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Acuity
UHD Configuration Guide

v9.2

ROSS

Document Information

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Feature Enhancements

A number of features have been added, or updated, to this version of software. This section provides a brief introduction to these features, and how to use them.

9.2f Features

No New Features

This version of software fixes a number of bugs and does not introduce any new features.

9.2d Features

CC Offline Mode

You can now have the switcher not execute events as you are recording and editing a custom control.

New Personality Options

The following switcher personality options have been added or changed.

Use Old DVE Color

Set whether the switcher uses the old or new color converter for DVE borders. The new color converter is similar to the one used by the matte color generator.

Press **HOME** > **Setup** > **Personality** and use the **Option** knob to select **Use Old DVE Color**.

- **Off** — use the OLD color converter for 2D and 3D DVE borders.
- **On** — use the NEW color converter for 2D and 3D DVE borders.

9.2c Features

New Personality Options

The following switcher personality options have been added or changed.

Router Name on MV

Set whether the MultiViewer shows the router mnemonic names or the switcher names for video sources.

Press **HOME** > **Setup** > **Personality** and use the **Option** knob to select **Router Name on MV**.

- **Router Name** — MultiViewer uses router mnemonic names.

- **Set Name** — MultiViewer uses switcher source names.

RossTalk Updates

The following commands have been added or updated.

PGM A/B Support

Support has been added to address PGM A,B,C,D,E,F when specifying an ME for a RossTalk command.

User Variables

The USERVAR RossTalk command has been added that allows you to set a value for a CC user variable or perform an operation on an existing CC variable.

RossTalk Tria Support

Support has been added for RossTalk control of Ross Video Servers. Commands include CUE, PLAY, STOP, GOTO, JOG, LOOP, ANGLE, and EJECT.

Tally Never Option

The option has been added to have sources selected on an ME or aux bus never tallied.

Press **HOME** > **Setup** > **Installation** > **Output** > **More** > **ME / Aux Tally**.

Alternate Device Locked

If an alternate device is assigned to a primary device, but not enabled, a lock symbol is shown on the menu (Press **HOME** > **More** > **Remote Enables** > **Alternate Device**) to indicate that you cannot toggle to the alternate.

Ultritouch Adds ME Bus

A ME Bus control has been added to the Ultritouch interface to allow you to select sources on an ME and keyer from the Ultritouch.
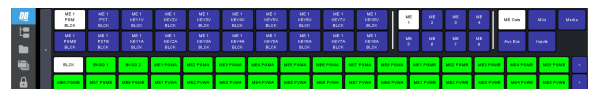
You can switch between the Aux Panel and Shot Box interface from the popout menu.

Expanded Up-Conversion

Support has been added for up-converting a number of video formats.

- 480i -> 720p 59.94Hz
- 480i -> 1080p 59.94Hz
- 720p 59.94Hz -> 1080i 59.94Hz
- 1080i 59.94Hz -> 720p 59.94Hz
- 576i -> 720p 50Hz
- 576i -> 1080p 50Hz
- 720p 50Hz -> 1080i 50Hz
- 1080i 50Hz -> 720p 50Hz

Split Self Keys Persist

When you split a Self key now, you can change the fill source without reverting the alpha. The split functionality will remain as long as the KEY MEM in not active and you don't change key types. Press the SELF key type button again to revert the split.

9.2b Features

Custom Control Logic

You can insert a logical expression (IF/ELSE) into a custom control as events. When the custom control is run the logical expression is evaluated and the results executed.
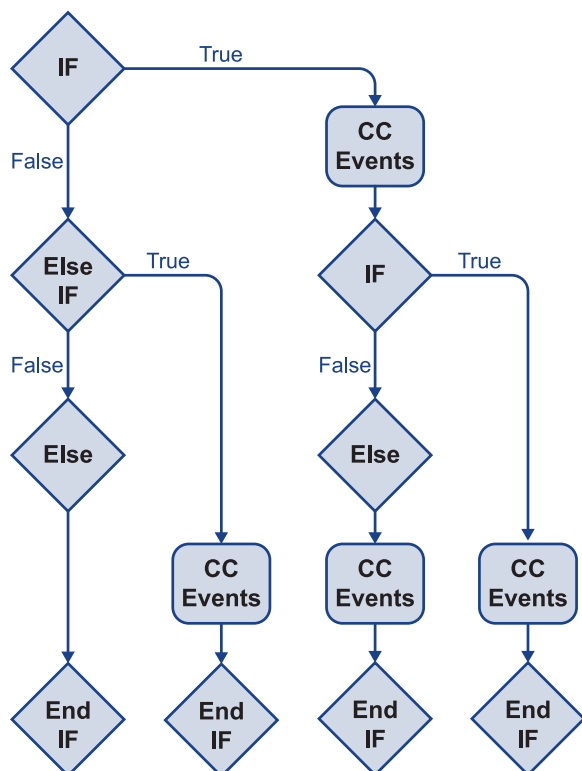
The following logical events are supported:

- **If** — the start of a boolean expression requiring a variable, operator, and condition. If the expression returns true the custom control events inserted after this event are executed. If the expression returns false the custom control jumps to the next boolean condition (**Else If** or **Else**) or end (**End If**).
- **Else If** — the start of a nested boolean expression where the parent boolean expression has returned false and another boolean expression is evaluated. An Else If, unlike an If, will only be evaluated if the parent If or Else If has returned false.
- **Else** — the end of a boolean expression where the current **If** (If or Else If) evaluation has returned false. The custom control events inserted after this event are executed only when the If evaluation returns false.
- **End If** — the end of the boolean expression. The End If is required for the expression to be evaluated properly. The custom control events inserted after this event are always executed.

Disable Device

Communications with a device can be temporarily stopped. The switcher will not attempt to connect to the device when the device is disabled. This can be useful if a device is temporarily out of service and you don't want to remove the device. This prevents the switcher from repeatedly attempting to connect to the device and logging the failed connection event.

Logging Level

Logging events can now be customized to include fewer events.

To Set the Log Level

1. Press **HOME** > **Setup** > **Installation** > **Output** > **More** > **More** > **Minimum Log Level**.
2. Use the log level knob to select the minimum log level you want recorded. Only events of the selected priority, or higher, are recorded to the logs.
   - **Log Emergency** — only emergency events are logged.
   - **Log Alert** — only alert and emergency events are logged.
   - **Log Critical** — only critical or higher events are logged.

- **Log Error** — only error or higher events are logged.
- **Log Warning** — only warning or higher events are logged.
- **Log Notice** — only notice or higher events are logged.
- **Log Info** — only info or higher events are logged.
- **Log Debug** — all listed events are logged.

9.2a Features

New Custom Controls

A number of custom controls have been added or expanded.

Command	Description
AuxKey Rate	Set the AuxKey transition rate. Use the **AuxKey Rate** knob to select the rate for the transition.

Key Include

Insert Event > **Special**.

Command	Description
Keys Include	Set what keys are selected on the Next Transition area of the ME depending on the current state of the key. Select either the A-Side (**Bkgd A**) or B-Side (**Bkgd B**) of a split ME that you want to perform the next transition on, and then select whether a key is included in the next transition only if the key is currently on-air (**Key *X* Off**) or only included if the key is currently off-air (**Key *X* On**). If you need to set both the A-Side and B-Side, you must create separate CC events.

Transition Select

Insert Event > **Special**.

Command	Description
Trans Select	Set what is selected on the Next Transition area of the ME. You can set up the next transition selections for both the A-Side (**Bkgd A**) and B-Side (**Bkgd B**) of a split ME. Select the background or keys that you want to include with the next transition.

Maximum Custom Controls Running

The maximum number of custom controls that can be running at one time has been increased to 96.

B-Side Glow Color

The B-Side of a split ME can now be assigned any of the user or glow colors.

RossTalk Updates

The following commands have been added or updated.

Acuity® Commands

The following commands can be sent to an Acuity® switcher.

Table 1: RossTalk Commands

Command	Description
KEYAUTOON *ME*:*keyer*	Transitions keyer number (*keyer*) on ME number (*ME*) on-air if the key is not currently on-air. For example, if key 2 is not currently on-air on ME 3, KEYAUTOON 3:2 triggers a transition of key 2 on ME 3.
KEYAUTOOFF *ME*:*keyer*	Transitions keyer number (*keyer*) on ME number (*ME*) off-air if the key is currently on-air. For example, if key 4 is currently on-air on ME 1, KEYAUTOON 1:4 triggers a transition of key 4 on ME 1.
KEYCUTON *ME*:*keyer*	Cuts keyer number (*keyer*) on ME number (*ME*) on-air if the key is not currently on-air. For example, if key 2 is not currently on-air on ME 3, KEYCUTON 3:2 triggers a cut of key 2 on ME 3.
KEYCUTOFF *ME*:*keyer*	Cuts keyer number (*keyer*) on ME number (*ME*) off-air if the key is currently on-air. For example, if key 4 is currently on-air on ME 1, KEYCUTON 1:4 triggers a cut of key 4 on ME 1.

XPression Commands

The following commands can be sent to an XPression server.

Table 2: RossTalk Commands

Command	Description
UNCUEALL	Removes all cued items from the cued state.

Command	Description
UNCUE *takeid*	Remove item with take id *takeid* from the cued state.

Search Clips Name

When you are inserting a **Go To Clip** custom control event, the 📝 allows you to type in the name of the clip you want to insert. The list jumps to the name that matches the name as you enter it.

New Custom Controls

A number of custom controls have been added or expanded.

Command	Description
AuxKey Rate	Set the AuxKey transition rate. Use the **AuxKey Rate** knob to select the rate for the transition.

New Device Support

The following devices or commands/interfaces were added or updated for this version of software.

New Devices

- TECNOPOINT Srl Tuning S for Panasonic® PTZ Cameras

New/Updated Commands

- Global-Store 1-4 were added as Tally IDs 4048-4051 for TSL Output mapping.

Features

Thank you for considering a Ross Video Acuity™ Production Switcher. The Acuity™ is a completely new large switcher platform that takes Ross production switchers to the next level of performance and unleashes operator creativity.

Hot Swappable Boards

The boards and power supplies in the Acuity™ frames are hot swappable. The resources, or sources provided by a board are lost when the board is removed.

Analog/Tri-Level Reference Input

The switcher supports both external and internal reference sources. The external reference can be an input from a house sync to the reference input BNC and back out the looping reference output. Although tri-level sync is recommended as your reference source for all HD applications, analog black burst can be used when operating the switcher.

Table 3: Compatible Video Formats

Input Reference	Usable Format
480i	480i
	480i 16:9
	720p 59.94Hz[1]
	1080i 59.94Hz[1]
	1080p 59.94Hz (A/B)[2]
	UHDTV1 59.94Hz (UHD-2SI)[3]
576i	576i
	576i 16:9
	720p 50Hz[1]
	1080i 50Hz[1]
	1080p 25Hz
	1080p 50Hz (A/B)[2]
	UHDTV1 50Hz (UHD-2SI)[3]
720p 50Hz	720p 50Hz
720p 59.94Hz	720p 59.94Hz

Input Reference	Usable Format
1080i 50Hz	576i
	576i 16:9
	720p 50
	1080i 50Hz
	1080p 25Hz
	1080p 50Hz (A/B)[2]
	UHDTV1 50Hz (UHD-2SI)[3]
1080i 59.94Hz	480i
	480i 16:9
	720p 59.94Hz
	1080i 59.94Hz
	1080p 29.97Hz
	1080p 59.94Hz (A/B)[2]
	UHDTV1 59.94Hz (UHD-2SI)[3]
1080i 60Hz	1080p 60Hz
	UHDTV1 60Hz (UHD-2SI)[3]
1080p 24Hz	1080p 24Hz
1080pSF 23.98Hz	1080pSF 23.98Hz
1080pSF 24Hz	1080pSF 24Hz

Notes

[1] It is not recommended that you operate the switcher in these video formats when you are using a composite sync (480i or 576i) reference signal. SMPTE® recommends using a tri level sync reference signal for high-definition video.

[2] The 1080p 50Hz Level B and 1080p 59.94Hz Level B video formats are only accepted by the MultiProcessor Input and 12G MultiProcessor Input boards where they are converted to level A automatically.

[3] Only the MultiProcessor Input and 12G MultiProcessor Input boards can process UHDTV1 UHD-2SI video signals. Only the 12G MultiProcessor Input can process UHDTV1 UHD-2SI (single link) at 12Gb/s.

Multi-Definition Serial Digital Inputs

The Acuity™ frames come standard with a single Video Input board providing 20 Multi-Definition SDI BNC inputs. Depending on the size of frame

you have this can be increased to either 60 or 120 BNCs.

- **4RU** – expandable from 20 to 40 or 60.
- **8RU** – expandable from 20 to 40, 60, 80, 100, or 120.

Multi-Definition Serial Digital Outputs

The Acuity™ frames come standard with a single Video Output board providing 20 Multi-Definition SDI BNC outputs. Depending on the size of frame you have this can be increased to either 40 or 60 BNCs.

- **4RU** – expandable from 20 to 40.
- **8RU** – expandable from 20 to 40 or 60.

Media-Store

Media-Store allows you to load stills or animations from the hard drive and make them available as a source on the switcher. The switcher provides two types of media-store, ME-Store and Global-Store.

The Global-Store consists of 1 dedicated channel of media-store (video+alpha) that is available as an input to all MEs and Aux Buses of the switcher. The 4 Gigabytes of Global-Store cache is provided from Frame CPU board.

The ME-Store option consists of 2 channels of media-store (video+alpha) that are available as inputs to the ME they have been installed for and can be re-entered onto any other ME in the switcher. The 8 Gigabytes of ME-Store cache per ME is provided from the 3G Video Processor board. If the ME is configured as a MultiViewer, the ME-Stores for that ME are configured as MV-Stores (MultiViewer Stores) with the same functionality.

In addition to the video channels of the Global-Store, an additional set of audio channels are provided.

MultiViewer

The switcher supports both a multi-headed video processor MultiViewer and a single-headed input MultiViewer. Both types of MultiViewer generators allow you to view up to 20 video sources in one of 41 different grids and include mnemonic source names and red and green tallies on every box.

- **Video Processor MultiViewer** — has access to every input on the switcher, has four heads (A,B,C,D), and replaces an ME in the switcher. Each Video Processor MultiViewer can also be configured to provide 2 floating 3D DVE keys that can be accessed from any ME on the switcher.
- **Input MultiViewer** — has access to only the input sources fed into the MultiProcessor Input board, and is not available on the standard Video Input board.
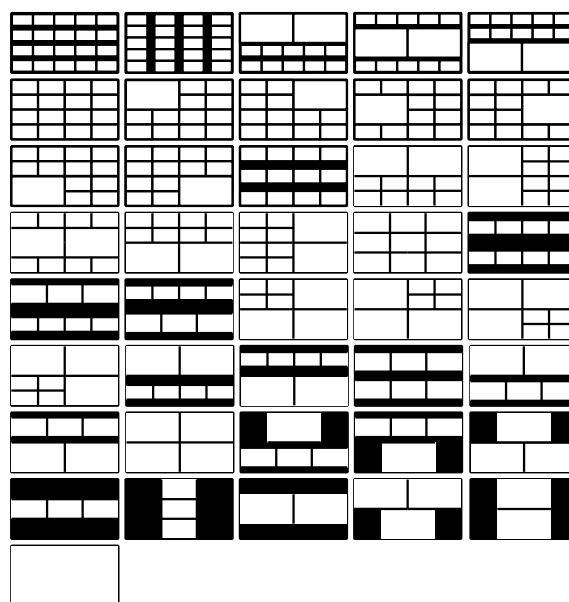
Figure 1: MultiViewer Grids

2D DVE

Each ME comes standard with 16 channels of advanced 2D DVE (8 in UHDTV1) that can be used for performing over the shoulder or picture in picture shots with full DVE key-framing with smooth interpolation. This allows preset pattern keys to be zoomed, cropped, a border or edge effect added, and repositioned horizontally and vertically to create the look you want, or you can use one of the useful pre-built 2D effects to perform 2D background transitions.

ME Effect System

Each ME (Multi-level Effect) provides 4 advanced keyers, dual border generator, pattern generators, key trails, and utility buses.

- **Keyer** — supporting matte fill, key invert, pattern mask, box mask, garbage mask, self-key, linear key, and preset pattern key. The 1 UltraChrome advanced chroma keyer

is standard for each ME and is available to each keyer.

- **Dual Border Generator** — provides border, shadow, and outline effects to the keyers with either hard or glowing edges. You can then move the border to any position on the screen - even above the key. Borders are flown in real time with the joystick in the same manner as wipe patterns and DVE effects. This border generator was designed as a creative tool and it can add an impressive visual impact to your keys.
- **Pattern Generator** — two advanced pattern generators provide rotary wipes, matrix wipes, heart, star, spade, modulation, and pattern rotation. Two additional pattern generators are dedicated to color wash generators. A single simple pattern generator is available to each key.
- **Trails** — allows you to add trail effects to any key type. Trail effects include Soft, Hard, Key, and Key Smear trails. Soft and Hard trails apply to the video in the key, and Key and Key Smear trails apply to the key itself. In the case of a shaped key, the trails are only visible within the key itself if a Soft or Hard Trail is used. Select a Key or Key Smear Trail if you need the trails to appear outside of the key.

The number of MEs depends on the size of your frame, the number of MultiViewers installed, and the video format you are operating in. Each MultiViewer or ME option uses the same hardware in the frame.

- **4RU** – expandable from 0 to 3.
- **8RU** – expandable from 0 to 4.

UltraChrome

The UltraChrome chroma keyers uses patented advanced video processing technology to provide exceptional blue spill reduction and clean edges, even with difficult source material. Glass, smoke, translucent materials, and natural shadows are handled superbly.

Chroma key shadows can either be extracted from the source image or simulated using the optional border generators.

There is 1 floating Chroma Key available to each ME and can be assigned to any keyer.

Color Correction

Color correction 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 sources on the fly to input video signals, entire buses, or aux bus outputs.

- **Input Based Correction** — color correction is applied to the video input regardless of which ME or Aux Bus it is selected on. Input-based color correction is not stored in switcher memories. Only supported on the MultiProcessor Input board.
- **ME Input Based Correction** — color correction is applied to all the video inputs to the ME. Not required with the MultiProcessor Input boards.
- **ME Bus Based Correction** — color correction is applied to the output of the assigned bus. Unlike the other color correction types, bus-based color correction is stored and recalled with memories. This allows you to include a color correction element as part of an effects dissolve.
- **Aux Bus Based Correction** — color correction is applied to the output of an Aux Bus. Like input-based color correction, Aux Bus color correction is not stored in switcher memories.

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

High Dynamic Range (HDR) and Wide Color Gamut (WCG) Conversion

The RGB color correctors are used to convert between different SDR and HDR ranges and between color gamuts (WCG).

Note: HDR and WCG input conversion is only supported on the MultiProcessor Input and 12G MultiProcessor Input boards. Output conversion is supported on any Video Output board.

HDR and WCG conversion can be applied on the fly to input video signals, entire buses, or aux bus outputs.

To configure the dynamic range and color gamut conversion of input sources you must set the MultiProcessor Input to a mode that supports HDR/WCG conversion. This will convert the input source to the format that the switcher is operating in. Video signals can again be converted for individual output BNCs.

Supported Color Gamuts:

*   **BT.709** — color gamut recommended for HD video signals.
*   **BT.2020** — wide color gamut recommended for UHDTV1 video signals.

Supported Dynamic Ranges

*   **SDR** — Standard Dynamic Range.
*   **HLG** — Hybrid Log Gamma.
*   **PQ** — Perceptual Quantizer.
*   **S-Log3** — Sony® S-Log3.

Look Ahead Preview

This feature allows you to view different preview outputs, depending on whether or not the ME is on-air. Look Ahead preview works differently than the standard Preview, as, instead of displaying the output of just the Program or Preview, the output of the Look Ahead preview changes depending on the on-air status of the ME.

Any output BNC can be assigned as the Look Ahead preview for an ME, except for the Program/Preset ME.

The output of the Look Ahead preview depends on whether the ME is on-air or not.

*   **ME Off-Air** — The Look Ahead preview displays the Program output for the assigned ME. This is what is displayed when you take this ME to air.
*   **ME On-Air** — The Look Ahead preview displays the Preview output for the assigned ME. This is what is taken to air if you transition this ME.

For example, if you have ME 4 on-air, the Look Ahead preview monitors display the Program output for ME 1, ME 2 and ME 3. If you re-enter ME 3 into ME 4, the Look Ahead preview for ME 1 and ME 2 remain unchanged, but the Look Ahead preview for ME 3 shows the Preview output for ME 3.

MultiPanel

You can connect one master panel and up to eight satellite panels to a single frame. Each of the control panels can control some, or all, of the MEs. Only the Master Panel supports all device control or OverDrive®.

SoftPanel

SoftPanel allows you to run the menu system of the switcher from a computer. The switcher treats the SoftPanel interface as a satellite panel, allowing it to control all aspects of the switcher that the menu system of a satellite panel can control.

The SoftPanel application uses the Oracle® VM VirtualBox to interface with the computer hardware and operating system, and connect to the switcher frame.

> **Tip:** *You can also point your Google Chrome™ browser to the SoftPanel to access the Acuity Virtual Panel.*

Custom Controls

A custom control is a series of commands, or button presses, that are recorded together into a single macro. When you run that custom control, the switcher runs all the commands and button pressed that were recorded in the macro. This allows you to simplify complex sequences of commands into simple button presses. For example, you can create a custom control that will recall a camera shot to preview, add a lower third, and then transition the background and key on-air.

The switcher supports up to 2304 custom controls.

Memory Functions

A memory register is a snapshot of the current state of the switcher that can include multiple MEs. Up to 1,000 memory registers per ME can be stored and recalled on the switcher. Each of these memory registers can store as little as the information of one ME, or as much as the current state of the entire switcher, including all MEs, Aux Buses, and DVE settings.

Effects Dissolve

An Effects Dissolve allows you to have the switcher slew from one memory to another using a memory recall. The switcher will

interpolate from the starting memory to the destination memory, creating a smooth, two keyframe effect.

Only elements such as clip level, pattern position, and DVE settings can be interpolated in the effects dissolve. Other elements, such as key priority, crosspoint selection, pattern, and next transition data are recalled first, and then the switcher will slew to the recalled memory.

The speed at which an effects dissolve is performed is either the Effect Rate. If you store an effects dissolve in a memory register, the effects dissolve rate stored with that memory is used. The effects rate of the destination memory is used for any effects dissolve. You can set a default effects dissolve rate that is used when an ME, or the switcher, is defaulted. This rate does not override the rate that is stored in the memory.

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.

The switcher has both fixed and configurable GPIs. The 10 fixed GPI inputs and 10 fixed GPI outputs are located on the Frame CPU board. The 24 GPIs on each Reference with Tally board can be configured as either an input, or an output.

Live Edit Decision Lists

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

The switcher supports the **CMX3600** format for recording EDL files.

Note: *The CMX3600 specification only supports a maximum of 999 events per ME or aux bus. If another event occurs beyond the 999 limit, a new file is created using the incremental file number.*

Tallies and Contact Closures

Tallies and contact closures are simple open collectors (tallies) or relays (contact closures) that the switcher uses to signal other devices, and users, that a particular video source is on-air. Typically, tallies are used to light a red light on a camera to show people that they are on-air and what camera they should be looking at.

You can only assign a single source to a tally/contact closure, but you can assign multiple tallies/contact closures to the same source.

Device Control

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

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.

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.

Product Comparison

Table 4: Acuity® Control Panel Comparison (Standard Control Panel)

	A1S	A2M	A2X	A3M	A3	A4
Custom Control Buttons	24	24	32	24	32	40
Max. Panel Tallies	36	72	72	72	72	108
Number of Rows	1	2	2	3	3	4
Source Buttons per Row	24	24	32	24	32	40
Max. Source Buttons	24	48	64	72	96	160

Table 5: Acuity® Control Panel Comparison (Double-Down Control Panel)

	A1S DD	A2M DD	A2X DD	A3M DD	A3 DD	A4 DD
Custom Control Buttons	21	21	29	21	29	37
Max. Panel Tallies	36	72	72	72	72	108
Number of Rows	1	2	2	3	3	4
Source Buttons per Row	22	22	30	22	30	38
Max. Source Buttons	22	44	60	66	90	152

Table 6: Carbonite Black Control Panel Comparison

	CB1	CB2
Custom Control Buttons	16	16
Max. Panel Tallies	0	0
Number of Rows	1	2
Source Buttons per Row	16	16
Max. Source Buttons	16	32

Table 7: Frame Comparison

	4RU	8RU
Max. GPI Inputs or Outputs	34	58
Max. Frame Tallies	36	72
Max. Contact Closures	12	24
Max. ME[2] or MultiViewer[1]	3	4
Max. UHD Video Inputs[2]	15	30
Max. UHD Video Outputs[2]	10	15

Notes:

[1] The ME and MultiViewer options use the same hardware and cannot both be active at the same time. For example, ME 1 and MultiViewer 8 use the same hardware and cannot both be on at the same time.

[2] If the switcher is operating in a UHDTV1 video format, the maximum number of MEs and video inputs and outputs is reduced. The corrected numbers are shown in the table.

Switcher Options and Configurations

A typical switcher configuration includes a control panel, a frame, and the resources and features you want installed. For example, the following options create a switcher with an A2X control panel with redundant power, a 4RU frame with 2 MEs, 10 video inputs, 10 video outputs, 72 panel tallies, and redundant power, plus a 3-year extended warranty on both the panel and frame, an Auxiliary Control Panel, and 2 days of commissioning.

Option	Description	Code	Qty.
A2X Panel	The A2X control panel.	A2X-PANEL	1
4RU Frame	The 4RU frame with no Video Input or Video Output boards.	ACU4-UHD-FRAME-NOIO	1
Redundant Power - Panel	Adds a redundant power supply for the A2X control panel.	A2XP-REDPSU	1
Redundant Power - Frame	Adds a redundant power supply for the 4RU frame.	ACU4-REDPSU	1
ME 1	Adds the UHDTV1 ME 1 option.	ACU4-UHD-ME1	1
ME 2	Adds the UHDTV1 ME 2 option.	ACU4-UHD-ME2	1
ME 3	Adds the UHDTV1 ME 3 option.	ACU4-UHD-ME3	1
12G MultiProcessor Input board	Adds two 12G MultiProcessor Input boards with 20 input BNCs (5 × 12Gb/s Single-Link UHD-2SI and 3Gb/s Quad-Link UHD-2SI/UHD-QSD signals) each.	ACU4-UHD-MULTIPROC12G-IN	2
12G Output board	Adds a 12G Output board with 20 output BNCs (5 × 12Gb/s Single-Link UHD-2SI and 3Gb/s Quad-Link UHD-2SI/UHD-QSD signals).	ACU4-UHD-12G-OUT	1

Option	Description	Code	Qty.
Control Panel Tallies, 36-72	Adds tally options up to 72 tallies.	AP-TALLY-72	1
Extended Warranty (Panel)	Adds two additional years to the standard 1-year warranty on the panel.	A2XP-ROSSCARE	2
Extended Warranty (Frame)	Adds two additional years to the standard 1-year warranty on the 4RU frame with 3 MEs.	ACU4-ROSSCARE-ME3	2
Auxiliary Control Panel	Adds the Auxiliary Control Panel (Backsplash) that has the same number of source buttons as the A2X control panel.	AP-AUX2RU32	1
Commissioning	Adds 3-days of on-site commissioning of your new switcher.	ACUITY-COM-1DAY	3

Control Panel Options

These options apply to the Acuity™ control panel.

Standard Acuity™ Control Panel

Any Acuity™ control panel can be matched with either Acuity™ frame and have full access to all the features that are available from the frame. The size of the control panel only limits the number of source buttons, panel rows, and tallies, and the placement of modules.

Option	Description
A1S-PANEL	A single panel row with 24 source and custom control buttons, VESA mountable touchscreen display, USB ports for keyboard or mouse control, 1,000 switcher memories, preview overlay, 36 parallel tally outputs, panel glow and user defined button color schemes, and 1-year transferable warranty with lifetime fader handle warranty.
A2M-PANEL	The same features as the previous panel, but with two panel rows with 24 source and custom control buttons each.

Option	Description
A2X-PANEL	The same features as the previous panel, but with two panel rows with 32 source and custom control buttons each.
A3M-PANEL	The same features as the previous panel, but with three panel rows with 24 source and custom control buttons each.
A3-PANEL	The same features as the previous panel, but with three panel rows with 32 source and custom control buttons each.
A4-PANEL	The same features as the previous panel, but with four panel rows with 40 source and custom control buttons each.

Option	Description
A2XDD-PANEL	The same features as the previous panel, but with two panel rows with 30 source buttons and 29 custom control buttons each.
A3MDD-PANEL	The same features as the previous panel, but with three panel rows with 22 source buttons and 21 custom control buttons each.
A3DD-PANEL	The same features as the previous panel, but with three panel rows with 30 source buttons and 29 custom control buttons each.
A4DD-PANEL	The same features as the previous panel, but with four panel rows with 38 source buttons and 37 custom control buttons each.

Carbonite Black Control Panel

Support has been added for some Carbonite Black control panels. An ARP can be using to provide the menu system.

Option	Description
AP-CB1-PANEL	A single panel row with 16 source and custom control buttons, 4 key select and transition buttons, and a single transition area.
AP-CB2-PANEL	The same features as the CB1 panel, but with 2 panel rows.

Double-Down Acuity™ Control Panel

Any Acuity™ control panel can be matched with either Acuity™ frame and have full access to all the features that are available from the frame. The size of the control panel only limits the number of source buttons, panel rows, and tallies, and the placement of modules.

Option	Description
A1SDD-PANEL	A single panel row with 22 source buttons and 21 custom control buttons, VESA mountable touchscreen display, USB ports for keyboard or mouse control, 1,000 switcher memories, preview overlay, 36 parallel tally outputs, panel glow and user defined button color schemes, and 1-year transferable warranty with lifetime fader handle warranty.
A2MDD-PANEL	The same features as the previous panel, but with two panel rows with 22 source buttons and 21 custom control buttons each.

Acuity Rack Panel (AP-SERVER-PANEL)

The Acuity Rack Panel (ARP) server provides the hardware to host the Acuity Virtual Panel which is a browser based virtual representation of an Acuity™ control panel with menu system. The Acuity Rack Panel replaces the need for the control panel, with the exception of not having any of the ports (Remote and Tally) that are present on the back of the control panel, and is upgraded in the same way as a normal panel.

The tally ports on the frame can be used instead of the panel tallies.

Panel Row Delete

This option removes the top row of crosspoint and control modules from the control panel. This gives you the expandability you will need for the future without the initial cost.

This option can only be included when ordering your standard control panel, and is not available for the Double-Down control panels.

Option	Description
A2MP-ROW-DEL	Removes the top row of modules from the A2M control panel.
A2XP-ROW-DEL	Removes the top row of modules from the A2X control panel.
A2XDDP-ROW-DEL	Removes the top row of modules from the A2XDD control panel.
A3MP-ROW-DEL	Removes the top row of modules from the A3M control panel.
A3P-ROW-DEL	Removes the top row of modules from the A3 control panel.

Option	Description
A4P-ROW-DEL	Removes the top row of modules from the A4 control panel.

Panel Row Add

This option adds the top row of crosspoint and control modules to the control panel that were removed with the Panel Row Delete option.

Option	Description
A2MP-ROW-ADD	Adds the top row of modules to the A2M control panel.
A2XP-ROW-ADD	Adds the top row of modules to the A2X control panel.
A2XDDP-ROW-ADD	Adds the top row of modules to the A2XDD control panel.
A3MP-ROW-ADD	Adds the top row of modules to the A3M control panel.
A3P-ROW-ADD	Adds the top row of modules to the A3 control panel.
A4P-ROW-ADD	Adds the top row of modules to the A4 control panel.

Redundant Power (Panel Only)

The redundant power option adds an additional power supply to the control panel. In the event that one power supply should fail, or the power to that supply is interrupted, the other power supply carries the load of the control panel.

Option	Description
A1SP-REDPSU	Adds redundant power to the A1S control panel.
A2MP-REDPSU	Adds redundant power to the A2M control panel.
A2XP-REDPSU	Adds redundant power to the A2X control panel.
A3MP-REDPSU	Adds redundant power to the A3M control panel.
A3P-REDPSU	Adds redundant power to the A3 control panel.
A4P-REDPSU	Adds redundant power to the A4 control panel.
PSU-12V16A-6PIN	Adds redundant power to the CB1 control panel.
PSU-12V16A-6PIN	Adds redundant power to the CB2 control panel.

Auxiliary Control Panels

The Auxiliary Control Panel is designed to extend the control surface of your Acuity™ control panel by providing access to another source bus that can be quickly assigned to any aux bus on the switcher. Additional Auxiliary Control Panels can be daisy-chained together from the same external link port on the control panel. The maximum number of Auxiliary Control Panels that can be daisy-chained together depends on the size of the Auxiliary Control Panel.

- AP-AUX2RU24 – up to 6 daisy-chained together
- AP-AUX2RU32 – up to 6 daisy-chained together
- AP-AUX2RU40 – up to 4 daisy-chained together

The Auxiliary Control Panel is a self contained unit that has both primary and redundant power supplies. It is designed to mount either on the back of the control panel or into a desk.

Table 8: Auxiliary Control Panel

Option	Description
AP-AUX2RU24	Adds the Auxiliary Control Panel with a single panel row with 24 source buttons, 6 bank select and 8 aux buttons, and 14 control buttons. Fits the A1S, A2M, and A3M control panels.
AP-AUX2RU32	The same features as the previous panel, but with 32 source buttons. Fits the A2X and A3 control panels.
AP-AUX2RU40	The same features as the previous panel, but with 40 source buttons. Fits the A4 control panels.
PSU-12V4A-2PIN	Adds a redundant power supply for the Auxiliary Control Panel Panel.

Ultritouch

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

The DashBoard interface on Ultritouch provides control over aux bus source selections. You must connect to the switcher from Ultritouch to be able to control the switcher functions. Refer to the Ultritouch documentation for information

on navigating the Ultritouch menu and manually connecting to a device.

Table 9: Auxiliary Control Panel

Option	Description
ULTRITOUCH-2	Adds the 2RU Ultritouch adaptable system control panel.
ULTRITOUCH-PS	Adds a redundant power supply for Ultritouch.

Extended Warranty (Panel Only)

Extends the standard one-year warranty on your control panel by one year. Additional years can be purchased if required.

Option	Description
A1SP-ROSSCARE	Extends the warranty on the A1S by a year.
A1SDDP-ROSSCARE	Extends the warranty on the A1SDD by a year.
A2MP-ROSSCARE	Extends the warranty on the A2M by a year.
A2MDDP-ROSSCARE	Extends the warranty on the A2MDD by a year.
A2XP-ROSSCARE	Extends the warranty on the A2X by a year.
A2XDDP-ROSSCARE	Extends the warranty on the A2XDD by a year.
A3MP-ROSSCARE	Extends the warranty on the A3M by a year.
A3MDDP-ROSSCARE	Extends the warranty on the A3MDD by a year.
A3P-ROSSCARE	Extends the warranty on the A3 by a year.
A3DDP-ROSSCARE	Extends the warranty on the A3DD by a year.
A4P-ROSSCARE	Extends the warranty on the A4 by a year.
A4DDP-ROSSCARE	Extends the warranty on the A4DD by a year.
CB1-PANEL-ROSSCARE	Extends the warranty on the CB1 by a year.
CB2-PANEL-ROSSCARE	Extends the warranty on the CB2 by a year.

Audio Control Module

The Audio Control module provides eight motorized audio faders with source mnemonics that can be mapped to audio channels, or groups, from an audio mixer controlled by the switcher.

When ordering a module with a new control panel, you must specific the empty slot on the control panel that you want the module installed into. Refer to *Panel Dimensions with Slot Locations* on page 37 for slot locations.

Option	Description
AP-AUDIO-SL1	Installs the Audio Control module in slot 1 of your control panel. Can only be ordered with a new control panel.
AP-AUDIO-SL2	Installs the Audio Control module in slot 2 of your control panel. Can only be ordered with a new control panel.
AP-AUDIO-SL3	Installs the Audio Control module in slot 3 of your control panel. Can only be ordered with a new control panel.
AP-AUDIO-UPG	Provides the Audio Control module as a field upgrade kit. Can only be ordered for an existing control panel installation.
AP-SIDESLIDE-E	Provides the Audio Control module in a SideBoxNet enclosure. The SideBoxNet enclosure allows you to mount a single module separate from your control panel. Each enclosure has independent primary and secondary power supplies and an ethernet port to connect the enclosure to your switcher.

Shot Box Module

The Shot Box module provides an additional 28 assignable custom control buttons. Custom Controls from various banks can be grouped together on a single Shot Box Page. Each Shot Box can access up to 28 pages of buttons.

CUSTOM CONTROL SHOT BOX

When ordering a module with a new control panel, you must specific the empty slot on the control panel that you want the module installed into. Refer to *Panel Dimensions with Slot Locations* on page 37 for slot locations.

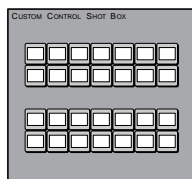| Option	Description
AP-SHOTBOX-SL1	Installs the Shot Box module in slot 1 of your control panel. Can only be ordered with a new control panel.
AP-SHOTBOX-SL2	Installs the Shot Box module in slot 2 of your control panel. Can only be ordered with a new control panel.
AP-SHOTBOX-SL3	Installs the Shot Box module in slot 3 of your control panel. Can only be ordered with a new control panel.
AP-SHOTBOX-UPG	Provides the Shot Box module as a field upgrade kit. Can only be ordered for an existing control panel installation.
AP-SIDESHOT-E	Provides the Shot Box module in a SideBoxNet enclosure. The SideBoxNet enclosure allows you to mount a single module separate from your control panel. Each enclosure has independent primary and secondary power supplies and an ethernet port to connect the enclosure to your switcher.

Extended Panel Tallies

The control panel comes with 36 tally relays. Additional tallies can be added in 36-tally increments. The maximum number of tallies that can be added depends on the model of control panel. Each tally option only adds 36 additional tallies. If you want 108 tallies, you must order the 72 and 108 tallies options.

Option	Description
AP-TALLY-72	Installs 36 additional tallies to all control panels for a total of 72 tallies.
AP-TALLY-108	Installs 36 additional tallies to the A4 control panel for a total of 108 tallies.

Replacement Mnemonics (AP-8MNEMONIC)

In the event that the mnemonics on one of your Crosspoint modules needs to be replaced, this option provides a replacement kit with an 8-mnemonic board and installation instructions.

Replacement Touchscreen Display (AP-TOUCHSCREEN-A)

A replacement touchscreen display kit can be ordered as a field replacement of the touchscreen display that comes with the control panel. You cannot use more than one touchscreen display at the same time.

Replacement Control Panel Modules

Replace an existing module that came installed in your control panel.

Use the same module ordering code for all sizes of control panels.
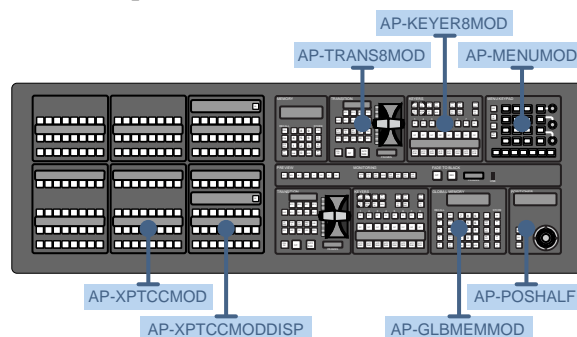
Option	Description
AP-KEYER8MOD	A replacement 8-Key Keyer module.
AP-TRANS8MOD	A replacement 8-Key Transition module.
AP-XPTMOD	A replacement Crosspoint Bus module. This module is only used on the upper rows of the control panel.
AP-DD-XPTMOD	A replacement Double-Down Crosspoint Bus module. This module is only used on the upper rows of the control panel.
AP-XPTMODDISP	A replacement Crosspoint Bus module with display. This module in only used in the right-most position of the upper rows of the control panel.

Option	Description
AP-DD-XPTMODDISP	A replacement Double-Down Crosspoint Bus module with display. This module in only used in the right-most position of the upper rows of the control panel.
AP-XPTCCMOD	A replacement Crosspoint/Custom Control Bus module. This module is only used on the bottom row of the control panel.
AP-DD-XPTCCMOD	A replacement Double-Down Crosspoint/Custom Control Bus module. This module is only used on the bottom row of the control panel.
AP-XPTCCMODDISP	A replacement Crosspoint/Custom Control Bus module with display. This module in only used in the right-most position of the bottom row of the control panel.
AP-DD-XPTCCMODDISP	A replacement Double-Down Crosspoint/Custom Control Bus module with display. This module in only used in the right-most position of the bottom row of the control panel.
AP-GLBMEMMOD	A replacement Global Memory module. Only one module of this type can be installed in the control panel.
AP-MENUMOD	A replacement Menu Keypad module. Only one module of this type can be installed in the control panel.
AP-POSHALF	A replacement Positioner module. Only one module of this type can be installed in the control panel.

Vision Control Panel Upgrade for Acuity™

Using the Vision control panel with Acuity™ requires the addition of the Acuity™ Menu module and touchscreen to your existing control panel. The existing Vision touchscreen is not compatible with Acuity™.

Depending on the size of Vision control panel you have, you may not have space for the Menu module inside your control panel. An external version with the Menu module installed in a SideBox is available for all control panels.

Option	Description
AP-VISION-MENU-UPG	Adds a Menu module that is to be installed into an empty slot on the control panel and the Acuity™ touchscreen display.

Option	Description
AP-VISION-MENU-EXT-UPG	Adds a Menu module that is pre-installed into a SideBox and the Acuity™ touchscreen display.

Frame Options

These options apply to the Acuity™ frames.

Acuity™ Frame

Any Acuity™ frame can be matched with any Acuity™ control panel. The size of the frame set the maximum number of MEs, MultiViewers, video inputs, and video outputs you can have.

Option	Description
ACU4-UHD-FRAME-NOIO	A 4RU frame with support for up to 3 MEs or 6 MultiViewers, 15 video inputs, and 10 video outputs. The fames comes with no video input or output boards.
ACU8-UHD-FRAME-NOIO	A 8RU frame with support for up to 4 MEs or 8 MultiViewers, 30 video inputs, and 15 video outputs. The fames comes with no video input or output boards.

12G MultiProcessor Inputs

Each 12G MultiProcessor Input board provides 20 SDI input BNCs allowing for 5 12Gb/s Single-Link UHD-2SI and 3Gb/s Quad-Link UHD-2SI/UHD-QSD signals at 50Hz, 59.94Hz, and 60Hz, as well as video processing capabilities for frame synchronizers and format conversion (FSFC), an input-based MultiViewer, and input proc amps and color correctors.

- **4RU** — 3 × ACU4-MULTIPROC12G-IN for a total of 15 inputs
- **8RU** — 6 × ACU8-MULTIPROC12G-IN for a total of 30 inputs

12G Outputs

Each 12G Output board provides 20 SDI output BNCs allowing for 12Gb/s Single-Link UHD-2SI and 3Gb/s Quad-Link UHD-2SI/UHD-QSD signals at 50Hz, 59.94Hz, and 60Hz, as well as video processing capabilities for frame synchronizers and format conversion (FSFC.

- **4RU** — 2 × ACU4-12G-OUT for a total of 10 outputs
- **8RU** — 3 × ACU8-12G-OUT for a total of 15 outputs

Reference with Tally (ACU8-REFGPIOTALLYCC)

This board provides an additional reference loop, 24 GPIs that can be assigned as inputs or outputs, 36 tallies, and 12 contact closures.

A single Reference with Tally comes standard with both the 4RU and 8RU frames. One additional board can be added to the 8RU frame.

MEs

Every ME option adds a 3G Video Processor board with the hardware to support the ME option.

ME options must be added in order starting with ME 1 (ACU4-UHD-ME1 or ACU8-UHD-ME1).

Note: *The ME and MultiViewer options use the same hardware and cannot both be active at the same time. For example, ME 1 and MultiViewer 8 use the same hardware and cannot both be on at the same time.*

Table 10: 4RU Frame Options

Option	Description
ACU4-UHD-ME1	Adds UHDTV1 ME 1, providing 4 keyers, 8 channels of 2D DVE, 1 channel of ME-Store, and a dual border generators with advanced key trails and key smear. This option cannot be combined with the ACU4-MV5 and ACU4-MV6 options.
ACU4-UHD-ME2	Adds ME 2 with the same features as above. This option cannot be combined with the ACU4-MV3 and ACU4-MV4 options.
ACU4-UHD-ME3	Adds ME 3 with the same features as above. This option cannot be combined with the ACU4-MV1 and ACU4-MV2 options.

Table 11: 8RU Frame Options

Option	Description
ACU8-UHD-ME1	Adds ME 1, providing 4 keyers, 8 channels of 2D DVE, 2 channels of ME-Store, and a dual border generators with advanced key trails and key smear. This option cannot be combined with the ACU8-MV7 and ACU8-MV8 option.
ACU8-UHD-ME2	Adds ME 2 with the same features as above. This option cannot be combined with the ACU8-MV5 and ACU8-MV6 options.

Option	Description
ACU8-UHD-ME3	Adds ME 3 with the same features as above. This option cannot be combined with the ACU8-MV3 and ACU8-MV4 options.
ACU8-UHD-ME4	Adds ME 4 with the same features as above. This option cannot be combined with the ACU8-MV1 and ACU8-MV2 options.

MultiViewers

The switcher does not come with any MultiViewers as standard. Every MultiViewer option adds a 3G Video Processor board with the hardware to support the MultiViewer option.

The MultiViewer option can either be ordered as a standalone MultiViewer or a MultiViewer with 2 floating 3D DVE keys. The floating 3D DVEs are available to every ME in the switcher. Only the first 4 MultiViewer options can include the floating 3D DVE.

Tip: *Any ME can be turned into a MultiViewer at no additional cost, but at the loss of the ME.*

MultiViewer options must be added in order starting with MultiViewer 1 (ACU4-MV1 or ACU8-MV1).

Note: *The ME and MultiViewer options use the same hardware and cannot both be active at the same time. For example, ME 1 and MultiViewer 8 use the same hardware and cannot both be on at the same time.*

Table 12: 4RU Frame Options

Option	Description
ACU4-MV1	Adds MultiViewer 1, providing 4 MultiViewer heads that can display up to 32 sources in 41 independent layouts. All MultiViewer heads share the same pool of 32 sources. This option cannot be combined with the ACU4-UHD-ME3 option.
ACU4-UHD-FLOAT-3DDVE-1	Adds MultiViewer 1 and 2 with the same features as above with the addition of 2 floating 3D DVE keys. This option cannot be combined with the ACU4-UHD-ME3 option.
ACU4-MV2	Adds MultiViewer 2 with the same features as above. This option cannot be combined with the ACU4-UHD-ME3 option.
ACU4-MV3	Adds MultiViewer 3 with the same features as above. This option cannot be combined with the ACU4-UHD-ME2 option.

Option	Description
ACU4-MV4	Adds MultiViewer 4 with the same features as above. This option cannot be combined with the ACU4-UHD-ME2 option.
ACU4-MV5	Adds MultiViewer 5 with the same features as above. This option cannot be combined with the ACU4-UHD-ME1 option.
ACU4-MV6	Adds MultiViewer 6 with the same features as above. This option cannot be combined with the ACU4-UHD-ME1 option.

Table 13: 8RU Frame Options

Option	Description
ACU8-MV1	Adds MultiViewer 1, providing 4 MultiViewer heads that can display up to 32 sources in 41 independent layouts. All MultiViewer heads share the same pool of 32 sources. This option cannot be combined with the ACU8-UHD-ME4 option.
ACU8-MV2	Adds MultiViewer 2 with the same features as above. This option cannot be combined with the ACU8-UHD-ME4 option.
ACU8-UHD -FLOAT-3DDVE-1	Adds MultiViewer 1 and 2 with the same features as above with the addition of 2 floating 3D DVE keys. This option cannot be combined with the ACU8-UHD-ME4 option.
ACU8-MV3	Adds MultiViewer 3 with the same features as above. This option cannot be combined with the ACU8-UHD-ME3 option.
ACU8-MV4	Adds MultiViewer 4 with the same features as above. This option cannot be combined with the ACU8-UHD-ME3 option.
ACU8-UHD -FLOAT-3DDVE-2	Adds MultiViewer 3 and 4 with the same features as above with the addition of 2 floating 3D DVE keys. This option cannot be combined with the ACU8-UHD-ME4 option.
ACU8-MV5	Adds MultiViewer 5 with the same features as above. This option cannot be combined with the ACU8-UHD-ME2 option.
ACU8-MV6	Adds MultiViewer 6 with the same features as above. This option cannot be combined with the ACU8-UHD-ME2 option.

Option	Description
ACU8-MV7	Adds MultiViewer 7 with the same features as above. This option cannot be combined with the ACU8-UHD-ME1 option.
ACU8-MV8	Adds MultiViewer 8 with the same features as above. This option cannot be combined with the ACU8-UHD-ME1 option.

3D DVE

The 3D DVE option allows every type of key to be squeezed or zoomed, cropped, repositioned, and rotated in 3D space. It can also perform 3D key or background transitions, or build sequences with complex timelines, keyframe editing, and quick sequence recall. 3D DVE also comes equipped with a positionable light source, preprocessor effects such as defocus, mosaic, posterization, colorization, strobe, picture frame borders, timeline sequences with holds, and a lot more.

Each 3D DVE option provides 1 channel of 3D DVE per ME. Each 3D DVE channel has 2 channel resources, allowing for up to 2 channel resources to be dedicated to each key. This allows you to fly a key, or combine two preset pattern keys in a single keyer for a 2-box. Preset pattern keys only use a single DVE channel resource and all other key types use 2.

Note: *3D DVE Warp effects are not available in UHDTV1.*

Table 14: 4RU Frame

Option	Description
ACU4-UHD-3DDVE-ME1	Adds 1 channel of 3D DVE to ME 1.
ACU4-UHD-3DDVE-ME2	Adds the same features as above to ME 2.
ACU4-UHD-3DDVE-ME3	Adds the same features as above to ME 3.

Table 15: 8RU Frame

Option	Description
ACU8-UHD-3DDVE-ME1	Adds 1 channel of 3D DVE to ME 1.
ACU8-UHD-3DDVE-ME2	Adds the same features as above to ME 2.
ACU8-UHD-3DDVE-ME3	Adds the same features as above to ME 3.
ACU8-UHD-3DDVE-ME4	Adds the same features as above to ME 4.

Port Expander

This option adds a Comtrol® DeviceMaster® with four (4) serial ports, effectively increasing the number of available panel remote ports for device control by four (4). The Comtrol® DeviceMaster® connects to the switcher over a single TCP/IP link and then to each device over a dedicated serial port that can be configured as either RS-232 or RS-422.

Option	Description
ACU4-NetExpander	Adds a Comtrol® DeviceMaster® to the 4RU frame.
ACU8-NetExpander	Adds a Comtrol® DeviceMaster® to the 8RU frame.

Device Support

The Acuity™ switcher comes standard with support for controlling external VTR (BVW-75), video servers (VDCP, AMP protocols), audio servers, and monitor walls, as well as devices that support the native RossTalk, serial tally, and Pbus protocols. Support for additional classes of devices can be added as required.

The functionality that is supported for a particular device depends on the protocol that is used to control the device and the features that the device has available. Visit the Ross Video *rossvideo.com/acuity-device/* for a complete list of supported devices.

Table 16: 4RU Frame

Option	Description
ACU4-ROUTER	Adds support for controlling a routing switcher to the 4RU frame.
ACU4-ROBOCAM	Adds support for controlling a robotic camera system to the 4RU frame.
ACU4-CGCII	Adds support for controlling a character generator to the 4RU frame.
ACU4-AUDMIXSM	Adds support for controlling a small audio mixer (16 and fewer inputs) to the 4RU frame.
ACU4-AUDMIXSMY	Adds support for controlling a Yamaha® O1V96 audio mixer to the 4RU frame.
ACU4-AUDMIXLG	Adds support for controlling a large audio mixer (17 and more inputs) to the 4RU frame.

Option	Description
ACU4-AUDMIXLGY	Adds support for controlling a large Yamaha® audio mixer, except the O1V96, to the 4RU frame.

Table 17: 8RU Frame

Option	Description
ACU8-ROUTER	Adds support for controlling a routing switcher to the 8RU frame.
ACU8-ROBOCAM	Adds support for controlling a robotic camera system to the 8RU frame.
ACU8-CGCII	Adds support for controlling a character generator to the 8RU frame.
ACU8-AUDMIXSM	Adds support for controlling a small audio mixer (16 and fewer inputs) to the 8RU frame.
ACU8-AUDMIXSMY	Adds support for controlling a Yamaha® O1V96 audio mixer to the 8RU frame.
ACU8-AUDMIXLG	Adds support for controlling a large audio mixer (17 and more inputs) to the 8RU frame.
ACU8-AUDMIXLGY	Adds support for controlling a large Yamaha® audio mixer, except the O1V96, to the 8RU frame.

Spare Parts Kit

The spare parts kit contains a number of field replaceable items that are susceptible to normal wear and tear. This includes replacement button caps, ethernet and power cables, hard drive, and compact flash.

Option	Description
ACU4-SPAREPARTS	Adds the spare parts kit for the 4RU frame.
ACU8-SPAREPARTS	Adds the spare parts kit for the 8RU frame.
ACU4-XPTANDFANKIT	Adds a spare 4RU Crosspoint and 4RU Fan board for the 4RU frame.
ACU8-XPTANDFANKIT	Adds a spare 8RU Crosspoint and 8RU Fan board for the 8RU frame.

Critical Spare Boards Kit

The critical spare boards kit includes replacement key system boards that are required for your switcher to operate. This

includes the Frame CPU, Crosspoint, Frame Fan, and Control Panel CPU boards.

Option	Description
ACU4 -CRITSPAREBOARDS	Adds the critical spare boards kit for the 4RU frame.
ACU8 -CRITSPAREBOARDS	Adds the critical spare boards kit for the 8RU frame.

Redundant Power (Frame Only)

The redundant power option adds additional power supplies to the frame. In the event that one power supply should fail, or the power to that supply is interrupted, the other power supply carries the load of the frame.

The number of power supplies provided for redundancy depends on the size of your frame.

Option	Description
ACU4-REDPSU	Adds redundant power to the 4RU frame.
ACU8-REDPSU	Adds redundant power to the 8RU frame.

Additional Manuals

The switcher already comes standard with a set of printed manuals. An additional set of printed manuals can be ordered as a spare, or a new set of printed manuals can be ordered for the latest software release. An electronic version of the manuals is always available for download from the Ross Video website, or from the control panel once the new software is installed.

Table 18: 4RU Frame Options

Option	Description
ACU4-MANUALENG	Adds a printed Setup manual to the 4RU frame.
ACU4-MANUALOPS	Adds a printed Operation manual to the 4RU frame.

Table 19: 8RU Frame Options

Option	Description
ACU8-MANUALENG	Adds a printed Setup manual to the 8RU frame.
ACU8-MANUALOPS	Adds a printed Operation manual to the 8RU frame.

Extended Warranty (Frame Only)

Extends the standard one-year warranty on your frame by one year. Additional years can be purchased if required.

When adding the extended warranty for your frame, quote the ordering code for the highest number of MEs in your switcher.

Table 20: 4RU Frame Extended Warranty Options

Option	Description
ACU4-UHD-ROSSCARE -ME1	Extends the warranty on the 4RU frame with 1 ME by a year.
ACU4-UHD-ROSSCARE -ME2	Extends the warranty on the 4RU frame with 2 MEs by a year.
ACU4-UHD-ROSSCARE -ME3	Extends the warranty on the 4RU frame with 3 MEs by a year.

Table 21: 8RU Frame Extended Warranty Options

Option	Description
ACU8-UHD-ROSSCARE -ME1	Extends the warranty on the 8RU frame with 1 ME by a year.
ACU8-UHD-ROSSCARE -ME2	Extends the warranty on the 8RU frame with 2 MEs by a year.
ACU8-UHD-ROSSCARE -ME3	Extends the warranty on the 8RU frame with 3 MEs by a year.
ACU8-UHD-ROSSCARE -ME4	Extends the warranty on the 8RU frame with 4 MEs by a year.

Training and Commissioning Options

Commissioning, 1-Day (ACUITY-COM-1DAY)

Once the customer has installed and cabled the equipment, a Ross Commissioning expert will come on site to get the switcher configured, verify that all peripheral interfaces are operating properly, provide a basic technical orientation, and help you get on the air.

Training is provided on the customer's equipment at their site. Expenses are extra, and billed at the completion of the visit. Ross Video cannot guarantee the availability of a local Trainer, as such, travel costs to all locations will be invoiced at cost. Two (2) days, or more, of training is recommended for multiple MLE systems. Four (4) weeks advanced scheduling notice is required. Additional days of training can be added if required.

Customers cancellation or rescheduling of services without seven (7) calendar days advanced notice will incur full invoice.

> *Note:* *Commissioning does not replace operator or technical training. Contact your Ross Video Sales Representative to discuss which types of assistance are best suited to your needs.*

Online Training, 1-Day (ACUITY-ONL-1DAY)

Comprehensive, web-based, online training is available from Ross Video trainers.

Two (2) days, or more, of training is recommended for multiple ME systems. Four (4) weeks advanced scheduling notice is required. Additional days of training can be added if required.

Customers cancellation or rescheduling of services without seven (7) calendar days advanced notice will incur full invoice.

Operations Training, 1-Day (ACUITY-OTR-1DAY)

Operations training is highly recommended to ensure that the process of taking your Ross Video switcher to air is a smooth one.

Training is provided on the customer's equipment at their site. Expenses are extra, and billed at the completion of the visit. Ross Video cannot guarantee the availability of a local Trainer, as such, travel costs to all locations will be invoiced at cost. Two (2) days, or more, of training is recommended for multiple MLE systems. Four (4) weeks advanced scheduling notice is required. Additional days of training can be added if required.

Customers cancellation or rescheduling of services without seven (7) calendar days advanced notice will incur full invoice.

Technical Training, 1-Day (ACUITY-OTT-1DAY)

Onsite technical training introduces the user to some of the technical aspects of switcher operation and maintenance. This includes, but is not limited to; Basic operation, Switcher installation and configurations, Peripheral interfaces, Video signal flow, System timing requirements, Circuit block diagrams, Circuit board overviews, Jumpers and indicators, Troubleshooting tips, Software upgrading, and Routine maintenance.

Training is provided on the customer's equipment at their site. Expenses are extra, and billed at the completion of the visit. Ross Video cannot guarantee the availability of a local Trainer, as such, travel costs to all locations will be invoiced at cost. Two (2) days, or more, of training is recommended for multiple MLE systems. Four (4) weeks advanced scheduling notice is required. Additional days of training can be added if required.

Customers cancellation or rescheduling of services without seven (7) calendar days advanced notice will incur full invoice.

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.

Table 22: Switcher Resources in SD/HD and UHDTV1 Modes

Resource	4RU HD	8RU HD	4RU UHDTV1	8RU UHDTV1
Custom Controls	2304 (48 Banks × 48 CCs)			
Custom Controls Running	96 (running at the same time)			
Aux Buses	64 (8 Banks × 8 Buses)			
Keyers per ME	8		4	
Proc Amp/Color Correctors per ME	2		1	
Input Proc Amp/Color Correctors per input	1^1			
Output Proc Amp/Color Correctors per Aux output	1^2			
Input Frame Synchs per input board	8^1		2^1	
Input Format Converters per input board	8^1		0	
Chroma Keys per ME	2		1	
2D DVE Channels per ME	16		8	
3D DVE Channels per ME	2^1		1^1	
3D DVE Warp channels per ME	1		0	
Maximum DVE Sequences	1,000			

Resource	4RU HD	8RU HD	4RU UHDTV1	8RU UHDTV1
Max AuxKeys	10	15	0	
Maximum GPI Inputs or Outputs	34 (10 fixed + 24 config)	58 (10 fixed + 48 config)	34 (10 fixed + 24 config)	58 (10 fixed + 48 config)
Maximum Fame Tallies	36	72	36	72
Maximum Contact Closures	12	24	12	24
Serial Remote Ports (panel)	8			
Serial Peripheral Ports (frame)	4			
Ethernet Ports (virtual)	64			
MultiViewers	6	8	6	8
Heads per MultiViewer	4	4	4	4
MultiProcessor Input MultiViewers (1 per board)	3	6	3	6
Maximum Video Inputs	60 (20 BNCs × 3 Boards)	120 (20 BNCs × 6 Boards)	15 (5 UHD-2SI × 3 Boards)	30 (5 UHD-2SI × 6 Boards)
Maximum Video Outputs	40 (20 BNCs × 2 Boards)	60 (20 BNCs × 3 Boards)	10 (5 UHD-2SI × 2 Boards)	15 (5 UHD-2SI × 3 Boards)
Max MEs	6	8	3	4
Memories	1,000 (100 Banks × 10 Memories)			
Mix/DSK Keyers	4		0	
MultiViewer Grids	41			
MultiViewer Layouts	50			
MultiViewer Input Sources	32			
MultiViewer Boxes	20			
Global-Store Channels	4	4	1 (vid+alpha)	1 (vid+alpha)
Global-Store RAM CACHE (Video)	4 Gigabytes			

Resource	4RU HD	8RU HD	4RU UHDTV1	8RU UHDTV1
Global-Store RAM CACHE (Audio)	4 Gigabytes			
ME-Store Channels	4	4	2 (vid+alpha)	2 (vid+alpha)
ME-Store RAM CACHE	8 Gigabytes per ME			
Clip Register List (VTR/Video Server)	31,837 Clips			

Notes:

[1] Only available on the MultiProcessor Input board.

[2] Output Proc Amp/Color Correctors are not available on the Evertz® IP Output board.

[3] A DVE channel is made up of 2 channel resources (video + alpha). These channel resources can be used separately for 2 Preset Pattern (**PST PATT**) keys per DVE channel.

Rack Requirements

The ambient temperature inside a rack-mount cabinet may be greater than the ambient temperature within a room. To ensure your switcher operates within its the maximum operating temperature range, maintain the following minimum dimensions within the equipment rack:

- 3 inches of clearance on both the right and left-hand sides of the switcher frame with unrestricted vertical airflow.
- 2RU of space, or the equivalent, for intake air at the bottom of the rack.
- 4RU of space, or the equivalent, for exhaust air at the top of the rack (open equipment rack top for example).

Hardware Weights

Hardware	Weight
4RU Frame	59lbs (26.8kg)
8RU Frame	92lbs (41.7kg)
A1S Panel	48lbs (21.8kg)
A2M Panel	57lbs (25.9kg)
A2X Panel	62lbs (28.1kg)

Hardware	Weight
A3 Panel	75lbs (34.0kg)
A3M Panel	74lbs (33.6kg)
A4 Panel	103lbs (46.7kg)

Operating Temperature

The switcher has been qualified at an operational temperature range of **0-35°C (32-95°F)**.

System Timing

The switcher has the following system timing characteristics:

- All video inputs are zero-time relative to reference input
- Auto timing correct for inputs out of sync by up to ± ¼ line (16us)

LTC Timecode Input

Specification	Value
Signal Level	0.5-2.0V (1.0V nominal)
Termination	600 ohm, soft-selectable

Video Input Specifications

Input Specification	Value
Equalization (using Belden 1694A cable)	>40m @ 12Gb/s
	>50m @ 3Gb/s
	>75m @ 1.5Gb/s
	>150m @ 270Mb/s (5°-40°C)
Impedance	75 ohms, terminating
Video Inputs, SDI	SMPTE 259M/292M/424M/ST-2082 (non-looping)
Reference Inputs (non-terminating, looping)	Standard Definition — analog black
	High Definition — tri-level sync

Video Output Specifications

Output Specification	Value
Return Loss	>4dB 6GHz to 12GHz
	>7dB 3GHz to 6GHz
	>10dB 1.485GHz to 3GHz
	>15dB 5MHz to 1.485GHz
Timing Jitter	UHD Video Format - <8.0UI
	HD Video Format - <1UI
	SD Video Format - <0.2UI
Alignment Jitter	UHD Video Format - <0.3UI
	HD Video Format - <0.2UI
	SD Video Format - <0.2UI
Rise and Fall Time	UHD Video Format - <10% amplitude
	HD Video Format - <240ps
	SD Video Format - 450ps to 700ps
Signal Level	800mV ±10%
DC Offset	0 Volts
Overshoot	<8%
Video Outputs (SDi)	UHD Video Format - SMPTE ST 2082-1:2015 (Amendment 1:2016)
	HD Video Format - 10-bit SMPTE 292M/424M
	SD Video Format - 10-bit SMPTE 259M-C

Power Rating

Table 23: Input Voltage

Component	Power Rating
Panel	90-250V~
	47-63Hz
Frame	100-120V~
	220-240V~
	47-63Hz
	9A 650W
	(Canada 120V~ only)

Table 24: Power Consumption

Component	Power Consumption (Full Load)
4RU Frame	1022W
8RU Frame	1412W
A1S Panel	159W
A2M Panel	247W
A2X Panel	289W
A3M Panel	340W
A3 Panel	379W
A4 Panel	526W

Serial Ports

The serial ports on the back of the frame and control panel support the RS-232 (TIA/EIA-232) and RS-422 (TIA/EIA-422) transmission standards.

The serial ports us a female DB9 connector.
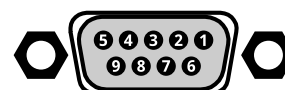
Table 25: Peripheral Port Pinouts

Pin	RS-232	RS-422
1	n/c	Odd/Even Tx+
2	Rx	Tx-
3	Tx	Rx+
4	Ground	Ground
5	Ground	Ground
6	n/c	Odd/Even Tx-
7	n/c	Tx+
8	n/c	Rx-
9	n/c	5V 1K Pull-up

Table 26: Remote Port Pinouts

Pin	RS-232	RS-422
1	n/c	n/c
2	Tx	Rx-
3	Rx	Tx+
4	Ground	Ground
5	Ground	Ground
6	n/c	n/c

Pin	RS-232	RS-422
7	n/c	Rx+
8	n/c	Tx-
9	n/c	5V 1K Pull-up

External Link Ports

The External Link ports use a female RJ-45 connector.
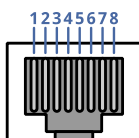
Table 27: External Link Port Pinouts

Pin	Signal
1	Rx+
2	Rx-
3	Tx+
4	PMC_SDI_Load+
5	PMC_SDI_Load-
6	Tx-
7	PMC_SDI_Latch+
8	PMC_SDI_Latch-

GPI Ports

There are GPI ports located on two types of boards in the frame. The GPI I/O port is located on the Frame CPU board in slot A, and the GPIO ports are located on the Reference with Tally board in slot G in the 4RU frame and slot L and M in the 8RU fame.

The GPI ports use a female DB25 connector.
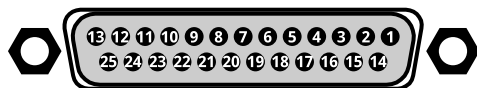
Table 28: GPI I/O Port Pinouts (Frame CPU)

Pin	Signal
1	Ground
2	n/c
3	n/c
4	GPI In 10
5	GPI In 9
6	GPI In 8
7	GPI In 7
8	GPI In 6
9	GPI In 5
10	GPI In 4
11	GPI In 3
12	GPI In 2
13	GPI In 1
14	n/c
15	n/c
16	GPI Out 10
17	GPI Out 9
18	GPI Out 8
19	GPI Out 7
20	GPI Out 6
21	GPI Out 5
22	GPI Out 4
23	GPI Out 3
24	GPI Out 2
25	GPI Out 1

Table 29: GPIO Port Pinouts (Reference with Tally)

Pin	Signal
1	Ground
2	GPI I/O 1
3	GPI I/O 2
4	GPI I/O 3
5	GPI I/O 4
6	GPI I/O 5
7	GPI I/O 6
8	GPI I/O 7
9	GPI I/O 8
10	GPI I/O 9
11	GPI I/O 10
12	GPI I/O 11
13	GPI I/O 12
14	GPI I/O 13
15	GPI I/O 14
16	GPI I/O 15

Pin	Signal
17	GPI I/O 16
18	GPI I/O 17
19	GPI I/O 18
20	GPI I/O 19
21	GPI I/O 20
22	GPI I/O 21
23	GPI I/O 22
24	GPI I/O 23
25	GPI I/O 24

Tally Ports

There are tally ports on the control panel and the frame. The tally ports 1 and 2 on the control panel and the frame have the same pinouts. On the frame, the tally ports are identified by the slot and the port number.

The tally ports use a female DB25 connector.
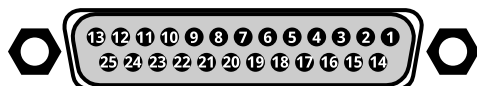
Table 30: Tally Rating

Specification	Value
Type	Solid-State Contact Closure
Input Voltage	100VDC
Maximum Current	120mA

Note: *Tally ports 3 through 6 on the control panel are used for the extended tallies option and require the extended tallies hardware to be installed before they can be used.*

Table 31: Panel Tally Locations

Pin	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
1	1	19	37	55	73	91
2	3	21	39	57	75	93
3	5	23	41	59	77	95
4	7	25	43	61	79	97
5	9	27	45	63	81	99
6	11	29	47	65	83	101
7	13	31	49	67	85	103
8	15	33	51	69	87	105
9	17	35	53	71	89	107
10	Common					

Pin	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
11	Common					
12	Common					
13	Common					
14	2	20	38	56	74	92
15	4	22	40	58	76	94
16	6	24	42	60	78	96
17	8	26	44	62	80	98
18	10	28	46	64	82	100
19	12	30	48	66	84	102
20	14	32	50	68	86	104
21	16	34	52	70	88	106
22	18	36	54	72	90	108
23	Common					
24	Common					
25	Common					

Contact Closure Ports

The contact closure (CtCl) ports are located at the back of the frame and use a female DB25 connector.
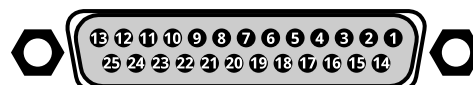
Table 32: Contact Closure Rating

Specification	Value
Type	Solid-State Contact Closure
Input Voltage	100VDC
Maximum Current	120mA

Table 33: Contact Closure Locations

Pin	Port 1
1	CtCl 1 Out
2	CtCl 2 Out
3	CtCl 3 Out
4	CtCl 4 Out
5	CtCl 5 Out
6	CtCl 6 Out
7	CtCl 7 Out
8	CtCl 8 Out
9	CtCl 9 Out

Pin	Port 1
10	CtCl 10 Out
11	CtCl 11 Out
12	CtCl 12 Out
13	n/c
14	CtCl 1 Common
15	CtCl 2 Common
16	CtCl 3 Common
17	CtCl 4 Common
18	CtCl 5 Common
19	CtCl 6 Common
20	CtCl 7 Common
21	CtCl 8 Common
22	CtCl 9 Common
23	CtCl 10 Common
24	CtCl 11 Common
25	CtCl 12 Common

Ordering Codes

Refer to the individual sections for more detailed information on each option.

Table 34: Acuity® Control Panel Options

	A1S	A2M	A2X	A3M	A3	A4
Standard Acuity™ Control Panel	A1S-PANEL	A2M-PANEL	A2X-PANEL	A3M-PANEL	A3-PANEL	A4-PANEL
Double-Down Acuity® Control Panel	A1SDD-PANEL	A2MDD-PANEL	A2XDD-PANEL	A3MDD-PANEL	A3DD-PANEL	A4DD-PANEL
Acuity Rack Panel	AP-SERVER-PANEL					
Panel Row - Add (Standard Panel)		A2MP-ROW-ADD	A2XP-ROW-ADD	A3MP-ROW-ADD	A3P-ROW-ADD	A4P-ROW-ADD
Panel Row - Add (Double-Down Panel)			A2XDDP-ROW-ADD			
Panel Row - Delete (Standard Panel)		A2MP-ROW-DEL	A2XP-ROW-DEL	A3MP-ROW-DEL	A3P-ROW-DEL	A4P-ROW-DEL
Panel Row - Delete (Double-Down Panel)			A2XDDP-ROW-DEL			
Redundant Power (Panel Only)	A1SP-REDPSU	A2MP-REDPSU	A2XP-REDPSU	A3MP-REDPSU	A3P-REDPSU	A4P-REDPSU
Auxiliary Control Panel - 24 Buttons with Mnemonics	AP-AUX2RU24	AP-AUX2RU24		AP-AUX2RU24		
Auxiliary Control Panel - 32 Buttons with Mnemonics			AP-AUX2RU32		AP-AUX2RU32	
Auxiliary Control Panel - 40 Buttons with Mnemonics						AP-AUX2RU40
Auxiliary Control Panel - Redundant Power	PSU-12V4A-2PIN					
Ultritouch Adaptable System Control Panel	ULTRITOUCH-2					
Ultritouch Redundant Power	ULTRITOUCH-PS					
Extended Panel Tallies, 72 Total		AP-TALLY-72				
Extended Panel Tallies, 108 Total						AP-TALLY-108
Extended Warranty, 1 Year (Standard Panel Only)	A1SP-ROSSCARE	A2MP-ROSSCARE	A2XP-ROSSCARE	A3MP-ROSSCARE	A3P-ROSSCARE	A4P-ROSSCARE
Extended Warranty, 1 Year (Double-Down Panel Only)	A1SDDP-ROSSCARE	A2MDDP-ROSSCARE	A2XDDP-ROSSCARE	A3MDDP-ROSSCARE	A3DDP-ROSSCARE	A4DDP-ROSSCARE
Panel Module - Audio Control (Field Upgrade)	AP-AUDIO-UPG					
Panel Module - Audio Control (Slot 1)	AP-AUDIO-SL1			AP-AUDIO-SL1	AP-AUDIO-SL1	AP-AUDIO-SL1
Panel Module - Audio Control (Slot 2)	AP-AUDIO-SL2					AP-AUDIO-SL2
Panel Module - Audio Control (Slot 3)	AP-AUDIO-SL3					

	A1S	A2M	A2X	A3M	A3	A4
Panel Module Replacement - 8-Key Keyer	AP-KEYER8MOD					
Panel Module Replacement - 8-Key Transition	AP-TRANS8MOD					
Panel Module Replacement - Crosspoint	AP-XPTMOD					
Panel Module Replacement - Double-Down Crosspoint	AP-DD-XPTMOD					
Panel Module Replacement - Crosspoint with Display	AP-XPTMODDISP					
Panel Module Replacement - Double-Down Crosspoint with Display	AP-DD-XPTMODDISP					
Panel Module Replacement - Crosspoint/Custom Control	AP-XPTCCMOD					
Panel Module Replacement - Double-Down Crosspoint/Custom Control	AP-DD-XPTCCMOD					
Panel Module Replacement - Crosspoint/Custom Control with Display	AP-XPTCCMODDISP					
Panel Module Replacement - Double-Down Crosspoint/Custom Control with Display	AP-DD-XPTCCMODDISP					
Panel Module Replacement - Global Memory	AP-GLBMEMMOD					
Panel Module Replacement - Menu Keypad Module	AP-MENUMOD					
Panel Module Replacement - Positioner	AP-POSHALF					
Panel Module - Shot Box (Field Upgrade)	AP-SHOTBOX-UPG					
Panel Module - Shot Box (Slot 1)	AP-SHOTBOX-SL1		AP-SHOTBOX-SL1	AP-SHOTBOX-SL1	AP-SHOTBOX-SL1	AP-SHOTBOX-SL1
Panel Module - Shot Box (Slot 2)	AP-SHOTBOX-SL2			AP-SHOTBOX-SL2	AP-SHOTBOX-SL2	AP-SHOTBOX-SL2
Panel Module - Shot Box (Slot 3)						AP-SHOTBOX-SL3
Replacement Mnemonics	AP-8MNEMONIC					
Replacement Touchscreen Display	AP-TOUCHSCREEN-A					
Ethernet SideBox Module - SideShotNet	AP-SIDESHOT-E					
Ethernet SideBox Module - SideSlideNet	AP-SIDESLIDE-E					

Table 35: Carbonite Black Control Panels

	CB1	CB2
Carbonite Black Control Panel	AP-CB1-PANEL	AP-CB2-PANEL
Extended Warranty	CB1-PANEL-ROSSCARE	CB2-PANEL-ROSSCARE
Redundant Power	PSU-12V16A-6PIN	

Table 36: Frame Options

	4RU	8RU
Acuity™ 4RU Frame (no I/O boards)	ACU4-UHD-FRAME-NOIO	
Acuity™ 8RU Frame (no I/O boards)		ACU8-UHD-FRAME-NOIO
12G MultiProcessor Input (20 Additional)	ACU4-UHD-MULTIPROC12G-IN	ACU8-UHD-MULTIPROC12G-IN
12G Output (20 Additional)	ACU4-UHD-12G-OUT	ACU8-UHD-12G-OUT
Reference with Tally		ACU8-REFGPIOTALLYCC
ME 1 - Add	ACU4-UHD-ME1	ACU8-UHD-ME1
ME 2 - Add	ACU4-UHD-ME2	ACU8-UHD-ME2
ME 3 - Add	ACU4-UHD-ME3	ACU8-UHD-ME3
ME 4 - Add		ACU8-UHD-ME4
MultiViewer 1 - Add	ACU4-MV1	ACU8-MV1
MultiViewer 2 - Add	ACU4-MV2	ACU8-MV2
MultiViewer 3 - Add	ACU4-MV3	ACU8-MV3
MultiViewer 4 - Add	ACU4-MV4	ACU8-MV4
MultiViewer 5 - Add	ACU4-MV5	ACU8-MV5
MultiViewer 6 - Add	ACU4-MV6	ACU8-MV6
MultiViewer 7 - Add		ACU8-MV7
MultiViewer 8 - Add		ACU8-MV8
MultiViewer 1 & 2 with Floating 3D DVE - Add	ACU4-UHD-FLOAT-3DDVE-1	ACU8-UHD-FLOAT-3DDVE-1
MultiViewer 3 & 4 with Floating 3D DVE - Add		ACU8-UHD-FLOAT-3DDVE-2
3D DVE for ME 1	ACU4-UHD-3DDVE-ME1	ACU8-UHD-3DDVE-ME1
3D DVE for ME 2	ACU4-UHD-3DDVE-ME2	ACU8-UHD-3DDVE-ME2
3D DVE for ME 3	ACU4-UHD-3DDVE-ME3	ACU8-UHD-3DDVE-ME3
3D DVE for ME 4		ACU8-UHD-3DDVE-ME4
Port Expander (Ethernet to Serial)	ACU4-NetExpander	ACU8-NetExpander
Routing Switcher Interface	ACU4-ROUTER	ACU4-ROUTER
Audio Mixer Interface - Small (16 and fewer inputs)	ACU4-AUDMIXSM	ACU8-AUDMIXSM
Audio Mixer Interface - Yamaha 01V96	ACU4-AUDMIXSMY	ACU8-AUDMIXSMY
Audio Mixer Interface - Large (17 and more inputs)	ACU4-AUDMIXLG	ACU8-AUDMIXLG

	4RU	8RU
Audio Mixer Interface - Yamaha Mixers (except 01V96)	ACU4-AUDMIXLGY	ACU8-AUDMIXLGY
Robotic Camera System Interface	ACU4-ROBOCAM	ACU8-ROBOCAM
Character Generator Interface	ACU4-CGCII	ACU8-CGCII
Spare Parts Kit	ACU4-SPAREPARTS	ACU8-SPAREPARTS
Spare Crosspoint and Fan board Kit	ACU4-XPTANDFANKIT	ACU8-XPTANDFANKIT
Critical Spare Boards Kit	ACU4-CRITSPAREBOARDS	ACU8-CRITSPAREBOARDS
Redundant Power (Frame Only)	ACU4-REDPSU	ACU8-REDPSU
Manual - Engineering	ACU4-MANUALENG	ACU8-MANUALENG
Manual - Operation	ACU4-MANUALOPS	ACU8-MANUALOPS
Extended Warranty, 1 ME (Adds 1 Year)	ACU4-UHD-ROSSCARE-ME1	ACU8-UHD-ROSSCARE-ME1
Extended Warranty, 2 ME (Adds 1 Year)	ACU4-UHD-ROSSCARE-ME2	ACU8-UHD-ROSSCARE-ME2
Extended Warranty, 3 ME (Adds 1 Year)	ACU4-UHD-ROSSCARE-ME3	ACU8-UHD-ROSSCARE-ME3
Extended Warranty, 4 ME (Adds 1 Year)		ACU8-UHD-ROSSCARE-ME4

Table 37: Vision Upgrade Options

	V1	V1M	V2	V2M	V2X	V3	V3M	V4
Internal Menu Module	AP-VISION-MENU-UPG				AP-VISION-MENU-UPG			
External Menu Module	AP-VISION-MENU-EXT-UPG							

Table 38: Training and Commissioning

|	
Commissioning - 1 Day	ACUITY-COM-1DAY
Online Training - 1 Day	ACUITY-ONL-1DAY
Operations Training - 1 Day	ACUITY-OTR-1DAY
Technical Training - 1 Day	ACUITY-OTT-1DAY

Panel Dimensions with Slot Locations

These dimensions are provided as a guide only. Contact Ross Video Technical Support for scale CAD drawings of the control panels and frames. The standard and Double-Down control panels are the same size.

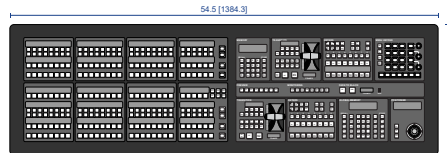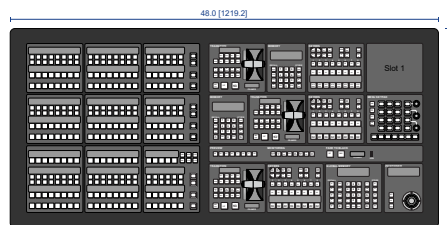Dimensions are in inches with metric dimensions shown in brackets [mm].
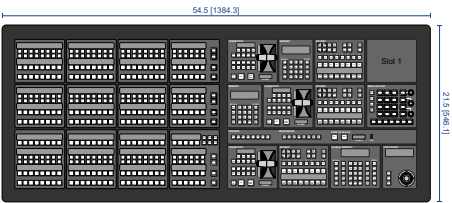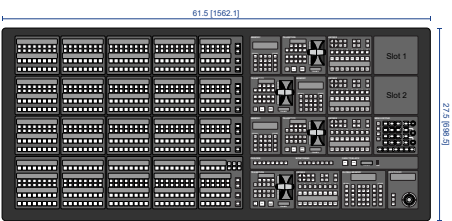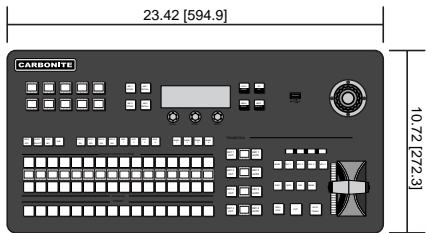
A1S/A1SDD
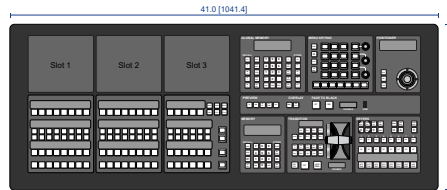
A2M/A2MDD
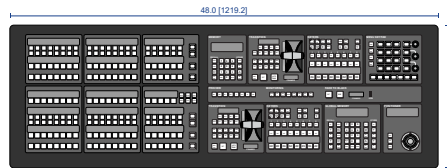
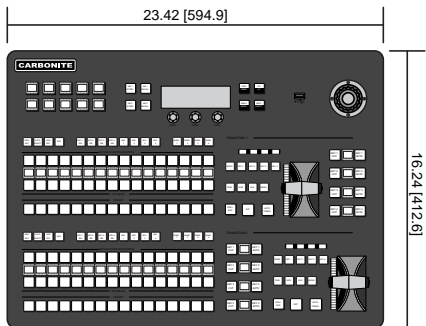## A2X/A2XDD

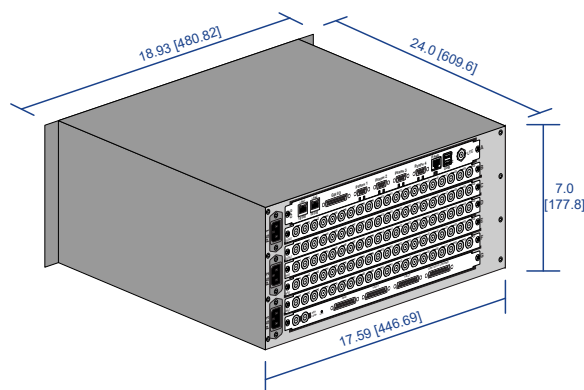## A3M/A3MDD

A3/A3DD

A4/A4DD

CB1

CB2

Frame Dimensions

These dimensions are provided as a guide only. Contact Ross Video Technical Support for scale CAD drawings of the control panels and frames. The standard and Double-Down control panels are the same size.

Dimensions are in inches with metric dimensions shown in brackets [mm].

4RU

8RU