

HDU-3800

Juno Upconverter

Installation & Operation Manual

HDU3800 MAN
Edition D

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 **LEITCH**®

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HDU-3800 Juno Upconverter

Installation and Operation Manual

Edition D
December 2001



Preface

Purpose This manual details the features, installation procedures, operational procedures, and specifications of the HDU-3800.

Audience This manual is written for technicians and operators responsible for installation, setup, and/or operation of HDU-3800.

Writing Conventions To enhance your understanding, the authors of this manual have adhered to the following text conventions:

Term or Convention	Description
Bold	Indicates dialog box, property sheet, field, button, checkbox, listbox, combo box, menu, submenu, window, list, and selection names.
<i>Italics</i>	Indicates email addresses, names of books and publications, and first instances of new terms and specialized words that need emphasis.
CAPS	Indicates a specific key on the keyboard, such as Enter, TAB, CTRL, ALT, DELETE.
Code	Indicates variables or command-line entries, i.e., a DOS entry, something you type into a field, etc.
>	Indicates direction of navigation through a hierarchy of menus and windows.
hyperlink	Indicates a jump to another location in the document or elsewhere (such as a website).

Revision History

Edition	Date
A	November 1998
B	March 1999
C	August 1999
D	December 2001

Important Safety Instructions

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. Read these instructions. Keep these instructions. Heed all warnings. Follow all instructions.

Safety Terms and Symbols



Note

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

Terms and Symbols in this Manual



WARNING:
Statements identifying conditions or practices that can result in personal injury or loss of life: High voltage is present. Uninsulated dangerous voltage within the product's enclosure may be sufficient to constitute a risk of electric shock to persons.



CAUTION:
Statements identifying conditions or practices that can result in damage to the equipment or other property: Important operating and maintenance (servicing) instructions in the literature accompanying the product.

Terms and Symbols on the Product



DANGER:
High voltage and indicates a personal injury hazard immediately accessible as one reads the marking.



WARNING:
Indicates a personal injury hazard not immediately accessible as one reads the marking.



CAUTION:
Indicates a hazard to property including the product or to take attention and refer to the manual.



Protective ground (earth) terminal.



Fuse:
Replace with same type and rating of fuse.



Observe precautions for handling electrostatic-sensitive devices.

Injury Precautions



WARNING!

To reduce the risk of electric shock, do not expose this apparatus to rain or moisture.



CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

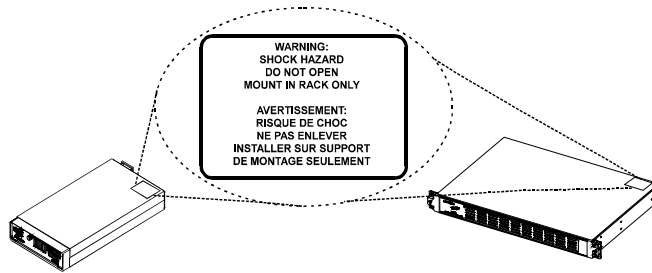


WARNING!

Potentially lethal voltages are present within this product's frame during normal operation. The AC power cord must be disconnected from the frame before the top panel is removed. (In frames with multiple power supplies, remove ALL power cords.) Power should not be applied to the frame while the top is open, unless properly trained personnel are servicing the unit.

[PL Poland] Przed zdjęciem pokrywy wyciągnąć wtyczkę z gniazda sieciowego.

[French] AVIS: RISQUE DE CHOC ELECTRIQUE - NE PAS OUVRIR.
INSTALLER SUR SUPPORT DE MONTAGE SEULEMENT.



WAARSCHUWING:
SCHOK GEVAAR
NIET OPEN MAKEN
ALLEEN IN RAK MONTER

AVVISO:
PERICOLO DI CORRENTE
E PROIBITO L'APERTURA
SI PREGA DI FARE IL MONTAGGIO
AL PROPRIO SOPPORTO

FIGYELEM:
ÁRAMÚTÉS VESZÉLY
CSAK A MEGTELELŐ
TARTÓKERETBE ÜZEMBEHELYEZNI

ADVARSEL:
MULIGHED FOR ELEKTRISK STØD
INDEHOLDER STRØMFØRENDE DELE
APPARATET MÅ KUN ÅBNES AF
KVALIFICERET.
SKAL INSTALLERES I JORDET RACK

ATENÇÃO:
PERIGO DE CHOQUE
SO PARA MONTAGEM
EM BASTIDOR

注意：
請勿打頂板以免觸電
該設備須放在機櫃中使用

경고 전기 충격 위험 가능 열지 마십시오

WARNUNG:
SCHOCK GEFAHR
NICHT ÖFFNEN
NUR IN DAS GESTELL MONTIEREN

UWAGA:
GROZI PORAZENIEM
NIE OTWIERAC
MONTOWAC TYLKO W RAMIE

VARNING:
FARA FÖR ELEKTRICITETNEM KINYITNI
ÖPPNA EJ
MONTERES ENDAST I RACK

ADVERTENCIA:
PELIGRO DE DESCARGA ELÉCTRICA
NO ABRIR EL EQUIPO
SOLO PARA INSTALAR EN RACK

ΠΡΟΕΙΔΡΟΙΝΕΜΗ
ΚΙΝΔΥΝΟΣ ΗΛΕΚΤΡΟΠΛΗΓΙΑΣ
ΜΗΝ ΑΝΟΙΓΕΤΕ
ΤΟ ΠΡΟΒΛΕΤΕ ΜΟΝΟ ΣΕ ΚΑΤΑΛΗΛΟ
ΗΛΕΚΤΡΟΓΡΑΜΜΑΤΙΚΟ ΠιψΤψ

ТРЕДУПРЕЖДЕНИЕ:
Электрический опасность не открыте.
Монтироваега в ракега только.

AVIS - Risque de choc électrique. Ne pas ouvrir.



Use Proper Power Cord

To avoid fire hazard, use only the power cord specified for this product.



Ground the Product

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

[United Kingdom] WARNING: THIS APPLIANCE MUST BE EARTHED.

[Sweden] APPARATEN SKALL ANSLUTAS TILL JORDAT UTTAG NÄR DEN ANSLUTS TILL ETT NÄTVERK.



Do Not Operate Without Covers

To avoid electrical shock or fire hazard, do not operate this product with covers or panels removed.



Use Proper Fuse

To avoid fire hazard, use only the fuse type and rating specified for this product.



Do Not Operate in Wet/Damp Conditions

To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture



Do Not Operate in an Explosive Atmosphere

To avoid injury or fire hazard, do not operate this product in an explosive atmosphere.



Avoid Exposed Circuitry

To avoid injury, remove jewelry such as rings, watches, and other metallic objects. Do not touch exposed connections and components when power is present.

Product Damage Precautions



Use Proper Power Source

Do not operate this product from a power source that supplies more than the specified voltage.



Use Proper Voltage Setting

Before applying power, ensure that the line selector is in the proper position for the power source being used.



Provide Proper Ventilation

To prevent product overheating, provide proper ventilation.



Do Not Block Any Ventilation Openings

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



Only Use Attachments/Accessories Specified by the Manufacturer



Do Not Operate With Suspected Failures

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

For Products with Multiple Power Cords:

CAUTION: This unit can have more than one power supply cord. To de-energize the internal circuitry, disconnect all power cords before servicing.

[Norwegian] ADVARSEL: Utstyret kan ha mere enn en tilførselsledning. For å gjøre interne deler spenningsløse må alle tilførselsledningene trekkes ut.

[Sweden] VARNING: Denna apparat har mer än en nätanslutning. Samtliga nätkablar måste bortkopplas för att göra de interna kretsarna spänningsfria.



Do not use this apparatus near water

Do not expose this apparatus to dripping or splashing water. Ensure that no objects filled with liquid, such as vases or cups, are placed on the apparatus.



Clean only with a dry cloth



Keep Product Away from Heat Sources

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



Install Near Socket Outlet

The equipment shall be installed near the socket outlet, and a disconnect device shall be easily accessible.



Protect the Power Cord

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



Unplug this Apparatus During Lightning Storms

Unplug this apparatus during lightning storms or when unused for long periods of time. Note: A UPS or power surge suppressor could be used as an alternative.



Attention:

Observe precautions for handling electrostatic-sensitive devices. See “Preventing Electrostatic Discharge” below for details.



Fuse Replacement:

CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH THE SAME TYPE OF FUSE.

[French]ATTENTION: REMPLACER UNIQUEMENT PAR UN FUSIBLE DE MEME TYPE.

Battery Use Warnings



CAUTION:

DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY PLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER. DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

[FI Finland] VAROITUS: Paristo voi rajahtaa, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan valmistajan suosittelemaan tyyppun. Havita käytetty paristo valmistajan ohjeiden mukaisesti.

[SE Sweden] VARNING: Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en eller en ekvivalent typ som rekommenderas av tillverkaren. Kassera anvant batteri enligt fabrikantens instruktion.

[D Denmark]

Advarsel! Lithiumbatteri. Eksplosionsfare ved fejlagtig handling.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Lever det brugte batteri tilbage till leverandoren.

[KO Korean]

경고

만약 틀린 전지로 교환했을 경우, 폭발 위험이 가능합니다.
똑같은, 동등한 종류와 교체하는 것을 제조업자로서 권장합니다.
제조업자의 지시에 따라, 사용된 전지는 버려 주십시오.

Preventing Electrostatic Discharge



CAUTION: Electrostatic discharge (ESD) can damage components in the product. To prevent ESD, observe these precautions when directed to do so:

1. Use a Ground Strap. Wear a grounded antistatic wrist strap to discharge the static voltage from your body while installing or removing sensitive components.
2. Use a Safe Work Area. Do not use any devices capable of generating or holding a static charge in the work area where you install or remove sensitive components. Avoid handling sensitive components in areas that have a floor or benchtop surface capable of generating a static charge.
3. Handle Components Carefully. Do not slide sensitive components over any surface. Do not touch exposed connector pins. Handle sensitive components as little as possible.
4. Transport and Store Carefully. Transport and store sensitive components in a static-protected bag or container.

Certifications and Compliances

This product has been tested and found to comply with the following CE, FCC, UL, ICES and CSA standards:

EMC Standards

EN55014	Limits and methods of measurement of radio disturbance characteristics of electric motor-operated and thermal appliances for household and similar purposes, electric tools and similar electric apparatus.
EN55022	Limits and methods of measurement of radio disturbance characteristics of information technology equipment Class A.
EN55103-1	Electromagnetic compatibility—Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use, Part 1: Emission, Environment E4.
EN55103-2	Electromagnetic compatibility—Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use, Part 2: Emission, Environment E4.
EN61000-4-2	Electrostatic discharge requirements “ESD” 2kV CD,4kV AD.
EN61000-4-3	Radiated radio-frequency electromagnetic field immunity test 1V/m {1kHz 80% AM, 80-1000MHz}.
EN61000-4-4	Electrical Fast transient requirements “Burst”, 0.5kV Sig. & Ctrl. Lines 0.5kV a.c. & d.c. Power line, 0.5kV functional earth.
EN61000-4-5	Surge Immunity test 0.5kV a.c. Power line.
EN61000-4-6	Immunity to conducted disturbances induced by radio frequency fields 1V rms 0.15-80MHz Sig. & Ctrl. Lines, 3V rms 0.15-80MHz d.c. Power line, 1V rms 0.15-80MHz a.c. Power line, 1V rms 0.15-80MHz functional earth.
EN61000-4-11	Voltage dips, short interruptions and voltage variations-immunity tests.

per the provision of the Electromagnetic Compatibility Directive 89/336/EEC of 3 May 1989 as amended by 92/31EEC of 28 April 1992 and 93/68/EEC, Article 5 of 22 July 1993.

These devices are for professional use only and comply with Part 15 of FCC rules. Operation is subject to the following two conditions:

- These devices may cause interference to Radio and TV receivers in residential areas
- These devices will accept any interference received, including interference that may cause undesired operations.

These devices do not exceed the class A limits for radio noise emissions from digital apparatus as set out in the interference standard entitled “Digital apparatus”, ICES-003 of the Canadian Department of Communications.

Safety Standards

EN60065	Safety requirements for mains operated electronic and related apparatus for household and similar general use [IEC 60065: 1985, 5th Edition + A1: 1987 + A2: 1989 + A3: 1992, (modified)], per the provision of the Low-Voltage Directive 73/23/EEC of February 19, 1973, as amended by 93/68/EEC.
UL 6500-98	Audio/Video and Musical Instrument Apparatus for Household, Commercial and Similar General Use.
CAN/CSA-E65-94	Safety Requirements for Mains Operated Electronic and Related Apparatus for Household and Similar General Use.

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Introduction

Overview

This chapter introduces and briefly describes the HDU-3800 Upconverter.

The following topics are found in this chapter:

- Product description and features
- Functionality
- Specifications
- Identifying product version

Product Description

The HDU-3800 Juno™ Upconverter offers a wide range of input and output formats condensed into a 2RU. The HDU-3800 Upconverter architecture lets you configure the input and output processing to exactly match the demands of the application. For the upconversion of composite video signals, the Upconverter can offer reference quality 10-bit digital decoding. 10-bit serial digital and analog component inputs are also supported.

The HDU-3800's conversion core is a high precision motion adaptive processor employing internal 16-bit accuracy to retain full 10-bit resolution from input to output. This motion adaptive technique provides optimum conversion quality. The spatial and temporal apertures applied during the conversion are controlled on a pixel by pixel basis, thus minimizing both interlace and motion artifacts while maximizing the signal to noise performance. This process of dynamic filter selection also allows enhanced vertical filter techniques to be used, thereby giving increased vertical resolution when compared with static aperture techniques.

A Film Mode is also selectable that can be used to optimize the vertical resolution for input material containing film originated 3:2 sequences. This process automatically detects the presence of any sustained 3:2 sequence and enhances vertical resolution by rejecting the video frame composed of non-matching film frames. In addition, the Upconverter offers comprehensive image processing facilities, a highly sophisticated Noise Reduction System, an audio delay/resynchronization option, and delay pulse output.

Feature Summary

The HDU-3800 Upconverter comes with a wide range of features.

The following is a listing of some HDU-3800 Upconverter features:

- Advanced conversion of SD to HDTV in 2RU (options include 1080i, 720p, and 480p60 formats)
- Full 10-bit resolution (16-bit internal accuracy)
- Wide range of input and output formats
- High quality digital comb-filter decoder option
- 60Hz, 59.94Hz, 50Hz
- Aspect ratio conversion
- Built-in standards conversion capability
- Audio delay option
- Modular construction
- Colorimetry controls
- Four-field by four-line aperture
- Detail enhance (horizontal and vertical)
- Black level
- Frame/chroma retiming (horizontal and vertical)
- Color balance (Cb/Cr)
- Test pattern generator
- Video/chroma gain
- Key output
- Freeze and fade/cut to black
- Noise Reduction

Feature Descriptions

The following describes some of the HDU-3800 Upconverter's main features:

Feature	Description
Motion Adaptive Upconversion and Standards Conversion	Enhance vertical resolution while minimizing artifacts, reducing noise, and offering improved decoding for composite sources.
Film Mode	Automatically detect any 3:2 sequence and ensures that the output is produced only from video frames having related fields. This process results in optimum vertical resolution.
Flexible I/O Capability	Custom configure various combinations of serial digital component, analog component, analog composite, and Fiber output. Wherever composite interfaces are provided, multiple standards are supported (NTSC, PAL/_M/_N).
Wide Range of HDTV Standards	Access a variety of signal output format options: serial digital (1.485Gb/s), analog (YPbPr, RGBS), and fibre optic (@1080i, 720p, or 480p60). Future HD signal formats are possible.
Highest Quality Decoding	Provide the cleanest possible transfer from the composite to component domain for NTSC, PAL, PAL_M, and PAL_N feeds.
Image Enhancement and Aspect Ratio Conversion	Correct and enhance the source material. The HDU-3800 Upconverter offers picture resizing, positioning, and aspect ratio conversion implemented using sophisticated digital FIR filters.
Comprehensive Noise Reduction Facilities	Choose from two methods of noise reduction. Within the motion adaptive core of the converter, significant noise reduction is achieved via proprietary techniques during the conversion process. An additional process is provided to give recursive noise filtering.
Audio Delay	Match audio to the delay in the video path.
Optional Colorimetry Processing	Translate SD colorimetries to HD colorimetries (when there are differences between luma equation and chromaticities).

Functionality

Signal Flow

Figure 1-1 is a functional block diagram that illustrates the regular operation of the HDU-3800 Upconverter.

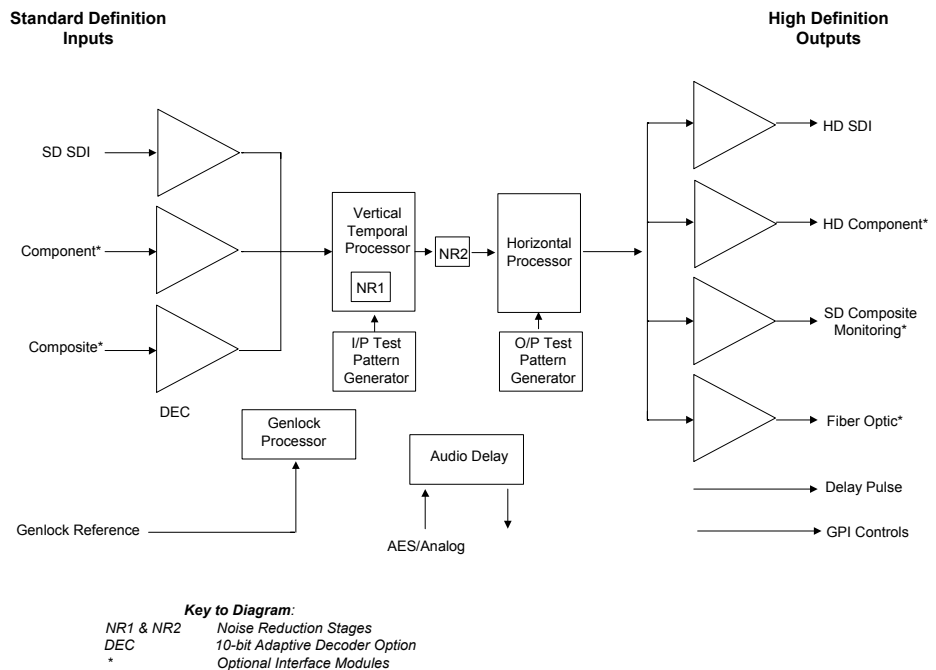


Figure 1-1. Upconverter Block Diagram

Signal Flow Description

The following table lists the HDU-3800 Upconverter's major functional blocks:

Function	Operation
Vertical Temporal Processor	Controls vertical line interpolation for resizing and motion-controlled temporal filtering.
Horizontal Processor	Controls the horizontal filtering and picture resizing.
Genlock Processor	Allows the unit to be genlocked to either an HD bi-polar sync signal or a standard definition NTSC black and burst reference.
I/P Test Pattern Generator	Generates SD test patterns.
O/P Test Pattern Generator	Generates HD test patterns.
NR1	This is the inherent motion-adaptive field-based noise reduction process.
NR2	This is the recursive noise reducer section.

Locating your Software and Hardware Version

To check your software version, press the **Shift** button on the right side of the HDU-3800 Upconverter while pressing in and holding the knob beside it.

The current software number (S/W) is then displayed together with the hardware version number (H/W).

Overview



Caution

These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that described in this manual, unless you are qualified to do so. Refer servicing to all qualified personnel.

This chapter explains the HDU-3800 Upconverter installation procedure, and some technical aspects of both products.

The following topics are found in this chapter:

- Pre-installation information
- Installation requirements
- Power considerations
- Installation procedure
- Connectors and LEDs

Pre-Installation Information

Unpacking

This product has been carefully inspected, tested and calibrated before shipment to ensure years of stable and trouble free service. Please check the equipment for any visible damage which may have occurred during transit. Please confirm that all items listed on the packing list have been received. If any item on the packing list is missing, please contact your Leitch dealer. If any item is damaged please contact the carrier. Ensure that all packaging material is removed from the product and its associated components before installing the unit.

It is suggested that you keep at least one set of original Leitch packaging, in the event that a product needs to be returned for service. If the original package is not available, you can purchase replacement packaging from Leitch at a modest cost or supply your own packaging as long as it meets the following criteria:

- Packaging must be able to withstand the product weight.
- Product must be held rigid within the packaging.
- There must be at least two inches of space between the product and the container.
- The corners of the product must be protected.

Products that are being returned to Leitch for servicing should be shipped pre-paid in the original packaging material if possible. If the product is still within the warranty period, the product will be returned by pre-paid shipment after servicing.

Siting Requirements

Environmental

The unit is cooled by forced air drawn in from its right-hand side, and expelled through vents on the left-hand side. Consequently, there must be free passage for air flow at both sides of the unit to allow for adequate ventilation. An ambient temperature should be maintained between 32°F (0°C) and 104°F (40°C) at a relative humidity of 10%-90% (non-condensing).

Electrical

The rear panel is fitted with a standard IEC mains connector. A supply of 100 V to 240 V, 50/60 Hz, is required.

Rack Mounting Requirements

Warning

Although the chassis is provided with standard front mounting ears for securing to the rack aperture, it is recommended that suitable shelf supports be provided within the rack. Failure to provide suitable shelf supports may result in equipment damage and/or personal injury.

The unit is designed for mounting into a standard 19 in. (483 mm) rack and occupies a vertical space of 2RU (3.5 in./90 mm). The chassis is provided with standard front-mounting ears for securing to the rack aperture (*see* Figure 2-1). Adequate space behind the mounting ears is required, plus clearance, for the connecting cables.

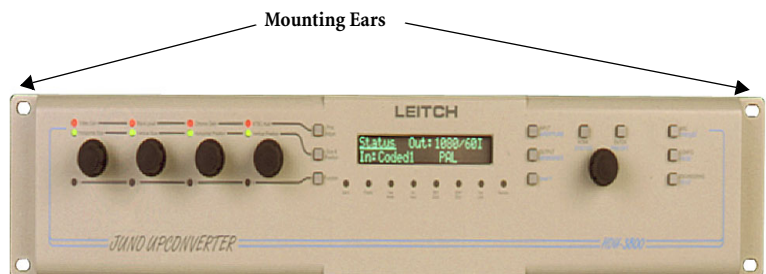


Figure 2-1. Front Panel Mounting Ears

Connecting Power to the Upconverter

Grounding the Unit

Warning

The HDU-3800 Upconverter must be grounded to avoid electrical shock. Failure to ground the unit may result in equipment damage and/or personal injury.

Before connecting power to the HDU-3800 Upconverter, the unit must first be grounded. On the back of the unit (Figure 2-2), a grounding screw is located above the ground (earth) symbol. If the power cable does not provide a suitable grounding connection, be sure to ground this screw to an appropriate ground connection source before connecting power to the unit.

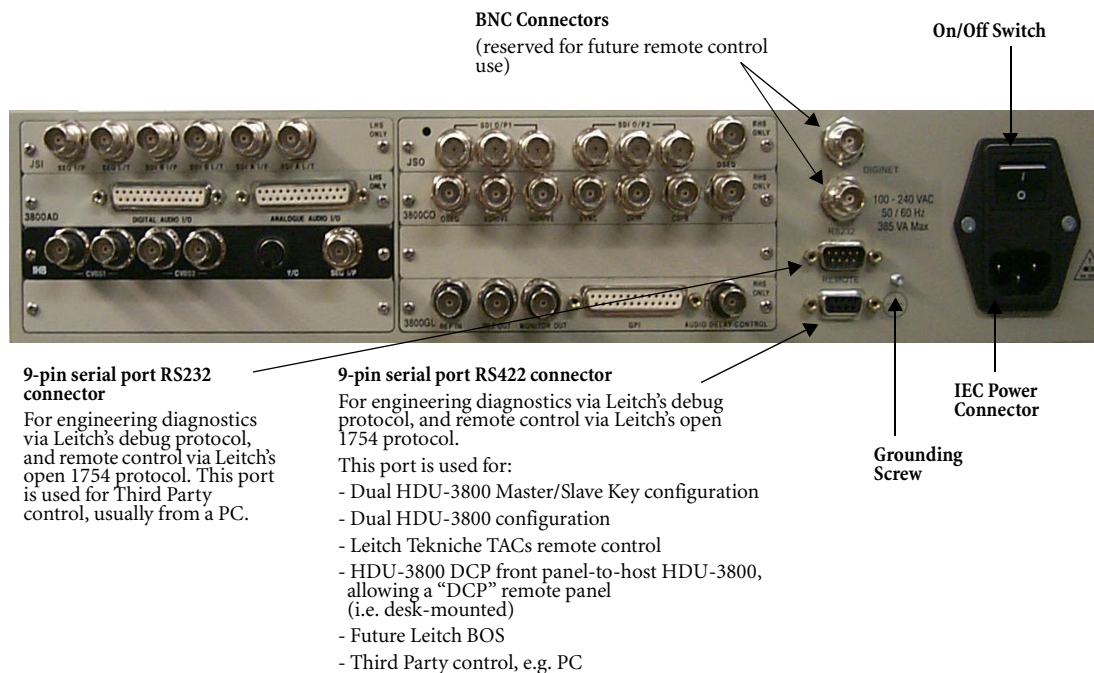


Figure 2-2. Upconverter Rear Panel

Power Connections

**Note**

Different power cords may be required for different countries. In case of difficulty, contact your Leitch agent.

The rear panel is fitted with a standard IEC connector for AC power supply of 100 V to 240 V (as applicable), 50/60 Hz.

Connect the power cord lead supplied with the HDU-3800 to the standard IEC power connector (*see* Figure 2-2).

You can turn on the unit by pressing the On/Off switch above the IEC connector.

Voltage/Fuse Ratings

Power Supply

The power supply automatically adjusts for 100 V to 240 V operation. There is no voltage selector switch.

Fuse

 **Warning**

To avoid the risk of fire, the fuse must always be replaced with the same type of fuse and specified rating: a 20 mm, 250 V, 5 amp anti-surge (T) cartridge fuse. Failure to comply may result in equipment damage and/or personal injury.

There may be occasion when you must access the unit's fuse. The mains input IEC connector incorporates one 20 mm, 250 V, 5 amp anti-surge (T) cartridge fuse.

Leitch recommends that qualified personnel replace the fuse if necessary. Contact your Leitch customer service representative for servicing.

To access the fuse:

1. Turn off the Upconverter, and then remove the power cord from the back of the unit.
2. Slide out the drawer directly above the cable connection.
This drawer contains the fuse. This fuse is in the Live line.
3. Replace the required fuse.

To avoid electric shock, never remove the unit's cover or front panel. There are no user-serviceable parts inside. Refer servicing to qualified personnel. Failure to comply may result in equipment damage and/or personal injury.

Module Options and System Configuration

Overview

This chapter describes the various optional modules available for the HDU-3800, and their appropriate back panel locations.

Various module combinations for the HDU-3800 Upconverter are possible. Because each Upconverter is manufactured and configured individually according to customer requirements and requests, your unit may or may not have all of the available modules.

This chapter provides information on the modules listed below:

- JSI (3800SI)
- IHB (3800HB)
- JSO (3800SO)
- JCI (3800CI)
- JGL (3800GL)
- JAA (3800AD)
- JCO (3800CO-1)

See page 29 for a total system configuration overview.

JSI (3800SI) Module

The JSI module provides input for SDI signals.

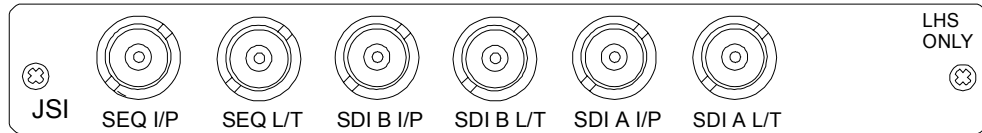


Figure 3-1. JSI Module Connections

The JSI module is located in the top slot on the left (rear) side of the unit.

The JSI module has the following connections:

Connection	Description
SEQ I/P	Film Sequence Signal Input. See Appendix A on page 111 for details.
SEQ L/T	BNC Sequence Input Loop-Through. Loop-Through from SEQ I/P.
SDI B I/P	BNC Serial Input Channel B. Standard definition serial SDI input 2.
SDI B L/T	BNC Serial Input Channel B Active Loop-Through from SDI 2.
SDI A I/P	BNC Serial Input Channel A. Standard Definition serial SDI input 1.
SDI A L/T	BNC Serial Input Channel A Active Loop-Through from SDI 1.

IHB (3800 HB) Module

The IHB module is a high-quality, 10-bit digital comb filter.

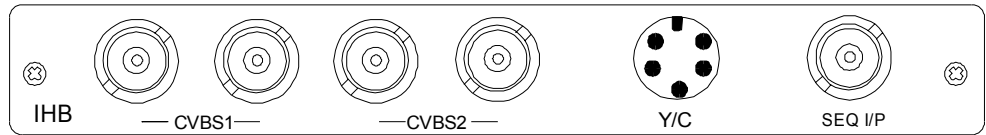


Figure 3-2. IHB Module Connections

If the IHB is fitted together with the JSI module, place it below the JSI module in the second slot on the left (rear) side of the unit. If it is not fitted with the JSI, then place it in the top slot on the left (rear) side.

The IHB module has the following connections:

Connection	Description
CVBS1	BNC Composite Video Input 1 with passive loop-through for proper termination.
CVBS2	BNC Composite Video Input 2 with passive loop-through for proper termination.
Y/C	Y/C (Luminance/Chrominance) Input. SVHS 5-pin connector.
SEQ I/P	Film Sequence Signal Input. <i>See Appendix A on page 111 for details.</i>

JSO (3800SO) Module

The JSO module provides 6 x HD serial outputs. The key output is available on the second triple-BNC output. Future options will allow for the addition of either additional HD-SDI outputs or Fiber outputs. These additional HD-SDI outputs can be used to provide an output key signal derived from the Upconverter ARC circuitry.

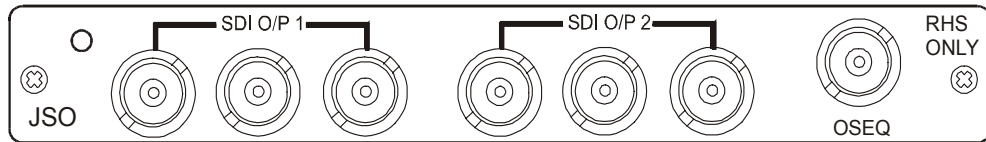


Figure 3-3. JSO Module Connections

The JSO module is located in the top slot on the right (rear) side of the unit, typically across from the JSI module.

The JSO module has the following connections:

Connection	Description
SDI O/P 1	Serial Output One. Comprised of three identical separate BNC outputs.
SDI O/P 2	Serial Output Two. Comprised of three identical separate BNC outputs.
OSEQ	BNC Output Sequence Pulse. Reserved for future use.

JCI (3800CI) Module

This board provides inputs for analog component signals in either GBR or YCrCb formats. A sync input with loop-through allows locking to external syncs. Menu selection is also available for different sync levels and for GBR signals with sync on green.



Figure 3-4. JCI Module Connections

The JCI module is located in the upper most available slot on the left hand side.

The JCI module has the following connections:

Connection	Description
SYNC 1	Input for external sync signal. This is required when the component input signals do not contain any integral sync information, such as sync on green. Selection between 1V and 2V sync levels is available from the Input Config menu.
SYNC 2	Loop-through from SYNC 1. This connector should be terminated with a 75 ohm termination or connected to another terminating piece of equipment.
Y/G I/P	Input for Y (Luminance) or G (Green) component input. Selection between these formats (YCbCr or GBR) is found in the Input Config menu.
Cb/B I/P	Input connector for Cb (component) or B (blue) input signal.
Cr/R I/P	Input connector for Cb (component) or R (red) input signal.

JGL(3800 GL) Module

The JGL module allows the HD output to be field locked to either SD Black/Burst or an HD tri-polar sync signal.

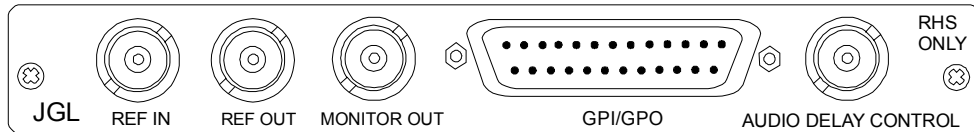


Figure 3-5. JGL Module Connections

The module is always located in the bottom slot on the right (rear) side of the unit.

The JGL module has the following connections:

Connection	Description
Ref In	BNC SD Ref Input.
Ref Out	BNC Configurable with on board links to produce either a loop-through of the Ref In signal or an HD Ref signal output.
Monitor Out	Reserved for future use.
GPI/GPO	GPI/GPO 25-pin serial port connector activates memories 1-4.
Audio Delay Control	Reserved for future use.

Pin Out Information for JGL D-Type

This table lists the pin out information for 25-way, JGL D-type male connector.

PIN	Function	PIN	Function
1	GPI 1+	14	GPI 1- (activates memory 1)
2	GPI 2+	15	GPI 2- (activates memory 2)
3	GPI 3+	16	GPI 3- (activates memory 3)
4	GPI 4+	17	GPI 4- (activates memory 4)
5	GPI 5+*	18	GPI 5- (activates memory 5)
6	GPI 6+	19	GPI 6- (activates memory 6)
7	GPO 1+	20	GPO 1- (not implemented)
8	GPO 2+	21	GPO 2- (not implemented)
9	GPO 3+	22	GPO 3- (not implemented)
10	GPO 4+	23	GPO 4- (not implemented)
11	GPO 5+	24	GPO 5- (not implemented)
12	GPO 6+	25	GPO 6- (power fail O/P)
13	Grounding Links		



Note

*Activation of GPI 5+ will toggle between two inputs of the selected format. These could be SDI1 and SDI2 when two SDI input boards are fitted and SDI is selected, or CVBS1 and CVBS2 when the 3800HB decoder (which has two inputs) is fitted and CVBS is selected. Input 1 is selected upon the transition to GPI contacts closed, and Input 2 upon the transition to open. In either contact steady state the inputs can still be selected manually from the control panel.

JAA (3800 AD) Module

This module provides inputs and outputs for both analog balanced audio and AES digital audio (75 ohm unbalanced or 110 ohm balanced). All connections are made through two 25-way D-type female connectors. The audio signals selected from the control panel are then delayed by an adjustable amount to allow matching with the unit's video processing delay.

You can install up to two JAA boards to allow for the processing of up to eight channels. When two boards are in use, the control panel changes you make will adjust both boards together.



Figure 3-6. JAA Module Connections

The JAA module has the following connections:

Connection	Description
Analog Audio	J2 25-way D-type female analog audio I/O connector
Digital Audio	J3 25-way D-type female digital audio I/O connector

Digital Audio I/O PIN Connections

The following table lists the digital audio I/O PIN connections.

PIN	Function	PIN	Function
1	AES I/P 1 75 or 110 R (input)	14	AES I/P 1 + 75 or 110 R (input)
2	AES I/P 1 AC ground (input)	15	AES I/P AC ground (input)
3	AES I/P 2 - (input)	16	AES I/P 2 + (input)
4	AES I/P ground (input)	17	AES I/P ground (input)
5	AES 2 O/P 4B ground (output)	18	AES 2 O/P 4B + 75R (output)
6	AES 2 O/P 2B - 110R (output)	19	AES 2 O/P 2B + 110R (output)
7	AES 2 O/P 4A ground (output)	20	AES 2 O/P 4A + 75R (output)
8	AES 2 O/P 2A - 110R (output)	21	AES 2 O/P 2A + 110R (output)
9	AES 1 O/P 3B ground (output)	22	AES 1 O/P 3B + 75R (output)
10	AES 1 O/P 1B - 110R (output)	23	AES 1 O/P 1B + 110R (output)
11	AES 1 O/P 3A - ground (output)	24	AES 1 O/P 3A + 75R (output)
12	AES 1 O/P 1A - 110R	25	AES 1 O/P 1A + 110R (output)
13	AC ground (output)		

Analog Audio I/O PIN Connections

This table lists the analog audio I/O PIN connections.

PIN	Function	PIN	Function
1	I/P Audio 1/ Left 1 (-) (input)	14	I/P Audio 1 / Left 1 (+) (input)
2	I/P Audio 2/ Right 1 (-) (input)	15	I/P Audio 2 / Right 1 (+) (input)
3	I/P Audio 3/ Left 2 (-) (input)	16	I/P Audio 3 / Left 2 (+) (input)
4	I/P Audio 4/ Right 2 (-) (input)	17	I/P Audio 4 / Right 2 (+) (input)
5	Audio 4B O/P/ Right (-) or AC LOW (output)	18	Audio 4B/Right O/P (+) or AC LOW (output)
6	Audio 4A/Right O/P (-) (output)	19	Audio 4A/Right O/P (+) (output)
7	Audio 3B/Left O/P (-) or ground (output)	20	Audio 3B/Left O/P (+) or ground (output)
8	Audio 3A/Left O/P (-) (output)	21	Audio 3A/Left O/P (+) (output)
9	Audio 2B/Right O/P (-) (output)	22	Audio 2B/Right O/P (+) (output)
10	Audio 2A/Right O/P (-) (output)	23	Audio 2A/Right O/P (+) (output)
11	Audio 1B/Left O/P (-) (output)	24	Audio 1B/Left O/P (+) (output)
12	Audio 1A/Left O/P (-) (output)	25	Audio 1A/Left O/P (+) (output)
13	AC ground (output)		

JCO (3800CO-1) Module

The JCO module provides the HD analog component outputs.

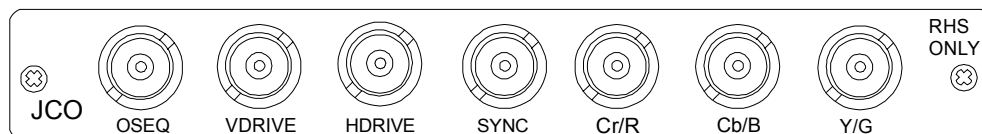


Figure 3-7. JCO Module Connections

If the JCO is fitted together with the JSO module, it must be placed below the JSO module in the second slot on the right (rear) side of the unit. If it is not fitted with the JSO, then it must be placed in the top slot on the right (rear) side.

The JCO module has the following connections:

Connection	Description
OSEQ	BNC Output Sequence pulse. Reserved for future use.
VDRIVE	BNC HD V level drive for use with equipment such as computer monitors. The level is set by adjusting the internal jumper. Jumpers can be factory set if requested, or you can adjust them manually. <i>See "Manual Adjustment of Jumpers" on page 27 for more details.</i>
HDRIVE	BNC HD H level drive for use with equipment such as computer monitors. The level is set by adjusting the internal jumper. Jumpers can be factory set if requested, or adjusted manually by the user. <i>See "Manual Adjustment of Jumpers" on page 27 for more details.</i>
SYNC	BNC tri-level HD SYNC output.
Cr/R	BNC Analog Component Cr output. Selectable from control panel. <i>See Chapter 5 "Operation" for more information on selecting outputs.</i>

Connection	Description
Cb/B	BNC Analog Component Cb output. Selectable from control panel. <i>See</i> Chapter 5 "Operation" for more information on selecting outputs.
Y/G	BNC Analog Component Y output. Selectable from control panel. <i>See</i> Chapter 5 "Operation" for more information on selecting outputs.

Manual Adjustment of Jumpers

J5 and J9 3-Pin Jumpers

There are two 3-pin jumpers available for adjustment on the JCO module.

- J5 (H-drive)
- J9 (V-drive)

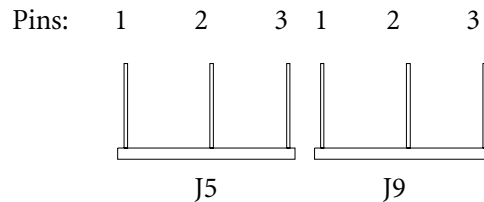


Figure 3-8. 3-Pin Jumpers, J5 (H-Drive) and J9 (V-Drive)

H-Drive and V-Drive Inversion and Non-Inversion



Warning

All power to the Upconverter unit must be turned off, and connector cables disconnected from the JCO module before removing the module and making any manual adjustment to the jumpers. Failure to do so may result in personal injury and/or equipment damage.

These jumpers will adjust the H-Drive and V-Drive sync. The jumpers can be either inverted (for a positive signal) or non-inverted (for a negative signal). J5 and J9 are factory set to be inverted.

- Linking pins 1 and 2 (the pins towards the rear of the card, or edge connector) of J5 and/or J9 will give a positive sync.
- Linking pins 2 and 3 (the pins towards the front of the card) will give a negative sync.

Description of H-Drive and V-Drive Sync Signals

Figure 3-9 demonstrates the H-Drive and V-Drive Sync signals when inverted and not inverted.

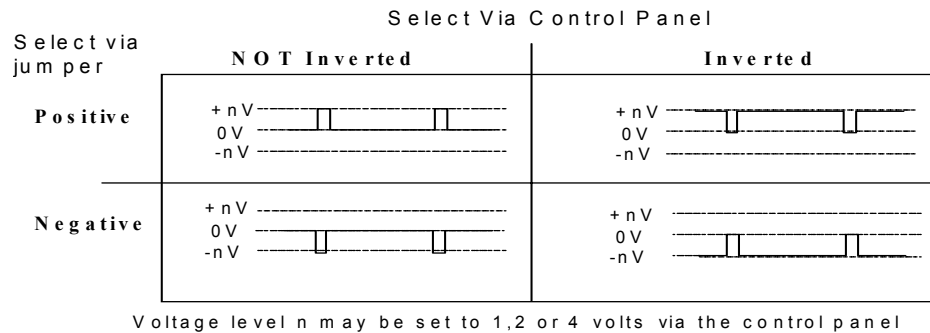


Figure 3-9. H-Drive and V-Drive Sync Signals

Setting the H-Drive and V-Drive sync



Caution

This product may contain Electrostatic Sensitive Devices (ESD). Take precaution to minimize the risk of damage due to electrostatic discharge during handling.

To set the H-Drive and V-Drive sync:

1. Turn the Upconverter unit's power off (hot-swapping is not possible).
2. Remove all connector cables to the JCO module.
3. Remove the JCO module by unscrewing the holding screws on either end of the module panel, and gently pulling it straight out.
4. Locate the appropriate jumper pins (J5 and/or J9) on the module card.
5. Place a jumper connector over the appropriate jumper pins (pins 1 and 2, or pins 2 and 3) to change the sync.
6. Replace the module by pushing it straight into its previous upconverter location and then secure it with the screws.
7. Replace connector cables, and then turn the unit on.

Termination

The output of the JCO module requires termination in 75 ohm for correct output levels. It is particularly important to check this when feeding into certain computer monitors that have hi-impedance inputs.

System Configuration

Avoiding Stress to Power Supply

HDU-3800 has eight rear slots to accommodate option modules. To avoid undue stress to the power supply, the total number of fitted modules should not exceed six, as shown in the accompanying diagrams. Contact your Leitch customer service representative if more than six modules are required.

Typical System Configurations

Figures 3-10, 3-11, and 3-12 show some typical system configurations.

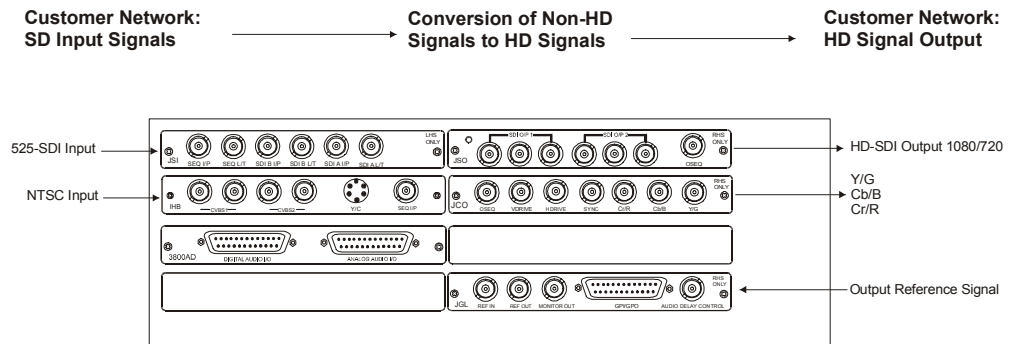


Figure 3-10. General System Overview

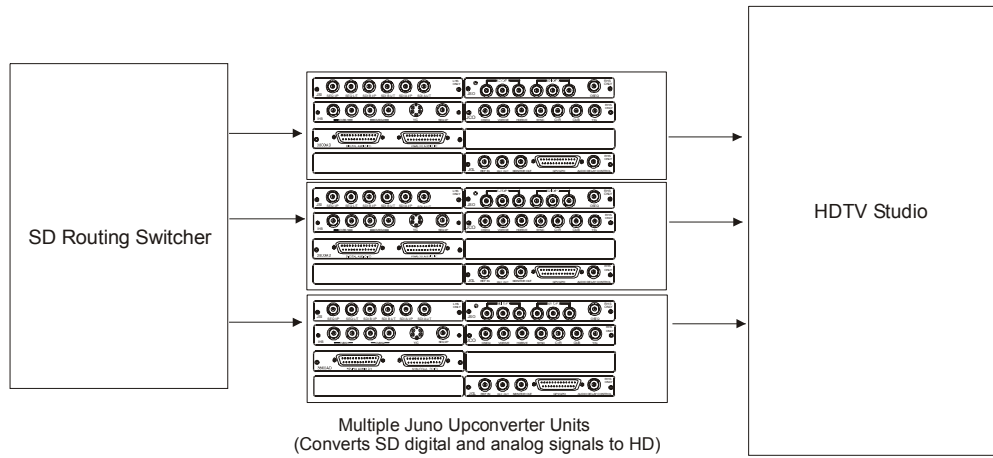


Figure 3-11. Typical System Configuration for HDU-3800, Example One

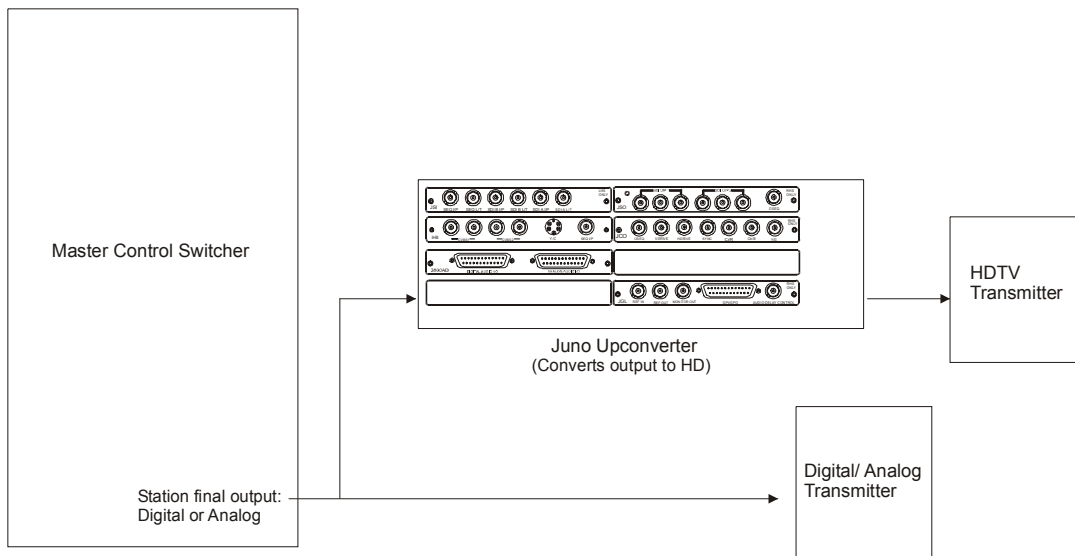


Figure 3-12. Typical System Configuration for HDU-3800 Upconverter, Example Two

Control Descriptions

Overview

Each HDU-3800 Upconverter is configured and controlled via its front panel.

The HDU-3800 Upconverter can be controlled with either a separate remote panel or an RS-422 ASCII based protocol. Contact your Leitch customer service representative for more information on these or future remote control options.

Front panel controls and indicators include:

- Indicator highways and rotary knobs
- Display screen and LED indicators
- Control buttons and menu knob

Indicator Highways and Rotary Knobs

Figure 4-1 shows the location of the indicator highways and menu controls.

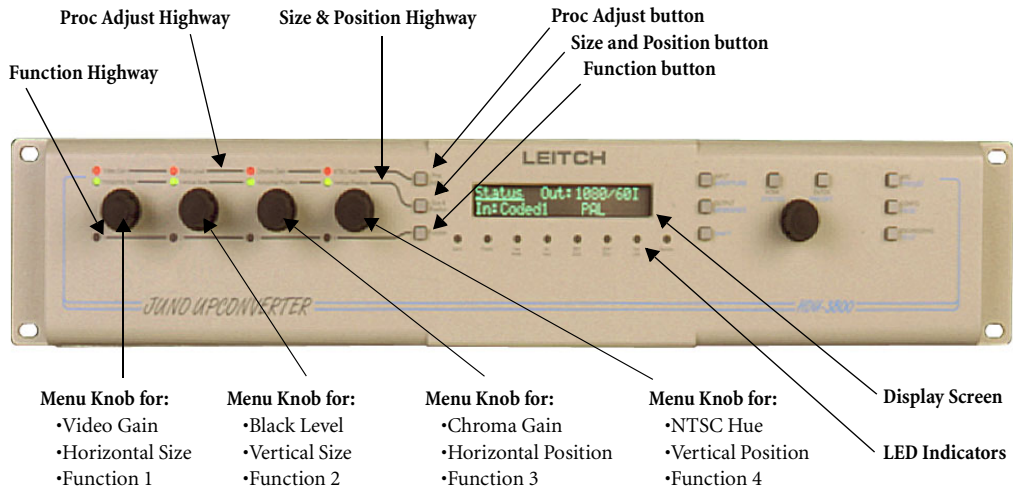


Figure 4-1. Indicator Highways and Menu Knobs

Control Descriptions

The following table lists the functionality of the indicator highways and menu knobs shown in Figure 4-1 on page 32.

Control	Description	Operation
Proc Adjust Button	<p>Activate the Proc Adjust highway (top row of indicators).</p> <p>On this highway, you can set:</p> <ul style="list-style-type: none"> • Video Gain - Set the gain of the system between the limits of +6 dB and -6 dB. The default value is 0 dB. • Black Level - Adjust the black level of the input signal within a range of approximately +100 mV to -100 mV. The default value is 0 mV. • Chroma Gain - Set the gain of the chroma amplifier chain between the limits of +6 dB and -6 dB. The default value is 0 dB. • NTSC Hue - Enable the phase of the input NTSC signal to be adjusted within a range of +180° to -180°. The default is set at 0°. <p>When the Proc Adjust highway is active, the LEDs have the following significance:</p> <ul style="list-style-type: none"> • Static green means the control is at its default setting and not active. • Flashing green means the control is at its default setting and active. • Static amber means that the control is not at its default setting and is not active. • Flashing red/amber means that the control is not at its default setting and is active. 	<ol style="list-style-type: none"> 1. Press the Proc Adjust button to activate the corresponding highway (top row of indicators). 2. Turn the knob directly below each indicator to adjust the bar graph level on the Display Screen. 3. Press the knob to set the adjustment. <p>To reset the adjustment to its default value, press and hold the appropriate knob for approximately 1.5 seconds.</p>

Control	Description	Operation
Size and Position Button	<p>Activate the Size and Position Highway (second row of indicators).</p> <p>On this highway, you can set:</p> <ul style="list-style-type: none"> • Horizontal Size - Set the horizontal size of the output picture between the limits of +89% and -50%. The default is set at 0%. • Vertical Size - Set the vertical size of the output picture between the limits of +50% and -50%. The default is set at 0%. • Horizontal Position - Set the horizontal position of the output picture between the limits of +50% to -50%. The default is set at 0%. • Vertical Position - Set the vertical position of the output picture between the limits of +40% and -40%. The default is set at 0%. <p>The above vertical and horizontal sizes and positions are measured relative to a standard 4:3 input picture.</p> <p>Example: If the Horizontal Size is set to 0% (default setting), the output will remain a 4:3 picture even when displayed on a 16:9 screen and will have blank right and left borders. To fill the 16:9 screen, the size will have to be increased by approximately 33%.</p> <p>If the Horizontal Position of a picture is moved by 50%, this will result in the picture moving half (50%) of its original width, to the left or right.</p>	<ol style="list-style-type: none"> 1. Press the Size and Position button to activate the corresponding highway (second row of indicators). 2. Turn the knob directly below each indicator to adjust the bar graph level on the Display Screen. 3. Press the knob to set the adjustment. <p>To reset the adjustment to its default value, press and hold the appropriate knob for approximately 1.5 seconds.</p>

Control	Description	Operation
Size and Position Button, con't	<p>There are no red or amber indicators on this highway.</p> <p>LEDs: When the Size and Position highway is active, the LEDs have the following significance:</p> <ul style="list-style-type: none">• Static green means the highway is selected.• Flashing green means a specific control (and knob) is active.• Flashing green means a specific control (and knob) is active.	
Function Button	<p>Activate the Function highway (bottom row of indicators).</p> <p>These settings are currently not available on the HDU-3800 Upconverter, and are reserved for future functionality.</p>	

Display Screen and LED Indicators

Figure 4-2 shows the HDU-3800 Upconverter Display Screen and LED Indicators.

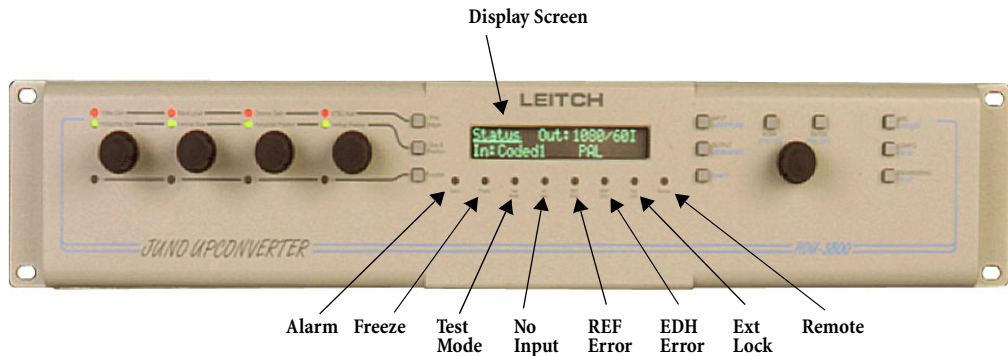


Figure 4-2. Display Screen and LED Indicators.

The Display Screen shows all menu levels, programmable settings, available options, and machine status. The home screen is the beginning of the main menu.

Menu level options are depicted one at a time on the right side of the screen. The current menu that is open appears on the left side of the screen.

Display Screen Indicators

The following table lists the various indicators that may appear on the Display Screen.

Indicator	Description
▼▲ Up and/or down arrows beside a menu option.	There are different menu levels to scan through.
» A horizontal double arrow head) beside a menu option.	The particular menu option has submenu options available as well.
● ON LED symbol beside a menu option on the right side of the screen.	A particular menu setting (mutually exclusive selection) was selected/activated.
○ OFF LED symbol beside a menu option on the right side of the screen.	A particular menu setting (mutually exclusive selection) was deselected/deactivated.
✓ A check mark on the right side of the screen.	More than one setting can be activated/enabled at a time within a particular menu level.

The Upconverter's Display Screen has a screen saver function of moving points that appears after a few minutes of non-use. This screen saver is deactivated as soon as any button or control is adjusted.

LED Indicators

The following table describes the conditions indicated by the LEDs:

LED	Color	Indicator
Alarm	Flashing red	A system/communication error occurred.
Freeze	Flashing red	A freeze is in process.
Test Mode	Static red	Internal test patterns are selected as output.
No Input	Static red	The selected source has no input or a faulty input.
REF Error	Red	An error is detected with the genlock reference signal.
EDH Error	Red	An error is detected.
Ext Lock	Static green	A signal is locked to an external reference.
Remote	Static green	The unit is being controlled remotely (remote control not currently available for the HDU-3800 Upconverter).

Control Buttons and the Menu Rotary Knob

There are eight control buttons on the Upconverter, shown Figure 4-3, that either open up corresponding menus to allow for adjustment and selection, or perform a defined function. Simply press the desired button to open the menu or perform a function.

Each button, with the exception of the **Shift** button, has two possible controls attached to it. The buttons with secondary control names that are italicized and screened in blue ink are activated by holding down the **Shift** button while pressing it.

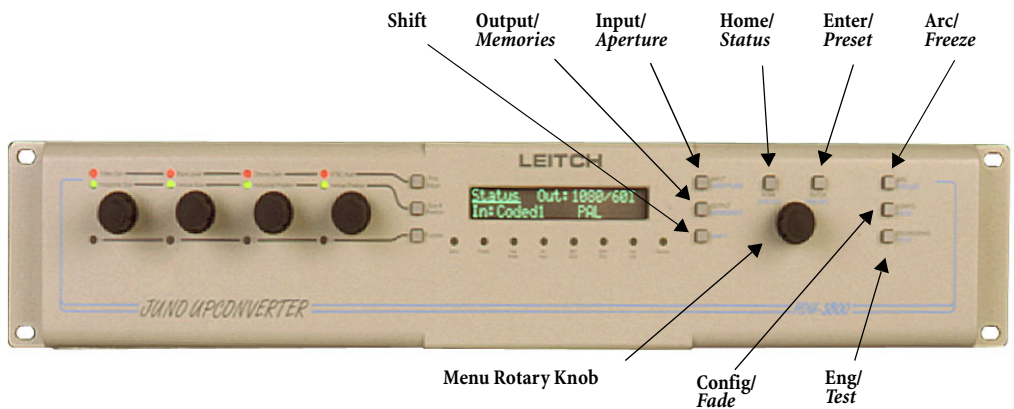


Figure 4-3. Control Buttons and Menu Knob.

Buttons

The following table explains lists the function of each button:

Button	Description
Input	Select the various analog or digital input formats.
Aperture (Shift + Input)	Set up of conversion apertures, enhancement apertures, and noise reduction controls.
Output	Set the output standard.
Memories (Shift + Output)	Save and restore programmed unit settings.
Shift	Activate secondary control functions (screened in blue ink and italicized).
Home	Return to a previous menu level. Press once to go back one menu level/step, or press repeatedly to return to the beginning of the main menu.
Status (Shift + Home)	See the input and output status of the system briefly on the Display Screen when activated.
Enter	Open a selected submenu level and/or activate a particular setting or function. Pressing the menu knob beneath it has the same effect.
Preset (Shift + Enter)	Reset the Proc Adjust settings (Video Gain, Black Level, Chroma Gain, and NTSC Hue) to factory preset values.
Arc	Select different output Aspect ratios.
Freeze (Shift + Config)	Turn the freeze status on and off. Allows selection of different frozen fields when turned on.
Config	Open up the configuration menu.
Fade	Activate a fade or cut and select from various Fade menu options.
Engineering	Open up the Engineering menu.
Test (Shift + Eng)	Select different test signal patterns when turned on.

Menu Knob

Turn the **Menu** knob to go up and down menu level options. Press it to select and enter a menu level, or to activate a particular setting/function (in place of the **Enter** button). It is also used to adjust various bar graph levels for certain functions.

Overview

This chapter tells you how to adjust various HDU-3800 Upconverter settings to suit your particular conversion requirements.

The HDU-3800 is controlled by its dedicated front panel. The front control panel is made up of various control buttons, menu knobs, LEDs, and a display screen.



Note

Available menu options and settings depend upon the module options fitted to your HDU-3800. The message NOT AVAILABLE appears on the Display Screen if a menu item is selected that is not available for adjustment.

You can activate the various functions by either directly pressing the appropriate button on the HDU-3800 front panel, or by entering the main menu and moving through the various categories and submenus until the desired function is reached. Regardless of how a function is opened (button or menu), the corresponding operating instructions remain the same. The rest of this chapter details the operating instructions once you access the main menu.

Accessing and Using the Main Menu

To access the Upconverter main menu:

1. Make sure there is power to the Upconverter, and it is turned on (by pressing the ON/OFF switch above the IEC connector).
2. Press the **Home** button on the right side of the Upconverter to display the beginning of the main menu.

From the main menu, you can choose to enter and then set submenu options from any of the following main menu items:

- Input
- Output
- ARC
- Config
- Engineering
- Aperture
- Memories
- Freeze
- Fade
- Test

To select one of the main menu options listed above:

1. Turn the menu knob on the right side of the front panel to move up and down through the main menu list.
2. Once you have selected an option, press the **Enter** button, or simply press the knob itself.

The selected menu option will open up its own menu categories for you to choose from and adjust.

To return to the previous menu level/step, press the **Home** button once. It will bring you back one menu level or step.

To return to the beginning of the main menu, press the **Home** button repeatedly.



Note

You can also open a main menu option directly (without moving up and down through the main menu list) by simply pressing the desired menu button on the right side of the Upconverter. To select an italicized, blue screened menu title, hold down the Shift button while pressing the desired menu button.

Selecting Analog or Digital Input Formats (Input Menu)

You can select various analog or digital input formats with the options on the **Input** menu.

Figure 5-1 shows the **Input** menu structure.

Main Menu Item	Submenu 1	Submenu 2
Input Coded 1	Coded 2	
	SDI 1	
	SDI 2	
	SDI 3	
	Comp 1	
	Comp 2	
	Y/C	
	Standard	625
		525
		PAL
	NTSC	
	PALM	
	PALN	
	N443	
	Secam	
	Comb	
	Auto	

Figure 5-1. Input Menu Structure

To access one of the **Input** menu options:

1. Open the **Input** menu.
2. Turn the knob to move up and down through the **Input** menu options.
3. Press the **Enter** button or knob to select a menu option, or open an option submenu.

In most cases an ON LED symbol or check mark will appear beside your selection.

Menu Descriptions

This table describes the choices available from the Input menu:

Option	Description	Operation
Coded 1 & Coded 2	Control the selection of either Coded 1 or Coded 2 input on the optional IHB input decoder module.	Press the Enter button or the knob. Result: The ON LED symbol will appear beside the selection.
SDI 1, 2, or 3	Control the selection of either input SDI 1 , SDI 2 or SDI 3 on the optional JSI or JAA (3800 AD) input module. This applies to the latest 3800 AD boards with SDI BNC.	Press the Enter button or the knob. Result: The ON LED symbol will appear beside the selection.
Comp 1 & Comp 2	Control the selection of the JCO Analog Component option. If two JCI are fitted, Comp 1 selects the card with the hex address switch setting of 0 (Up to 2 JCI or JAA cards can be fitted in the left-hand (from rear) side of the Upconverter chassis. If two cards are fitted, their hex address switches should be set to 0 on one card and 1 on the other). If only one card is fitted, either option will select it.	Press the Enter button or the knob. Result: The ON LED symbol will appear beside the selection.

Option	Description	Operation
Y/C	Select the Y/C input on the optional IHB Decoder Option module.	Press the Enter button or the knob. Result: The ON LED symbol will appear beside the selection.
Standard	<p>Select either auto mode or an input standard.</p> <p>The Standard menu option has its own submenu from which you can make a selection (the horizontal double arrow head, », beside this choice indicates the presence of a submenu). The ON LED symbol or check mark appears beside the adjusted selection.</p> <p>A check mark replaces the ON LED symbol if more than one setting can be selected/activated at a time within a particular menu or submenu level.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button again to make a selection, or simply press the knob itself.

Option	Description	Operation
625, 525, PAL, NTSC, PALM, PALN, N443, Secam	Choose one of these input standards.	Press the Enter button or the knob. Result: The ON LED symbol will appear beside the selection.
Comb	Enable the Comb decoder in Composite (Coded) Input operation (available only if your HDU-3800 Upconverter is fitted with an optional IHB module). Operation of the Comb filter is only appropriate for coherent signals, as with those having a stable SC/H relationship. Use with non-coherent signals, such as VHS, will result in distortion of the output.	Press the Enter button or the knob. Result: A check mark will appear beside the selection.
Auto mode	Automatically select the required input standard. Additionally, with composite inputs, the Comb filter is enabled if the input signal is detected as coherent.	Press the Enter button or the knob. Result: A check mark will appear beside the selection.

Setting the Output Standard (Output Menu)

You can set the output standard with the options on the **Output** menu. Figure 5-2 shows the **Output** menu structure.

Main Menu Item	Submenu 1
Output	1080/60I
	1080/59I
	720/60P
	720/59P
	1035/60I
	1035/59I
	1080/50I
	480P

Figure 5-2. Output Menu Structure



Note

To select the 480P option, you must first set the output signal to either 1080/60I, 1080/59I, 720/60P, or 720/59P as required and then select 480P from the menu.

Rationale: The 480P output signal is embedded into either a 720P or a 1080I transport signal.

To access one of the **Output** menu options:

1. Open the **Output** menu.
2. Turn the knob to move up and down through the **Output** menu options.
3. Press the **Enter** button or knob to select a menu option.

In most cases an ON LED symbol or check mark will appear beside your selection.

Changing the Aspect Ratio (Arc Menu)

You can change the aspect ratio with the options on the Arc menu.

Figure 5-3 shows the Arc menu structure.

Main Menu Item	Submenu 1	Submenu 2	Submenu 3	
ARC	16:9			
	14:9			
	4:3			
	Use ARC1			
	Use ARC2			
	Use ARC3			
	Use ARC4			
	Variable	Save ARC1		
		Save ARC2		
		Save ARC3		
	Save ARC4			
	Zoom			
	H Size			
	V Size			
	H Posn			
	V Posn			
	Move Type	Cut		
		Linear		
		S-Curve		
	Move Len			

Figure 5-3. Arc Menu Structure

To access one of the **Arc** menu options:

1. Open the **Arc** menu.
2. Turn the knob to move up and down through the **Arc** menu options.
3. Press the **Enter** button or knob to select a menu option, or open an option submenu.

In most cases an ON LED symbol or check mark will appear beside your selection.

Menu Descriptions

This table describes the choices available from the **Arc** menu:

Option	Description	Activation
16:9	Stretch the output across the full width of the HD output. This is appropriate for SD material originated in a squeezed anamorphic format.	Press the Enter button or the knob. Result: An LED appears beside the option, indicating activation.
14:9	Expand the Horizontal and Vertical Sizes equally, losing the top and bottom of the picture, and leaving black bars at the left and right edges. The output picture occupies a 14:9 window on a 16:9 monitor, without distorting the shape of the picture.	Press the Enter button or the knob. Result: An LED appears beside the option, indicating activation.
4:3	Set the standard definition (SD) input signal to appear as a 4:3 rectangle in the centre of the 16:9 high definition (HD) output picture.	Press the Enter button or the knob. Result: An LED appears beside the option, indicating activation.
Use ARC1 Use ARC2 Use ARC3 Use ARC4	Apply previously stored user definable Arc setups using the Save function (<i>see</i> Variable option below).	Press the Enter button or the knob. Result: An LED appears beside the option, indicating activation.

Option	Description	Activation
Variable	<p>Choose from several Save options (Save 1-4) for the preset Aspect ratio, as well as adjust individual settings for the vertical and horizontal size and position of the active input picture as viewed on the output. You can also set the time for aspect ratio conversion, and the type of movement (Cut or Linear) to a new aspect ratio.</p> <p>Selecting Variable will also activate the Size and Position highway choices and corresponding LEDs on the left of the Upconverter.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button to make a selection, or simply press the knob itself.
Save 1-4	<p>Save the preset Aspect ratio to Memories Save 1, 2, 3, or 4. Memories can later be recalled with Output Use 1, 2, 3, or 4.</p>	<p>To activate one of these menu choices, press the Enter button or the knob.</p>
Zoom	<p>Link the Horizontal Size and Vertical Size controls to the same value. This lets you re-size the output picture with either control, while maintaining the same shape as the input picture.</p> <p>The 4:3 and 14:9 Arc options are compatible with Zoom, while the 16:9 option is not. Therefore, Zoom will automatically be cancelled if 16:9 is selected.</p>	<p>Press the Enter button or the knob.</p> <p>Result: A check mark appears beside the option, indicating activation.</p>

Option	Description	Activation
H Size	<p>Set the horizontal size of the active input picture as viewed on the output.</p> <p>When selected, the Display Screen displays an H Size bar graph as illustrated below. The H Size can be set between +89.99% and -50.00%.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the H Size level. 3. Press the Enter button or press the knob to set it. <p>The H Size bar graph can also be activated and then adjusted simply by pressing and/or turning the corresponding Size and Position highway knob on the left side of the Upconverter.</p>

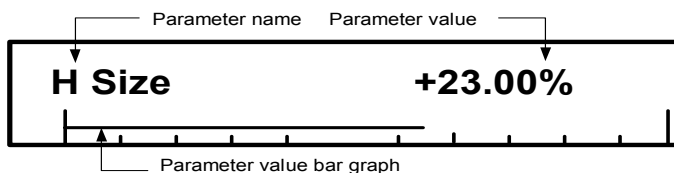


Figure 5-4. H Size Bar Graph

Option	Description	Activation
V Size	<p>Set the vertical size of the active input picture as viewed on the output.</p> <p>When selected, the Display Screen displays a V Size bar graph. The V Size can be set between +50.00% and -50.00%.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the V Size level. 3. Press the Enter button or press the knob to set it. <p>The V Size bar graph can also be activated and then adjusted simply by pressing and turning the corresponding Size and Position highway knob on the left side of the Upconverter.</p>
H Posn	<p>Set the horizontal position of the active input picture as viewed at the output.</p> <p>When selected, the Display Screen displays an H Posn bar graph. The H Posn can be set between +50.00% and -50.00%.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the H Posn level. 3. Press the Enter button or press the knob to set it. <p>The H Posn bar graph can also be activated and then adjusted simply by pressing and turning the corresponding Size and Position highway knob on the left side of the Upconverter.</p>

Option	Description	Activation
V Posn	<p>Set the vertical position of the active input picture as viewed at the output. When selected, the Display Screen will display a V Posn bar graph. The V Posn can be set between +40.00% and -40.00%.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the V Posn level. 3. Press the Enter button or press the knob to set it. <p>The V Posn bar graph can also be activated and then adjusted simply by pressing and turning the corresponding Size and Position highway knob on the left side of the Upconverter.</p>
Move Type	<p>Select the way in which a programmed aspect ratio will display.</p> <p>Choose to activate one of the following options:</p> <p>Cut: Cuts quickly and automatically to a new aspect ratio.</p> <p>Linear: Changes to the new aspect ratio over a set length of time (you must enter a field rate in the Move Len category).</p> <p>S-Curve: Changes to the new ratio with the movement at the start and at the end of the change being slower than during the middle section.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu. 3. Press the Enter button or press the knob to make a selection. <p>Result: The ON LED symbol appears beside the selection.</p>

Option	Description	Activation
Move Len	Select the duration of the transition when an automatic change between preset ratios is activated. The duration can be set between 0 and 2000 fields.	<ol style="list-style-type: none"><li>1. Press the Enter button, or the knob, to open the bar graph.<li>2. Turn the knob to select the Fld rate.<li>3. Press the Enter button or press the knob to set it.

Configuring Input/Output Settings (Config Menu)

You can configure input and output settings with the options on the **Config** menu.

Figure 5-5 Shows the **Config** menu structure.

Main Menu Item	Submenu 1	Submenu 2	Submenu 3	Submenu 4	
Config	I/P Conf	No Ped			
		SMPTE/Ebu			
		GBR			
		Ext Sync			
		2V Sync			
		No I/P	Ignore		
			Freeze		
			Black		
			Blue		
			No Out		
		Clip	No Clip		
			601 Clip		
		O/P Conf	EDH On		
			GBR (yuv)		
		O/P Mono			
		H&V Sync	Invert		
			1V		
			2V		
			4V		
		Comp Blnk	0 to +600		
		Border	On		
			H Trim	-16 to +126	

Main Menu Item	Submenu 1	Submenu 2	Submenu 3	Submenu 4
O/P Conf, <i>con't</i>	Border	V Trim	-16 to +126	
		Black		
			Blue	
	Color Im	Auto		
		Chrmcty	SD	
			1080	
			1035	
	Monitor	480as720		
	Fade/Cut	Fade		
		Cut		
	Audio	Delay Adj	+5 to +420mS	
		Ctrl Mod	FixeDely	
			Cont	
			Jump	
Source		Analog		
		AES/Ebu		
		75R AES		
		75 Ohm		
		SDI		
		75R AES		
AutoAPTX				
Resample				
AnlgIpGn	Mute			
	+10dBu			
	+12dBu			
	+15dBu			
	+18dBu			
	+20dBu			

Main Menu Item	Submenu 1	Submenu 2	Submenu 3	Submenu 4	
Audio, <i>con't</i>	AnlgIpGn		+24dBu		
			+28dBu		
	AnlgOpGn			Mute	
				+10dBu	
				+12dBu	
				+15dBu	
				+18dBu	
				+20dBu	
				+24dBu	
				+28dBu	
Panel	Lockout				
	Remote			Unit	
				Select Remote Unit	
Bright			Max Addr		

Figure 5-5. Configuration Menu Structure

To access one of the **Config** menu options:

1. Open the **Config** menu.
2. Turn the knob to move up and down through the **Config** menu options.
3. Press the **Enter** button or knob to select a menu option, or open an option submenu.

In most cases an ON LED symbol or check mark will appear beside your selection.

Menu Descriptions

This table describes the choices available from the **Config** menu:

Option	Description	Activation
I/P Conf	Choose an I/P Config option from the I/P Config submenu. The ON LED symbol or check mark appears beside the adjusted selection. A check mark takes the place of the ON LED symbol if more than one setting can be selected/activated at a time within a particular menu or submenu level.	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button to make a selection, or simply press the knob itself.
No Ped	Obtain correct black level and optimum signal-to-noise performance for analog composite and component 525 signals which include a pedestal (setup).	Press the Enter button or the knob. Result: A check mark appears beside the option, indicating activation.
Smpte/Ebu	Specify conformity of input component signals. This menu option should be enabled when the input component signals conform to the SMPTE/EBU-N10 levels (100%).	Press the Enter button or the knob. Result: A check mark appears beside the option, indicating activation.
GBR	Specify the input signal format. Select this option if the input is in GBR format. When not selected, the input must be in Y,Cr,Cb component format.	Press the Enter button or the knob. Result: A check mark appears beside the option, indicating activation.
Ext Sync	Specify input signal sync. This option is enabled when external syncs are used for the input signal. When not enabled, the unit will assume that syncs are present on the Y or G channel.	Press the Enter button or the knob. Result: A check mark appears beside the option, indicating activation.

Option	Description	Activation
2V Sync	<p>Relate information about the input sync level.</p> <p>Enable this menu option when the input sync level is 2 V.</p>	<p>Press the Enter button or the knob.</p> <p>Result: A check mark appears beside the option, indicating activation.</p>
No I/P	<p>Set the desired response on the output picture when there is a loss of input.</p> <p>Use the following submenu options to select the required action when an input signal is lost:</p> <p>Ignore: The unit will keep trying to find a good input signal.</p> <p>Freeze: The output will freeze on the last detected input field.</p> <p>Black: The output is forced to black on the loss of input.</p> <p>Blue: The output is forced to blue on the loss of input.</p> <p>No Out: An illegal output is produced at the SDI output (no TRS) on the loss of input.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button or press the knob to make a selection. <p>Result: The ON LED symbol will appear beside the selection.</p>
Clip	<p>Restrict the luminance and chrominance digital video values to CCIR REC 601 specification limits.</p> <p>From the Clip submenu, choose to activate either:</p> <p>No Clip: Turns all clips off.</p> <p>601 Clip: Applies REC 601 clip levels.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button or press the knob to make a selection. <p>Result: The Enter symbol will appear beside the selection.</p>

Option	Description	Activation
O/P Conf	<p>Choose an O/P Config option from the O/P Config submenu.</p> <p>The ON LED symbol or check mark appears beside the adjusted selection.</p> <p>A check mark replaces the ON LED symbol if more than one setting can be selected/activated at a time within a particular menu or submenu level.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button to make a selection, or simply press the knob itself.
EDH On	Reserved for future use.	
GBR (yuv)	Select the analog component output format generated from the JCO option module (GBR when checked).	<p>Press the Enter button or the knob.</p> <p>Result: A check mark appears beside the option, indicating activation.</p>
O/P Mono	Set all outputs to monochrome.	<p>Press the Enter button or the knob.</p> <p>Result: A check mark appears beside the option, indicating activation.</p>
H&V Sync	<p>Adjust the Horizontal Sync and Vertical Sync.</p> <p>You can choose from the following submenu options:</p> <p>Invert</p> <ul style="list-style-type: none"> • 1 V • 2 V • 4 V 	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button to make a selection, or simply press the knob itself.

Option	Description	Activation
Comp Blnk	Adjust the Component Blanking. The setting can be adjusted between 0 and +600.	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to adjust the required setting. 3. Press the Enter button or press the knob to set it.
Border	<p>Activate one of the following submenu options:</p> <p>On: Switches on the black or blue border around the active picture area.</p> <p>H Trim: Allows adjustment of the horizontal size of the applied border. When H Trim is selected, the Display Screen displays a bar graph. H Trim can be set between +126 Ln and -16 Ln.</p> <p>V Trim: Allows adjustment of the vertical size of the applied border. When V Trim is selected, the Display Screen displays a bar graph. The V Trim can be set between +126 Ln and -16 Ln.</p> <p>Black: Sets the border to black.</p> <p>Blue: Sets the border to blue.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button or press the knob to make a selection. <p>Result: A check mark or ON LED symbol will appear beside the selection in most cases.</p> <p>To activate H Trim or V Trim:</p> <ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the Trim level. 3. Press the Enter button or the knob to set it.

Option	Description	Activation
Color Im	<p>Select various colorimetry matrices. You should set the colorimetry to Auto unless the you have some knowledge of chromaticity settings. You can activate one of the following submenu options:</p> <p>Auto: Automatically selects the appropriate colorimetry depending on the output standard selected. This is the recommended setting for the chromaticity controls. If selected, a check mark appears beside it to indicate activation.</p> <p>Chrmcty: Allows individual setting of the chromaticity. The Chrmcty selection asks you to select from SD, 1080, or 1035.</p> <p>LumaEqn: Allows individual setting of the luminance matrix equation. The LumaEqn selection asks you to select from SD, 1080, or 1035.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button or press the knob to make a selection. <p>To choose Chrmcty and LumaEqn settings:</p> <ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open a submenu. 2. Turn the knob to move up and down through the setting choices. 3. Press the Enter button or press the knob to make a selection. <p>Result: The ON LED symbol will appear beside the selection.</p>
Monitor	<p>Produce a 480as720P signal from the JCO analog output when the main HD-SDI output has been selected as 480P in 1080I.</p> <p>This makes monitoring of the output signal possible on a suitable 720P capable monitor.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Press the Enter button, or the knob, to activate the selection. <p>Result: A check mark will appear beside the selection.</p>

Option	Description	Activation
Fade/Cut	<p>Select the action initiated when the control panel Fade button is pressed. You can activate one of the following submenu options:</p> <p>Fade: Selects a fade-to or fade-from black, initiated when the Fade button is pressed.</p> <p>Cut: Selects a cut-to or cut-from black, initiated when the Fade button is pressed.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button or press the knob to make a selection. <p>Result: The ON LED symbol will appear beside the selection.</p>
Audio	<p>Choose Audio options from the Audio submenu.</p> <p>The ON LED symbol or check mark appears beside the adjusted selection. A check mark replaces the ON LED symbol if more than one setting can be selected/activated at a time within a particular menu or submenu level.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button to make a selection, or simply press the knob itself.
Delay Adj	<p>Adjust the amount of delay applied to the audio.</p> <p>Delay Adj can be selected in steps of 5 mS. Typically, this is set to match the processing delay of the video standards conversion process which corresponds to two input fields. For 625/50 inputs, this will be 40 mS and for 525/60, about 35 mS. Larger delays up to 420 mS can be selected to provide delay compensation when other external video processes cause additional delays.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to adjust the required setting between +5 and +420mS. 3. Press the Enter button or press the knob to set it.

Option	Description	Activation
Ctrl Mode	<p>Activate one of the following submenu options:</p> <p>In tracking mode, the audio delay tracks the video delay either in Continuous or Jump Start mode.</p> <p>When tracking is not selected, audio is delayed by an amount set in the Delay Adj menu. This value can be between 5mS and 420 mS.</p>	<ol style="list-style-type: none">1. Press the Enter button, or the knob, to open the submenu.2. Turn the knob to move up and down through the submenu choices.3. Press the Enter button or press the knob to make a selection. <p>Result: The ON LED symbol will appear beside the selection.</p>

Option	Description	Activation
Source	<p>Select the audio source.</p> <p>You can activate one of the following submenu options:</p> <p>Analog: Selects the analog audio inputs connected to the analog input 25-way D-type connector.</p> <p>AES/Ebu: Select the AES/EBU digital inputs connected to the 25-way D-type digital audio connector on the JAA (3800AA) board.</p> <p>SDI: Selects the SDI on a SDI capable JAA (3800AD) audio delay module as the source of the embedded audio.</p> <p>75R AES: Control the selection of whether the input impedance of the AES channels is 75 ohm (unbalanced) or 110 ohm (balanced). Choosing this option enables 75 ohm input operation.</p> <p>Audio APTX: Automatically selects non-resampling operation when APTX compressed audio is detected.</p> <p>Resample: Selects whether audio is resampled or not. When compressed audio is in use (APTX, AC3), the resampling process must be disabled. Although the unit can auto-detect APTX compressed audio (if Auto APTX is ticked), it cannot auto detect AC3 compression. This control is provided to allow the user to manually disable resampling when using AC3 by ticking "compressed". It may also be used if unreliable detection of compressed audio is experienced.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button or press the knob to make a selection. <p>Result: The ON LED symbol or check mark will appear beside the selection.</p>

Option	Description	Activation
AnlgIpGn	<p>Select different maximum input analog audio levels.</p> <p>You can select gains from a range of +10 dBu to +28 dBu. Levels appropriate for audio source equipment should be selected. The Mute option mutes the analog audio, forcing all audio outputs to silence.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button or press the knob to make a selection. <p>Result: The ON LED symbol will appear beside the selection.</p>
AnlgOpGn	<p>Select different maximum output analog audio levels.</p> <p>You can select gains from a range of +10 dBu to +28 dBu. Levels appropriate for audio source equipment should be selected. The Mute option mutes the analog audio, forcing all audio outputs to silence.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button or press the knob to make a selection. <p>Result: The ON LED symbol will appear beside the selection.</p>

Option	Description	Activation
Panel	<p>Choose Panel options from the Panel submenu.</p> <p>Options include:</p> <p>Lockout: Allow some protection from unauthorized or inadvertent alteration of control panel settings. When Lockout is enabled, pressing the buttons allow the various menu settings to be viewed but not changed, and the warning PANEL LOCKOUTE remains on the Display Screen. When disabled, the panel will allow full control of adjustments and option settings.</p> <p>Remote: By selecting values from a submenu, you can remotely control up to 30 separate unites. The control panel will automatically detect the available units and add a display option for each. Select Remote to identify an individual unit for control, and by setting the Max Addr to the maximum hex digit address in use, the remote control performance is optimized. See Appendix A "HDU-3800 Sequence Input" on page 111 for more information.</p> <p>Bright: Reserved for future use. Currently, the intensity of the Display Screen is set at 100% brightness, or full luminance.</p>	<ol style="list-style-type: none"> 1. Press the Enter button to open the submenu, or press the knob. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button to make a selection, or simply press the knob itself. <p>Result: A check mark will appear beside the selection.</p>

Calibrating Video (Engineering Menu)

You can calibrate video levels and settings with the options on the **Engineering** menu.

Figure 5-6 shows the **Engineering** menu structure.

Main Menu Item	Submenu 1	Submenu 2	Submenu 3	Submenu 4
Engineering	Proc Adj	Col Bal	Cr Gain	-6.00dB to +6.00dB
			Cb Gain	-6.00dB to +6.00dB
			Cr Level	-100.02mV to +99.25mV
			Cb Level	-100.02mV to +99.25mV
			Vid Gain	-6.00dB to +6.00dB
			Chr Gain	-6.00dB to +6.00dB
			Blk Level	-102.28mV to +101.48mV
			NTSC Hue	-180.0deg to +180.0deg
Retiming			Pict H	-8.296ps to +8.296ps
			Chrm H	-444ns to +444ns
			Luma V	-2Ln to +2Ln
			Chrm V	-2Ln to +2Ln
Overscan			H	-5.00% to +4.99%
			V	-5.00% to +4.99%

Main Menu Item	Submenu 1	Submenu 2	Submenu 3	Submenu 4
	Overscan, <i>con't</i>	Topfixed		
		X-Couple		
	Genlock			
		GLfram'g	+/- 1 output field	
		GLcoarse	-329.10ps to +882.63ps	
		Ext Ref		
NR Ctrl	Rec Nr			
	Picture		0 to +14	
	Chroma		0 to +14	

Figure 5-6. Engineering Menu Structure

To access one of the **Engineering** menu options:

1. Open the **Engineering** menu.
2. Turn the knob to move up and down through the **Engineering** menu options.
3. Press the **Enter** button or knob to select a menu option, or open an option submenu.

In most cases an ON LED symbol or check mark will appear beside your selection.

Menu Descriptions

This table describes the choices available from the **Engineering** menu:

Option	Description	Activation
Proc Adj	Choose a Proc Adj option from the Proc Adj submenu. Selecting Proc Adj will also activate the Proc Adjust highway choices and corresponding LEDs on the left of the Upconverter. While the Col Bal selection will open up further submenus, the other menu choices all display bar graphs which can be set.	<ol style="list-style-type: none">1. Press the Enter button, or the knob, to open the submenu.2. Turn the knob to move up and down through the submenu choices.3. Press the Enter button to make a selection, or simply press the main knob itself.

Option	Description	Activation
Col Bal	<p>Choose a submenu option to adjust levels for the following:</p> <p>Cr Gain: Sets the gain of the Cr color component channel. When selected, the Display Screen displays a Cr Gain bar graph. The Cr Gain can be set between +6.00 dB and -6.00 dB.</p> <p>Cb Gain: Sets the gain of the Cb color component channels. When selected, the Display Screen will display a Cb Gain bar graph. The Cb Gain can be set between +6.00 dB and -6.00 dB.</p> <p>Cr Level: Shifts the Cr color component channels. When selected, the Display Screen will display a Cr Level bar graph. The Cr Level can be set between +99.25 mV and -100.02 mV.</p> <p>Cb Level: Shifts the Cb color component channels. When selected, the Display Screen will display a Cb Level bar graph. The Cb Level can be set between +99.25 mV and -100.02 mV.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the Col Bal submenu choices. 3. Press the Enter button or press the knob to make a selection. <p>In all cases, a corresponding bar graph will appear on the Display Screen that requires setting.</p> <p>If the option Lockout was activated from the Config>Panel menu, then manual Col Bal level adjustment will not be available.</p> <p>To choose settings for Cr Gain, Cb Gain, Cr Level, and CB Level:</p> <ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to adjust the required setting. 3. Press the Enter button or press the knob to set it.

Option	Description	Activation
Vid Gain	<p>Set the overall amplitude of the output video signal.</p> <p>When selected, the Display Screen will display a Vid Gain bar graph. The Vid Gain can be set between +6.00 dB and -6.00 dB.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the Vid Gain. 3. Press the Enter button or press the knob to set it. <p>The Vid Gain bar graph can also be activated and then adjusted simply by pressing and/or turning the corresponding Proc Adjust highway knob on the left side of the Upconverter.</p>
Chr Gain	<p>Set the gain of the chroma signal path through the unit.</p> <p>When selected, the Display Screen will display a Chr Gain bar graph. The Chr Gain can be set between +6.00 dB and -6.00 dB.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the Chr Gain. 3. Press the Enter button or press the knob to set it. <p>The Chr Gain bar graph can also be activated and then adjusted simply by pressing and/or turning the corresponding Proc Adjust highway knob on the left side of the Upconverter.</p>

Option	Description	Activation
Blk Level	<p>Adjust the black level of the input signal.</p> <p>When selected, the Display Screen will display a Blk Level bar graph. The Blk Level can be set between +101.48 mV and -102.28 mV.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the Blk Level. 3. Press the Enter button or press the knob to set it. <p>The Blk Level bar graph can also be activated and then adjusted simply by pressing and/or turning the corresponding Proc Adjust highway knob on the left side of the Upconverter.</p>
NTSC Hue	<p>Enable the phase of the input NTSC signal to be adjusted for composite inputs.</p> <p>When selected, the Display Screen will display a NTSC Hue bar graph. The NTSC Hue can be set between +180.0° and -180.0°.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the NTSC Hue. 3. Press the Enter button or press the knob to set it. <p>The NTSC Hue bar graph can also be activated and then adjusted simply by pressing and/or turning the corresponding Proc Adjust highway knob on the left side of the Upconverter.</p>

Option	Description	Activation
Retiming	Choose a timing or vertical shift option from the Retiming submenu. All menu choices have display bar graphs which can be set.	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button to make a selection, or simply press the main knob itself.
Pict H	<p>Enable the adjustment of the timing of chrominance and luminance simultaneously in the horizontal direction.</p> <p>When selected, the Display Screen will display a Pict H bar graph. The Pict H can be set between +8.296 ps and -8.296 ps.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the Pict H level. 3. Press the Enter button or press the knob to set it.
Chrm H	<p>Enable the adjustment of the timing of chrominance relative to luminance in the horizontal direction.</p> <p>When selected, the Display Screen will display a Chrm H bar graph. The Chrm H can be set between +444 ns and -444 ns.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the Chrm H level. 3. Press the Enter button or press the knob to set it.
Luma V	<p>Shift the luminance part of the picture up or down.</p> <p>When selected, the Display Screen will display a Luma V bar graph. The Luma V can be set between +2 Ln and -2 Ln.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the Luma V level. 3. Press the Enter button or press the knob to set it.

Option	Description	Activation
Chrm V	<p>Shift the chrominance part of the picture up or down.</p> <p>When selected, the Display Screen will display a Chrm V bar graph. The Chrm V can be set between +2 Ln and -2 Ln.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the Chrm V level. 3. Press the Enter button or press the knob to set it.
Overscan	<p>Choose Overscan options from the Overscan submenu.</p> <p>The H and V menu choices have display bar graphs which can be set. The ON LED symbol or check mark appears beside the adjusted selection. A check mark replaces the ON LED symbol if more than one setting can be selected/activated at a time within a particular menu or submenu level.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button to make a selection, or simply press the knob itself.
H	<p>Set the horizontal size of the input picture.</p> <p>When selected, the Display Screen displays an H bar graph. The H level can be set between +4.99% and -5.00%.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the H level. 3. Press the Enter button or press the knob to set it.
V	<p>Set the vertical size of the input picture.</p> <p>When selected, the Display Screen displays a V bar graph. The V level can be set between +4.99% and -5.00%.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the V level. 3. Press the Enter button or press the knob to set it.

Option	Description	Activation
Topfixed	<p>Hold the top of the picture in place during vertical overscan.</p> <p>This is typically of use to remove switching points seen at the bottom of the pictures from VHS sources.</p>	<p>Press the Enter button or the knob.</p> <p>Result: A check mark appears beside the option, indicating activation.</p>
X-Couple	<p>Enable both horizontal and vertical overscan simultaneously (like a Zoom mode).</p>	<p>Press the Enter button or the knob.</p> <p>Result: A check mark appears beside the option, indicating activation.</p>
Genlock	<p>Choose Genlock options from the Genlock submenu.</p> <p>The GLcoarse and GLfine menu choices have display bar graphs which can be set. The ON LED symbol or check mark appears beside the adjusted selection. A check mark replaces the ON LED symbol if more than one setting can be selected/activated at a time within a particular menu or submenu level.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button to make a selection, or simply press the knob itself.
GL fram'g	<p>Set the vertical genlock setting in steps of one line.</p> <p>The Genlock Framing control is continuous between + 1 and -1 field in the selected output standard.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the GLcoarse level. 3. Press the Enter button or press the knob to set it.
GL Coarse	<p>Set the coarse H phase in steps of 54ns.</p> <p>When selected, the Display Screen will display a GLcoarse bar graph. The GLcoarse level can be set between +882.63 ps and -329.10 ps.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select a level. 3. Press the Enter button or press the knob to set it.

Option	Description	Activation
Ext Ref	<p>Allow the Upconverter to be genlocked to an external reference.</p> <p>If the unit detects that there is no reference applied or the incorrect standard is supplied, the REF Error LED will light and the unit will default to internal reference.</p>	<p>Press the Enter button or the knob.</p> <p>Result: A check mark appears beside the option, indicating activation.</p>
NR Ctrl	<p>Access various noise reduction options.</p> <p>The Picture and Chroma menu choices have display bar graphs which can be set.</p> <p>NR Ctrl and its submenu choices can also be adjusted under the Aperture category.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button to make a selection, or simply press the knob itself.
Rec NR	<p>Enable the recursive noise reduction process.</p>	<p>Press the Enter button or the knob.</p> <p>Result: A check mark appears beside the option, indicating activation.</p>

Option	Description	Activation
Picture	<p>Adjust the amount of recursive noise filtering if Rec NR is activated.</p> <p>Picture controls the amount of noise reduction applied in the recursive process. In general, the higher the setting, the greater the noise reduction obtained.</p> <p>The Recursive noise filter is motion adaptive and will automatically reduce the recursion in areas of movement. However, some user control is included to let you set more recursion on moving areas at the risk of increasing artefacts such as smearing.</p> <p>Picture affects both luminance and chrominance channels. When selected, the Picture bar graph is displayed. The Picture can be set between +0 and +14.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the Picture level. 3. Press the Enter button or press the knob to set it.
Chroma	<p>Adjust the amount of recursive noise filtering if Rec Nr is activated.</p> <p>Though the Picture setting affects both luminance and chrominance channels, the Chroma can be adjusted separately to allow greater amounts of noise reduction to be applied to the chrominance channel where appropriate. When selected, the Chroma bar graph is displayed for level adjustment. The Chroma can be set between +0 and +14.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the Chroma level. 3. Press the Enter button or press the knob to set it.

Controlling Filters and Apertures (Aperture Menu)

You can control various filters and apertures affecting the conversion process with the options on the **Aperture** menu.

Figure 5-7 shows the **Aperture** menu structure.

Main Menu Item	Submenu 1	Submenu 2	Submenu 3
Aperture	AutoMThr		
	MtnThr	0 to +127	
	Adapt On		
	AutoFilm		
	FixedFilm		
	FrameCtl	CC flags	
		Seq BNC	
	Temporal	Slowest	
		Slow	
		Medium	
		Fast	
	V Detail	-8 to +7	
	Stat Enh	-8 to +7	
	H Detail	-8 to +7	
	Nr Ctrl	Rec NR	
		Picture	0 to +14
		Chroma	0 to +14

Figure 5-7. Aperture Menu Structure

To access one of the **Aperture** menu options:

1. Open the **Aperture** menu.
2. Turn the knob to move up and down through the **Aperture** menu options.
3. Press the **Enter** button or knob to select a menu option, or open an option submenu.

In most cases an ON LED symbol or check mark will appear beside your selection.

Menu Descriptions

This table describes the choices available from the **Aperture** menu:

Option	Description	Activation
AutoMThr (automatic motion threshold)	Override any manual motion threshold settings. If activated, noise characteristics of the input signal will be constantly evaluated and a suitable threshold level automatically determined.	Press the Enter button or the knob. Result: A check mark appears beside the option indicating activation.

Option	Description	Activation
MtnThr	<p>Set a threshold to help the system to distinguish between noise and motion.</p> <p>There are 128 settings from 0 to +127. A typical setting would be around 32, with higher numbers required for noisier sources and lower numbers for cleaner sources. This is a difficult adjustment to make manually, and enabling of the AutoMThr is recommended.</p> <p>When selected, the Display Screen will display a MtnThr bar graph that requires level adjustment. The MtnThr can be set between 0 and +127.</p> <p>If AutoMThr is activated, then MtnThr can only be displayed, and not adjusted.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the MtnThr level. 3. Press the Enter button or press the knob to set it.
Adapt On	<p>Turn motion detection on or off.</p> <p>When upconverting, motion detection is used to provide enhanced vertical detail and a degree of noise reduction in those parts of the picture that are detected as stationary. Adapt On can turn this feature on or off for test purposes, though it should normally be left on.</p>	<p>Press the Enter button or the knob.</p> <p>Result: A check mark appears beside the option, indicating activation.</p>

Option	Description	Activation
AutoFilm	<p>Enable the automatic detection of any 3:2 sequence that may be present on incoming signals containing material originated from a telecine transfer.</p> <p>This allows the Upconverter to optimize vertical resolution by avoiding input video frames that are a mixture of different originating film frames. This mode of operation will automatically detect when 3:2 processing is not appropriate and smoothly revert to standard video conversion.</p>	<p>Press the Enter button or the knob.</p> <p>Result: A check mark appears beside the option, indicating activation.</p>
FixedFilm	<p>Maintain film processing throughout a sequence even at points when film sequence detection is not feasible.</p> <p>Use this function when the source material is reliably known to have a fixed 24 or 30 frame sequence.</p> <p>Mixed 24/30 fps, video inserts, and non-compliant editing will cause detection failures in fixed mode. Therefore, AutoFilm mode should be used when in doubt.</p>	<p>Press the Enter button or the knob.</p> <p>Result: A check mark appears beside the option, indicating activation.</p>

Option	Description	Activation
FrameCtl	<p>Access frame control options that include:</p> <p>CC flags: Control the film aperture of “Closed Caption” type signals embedded in the incoming SDI signal.</p> <p>Contact a Leitch customer service representative for details on implementing this option.</p> <p>Seq BNC: Control the film sequence aperture from signals fed into the SEQ input of the selected input source (either JSE or IHB input boards).</p> <p>See Appendix A "HDU-3800 Sequence Input" on page 111 for details of the film sequence signal specifications.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button to make a selection, or simply press the knob itself. <p>To activate CC flags or Seq BNC, press the Enter button or the knob.</p>

Option	Description	Activation
Temporal	<p>Control the temporal aperture shape.</p> <p>There are four settings:</p> <ul style="list-style-type: none"> • Fast • Medium • Slow • Slowest <p>Note that a slower aperture corresponds to a wider temporal filter.</p> <p>Although Upconverter is motion adaptive and will change the shape of its conversion filters under control of its motion detectors, some overall optimization controls have been provided for extreme source material.</p> <p>Recommended Settings: When the temporal aperture is set to Slow, the temporal aperture is wide and will use all four available fields to generate the output. This is the recommended setting for slow video or film originated material. Fast video originated material may benefit from the selection of a faster aperture setting. For general material, the Slow or Slowest settings are recommended.</p> <p>Selection of temporal apertures is not available when converting between standards with different frame rates. When standards converting, the conversion is pre-set to an optimized range of adaptive filters.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button to make a selection, or simply press the knob itself. <p>Result: The ON LED symbol appears beside the option, indicating activation.</p>

Option	Description	Activation
V Detail	<p>Control the overall vertical detail level, in both moving and static areas of the picture.</p> <p>The recommended setting is centre “0”. Higher settings give enhanced vertical resolution but with an increased risk of exhibiting interlace artefacts.</p> <p>When selected, the Display Screen displays a V Detail bar graph. You can set the V Detail between +7 and -8.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the V Detail level. 3. Press the Enter button or press the knob to set it.
Stat Enh	<p>Have some control over the enhanced processing of particularly difficult material.</p> <p>The motion adaptive nature of the Upconverter allows the conversion to be optimized to obtain excellent vertical resolution while minimizing interlace artifacts. Although this process is fully automatic, some user control has been provided.</p> <p>You can use the Stat Enh control to sets the amount of additional vertical detail enhancement on static area of the picture. It can, if required, be set to make the adaption process between moving and static areas less apparent by setting to a negative value.</p> <p>When selected, the Stat Enh bar graph is displayed. You can set the Stat Enh between +7 and -8. The recommended setting for general use is to “0”.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the Stat Enh level. 3. Press the Enter button or press the knob to set it.

Option	Description	Activation
H Detail	Soften or sharpen the horizontal detail in a picture. When selected, the H Detail bar graph is displayed. The H Detail can be set between +7 and -8.	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the H Detail level. 3. Press the Enter button or press the knob to set it.
NR Ctrl	<p>Provides access to various noise reductions options.</p> <p>The Picture and Chroma menu choices have display bar graphs which can be set.</p> <p>NR Ctrl and its submenu choices can also be adjusted under the Engineering category.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button to make a selection, or simply press the knob itself.
Rec NR	Turn the recursive noise reduction option on or off.	<p>Press the Enter button or the knob.</p> <p>Result: A check mark appears beside the option, indicating activation.</p>

Option	Description	Activation
Picture	<p>Adjust the amount of recursive noise filtering if Rec NR is activated.</p> <p>Picture controls the amount of noise reduction applied in the recursive process. In general, the higher the setting, the greater the noise reduction obtained.</p> <p>The Recursive noise filter is motion adaptive and will automatically reduce the recursion in areas of movement. However, some user control is included to allow more recursion to be set on the moving area at the risk of increasing artefacts such as smearing.</p> <p>Picture affects both luminance and chrominance channels.</p> <p>When selected, the Display Screen will display a Picture bar graph that requires level adjustment. The Picture can be set between +0 and +14.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the Picture level. 3. Press the Enter button or press the knob to set it.
Chroma	<p>Adjust the amount of recursive noise filtering if Rec Nr is activated.</p> <p>Though the Picture setting affects both luminance and chrominance channels, the Chroma can be adjusted separately to allow greater amounts of noise reduction to be applied to the chrominance channel where appropriate.</p> <p>When selected, the Display Screen will display a Chroma bar graph that requires level adjustment. The Chroma can be set between +0 and +14.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the Chroma level. 3. Press the Enter button or press the knob to set it.

Saving and Recalling Unit Settings (Memories Menu)

You can save and recall up to four programmed unit settings with the options on the **Memories** menu. These memories are snapshots of most of the control panel settings.

Figure 5-8 shows the **Memories** menu structure.

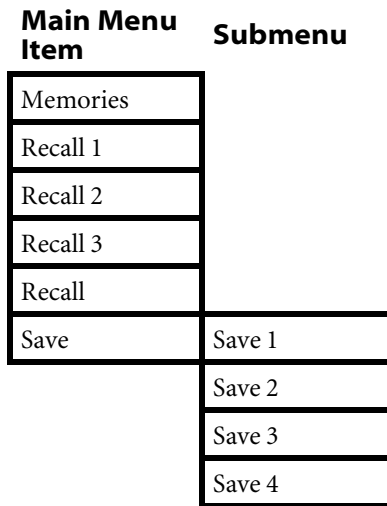


Figure 5-8. Memories Menu Structure

Functions that Can be Saved and Recalled

The following functions can be saved and recalled with **Memories**:

- Input and output standards
- Input and output configs
- All Proc Amp adjustments
- Noise reduction ON
- Adaption ON
- AutoMThr state, clipping state

Functions that Cannot be Saved and Recalled

The following functions can NOT be saved and recalled with **Memories**:

- Genlock timings for non-current O/P standards
- Ext Ref state
- Fade state
- Freeze state
- Test state
- Test pattern selections
- Test adjustments (e.g. noise amount, motion amount, etc.)
- Panel status (e.g. lockout, remote)

To access one of the **Memories** menu options:

1. Open the **Memories** menu, or press the knob.
2. Turn the knob to move up and down through the **Memories** menu options.
3. Press the **Enter** button or knob to select a menu option, or open an option submenu.

In most cases an ON LED symbol or check mark will appear beside your selection.

Menu Descriptions

This table describes the choices available from the **Memories** menu:

Option	Description	Activation
Save	<p>Save present control panel settings.</p> <p>New control panel settings can be saved over old ones.</p> <p>Adjust settings as usual, and then save them over an existing Save setting (Save 1, Save 2, Save 3, or Save 4).</p> <p>The original Save setting will be deleted and replaced with the new one.</p>	<p>Press the Enter button or the knob and hold for approximately 2 seconds.</p> <p>Result: The ON LED symbol appears beside the option, indicating activation.</p>
Recall	<p>Recall and apply previously stored control panel settings.</p>	<p>Press the Enter button or the knob.</p> <p>Result: The ON LED symbol appears beside the option, indicating activation.</p>

Using Freeze Status (Freeze Menu)



Note

You can deactivate the freeze function again by holding the **Shift** button down while pressing the **Freeze (Arc)** button on the right side of the Upconverter.

You can turn the freeze status on or off with the options on the **Freeze** menu. Once you enter the **Freeze** menu, the freeze function is turned on (activated). You can then select one of the four frozen fields or two frames. Both of the **Freeze** menu choices have individual submenus from which you can make selections.

Figure 5-9 shows the **Freeze** menu structure.

Main Menu Item	Submenu 1	Submenu 2
Freeze	Field	Field 1
		Field 2
		Field 3
		Field 4
	Frame	Frame 1
		Frame 2

Figure 5-9. Freeze Menu Structure

To access one of the **Freeze** menu options:

1. Open the **Freeze** menu.
2. Turn the knob to move up and down through the **Freeze** menu options.
3. Press the **Enter** button or knob to select a menu option, or open an option submenu.

Menu Descriptions

This table describes the choices available from the **Freeze** menu:

Option	Description	Activation
Field	<p>Access various Field options. Submenu choices include:</p> <ul style="list-style-type: none"> • Field 1 • Field 2 • Field 3 • Field 4 <p>Each choice displays an output generated from a single stored field. This will result in reduced vertical resolution than in Frame Freeze mode.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button to make a selection, or simply press the knob itself. <p>To activate a Field submenu choice (for example, Field 3), press the Enter button or the knob.</p>
Frame	<p>Access various Frame options. Submenu choices include:</p> <ul style="list-style-type: none"> • Frame 1 • Frame 2 <p>Each Frame displays the output generated from the two stored fields that comprise the frame. The output is motion adaptive and will not display inter field motion effects.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button to make a selection, or simply press the knob itself. <p>To activate a Frame submenu choice (for example, Frame 1), press the Enter button or the knob.</p>

Fading to/from Black (Fade Menu)

**Note**

You can deactivate the fade function by re-entering the **Fade** menu.

You can turn the fade option on or off. The options on the **Fade** menu let you toggle between a fade (or cut) to or from black.

Once you enter the **Fade** menu, the fade function is essentially turned ON (activated), and the word “FADED” will flash across the Display Screen. You can then access the fade options.

Figure 5-10 shows the **Fade** menu structure.

Main Menu Item	Submenu
Fade	Fade
	Cut

Figure 5-10. Fade Menu Structure

To access one of the **Fade** menu options:

1. Open the **Fade** menu.
2. Turn the knob to move up and down through the **Fade** menu options.
3. Press the **Enter** button or knob to open a menu option.
The ON LED symbol will appear beside your selection.

Menu Descriptions

This table describes the choices available from the **Fade** menu:

Option	Description	Activation
Fade	Set the Fade control to Fade mode. The fade duration is fixed at approximately 2 seconds.	Press the Enter button or the knob. Result: The ON LED symbol appears beside the option, indicating activation.
Cut	Set the Fade control to Cut mode.	Press the Enter button or the knob. Result: The ON LED symbol appears beside the option, indicating activation.

Activating Test Signal Patterns (Test Menu)

You can select from and activate a variety of test signal patterns with the options on the **Test** menu. I/P tests are generated digitally on the input side of the convertor and pass through the conversion process. The O/P tests are digitally generated in the applicable high definition standard and do not undergo any significant processing.

Figure 5-11 shows the **Test** menu structure. Both of the **Test** menu choices have individual submenus to open and make selections from.

Main Menu Item	Submenu 1	Submenu 2	Submenu 3	
Test	I/P Test	SD Patr	None	
			100%	
			75%	
			Sweep	
	O/P Test	HD Patr	None	Marker
				4-Seg
				Motion
				0 to +15
				Zone
				TK MotnMode
Test	I/P Test	SD Patr	2:2 in 525	
			Rectangl	
			Red Fld	
			Color Bar	
			Sweep	
			Ramp	

Figure 5-11. Test Menu Structure

To access one of the **Test** menu options:

1. Open the **Test** menu.
2. Turn the knob to move up and down through the **Test** menu options.
3. Press the **Enter** button or knob to select a menu option, or open a submenu option.

In most cases, the ON LED symbol or check mark will appear beside your selection.

Menu Descriptions

This table describes the choices available from the **Test** menu:

Option	Description	Activation
I/P Test	Choose I/P Test options from the I/P Test submenu. The ON LED symbol or check mark appears beside the adjusted selection. A check mark replaces the ON LED symbol if more than one setting can be selected/activated at a time within a particular menu or submenu level.	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button to make a selection, or simply press the knob itself.

Option	Description	Activation
SD Patr	<p>Generate SD test patterns at the input and passes them through the conversion process.</p> <p>The following options are available:</p> <p>None: Deselects all test patterns.</p> <p>100% or 75%: Produces 100% or 75% color bars.</p> <p>Sweep: Produces a frequency sweep.</p> <p>Marker: Produces a test signal marker.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button to make a selection, or simply press the knob itself. <p>To activate None, 100%, 75%, Sweep, or Marker, press the Enter button or the knob.</p> <p>Result: The ON LED symbol appears beside the option, indicating activation.</p>
4-Seg	<p>Produce a test pattern comprised of four different test signals in bands from top to bottom.</p>	<p>Press the Enter button or the knob.</p> <p>Result: A check mark appears beside the option, indicating activation.</p>
Motion	<p>Move a selected test pattern across the screen.</p> <p>When selected, the Display Screen will display a Motion bar graph. The Motion can be set between 0 and +15.</p> <p>Note: The Motion function cannot be set unless Zone is activated.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the bar graph. 2. Turn the knob to select the Motion level. 3. Press the Enter button or press the knob to set it.
Zone	<p>Generate a Zone Plate test pattern.</p> <p>Note: 2:2 in 525 and TK Motn activation, along with Motion adjustment, are only possible if Zone is activated.</p>	<p>Press the Enter button or the knob.</p> <p>Result: A check mark appears beside the option, indicating activation.</p>

Option	Description	Activation
TK Motn	<p>Generate a 3:2 sequence when Zone is selected.</p> <p>Note: TK Motn activation is only possible if Zone is activated. If Zone is deactivated, this option will likewise be deactivated.</p>	<p>Press the Enter button or the knob.</p> <p>Result: A check mark appears beside the option, indicating activation.</p>
2:2 in 525	<p>Generates a 2:2 sequence in 525 when Zone is selected.</p> <p>2:2 in 525 activation is only possible if Zone is activated. If Zone is deactivated, this option will likewise be deactivated.</p>	<p>Press the Enter button or the knob.</p> <p>Result: A check mark appears beside the option, indicating activation.</p>
O/P Test	<p>Choose O/P Test options from the O/P Test submenu.</p> <p>The ON LED symbol appears beside the adjusted selection.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button to make a selection, or simply press the knob itself.

Option	Description	Activation
HD Patr	<p>Provide a number of HD output test signal patterns to choose from.</p> <p>The following options are available:</p> <p>None: Deselects any previously selected HD test pattern.</p> <p>Rectangle: Produces a rectangle test signal pattern.</p> <p>Red Fld: Generates a red field.</p> <p>Color Bar: Generates color bars.</p> <p>Sweep: Generates an HD frequency sweep.</p> <p>Ramp: Generates a luminance and chrominance ramp. When viewed in GBR output format, this signal generates illegal levels.</p>	<ol style="list-style-type: none"> 1. Press the Enter button, or the knob, to open the submenu. 2. Turn the knob to move up and down through the submenu choices. 3. Press the Enter button to make a selection, or simply press the knob itself. <p>Result: The ON LED symbol appears beside the option, indicating activation.</p> <p>To select an HD output test signal pattern (such as Ramp), press the Enter button or the knob.</p>

Tips and Shortcuts

This table describes the tips and shortcuts you can use to accomplish various tasks using your Upconverter:

Function	Action	Result
Return to a previous menu level	Press the Home button.	The previous menu appears.
Return to the beginning of the main menu	Press the Home button repeatedly.	The start of the main menu appears.
Show the input and output status of the system on the Display Screen	Hold down the Shift button while pressing the Status button.	The status appear briefly before returning to the main menu.
Reset the Proc Adjust highway settings (Video Gain, Black Level, Chroma Gain, and NTSC Hue) to factory preset values	Hold down both the Shift button and the Preset button.	The LEDs on the Proc Adjust highway return to green to show that they have been reset to their default values.
Check the software and hardware version of your Upconverter	Press the Shift button and press and hold the main knob beside it.	The current software number (S/W) displays with the hardware version number (H/W).
Directly adjust and set the Proc Adjust Highway (instead of entering the main menu, moving through various categories, and opening up different menus and submenus)	Press the Proc Adjust button on the left side of the Upconverter.	The highway options are activated. You can now adjust specific variables by turning and pressing the corresponding highway knobs.
Directly adjust and set the Size and Position Highway (instead of entering the main menu, moving through various categories, and opening up different menus and submenus)	Press the Size and Position button on the left side of the Upconverter.	The highway options are activated. You can now adjust specific variables by turning and pressing the corresponding highway knobs.

Function	Action	Result
Directly adjust and set the Function Highway (instead of entering the main menu, moving through various categories, and opening up different menus and submenus)	Press the Function button on the left side of the Upconverter.	The highway options are activated. You can now adjust specific variables by turning and pressing the corresponding highway knobs.

Technical Reference and Servicing Instructions



These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the Operating Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

This equipment has more than one power supply cord. To reduce the risk of electric shock disconnect all power supply cords before servicing.

Display Screen Messages

The following table lists the HDU-3800 Upconverter Display Screen messages and their meaning:

Message	Meaning
Option Not Fitted	An option has been manually selected that is not fitted on this unit. Example: Selection of an analog source on a digital-only unit.
Panel Lockout	No changes can be made to the unit's status while Panel Lockout is on.
Faded	The Fade function has been enabled. To Deactivate: Press the Shift and Config buttons simultaneously.
Not Available	The HDU-3800 has not been fitted with the module option that corresponds to the selected menu item/control.

HDU-3800 Upconverter Specifications

The following table contains the HDU-3800 specifications:

Item	Specification
Conversion Aperture	4 field by 4 line motion adaptive
Video Gain	± 6 dB
Chroma Gain	± 6 dB
Black Level	± 100 mV
NTSC Hue Phase Range	$\pm 180^\circ$
Horizontal Picture Retiming	-8 μ s to +8 μ s
Horizontal Chroma Retiming	-444 ns to +444 ns
Video Delay Through Unit	2 input fields (525/59.94=33 mS) typical
AC Voltage (Auto-Selecting)	100 - 240 V
AC Power	385 VA max
Cooling	Side-to-side forced air
Depth	22.05 in. (560 mm)
Width	19 in. (483 mm) rack fitting
Height	3.5 in. (88 mm)
Weight	35 lbs (15.88 kg) approximately
Cable Clearance	3.94 in. (100 mm) min.

Specifications and designs are subject to change without notice.

Changing the Battery in the DCP Front Panel

If your HDU-3800 Upconverter has been working for some years and you find that the **Arc** settings are corrupt, it is most likely that the DCP lithium battery needs replacement. This battery provides power to the non-volatile RAM that stores the **Arc** settings.

You will need the following tools:

- Screwdriver: 6 inch pozi drive Number 0
- Screwdriver: Small flat blade



CAUTION:

DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY PLACED. REPLACE ONLY WITH THE SAME TYPE RECOMMENDED BY THE MANUFACTURER: SONY CR2032. DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

[FI Finland] VAROITUS: Paristo voi rajahtaa, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan valmistajan suosittelemaan tyyppun. Havita kaytetty paristo valmistajan ohjeiden mukaisesti.

[SE Sweden] VARNING: Explosionsfara vid felaktigt batteritype. Anvand samma batterityp eller en eller en ekvivalent typ som rekommenderas av tillverkaren. Kassera anvant batteri enligt fabrikantens instruktion.

[D Denmark]

Advarsel! Lithiumbatteri. Eksplosionsfare ved fejlagtig handling. Udskiftning ma kun ske med batteri af samme fabrikat og type. Lever det brugte batteri tilbage till leverandoren.

[KO Korean]

경고

만약 틀린 전지로 교환했을 경우, 폭발 위험이 가능합니다. 똑같거나, 동등한 종류와 교체하는 것을 제조업자로서 권장합니다. 제조업자의 지시에 따라, 사용된 전지는 버려 주십시오.

Battery Replacement Procedure

Preparation and Disassembly

1. Turn off the HDU-3800, and then remove the power cord.
2. Remove the top and bottom screws securing the front panel.
On some models, there is a screw on either side of the front panel. These should also be removed.
3. Pull the front panel forward and down, and allow it to rest on its side supports.
4. Unclip the grey DC power cable on the left side of the front panel from the black connector on the front panel PCB.
5. Use a 6 inch pozi drive No. 0 screwdriver to remove the four pozi screws at the corners of the front panel backplate.
6. Support the front panel with one hand and remove the two screws at the middle edges of the backplate.
7. Separate the front panel from the front panel backplate and the daughter board to which it was attached.

Result: The circular lithium battery will now be clearly visible on the front panel printed circuit board.

Replacing Battery



Note

Avoid putting your fingers across the + and - sides of the battery. This could discharge the battery.

1. Use a small flat blade screwdriver to lift the battery retaining plate about half an inch and allow the used battery to fall out of its socket.
2. Insert a SONY CR2032 battery into the socket.
Ensure that the + end of the battery is facing up towards you.

Reassembly and Connection

1. Bring the two halves of the front panel together, and then carefully attach the grey female connector on the front panel with the grey male connector on the daughter board which is fixed to the backplate.
2. Hold the front panel with one hand to keep the two halves together, and screw the two middle edge screws into the backplate.
3. Screw the four corner screws into the backplate.
4. Press the grey DC power cable into its socket on the left side of the front panel PCB.
5. Lift the front panel to the horizontal position and slowly move it forward until it fits into place, being careful not to trap any of the front panel cable assemblies.
6. Screw in the two front panel retaining screws (one on top and one underneath).

If your Upconverter model has two retaining screws for either side of the front panel, screw them in also.
7. Connect the power cord back to the HDU-3800, and switch on the unit.

Testing the New Battery

Save some new Arc settings to the front panel memory and recall them to ensure the new battery is working correctly.

HDU-3800 Sequence Input

Sequence Input Explanation and Specifications

When the input signal to the HDU-3800 Upconverter contains film originated material, it is possible to optimize the conversion apertures, thereby maximizing resolution.

3:2 Pull Down Sequence

Film based material contains information processed through a telecine which results in either a 3:2 or 2:2 relationship between film frame and video field, often called the “3:2 (or 2:2) pull down sequence.”

Knowledge of this sequence can be used to ensure that upconversion is done only using fields that originate from the same film frame. The result is optimum vertical resolution.

HDU-3800 includes circuitry to automatically detect such a film based sequence, though alternatively an external SEQ signal might be used.

Sequence Input Design

The HDU-3800 Sequence Input has been designed to receive the Sequence Output from a MKIII Cintel (or compatible) telecine machine. Both the JSI and IHB Modules have a fitted SEQ BNC, and selection will follow the selected input format.

Signal Timing

The nominal specification of the SEQ signal from a MKIII Cintel telecine is that it sits close to ground on all frames with the exception of the first video field scanned from a new film frame. It then drops low to about -4 V for about 2 mS starting just before the broad pulses.

Figure A-1 demonstrates a typical 3:2 sequence:

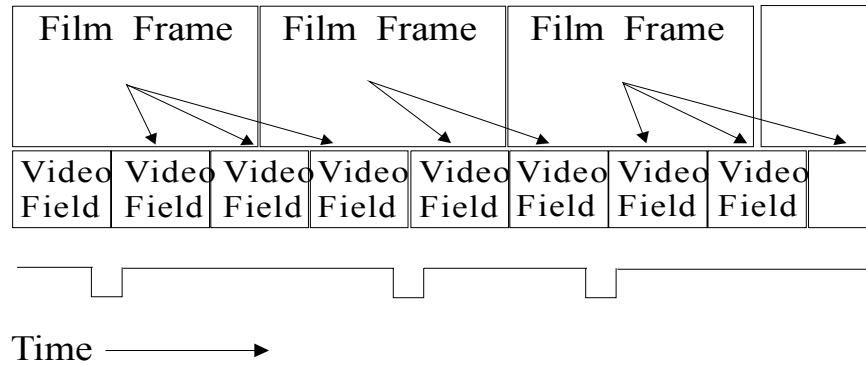


Figure A-1. 3:2 Sequence

In practice the HDU-3800 Sequence Input will tolerate a much wider range of signal timing, as described below.

Ensuring a Working Sequence Input

The HDU-3800 Sequence Input will work provided that there are no negative going glitches on the SEQ signal greater than 1 μ S wide, and that the SEQ signal:

- Falls no earlier than eight lines before the broad pulses (of the first video field from a new film frame fed to HDU-3800)
- Falls no later than the start of the broad pulses (of that field)
- Rises again no sooner than 20 μ S after it falls, and no later than 200 lines after the start of the broad pulses (of that field)
- Is not low for two or more adjacent video fields

Remote Control Operation of the HDU-3800

Overview

Remote control of up to 30 separate HDU-3800 units can be done from a single HDU-3800 control panel. The control panel, when correctly connected to other units, will automatically detect the available units and add a display option for each remote unit.

This section outlines the method of connection used to attach the individual HDU-3800 units to a single control panel.

Method of Connection

The HDU-3800 “DCP” style control panel can be used to remotely control a maximum of 30 HDU-3800s. Connecting more than one HDU-3800 unit can be accomplished by using multiple 9-pin D-type connectors chained together using the appropriate cable (See Figure A-2).

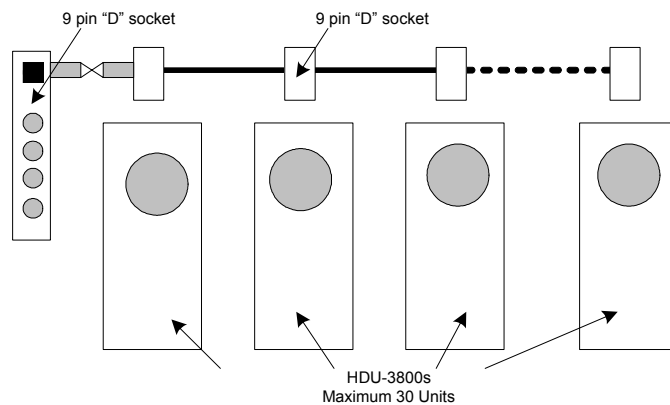


Figure A-2. Connections Between Multiple Upconverters

Single units can be attached to either the front or the rear of the HDU-3800 using a remote cable connection as shown in Figure A-3.

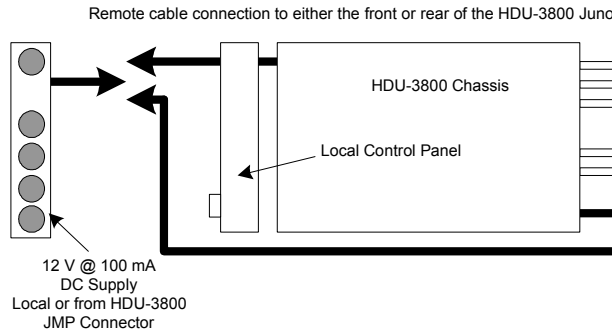


Figure A-3. Connection to a Single Upconverter

As mentioned, connections are made between the master control panel 9-way D-type connector and the nine way D-type connector on the rear of each HDU-3800. Figure A-4 shows the actual wiring employed between the connections.

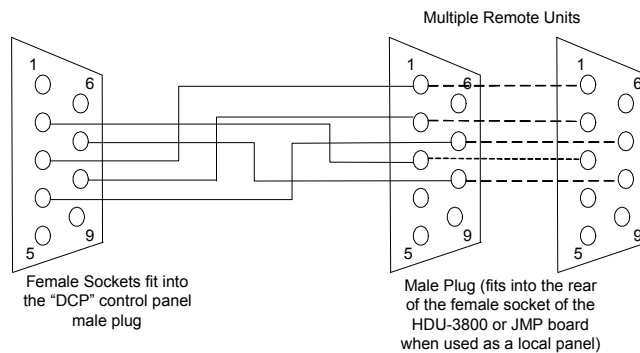


Figure A-4. 9-way D-type Connector Wiring

When Using Long Cables

If problems arise during remote panel initialization while using longer cable lengths, the addition of a 100k ohm resistor is recommended (see Figure A-5). A maximum length of approximately 100 ft. (approximately 33 m) of standard ribbon cable has been tested under laboratory conditions, but the use of Ethernet CAT5 UTP cable (2 twisted-pair plus ground) is recommended for reliable communications.

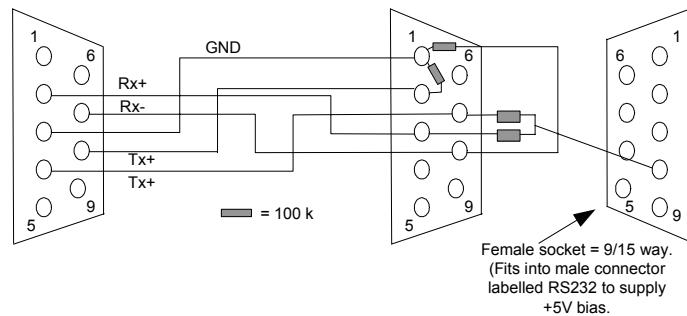


Figure A-5. HDU-3800 Connections Showing Insertion Point for 100 K Ω Resistors

Starting up Multiple Connected HDU-3800 Units

When a master HDU-3800 control panel is first switched on, it searches for any remotely connected units. Each remote HDU-3800 is identified by a unique address that is set up using rotary hex switches on the rear of the JMP board. To gain access to the rear of the JMP board, the front panel and the JMP board need to be removed first (*see* Figure A-6).

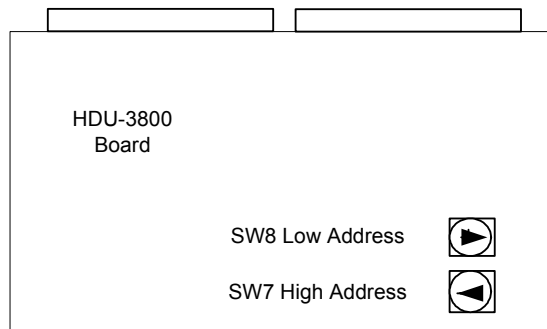


Figure A-6. Location of Address-Setting Hex Switches on JMP Board

Setting Optimal Search Time

In order to optimize the initial search time, the MAX address menu should be set to an equal, or slightly higher, address value than the maximum remote address in use.

Once the MAX address menu is set, the master control panel will search for address values up to the set address and add selection options to the control menu for all detected remote units. If no units are detected below the specified MAX address, higher addresses are searched for.

On locally controlled units, only one address is displayed under the unit submenu, this being the address of that unit.

Remote Control Menus

Remote control menus are found in the following menu sequence:

- Config menu
- Panel submenu
- Unit submenu

Main Menu Item	Submenu 1	Unit Submenu	
		JUNO 01	
		JUNO 02	
		JUNO 03	
		JUNO 04	
		JUNO 05	
		JUNO 06	
		JUNO 07	
		JUNO 08	
		JUNO 09	
		JUNO 0A	
		JUNO 0B	
		MAX Address	0B

Figure A-7. Typical 11 Unit Remote Menu - Hex Values

Addresses are set in hex numbers ranging between 00 and FF. When operating more than nine HDU-3800's (Upconverters), it is possible to miss the higher hex alphas (A to F) and thereby mimic decimal addresses.

Main Menu Item	Submenu 1	Unit Submenu	
		JUNO 01	
		JUNO 02	
		JUNO 03	
		JUNO 04	
		JUNO 05	
		JUNO 06	
		JUNO 07	
		JUNO 08	
		JUNO 09	
		JUNO 10	
		JUNO 11	
		MAX Address	11

Figure A-8. Typical 11 Unit Remote Menu - Decimal Values

Controlling a Specific Unit

To control a specific remote unit, tick the required remote unit address in the **Unit** submenu. The selection is indicated when the normally intermittent, flashing green remote LED on the unit lights up permanently

Local control of the selected unit is still possible, although this can be disabled by selecting the following menu path;

Config menu > **Panel** submenu > **Lockout** menu

Lockout cannot be activated remotely. Selecting **Lockout** on the master panel will lockout the master panel itself.

Changes made to the master panel are reflected immediately on the remote unit. The menu selections on the active panel are updated and the appropriate controls are adjusted.

The menu options displayed on the local panel are entirely under local panel control and do not follow the master panel display selections.

Colorimetry in the Juno Upconverter

Overview

The HDU-3800 Upconverter has a linear colorimetry processing matrix feature. It compensates for the differences in system colorimetry between 601 Standard Definition and 1080I/720P or 1035I High Definition systems.

System colorimetry differences occur in two areas:

- Luminance Equation (luminance and color difference derivation from RGB primaries are different)
- Chromaticity Coordinates (reference RGB primaries CIE chromaticity coordinates).

These two areas can be adjusted within their respective video standards.

There is an Auto and a Manual mode of operation for the Upconverter colorimetry feature to allow compensation for either, neither, or both luminance equation and chromaticity coordinates, as required.

Luminance Equation and Chromaticity Coordinates

Each video standard defines how to derive YPbPr signal values from its basic RGB primaries. This is done as a set of equations. These luminance and color difference equations are found in the tables below.

The Chromaticity CIE X,Y coordinates are also tabled below.

Both the luminance equations and CIE coordinates are tabled for the following video standards:

- SMPTE 125M
- SMPTE 240M
- SMPTE 274M/296M

SMPTE 125M

The following tables list the Chromaticity CIE X,Y Coordinates (top) and the Luminance and Color Difference Equations (bottom):



Note

Rec 601 (Standard Definition) uses SMPTE RP145 for chromaticity co-ordinates.

Chromaticity	X	Y
Red	0.630	0.340
Green	0.310	0.595
Blue	0.155	0.070
White	0.3127	0.3290

Rec 601 (Standard Definition) uses SMPTE RP145 for chromaticity coordinates.

Luminance Equation	Y	$0.2990R + 0.5870G + 0.1140B$
Color Difference Equation	U	$-0.1690R - 0.3310G + 0.5000B$
Color Difference Equation	V	$0.5000R - 0.4190G - 0.0810B$

SMPTE 240M

The following tables list the Chromaticity CIE X,Y Coordinates (top) and the Luminance and Color Difference Equations (bottom):

**Note**

Rec 601 (Standard Definition) uses SMPTE RP145 for chromaticity co-ordinates.

Chromaticity	X	Y
Red	0.630	0.340
Green	0.310	0.595
Blue	0.155	0.070
White	0.3127	0.3290

Luminance Equation	Y	$0.2120R + 0.7010G + 0.0870B$
Color Difference Equation	U	$-0.1160R - 0.3840G + 0.5000B$
Color Difference Equation	V	$0.5000R - 0.4450G - 0.0550B$

SMPTE 274M/296M

The following tables list the Chromaticity CIE X,Y Coordinates (top) and the Luminance and Color Difference Equations (bottom):

**Note**

1080I/720P (High Definition) uses ITU-R BT.709 for all colorimetry.

Chromaticity	X	Y
Red	0.640	0.330
Green	0.300	0.600
Blue	0.150	0.060
White	0.3127	0.3290

Luminance Equation	Y	$0.2126R + 0.7152G + 0.0722B$
Color Difference Equation	U	$-0.1146R - 0.3854G + 0.5000B$
Color Difference Equation	V	$0.5000R - 0.4542G - 0.0458B$

Extent of Colors

The extent of colors that can be mixed from basic RGB primaries (gamut) is greater in the ITU-R BT.709 specification for High Definition than in Standard Definition.

RGB primaries are defined in their own color. The R, G and B points in Figure B-1 below form a triangle. The area within the triangle represents the extent of colors that can be mixed from those primaries. Additionally, the reference white color is also plotted on this diagram.

Note

The “601 SD” R-G-B triangle is enclosed by the “709 HD” R-G-B triangle because the color gamut is greater for HD than for SD.

Result: This means, for example, that a 601 SD “saturated red” will not be a 709 “saturated red” in the HD color gamut.

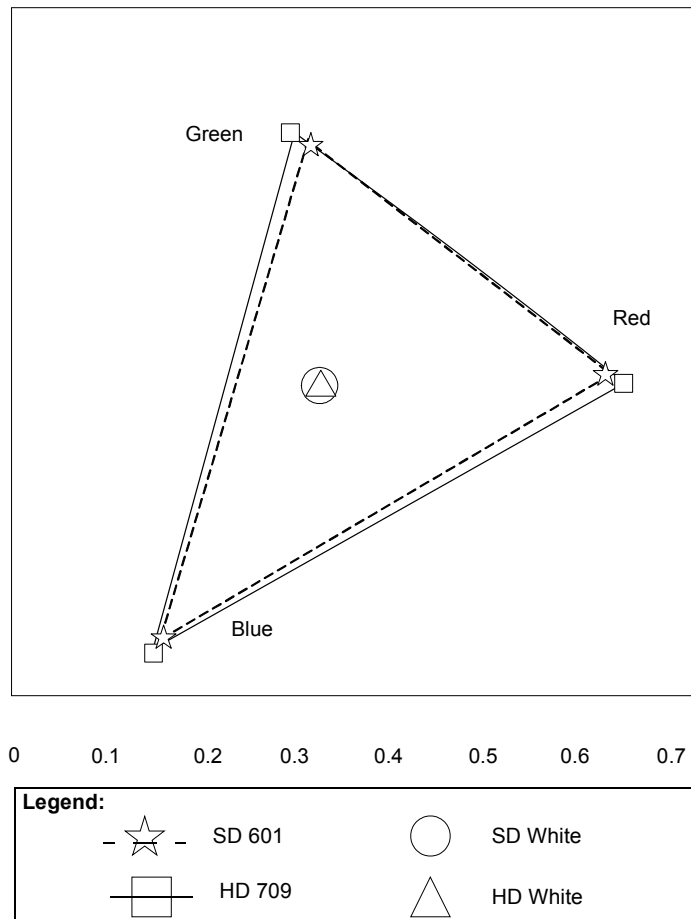


Figure B-1. SD and HD Chromaticity compared on CIE Chromaticity Axes

Color Bars Test Signal

The color bars test signal is derived from the RGB component colors, and is made up of eight saturated color bars. These eight bars are the colors produced from different combinations of R, G or B that have either been turned "full-on" or "off".

The YPbPr signals are obtained by using the appropriate luminance and color difference derivation equations for the video standard.

Below is a diagram that shows the basic process of color bar conversion between GBR and YPbPr colorspace.

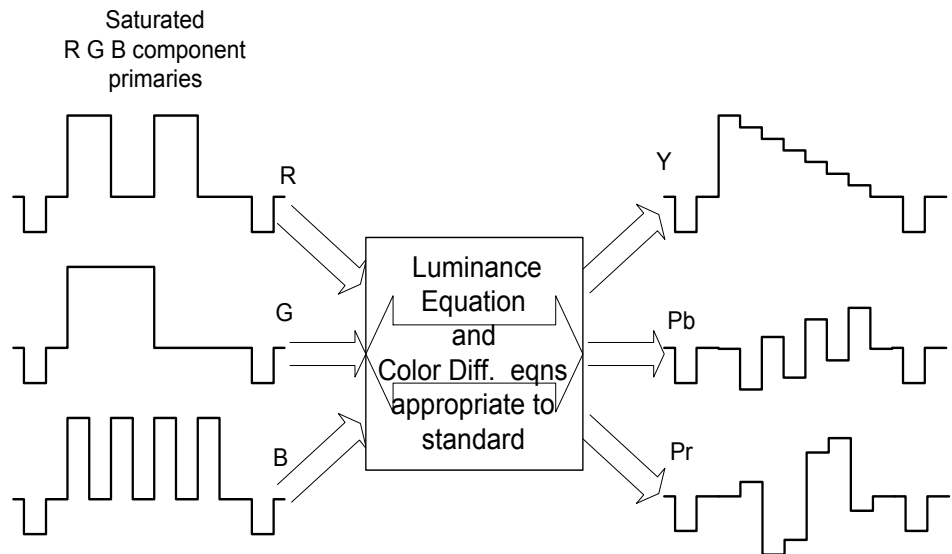


Figure B-2. Formation of YPbPr Video Waveforms from RGB Components (not to scale)

Explanation

Figure B-2 shows that the YPbPr waveforms of color bars are directly related to the saturated RGB component primary waveforms of their own color-space.

This means that for Standard Definition, the SD color-bar colors relate back to SD saturated primary components via SD luminance and color difference equations.

Likewise for High Definition, the HD color bar colors relate back to HD saturated primaries, this time via HD luminance and color difference equations.

SD and HD Color Bars

The diagram below illustrates the relations between the various color bars.

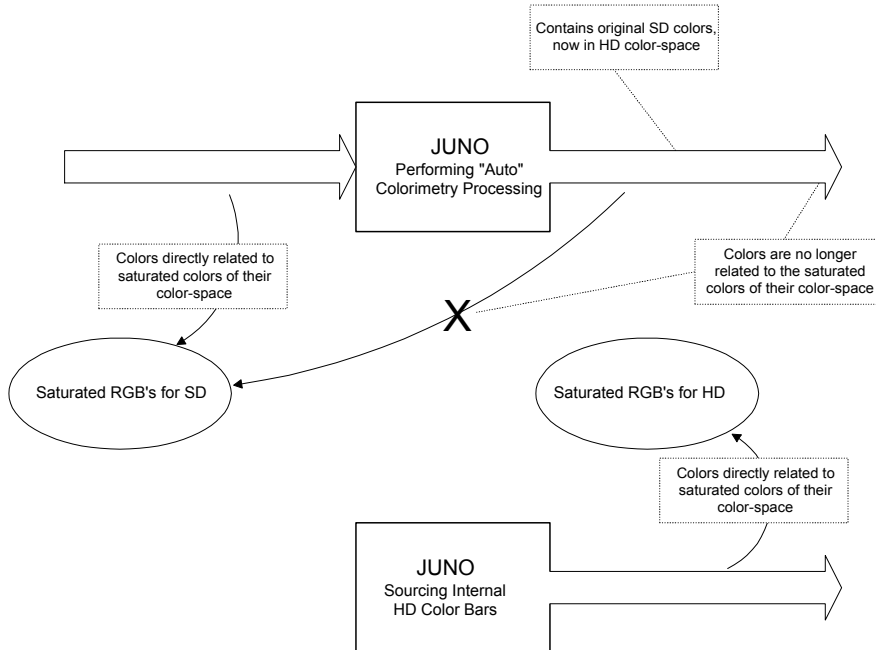


Figure B-3. SD Color Bars Through Juno Versus Internal Juno HD Color Bars

In Figure B-3, the input SD color bars are directly related to the saturated RGB primaries of their SD color-space. The emerging colorimetry-processed color-bar waveform is no longer related to the saturated colors of the new (HD) color-space. (This broken relationship is shown by the "X" in the center of the diagram). Rather, it is the internal Upconverter HD color bars test pattern which is now directly related to the saturated colors of the new (HD) color-space.

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Worldwide 24/7 Customer Support

United States

Phone: 1-757-548-2300
Toll Free: 1-888-8LEITCH
Fax: 1-757-549-4112
Email: Service.US@Leitch.com

Canada

Phone: 1-416-445-4032
Toll Free: 1-888-LEITCH6
Fax: 1-416-445-9207
Email: Service@Leitch.com

Europe

Phone: +44 (0) 1344 446099
Fax: +44 (0) 1344 446090
Email: Service.Europe@Leitch.com

International

Phone: 1-416-445-4032
Fax: 1-416-445-9207
Email: Service@Leitch.com