RH10UC

**SD to HD Upconverter
R-series Card Module**

Installation and Operation
Guide

Because it matters.

AJA

VIDEO SYSTEMS

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Notice

Contacting Support

To contact AJA Video for sales or support, use any of the following methods:

180 Litton Drive, Grass Valley, CA. 95945 USA

Telephone: 800.251.4224 or 530.274.2048
Fax: 530.274.9442

Web: http://www.aja.com
Support Email: support@aja.com
Sales Email: sales@aja.com

When calling for support, have all information at hand prior to calling.

Limited Warranty

AJA Video warrants that this product will be free from defects in materials and workmanship for a period of five years from the date of purchase. If a product proves to be defective during this warranty period, AJA Video, at its option, will either repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

In order to obtain service under this warranty, you the Customer, must notify AJA Video of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. The Customer shall be responsible for packaging and shipping the defective product to a designated service center nominated by AJA Video, with shipping charges prepaid. AJA Video shall pay for the return of the product to the Customer if the shipment is to a location within the country in which the AJA Video service center is located. Customer shall be responsible for paying all shipping charges, insurance, duties, taxes, and any other charges for products returned to any other locations.

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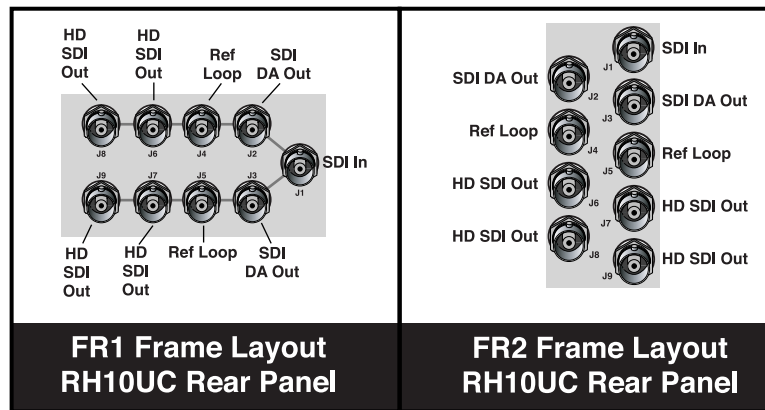
Features

- Full 10-bit broadcast quality SD to HD upconverter mode of operation
- HD Framesync mode of operation
- 8/10 bit SMPTE 259 SDI input, 2 re-clocked outputs
- 8/10 bit SMPTE 292 HD-SDI output, 4 outputs
- 8 Channels of Embedded SDI Audio are supported in Upconvert mode (audio is not supported in HD Framesync mode)
- bi/tri-level sync genlock input, 2 BNC loop-through with adjustable output timing
- 4:3 or 16:9 SD inputs
- 4:3 to 16:9 conversion modes:
    4:3 pillar box (4:3 image in center of screen, black sidebars)
    14:9 pillar box (4:3 image zoomed to fill a 14:9 image, black sidebars)
    Full Screen (for anamorphic inputs)
    Letterbox (input 16:9 letterbox is zoomed to full screen)
    Widezoom (a combination of zoom and horizontal stretch to fill 16:9 screen; will introduce a small aspect ratio error)
- Separate multipoint H and V filters
- Motion adaptive interpolation
- 16 bit coefficients, 16 bit internal data paths
- Accurate 16 bit SD to HD colorspace conversion
- 1 slot AJA FR1 or FR2 frame

Upconverter Specifications

Table 1.

Item	Specification
Input	SDI (525 or 625) in Upconvert Mode HD SDI (1080i or 720p) in HD Framesync Mode
Output	HD SDI (1080i or 720p)
Delay	1 Frame. Audio is delayed to compensate for the delay through the video path.
Power	7 Watts

I/O Connections

HD SDI Out · HD SDI Out · Ref Loop · SDI DA Out · J8 · J6 · J4 · J2 · SDI In · J9 · J7 · J5 · J3 · J1 · HD SDI Out · HD SDI Out · Ref Loop · SDI DA Out

FR1 Frame Layout RH10UC Rear Panel

SDI In · SDI DA Out · J1 · J2 · SDI DA Out · J3 · Ref Loop · J4 · Ref Loop · J5 · HD SDI Out · J6 · HD SDI Out · J7 · HD SDI Out · J8 · HD SDI Out · J9

FR2 Frame Layout RH10UC Rear Panel

FR1 and FR2 BNC Connector Assignments, RH10UC Card Module

When the RH10UC module is installed in an AJA FR1 or FR2 frame, a corresponding group of 9 BNCs on the rear panel then provide I/O for the module. The illustration above shows the connector assignments for both the FR1 and FR2 when used with the RH10UC.

Installation

Typically, RH10UC installation consists of the following:

1. disconnect power from the frame (remove line cord)
2. remove the FR1/FR2 front panel
3. install RH10UC card module
4. replace the FR1/FR2 front panel
5. apply power to the frame by connecting a north american-style power cord from the frame to mains power (90 to 260 VAC)

Warning!

Ensure Mains Power is disconnected before installing the FR1 or FR2 frame R-series modules into the frame, or installing and removing options. If a Mains switch is not provided, the power cord(s) of this equipment provide the means of disconnection. The socket outlet must be installed near the equipment and must be easily accessible.

Warning!

FR2 Dual Power Cord Notice—please read this. To reduce the risk of electrical shock, disconnect both power cords before servicing equipment.

Caution!

The FR1/FR2 front fan door is heavy and is not hinged. Remove with Caution.

Instructions for removing the frame front door for module installation is discussed in the *FR1/FR2 User Manual.*

User Controls

The user interface for the RH10UC consists of two toggle switches and a 4-character alphanumeric display. See the photo "*RH10UC User Interface Controls*" that follows for control location and function.

The *Parameter Select* (PS) switch selects a parameter for adjustment and viewing on the display. Once a desired parameter is selected by moving the PS switch, you then use the other switch—called *Parameter Adjust* (PA)—to make a change to the parameter setting. Both switches are toggle switches that can be pushed to the right or left, allowing you to move forward or backward through available choices. After actuation, either switch will return to a middle position.

If you move a switch and hold it in place (left or right), the RH10UC will sense this and auto-increment or decrement.

By default, the 4-character display shows the current status of the RH10UC—referred to as status mode. When you're adjusting parameters or settings, the display changes from status mode to adjust mode to show the new value settings or parameters. After a period of inactivity the display always reverts to status mode.

Switches
Toggle
Left and Right

PS Switch
Parameter Select

PA Switch
Parameter Adjust

4-Character
Display
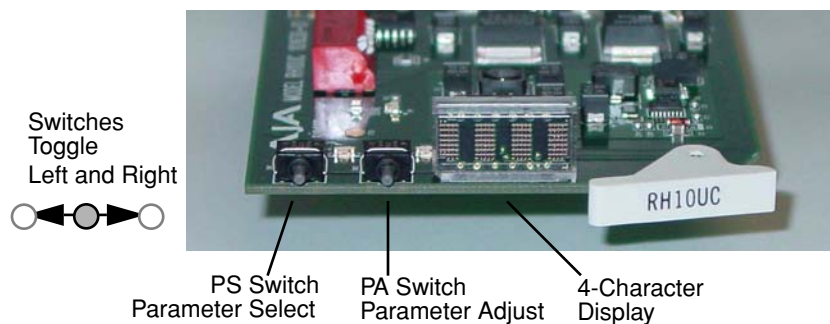
RH10UC User Interface Controls

Normal Operation Status Mode

The RH10UC display by default will show you which inputs are present, any detected error conditions, and the functional mode the board is in (upconverting, downconverting, HD/SD framesync, etc.). After the board is powered on, it enters *status mode* and stays there until a toggle switch is selected and you enter *adjust mode*. After 5 seconds of inactivity in adjust mode, it then returns to status mode.

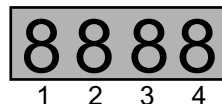While in status mode, the 4-character display indicates the following:

8888
1 2 3 4

Table 2.

Character #	Indicates
1	S—Standard Definition (SD) input signal present E—Error on input signal H—High definition signal present (HD Framesync mode only)
2	Blank—not used
3 or 4	Mode Mnemonic: these codes show what the board is doing 　　UP—up convert 　　HF—High Definition Framesync

Editing and Viewing Board Settings Adjust Mode

Moving the PS switch in either direction causes the RH10UC to enter *adjust mode.* When this happens, the display will change to indicate the parameter being shown/edited.

Table 3.

Character #	Indicates
1	Normally displays parameter number 0 through 9, and A to Z (some numbers and letters are currently not used—only those used will be discussed in this document). If the parameter value (see below) exceeds 3-digits, this display character will also be used so 4-digits of the value can be viewed.
1 to 4	A 1 to 4-character code that indicates a parameter value. Usually the value will be shown in characters 2 through 4, except when the value requires all 4 characters.

When a parameter is shown in adjust mode, the last selected parameter is shown in character 1 and the current parameter value is shown in characters 2 through 4—if the value exceeds 3 digits, then all 4 characters in the display are used to show the value. Parameter choices and their definitions are listed in a table on the following page.

Selecting Parameters

Move the PS switch to the left to increment the parameter number or move it to the right to decrement the parameter number. Characters 2 through 4 will change to reflect the settings of these parameters as they are incremented/decremented.

Editing Parameters

When a parameter has been selected with the PS switch, use the PA switch to then change the parameter value (as displayed by characters 2 through 4) to another value. Like the PS switch, you'll move PA switch to the left or

right to scroll through the setting choices. When a desired choice is found, simply leave it at that choice to select it.

Changing Operating Modes

Changing the selection in Param 0 from "UP" to "HF" selects the operating mode of the board and results in alternate sets of parameters and definitions. The two tables that follow show the parameter choices and definitions available when the board is in Upconvert or HD Framesync mode. Making a change in Param 0 results in an alternate bitfile to be loaded and the HD Framesync H and V output timing params to be loaded into the registers. During the bitfile loading process you may notice a short delay when the switches are not responsive. After the process completes, the unit will return to the status display.

In the Status display, which is active when the unit's switches have not been toggled for 5 seconds or more, an "H" will appear in the character 1 position if the unit is in HD Framesync mode—and there is a valid HD signal present on both the video input and the genlock input (the two must match).

Parameter Choices and Definitions When in Upconvert Mode

Table 4.

Parameter (Character 1)	Definitions (Choices are shown in italics)

0	Selects a Mode of operation for the board. Choices are:
	        UP—up convert
	        HF—high definition framesync

1	Output Format. Choices are:
	        Ii—1080i 59.94Hz
	        7p—720p 59.94Hz
	        A—automatic; output follows the tri-sync input (default)

2	Upconvert Mode. Choices are:
	        43—4x3 pillar box format
	        14—14x9 pillar box format (default)
	        FS—full-screen (anamorphic display) format
	        LB—16x9 letterbox input to full
	        WZ—wide zoom format

5	Output Timing Mode, Set Reference Source. Choices are:
	
	        R—reference input
	        I—video input
	        F—free run (default)

6	ON—allows VITC timecode and Closed Caption (CC) information to be passed on lines 20 and 21. OFF—lines 20 and 21 are blanked (default).

Table 4.

Parameter (Character 1)	Definitions (Choices are shown in italics)
7	Freeze Video ON—Freezes the output video. OFF—Not Frozen (default).
8	Generate test pattern: ON—75% color bars OFF—none (default)
9	ON—Sharp Vertical Filter. Results in sharper image, with increased edge artifacts. OFF—Standard Vertical Filter (default). Provides the best possible image, although edges are not as sharp.
A	Display SD Input Format, possible values are: A—No input detected AERR— Input error detected A525—SD 525 A625—SD 625
H	Output Timing Adjust—Horizontal The maximum range changes based on the output frame rate and the frame geometry. Switch adjusts value by pixels to shift horizontally. The factory defaults are zero-timed values as measured empirically at AJA. They are given in the table below. The RH10UC remembers H and stores it in flash, recalling it as needed when the output frame rate or geometry changes. Refer to the H and V Parameter Reference Table appearing later in this manual for value ranges.
V	Output Timing Adjust—Vertical The maximum range changes based on the output frame rate and the frame geometry. Switch adjusts value by lines in frame. V delays are signed numbers, with zero timing relative to the reference signal noted as zero ("0"). Zero is the factory default for both V timing parameters. The RH10UC remembers V and stores it in flash, recalling it as needed when the output frame rate or geometry changes. Refer to the H and V Parameter Reference Table that follows for ranges.
I	Information—shows current software version
W	Set RH10UC To Factory Defaults To set all values to factory defaults, select Param W, and move the adjust switch to the right. This will set all parameters in the system to factory values. After a 5 second inactivity time-out, the values will be written to flash. If all the values in the system match the factory defaults, either through adjustment or by setting them as above, the display for param W will be "WFAC". If any of the values are different, the display for param W will simply be "W".

Parameter Choices and Definitions When in HD Framesync mode

Table 5.

Parameter (Character 1)	Definitions (Choices are shown in italics)
0	Selects a Mode of operation for the board. Choices are: UP—up convert HF—high definition framesync
5	Output Timing Mode, Set Reference Source. Choices are: R—reference input I—video input F—free run (default)
7	Freeze Video ON—Freezes the output video. OFF—Not Frozen (default).
A	Display HD Input Format, possible values are: A—No input detected AERR— Input error detected A1p2—HD1080psf 23.98 A1i6—HD 1080i 59.94 or 1080i 60 A1i5—HD 1080i 50 A7p6—HD 720p 59.94 or 720p 60
V	Output Timing Adjust—Vertical The maximum range changes based on the output frame rate and the frame geometry. Switch adjusts value by lines in frame. V delays are signed numbers, with zero timing relative to the reference signal noted as zero ("0"). Zero is the factory default for both V timing parameters. The RH10UC remembers V and stores it in flash, recalling it as needed when the output frame rate or geometry changes. Refer to the H and V Parameter Reference Table that follows for ranges.
H	Output Timing Adjust—Horizontal The maximum range changes based on the output frame rate and the frame geometry. Switch adjusts value by pixels to shift horizontally. The factory defaults are zero-timed values as measured empirically at AJA. They are given in the table below. The RH10UC remembers H and stores it in flash, recalling it as needed when the output frame rate or geometry changes. Refer to the H and V Parameter Reference Table that follows for ranges.
I	Information—shows current software version

Table 5.

Parameter (Character 1)	Definitions (Choices are shown in italics)
W	Set RH10UC To Factory Defaults To set all values to factory defaults, select Param W, and move the adjust switch to the right. This will set all parameters in the system to factory values. After a 5 second inactivity time-out, the values will be written to flash. If all the values in the system match the factory defaults, either through adjustment or by setting them as above, the display for param W will be "WFAC". If any of the values are different, the display for param W will simply be "W".

H and V Parameter Reference Table For Upconvert Mode

Output Geometry @ FR	Min V Delay	Zero-timed V Delay	Max V Delay	Min H Delay	Zero-timed H Delay	Max H Delay
1080i @ 29.97 Hz	-999	0	562	0	1877	2199
1080i @ 25 Hz	-999	0	562	0	2014	2639
720p @ 59.94 Hz	-749	0	740	0	1304	1649
720p @ 50 Hz	-749	0	740	0	1304	1649

H and V Parameter Reference Table For HD Framesync Mode

Output Geometry @ FR	Min V Delay	Zero-timed V Delay	Max V Delay	Min H Delay	Zero-timed H Delay	Max H Delay
1080i @ 29.97 Hz	-999	0	5	0	2134	2199
1080i @ 25 Hz	-999	0	5	0	68	2639
1080psf @ 23.98 Hz	-999	0	5	0	2134	2749
720p @ 59.94 Hz	-749	0	5	0	0	1649
720p @ 50 Hz	-749	0	5	0	1100	1979

External Reference Information

The RH10UC expects the External Reference to be an HD Tri-level sync signal. The Reference must be consistent with the Output Format selection. If the Output Format selection is "A" for automatic - the RH10UC will detect the format of the Tri-level sync input and set the Output Format to the detected format. If no reference is provided, the RH10UC will lock to the input video.

The External Reference input can come from two different sources on the RH10UC. There are jumpers on the RH10UC (see figure below) for selecting the external reference source and for optionally terminating the selected reference source.

Looping Reference

The RH10UC cell group of 9 BNCs contains two BNCs that can be used for a looping reference connection. If this method is used, then the reference select setting on the RH10UC should be set to "LOOP" and the TERMINATION setting should be set to "OFF" (no termination). Optionally, if you're using only one of the looping reference BNCs, then the TERMINATION setting should be set to "ON."
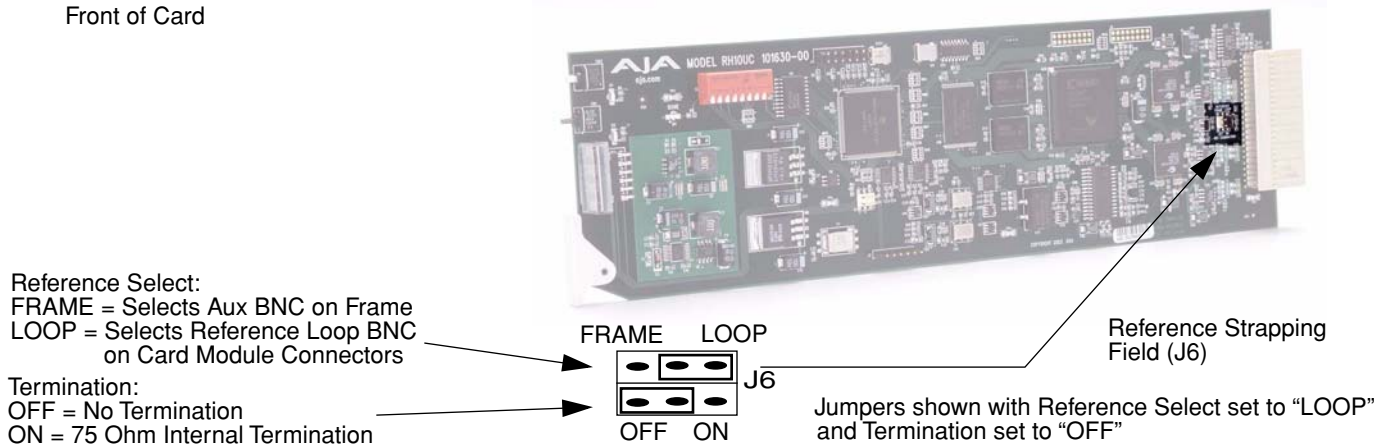
Frame Reference

Alternatively, the RH10UC installed in a FR1 or FR2 frame can use the frame's frame reference input BNC connector, which feeds an external reference video signal to all modules installed in the frame. How the signal is distributed differs for the FR1 and FR2 frames. Additionally, individual modules can usually be strapped as to whether external reference is distributed from the frame or directly to BNCs on the module's corresponding cell group (the 9 BNCs on the rear panel).

FR1 Frame: the external reference signal is distributed passively to all frame modules. If you wish to use the frame reference, the RH10UC should have "FRAME" reference selected on the module strapping, and one and only one card in the frame should have "TERMINATION" set to "ON." All other cards in the frame should have TERMINATION set to "OFF."

FR2 Frame: the external reference signal is distributed by an in-frame distribution amplifier to all frame modules. This system terminates the Frame Reference input BNC and buffers the signal to all slots. If using frame reference, the RH10UC installed in the FR2 frame should have "FRAME" set for reference select, and all cards should have TERMINATION set to "OFF."


Front of Card

Reference Select:
FRAME = Selects Aux BNC on Frame
LOOP = Selects Reference Loop BNC
        on Card Module Connectors

Termination:
OFF = No Termination
ON = 75 Ohm Internal Termination

FRAME   LOOP

J6

OFF   ON

Reference Strapping
Field (J6)

Jumpers shown with Reference Select set to "LOOP"
 and Termination set to "OFF"

Reference Select and Termination Configuration

RH10UC Aspect Ratio Modes

4:3 Upconverts To →→→ These displays on 16:9

Full Screen
or
"Anamorphic"

4:3

16:9
or
"Letterbox"

14:9

Wide Zoom
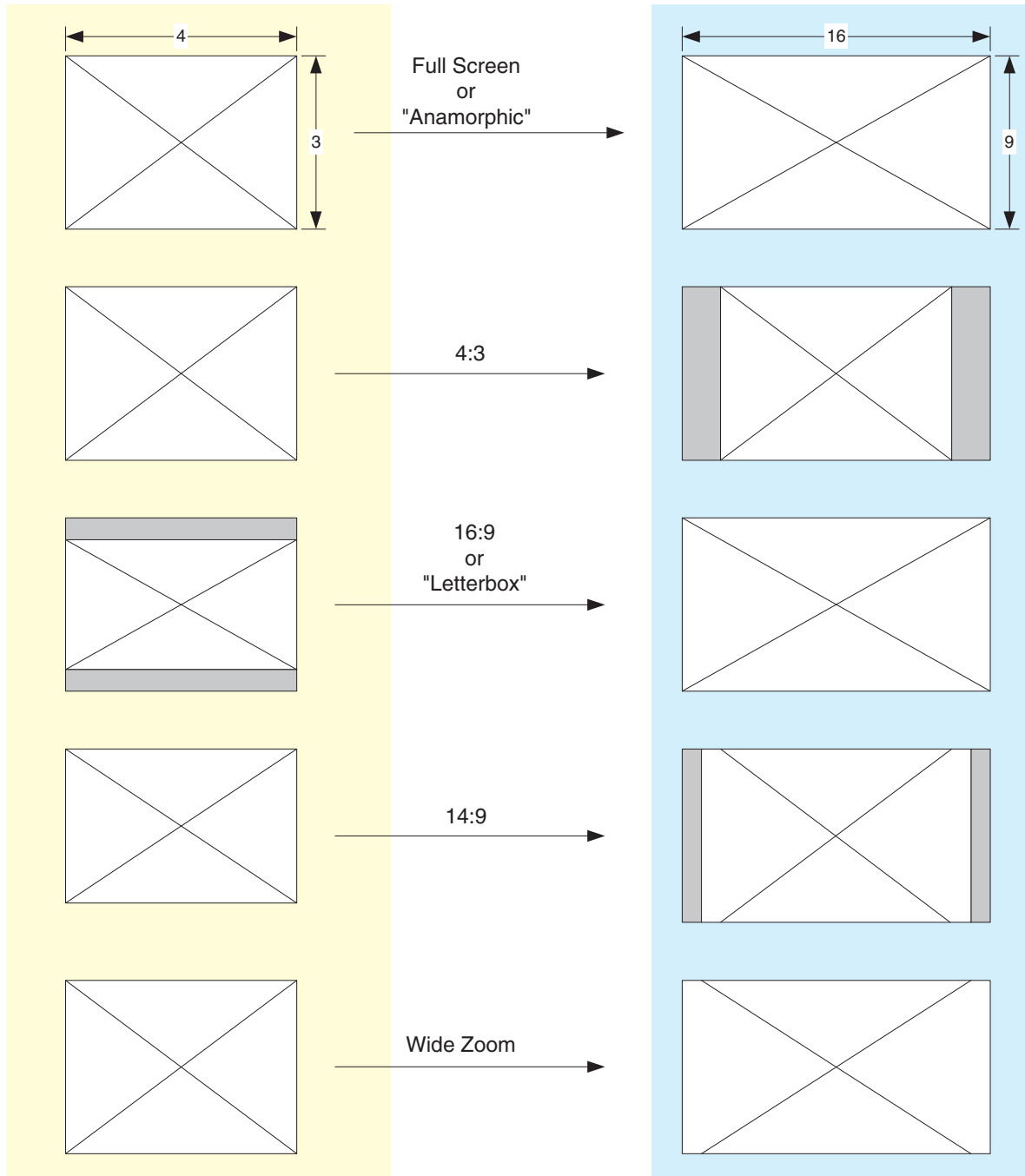
Specifications

Item	Specification
Input Formats	525/59.94, 625/50, SMPTE 259M
Output Formats	1080i 50/59.94, 720p 59.94 Hz (50Hz output requires 50 Hz input)
Upconversion	Motion adaptive, Multi-point interpolation, 10-bit processing
Inputs	SDI, BNC
Reference	2 x BNC, looping
Outputs	Input Loop, 2 x BNC, Equalized HD-SDI, 4 x BNC
User Controls	Mode: Upconvert, Frame Synchronizer, Output Format, Aspect Ratio Convert Select, and Output Timing
Size:	Fits AJA R-Series Frames Compatible With Leitch® 6800 Series Frames
Power Consumption:	6 watts

Appendix A: Safety & Compliance

Federal Communications Commission (FCC) Compliance Notices

Class A Interference Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15, Subpart B of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. 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. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Canadian ICES Statement

Canadian Department of Communications Radio Interference Regulations

This digital apparatus does not exceed the Class A limits for radio-noise emissions from a digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications. This Class A digital apparatus complies with Canadian ICES-003.

Règlement sur le brouillage radioélectrique du ministère des Communications

Cet appareil numérique respecte les limites de bruits radioélectriques visant les appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique du ministère des Communications du Canada. Cet appareil numérique de la Classe A est conforme à la norme NMB-003 du Canada.

European Union and European Free Trade Association (EFTA) Regulatory Compliance

This equipment may be operated in the countries that comprise the member countries of the European Union and the European Free Trade Association. These countries, listed in the following paragraph, are referred to as The European Community throughout this document:

AUSTRIA, BELGIUM, BULGARIA, CYPRUS, CZECH REPUBLIC, DENMARK, ESTONIA, FINLAND, FRANCE, GERMANY, GREECE, HUNGARY, IRELAND, ITALY, LATVIA, LITHUANIA, LUXEMBOURG, MALTA, NETHERLANDS, POLAND, PORTUGAL, ROMANIA, SLOVAKIA, SLOVENIA, SPAIN, SWEDEN, UNITED KINGDOM, ICELAND, LICHTENSTEIN, NORWAY, SWITZERLAND

Declaration of Conformity

Marking by this symbol indicates compliance with the Essential Requirements of the EMC Directive of the European Union 2004/108/EC.

$C\epsilon$

This equipment meets the following conformance standards:

Safety:

CB- IEC 60065:2001 + A1:2005

NRTL - UL 60065:2003 R11.06, CSA C22.2 NO. 60065:2003 + A1:06

GS - EN 60065:2002 + A1

Additional licenses issued for specific countries available on request.

Emissions:

EN 55103-1: 1996

EN61000-3-2:2006, EN61000-3-3:1995 +A1:2001 +A2:2005

Immunity:

EN 55103-2: 1996

EN61000-4-2:1995 + A1:1999 + A2:2001, EN61000-4-3:2006, EN61000-4-4:2004,

EN 61000-4-5: 2005, EN 610004-6:2007, EN61000-4-11:2004

The product is also licensed for additional country specific standards as required for the International Marketplace.

Warning!

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take appropriate measures.

Achtung! Dieses ist ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten, in welchen Fällen der Benutzer für entsprechende Gegenmaßnahmen verantwortlich ist.

Attention! Ceci est un produit de Classe A. Dans un environnement domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l'utilisateur de prendre les mesures spécifiques appropriées.

Korea KCC Compliance Statement

1) Class A ITE

A급 기기 (업무용 방송통신기기)	이 기기는 업무용 (A 급) 으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

1) Class A device

Class A (Broadcasting and Communication Equipment for Business Use)	Please note that this equipment has obtained EMC registration for business use (Class A), and it is intended to use in other than home area.

Taiwan Compliance Statement

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻
干擾，在這種情況下，使用者會被要求採取某些適當的對策。

This is a Class A product based on the standard of the Bureau of Standards, Metrology and Inspection (BSMI) CNS 13438, Class A.

Japanese Compliance Statement

1. Class A ITE

この装置は、クラスA 情報技術装置です。この装置を家庭環境で使用すると電波妨害

を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求され

ることがあります。ＶＣＣＩ－Ａ

This is a Class A product based on the standard of the VCCI Council (VCCI V-3/2008.04). If this equipment is used in a domestic environment, radio interference may occur, in which case, the user may be required to take corrective actions.

Translated caution statements, warning conventions and warning messages

The following caution statements, warning conventions, and warning messages apply to this product and manual.

Warning Symbol   Caution Symbol

Before operating your unit, please read the instructions in this document

Warning!

Read and follow all warning notices and instructions marked on the product or included in the documentation.

Avertissement ! Lisez et conformez-vous à tous les avis et instructions d'avertissement indiqués sur le produit ou dans la documentation.

Warnung! Lesen und befolgen Sie die Warnhinweise und Anweisungen, die auf dem Produkt angebracht oder in der Dokumentation enthalten sind.

¡Advertencia! Lea y siga todas las instrucciones y advertencias marcadas en el producto o incluidas en la documentación.

Aviso! Leia e siga todos os avisos e instruções assinalados no produto ou incluídos na documentação.

Avviso! Leggere e seguire tutti gli avvisi e le istruzioni presenti sul prodotto o inclusi nella documentazione.

Warning!

Do not use this device near water and clean only with a dry cloth.

Avertissement! N'utilisez pas cet appareil près de l'eau et nettoyez-le seulement avec un tissu sec..

Warnung! Das Gerät nicht in der Nähe von Wasser verwenden und nur mit einem trockenen Tuch säubern.

¡Advertencia! No utilice este dispositivo cerca del agua y límpielo solamente con un paño seco.

Aviso! Não utilize este dispositivo perto da água e limpe-o somente com um pano seco.

Avviso! Non utilizzare questo dispositivo vicino all'acqua e pulirlo soltanto con un panno asciutto.

Warning!

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

Avertissement ! Ne bloquez aucune ouverture de ventilation. Suivez les instructions du fabricant lors de l'installation.

Warnung! Die Lüftungsöffnungen dürfen nicht blockiert werden. Nur gemäß den Anweisungen des Herstellers installieren.

¡Advertencia! No bloquee ninguna de las aberturas de la ventilación. Instale de acuerdo con las instrucciones del fabricante.

Aviso! Não obstrua nenhuma das aberturas de ventilação. Instale de acordo com as instruções do fabricante.

Avviso! Non ostruire le aperture di ventilazione. Installare in conformità con le istruzioni del fornitore.

Warning!

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

Avertissement ! N'installez pas l'appareil près d'une source de chaleur telle que des radiateurs, des bouches d'air de chauffage, des fourneaux ou d'autres appareils (amplificateurs compris) qui produisent de la chaleur.

Warnung! Nicht in der Nähe von Wärmequellen wie Heizkörpern, Heizregistern, Öfen oder anderen Wärme erzeugenden Geräten (einschließlich Verstärkern) aufstellen.

¡Advertencia! No instale cerca de fuentes de calor tales como radiadores, registros de calor, estufas u otros aparatos (incluidos amplificadores) que generan calor.

Aviso! Não instale perto de nenhuma fonte de calor tal como radiadores, saídas de calor, fogões ou outros aparelhos (incluindo amplificadores) que produzam calor.

Avviso! Non installare vicino a fonti di calore come termosifoni, diffusori di aria calda, stufe o altri apparecchi (amplificatori compresi) che emettono calore.

Warning!

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

Avertissement ! Référez-vous au personnel de service qualifié pour tout entretien. L'entretien est exigé quand l'appareil a été endommagé de quelque manière que ce soit, par exemple lorsque le cordon d'alimentation ou la prise sont endommagés, que du liquide a été versé ou des objets sont tombés dans l'appareil, que l'appareil a été exposé à la pluie ou à l'humidité, ne fonctionne pas normalement ou est tombé.

Warnung! Das Gerät sollte nur von qualifizierten Fachkräften gewartet werden. Eine Wartung ist fällig, wenn das Gerät in irgendeiner Weise beschädigt wurde, wie bei beschädigtem Netzkabel oder Netzstecker, falls Flüssigkeiten oder Objekte in das Gerät gelangen, das Gerät Regen oder Feuchtigkeit ausgesetzt wurde, nicht ordnungsgemäß funktioniert oder fallen gelassen wurde.

¡Advertencia! Consulte al personal calificado por cuestiones de reparación. El servicio de reparación se requiere cuando el dispositivo ha recibido cualquier tipo de daño, por ejemplo cable o espigas dañadas, se ha derramado líquido o se han caído objetos dentro del dispositivo, el dispositivo ha sido expuesto a la lluvia o humedad, o no funciona de modo normal, o se ha caído.

Aviso! Remeta todos os serviços de manutenção para o pessoal de assistência qualificado. A prestação de serviços de manutenção é exigida quando o dispositivo foi danificado mediante qualquer forma, como um cabo de alimentação ou ficha que se encontra danificado/a, quando foi derramado líquido ou caíram objectos sobre o dispositivo, quando o dispositivo foi exposto à chuva ou à humidade, quando não funciona normalmente ou quando foi deixado cair.

Avviso! Fare riferimento al personale qualificato per tutti gli interventi di assistenza. L'assistenza è necessaria quando il dispositivo è stato danneggiato in qualche modo, ad esempio se il cavo di alimentazione o la spina sono danneggiati, è stato rovesciato del liquido è stato rovesciato o qualche oggetto è caduto nel dispositivo, il dispositivo è stato esposto a pioggia o umidità, non funziona correttamente o è caduto.

Caution!

This device is a Class A product. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to take whatever measures may be necessary to correct the interference at their own expense.

Attention! Le périphérique est un produit de Classe A. Le fonctionnement de cet équipement dans une zone résidentielle risque de causer des interférences nuisibles, auquel cas l'utilisateur devra y remédier à ses propres frais.

Achtung! Dies ist ein Gerät der Klasse A. Bei Einsatz des Geräts in Wohngebieten kann es Störungen des Radio- und Fernsehempfangs verursachen. In diesem Fall muss der Benutzer alle notwendigen Maßnahmen ergreifen, die möglicherweise nötig sind, um die Störungen auf eigene Rechnung zu beheben.

¡Precaución! Este es un producto clase A. El uso de este equipo en áreas residenciales puede causar interferencias nocivas, en cuyo caso, se requerirá que los usuarios tomen cualquier medida necesaria para corregir la interferencia por cuenta propia.

Cuidado! Este dispositivo é um produto Classe A. Operar este equipamento em uma área residencial provavelmente causará interferência prejudicial; neste caso, espera-se que os usuários tomem as medidas necessárias para corrigir a interferência por sua própria conta.

Attenzione! Questo dispositivo è un prodotto di Classe A. Il funzionamento di questo apparecchio in aree residenziali potrebbe causare interferenze dannose, nel cui caso agli utenti verrà richiesto di adottare tutte le misure necessarie per porre rimedio alle interferenze a proprie spese.

Warning!

Disconnect the external AC power supply line cord(s) from the mains power before moving the unit.

Avertissement ! Retirez le ou les cordons d'alimentation en CA de la source d'alimentation principale lorsque vous déplacez l'appareil.

Warnung! Trennen Sie die Wechselstrom-Versorgungskabel vom Netzstrom, bevor Sie das Gerät verschieben.

¡Advertencia! Cuando mueva la unidad desenchufe de la red eléctrica el/los cable(s) de la fuente de alimentación CA tipo brick.

Advertência! Remova os cabos CA de alimentação brick da rede elétrica ao mover a unidade.

Avvertenza! Scollegare il cavo dell'alimentatore quando si sposta l'unità.

Warning!

Ensure Mains Power is disconnected before installing the FR1 or FR2 frame R-series modules into the frame, or installing and removing options. If a Mains switch is not provided, the power cord(s) of this equipment provide the means of disconnection. The socket outlet must be installed near the equipment and must be easily accessible.

Avertissement ! S'assurer que la source principale d'alimentation est débranchée avant d'installer les modules des cartes série R de boîtier FR1 ou FR2 sur l'appareil, ou avant d'installer ou de supprimer des options. Si aucun commutateur principal n'est fourni, le ou les cordons d'alimentation de cet équipement fournissent le moyen nécessaire pour le débranchement. La prise doit être installée près de l'équipement et doit être facilement accessible.

Warnung! Vor der Installation der FR1 oder FR2 Steckkartenmodule der R-Serie in den Rahmen bzw. vor der Installation oder dem Entfernen von Optionen muss sichergestellt werden, dass der Netzstrom ausgeschaltet bzw. abgetrennt ist. Wenn kein Netzschalter verfügbar ist, kann der Netzstrom mithilfe des/der Netzkabel(s) am Gerät getrennt werden. Die Steckdose muss in der Nähe des Geräts installiert und leicht zugänglich sein.

¡Advertencia! Asegúrese de que la energía de la red de electricidad esté desconectada antes de instalar el módulo de tarjeta de cuadro FR1 o FR2 serie R dentro del cuadro, o antes de instalar o desinstalar opciones. Si el interruptor de la red eléctrica no se encuentra disponible, desconecte el/los cable(s) eléctrico(s) del equipo. La toma de corriente debe ser instalada cerca del equipo y debe estar fácilmente accesible.

Advertência! Certifique-se de que a alimentação principal esteja desconectada antes de instalar os cartões R-series FR1 ou FR2 no quadro ou ao instalar e desinstalar opcionais. Se não houver um interruptor de alimentação principal, o próprio cabo de alimentação do equipamento é o meio de desconexão. A tomada de alimentação deve ser instalada próxima ao equipamento e seu acesso deve ser fácil.

Avvertenza! Verificare che la rete di alimentazione sia scollegata prima di installare i moduli FR1 o FR2 serie R nel telaio, o installare o rimuovere le opzioni. Se non è disponibile un interruttore di alimentazione, il/i cavo/i di alimentazione di questa apparecchiatura forniscono i mezzi di sconnessione. La presa deve essere installata vicino all'apparecchio e deve essere facilmente accessibile.

Warning!

FR2 Dual Power Cord Notice—please read this. To reduce the risk of electrical shock, disconnect both power cords before servicing equipment.

Avertissement ! Notice relative aux doubles cordons d'alimentation de FR2—veuillez lire. Pour réduire le risque de choc électrique, débranchez les deux cordons d'alimentation avec d'effectuer tout entretien de l'équipement.

Warnung! Hinweis zum FR2 mit doppeltem Netzkabel – bitte beachten. Um das Risiko eines Elektroschocks zu verringern, sind beide Netzkabel vor der Wartung des Geräts abzutrennen.

¡Advertencia! Aviso: Cable eléctrico FR2 dual — Por favor leer. Para reducir el riesgo de electrocución, desconecte ambos cables eléctricos antes de reparar el equipo.

Advertência! Aviso do cabo duplo de alimentação FR2 — leia isto. Para reduzir o risco de choque elétrico, desconecte ambos os cabos de alimentação antes de qualquer manutenção no equipamento.

Avvertenza! Avviso cavo a doppia potenza FR2. Per ridurre il rischio di scosse elettriche, scollegare entrambi i cavi di alimentazione prima di effettuare qualsiasi operazione di manutenzione.

Caution!

The FR1/FR2 front fan door is heavy and is not hinged. Remove with Caution.

Attention ! La porte frontale du ventilateur de FR1/FR2 est lourde et ne repose pas sur des charnières. Retirer avec précaution.

Achtung! Die vordere Gebläsetür des FR1/FR2 ist schwer und lässt sich nicht klappen. Bitte vorsichtig entfernen.

¡Precaución! La puerta del ventilador delantero del FR1/FR2 es pesada y no posee bisagras. Extraer con precaución.

Atenção! A porta frontal de acesso aos ventiladores do FR1/FR2 é pesada e não possui dobradiças. Remova com cuidado.

Attenzione! La porta anteriore della ventola FR1/FR2 è pesante e non è a cerniera. Rimuovere con cautela.