Sync and Format Conversion

The switcher has multiple frame synchronizer / format converter (FSFC) and de-interlacers that can be used to convert video signals to the format that the switcher is operating in, as well as correct mistimed, or drifting, video signals. The frame synchronizers cannot completely correct badly formatted video, mistimed switches, signal drops, or similar issues.

Each FSFC channel maintains a separate setting for different video formats. This lets you change between video formats without losing FSFC channel configurations.

Keep the following in mind when working with Frame Synchronizers and Format Converters:

- The output format converters are only available on output BNCs 11 to 22.
- The switcher cannot frame sync a 1080pSF video format on input BNC 1. All other inputs work correctly.
- The FSFCs used in the switcher conform to the SMPTE ST 125:2013 standard. Some older equipment may not fully conform to the current standards and can send out-of-spec video to the switcher which can have unexpected results. Ensure that video coming into the switcher conforms to current standards, especially with regard to 480i video signals with variable blanking sizes.

Supported FSFC Input Mode Video Formats

FSFCs can only convert between specific video formats at a given frequency. The available conversions also depends on the switcher mode you are in.

Table 6: Supported FSFC Input and Output Formats

Input	Switcher	Output
1080p 59.94Hz	1080p 59.94Hz	1080p 59.94Hz
1080i 59.94Hz		1080i 59.94Hz
720p 59.94Hz		720p 59.94Hz
1080p 50Hz	1080p 50Hz	1080p 50Hz
1080i 50Hz[1]		1080i 50Hz
720p 59.94Hz		720p 59.94Hz
1080p 29.97Hz	1080p 29.97Hz	1080p 29.97Hz
1080p 59.94Hz[2]		
1080p 25Hz	1080p 25Hz	1080p 25Hz
1080p 50Hz[2]		

Input	Switcher	Output
1080i 59.94Hz	1080i 59.94Hz	1080i 59.94Hz
1080p 59.94Hz		1080p 59.94Hz
720p 59.94Hz		720p 59.94Hz
480i 59.94Hz		480i 59.94Hz
1080i 50Hz	1080i 50Hz	1080i 50Hz
1080p 50Hz		1080p 50Hz
720p 50Hz		720p 50Hz
576i 50Hz		576i 50Hz
720p 59.94Hz	720p 59.94Hz	720p 59.94Hz
1080p 59.94Hz		1080p 59.94Hz
720p 50Hz	720p 50Hz	720p 50Hz
1080p 50Hz		1080p 50Hz

Notes

- [1] Converted using either a simple line-doubler or 4-line interpolater and may result in lower quality video.
- [2] Converted by dropping frames and may result in lower quality video.

To Set Up Input FSFC

Turn on an FSFC for each input that needs to be converted.

Refer to *Supported FSFC Input Mode Video Formats* on page 26 for a list of compatible video format conversions.

1. Click **Navigation Menu** > **Configuration** > **Inputs** > **Physical**.
2. Click the **Configure** button for the input you want to assign an FSFC to.
3. Click the **Type** button for the type of frame sync you want to apply.
    - **SDI** — no FSFC is applied to the input.
    - **SDI-FS** — an FSFC is applied to the input.
    - **QuadFS** — a timed FSFC is applied to the input. Each QuadFS is timed to the first SDI-FS in the group of four (1-4, 5-8, 9-12, etc.). The SDI-FS must be applied to the first input and QuadFS to the rest of the inputs in the group.

> **Tip:** Use this if you are taking the quad-split output from an untimed UHDTV1 camera that you need to frame-sync. The frame syncs applied to each input are locked together for timing so that all four inputs are in sync.

4. Click the **Framing** button for the aspect ratio conversion mode you want to use.

The options that are available depend on the video format that the switcher is converting from and to.

* **Full** — The video signal is scaled disproportionately to fill the display of the new aspect ratio. Aspect distortion occurs as the image is stretched/compressed to fit in the new aspect ratio.
* **Zoom** — The central portion of the video signal is zoomed to fill the display of the new video format. No aspect distortion is introduced but the edges of the video signal may be cropped.
* **Letter Box** — Black bars are added to the top and bottom of a 16:9 image to display correctly in a 4:3 video format.
* **Pillar Box** — Black bars are added to the right and left of a 4:3 image to display correctly in a 16:9 video format.

To Set Up Output FSFC

Turn on an FSFC for each input that needs to be converted.

Note: Only outputs 11 to 22 support output FSFC conversion.

Refer to *Supported FSFC Input Mode Video Formats* on page 26 for a list of compatible video format conversions.

1. Click **Navigation Menu** > **Configuration** > **Outputs**.
2. Click the **Conversion** button for the output you want to convert.
3. Click the **Output Conversion** button for the format you want to feed out of the selected output.
4. Click the **Framing** button for the aspect ratio conversion mode you want to use.

The options that are available depend on the video format that the switcher is converting from and to.

* **Full** — The video signal is scaled disproportionately to fill the display of the new aspect ratio. Aspect distortion occurs as the image is stretched/compressed to fit in the new aspect ratio.
* **Zoom** — The central portion of the video signal is zoomed to fill the display of the new video format. No aspect distortion is introduced but the edges of the video signal may be cropped.
* **Letter Box** — Black bars are added to the top and bottom of a 16:9 image to display correctly in a 4:3 video format.
* **Pillar Box** — Black bars are added to the right and left of a 4:3 image to display correctly in a 16:9 video format.

Output Reference Synchronizers

The output reference synchronizers allow you to have the switcher output a reference signal that other devices, such as cameras and video servers, can lock to.

Note: Different applications require different output reference formats and delay settings. Consult a facility engineer for assistance in configuring these settings.

To Set Up an Output Reference Sync

If you are using one of the output references to time external devices, ensure that they are connected to the appropriate **REF OUT** output BNC.

1. Click **Navigation Menu** > **Configuration** > **Reference**.
2. Click on the **Reference Output *X*** button for the reference output BNC that you want to set up.
3. Click on the reference format you want to output from the switcher.

The available output reference formats depend on the video format that the switcher is operating in. You must be in a 50Hz video format for PAL and a 59.94Hz video format for NTSC.

4. Select the type of delay you want to apply to the reference signal.

* **V** — vertical delay in lines
* **H** — horizontal delay in pixels
* **F** — frame delay in frames (NTSC/PAL only)

5. Click **Update**.
6. Click **Yes** to assign the output reference synchronizer.

If you select an analog reference format (NTSC/PAL) you must set whether you want to use color framing for the reference output or not.

To Set Color Framing for Analog Reference

When the output reference (OSync) is set to an analog format (NTSC/PAL), the color framing in the sub-carrier can be synced to the color framing of the input

reference. The input reference must also be set to an analog format.

> *Note:* *Jitter on the color framing of the input reference causes the analog output reference to reset in an attempt to re-sync.*

1. Click **Navigation Menu** > **Configuration** > **Reference**.

2. Toggle the **Color Framing** button to turn color framing on or off.
   - **No Sync** — color framing not synced between input and output references
   - **Sync** — reference output color framing is synced with reference input color framing

Switching Field

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

If you are using a Frame Sync or Format Conversion (FSFC), transitions are locked to F1.

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

2. Click a **Field Dominance** button to select which field video transitions occur on.
   - **Field 1** — transitions occur on odd field
   - **Field 2** — transitions occur on even field
   - **Both** — transitions occur on current field, either even or odd

Video Input Setup

Video sources come into the switcher through the input BNCs. Depending on how you want to use these video sources, or where they come from, you may want the switcher to pair them together. 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.

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.

To Set Up an Auto Key Association

Input sources and internally generated sources, such as media-stores and color backgrounds,can be set up as an auto key.

1. Click **Navigation Menu** > **Configuration** > **Inputs** > **Physical** if you are setting up the auto key for a physical input, or **Internal** if you are setting up the auto key for an internal input.

2. Click the **Alpha Source** button for the key video source that you want to assign an alpha to.

3. Click the key alpha source that you want to assign to the key video.

   - **--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
   - **MiniME***X* — assign the output of MiniME™ *X* as the key alpha
   - **MM***X* **PV** — assign the preview output of MiniME™ *X* as the key alpha
   - **MM***X* **Cmb** — assign the combined alpha output of MiniME™ *X* as the key alpha

4. Click the **Alpha Mode** button and select the alpha mode for the key alpha.

   - **Linear** — the alpha cuts a hole based on the gradient values of the alpha (gray)
   - **Shaped** — the alpha cuts a hole based on the monochrome value of the alpha (black or white)

Source Names

Each video source in the switcher can be given a unique name.

> *Note: If a TSL ID is assigned to a source, the switcher overwrites the source name on the MultiViewer 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

Apply unique names to each video source.

Source names are restricted to eight characters in length.

1. Click **Navigation Menu** > **Configuration** > **Inputs** > **Physical** if you are naming a physical input, or **Internal** if you are naming an internal input.

2. Enter a new name in the text box for the video input that you want to name.

> *Note: The **Size**, **Color**, and **Inverse** options are only used if you have a control panel attached to the system.*

To Assign a TSL ID to a Video Input

The switcher accepts incoming TSL data on TCP port 5727.

1. Click **Navigation Menu** > **Configuration** > **Inputs** > **Physical**

2. Click the **TSL Address** button for the input you want to assign a TSL ID to.

3. Click TSL ID number that you want to assign to the selected input BNC.

4. Click the **TSL Tally** button and select how the sources are tallied and which mnemonic name is use.

   - **Off** — TSL tally information for the selected ID is ignored. TSL mnemonic source names are used.
   - **On** — 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 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.

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.

To Assign a GPI to a Video Source

1. Click **Navigation Menu** > **Configuration** > **Inputs** > **Physical** if you are setting up a physical input, or **Internal** if you are setting up an internal input.

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.

Input Media-Store

Each video input on the switcher can be configured as a Media-Store.

Note: The input Media-Store channels are separated into groups of 6 (1-6, 7-12, 13-18 etc.) that share the same cache pool.

To Set Up an Input Media-Store

You can convert an input BNC to a Media-Store channel. Selecting that input on a bus displays the media file and not the input video on that BNC.

1. Click **Navigation Menu** > **Configuration** > **Inputs** > **Physical**.

2. Click the **Configure** button for the input you want to convert to a Media-Store.

3. Click **Still**.

Video Outputs

The frame has a number of output BNCs that can have any video source in the switcher, including Media-Store channels, and aux buses assigned to them.

Output Sources

You can assign a video source or bus to an output BNC. Some outputs can only be used for certain features.

To Assign a Source to an Output

1. Click **Navigation Menu** > **Configuration** > **Outputs**.

2. Click on the **Source** button for the output BNC that you want to assign a source to.

3. Click the video source that you want to assign to the output.

> *Note: Outputs 1 and 2 can only be assigned to MultiViewer 1.*

- *XX* — video inputs 1-36
- **BK** — black
- **BG** — matte generator
- **AUX***X* — aux buses
- **MiniME***X* — output of MiniME™ *X*
- **MM***X* **PV** — output of MiniME™ *X*

> *Note: The MiniME™ preset only shows the source that is selected on the preset bus for the MiniME™. This does not include keys or any video manipulation that is done if the MiniME™ is used as part of a Canvas.*

- **MM***X* **Cmb** — combined alpha output of MiniME™ *X*

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).

> *Note: Only external inputs that are selected on an aux bus assigned to an output can maintain their ancillary data. All other sources and outputs configurations have their ancillary data stripped.*

To Strip or Pass Ancillary Data

Ancillary data contains information such as closed captioning and embedded audio. Stripping this information replaces it with black.

> *Note: Only external inputs that are selected on an aux bus assigned to an output can maintain their ancillary data. All other sources and outputs configurations have their ancillary data stripped.*

1. Press **MENU** > > **NEXT**.

2. Use the **AnClry** knob to select whether ancillary data is stripped or passed.

   - **Strip** — ancillary data is stripped
   - **Pass** — ancillary data is passed unmodified

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. Up to 4 MultiViewer outputs are supported.

A time-clock can be added as an overlay to the MultiViewer showing either system time or time code.

Keep the following in mind when working with a MultiViewer:

- MultiViewer 1 is fixed to output BNCs 1 and 2 and MultiViewer 2/3/4 are fixed to outputs MV 3/4/5 respectively.
- The layout is configured independently for each MultiViewer.
- Inputs are displayed with a red border when they are on-air. A green border is displayed when the input is selected on the Preset bus.
- When the switcher is operating in a standard-definition video format, the MultiViewer is shown in high-definition.
- All ancillary data is stripped from the MultiViewer outputs.

MultiViewer Output Formats

Depending on the format the switcher is operating in, the MultiViewer may output a different video format than the switcher is operating in.

Switcher Video Format	MultiViewer Format
480i	1080i 59.94Hz
576i	1080i 50Hz
720p 59.94Hz	720p 59.94Hz
720p 50Hz	720p 50Hz
1080i 50Hz	1080i 50Hz
1080i 59.94Hz	1080i 59.94Hz
1080pSF 23.98Hz	1080pSF 23.98Hz

Switcher Video Format	MultiViewer Format
1080pSF 25Hz	1080i 50Hz
1080pSF 29.97Hz	1080i 59.94Hz
1080p 25Hz	1080p 25Hz
1080p 29.97Hz	1080p 29.97Hz
1080p 50Hz	1080i 50Hz
1080p 59.94Hz	1080i 59.94Hz

MultiViewer Sources

Some MultiViewers only have access to specific inputs and outputs.

Table 7: Available MultiViewer Sources

MultiViewer	Inputs	Outputs
1	All	All
2 (MV 3)	1-12	11-14
3 (MV 4)	13-24	15-18
4 (MV 5)	24-36	19-22

Tip: To monitor a specific bus, assign that source to one of the outputs that are available to the MultiViewer. This also allows you to change what buses are being monitored using an aux panel rather than changing the MultiViewer setup.

To Set Up a MultiViewer

Note: A MultiViewer must be assigned to a video output to be usable.

1. Click **Navigation Menu** > **Configuration** > **MultiViewers**.
2. Click **MultiViewer *X*** to select the MultiViewer you want to set up.
3. Click the **Layout** button and select the arrangement of the boxes that you want to use for the selected MultiViewer.

   Note: MultiViewer 1 supports layouts with up to 10 boxes, and MultiViewers 2/3/4 support layouts with up to 16 boxes.

4. Use the **Transparency** slider to adjust the transparency of the background behind the source label for the selected MultiViewer.

5. Click a **Tally** button to select how boxes on the MultiViewer are tallied.
   - **Box** — red or green border is shown around the outside of the MultiViewer box
   - **Label** — red or green boxes are shown inside the label area of the MultiViewer box
   - **LblRev** — 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 the **Clock** button.
8. Click a **Mode** button to select the type of clock you want.
   - **Off** — turns the clock off
   - **Timecode** — displays the timecode fed to the switcher (hh:mm:ss:ff)
   - **System** — displays the system time of the switcher in 12-hour or 24-hour format (hh:mm:ss)
9. For a Timecode clock, click a **Frame Count** button to select whether the number of frames for a timecode is displayed (**On**) or not (**Off**).
10. For a System clock, 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.
11. Click the **Position** tab.
12. Use the **X Position**, **Y Position**, and **Size** sliders to position the clock and change the size.
13. Click the **Foreground Color** tab and select the color and transparency you want to use for the text of the clock.
14. Click the **Background Color** tab and select the color and transparency you want to use for the background of the clock.
15. Click on one of the **Boxes** buttons and set up how that box appears on the MultiViewer.
    - **Input/Output** — select the video source or bus that you want to assign to this box on the MultiViewer. When you assign an output to a box, the switcher routes the source selected on

that bus to the box, and not the output of the bus.

- **Green Tally** — turn the preview (green) tally for the MultiViewer box on or off.
- **Red Tally** — turn the program (red) tally for the MultiViewer box on or off.
- **Border** — turn the border around the 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 MultiViewer box off, or on in a selected position
- **Label Pos** — select a position for the source label for the MultiViewer box(**Bottom** or **Top**).
- **Aspect** — turn aspect ratio markers for the MultiViewer box on (**Aspect**) or off (**Off**).
- **MultiSc *X*** — turn the Canvas overlay on (**On**), or off (**Off**). The overlay shows what portions of the image are cropped out to fit into the output of the Canvas.

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

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**).

Mosaic

Mosaic works by breaking your display into individual panels. Each panel is represented by a tile in Mosaic and the entire display is represented by the canvas. To properly set up Mosaic you must calculate the total number of pixels on your display (width and height). In the example shown below we are using a display that is 7680 pixels wide and 2160 pixels high. This information is entered as the canvas size.

> **Tip:** *Mosaic uses a MiniME™ to create a tile. The two terms are used interchangeably in the menus.*

Venue Display = Canvas Size
(7680×2160 pixels)

Once the canvas has been set, you need to calculate how many tiles it will take to cover the canvas. The size of the tiles is determined by the video format the switcher is operating in. For example, if you are a 1080 format, each tile will be 1920 pixels wide by 1080 pixels high. Mosaic can automatically position the tiles in an X by Y grid over the canvas.

> **Tip:** *If your canvas is larger or smaller than the grid of tiles, make sure to use enough tiles to cover the entire canvas.*

(Tile = 1920×1080 pixels)

Putting video onto the tiles can be done in a number of ways, depending on how the background graphic you want to use was created. In the case of a pre-tiled source, the background image has already been divided up into individual segments. A separate video source is fed into the switcher for each tile. In the example below, tile 1 is fed the video source on BNC 1 (Source 1), tile 2 is fed form BNC 2, and so on.

> **Tip:** *When dealing with pre-tiled sources, it is recommended that you set up a substitution table for all the sources you will use. This allows you to select a source on one MiniME™ and have the switcher automatically select the corresponding sources on the other MiniME™ buses.*

Pre-Tiled Source
(Sources = 8)

Alternatively to the pre-tiles sources, Mosaic can use DVE resources to stretch a single image over the entire background.

Background DVE
(Sources = 1 stretched)

Mosaic Video Processor Setup

The Mosaic compositing engine allows you to map switcher outputs (Tile/MiniME™) to regions on your LED display (Canvas). With the tiles laid out on the canvas, background images can be stretched (Background DVE) or tiled (Pre-Tiled Source) across the entire canvas.

> **Tip:** *The size and number of the canvases depends on the number of tiles you have available.*

Keys are automatically interpolated between tiles across the entire canvas. As the key moves from one tile to another, the keyer for that MiniME™ takes over. You must keep in mind how many keyers you are using on each tile as you move keys around the canvas.
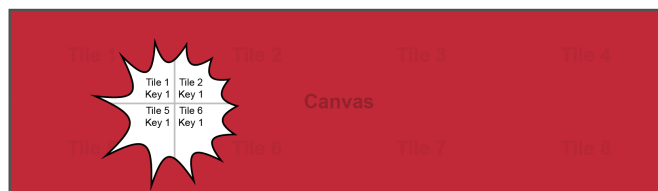
Mosaic Terms

The following terms are used when discussing Mosaic:

- **Canvas** — The pixel-based surface area of your LED display. For irregular shaped display assemblies, your canvas should be the maximum height and width of you display.
- **Tile** — The individual MiniME™ video outputs of the switcher that go to each panel of the display. How the tiles are arranged on the canvas must match how the panels are arranged on the display.
- **Bezel** — The pixel compensation for any bezel on the edges of the individual panels that make up the display. Bezel compensation in the absolute distance between the active pixels on the panels, and not the size of the bezel on each panel. Adjust bezel values based on visual inspection of active video on the display.
- **Background DVE** — DVE resources are used to stretch the background image to cover the entire canvas. DVE resources may not be needed if pre-tiled sources are used with the substitution table.
- **Pre-Tiled Sources** — The background image has already been separated for each tile of the canvas. Each part is fed into the switcher as a separate video source and a substitution table is used to tell the switch which source to put on each tile/MiniME™.

Important Notes

Keep the following in mind when setting up Mosaic:

- The Canvas uses MiniME™/Tile resources to provide the keys and outputs. As a key crosses from one tile to the next, a key from either of the MiniME™/Tile outputs is being used to provide the two halves of the key.
- The Canvas can either take separate parts of a pre-tiled source, or scale a single source to the size of the Canvas output. When you use a pre-tiled source, you must assign sources to each MiniME™/Tile that is used in the Canvas. This substitution table allows you to select a single source on the Canvas program bus and the switcher automatically assigns the required source to each MiniME™/Tile.
- The Canvas does not support edge blending.

To Set Up Mosaic

Create your canvas and then overlay tiles to cover the canvas area with video.

1. Click **Navigation Menu** > **Configuration** > **Canvases**.

2. Click **Canvas *X*** to select the Canvas you want to set up.

   On the right of the screen is a canvas workspace with a visual representation of the canvas in red. Tiles appear as numbered gray boxes in the workspace. The MiniME™/tiles are the only outputs of the system. The canvas is shown to help visualize the placement of the tiles and should be the same pixel size as your target display.

3. Click a **Can*X*** for each **Tile/MiniME** to assign that tile to the selected canvas. A tile can only be applied to one canvas at a time.

   *Tip: Click **Off** to have the tile not applied to any of the canvases. This does not turn off the output of the MiniME™.*

   The tiles appears as a grey boxes on the canvas workspace you apply them to.

4. In the **Canvas Size** area, enter the **Width** and **Height** of your display in pixels.

   A red box representing the canvas is shown in the workspace.

5. Click **Layout Presets** and select how you want the tiles arranged on the canvas.

   - **Num X Tiles** — enter the number of columns of tiles you want.
   - **Num Y Tiles** — enter the number of rows of tiles you want.
   - **X Bezel Size** — enter the size of the gap you want between columns of tiles to compensate for display bezels or projector edges. This is the total gap and not the size of an individual bezel.
   - **Y Bezel Size** — enter the size of the gap you want between rows of tiles to compensate for display bezels or projector edges. This is the total gap and not the size of an individual bezel.

   Note: The canvas size does not automatically compensate for bezel offsets.

6. Click **Create**.

   The tiles are laid out on the canvas from the top/left corner to the bottom/right corner.

7. Click a **Background DVEs** button to select how DVE resources are used to scale sources for the Canvas screen.

   - **Off** — DVE resources are not allocated to the Canvas for scaling of background sources.
   - **On** — DVE resources are always allocated to the Canvas for scaling of background sources. This reduces the number of available DVE

resources to the switcher when a Canvas is turned on.

- **Dynamic** — DVE resources are dynamically allocated to the Canvas for scaling of background sources if there is no substitution table.

Note: *If there are no DVE resources to scale the background source across the entire Canvas, the switcher needs a substitution table to map separate inputs to the Canvas screens or the selected source is repeated in each screen of the Canvas.*

8. Click **OK**.

9. Click a **MV 1 Follow** button to have MultiViewer 1 mimic the current tile layout.

Note: *The MultiViewer layout only follows the last layout that you generated (**Layout Preset**). Manually moving tiles around is not followed in the MultiViewer. The MultiViewer can only mimic layouts that currently exist as MultiViewer layouts.*

To Set Up a Pre-Tiled Source

The substitution table allows you to pre-assign which input goes to each tile/MiniME™ on a canvas.

You must set up your external source generator to output a separate output for each screen of the Canvas layout. The bezel compensation and data doubling setting should be set up on the source generator.

1. Click **Navigation Menu** > **Configuration** > **Inputs** > **Substitutional**.

2. Click **New**.

3. Click the **Source** button and select the source you want to use to assign the pre-tiled sources to the MiniME™ outputs for the Canvas.

4. Click the **ME** button and select the MiniME™ that you want to assign a substitution source to.

5. Click the **Substitution** button and select the pre-tiled source for the MiniME™.

6. Click **Save**.

7. Assign substitution sources to the each MiniME™ as required.

Color Correction

Color correction in the switcher is performed by either Processing Amplifiers (Proc Amps) in the HSL (Y-Cr-Cb) color space or by RGB Color Correctors in the RGB color space. Both Proc Amps and RGB Color Correctors allow you to apply color correction to video on input to the switcher, before the crosspoint, and on the output from the switcher. Correction applied to the input video is then available to all buses. Output based correction is only available on output BNCs 11 to 22.

Color correction is additive, allowing you to apply any combination of Proc Amp and RGB Color Corrector based adjustment to a video signal. If multiple color corrections are applied, the correction is applied first, and the bus-based correction is applied after that.

Proc Amp Color Correction

The Proc Amp video correction allows you to adjust the gain, offset, black level, and gamma of the video signal.

To Apply a Proc Amp to a Video Source

1. Click **Navigation Menu** > **Configuration** > **ProcAmps** > **ProcAmp**.
2. Click the **ProcAmps and Color Correctors** button and select the input or output that you want to apply the Proc Amp to.

   *Tip: If correction has already been applied (**On**), press **Reset** to return the Proc Amp and Color Correction to the default values.*

3. Click an **Enable** button to turn the Proc Amp on (**On**) for the selected input or output.
4. Use the sliders to adjust the video source.

   - **Gain** — adjust the chrominance and luminance gain together.
   - **Chroma Gain** — adjust the chrominance gain only.
   - **Luma Gain** — adjust the luminance gain only.
   - **Hue Rotation** — adjust the Hue. Increasing the Hue Rotation turns the color wheel

clockwise, and decreasing the Hue Rotation turns the color wheel counter-clockwise.
   - **Black Level** — adjust the black level. Black level acts as a luminance offset.
   - **Gamma** — adjust the luminance gamma value.
   - **Gamma Offset** — adjust the luminance gamma offset.
   - **Cr Gain** — adjust the gain of the Cr (red color difference).
   - **Cr Offset** — adjust the offset of the Cr.
   - **Cb Gain** — adjust the gain of the Cb (blue color difference).
   - **Cb Offset** — adjust the offset of the Cb.

RGB Color Correction

The RGB color correctors allow you to adjust the red, green, and blue component gain, offset, and gamma of the video signal.

To Apply a RGB Color Correction to a Video Source

1. Click **Navigation Menu** > **Configuration** > **ProcAmps** > **ProcAmp**.
2. Click the **ProcAmps and Color Correctors** button and select the input or output that you want to apply the RGB color corrector to.

   *Tip: If correction has already been applied (**On**), press **Reset** to return the Proc Amp and Color Correction to the default values.*

3. Click an **Enable** button to turn the color corrector on (**On**) for the selected input or output.
4. Click the **Component** button for the individual color component (**Red**, **Green**, **Blue**) you want to adjust, or **RGB** for all of them.
5. Use the sliders to adjust the color components.

   *Tip: Click one of the **Preset Color Temp** buttons to apply a temperature color correction to the video.*

   - **Gain** — adjust the gain of the component(s).
   - **Offset** — adjust the offset of the component(s).
   - **Lower Offset** — adjust the lower offset of the component(s).
   - **Gamma** — adjust the gamma value of the component(s).
   - **Gamma Offset** — adjust the gamma offset of the component(s).

High Dynamic Range Conversion (HDR)

The RGB color correctors are used to convert between High Dynamic Range (HDR) and Standard Dynamic Range (SDR). The actual conversion takes the form of contrast matching between SDR and HDR. This contrast matching preserves the colors of the SDR video signal.

Only the HLG600 and HLG1200 HDR presets are supported at this time.

To Convert a Source to HDR

A source is converted between SDR and HDR using the RGB color correctors to contrast match the SDR video stream to the HDR video stream.

1. Click **Navigation Menu** > **Configuration** > **ProcAmps** > **Color Correction**.

2. Click the **ProcAmps and Color Correctors** button and select the input or output that you want to apply the HDR conversion to.

   *Tip: If correction has already been applied (**On**), press **Reset** to return the Proc Amp and Color Correction to the default values.*

3. Click an **Enable** button to turn the color corrector on (**On**) for the selected input or output.

4. Click an **HDR** button to apply the conversion.

   • **SDR To HLG600** — conversion using contrast matching in the HLG600 format.
   • **SDR To HLG1200** — conversion using contrast matching in the HLG1200 format.

   *Tip: Click the **HDR** button again to reset the color correction values if you have adjusted them.*
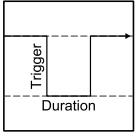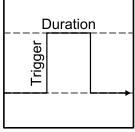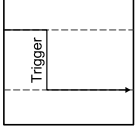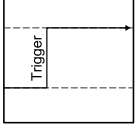
GPI Control

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.

GPI Trigger Types

There are four trigger types supported by the switcher. These can be either output triggers, or input triggers.

Table 8: 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.

To Set Up a GPI Input

The switcher requires a Low Edge GPI input trigger.

1. Click **Navigation Menu** > **Configuration** > **GPIO**.

   The page lists all the GPIs on the switcher and how they are currently configured.

2. Click **Edit** for the GPI that you want to configure as an input.

3. Click **GPI**.

4. Click an **Event** button to select the action you want to assign to the selected GPI input pin.

   - **--none--** — no action is taken
   - **CC** — run a specific custom control
     - enter the custom control bank in the **Bank** field
     - enter the custom control in the **CC** field
   - **Mem Recall** — recall a memory on all MiniME™s (enter the memory to recall in the **Mem** field)
   - **FtB** — perform a transition to black on program 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 area (click an **ME** button to select the MiniME™, or Canvas)
   - **ME Auto** — perform a background auto transition on the selected area (click an **ME** button to select the MiniME™, or Canvas)
   - **Key Cut** — perform a key cut on the selected area and Key
     - click an **ME** button to select the MiniME™, or Canvas
     - click a **Key** button to select the keyer
   - **Key Auto** — perform a key auto transition on the selected MiniME™, or Canvas and Key
     - click an **ME** button to select the MiniME™, or Canvas
     - click a **Key** to select the keyer number
   - **Aux Xpt** — select a video source on an aux bus
     - click the **Aux** button and select the aux bus
     - 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** > **GPIO**.

   The page lists all the GPIs on the switcher and how they are currently configured.

2. Click **Edit** for the GPI that you want to configure as an output.

3. Click **GPO**.

4. Click a **Trigger** button to select whether you want to use an edge trigger (**Edge**), or a level trigger (**Level**).

5. Click a **Level** button to select whether you want the GPI to trigger low (**Low**), or high (**High**) trigger.

6. For edge triggers, use the **Duration** 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)

GPI Output Triggers

Each video source can have a GPI output assigned to it. This GPI can be used to trigger an external device, such as a video server, to play the cued clip when the video sources from the video server are taken on-air. This trigger can be set up to occur automatically any time the video source is transitioned on-air.

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.

To Assign a GPI Output to a Video Source

You can set a pre-delay, or pre-roll, that will specify when the GPI is triggered in relation to taking the video source on-air. This is useful for VTR pre-roll delay and other situations where an input source is not immediately ready to be taken to air. The **RlClip** knob must be set to **On** to trigger the GPI output with the transition.

Note: You cannot assign a GPI output to Aux bus special sources (AUX PGM, AUX PV, AUX CLN).

1. Click **Navigation Menu** > **Configuration** > **Inputs** > **Physical**.

2. Click the **GPO** button for the video source that you want to assign a GPI output to.

   When you select this source on a bus, the GPI output will trigger automatically.

3. Click the GPI output that you want to assign to the selected video source.

4. In the **Predelay** field, enter the pre-delay interval (in frames) that the switcher waits after the GPI output is triggered before taking the input source on-air.

Diagnostics and Calibration

There are a number of calibration and diagnostics tools in the switcher that can be used to troubleshoot problems with your switcher.

Note: *If you are having problems with your switcher, please contact Ross Video Technical Support for assistance.*

Switcher Information and Logs

Switcher information and logs can be used to identify and diagnose problems with the switcher. Use this information when contacting Ross Video Technical Support.

Switcher Status

The Status node provides a read only overview of the state of a number of important switcher components and equipment.

The following items are available on the **Status** node:

- **Software Version** — the current version of the software running on the switcher
- **Serial Number** — the serial number of the frame
- **Engine Type** — the model of frame
- **Switcher Mode** — the current mode the switcher is operating in
- **Video Mode** — the video format that the switcher is operating in
- **Video Reference Source** — the source of video reference to the switcher
- **External Reference** — the video format of the external reference, if connected
- **Reference** — status of whether the switcher has locked to the reference format
- **Temperature** — status of the ambient temperature in the frame
- **CPU Temperature (C)** — the temperature of the frame CPU in degrees Celsius
- **FPGA Temperature (C)** — the temperature of the frame FPGA in degrees Celsius
- **Fan #1** — status of fan 1 in the frame (left fan)
- **Fan #2** — status of fan 2 in the frame (right fan)
- **Timecode** — the current timecode being received by the switcher
- **RossTalk Server Port** — the network port that the switcher is listening on for RossTalk commands.
- **TSL UMD Server Port** — the network port that the switcher is listening on for TSL UMD commands.
- **Allocated DVEs** — where DVE channels are allocated in the switcher.

To Copy Logs To a USB

Switcher logs can be stored onto a USB to be sent to technical support to diagnose problems with your switcher.

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 frame or control panel. Wait 5 seconds after inserting the USB drive before using it.
2. Click **Navigation Menu** > **Configuration** > **Diagnostics**.
3. Click **Copy** to copy the switcher logs to the USB 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.

Diagnostics

Diagnostics consist of a number of tests that are used to confirm the functionality of switcher components.

Frame Diagnostic LEDs

There are a number of LEDs inside the frame that are used to diagnose the operation of the switcher.

Figure 6: Frame Diagnostic LEDs

- **FRM UPGD** — is lit when the software on the frame is being upgraded
- **1 (heartbeat)** — flashes to indicate normal operation of the frame
- **2 - 8** — unused
- **PANEL** —
- **MC** — is not used at this time
- **POWER** — is lit when the frame is on
- **PS1** — is lit when power supply one is getting power
- **PS2** — is lit when power supply two is getting power

Frame DIP Switches

There are a number of DIP switches inside the frame that are used to diagnose the operation of the switcher.

Table 9: Frame DIP Switches

DIP	Description
1	This DIP switch forces a RAM test every time the switcher is powered on. It is in the up (off) position by default.
2	This DIP switch is unused and should be left in the default up (off) position.
3	This DIP switch is used to set the IP address of ethernet port 1 on the frame to the default value (192.168.0.123) and ethernet port 2 to DHCP. It must be in the up (off) position to set another IP address for the frame.
4	This DIP switch prevents software upgrades. It must be in the up (off) position to upgrade the switcher.
5	This DIP switch is unused and should be left in the default up (off) position.
6	This DIP switch is unused and should be left in the default up (off) position.
7	This DIP switch is unused and should be left in the default up (off) position.
8	This DIP switch is unused and should be left in the default up (off) position.

Switcher Soft Reset

If required, the switcher can be reset to return it to a user-defined default setting, or the factory default state. A reset can be performed for the entire switcher, or individual components, such as keys.

Custom Reset Settings

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

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.

You can customize many of the default switcher parameters and save them as a user-defined custom reset.

1. Click **Navigation Menu** > **Live Assist** > **Memory** > **RState**.
2. Click **Aux***X*, **Media***X*, **MiniME***X*, and **Canvas***X* to select the buses or channels that are reset with a switcher reset.

    > **Tip:** Click the **All** button to select or de-select all the items in that category.

3. Click **Save RState** and **Yes**.

To Load a Custom Reset Setting

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**.

Specifications

The information is this section is subject to change without notice.

Switcher Resources

The number of resources specific to your switcher depends on the options installed.

Resource	Carbonite Black	Carbonite Black+	Carbonite Black + 12G	Mosaic
2D DVE Channels per ME (Max/Min)[1]	8/4			18
Aux Buses	20			10
Chroma Keys per ME	2 (floating)			0
Custom Controls	256 (8 Banks × 32 CCs)			
Max Events per CC	998			
FSFCs (Max/Min)[1]	6/0	36		
GPI I/Os	34			
Keyers per ME	4			0
Matte Generators per ME	2			1
Media-Store Channels	4			36[3]
Media-Store CACHE	8 GB			512 MB[5]
Memories per ME	100			
MEs (max)	3			0
MiniME™ Engines (max)	4			10
Canvas(MultiScreen)	2[2]			5[2]
MultiViewer Boxes	16			10[4]
MultiViewer Layouts	39			28[4]
MultiViewer Outputs	2	5		4
Pattern Generators per ME	2			0
Tallies	34			34
SDI Video Inputs	36			
SDI Video Outputs	22	25		
Frame IP	192.168.0.123			
Panel/CarboNET IP	192.168.0.129			n/a

Notes

- [1] The number of DVE channels and FSFCs that are available depends on the switcher mode you are in. This table assumes that all options are installed.
- [2] Each Canvas consumes MiniME™ engines to generate the output. The number of Canvas outputs that are available depends on the number of MiniME™ engines that are available.
- [3] Each video input can be converted to a Media-Store.
- [4] The standard MultiViewer supports 28 layouts and a maximum of 10 boxes. The I/O MultiViewers support 40 layouts and a maximum of 16 boxes.
- [5] The cache is shared across each set of 6 input BNCs (1-6, 7-12, etc.) for Media-Stores and input FSFC.

Environmental Characteristics

	All Switchers
Ambient Temperature Range	0 - 40°C (32 - 104°F)
Frame Cooling	Active, Front-to-Back airflow
Control Panel Cooling	Passive

Video Input Specifications

Input Specification	Value
Equalization (using Belden 1694 cable)	>50m @ 3Gb/s
	>100m @ 1.5 Gb/s
	>300m @ 270 Mb/s (5°-40°C)
Impedance	75 ohm, terminating
Video Inputs, SDI	SMPTE 259M/292M/424M (non-looping)
Reference Inputs (non-terminating, looping)	Standard Definition — analog black
	High Definition — tri-level sync

Video Output Specifications

Output Specification	Value
Return Loss	<-23dB @ 1.5GHz
	<-18dB @ 3GHz
Rise and Fall Time	800ps ±10% (SD)
	240ps ±10% (HD)
Signal Level	800mV ±10%
DC Offset	0 Volts
Overshoot	<10%
Video Outputs, SDI HD Mode	10-bit SMPTE-292M/424M serial digital

Audio Specifications

Specification	Value
Audio Depth	24-bit AES3 in HD (20-bit in SD)
Channels	1 Stereo Pair (2 channels)
Output	AES
File Format	Multi-channel Waveform Audio File (.wav)
Impedance	110 Ohms, differential
Minimum/Maximum output voltage swing	1.5/6V peak-to-peak
Rise and Fall Times	20ns, typical
Sample Rate	48kHz
Synchronization	Locked to Video

Jitter

| Specification	Value
HD - Tri-Level Sync	Alignment (> 100KHz) < 0.2UI
	Timing (<10Hz) < 1.0UI
HD - Composite Reference	Performance not guaranteed with composite reference
SD - Tri-Level Sync	Alignment (> 1KHz) < 0.2UI
	Timing (<10Hz) < 0.2UI
SD - Composite Reference	Alignment (> 1KHz) < 0.2UI
	Timing (<10Hz) < 0.5UI

System Timing

- All video inputs zero time relative to reference input, auto timing will correct for inputs out of time by up to +/- 0.25 line.
- System delay is less than 1 line.

Power Consumption — Frame

	Carbonite Black	Carbonite Black+	Carbonite Black+ 12G
Consumption	120W 2.5A 48V	180W 3.75A 48V	206W 4.3A 48V
Input Voltage	100 - 120V~, 220 - 240V~, 47-63Hz		

Ports
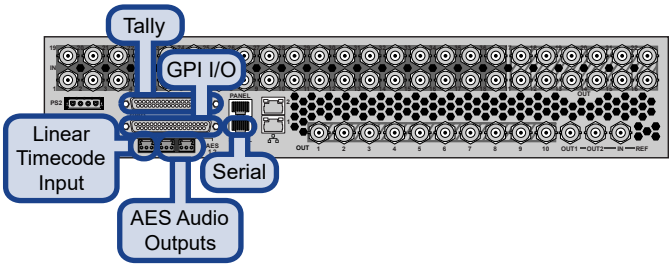
Note: The LTC and Tally ports are not supported at this time.

Serial Port

The serial port supports the RS-422 transmission standard in the following format:

- 38.4k Baud
- 8 bits
- 1 stop bit
- Even Parity

Table 10: 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 34 GPI I/Os.

Table 11: 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

Pin	Signal
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
26	GPI I/O 25
27	GPI I/O 26
28	GPI I/O 27
29	GPI I/O 28
30	GPI I/O 29
31	Ground
32	GPI I/O 30
33	GPI I/O 31
34	GPI I/O 32
35	GPI I/O 33
36	GPI I/O 34
37	n/c

AES Port

The AES ports on the back of the frame each support a single 24-bit (20-bit in SD) stereo pair.
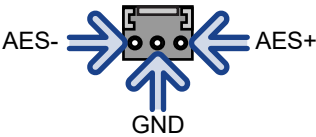
Custom Control Events

The Custom Control editor in DashBoard allows you to add or edit events in custom controls.

Event	Location	Description
Ancillary Data Mode	**Switcher Installation > Ancillary Mode**	Select how the switcher will strip or pass ancillary data. 1. Click a **Value** button to select how the switcher treats ancillary data.
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.
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**.
Bus Source Select	**Switcher > Bus Source Select**	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.
Cancel All CC	**Special > Cancel All**	Cancel all running custom controls.
Cancel CC	**Special > Cancel CC**	Cancel a running custom control. 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.
Chroma Key, Initialize	**Switcher > Keyer > Chroma Keyer 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. 2. Click the **Keyer** button for the key you want to perform the event on.

Event	Location	Description
Chroma Key Color	**Switcher** > **Keyer** > **Chroma Keyer 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 the **Keyer** button for the key you want to perform the event on. 3. Click **Color** and select the color you want to key out.
Chroma Key Mode	**Switcher** > **Keyer** > **Chroma Keyer Mode**	Select the mode for 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. 2. Click the **Keyer** button for the key you want to perform the event on. 3. Click a **Mode** button to select whether you want the chroma key to operate in basic mode (**Basic**), or advanced (**Advanced**).
Chroma Key Setup	**Switcher** > **Keyer** > **Chroma Keyer 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 **Keyer** button for the key you want to perform the event on. 3. Click the **Parameter** button and select the parameter you want to adjust. 4. Click the **Value** button and select the new value you want to enter for the selected parameter.
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 a **Before Keyer** button to select whether you want the clean feed output to be taken before key 1 (**Keyer 1**), key 2 (**Keyer 2**), or key 3 (**Keyer 3**).
Color Framing	**Switcher Installation** > **Reference** > **Color Framing**	Select whether color framing for the reference outputs is synchronized. 1. Click a **Framing** button to select whether color framing is synchronized (**Sync**) or not (**NoSync**).
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 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.

Event	Location	Description
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 **Border**. 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.

Event	Location	Description
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.
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 **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.

Event	Location	Description
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.
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**).
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.
EmbeddedTriggers — Enable	**Switcher Installation** > **Embedded Trigger** > **Enable**	Select whether EmbeddedTriggers is enabled or not for the selected output. 1. Click the **Output** button and select the output BNC that you want to send EmbeddedTriggers commands 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 EmbeddedTriggers commands are inserted for the selected output (**On**) or not (**Off**).

Event	Location	Description
EmbeddedTriggers — Insert Trigger	**Switcher Installation** > **Embedded Trigger** > **Trigger CC**	Select the custom control to insert into the EmbeddedTriggers message. 1. Enter the custom control bank in the **Bank** field. 2. Enter the custom control in the **CC** field.
EmbeddedTriggers — Set DID	**Switcher Installation** > **Embedded Trigger** > **Settings**	Select the data identifier word (DID) you want to use for the EmbeddedTriggers message. 1. Click **DID** 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 DID value you want to use in the **Value** field.
EmbeddedTriggers — Set Line	**Switcher Installation** > **Embedded Trigger** > **Settings**	Select the line in the VANC that the EmbeddedTriggers message will be inserted on. 1. Click **Line** 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 line value you want to use in the **Value** field.
EmbeddedTriggers — Set Remote ID	**Switcher Installation** > **Embedded Trigger** > **Settings**	Select the remote ID you want to use to identify the switcher that the EmbeddedTriggers message is coming from. 1. Click **Remote ID** 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 remote ID value you want to use in the **Value** field.
EmbeddedTriggers — Set SDID	**Switcher Installation** > **Embedded Trigger** > **Settings**	Select the secondary data identifier word (SDID) you want to use for the EmbeddedTriggers message. 1. Click **SDID** 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 SDID value you want to use 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**).
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.

Event	Location	Description
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.
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.
Hold CC	**Special** > **Hold**	Insert a hold into the custom control.
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.
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.

Event	Location	Description
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 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 whether they key should perform a cut (**Cut**), or auto transition (**Auto Trans**).
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.
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.

Event	Location	Description
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.
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.
Layer Mode	**Switcher Installation** > **ME** > **ME Layer Mode**	Select whether external layer mode is active for 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 a **Value** button to select whether external layer mode is on (**On**) or not (**Off**).
Loop CC	**Special** > **Loop**	Insert a loop into the custom control.
Mask, Force	**Switcher** > **Keyer** > **Mask Force**	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 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 force the area inside the mask region to the foreground (**On**) or not (**Off**).
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**).

Event	Location	Description
Mask, Reset	**Switcher** > **Keyer** > **Mask Reset**	Reset 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 **Action** button and select the parameter you want to reset.
		• **Reset Type** — turn mask off.
		• **Reset Forced** — turn force off.
		• **Reset Inverted** — turn invert off.
		• **Reset X-Pos** — reset horizontal position.
		• **Reset Y-Pos** — reset vertical position.
		• **Reset Size** — reset size.
		• **Reset Ver Edges** — reset top and bottom edges.
		• **Reset Hor Edges** — reset left and right edges.
Mask (Box) — Bottom Edge Position 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) — 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.
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.

Event	Location	Description
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) — Pattern	**Switcher** > **Keyer** > **Pattern Mask Effect**	Select a pattern 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 **Pattern** and select the pattern you want to use for the pattern generator.
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.

Event	Location	Description
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.
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**).
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**.

Event	Location	Description
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 **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 **Color** button and select the color you want to use.
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.
Media-Store — Auto Play	**Switcher** > **MediaStore** > **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**).
Media-Store — Capture Alpha	**Switcher** > **MediaStore** > **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 **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 **Enable** button and select whether the alpha is captured with the source (**On**) or not (**Off**).
Media-Store — Capture	**Switcher** > **MediaStore** > **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. Enter the number you want to assign to the capture file in the **Capture File** field.
Media-Store — Capture Mode	**Switcher** > **MediaStore** > **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.

Event	Location	Description
Media-Store — Capture Source	**Switcher** > **MediaStore** > **Media 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.
Media-Store — Clear Channel	**Switcher** > **MediaStore** > **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**.
Media-Store — Cut Frame	**Switcher** > **MediaStore** > **Attributes**	Select the point, in frames, from the start of the animation 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 animation that you want to cut to occur for the MediaWipe in the **Value** field.
Media-Store — Delete Capture	**Switcher** > **MediaStore** > **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** > **MediaStore** > **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.
Media-Store — Looping	**Switcher** > **MediaStore** > **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**).
Media-Store — Move To Frame	**Switcher** > **MediaStore** > **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.

Event	Location	Description
Media-Store — Mute	**Switcher** > **MediaStore** > **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**).
Media-Store — Play	**Switcher** > **MediaStore** > **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**.
Media-Store — Play Speed	**Switcher** > **MediaStore** > **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.
Media-Store — Reset Media	**Switcher** > **MediaStore** > **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**.
Media-Store — Reverse	**Switcher** > **MediaStore** > **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**).
Media-Store — Rewind	**Switcher** > **MediaStore** > **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**.
Media-Store — Shaped	**Switcher** > **MediaStore** > **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**).

Event	Location	Description
Media-Store — Trigger GPI Output	**Switcher** > **MediaStore** > **Attributes**	Select the GPI output that you want to trigger with a MediaWipe 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 **GPO**.
		4. Enter the GPI output that you want to trigger with the MediaWipe in the **Value** field.
Media-Store — Trigger GPI Output Delay	**Switcher** > **MediaStore** > **Attributes**	Select the time from the start of the MediaWipe that the GPI output is triggered 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 **GPO Frame**.
		4. Enter the delay, in frames, for the GPI output to be triggered in the **Value (fr)** field.
Media-Store — X-Position	**Switcher** > **MediaStore** > **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.
Media-Store — Y-Position	**Switcher** > **MediaStore** > **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.
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**.

Event	Location	Description
MediaWipe — Direction, Flip-Flop	**Switcher** > **Transition** > **Media 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** > **Media 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**.
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**.
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.

Event	Location	Description
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.
Canvas — Edge Blending	**Switcher Installation** > **MultiScreen** > **Edge Properties**	Select whether edge blending is applied to the edges of the overlapping edges 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 **Blending**. 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 **Edge** button and select the edge that you want to adjust. 5. Click the **Value** button and select whether blending is applied edge (**On**) or not (**Off**).
Canvas — Edge Distance	**Switcher Installation** > **MultiScreen** > **Edge Parameters**	Select the distance between screens 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 **Distance**. 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 **Edge** button and select the edge that you want to adjust. 5. Enter the distance between the screens on the selected edge in the **Value (%)** field.
Canvas — Edge Gamma	**Switcher Installation** > **MultiScreen** > **Edge Parameters**	Select the amount of gamma correction applied to the overlapping edges 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 **Gamma**. 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 **Edge** button and select the edge that you want to adjust. 5. Enter the amount of gamma correction in the **Value (%)** field.

Event	Location	Description
Canvas — Edge Smoothness	**Switcher Installation > MultiScreen > Edge Parameters**	Select the amount of smoothing applied to the overlapping edges 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 **Smoothness**. 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 **Edge** button and select the edge that you want to adjust. 5. Enter the amount of smoothing in the **Value (%)** field.
Canvas — Layout	**Switcher Installation > MultiScreen > Layout**	Select a layout for the selected Canvas. 1. Click the **ME** button for the Canvas that you want to perform the event on. 2. Click the **Layout** button and select the layout you want to use.
Canvas — Offset	**Switcher Installation > MultiScreen > Offset**	Select the placement of the background scaling 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 **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 the amount of offset in the **Value (%)** field.
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 that 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**).
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 that 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**).

Event	Location	Description
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 that 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 that 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 that 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 **Label Mode** button and select whether the name comes from the switcher (**Switcher**), the router (**Router**), or both are shown (**Both**).
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 that 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**).
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 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. Enter the amount of transparency in the **Value (%)** field.

Event	Location	Description
MultiViewer Box — Canvas Markers	**MultiViewer > Box > MV Box MultiScreen Marker**	Select whether the Canvas overlay is shown for the selected box on the selected MultiViewer. The overlay shows what portions of the image are cropped out to fit into the output of the MultiScreen. 1. Click a **MultiViewer** button to select which MultiViewer you want that 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 **ME** button and select the Canvas you want to view. 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. Click a **Value** button and select whether the overlay is shown (**On**) or not (**Off**).
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 that 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 that 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 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. Enter the amount of clipping to be applied 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 that 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 — 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 that 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 that 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 that 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 that you want to perform the event on. 2. Click a **Clock Mode** button and select whether the clock shows timecode (**Timecode**), system time (**System**), or is off (**Off**).
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 that 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 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 a **Value** button and select whether the frame count is shown (**On**) or not (**Off**).

Event	Location	Description
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 that 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	**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 that 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 — 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 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 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 that you want to perform the event on. 2. Click the **Layout** button and select the layout you want to use.
MultiViewer — Outputs	**Switcher Installation** > **Output Mode**	Select which outputs the MultiViewer is available on. This feature is only available when the switcher is operating in a standard-definition or 3G video mode. 1. Click an **Outputs** button to select which pair of output BNCs you want to assign to as MultiViewer outputs. 2. Click a **Lock MultiViewers** button to assign the selected output BNCs as MultiViewer outputs (**On**) or not (**Off**).
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 that 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
Output BNC Assignment	**Switcher Installation** > **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.
Pause CC	**Special** > **Hold**	Insert a pause into the custom control. 1. Enter the length of the pause in the **Pause (fr)** field.
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.
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**).

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

Event	Location	Description

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 a **Value** button to select whether Roll Clip is always on (**Force**) or must be turned on manually (**User**).
Play CC	**Special** > **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.
Reference Source	**Switcher Installation** > **Reference** > **Video Reference**	Select the reference source for the switcher. 1. Click a **Reference Source** button to select whether to use an internal (**Internal**) or external (**External**) reference source.
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**.
Resume CC	**Special** > **Resume CC**	Resume a custom control at hold. 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.
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.

Event	Location	Description
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.
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.
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**).
RossTalk CC	**Devices** > **RossTalk**	Send the simulated custom control to the selected device. 1. Click **CC**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 3. Enter the bank of the custom control in the **Bank** field. 4. Enter the number of the custom control in the **Custom** field.
RossTalk Clear	**Devices** > **RossTalk**	Send the Clear Framebuffer command for a framebuffer and layer to the selected device. 1. Click **Clear Channel**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 3. Enter the framebuffer that you want to clear in the **Channel** field. 4. Enter the layer that you want to clear in the **Layer** field.

Event	Location	Description
RossTalk — Cue (item + framebuffer)	**Devices** > **RossTalk**	Send the Cue command for a specific item and framebuffer to the selected device. 1. Click **Cue (2)**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 3. Enter the take item id of the item you want to cue in the **Take ID** field. 4. Enter the framebuffer that you want to cue the item on in the **Channel** field.
RossTalk — Cue (item + framebuffer + layer)	**Devices** > **RossTalk**	Send the Cue command for a specific item and location to the selected device. 1. Click **Cue (3)**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 3. Enter the take item id of the item you want to cue in the **Take ID** field. 4. Enter the framebuffer that you want to cue the item on in the **Channel** field. 5. Enter the layer that you want to cue the item on in the **Layer** field.
RossTalk — Cue Current	**Devices** > **RossTalk**	Send the Cue command to the selected device. 1. Click **Cue**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to.
RossTalk Custom Command	**Devices** > **RossTalk**	Send a manual RossTalk string to the selected device. 1. Click **RossTalk CustomCmd**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 3. Enter the RossTalk string in the **Custom Cmd** field.
RossTalk — Focus	**Devices** > **RossTalk**	Send the Focus command for a specific item to the selected device. 1. Click **Focus**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 3. Enter the take item id of the item you want to have focus in the **Take ID** field.
RossTalk — GPI	**Devices** > **RossTalk**	Send the simulated GPI input to the selected device. 1. Click **GPI**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 3. Enter the GPI you want to simulate triggering in the **GPI** field.
RossTalk — Next	**Devices** > **RossTalk**	Send the Next command to the selected device. 1. Click **Take Next**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to.

Event	Location	Description
RossTalk — Read	**Devices** > **RossTalk**	Send the Read command for a specific item and layer to the selected device. 1. Click **Read**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 3. Enter the take item id of the item you want to read in the **Take ID** field. 4. Enter the layer that you want to cue the item on in the **Layer** field.
RossTalk — Resume	**Devices** > **RossTalk**	Send the Resume command for a framebuffer and layer to the selected device. 1. Click **Resume Channel**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 3. Enter the framebuffer that you want to resume in the **Channel** field. 4. Enter the layer that you want to resume in the **Layer** field.
RossTalk — Sequencer Down	**Devices** > **RossTalk**	Send the Sequencer Down command to the selected device. 1. Click **Sequencer Down**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to.
RossTalk — Sequencer Up	**Devices** > **RossTalk**	Send the Sequencer Up command to the selected device. 1. Click **Sequencer Up**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to.
RossTalk — Swap Current	**Devices** > **RossTalk**	Send the Swap command to the selected device. 1. Click **Swap**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to.
RossTalk — Swap	**Devices** > **RossTalk**	Send the Swap command for a specific location to the selected device. 1. Click **Swap (2)**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 3. Enter the framebuffer that you want to swap the items on in the **Channel** field. 4. Enter the layer that you want to swap the items on in the **Layer** field.
RossTalk — Take Current	**Devices** > **RossTalk**	Send the Take command to the selected device. 1. Click **Take**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to.

Event	Location	Description
RossTalk — Take	**Devices** > **RossTalk**	Send the Take command for a specific item and location to the selected device. 1. Click **Take (3)**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 3. Enter the take item id of the item you want to take in the **Take ID** field. 4. Enter the framebuffer that you want to take the item on in the **Channel** field. 5. Enter the layer that you want to take the item on in the **Layer** field.
RossTalk — Take Off	**Devices** > **RossTalk**	Send the Take Off command for a specific item to the selected device. 1. Click **Take Offline**. 2. Click the **RossTalk Device** button and select the device you want to send the RossTalk command to. 3. Enter the take item id of the item you want to take in the **Take ID** field.
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.
Source Substitution, Delete	**Switcher Installation** > **Source Substitution** > **Delete Subst Table**	Delete an entry from the substitution table. 1. Click the **Source** button and select the source that you want to delete the substitution(s) for. If more than one substitution entry exists for the selected source, all those entries will be deleted.
Source Substitution	**Switcher Installation** > **Source Substitution** > **Source ME Sub**	Set a 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 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.
State, Insert	**Special** > **State**	Insert the current state of the switcher into the custom control. 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.
Switching Field	**Switcher Installation** > **Field Switch**	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**).
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 Elements	**Switcher** > **Transition** > **ME Trans Elements**	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.

Event	Location	Description
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 Limit 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 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 point in the transition that you want to place the trans limit in the **Value (%)** field.
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.
Video Server — Cue	**Devices** > **Video Server**	Send the Cue command and name of clip to cue to the selected device. 1. Click **Cue**. 2. Click the **Video Server** button and select the device you want to send the command to. 3. Click a **Channel** button to select the channel you want to send the command to. 4. Enter the identifier of the clip in the **Clip Name** field.
Video Server — Loop Off	**Devices** > **Video Server**	Send the Loop Off command to the selected device. 1. Click **Loop Off**. 2. Click the **Video Server** button and select the device you want to send the command to. 3. Click a **Channel** button to select the channel you want to send the command to.
Video Server — Loop On	**Devices** > **Video Server**	Send the Loop On command to the selected device. 1. Click **Loop On**. 2. Click the **Video Server** button and select the device you want to send the command to. 3. Click a **Channel** button to select the channel you want to send the command to.

Event	Location	Description
Video Server — Play	**Devices** > **Video Server**	Send the Play command to the selected device. 1. Click **Play**. 2. Click the **Video Server** button and select the device you want to send the command to. 3. Click a **Channel** button to select the channel you want to send the command to.
Video Server — Record	**Devices** > **Video Server**	Send the Record command to the selected device. 1. Click **Record**. 2. Click the **Video Server** button and select the device you want to send the command to. 3. Click a **Channel** button to select the channel you want to send the command to.
Video Server — Stop	**Devices** > **Video Server**	Send the Stop command to the selected device. 1. Click **Play**. 2. Click the **Video Server** button and select the device you want to send the command to. 3. Click a **Channel** button to select the channel you want to send the command to.
Wash Color (HSL)	**Switcher** > **Matte** > **Wash Color (HSL)**	Select the custom matte color for the selected ME or aux. Each component of the HSL color must be inserted individually. This is the second color of the wash, the first color is set from the matte color. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Matte** button and select **Wash**. 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.
Wash Color (Preset)	**Switcher** > **Matte** > **Wash Color (Preset)**	Select a preset wash color for the selected ME. This is the second color of the wash, the first color is set from the matte color. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Matte** button and select **Wash**. 3. Click the **Color** button and select the color you want to use.
Wash Color Reset	**Switcher** > **Matte** > **Wash Color Reset**	Reset the matte color for the selected ME. This is the second color of the wash, the first color is set from the matte color. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Matte** button and select **Wash**.
Wash Generator — Disable	**Switcher** > **Matte** > **Wash Enabled Reset**	Disable the wash generator for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on.
Wash Generator — Enable	**Switcher** > **Matte** > **Wash Enabled**	Enable the wash generator for the selected ME. 1. Click the **ME** button for the ME that you want to perform the event on. 2. Click the **Wash** button and select whether the wash generator is enabled (**On**) or not (**Off**).

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.

Event	Location	Description
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.
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.

Event	Location	Description
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.
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.

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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