DENSITÉ series

XVP-1801
HD/SD Universal Video Processor/Converter
Guide to Installation and Operation

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Electromagnetic Compatibility

This equipment has been tested for verification of compliance with FCC Part 15, Subpart B requirements for Class A digital devices.

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

This equipment has been tested and found to comply with the requirements of the EMC directive 2004/108/CE:

- EN 55022 Class A radiated and conducted emissions
- ENV 50204 Radiated EMF Immunity – RF 900 MHz Pulsed
- EN 61000-3-2 Harmonic current emission limits
- EN 61000-3-3 Voltage fluctuations and flicker limitations
- EN 61000-4-2 Electrostatic discharge immunity
- EN 61000-4-3 Radiated electromagnetic field immunity – radio frequencies
- EN 61000-4-4 Electrical fast transient immunity
- EN 61000-4-5 Surge transient immunity
- EN 61000-4-6 Conducted disturbances immunity
- EN 61000-4-11 Voltage-dips, short-interruption and voltage variation immunity

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XVP-1801

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1 XVP-1801 HD/SD Universal Video Processor/Converter

1.1 Introduction

The XVP-1801 is a highly integrated module designed to synchronize, convert and process HD and SD signals into HD/SD hybrid plants. The XVP-1801 (Densité) offers similar functionality to the very successful XVP-811i (Imaging). One of the main differences is that it is a single channel card, but audio I/Os have been integrated on the card.

The XVP-1801 can accept either HD or SD inputs and will provide an HD or SD output regardless of the input standard. The output path provides format, color space, and aspect ratio conversion necessary to maintain a constant signal format. The conversion format will automatically adjust to input format changes. A cross converter feature even allows the XVP-1801 to convert from 720p to 1080i and vice versa.

The XVP-1801 can process up to 16 audio channels (4 groups of embedded audio) or 8 channels (4 discrete AES) inputs/outputs. The XVP-1801 allows for an external connection to other audio processing cards like the UAP, AAP and DAP. These boards can be used when analog audio or Dolby E encoding/decoding are a requirement.

The module provides streaming video and audio level metering, so an operator can remotely and effectively monitor the signal path using Miranda's iControl facility monitoring and control system.

1.2 Features

- Built-in up, down and cross conversion
- Dual HD/SD inputs
- HD/SD output can be 1080i50, 1080i59.94, 720p50, 720p59.94, 480i (525/59.94) or 576i (625/50)
- Configuration and operation by card edge, GPI, RCP-100 or iControl
- Up to 16 channels of embedded audio processing
- 4 discrete AES inputs and 4 discrete AES outputs
- Compatible with Miranda external audio processor modules
- Built-in frame sync and proc amp
- Flexible HD/SD reference input
- Auto failover/change over to second input
- Fill input for background side panels or letterbox
- Automatic aspect ratio conversion, using AFD signaling
- Processes and converts Ancillary data such as closed captions and time code
- Discrete 5.1 to LtRt/LoRo downmix with input shuffler and normalization
- Available sub-models that can be upgraded to full XVP-1801 operation

1.3 XVP-1801 variants

The following block diagram shows the XVP-1801.
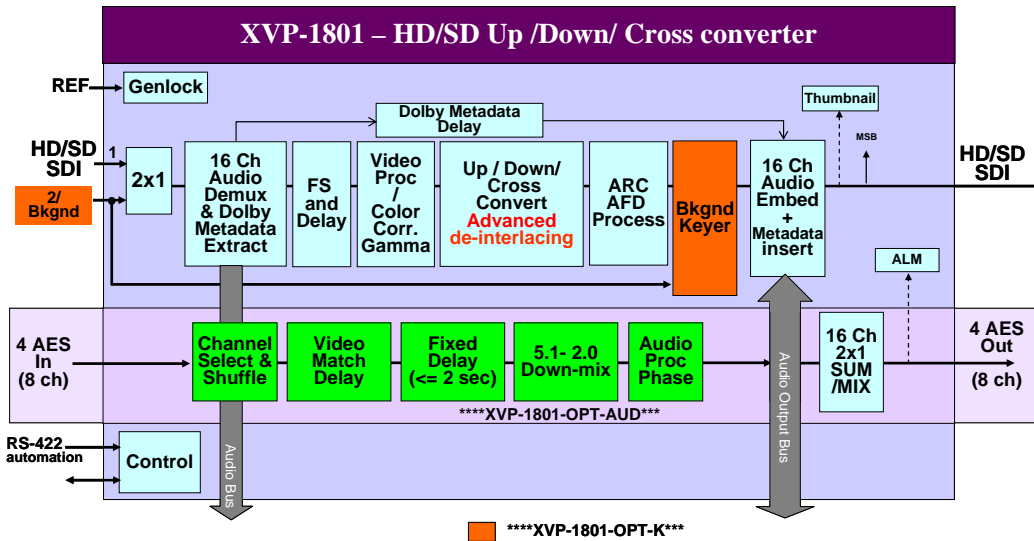
Figure 1.1 *Functional block diagram XVP-1801*

The XVP-1801 is also available in models with reduced functionality for applications where the full capabilities of the XVP-1801 are not required. The various models that are available are described below.

- *Note that each of these models can be upgraded to a fully-functional XVP-1801 with the purchase of an upgrade key. See Section 3.5.14 for details.*

- *The Audio and Key/Fill options are available on all of these models – see Section 3.5.14.*

1.3.1 XVP-1801-SD
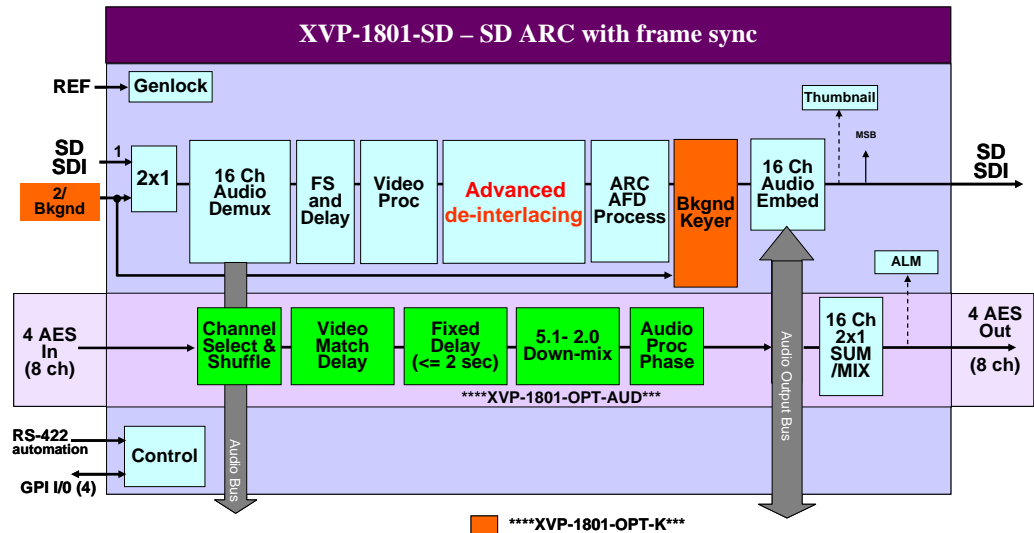
Figure 1.2 *Functional block diagram XVP-1801-SD*

The XVP-1801-SD is an SD-to-SD processor with frame sync and Aspect Ratio Conversion (ARC).

1.3.2   XVP-1801-FS
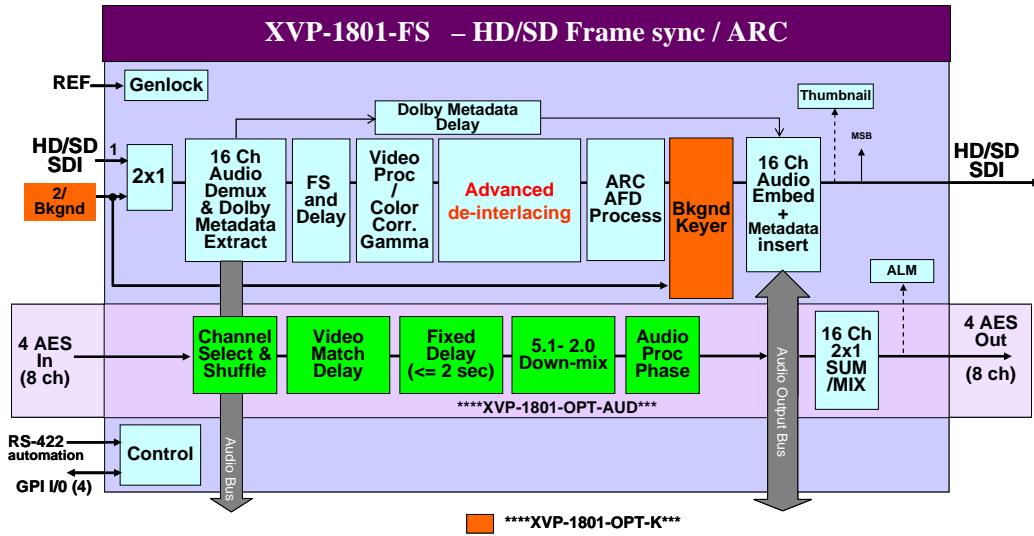
Figure 1.3   *Functional block diagram XVP-1801-FS*

The XVP-1801-FS is an HD-to-HD frame synchronizer, and an SD-to-SD ARC processor with frame sync.

1.3.3   XVP-1801-DC
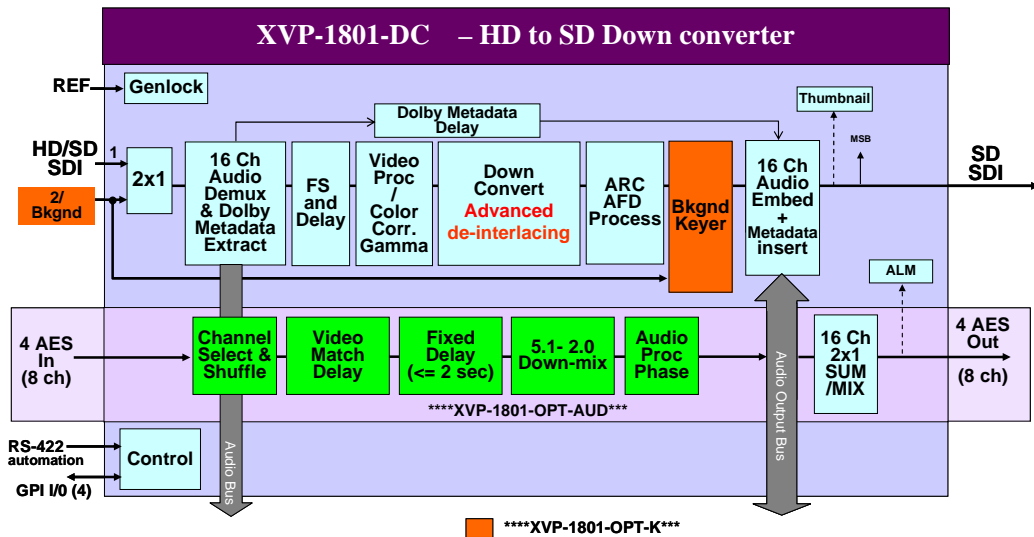
Figure 1.4   *Functional block diagram XVP-1801-DC*

The XVP-1801-DC is an SD-to-SD ARC processor and an HD-to-SD downconverter.

1.3.4 XVP-1801-UC
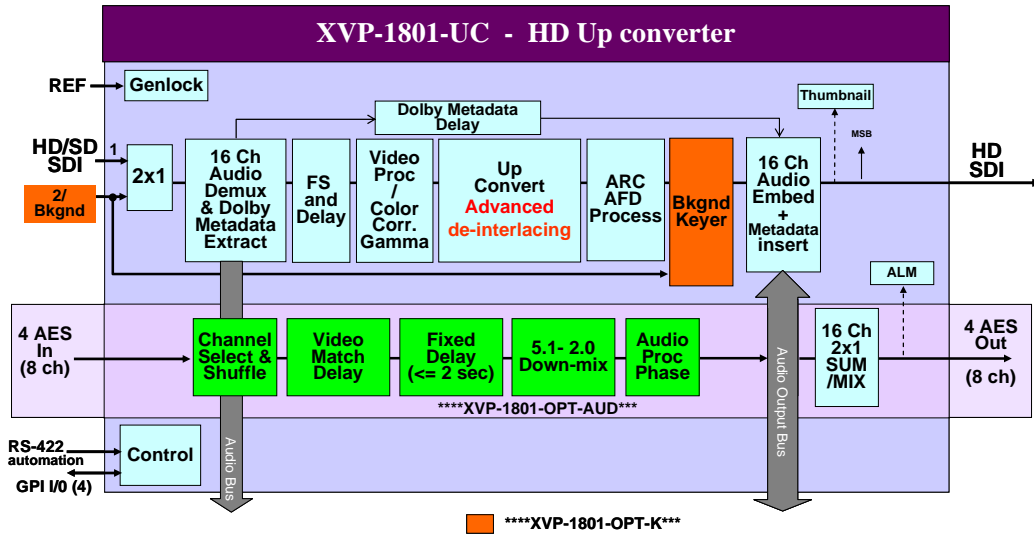
Figure 1.5 *Functional block diagram XVP-1801-UC*

The XVP-1801-UC is an HD-to-HD processor and an SD-to-HD upconverter.

The chart summarizes the functionality of the various models

Feature	SD	FS	UC	DC	Full
SD-to-SD with ARC	•	•		•	•
HD-to-HD same format		•	•		•
SD-to-HD (720p/1080i)			•		•
HD (720p/1080i)-to-SD				•	•
SD/HD to HD/SD					•

1.4 Front Card-edge Interface

The front card-edge of the XVP-1801 incorporates three elements:

- Status LED (see section 3.2)
- Select Button (see section 3.3)
- ABUS connector (see section 2.3)
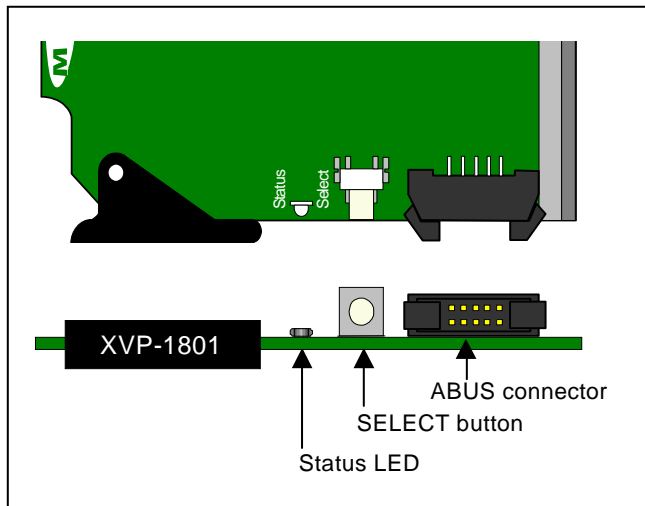
Figure 1.6 *Front card-edge layout*

2   Installation

2.1   Unpacking

Make sure the following items have been shipped with your XVP-1801. If any of the following items are missing, contact your distributor or Miranda Technologies Inc.

- XVP-1801 HD/SD Universal Video Processor/Converter
- XVP-1801-110-QRP or XVP-1801-75 -QRP Quadruple Rear Panel. If you ordered the new 3RU rear, you could have an XVP-1801-110-3DRP or XVP-1801-75 -3DRP Double Rear Panel for the Densité 3RU frame. See figure 2.2

2.2   Installation in the Densité frame

The XVP-1801 and its associated rear connector rear panel must be mounted in a DENSITÉ frame. It is not necessary to switch off the frame's power when installing or removing the card. See the DENSITÉ Frame manual for detailed instructions for installing cards and their associated rear panels.

The XVP-1801 has multiple inputs and outputs, and requires a quadruple-width rear panel.

With the quadruple–width rear panel installed, the XVP-1801 must be installed in the second slot from the right-most of the 4 slots covered by the panel in order to mate with the panel's connectors. If it is placed in the wrong slot, the front panel LED will flash red. Move the card to the designated slot for correct operation. No damage will result to the card should this occur.

2.3   ABUS Connection to Companion Audio Cards

When the XVP-1801 is used in conjunction with one or two companion audio cards (Miranda's AAP, DAP or UAP series), the ABUS flat cable must be installed between the ABUS connector of the XVP-1801 and the connectors on the audio cards. The ABUS flat cable is supplied with the audio card.
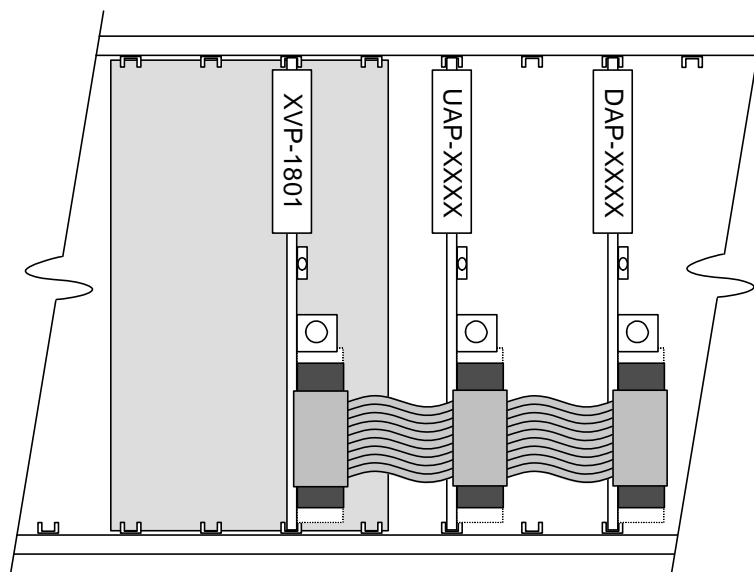
Figure 2.1   *ABUS flat cable installation*

Note: If only one audio card is used, you must use the two end connectors on the ABUS cable, and leave the center connector unplugged

2.4   Rear Panel Connectors

Figure 2.2   *XVP-1801 Rear Panels*

REF IN – Studio reference input

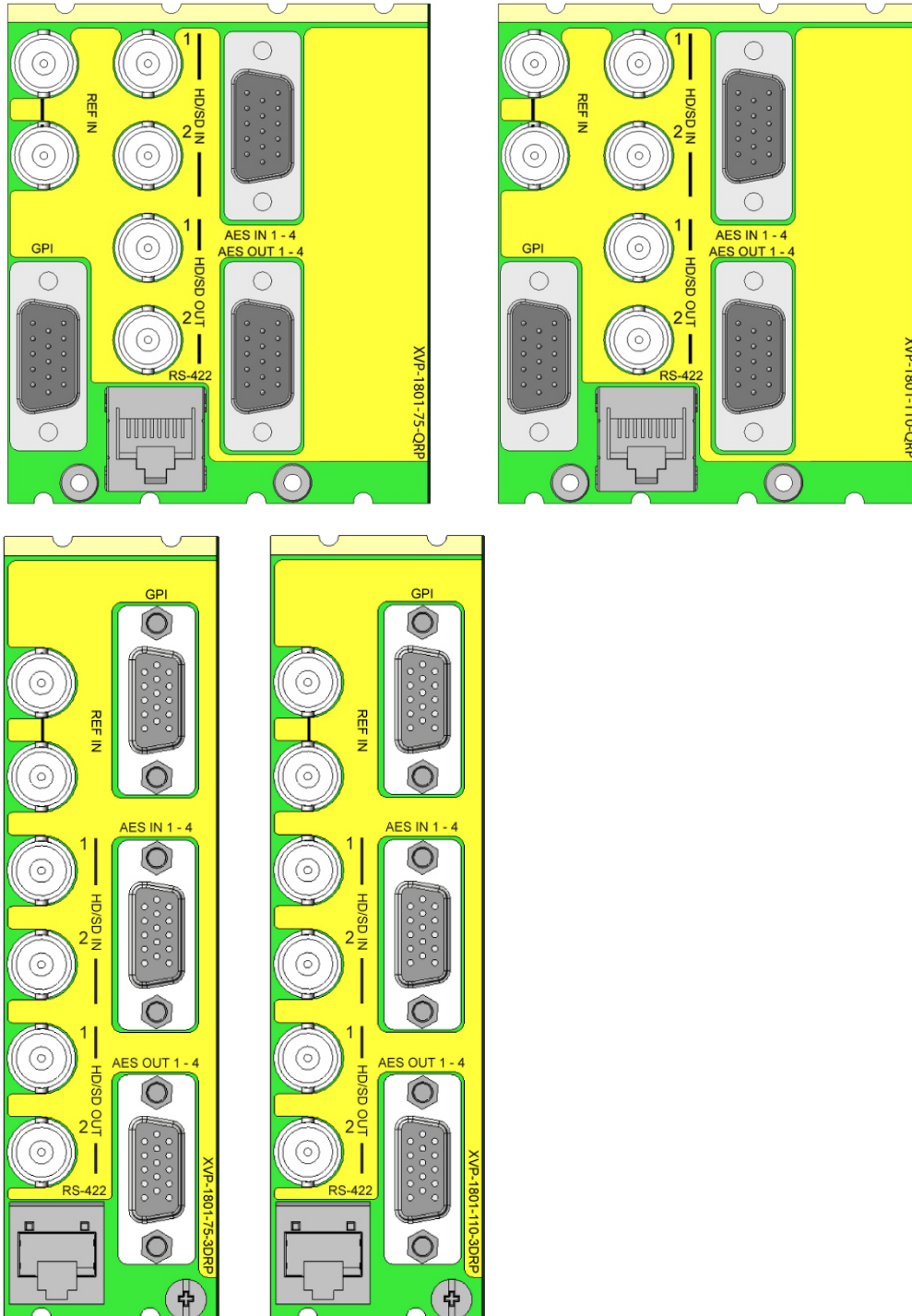For external synchronization, connect a black studio reference signal to the BNC labeled **REF IN**. The reference input must conform to SMPTE 170M/SMPTE 318M/ITU 624-4/BUT 470-6 for standard definition signals and SMPTE 274M / SMPTE 296M for high definition signals and is used to phase the HD/SD SDI outputs to the studio. A reference mismatch may occur if there is a difference between the input video format's frame rate and the reference format's frame rate. When a mismatch occurs, the output will freeze to the reference frame rate and produce an input error and the card-edge Status LED will turn red to indicate the mismatch.

Note that in the case of HD signals of the same frame rate, any reference signal may be used to genlock any output signal, regardless of scan type (progressive or interlaced). When a 720p/tri-level sync reference signal is used with an interlaced output, the output is synchronized but there may be a delay of one field depending on when the synchronization started.

The loop must be terminated if not used.

HD/SD SDI IN – serial digital HD/SD input

Connect up to two serial digital video signal, conforming to the SMPTE 292M standard for HD input signals and SMPTE 259M standard for SD input signals, to the BNC labeled **HD/SD SDI IN**. The XVP-1801 will automatically switch to the detected line format.

HD/SD SDI OUT – serial digital video outputs

The XVP-1801 provides two HD/SD SDI video outputs on BNC connectors, labeled **HD/SD SDI OUT 1** and **2**. The SDI video signal conforms to the SMPTE 292M and SMPTE 259M-C standard.

GPI – GPI I/O connector

The rear panel GPI connector on a 15-pin D-SUB provides 8 GPI: 2 for input selection, 4 to recall user configurable presets and 2 GPIs to indicate which input is selected.
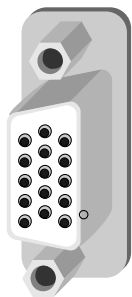
GPI Label	Pin #
GPI USER1	1
GPI USER2	6
GPI USER3	2
GPI USER4	7
GPI INPUT 1	3
GPI INPUT 2	8
GPI OUT1 (IN1 selected)	13
GPI OUT2 (IN2 selected)	10
N/C	4, 9
GND	5, 11, 12, 14, 15

The User Preset and Input selections are all contact closures to ground (GND). To select a preset (User 1 to 4) or an input (Input 1 or 2) using the GPI, simply short the preset or input pin to any GND pin.
- The card detects the transition to ground
- user presets must be configured and saved through the normal operating mode of the XVP-1801.

GPI loading is a "single load" process triggered by a transition to ground: it needs to be activated only for a short period (around 10 millis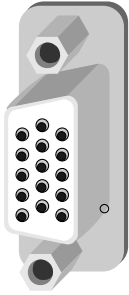econds) to be detected by the card. Since it is not activated by a level, it is not necessary to maintain the level at ground after the activation.

GPIs, system and user presets are not operating modes: when loaded, they change only the current card configuration.

AES IN 1-4 – discrete AES3 digital audio inputs (4)

110 Ohm rear		Pin #	75 Ohm rear
AES IN 1	High	1	AES IN 1
AES IN 1	Low	6	GND
AES IN 2	High	2	AES IN 2
AES IN 2	Low	7	GND
AES IN 3	High	3	AES IN 3
AES IN 3	Low	8	GND
AES IN 4	High	13	AES IN 4
AES IN 4	Low	10	GND
GND		5	GND
N/C		4, 9, 11, 12, 14, 15	N/C

AES OUT 1-4 – discrete AES3 digital audio outputs (4)

110 Ohm rear		Pin #	75 Ohm rear
AES OUT 1	High	1	AES IN 1
AES OUT 1	Low	6	GND
AES OUT 2	High	2	AES IN 2
AES OUT 2	Low	7	GND
AES OUT 3	High	3	AES IN 3
AES OUT 3	Low	8	GND
AES OUT 4	High	13	AES IN 4
AES OUT 4	Low	10	GND
GND		5	GND
N/C		4, 9, 11, 12, 14, 15	N/C

RS-422 – Machine Control Interface (RJ45 socket):

RS-422 Label	Pin #
RS422-TX1	1
RS422-TX0	2
RS422-RX1	3
RS422-RX0	6
N/C	4,5,7,8

3 Operation

3.1 Control options

The XVP-1801 can be controlled in three different ways:

- The local control panel and its push-buttons can be used to move through a menu of parameters and to adjust parameter values (see section 3.3).

- Miranda's RCP-100 remote control panel can be used to access the same menu structure from a remote location (see section 3.4).

- Miranda's iControl system can be used to access the card's operating parameters from a remote computer, using a convenient graphical user interface (GUI). (see section 3.5)

3.2 Card-Edge Status LED

The status monitor LED is located on the front card-edge of the XVP-1801, and is visible through the front access door of the DENSITÉ frame. This multi-color LED indicates the status of the XVP-1801 by color, and by flashing/steady illumination.

The chart shows how the various error conditions that can be flagged on the XVP-1801 affect the LED status.
- If a cell is gray, the error condition cannot cause the LED to assume that status
- If more than one LED status is possible for a particular error condition, the status is configurable. See Section 3.5.15 for details.
- The factory default status is shown by a ✪

The LED will always show the most severe detected error status that it is configured to display, and in the chart error severity increases from left to right, with green representing no error/disabled, and flashing red the most severe error.

Error Condition	LED Status			
	Green	Yellow	Red	Flashing Red
Cooling Fan 1 error				✪
Cooling Fan 2 error				✪
FPGA 1 error				✪
FPGA 2 error				✪
AES Receiver 1 error				✪
AES Receiver 2 error				✪
AES Receiver 3 error				✪
AES Receiver 4 error				✪
Dataflash error				✪
No Rear				✪
Card System error			✪	
Reference missing			✪	
Reference mismatch			✪	
Manual Freeze		✪		
Test Mode		✪		
Input 2 format mismatch			✪	
Input 2 failover	✪			
Carrier 1 detect error			✪	

Carrier 2 detect error (keyer mode)			✪	
Carrier 2 detect error (switcher mode)	✪			
Carrier 2 detect error (failover mode)			✪	
AES 1 presence error	✪			
AES 2 presence error	✪			
AES 3 presence error	✪			
AES 4 presence error	✪			
Silence detected Channel 1	✪			
Silence detected Channel 2	✪			
Silence detected Channel 3	✪			
Silence detected Channel 4	✪			
Silence detected Channel 5	✪			
Silence detected Channel 6	✪			
Silence detected Channel 7	✪			
Silence detected Channel 8	✪			
Silence detected Channel 9	✪			
Silence detected Channel 10	✪			
Silence detected Channel 11	✪			
Silence detected Channel 12	✪			
Silence detected Channel 13	✪			
Silence detected Channel 14	✪			
Silence detected Channel 15	✪			
Silence detected Channel 16	✪			

✪ : Factory default.

If the LED is Flashing Yellow, it means that the card is selected for local control using the Densité frame's control panel. See Section 3.3 for details.

3.3   Local control using the Densité frame control panel

3.3.1   Overview

Push the SELECT button on the XVP-1801 card edge (see Section 1.4) to assign the local control panel to operate the XVP-1801. Use the control panel buttons to navigate through the menu, as described below.

All of the cards installed in a Densité frame are connected to the frame's controller card, which handles all interaction between the cards and the outside world. There are no operating controls located on the cards themselves. The controller supports remote operation via its Ethernet ports, and local operation using its integrated control panel.

The local control panel is fastened to the controller card by a hinged connector, and when installed is located in the front center of the frame, positioned in front of the power supplies. The panel consists of a display unit capable of displaying two lines of text, each 16 characters in length, and five pushbuttons.

The panel is assigned to operate any card in the frame by pushing the SELECT button on the front edge of that card.
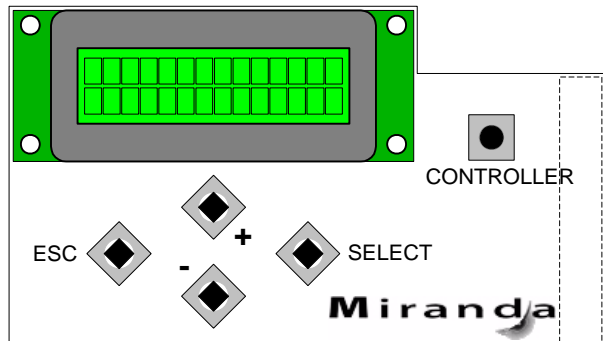

Figure 3.1 Densité Frame local control panel

- Pushing the CONTROLLER button on the control panel selects the Controller card itself.
- The STATUS LED on the selected card flashes yellow.

The local control panel displays a menu that can be navigated using the four pushbuttons located beneath the display. The functionality of the pushbuttons is as follows:

[+] [–]   Used for menu navigation and value modification

[SELECT]   Gives access to the next menu level. When a parameter value is shown, pushing this button once enables modification of the value using the [+] and [–] buttons; a second push confirms the new value

[ESC]   Cancels the effect of parameter value changes that have not been confirmed; pushing [ESC] causes the parameter to revert to its former value.

Pushing [ESC] moves the user back up to the previous menu level. At the main menu, [ESC] does *not* exit the menu system. To exit, re-push the [SELECT] button for the card being controlled.

If no controls are operated for 30 seconds, the controller reverts to its normal standby status, and the selected card's STATUS LED reverts to its normal operating mode.

3.3.2   Menu for local control

The XVP-1801 has operating parameters which may be adjusted locally at the controller card interface.
- Press the SELECT button on the XVP-1801 front card edge to assign the Densité frame's local control panel to the XVP-1801
- Use the keys on the local control panel to step through the displayed menu to configure and adjust the XVP-1801.

The complete menu structure is shown in Annex 1 to this document, beginning on page 56.

3.4   Remote Control Using the RCP-100

The XVP-1801 can be controlled through a menu accessible using Miranda's RCP-100 remote control panel.

Please refer to the RCP-100 Guide to Installation and Operation for detailed instructions on installing and operating the RCP-100, and for instructions on how to connect the RCP-100 to the XVP-1801 (or any other supported card) so that the menu can be accessed.

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3.5   Remote control using iControl

The operation of the XVP-1801 may be controlled using Miranda's iControl system.

- This manual describes the control panels associated with the XVP-1801 and their use.
- Please consult the iControl User's Guide for information about setting up and operating iControl.

In iControl Navigator or iControl Websites, double-click on the XVP-1801 icon to open the control panel.

3.5.1   The iControl graphic interface window

The basic window structure for the XVP-1801 is shown in figure 3.2. The window identification line gives the card type (*XVP-1801*) and the slot number where the card installed in its Densité frame.
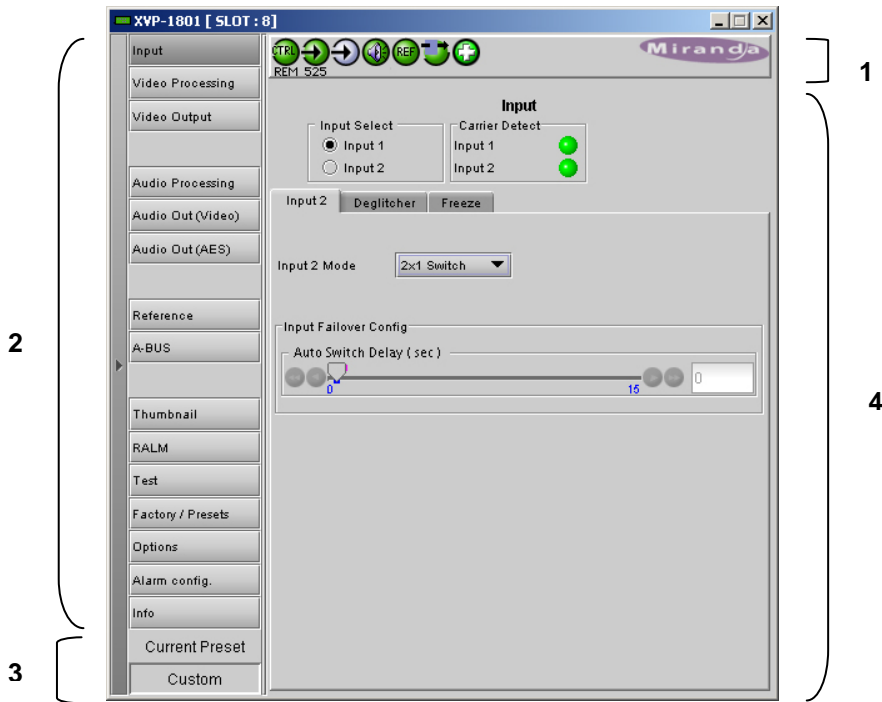
Figure 3.2   *XVP-1801 iControl graphic interface window:*

There are four main sections in the window itself, identified in figure 3.2:

1.   The top section displays icons on the left. These icons report different statuses such as card communication status, input signal and reference signal format and statuses. In some instances, they relate to conditions defined through parameters settings.

Icon #   1   2   3   4   5   6   7

Move the mouse over an icon and a status message appears below the icon providing additional information.

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If there is an error, the error status message appears in the message area without mouse-over.

- If there are multiple errors, the error messages cycle so all can be seen
- The icon whose status or error message is shown is highlighted with a mauve background

The table below lists the various status icons that can appear, and how they are to be interpreted.

- In cases where there is more than one possible interpretation, read the error message in the iControl window to see which applies.

Table –iControl Status Icon interpretation

Icon #1 – Manual Card Configuration	
(green)	Remote card control activated. The iControl interface can be used to operate the card
(yellow)	Local card control active, The card is being controlled using the Densité frame control panel, as described in section 3.3. Any changes made using the iControl interface will have no effect on the card.
Icon #2 – Input 1 / Input 2 status **This icon reports the status of either input 1 or input 2, depending on Input 2 operating mode (see Sect. 3.5.2) and situation** • **2x1 Switch – status of the input selected in the Input Select area of the input panel** • **Failover – usually status of input 1, but status of input 2 if input 1 has failed** • **Key/Fill – status of input 1**	
(green)	Signal detected and valid. • Beneath the icon, the format will be indicated as HD or SD, and the specific format details will be listed if the cursor is moved over the icon.
(red)	Signal absent (Input 1 or Input 2 will be specified) No rear Reference mismatch Video/TRS error Input 2 selected in Failover mode
Icon #3 – Input 2 status – only if Input 2 is in the Key/Fill operating mode (see Sect. 3.5.2)	
(green)	Signal detected and valid

(red)	Signal absent No rear Format mismatch with output format Input 2 Video/TRS error Input 2 Format
(gray)	This icon is shown if Input 2 is not in the Key/Fill mode
Icon #4 – Audio Status	
(green)	Audio OK
(yellow)	Yellow alarm condition detected on 1 or more channels
(red)	Red alarm condition detected on 1 or more channels
(gray)	All audio disabled
(red)	Card System Mismatch – the audio cards detected on the ABUS do not match the configuration selected in the ABUS panel
Icon #5 – Reference	
(green)	Reference OK. Mouse over to see the source of the reference, and its format, e.g. external, NTSC
(red)	Reference mismatch or Missing reference
(gray)	Reference absent
Icon #6 – Operation Mode	
(green)	Operation mode: process – normal processing of the input signal

(yellow)	Operation mode: TEST – color bar and audio test tones enabled (see Sect. 3.5.12)
(yellow)	Operation mode: Manual Freeze ON (see Sect. 3.5.2 – Freeze tab)
Icon #7 – Health Monitoring	
(green)	Hardware OK
(red)	Hardware Health Monitoring (Fan1, Fan2, Hardware fault detected) If this icon appears red, return the card to Miranda.

2.   The left portion of the window contains all the parameter groups, which become highlighted when they are selected; the main panel (4) then displays the group's set of parameters. Each of the groups is described in detail below.

3.   The lower section of the window identifies the Preset currently in use, or "Custom" if none is applicable.

4.   The main panel contains all the parameters specific to the group selected. It may contain several tabs to help manage the different parameters.

Each of the panels associated with the groups accessed from the buttons in Section 2, and shown in Section 4, is described individually in the following sections.

3.5.2   The *Input* group

This group allows input selection, second input operation mode selection, and control of the deglitcher and freeze functions. See figure 3.3.

Input Select: choose one of the two inputs connected to the rear panel. The *Carrier Detect* icon color indicates the status of the two input signals: green if a carrier is present, grey if there is no input, red if Key/fill mode is selected and there is no signal on input 2.

- The video input status in the top section (icon #2 and error message) refers only to the input selected here

Figure 3.3   *Video Input group*

Input 2 Tab

Input 2 Mode: Specify the operation mode for the second input using the pulldown. Available choices are:

2x1 Switch operation
2x1 Switch: when this mode is selected, the card can be manually switched between the 2 inputs, using the radio buttons in the *Input Select* area. Keep in mind that all current settings (ARC, audio, etc.) will remain and be applied to input 2.

Input Fail Over operation
Fail Over: when this mode is selected, the card will automatically switch from input 1 to input 2 when input 1 is lost for a delay longer than the *Auto Switch Delay* set below.
- All current settings (ARC, audio, etc.) will remain and be applied to input 2.
- The card will remain on input 2, even if input 1 returns to normal, until it is manually reset to input 1

Auto Switch Delay (sec): using the slider, set the *Auto Switch Delay,* from 0 to 15 seconds.

Some points to note for the Failover mode:
- The Failover mode only switches from input 1 to input 2, not from 2 to 1.
- If input 2 and Failover mode are both selected, an error is reported by iControl and the card edge LED turns red. The second input is always required in this mode.
- Both input signals must be present – the system cannot switch to input 2 if there is no signal there – and the absence of either of the signals will be flagged as an error (icon #2 and card-edge LED red)
- If there is no input 2, the iControl carrier detect icon for input 2 will be red, but no input error will be flagged.

Key/Fill operation
Key/Fill: when this mode is selected, the card uses input 1 as the main video input, and the second input is used as background graphics to the output side panels or letterbox. For this mode to function properly:
- In order for the two signals to be properly phased at the keyer, it is necessary for the second input to be timed between 414 pixels and 1 line+413 pixels ahead of the output timing.
- The second input must be the same format as the output.
- If the second input is lost, the specified background color is used until the input comes back.
- Input 2 selection in the Input Select area is disabled in the Key/Fill mode.

The format and status for the second input is displayed in an icon at the top of the interface.

Deglitcher tab
Mode: select OFF or ON from the pulldown.

When the Deglitcher is active, the card supports a hot-switch between two signals (either on the same input, or between the card's two inputs) without producing a freeze on the frame sync, and without producing artifacts on the output. For this mode to function correctly:
- The two inputs must be synchronized to the reference
- They must be phased within one line of each other
- They must be phased to within +/- ½ line of the HREF of the reference signal
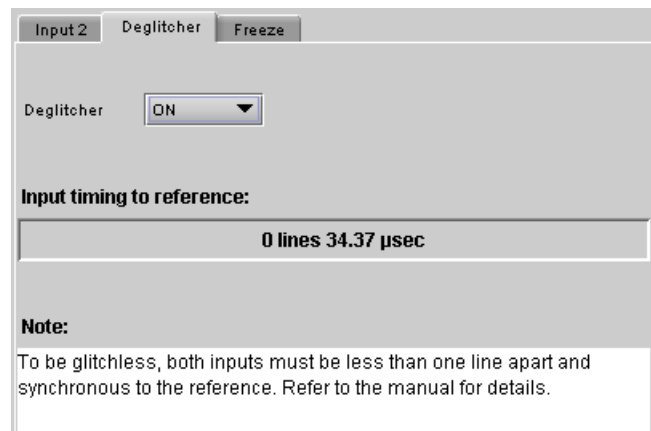
Figure 3.4   Input group – Deglitcher tab

The offset from the VREF can be variable, but a distance of greater than 10 lines could create an artifact in the active video. If the two signals are more than 1 line apart, we will see a vertical jump at the moment of switching that is proportional to the number of vertical lines of offset between the two signals. This will last for only one frame. There may also be problems in the transition when in the AFD automatic or forced mode.

When a reference is present and the deglitcher is active, the card reports the difference in timing between the input and the reference when the transition occurs.

- If the reference is missing when the deglitcher is activated, the Input timing to reference box will indicate "Missing reference" in red, and the reference status icon at the top of the iControl window will turn red and show the message "Reference missing".

- If the deglitcher is OFF, the reference status icon will be grey, and its message will read "Reference absent"

To perform a glitch-free switch between two sources, they must be in the same clean switch region. A clean switch region is contained within ± ½ line about an H=0 point in the reference signal, as shown by the dotted lines in the figure. There is a clean switch region centered on every H interval. As you can see, vertical alignment with the reference is not important for the deglitcher to operate properly.
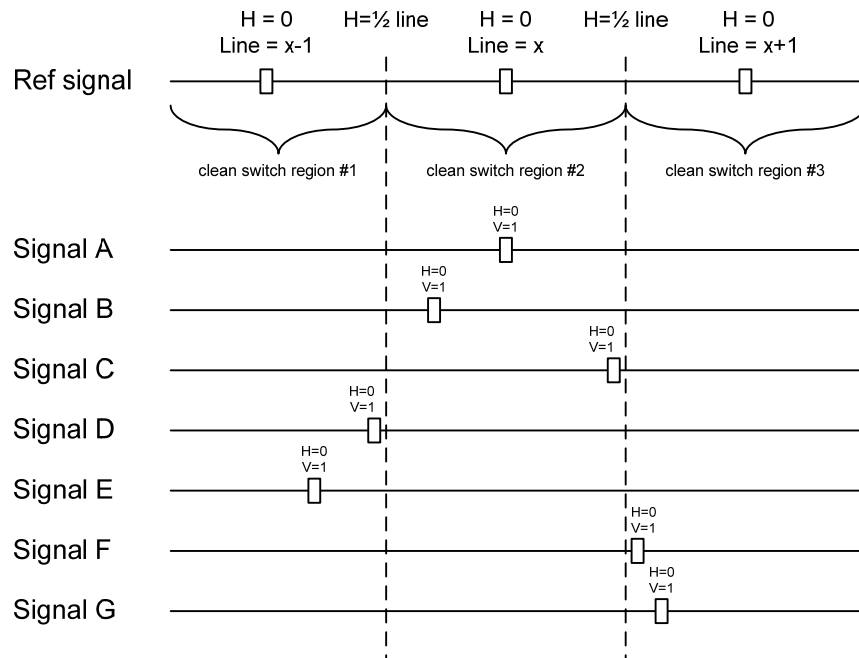
You may switch between signals A, B or C, without any glitch, and also between signals D⇔E and signals F⇔G. Any other transition, like A⇔D, will cause a vertical image shift for one frame.

To determine whether a clean hot switch is possible, you need to determine whether the two input signals lie in the same clean switch region. There are two ways to measure the position of the signals with respect to the reference:

- Use the deglitcher tab in iControl (Input→Deglitcher)
- Use the controller menu in Appendix 2 (video→timing→in timing to ref).

When the deglitcher mode is on, each of these sources will display the alignment offset between the reference signal and the input signal. Knowing the offset for both input signals, you can determine if they are in the same clean switch region. If so, any hot-switch between those two signals will be glitch less.

To determine the limits of a clean switch region, you must know the input's line length in μs. The first region is delimited by +½ line and -½ line of the reference. For example, with an SD (525) signal the line length is 63.5 μs and so the first region lies between -31.76 μs and 31.76 μs. Other regions can be found by adding or removing a multiple of line length to the two boundaries.

Example: for an SD (525) input signal, we have these clean switch regions:
-1 line and -31.76 μs to 0 line and -31.76 μs
 0 line and -31.76 μs to 0 line and 31.76 μs
 0 line and   31.76 μs to 1 line and 31.76 μs
etc.

Practical examples:

Example 1: we have two SD (525) sources, one that indicates an offset of -25 μs with respect to the reference (A) and the other an offset of -35 μs (B). We know that a clean switch region limit is present at -½ line, which corresponds to -31.76 μs. We can now determine that this switch will not be clean, because the two sources are on opposite sides of the limit, and are therefore not in the same clean switch region.
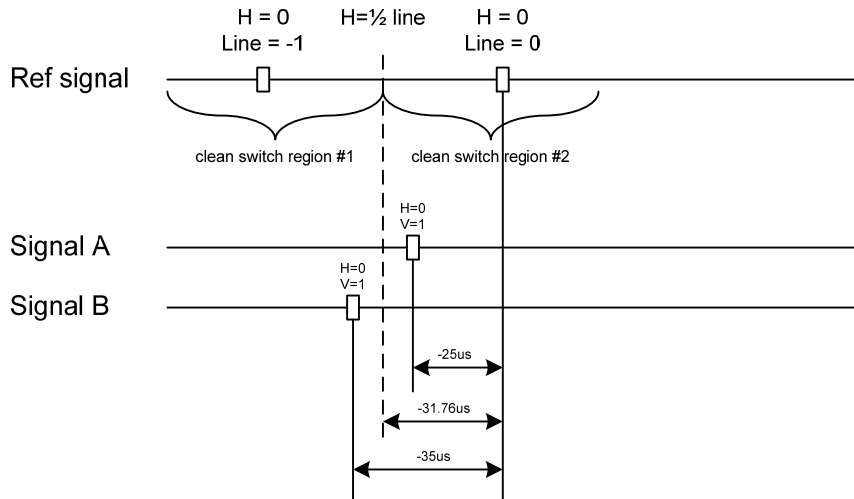
Example 2: We have two SD (525) sources, one that indicates an offset of 50μs with respect to the reference (A) and the other an offset of 40μs (B). We know that a clean switch region limit is present at + ½ line and another one at ½ line plus one line. These correspond to 31.76μs and 95.28μs. We can now determine that this switch will be clean, because the two sources are inside the same clean switch region.
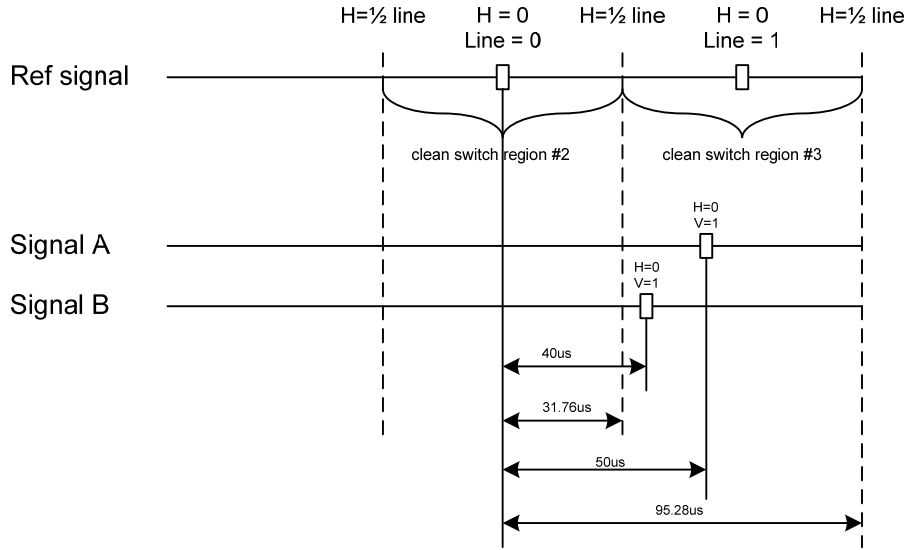
Freeze tab

Freeze type: This is a pull-down menu with four options – FIELD 1, FIELD 2, FRAME and BLACK. It determines the manner in which the XVP-1801 responds to a manual freeze, a video input switch ("hotswitch" as defined by SMPTE recommended practice RP-168, revised January 2002), a loss of input signal or other input errors. The four possible options yield the following results:
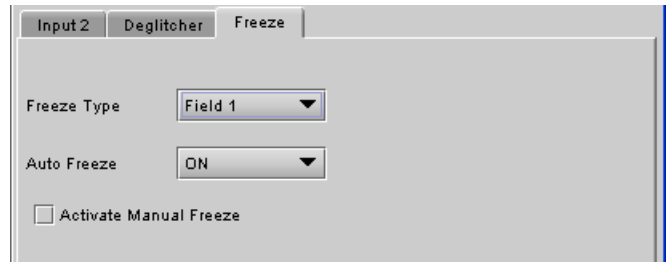
Figure 3.5 *Input group – Freeze tab*

Freeze Option	Auto Mode	Manual Mode
• Field 1		Freeze to last valid FIELD 1
• Field 2	Freeze to last valid FIELD	Freeze to last valid FIELD 2
• Frame		Freeze to last valid FRAME
• Black	Freeze to BLACK	

Auto Freeze: This pulldown (ON/OFF) enables or disables the auto freeze function. In Auto Freeze mode, a reference must be present to ensure a glitchless output when a freeze is activated. There are only two freeze possibilities in Auto mode: freeze to last valid Field or freeze to black. When Auto Freeze mode is disabled, the content of the active picture will reflect whatever garbage is present at the input but, if a reference is present, the output synchronization will be maintained to avoid unlocking downstream equipment.

Manual: Select this checkbox to immediately freeze the output according to the mode selected in the Freeze Type pull-down.

Note: The manual freeze setting is saved in the non-volatile memory of the card. If the manual freeze is activated and the power is cycled, the card will start in freeze mode at the next power-up and the output will be invalid. Just turn off the manual freeze to restore the output.

In all cases, audio will be muted when there is an input error. See audio section for more information.

3.5.3   The *Video Processing* group

This group contains color-correction parameters that apply to the input signal.

*Proc Mode***:** Select whether the processing controls will be presented in YCbCr or RGB processing mode.

RGB Gamut: When ON, all illegal YCbCr colors in the RGB space will be clipped to a legal value.

Basic tab
All Gain: Sets Luma and Chroma gains, or G, B and R gains to a specific value. When other gains are individually set, ALL GAIN reflects the average value of the combined gains. Gains range from -*800* (0% of input) to +*800* (200% of input), while *0* is the nominal value.
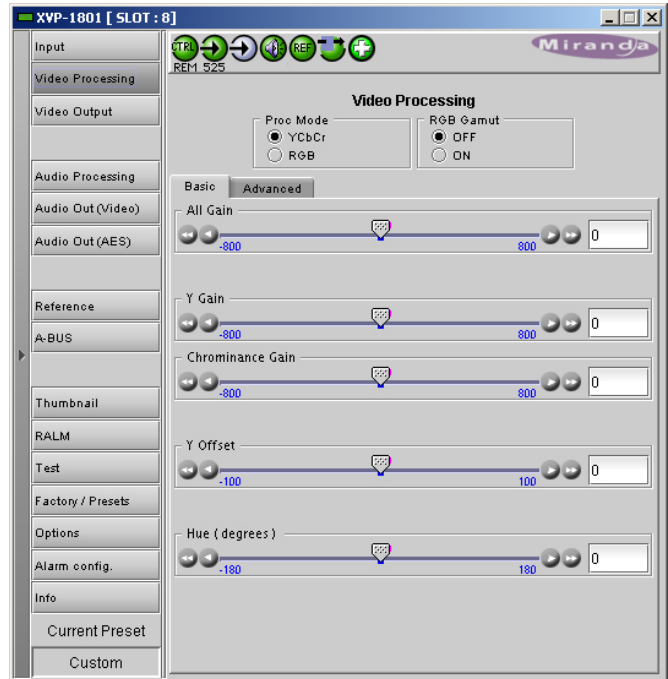
Figure 3.6 *Video Processing group – Basic tab*

Y Cb Cr mode		RGB mode	
Slider name	*Range*	*Slider name*	*Range*
All gain	-800 to +800	All Gain	-800 to +800
Y Gain	-800 to +800	G Gain	-800 to +800
Chrominance Gain	-800 to +800	B Gain	-800 to +800
Black Offset	-100 to +100	R gain	-800 to +800
Hue (degrees)	-180 to +180		

Advanced tab
This tab provides individual controls for each of these parameters.

Y Cb Cr mode		RGB mode	
Slider name	*Range*	*Slider name*	*Range*
Y Gain	-800 to +800	G Gain	-800 to +800
Cb Gain	-800 to +800	B Gain	-800 to +800
Cb Gain	-800 to +800	R Gain	-800 to +800
Black Offset	-100 to +100	G offest	-100 to +100
Cb Offset	-100 to +100	B Offset	-100 to +100
Cr Offset	-100 to +100	R Offset	-100 to +100
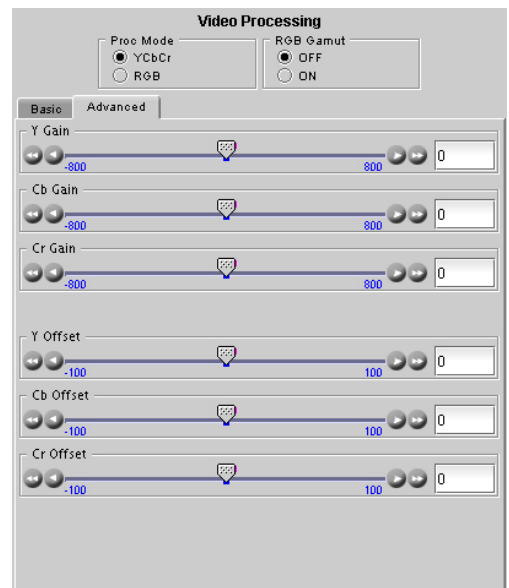
Figure 3.7 *Video Processing group – Advanced tab*

3.5.4 The *Video Output* group

This group allows control over several aspects of the high definition and standard definition video output:

- aspect ratio conversion
- timing control
- image quality processing
- metadata insertion.

The upper portion of the panel is occupied by two video screen images, labelled *Input* and *Output.* These screens do not show the actual video being processed by the XVP-1801, but rather show graphic images that represent the geometric aspects of the input signal and the output that results after it is exposed to the current ARC processing functions. The image is a green circle on a white background; the circle is used because it is easy to see if it is asymmetrical. Lines on the images indicate protected areas for the AFD implementation.

Aspect Ratio Conversion (ARC) modifies the video active picture shape as the signal is converted between SD at 4:3 aspect ratio and HD/SD at 16:9 aspect ratio. If the input is simply stretched or squeezed to fit the output, the image will be asymmetrically distorted; this is called *anamorphic* distortion. If the image is expanded or contracted symmetrically, it must be cropped, and/or have new blank background segments added to it, in order to fill the output picture. The ARC processing in the XVP-1801 allows a wide range of symmetrical and asymmetrical picture size modification, coupled with cropping and background addition, to be applied to an input signal.

When the Input AFD Mode is set to *Auto*, all the ARC settings are set automatically according to the AFD flag (see the table in Annex 2 beginning on page 59) and cannot be changed by the user.

- There are some exceptions – with certain input AFD codes the masks can be customized. Each mask can be customized for each different AFD code allowing different mask settings according to each specific code. For certain AFD codes that are less used, the masks cannot be configured and will be de-activated.

Figure 3.8 *SD (left) and HD (right) Video Output group – ARC tab*

The Input Screen
The *Input* preview screen shows the portion of the input image which will be presented at the XVP-1801 output. It has a pull-down *AFD Mode* menu at the top left corner through which the user selects the aspect ratio of the input signal. Available choices are: [4:3, 16:9, Auto, Forced] for SD inputs and [16:9, Auto, Forced] for HD inputs.

> ***Note 1 – Auto mode:*** *When Auto is selected, all the ARC values are automatically set based on the AFD flag detected at the input, and the ARC controls and presets described below are* **disabled***. Annex 2 shows the AFD functions implemented. If no AFD flag is detected at the input, the card uses the Default AFD flag specified in the AFD tab*

> ***Note 2 – Forced mode:*** *Forced mode is useful when the input AFD flag is unreliable, missing or if the user wants a simple way to force the aspect ratio conversion. The function is the same as the Auto mode, except that the incoming AFD flag is ignored, and a user-specified forced flag is used instead. As in the Auto mode, the ARC controls and presets described below are* **disabled***.*

The input screen shows how much of the input signal will appear at the output after the ARC processing in the XVP-1801. It does so by showing any cropped portions of the image in blue.

The Output Screen
The output screen shows the final result of the ARC processing.
- The side panels or letterbox is shown in the selected background color
- The masks are shown in Gray

A pull-down menu at the bottom of the screen allows the user to select some parameters of the output:
- SD outputs: allows the output aspect ratio to be set to either *4:3* or *16:9*.
- The *Format* pull-down is used to select the output format: 720 (or 704) x484i 59; 720 (or 704) x576i 50; 1920x1080i or 1280x720p.
  - ➢ Note – when an HD input is down-converted to SD, the output H resolution can be selected as either 720 pixels (default) or 704 pixels. The choice is made in the *Video Output – Advanced* panel (see details on page 28) and appears in the pull-down beneath the output screen. In all other cases the SD H resolution is 720 pixels.

The *ARC* tab

Under the *ARC* tab, several sub-sections are found allowing extended control over how the output will be displayed. For convenience, presets are available for frequently-encountered aspect ratio conversions.
- These controls are disabled when the ARC Mode pulldown on the Input Screen is set to *Auto* or *Forced*

Input sub-section
Input: Crop – Horizontal and Vertical
The crop controls allow selection of a portion of the original image – the amount of horizontal and vertical cropping is expressed as a percentage of the size of the original image.

The user can manually adjust the level of horizontal and vertical cropping. Horizontal cropping is done on an 8-pixel basis. Vertical cropping is done on 4-line basis. To achieve non-symmetrical vertical or horizontal cropping, uncheck the *Center* box underneath and position the image using the *Tilt* function described below.

Input cropping changes the scaling factor between the input and the output. If we crop the input (H&V) by 10%, the output image is resized and scaled by +10%. By providing different H and V cropping, the user can produce an anamorphic image.

The padlock icon appearing next to the data window allows the data to be "locked". See the paragraph *Locking controls* under *Output sub-section* below for a discussion of this option.

Input: Tilt
Once a smaller window has been established by cropping the input signal, it can be moved vertically (*Tilt*, expressed in lines) within the original image to place the desired portion of the image in view. By default, a *Center* check box beneath the Tilt scroll box forces the cropping window to be centered on the input window. When it is checked, the necessary Tilt value will be calculated and displayed in the Tilt data window. You cannot tilt if the cropping value is zero.

Input: Pan
Once this smaller window is established, it can be moved horizontally (*Pan*, expressed in pixels) within the original image to place the desired portion of the image in view. A *Center* check box beneath the Pan scroll box forces the cropping window to be centered on the input window. When checked, the necessary Pan value will be calculated and displayed in the data window. You cannot Pan if the cropping value is zero.

Output sub-section
Output: Side Panels / Letterbox
This scrollable data entry box is used to shrink the width of the image so that the output image has blanked areas on each side of the displayed picture, which occupy the indicated percentage of the screen width. These areas are symmetric about the center, so a setting of 25% side panels would show a bar 12.5% of the screen width on each side of the image. The same apply for letterbox.

Output: Position
This control allows the positioning of the output picture when side panels or letterbox are present. For side panels, the picture can be moved totally to the left, centered or totally to the right. When letterbox is present, the picture can be moved to the top, to the center or to the bottom of the frame. This control is not available in Auto AFD mode or Forced AFD mode. The picture will be centered by default when an ARC Preset is selected.

Output: Anamorphism
This control box allows the output image to be resized asymmetrically. Anamorphism is expressed in percent, where positive values indicate an increase in width with respect to height, and negative values a decrease in width with respect to height.

Locking controls
Represented by padlock icons, these buttons allow the *V Crop*, *H Crop, Anamorphism* and *Side Panels* controls to be "locked". When a control is locked, user access to that control is disabled. Changes to unlocked controls will not affect the data values of locked controls. There is some interactivity within the locking function, as follows:
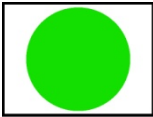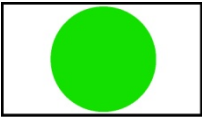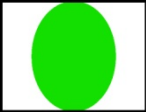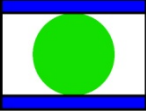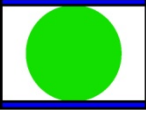
- If either *V Crop* or *H Crop* is locked, *Anamorphism* is unlocked.
- If either *Side Panels* or *Anamorphism* is locked, the other is unlocked, along with *V Crop* and *H Crop*.

Presets sub-section
For convenience in manual operation, several of the most common conversion situations are pre-programmed into the XVP-1801, and can be quickly accessed. The available Presets change according to the AFD mode and Output Format selections made using the pulldowns on the input and output screens.

The charts that follow illustrate graphically the effect of each preset on the input image.

- Only those presets for which an output is shown will appear on the Video Output panel.
- For example, when the input and output formats are the same, only the *Bypass* button will appear
- In all cases, a button labeled *Custom* will appear, and will be selected whenever the parameter settings do not correspond exactly to one of the available presets

Output Format 4:3 (when selected on the SD Video Output panel)		
Input Format (selected by AFD Mode pulldown)	4:3	16:9
Presets	**Output after ARC processing**	
Anamorphic		
Letter Box 25%		
Crop 25%		
14:9		
Bypass		

Figure 3.9a *Available Presets for various AFD Mode selections (4:3 output)*

Figure 3.9b   *Available Presets for various AFD Mode selections (16:9 output)*

The advantage of using Presets is to provide a unique conversion without having to specify the H&V scaling factor or the percentage of cropping/side panels and anamorphism. When an ARC Preset is selected, it re-centers the output picture in case of side panels or letterbox, but it does not affect the output masks.

Masks sub-section
Mask: Horizontal and Vertical
Sometimes with aspect ratio conversion, some of the edges of the original image are exposed in the output signal. Often, there will be artifacts in the source along these edges, extending for several lines vertically or several pixels horizontally after conversions. Masks are adjustable "curtains" which can be used to frame the output image, covering up the edge artifacts and leaving a clean transition from image to mask.

The Masks tab presents four controls to set mask position on the four sides of the output image. Top and bottom position are set in lines, while left and right position are set in pixels. Scroll boxes with data windows for reporting and direct data entry are used.

Masks should be adjusted by viewing the output on a video monitor and positioning the masks to cover edge effects with a minimum loss of clean picture content. Usually masks are the final adjustment to be made. The
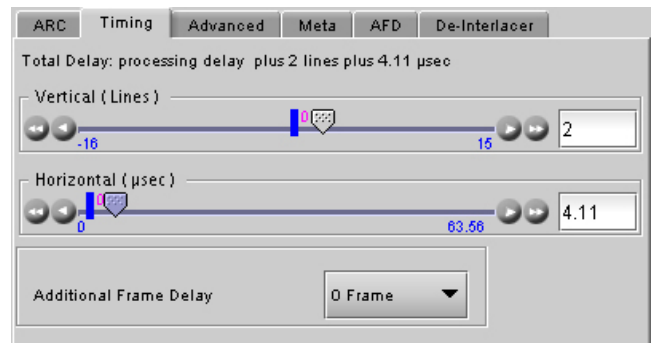
masking is shown on the top right Output screen by graying out the masked portion. Note that mask – or Background - color may be changed in the *Advanced* tab. The maximum amount of masking that can be introduced depends on the image format, and is measured starting from the edges of the displayed image, as shown in the following table. Masks can cover a minimum of 25% of the active area.

Image format	Pixels	Lines
525	106	76
625	106	88
720p	176	106
1080i	256	150

Note: all masks are adjusted in steps of 2 pixels or 2 lines.

The *Timing* tab

The Timing tab provides access to timing adjustments which affect the signal outputs. There are two slider controls, each with a data reporting box which shows the current value, and into which values can be typed directly. The total delay is reported at the top of the window.

Vertical (lines): With this adjustment, a value ranging from *−16* to *+15* lines, compared to the reference or the processing delay, may be set. This adjustment can be used in conjunction with the horizontal timing adjustment.

Figure 3.10   *Video Output group – Timing tab*

Horizontal (µs): With this adjustment, a value ranging from zero to the equivalent of 1 horizontal line in the current operating format (e.g. ranging from *0* to *63.46* µs for 525-line operation; *0* to *64.00* µs for 625-line operation; etc) compared to the reference or the frame boundary, may be set.

Additional Frame Delay: This parameter affects the overall processing delay of the card. It affects both the HD and SD output by adding supplemental frame delay to the current processing delay. This parameter will add a delay ranging from 0 to 6 interlaced frames (steps of 33 ms in 59.94 Hz and 40 ms in 50 Hz) to the current processing delay. Without a reference, the normal processing delay is 1 frame. You can extend this delay up to 7 frames if the additional delay is 6. With a reference, up to 6 frames can be added to the frame sync delay which depends on the timings between the input and the reference.

Note that, in order to compensate for the processing delay of the Dolby-E decoder on the companion audio card, the additional frame delay must be set to at least one (1) frame or more depending on the module used.

The *Advanced* tab

The *Advanced* tab provides controls over the type and level of detail enhancement that will be performed, and the color of the mask.
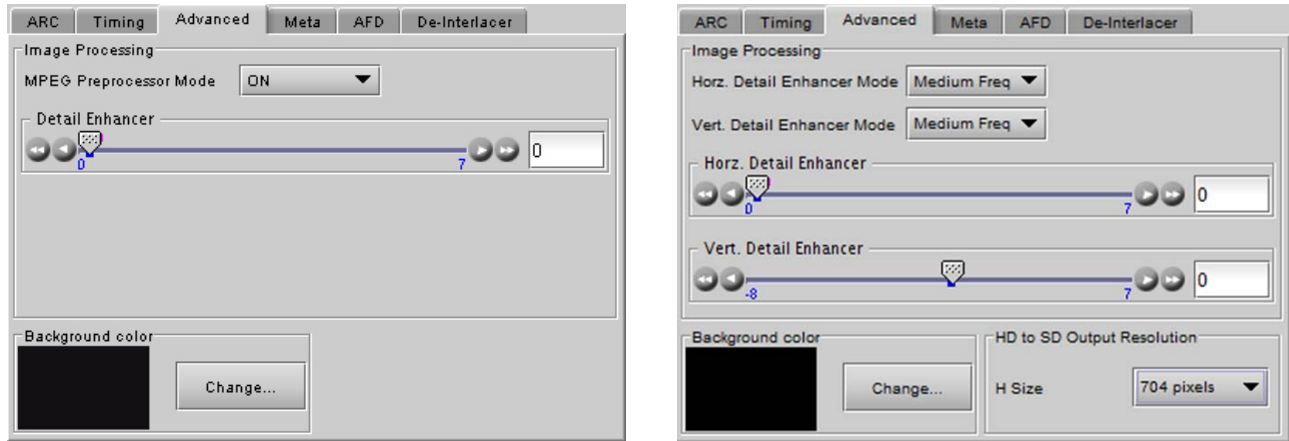
Figure 3.11   *HD (left) and SD (right) Video Output group – Advanced tab*

***Image Processing* sub-section, HD ouput**

MPEG Preprocessor Mode: This control changes the functionality of the detail enhancer. When MPEG preprocessor is activated ('*ON*'), the adaptive detail enhancer will use a psycho-visual model to increase the level of details and the sharpness of edges without adding high frequency content that may be difficult to encode at a lower bit rate on a downstream MPEG encoder.

When the MPEG preprocessor is deactivated (*OFF*), the adaptive detail enhancer will increase the details and the sharpness of edges without causing ringing on the HD output. In this mode ('*OFF*'), high frequency content is added to the HD video output to improve graphic contents and characters. This setting is very useful for upconverted material in character generation (CG) applications.

Detail Enhancer: Enhances the perceived sharpness of fine detail and edges. A single control adjusts both Horizontal and Vertical detail enhancement: a slider and a data reporting/entry box allow the user to select a value ranging from *0* (no enhancement) to *7* (maximum enhancement). The default value varies according to the processing mode: 4 for SD to HD mode and 0 for HD to HD mode.

***Image Processing* sub-section, SD output**

Separate controls are provided for Horizontal and Vertical detail enhancement:

Horiz. Detail Enhancer Mode: this pull-down box controls the type of horizontal detail enhancement, which may improve sharpness of textures and contours.
- *High Freq* boosts high frequencies of the input signal
- *Medium Freq* boosts medium frequencies of the input signal

Horz. Detail Enhancer: a slider and a data reporting/entry box allow the user to select a value in the range 0 (no enhancement) to 7 (maximum enhancement).The default value is 1 for HD to SD mode, and 0 for SD to SD mode

Vert Detail Enhancer Mode: this pull-down box controls the type of vertical detail enhancement, which may improve sharpness of textures and contours.

- *High Freq* boosts high frequencies of the input signal
- *Medium Freq* boosts medium frequencies of the input signal

Vert. Detail Enhancer: a slider and a data reporting/entry box allow the user to select a value in the range -8 (some softening) to +7 (maximum enhancement). Set the value to 0 for no enhancement. The default value is 1 for HD to SD mode, and 0 for SD to SD mode

HD to SD Output Resolution

Select the output image width (in pixels) when the SD output is down-converted from HD. Select between 720 pixels (default) and 704 pixels.

- Normal SD image width is 720 pixels. In ATSC applications MPEG encoders will crop to 704 pixels for encoding and the setup box will stretch back to 720 pixels creating 2% anamorphism. To compensate for this problem, the user may select 704 pixels using the *H Size* pull-down. This will compress the down-converted image to 704 pixels instead of 720 pixels. When stretched back to 720 pixels by the setup box, the anamorphism will be eliminated. This functionality is only available for HD-to-SD conversions. The factory default for this parameter is 720 pixels. The value selected here appears in the pull-down beneath the Output Screen at the top of the panel when an HD-to-SD down-conversion is selected.

Background color sub-section, HD and SD output

This color patch (black by default) indicates the color that will be used for the masks, and will therefore surround the output image when it does not occupy the full output screen. Click on the *Change*… button to open the Background Colors window. This window includes YCbCr sliders with data entry boxes, and a color preview patch. The color is represented by an 8-bit value for each component.

- If you have selected an illegal RGB color, it will be flagged as "Invalid RGB" beneath the color patch, and also within the color patch shown in the Advanced tab if you apply it. This invalid RGB color will not be clipped by the Gamut correction. Make sure you select a valid RGB color if you care about Gamut errors.
- Colors for HD and SD masks are specified independently when the corresponding output format is selected. The same color is used in 720p and 1080i.

The *Meta* tab

The Meta tab provides resources to deal with Metadata incorporated into the incoming signal.

Closed Caption sub-section
Presence: this icon turns green in the presence of incoming EIA-708-B or EIA-608-B closed captioning data when an HD source is installed or when line 21 closed captions are detected when an SD source is installed.

Insertion: The pull-down is used to select between *Auto* or *OFF*. Availability of these controls is affected by whether or not Line 21 of the input SD or output SD signal has been configured as blanking; see *SD Input/Output Config* subsection below for details.

When *Auto* is selected, closed captioning information is processed as follows:
SD to HD Upconversion:
The closed-captioning information from line 21 field 1 and the V-chip information from line 21 field 2 of the incoming 525-line signal may be inserted as ancillary packets required for FCC compliance. NTSC and DTV

closed captions will be embedded, in the HD outputs, within EIA-708-B packets as per SMPTE 334M. CC1 from NTSC field 1 is up-converted to DTV service 1, and CC3 from field 2 is up-converted to DTV service 2.
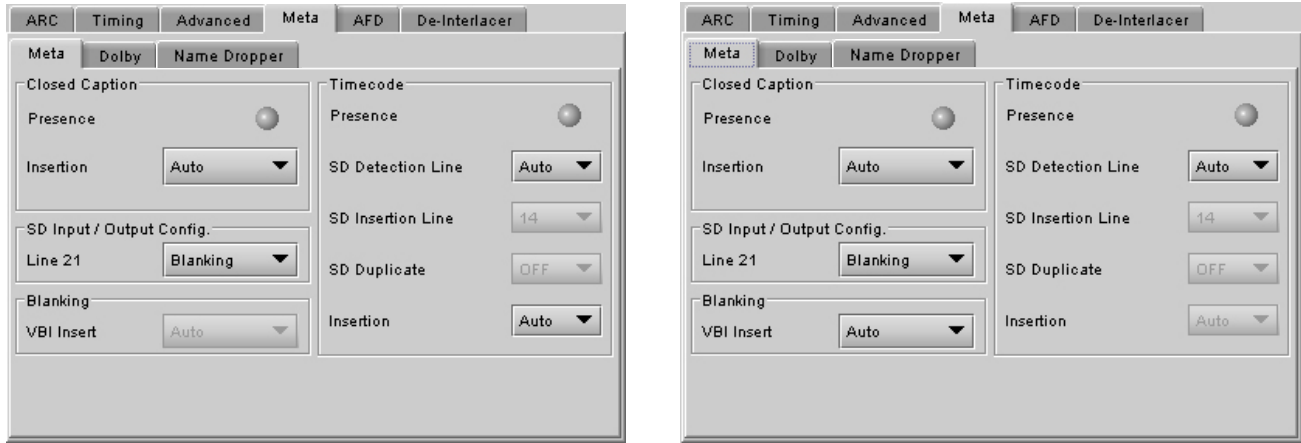
Figure 3.12   *Video Output group – Meta tab*

HD to SD Downconversion:
As described in EIA-708-B, closed captioning within an HD signal is embedded in the form of ANC packets. The XVP-1801 extracts the NTSC CC bytes from within incoming EIA-708-B DTV closed captions, buffers, and re-inserts the data within line 21 of the output SD signals. Processing is restricted to NTSC CC information only.

The XVP-1801 also supports incoming EIA-608-B CC packets conforming to SMPTE 334M. However, EIA-708-B packets have priority. If both are embedded in the source, the EIA-708-B packets are decoded, as explained above, and the EIA-608-B packets are discarded. If no EIA-708-B packets are detected, EIA-608-B packets are automatically extracted if detected.

Field 2 of closed captioning is also processed and encoded to provide V-chip rating.

HD to HD Cross-conversion:
EIA-708-B closed captions are detected at the input and re-inserted into the output HD signal conforming to the selected output HD format.

SD Input/Output Config sub-section
Line 21: Specifies if line 21 (or line 23 in PAL) shall be considered as blanking or active video; this selection affects *Close Caption* availability, controlled in the *Close Caption* sub-section of this tab (see above). Depending on the settings and input/output selected, it also affects the output video, as shown in this table:

For SD Output:

Input Format	Line 21 Status	CC Insertion	Effect on SD Output
HD 60 Hz	Blanking	Off	Line 21 blanked, first active line is 22, image slightly downscaled
		Auto	CC run-in on line 21, first active line is 22, image slightly downscaled.
	Active	N/A	Line 21 has active video and may be resized.
SD 60 Hz	Blanking	Off	Line 21 blanked.
		Auto	Input line 21 copied to output.
	Active	N/A	Line 21 has active video and may be resized.
HD 50 Hz	Blanking	N/A	Line 23 blanked, first active line is 24.
	Active	N/A	Line 23 has video and may be resized.
SD 50 Hz	Blanking	N/A	Line 23 blanked, first active line is 24.
	Active	N/A	Line 23 has active video and may be resized.

For HD Output:

Input Format	Line 21 Status	CC Insertion	Effect on HD Output
HD 60 Hz	N/A	Off	No DTV closed captions.
	N/A	Auto	DTV closed captions enabled
SD 60 Hz	Blanking	Off	Input line 21 ignored for scaling, image slightly upscaled. No DTV closed captions.
		Auto	Input line 21 ignored for scaling, image slightly upscaled. DTV closed captions enabled.
	Active	N/A	Input line 21 has video. No DTV closed captions.
HD 50 Hz	N/A	N/A	No effect
SD 50 Hz	Blanking (line 23)	N/A	Input line 23 ignored for scaling, image slightly upscaled. No DTV closed captions.
	Active	N/A	Input line 23 has video. No DTV closed captions.

Blanking **sub-section**

Insertion of the Vertical Blanking Interval may be turned *OFF* or *ON,* using the pull-down box. Insertion is disabled if no VBI data is present.

- VBI insertion may only be enabled during SD to SD and HD to HD operation.
- Audio, closed-captioning, time-code, and AFD data is not handled by this parameter. The only exception is time code during SD to SD operation, in which case the user must use this parameter to enable/disable time code insertion.
- SD to SD: All incoming HANC packets within H blanking, VANC packets within VBI, and VBI lines may be bypassed to the output.
- HD to HD: All incoming HANC packets within H blanking and VANC packets within VBI may be bypassed to the output.
- HD to HD cross-conversions also supported.
- HD to HD blanking conversions are applied on luminance channel only. Packets in chrominance channel not supported.

Timecode **sub-section**

If the input is HD SDI, the HD ATC packet will be transcoded to SD only when ATC timecode is present on the HD input video. In the case of an SD input, the DVITC in the VBI interval is transcoded in an ATC timecode packet for the HD output. When enabled, timecode insertion is automatic when there is embedded timecode in the source.

- The XVP-1801 supports only HD-ATC VITC timecode for down-conversion and DVITC for up-conversion. ATC packets of type LTC are ignored, but they are passed through at the output. No conversion is done from HD to SD or SD to HD.

Presence: the icon turns green when timecode is detected in the incoming signal

SD Detection Line: Select *AUTO* mode to automatically detect the line that contains the timecode. If time code appears on multiple lines, the first is selected. Select a specific line if desired; this allows a choice to be made when multiple time code lines are present.

SD Insertion Line: the line on which timecode is to be inserted is selectable through a pull-down menu, between lines *10* and *20* for 525-line output, and between lines *7* and *22* for 625-line output.

- This control is disabled when the input is SD

Duplicate: forces a second copy of the time code to be inserted on the 2nd line following the selected line. For example, selecting line 14 for time code insertion, and turning timecode duplication *ON*, will result in time

code being inserted into both lines 14 and 16. Note that time code cannot be inserted on lines outside the allowable range, so for example, if line 19 is selected for time code insertion in a 525 line output, and timecode duplication is turned *ON*, the duplicate time code which would have appeared on line 21 will not be inserted because the upper bound for time code is line 20. Thus, the timecode duplication function has no effect when the selected line for time code is 19 or above for 525-line outputs, or 21 or above for 625-line outputs.

- This control is disabled when the input is SD

Insertion: Insertion options are available through a pull-down menu, offering these choices:

AUTO: Time code is inserted if present; insertion is disabled if no time code is present.
OFF: Time code insertion at the output is disabled.

- This control is disabled when the input and output are both SD. In this case, VBI Blanking may be used to enable/disable time code insertion – see *Blanking* sub-section above

Warning messages
Warning messages may appear at the bottom of the panel when conflicts arise because of the settings. The possible messages and their meanings are as follows:

- AFD/TC metadata line insertion conflict. Refer to manual.
  [message in red letters]
  Conditions: HD to SD, same line set for AFD and TC insertion (duplicate TC included)
  Consequences: Since TC and SMPTE-2016 AFD cannot reside on the same line, TC data will not appear on the insertion line but AFD data will be inserted.

- AFD insertion will overwrite incoming TC or VLI on insertion line. Refer to manual. [in blue letters]
  Conditions: SD to SD, both AFD and VBI insertion enabled
  Consequences: Since TC (or VLI) and SMPTE-2016 AFD cannot reside on the same line, the incoming TC (or VLI) is blanked (if any), and the AFD data is inserted.

- VLI insertion will overwrite incoming VANC packets on insertion line. Refer to manual [in blue letters].
  Conditions: SD to SD, both VLI and VBI insertion enabled
  Consequences: Since VLI and ancillary packets like SMPTE-2016 AFD or RP2020 Audio Metadata cannot reside on the same line, the incoming ANC packets are blanked (if any) and the VLI is inserted. This affects only line 11 in 525 and line 14 in 625.
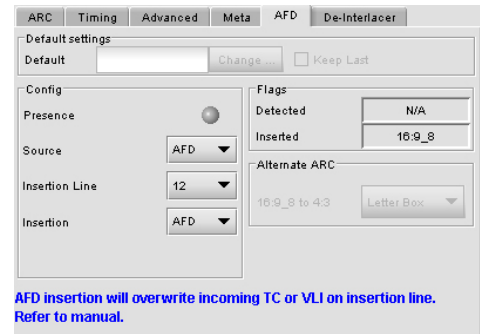
Meta / Dolby **tab**
The Dolby metadata is used to send information about the audio stream, e.g. program configuration, dialnorm. Available only in HD.

Presence: The status indicator turns Green when the metadata is detected on specified detection line.

Detection Line: The Insertion line is used to select on which line in the VANC the audio metadata packet is detected. The range is from 9 to 20.

Insertion Line: Specifies on which HD line the packet will be inserted at the output.
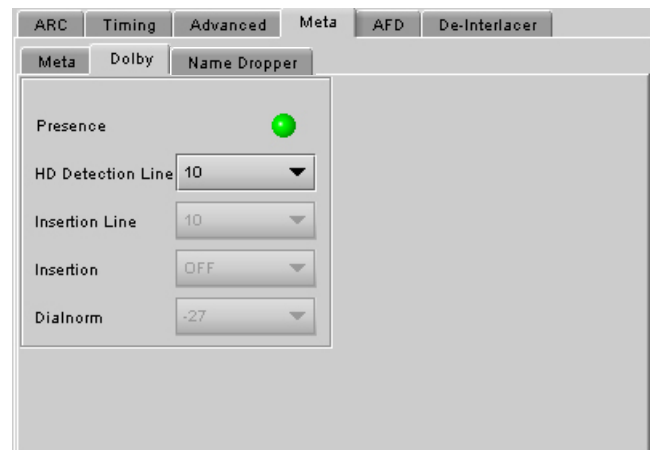

Figure 3.13   *Video Output group – Meta/Dolby tab*

The Insertion pulldown is used to enable/disable the insertion of Dolby Metadata, and to specify the source:
- OFF   no embedding. Incoming audio metadata in the HD input will pass through to the output.
- From ABUS   embed metadata from an external card connected on the ABUS (A1 only).
- Fixed PCM   embed default PCM metadata using the specified Dialnorm value.

The Dialnorm pulldown is enabled when Fixed PCM is selected in the Insertion pulldown, and allows selection of the Dialog Normalization Value for embedded PCM data:
- Available selections are [-20, -22, -24, -26, -27, -28, -30, -31] dB

The Status Indicator turns green when Dolby metadata has been detected within an HD input signal.

Namedropper **tab**
A green button indicates the presence of Namedropper on line 18 for SD inputs. The same indication is used for HD inputs if a compliant Namedropper ANC packet is present.

The AFD **tab**

Default settings **area**

Default/Forced: this text box is labeled according to the mode selected in the Input Screen pulldown in the Video Output Group – see page 22

- In AUTO mode, labeled DEFAULT and shows the current default AFD code to be used if no valid AFD code is detected at the input.
- In FORCED mode, labeled FORCED, and shows the code that is forced into the system input regardless of the actual input code.

Change: Click the Change button to open the *Select AFD* panel showing the available AFD codes that could be used as the default. Click on one to select it, then click *Apply* or *OK* at the bottom of the panel.

Figure 3.14   *Video Output group – AFD tab*

Keep Last: click in this checkbox to use the last detected AFD code at the input as the default code to be used in the *Auto* mode when no AFD flag is detected. This box is disabled in the *Forced* mode.

Config **area**

Presence: The status indicator turns Green when AFD is detected on the input signal. On an SD input, the AFD presence will indicate the presence of the selected AFD source only, i.e. AFD, VLI or WSS (for 625 sources only)

Source: Selects the source of AFD information – options are AFD (SMPTE 2016), VLI of WSS (for 625 sources only).

Insertion Line: The Insertion line is used to select on which line in the VANC the AFD packet (SMPTE 2016) will be inserted. It is not necessary to specify the detection line since the card will automatically detect the incoming packet.

Insertion: The Insertion pull-down menu is used to enable or disable the insertion of AFD on the two outputs:
- On the HD output, the Ancillary Aspect Ratio packet will be inserted
- For SD outputs, a selection must be made when enabling insertion:
  - 525 outputs – AFD (SMPTE 2016) or VLI
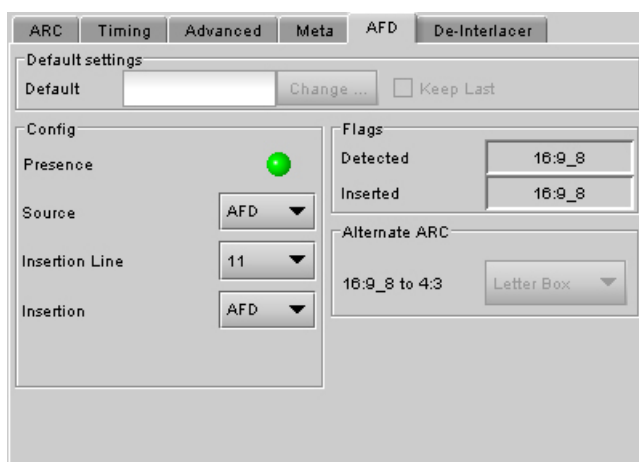 - 625 outputs – AFD (SMPTE 2016), VLI or WSS

***Flags* area**

The Flags sub-section indicates which AFD flag is detected at the input and which flag is inserted at the output.

The Active Format Descriptor (AFD) flag is used to identify the aspect ratio and protected areas of a video signal. The XVP-1801 uses this flag in some cases to adjust the output aspect ratio and image cropping to obtain the best possible presentation of the image. The AFD flag is implemented differently in SD and HD:

* In HD, the AFD flag is sent in an ancillary packet, normally found on line 11 in the vertical ancillary space.
* In SD, the AFD flag is sent as a VLI signal (RP 186) for 525 and 625 formats, as a WSS signal (ITU-R BT.1119-2) for PAL only, and as an AFD packet (SMPTE 2016).

When AFD is present at the input, the card can perform an automatic adjustment of the aspect ratio. See the appendix for more details.

***Alternate ARC* area**

When the output is 4:3 SD, if the input AFD setting is set to Auto or Forced mode and the input AFD is a full screen 16:9 (AFD code 16:9_8), the output image may be scaled in one of 2 ways. Use the pulldown to select which will be used:

* *Letterbox:* Uses the traditional 16:9 letter box within a 4:3 frame where there is no loss of image.

* *Center Cut:* The XVP-1801 provides a second alternative – the input is horizontally cropped about the center to create a full screen 4:3 image. Choosing this alternative essentially removes 25% of the original image.

The De-interlacer tab

Some interlaced video sources are film-based originating from 24p film images. For optimum scaling performance, it would be best to de-interlace this type of source by simply merging the source's fields to recreate the original 24p image, thereby introducing no de-interlacer artifacts prior to scaling and format conversion.

Film mode: When The Film Mode selection is set to ON, the XVP-1801 monitors the input for film-based sequences and applies the proper algorithm.

Film detection is provided for 3:2, 2:2 (59Hz and 50 Hz sources) and 5:5 sequences.

Video Over Film: When the film mode is enabled, turn ON the Video-Over-Film (VOF) function to detect and bypass field-merging on certain video regions such as scrolling video characters over an entire film frame, thereby preventing any unwanted combing effects.

Figure 3.15 *Video Output group – deinterlacer tab*

3.5.5 The *Audio Processing* group

The Audio Processing group provides full audio processing and delay parameters for the input embedded or discrete audio channels. These parameters affect both the output audio channels (embedded and AES) and the audio channels sent to the DAP or UAP companion cards.

Group Detected sub-section
Status indicators turn green when audio groups 1, 2, 3 or 4 are detected.

Discrete AES Detected sub-section
Signal presence indicators monitor the presence of AES inputs. The indicators turn green when AES input signals are detected. The signal presence warning color can be configured by the user in the Alarm Config panel (Sect. 3.5.15)

Signal Presence sub-section
Signal presence indicators monitors the audio channels presence and are related to the *Silence* parameters defined in the **Ch XX/Silence** tab (see details below): the indicator is green when an active signal is present and configurable when a

Figure 3.16   *Audio Processing group – CH 1-4 tab*

silence is detected according to the "no signal" threshold and the channel detection warning. The signal presence warning color can be configured by the user in the Alarm Config panel (Sect. 3.5.15)
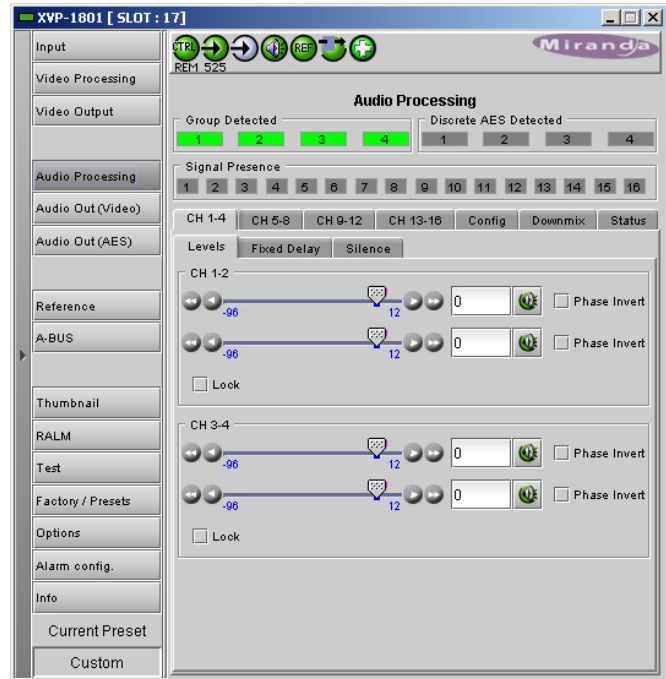
CH 1-4, CH 5-8, CH 9-12 and CH 13-16 Tabs

Each of these tabs controls *Levels*, *Fixed Delays* and *Silence* detection for four audio channels; each channel is provided with a set of controls.

Levels sub-tab: grouped by pair of channels, each channel has the following controls:

> *Level* (slider and input box): Sets the audio gain from -96 to 12 dB in 0.5 dB steps. For non-PCM audio, the level value is overridden to 0 dB.
>
> *Mute* (speaker button): Mutes the selected audio channel
>
> *Phase Invert*: When checked, inverts the selected audio channel phase.
>
> *Lock*: "Locks" both channel sliders together for levels and delay (coarse only), so that moving one slider moves the other one as well.
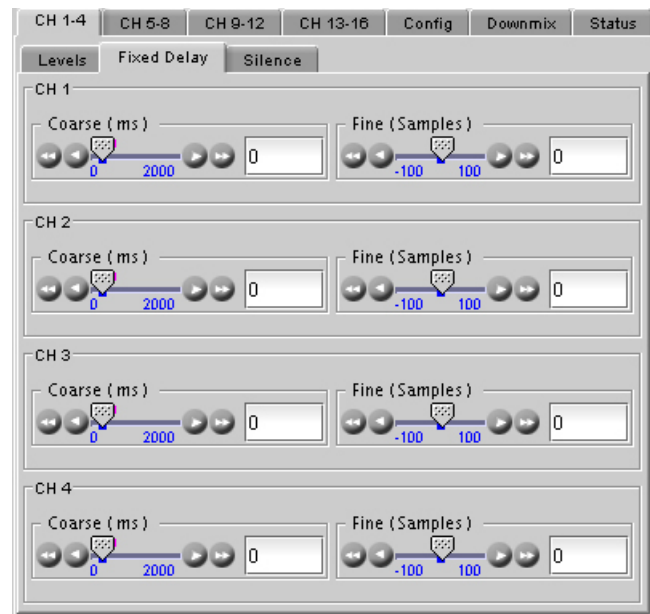

Figure 3.17 *Audio Processing group – Fixed Delay sub-tab*

Fixed Delay sub-tab: although the XVP-1801 automatically matches audio and video throughput timing, provision is made for the user to insert an audio delay offset from the nominal value, in order to deal with

problems such as lip sync errors and audio phase alignment in the incoming feed. For each channel, two sliders allow the delay to be adjusted.

- *Coarse* – adjusts the delay in milliseconds, over a range of values that depends on the Additional Frame Delay set on the timing tab in the Video Output group (see page 26), as follows:

Additional Frame Delay	Adjustment Range (59.94 Hz)	Adjustment Range (50 Hz.)
0	0 to 2000 ms	0 to 2000 ms
1	-33 to 2000 ms	-40 to 2000 ms
2	-66 to 2000 ms	-80 to 2000 ms
3	-99 to 2000 ms	-120 to 2000 ms
…	…	…
7	-231 to 2000 ms	-280 to 2000 ms

- *Fine* – adjusts the delay in audio sample increments, from -100 to +100 samples.

Silence sub-tab

This tab sets the card's behavior in the event of a loss or absence of audio signal. The Signal Presence indicators are then triggered according to these setting*s:*

Silence Detect: select which audio channels to monitor for audio silences by checking their boxes. This enables the signal presence indicators to change color when there is no signal present which activates the audio silence alarm. Otherwise, when checkboxes are not checked, the signal presence indicators turns grey when there is no signal present and the audio silence alarm is not activated

Threshold: Signal absence is declared when the signal level is lower than the signal threshold for a duration longer than the No Signal Delay. The threshold can be set to *OFF* or to a specific value: *-72, -66, -60, -54, -48* dBFS. The default value is –60 dBFS

No Signal Delay: The period for which signal must be continuously absent before an alarm can be triggered can be adjusted from 3 to 255 seconds in preset steps: 3, 5, 7, 10, 15, 20, 30, 40, 50, 60, 90, 120, 180, 210, 240, 255 sec. The default value is set to 15 seconds.
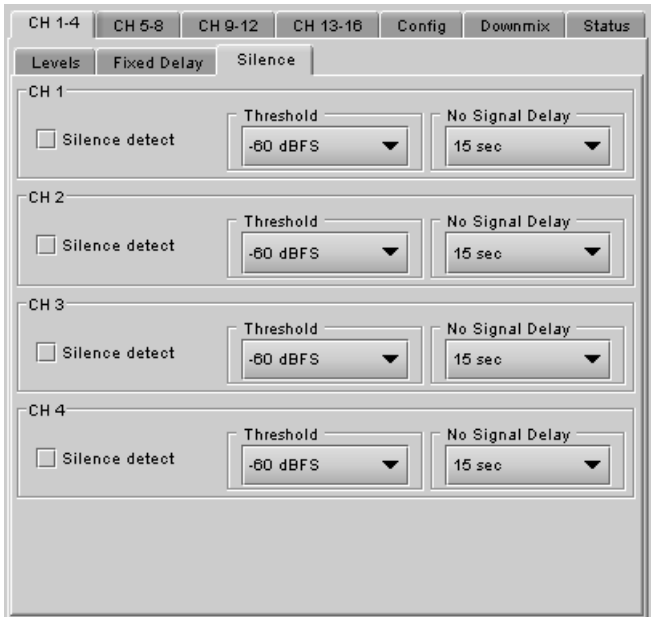
Figure 3.18 *Audio Processing group – Silence tab*

***Config* Tab**

This tab provides a selection between the embedded audio and the discrete AES inputs. Channels 1 to 8 will always be the first 8 embedded channels. However, channels 9 to 16 can be either embedded channels 9 to 16 or the 8 discrete channels from the 4 AES inputs.
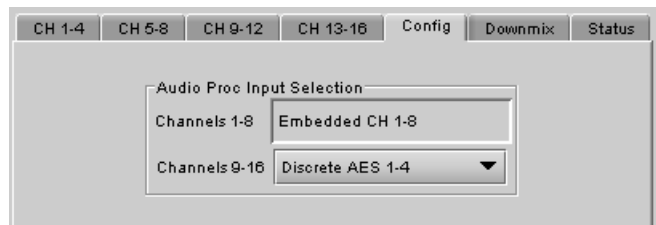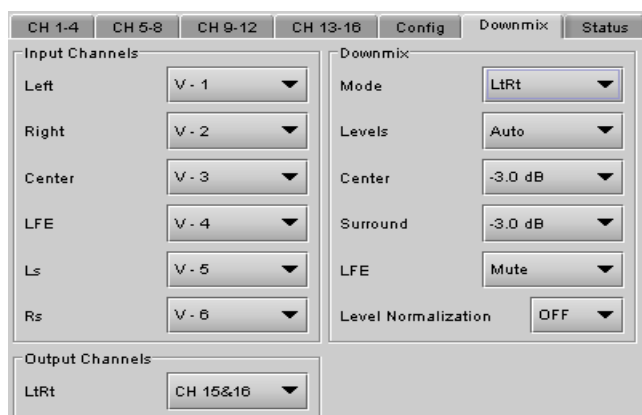

Figure 3.19 *Audio Processing group – Config tab*

Downmix tab

This tab provides resources to control the downmix of a "5.1 channel" surround-sound audio signal into an LtRt or LoRo stereo pair. The 5.1 terminology refers to six discrete audio channels, with the low frequency effect (LFE) channel of limited bandwidth designated as the .1 channel. The downmix can be done using any of the 16 audio channels processed by the audio processor using the Input Channels controls in the interface.

Input Channels area: Use the 6 pulldowns to select the source channels for the downmix process.

Output Channels area: The downmix stereo pair output can be mapped to either channels 7&8 or 15&16, selected from the pulldown. The pulldown is labeled according to the Mode selection made in the Downmix area.

Figure 3.20 *Audio Processing group – Downmix tab*

Downmix area:

*Mode:* this pulldown menu selects the downmix mode:
- OFF: disables the audio downmix. Audio channels 7 and 8 or 15 and 16 pass through unchanged.
- LtRt: enables the downmix of 5.1 channels into an LtRt matrix surround encoded stereo pair. The input signals on channels 7 and 8 or 15 and 16 are discarded.
- LoRo: enables the downmix of 5.1 channels into an LoRo stereo pair, which is a conventional stereo signal. The input signals on channels 7 and 8 or 15 and 16 are discarded.

*Levels:* This pulldown selects the downmix levels mode:
- AUTO: the Center and Surround downmix levels and the dialogue normalization (dialnorm) level are taken from the Dolby metadata embedded in the video input, when present. If no Dolby metadata is present, the downmix levels default to those currently set by the user in the Center and Surround pulldowns. The LFE downmix level is taken from the LFE pulldown.
- MANUAL: the user sets the downmix levels via the CENTER, SURROUND and LFE pulldowns:
  ◊   CENTER – sets the center channel downmix level to the selected value

     [+3 dB, +1.5dB, 0 dB, -1.5 dB, <u>-3 dB</u>, -4.5 dB, -6 dB, mute]

  ◊   SURROUND – sets the surround channels (Ls & Rs) downmix level to the selected value

     [+3 dB, +1.5dB, 0 dB, -1.5 dB, <u>-3 dB</u>, -4.5 dB, -6 dB, mute]

  ◊   LFE – sets the LFE channels downmix level to the selected value. The LFE downmix value is used in both Auto and Manual modes.

     [+10 dB, +9 dB, +7.5, +6 dB, +4.5 dB, +3 dB, +1.5dB, 0 dB, -1.5 dB<u>, -3 dB</u>, -4.5 dB, -6 dB, <u>mute</u>]

The block diagrams below shows the configuration of the LtRt surround sound downmixer and the LoRo stereo downmixer.
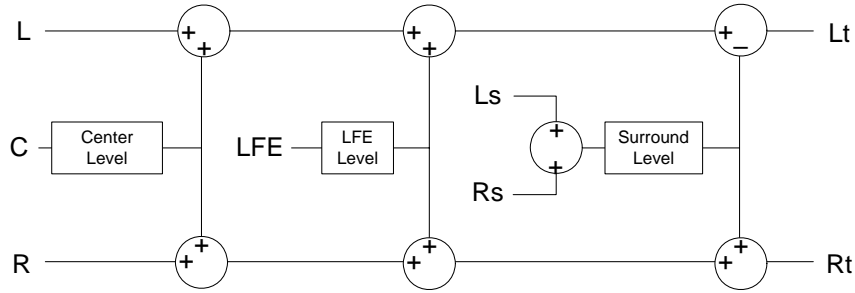
Figure 3.21 *LtRt Surround Sound downmixer*
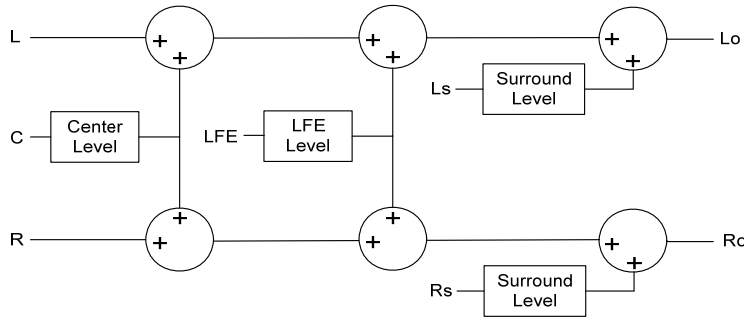
Figure 3.22 *LoRo Stereo downmixer*

- Normalization: the downmix levels can be normalized to provide normalized levels according to the downmix levels used in manual mode or AUTO mode.

Status tab

The Status tab reports the type of audio present at the input and the Dolby-E alignment.

Audio Type Status:

- PCM – the audio channel carries PCM audio (orange)

- Dolby E – the audio channel carries Dolby E encoded audio (blue)

- AC3 – the audio channel carries Dolby Digital (AC-3) encoded audio (violet)

- NPCM – the audio channel carries non-PCM other than Dolby E or Dolby Digital (AC-3) (yellow).

Figure 3.23 *Audio Processing group – Status tab*

Dolby-E Alignment:

- When Dolby-E audio is present, this panel will display the offset/delay between the Dolby-E and the video <u>output</u> of the card. You may click the Auto Align button to automatically adjust the audio timing delay to ensure a perfect zero delay with the video. This is equivalent to changing manually the audio delay in the audio processor. If you change the output timing of the card or the video output format, you may have to re-align the Dolby-E.
- The offset is not available for any other audio type than Dolby-E.

The measured Dolby-E offset can be a positive OR a negative value. A negative value indicates the Dolby-E is in advance compared to the video and additional delay should be added to the audio channel pair.

A positive value indicates the Dolby-E is late compared to the video and the audio delay must be reduced for this channel pair. Sometimes, the audio delay cannot be compensated because it would mean to have an audio delay lower than the processing delay of the card. In this case, you have to add an extra frame delay to the video to provide more range to the audio delay.

3.5.6 The *Audio Out (Video)* group

This group provides additional audio processing for the 16 audio channels embedded in the HD/SD outputs: audio channels mixing and audio embedding mode. The XVP-1801 may be paired with up to two DAP, AAP or UAP cards for additional audio channel inputs to the mixers and for discrete AES outputs.

CH 1-2, CH 3-4, CH 5-6, CH 7-8, CH 9-10, CH 11-12, CH 13-14 and CH 15-16 tabs

Each of these tabs provides all necessary controls for the output mixers.

Operation Mode (Off, A, SUM(A+B), Mix): This menu allows the source of each output channel to be selected – a single channel, the sum of two channels or a mix of two channels.

> *Off:* The output channel is muted.

> *A*:   The output channel is the channel source (*ABUS Select* and *Channel*) selected in sub-menu SOURCE A.

> *SUM (A+B)*: The output channel is the sum of the two channels sources (*ABUS Select* and *Channel*) selected in sub-menus SOURCE A and SOURCE B.

- If you select this option, the SUM (A+B) Level pull-down is activated, allowing you to reduce the level of the summed output (0dB, -3dB or -6dB).

Figure 3.24 *Audio Out (Video) group*

> *Mix*: The output channel is a mono mix of the (*ABUS Select* and *Channel*) selected in sub-menus SOURCE A and SOURCE B.

*Mix 4Ch***:** This mode allows a 3-input or 4-input mix on the chosen <u>even</u> output. A standard 2-input mix is available on the <u>odd</u> output. On the same tab, the two selected sources of the even channel are mixed with the one or two selected sources of the odd channel. The four sources are mixed, with the level of each source adjusted using its slider or data entry box. You can swap the odd and even output by putting a check mark in the Channel Swap (1&2) checkbox.

Note: *in the case of SUM and MIX, if either of the two input channels is non-PCM, the output will always be SOURCE A*

Mute: Mute the audio channel by checking this box.

Source A & Source B: This sub-section allows the source channels (A&B) to be selected for each output channel.

ABUS Select: V, A1, A2: selects the embedded input audio (V), one of two audio companion cards (A1 or A2) or one of two Dolby-E decoding modules installed on companion cards (A1 or A2 channels 9-16) to be used as the source for this channel. Audio Bus is configured in the *ABUS* group.

*Channel*: Channel 1, …, Channel 16: selects the channel to be used from the selected audio source.

Level (dB): -96 to 0 dB in 0.5 dB steps: sets an attenuation level to the channel source. For non-PCM audio, the level value is overridden to 0 dB.

Embedding **tab, HD output**

Audio Insert: insertion of audio in the HD output signal may be set to *Auto* or *OFF*. When set to *Auto*, only the audio groups containing at least one audio channel will be embedded at the output. When set to *OFF*, no audio is embedded in the HD output.

Embedding **tab, SD output**

Audio Insert: insertion of audio in the SD output signal may be set to *Auto 24 bit, Auto 20 bit* or *OFF*. When set to *Auto*, only audio groups containing at least one audio channel will be embedded at the output at the bit depth selected. When mode is set to *OFF*, no audio is embedded in the SD output.
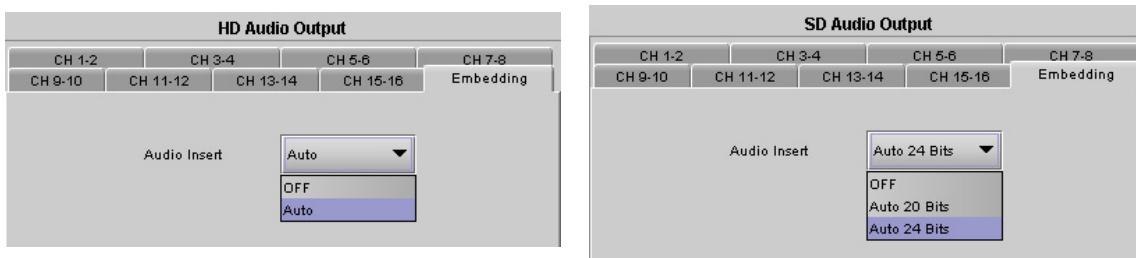
Figure 3.25 *Embedding tab: HD Audio Output group (left) and SD Audio Output group (right)*

3.5.7   The *Audio Out (AES)* group

This group provides additional audio processing for the 4 discrete AES outputs.

Operation Mode (Off, A, SUM(A+B), Mix): This menu allows the source of each output channel to be selected – a single channel, the sum of two channels or a mix of two channels.

> *Off:* The output channel is muted.
>
> *A:*   The output channel is the channel source (*ABUS Select* and *Channel*) selected in sub-menu SOURCE A.
>
> *SUM (A+B)*: The output channel is the sum of the two channels sources (*ABUS Select* and *Channel*) selected in sub-menus SOURCE A and SOURCE B.
>
> * If you select this option, the SUM (A+B) Level pull-down is activated, allowing you to reduce the level of the summed output (0dB, -3dB or -6dB).

Figure 3.26   *Audio Out (AES) group*

Mix: The output channel is a mono mix of the (*ABUS Select* and *Channel*) selected in sub-menus SOURCE A and SOURCE B.

*Mix 4Ch***:** This mode allows a 3-input or 4-input mix on the chosen <u>even</u> output. A standard 2-input mix is available on the <u>odd</u> output. On the same tab, the two selected sources of the even channel are mixed with the one or two selected sources of the odd channel. The four sources are mixed, with the level of each source adjusted using its slider or data entry box. You can swap the odd and even outputs by putting a check mark in the Channel Swap (1&2) checkbox.

Note: *in the case of SUM and MIX, if either of the two input channels is non-PCM, the output will always be SOURCE A*

Mute: Mute the audio channel by checking this box.

Source A & Source B: This sub-section allows the source channels (A&B) to be selected for each output channel.

> *ABUS Select*: V, A1, A2: selects the embedded input audio (V), one of two audio companion cards (A1 or A2) or one of two Dolby-E decoding modules installed on companion cards (A1 or A2 channels 9-16) to be used as the source for this channel. Audio Bus is configured in the *ABUS* group.
>
> *Channel*: Channel 1, …, Channel 16: selects the channel to be used from the selected audio source.
>
> *Level (dB)*: -96 to 0 dB in 0.5 dB steps: sets an attenuation level to the channel source. For non-PCM audio, the level value is overridden to 0 dB.

3.5.8 The *Reference* group

This group of parameters allows the selection of the reference to be used by the XVP-1801.

Use the radio buttons in the Reference Source area to select from the following options:

- Auto – this mode selects the first source detected in this order of priority:
  - External Reference input
  - URS
  - Selected Input signal
- External – selects the signal connected to the rear-panel REF IN connector
- URS (Universal Reference Signal) – selects the internal reference from the backplane
- Input – uses the currently-selected input signal.

URS Format – use the radio buttons in the URS Format area to select whether the URS is OFF, 29.97 Hz or 25 Hz.

- When URS is OFF, the URS reference format source cannot be selected, and will also be ignored by the automatic detection mode.

Figure 3.27 *Reference group*

3.5.9 The *ABUS* group

When companion audio cards such as the DAP and UAP are used to provide additional audio channels, the ABUS audio bus links the installed audio cards and the XVP-1801. This panel, called ABUS group, is used to instruct the XVP-1801 about the presence of installed audio cards and the system configuration.

Multiple Card Config **sub-section**

A1/A2 Presence: Monitors the presence of companion audio cards installed in the chassis (see section 2.2 XVP-1801 Installation).

E1/E2 Presence: Monitors the presence of Dolby-E decoding modules installed on companion audio cards installed in the chassis.

Card System Config: To enable the audio bus, use the pull-down box and select your system's configuration. Selecting Video restricts available audio signals to audio signals on the video card; Video / A1 or Video / A1 / A2 adds the audio channels incoming from the installed audio cards detected.

Figure 3.28 *ABUS group*

3.5.10 The *Thumbnail* group

The thumbnail area displays thumbnail images for the inputs and outputs selected in the Player area.

Player – Click the checkbox to display the thumbnail

Control – Click the checkboxes to apply the Mode, Format, Quality and Refresh Rate settings to the these thumbnails.

Mode – select between Video mode and Test mode. Use Video mode for normal operation.

Format – choose the thumbnail size: small, medium, large

Quality – choose the quality of the displayed image by selecting Poor, Normal or HiQ from the pulldown list

Refresh Rate – select the desired refresh rate from the pull-down box. The choices are:

> [Fast, 1 sec, 2 sec, …, 9 sec, 10 sec.]

Figure 3.29 Thumbnail group

Streaming Priority Control – Click the *Take control from Slot [##]* checkbox to force the Densité Controller for this frame to assign more bandwidth for this card's streaming output. Only one card in the frame can use this feature. It has no effect unless you have selected *Fast* for the refresh rate. The actual slot number of this card, as shown in the window title bar, will appear when the checkbox is ticked.

- This feature is only available with the version 1 of the Densité Controller

3.5.11 The *RALM* group

The Remote Audio Level Meter (RALM) panel displays audio level meters for up to 8 channels. Channels are displayed in pairs, so up to four meters will be present in the meter display window The source for each meter is selected using the pulldowns in the RALM Remote Control area at the bottom of the control panel.

- Choices are OFF, Embedded CH 1&2, and each pair up to CH 15&16, AES1 to AES 4

The meter is divided into three zones, and the dividing points and color of each zone are individually configurable under the *Meter Ballistics Config* tab.

Speed – select the meter response from the pull-down list, options are [fast, medium, slow]

Figure 3.30 RALM group – RALM Connections tab

RALM Connections tab

Use the radio buttons to turn the meter display ON (RALM) or OFF for the indicated channels. The meter appears directly above the controls.

Reset Counter: click this button to reset the overload counter on the ALM display to zero. See the next section for instructions on setting up the overload counter.

Meter Ballistics Config tab

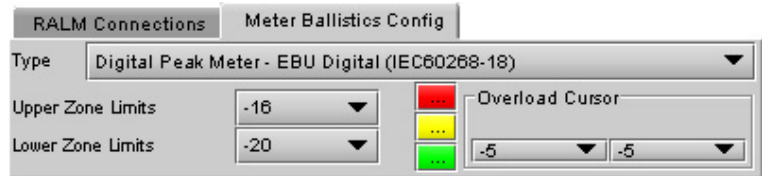*Type* – select a type of meter from the pull-down list

Upper Zone Limits – select the crossover level between the upper and middle zones of the meter (the range of values shown in the pull-down list depends on the type of meter selected)

Figure 3.31   RALM group – Meter Ballistics Config tab

Lower Zone Limits – select the crossover level between the middle and lower zones of the meter (the range of values shown in the pull-down list depends on the type of meter selected)

Color samples – the three samples show the current selected color for the upper, middle and lower zones of the meter.

- Click on the color sample of a zone to open a color selection panel to choose a different color for that zone

Overload Cursor – The overload cursor appears on the meter as an arrowhead in the meter scale. The two pulldown boxes set the position of the overload cursor on the left and right meters. If the audio level on that channel goes above the cursor, the Overload Counter at the top of the meter is incremented.

The *Overload Counter* shows a running count of the number of overloads detected. The Overload level is shown by a marker beside the meter, and its position can be set under the *Meter Ballistics Config* tab

The *Phasemeter* (located at the bottom of the RALM meter display) is a small meter that represents the phase correlation factor between the two channels of a pair.

Note – The level and phase meters are disabled for channels carrying non-PCM audio (Dolby E, Dolby Digital or other non-PCM types).
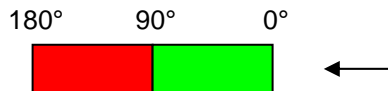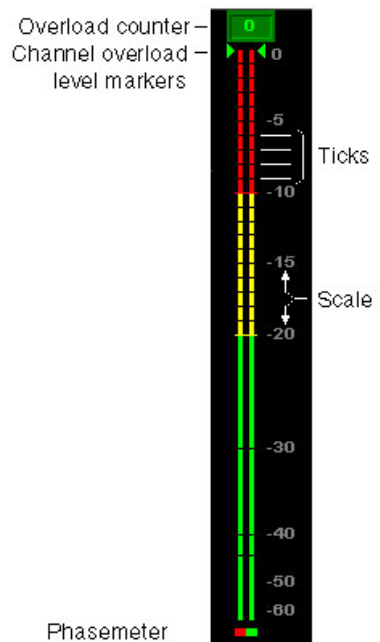
3.5.12 The *Test* group

This group contains a single checkbox that sends a 75% color bar test pattern (100% white), along with audio test tones (a continuous tone on right channel with pulsed tone on left channel in every pair) to the XVP-1801 output.

Figure 3.32 *Test group*

3.5.13 The *Factory/Presets* group

Load Factory: Clicking this button will restore the card to a factory default state. Two checkboxes enable the user to choose whether to include Parameters and/or Alarms in the restoration process

- Note that User Presets not changed

User Presets

The XVP-1801 has memory registers which can hold up to 5 user-defined parameter settings. The first 4 user presets can be recalled by GPI 1 to 4.

Select any one of the five presets using the pull-down list. The name of the currently-selected User Preset is shown on the name bar.

Click **Load** to load the contents of the selected User Preset into the XVP-1801. All parameter settings and values will be replaced by the contents of the selected User Preset.

Click **Save** to store the current parameter settings and values from the XVP-1801 into the selected User Preset. The existing contents of the preset will be overwritten.
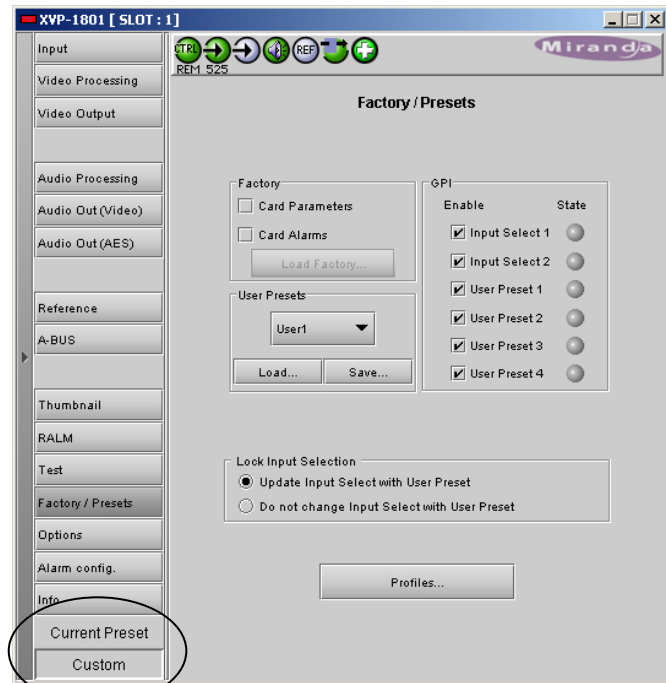
Figure 3.33 *Factory/Presets group*

GPI sub-section
Each of the 6 GPI inputs can trigger an automated action on the card when enabled. To disable this automated action, just uncheck the checkbox for the corresponding GPI. The current state of each GPI is also reported. When a contact closure to ground is present on the GPI input, the state will be green. Otherwise, the state will be gray.

The *Current Preset* box displays the last loaded preset. Any change to the card configuration after a preset is loaded will change the display to "Custom" instead of the preset value.

***Lock Input Selection* sub-section**
When User Presets are saved, the input selection is saved as well. This means that changing User Preset may change input selection, according to which one is associated with the User Preset. This is the normal behavior when "*Update Input Select with User Preset*" is chosen.

Selecting "*Do Not Change Input Select with User Preset*" prevents the current input selected from changing while applying all other settings of the selected preset.

***Profiles* sub-section**
This section provides the option to save and recover the entire card configuration (including user presets if desired) on an external disk, or to copy it to another XVP-1801 card.

Click on *Profiles* to open the Profile Copy window.

***Copy profile from* section**
This line shows this XVP-1801 card, and identifies it by App server, Densité frame and slot number, card type and firmware version.

The *Profile* column has a pulldown that allows you to select which profiles you will work with, and gives these choices:
- Current, User1, User2, User3, User4, User5, All

The *Select* column includes a checkbox, preselected as checked, to confirm that you want to work with the current card.
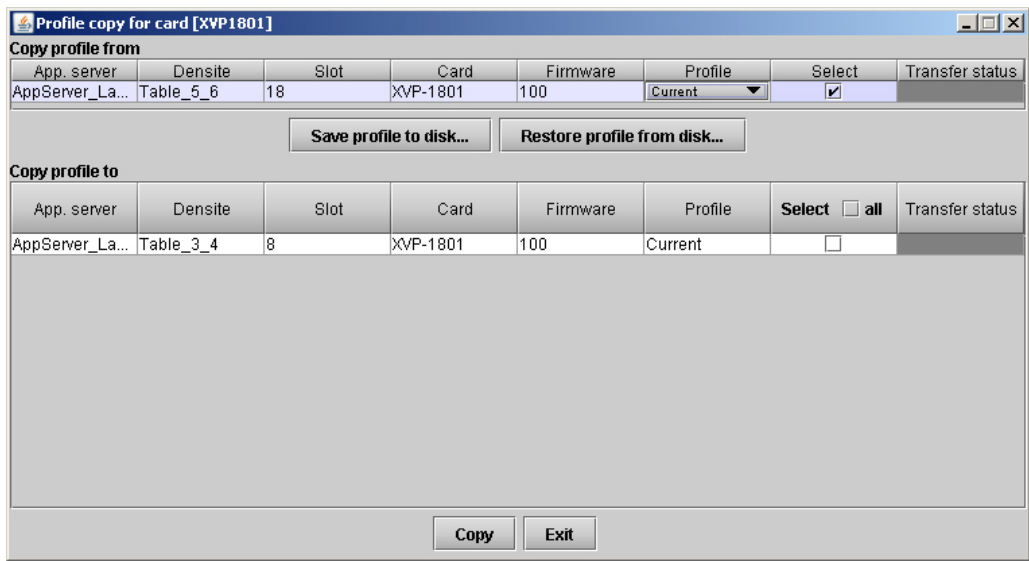

Figure 3.34   *Copy Profile for Card window*

Save Profile to Disk…
Click this button to open a Save dialog allowing you to specify a file name and location to which the selected profiles for this card will be saved.

Hint - It is a good idea to create a folder for these files, because they are not explicitly identified as XVP-1801 profiles, and will be difficult to find and identify if not clearly named and conveniently located.

- Click the save button once the name and location have been identified in the Save box
- If the file is saved correctly, the Transfer Status box on the right of the *Copy profile from* line will indicate *Succeeded* against a green background
- If the file was not saved for some reason, the Transfer Status box to the right of the *Copy profile from* line will indicate *Failed* against a red background

Restore profiles from disk…
Click this button to open an *Open* dialog box within which you can locate and select a valid XVP-1801 profile file.

- Click Open to read the contents of the file and to reconfigure this XVP-1801's profiles according to its contents
- While the reconfiguration is in progress, the Transfer Status box on the right of the *Copy profile from* line will indicate *Working* against a yellow background
- When the reconfiguration is complete, the Transfer Status box on the right of the *Copy profile from* line will indicate *Succeeded* against a green background
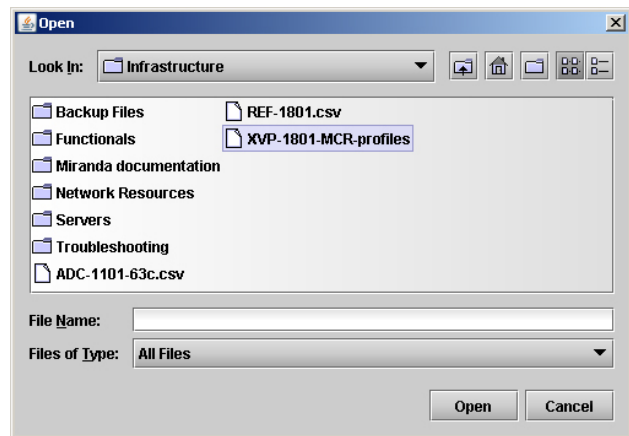
Copy profile to section

This line shows other XVP-1801 cards that are available on the iControl network, each identified by App server, Densité frame and slot number, card type and firmware version.

The *Profile* column shows the same information as is shown for the current card in the Copy profile from line, i.e.
- Current, User1, User2, User3, User4, User5, All

The *Select* column includes a checkbox to identify which XVP-1801 cards you wish to copy profiles into from the current card.
- For convenience, a *Select all* checkbox is provided in the column header

Click *Copy* to copy the selected profiles from this card into the selected other XVP-1801 cards

- While the profile copy operation is in progress, the Transfer Status box on the right of the *Copy profile to* line will indicate *Working* against a yellow background
- When the profile copy operation is complete, the Transfer Status box on the right of the *Copy profile to* line will indicate *Succeeded* against a green background

3.5.14 The *Options* group

Three options are available for the XVP-1801:
- Discrete AES and 16 Channel Internal Audio Processing Option (XVP-1801-OPT-AUD)
- the key/fill functionality (XVP-1801-XVP-OPT-K)
- the XVP-1801 Full Upgrade option (XVP-1801- OPT-FULL).

To activate each of these options, you must
- Obtain a licence key from Miranda Technologies Inc.
- Type the licence key in the box
- Click on ENABLE OPTION to enable the option's features.

Audio option:
Enables discrete AES I/Os and 16-channel internal audio processing.

Note: When the Audio option is not enabled, all discrete AES I/Os and audio processing features are disabled. If there is embedded audio in the input signal, it passes through to the output signal. However, when the Audio option is not enabled (using a software key) BUT there are companion audio cards installed and connected to the XVP-1801 with the ABUS cable, the Audio Processing and HD/SD Audio Output controls will be available and functional.

XVP Key/Fill option:
This option is used to enable the background key/fill functionality for the side panels and letterbox.

Figure 3.35 *Options group - Audio*
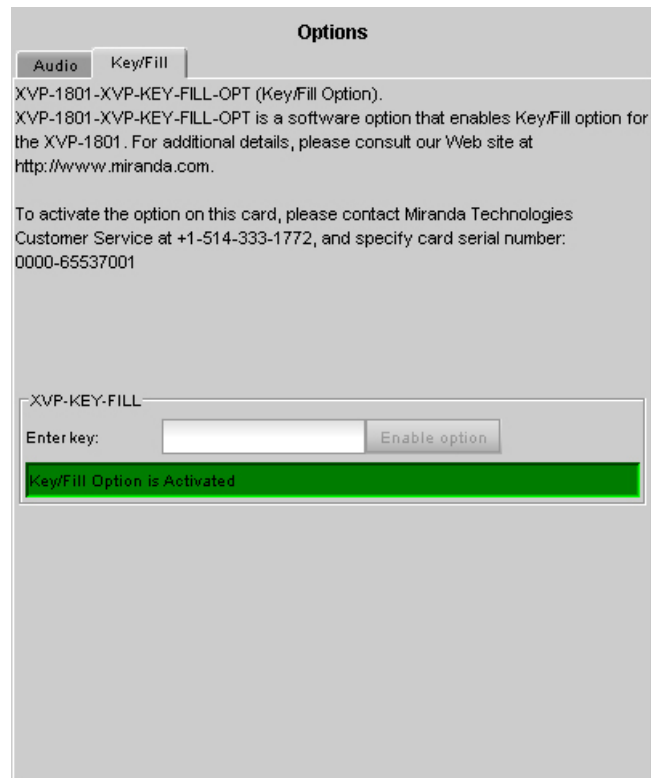
Figure 3.36 *Options group – Key/Fill*

XVP Upgrade option:
This option can be used to upgrade an XVP-1801-
UC, -ARC, -DC, or -XC model to a full XVP-1801.

- The option name varies depending on which
  model you have. See your Miranda
  representative for more details.

- The tab for this option does not appear in this
  group when the card is a full XVP-1801 (as
  shown in fig. 3.34).
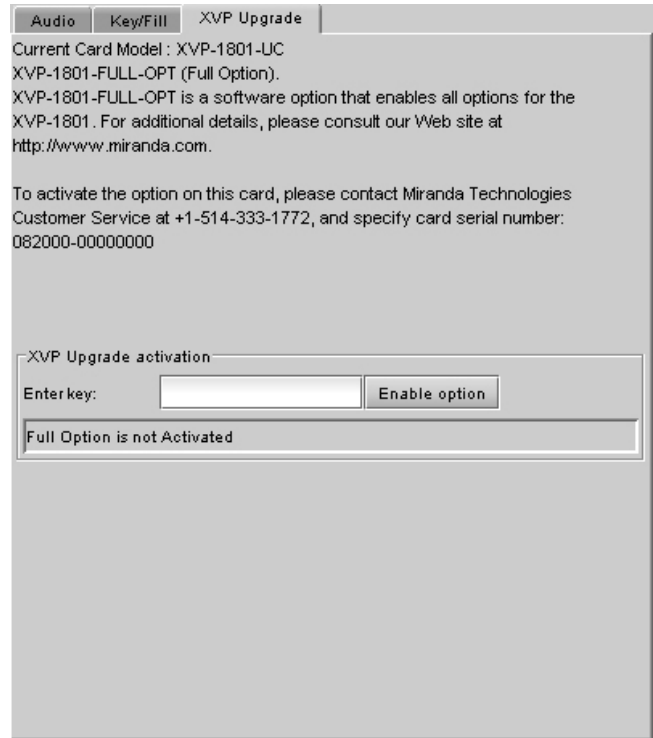
Figure 3.37 *Options group – XVP Upgrade (Full)*

3.5.15 The *Alarm Config* group

This panel allows the alarm reporting of the
XVP-1801 to be configured. The panel
opens in a new window when the button is
clicked, and can be resized if needed.

The panel is organized in columns.

Status/Name
This contains an expandable tree listing all
the alarms reported by this XVP-1801 card.

- Each alarm name includes an icon
  that shows its current status

- Some alarms may be text-only and
  the alarm status is shown in the
  name and not by a status icon

The **Card LED**, **Overall alarm** and **GSM
contribution** columns contain pulldown
lists that allow the level of contribution of
each individual alarm to the alarm named in
the column heading to be set.

- If there is no arrowhead in the box,
  there is no pulldown and the alarm is
  not user-configurable
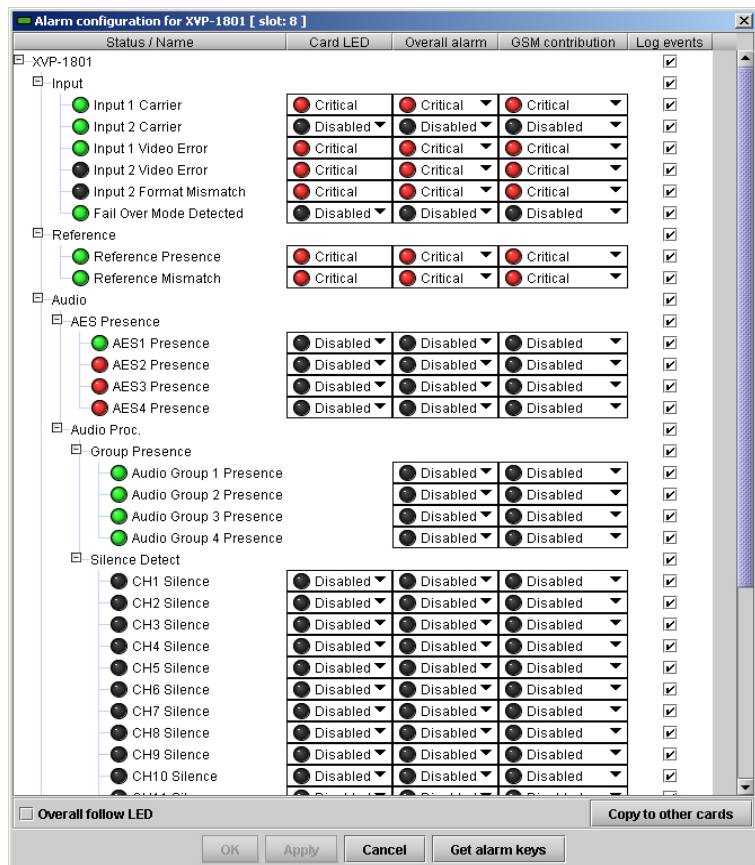
Figure 3.38 *Alarm Configuration panel*

- **Card LED**
  This column allows configuration of the contribution of selected individual alarms to the status LED located on the front card edge. The Card LED status is shown at the bottom of the alarm tree in the Status/Name column.

- **Overall Alarm**
  This column allows configuration of the contribution of each individual alarm to the Overall Alarm associated with this card. The Overall Alarm is shown in the upper left corner of the iControl panel, and also appears at the bottom of the Status/Name column.

- **GSM Contribution**
  This column allows configuration of the contribution of each individual alarm to the GSM Alarm Status associated with this card. GSM is a dynamic register of all iControl system alarms, and is also an alarm provider for external applications. The possible values for this contribution are related to the Overall alarm contribution:

  - If the Overall alarm contribution is selected as Disabled, the GSM alarm contribution can be set to any available value

  - If the Overall alarm contribution is selected as any level other than disabled, the GSM contribution is forced to follow the Overall Alarm.

Levels associated with these alarms:

The pulldown lists may contain some or all of the following options:

⚫ Disabled ▼	The alarm makes no contribution (black icon)
🟡 Minor ▼	The alarm is of minor importance (yellow icon)
🟠 Major ▼	The alarm is of major importance (orange icon)
🔴 Critical ▼	The alarm is of critical importance (red icon)
🟡 Passthrough ▼	The alarm exists but has no effect (used for text and composite alarms)

Shortcut: *if you click in one of the columns beside a major heading in the Status/Name column (where there is no pulldown shown), you will open an "invisible" pulldown that lets you assign a level to all alarms in that section of the column simultaneously.*

Log Events
iControl maintains a log of alarm events associated with the card. The log is useful for troubleshooting and identifying event sequences. Click in the checkbox to enable logging of alarm events for each individual alarm.

At the bottom of the window are several other controls

Overall follow LED
Click in the checkbox to force the Overall alarm to be identical to the Card LED status

- All Overall alarms for which there is a Card LED alarm will be forced to match the Card LED alarm

- All Overall Alarms for which there is no Card LED alarm will be forced to Disabled
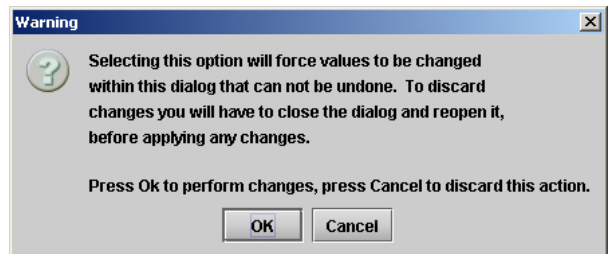

Figure 3.39 *Overall follow LED warning*

A warning box will open allowing you to confirm the action, since it will result in changes to the configuration and there is no *undo* function.

Copy to other cards
Click this button to open a panel that allows the alarm configuration set for this card to be copied into another XVP-1801 card.

- Select one or more destination cards from the list in the window by clicking in the checkboxes, or all of them by clicking in the *All* checkbox

- Note that when you do a Copy Profile for this card (see Sect.3.5.13), the alarm configuration is copied along with all the other settings.
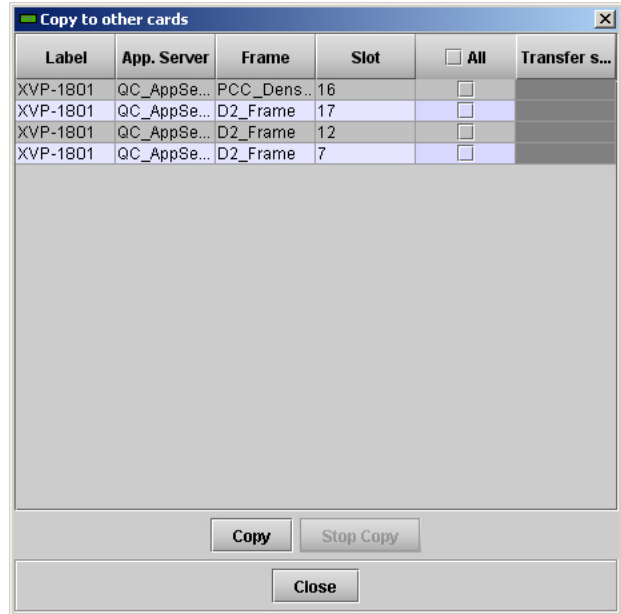
Figure 3.40 *Copy to other cards*

Get alarm keys
Click this button to open a save dialog where you can save a file containing a list of all alarms on this card and their current values, along with an Alarm Key for each. The alarm keys are useful for system integration and troubleshooting.

- The file is saved in Excel.csv format
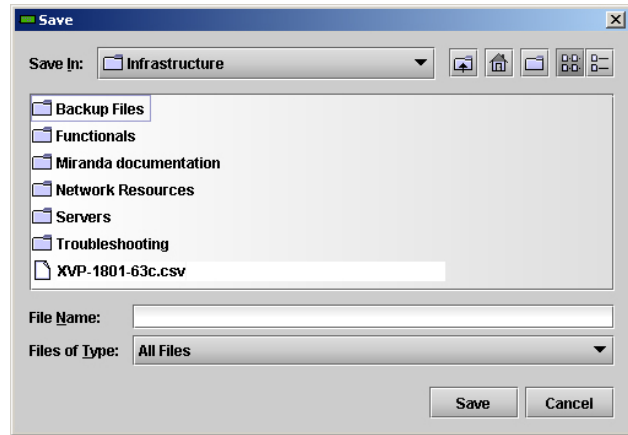
Figure 3.41 *Get alarm keys save dialogue*

OK, Apply, Cancel

- *OK* accepts the settings and closes the window once the card confirms that there are no errors.
- *Apply* accepts the settings, but leaves the window open
- *Cancel* closes the window without applying any changes, and leaves the previous settings intact.

3.5.16 The *Info* group

The top two lines in this panel identify the model of this XVP-1801, and the rear panel that is currently installed.

When the XVP-1801 is included in an iControl environment, certain information about the card should be available to the iControl system. The user can enter labels and comments that will make this card easy to identify in a complex setup. This information is entered into data boxes in the Info control panel.

Label: type the label that is shown for this XVP-1801 when it appears in iControl applications

Short Label   type the short-form label that iControl uses in some cases (8 characters)

Source ID   type a descriptive name for this XVP-1801

Comments: type any desired text

Figure 3.42   *Info group*

The remaining data boxes show manufacturing information about this card.

Three buttons in the panel give access to other information.

- Details…: Reports the Firmware version, service version, and panel version for this card

Figure 3.43   *Details window*

- Advanced…: Shows the Miranda LongID for this card. The Miranda LongID is the address of this XVP-1801in the iControl network.

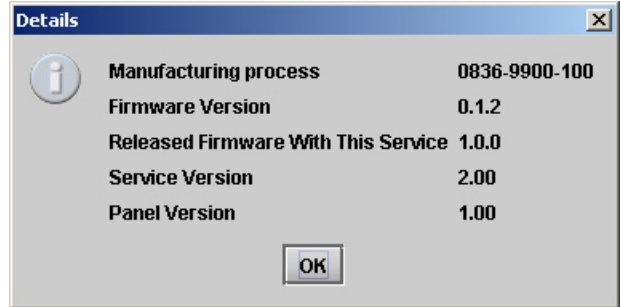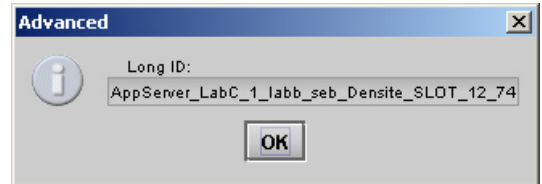**Figure 3.44**   *Advanced window*

- Remote System Administration – opens the Joining Locators data box, which lists remote lookup services to which this XVP-1801 is registered.

    Add: Force the iControl service for this XVP-1801 to register itself on a user-specified Jini lookup service, using the following syntax:

    jini://<ip_address>

    where <ip_address> is the ip address of the server running the lookup service

    Remove: select one of the services listed in the window by clicking on it, and click *Remove* to delete it from the window.
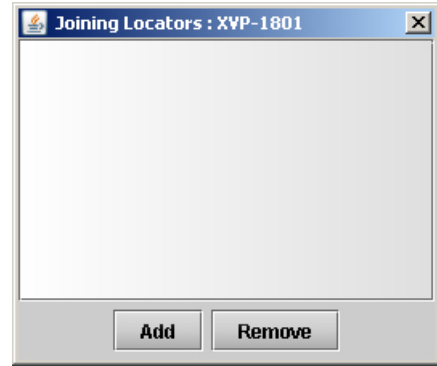
Figure 3.45 *Joining Locators window*

3.6   Automation Using RS-422

Some card behaviors can be controlled using the RS-422 port. This is especially useful for automation systems. For detailed information about the protocol including the handshaking, please refer to the Oxtel Series Automation Protocol manual. The "Transport Layer" chapter gives more details about the encapsulation of the command strings described below.

In the current version, we use the "Load image R0" command from the protocol to load User Presets, Factory Defaults or ARC Presets.

3.6.1   Load Image R0 Command

- In the original protocol, the R0 command has 2 parameters which have been renamed "Layer" and "Oper_String" for this application. The supported values for each of these parameters are defined in the tables below.

Layer '0' is used to load User Presets or the factory defaults. Layer '1' is used to load ARC Presets.

Command	Layer	Oper_String	Description
R0	0	USER_1	Load user preset 1
R0	0	USER_2	Load user preset 2
R0	0	USER_3	Load user preset 3
R0	0	USER_4	Load user preset 4
R0	0	USER_5	Load user preset 5
R0	0	FACTORY	Load factory default

Command	Layer	Oper_String	Description
R0	1	0-0-BYPASS	IN 4:3, OUT 4:3, bypass (no ARC)
R0	1	0-1-SIDE25	IN 4:3, OUT 16:9 with 25% side panels
R0	1	0-1-CROP25	IN 4:3, OUT 16:9 with 25% input center V crop
R0	1	0-1-ANAM	IN 4:3, OUT 16:9, anamorphic stretched
R0	1	0-1-14/9	IN 4:3, OUT 16:9, 14:9 output aspect ratio
R0	1	1-1-BYPASS	IN 16:9, OUT 16:9, bypass
R0	1	1-0-LBOX25	IN 16:9, OUT 4:3 with 25% letterbox
R0	1	1-0-CROP25	IN 16:9, OUT 4:3 with 25% input center H crop
R0	1	1-0-ANAM	IN 16:9, OUT 4:3, anamorphic compressed
R0	1	1-0-14/9	IN 16:9, OUT 4:3, 14:9 output aspect ratio

Example:

To convert a 4:3 input to 16:9 with 25% side panels at the output, the " R010-1-SIDE25" command string should be encapsulated and sent by the automation to the card. In this case, the final string would be:

   <STX0>R010-1-SIDE25:<CRC low><CRC high>

Where <STX0>, <CRC low> and <CRC high> are described in the Oxtel Series Automation Protocol manual.

4   Specifications

VIDEO INPUTS (2)

SIGNAL:	SMPTE-259M-C (270Mbps) and
	SMPTE-292M (1.485, 1.485/1.001 Gbps)
FORMATS:	SD: 480i59.94, 576i50
	HD: SMPTE-274M: 1080i59.94, 1080i50
	HD: SMPTE-296M: 720p59.94, 720p50
CABLE LENGTH:	>340 m Belden 1694A at 270 Mbps
	>150 m Belden 1694A at 1.485 Gbps
RETURN LOSS:	>15 dB up to 1.5 GHz

VIDEO OUTPUT (2)

SIGNAL:	SMPTE-259M-C (270Mbps) and
	SMPTE-292M (1.485, 1.485/1.001 Gbps)
FORMATS:	SD: 480i59.94, 576i50
	HD: SMPTE-274M: 1080i59.94, 1080i50
	HD: SMPTE-296M: 720p59.94, 720p50
RETURN LOSS:	>15 dB up to 1.5 GHz
JITTER:	< 0.2UI at 100 kHz as per SMPTE-292M
	< 0.2 UI at 10 Hz as per SMPTE-240M

REFERENCE INPUT and LOOP

SIGNAL (1) :	SMPTE 170M/SMPTE 318M/ITU 624-4/BUT 470-6 black burst
	SMPTE 274M / SMPTE 296M Tri-Level Sync
RETURN LOSS:	>35 dB up to 5.75 MHz

GPI (8)

CONNECTOR:	15-pin D-SUB providing 4 user preset recalls, 2 input selects and 2 input status outputs
	Opto-isolated, contact closure to ground

AES INPUTS (4)

SIGNAL:	AES3 or AES-3id
LEVEL:	0.2V to 7V p-p
IMPEDANCE:	110 Ohms balanced or 75 Ohms unbalanced depending on rear
CABLE LENGTH:	250 m (110 Ω)
	700 m (75 Ω)
COMMON MODE REJECTION:	1.75 V peak, DC to 20 KHz
RETURN LOSS:	>15 dB up to 6.2 MHz

AES OUTPUTS (4)

SIGNAL:	AES3 or AES-3id
LEVEL:	1 V p-p +/- 10% (75 Ω)
	3 V p-p +/- 10% (110 Ω)
IMPEDANCE:	110 Ohms balanced or 75 Ohms unbalanced depending on rear
RETURN LOSS:	>15 dB up to 6.2 MHz

VIDEO PROCESSING PERFORMANCE

SIGNAL PATH:	10 bits
PROCESSING DELAY:	1 frame in all modes
	Up to 3 additional frames can be added manually.

AUDIO PROCESSING PERFORMANCE

QUANTIZATION:	24 bits
INPUT SAMPLING RATE:	32 KHz to 96 KHz, asynchronous
SAMPLING:	48 KHz, synchronous
NUMBER OF CHANNELS:	16, 8 pairs, 4 Groups
POWER:	20 W
PHYSICAL FORMAT:	*Densité* size (3.0 in x 10.0 in)

ANNEX 1 – XVP-1801 User interface

Menu level	LEV1	LEV2	LEV3	LEV4	VALUES	Conditions
Card Status	STATUS	GENERAL STATUS			CARD MODEL/ REAR TYPE / FAN ERROR 1 or 2/ CRITICAL HEALTH (XXXX)	
		VIDEO STATUS			IN NO CARRIER/ IN FORMAT/ IN TRS ERROR/ REF FORMAT/ REF MISMATCH	
		AUDIO STATUS			ABUS: NONE, A1, A2/ GROUP PRESENCE 1 to 4/ AES PRESENCE	Audio option only
		METADATA STATUS			CC PRESENCE/TC PRESENCE/ AFD PRESENCE/ DOLBY PRESENCE	
Configuration load	CONFIG	LOAD			[USER1, USER2, USER3, USER4, USER5]	
Configuration save		SAVE			[USER1, USER2, USER3, USER4, USER5]	
GPI Enable		GPI	INPUT SELECT 1		[ENABLE, DISABLE]	
			INPUT SELECT 2		[ENABLE, DISABLE]	
			USER PRESET 1		[ENABLE, DISABLE]	
			USER PRESET 2		[ENABLE, DISABLE]	
			USER PRESET 3		[ENABLE, DISABLE]	
			USER PRESET 4		[ENABLE, DISABLE]	
Input Selection	INPUT	INPUT SELECT			[1, 2]	
Input 2 mode		INPUT 2 MODE			2x1 SWITCH, FAILOVER, KEY/FILL]	
Failover emergency delay		FAIL DELAY			[0, 3, 15] seconds	
Lock Input Selection		LOCK INPUT			[NO, YES]	
Reference source	REFERENCE	SOURCE			[AUTO, EXT, URS, IN]	
URS rate		URS			[OFF, URS-29.97, URS-25]	
Input aspect ratio mode	ASPECT	AFD			[4:3, 16:9, AUTO, FORCED]	SD input
					[16:9, AUTO, FORCED]	HD input
Default AFD flag		DEFAULT			[4:3_8, 4:3_10,...LAST]	auto AFD mode
Forced AFD flag		FORCED			[4:3_8, 4:3_10,...]	forced AFD mode
Deglitcher mode	DEGLITCHER				[OFF, ON]	
Procamp Mode	PROCAMP	MODE			[YCbCr, RGB]	
Overall gain		ALL GAIN			[-800,...,0, 1, ..., 800] no unit	
		Y/G GAIN			[-800,...,0, 1, ..., 800] no unit	
		Cb/B GAIN			[-800,...,0, 1, ..., 800] no unit	
		Cr/R GAIN			[-800,...,0, 1, ..., 800] no unit	
Chroma gain		SATURATION			[-100,...,0, 1, ..., 100] no unit	
		BLACK/G OFFSET			[-100,...,0, 1, ..., 100] no unit	
		Cb/B OFFSET			[-100,...,0, 1, ..., 100] no unit	
		Cr/R OFFSET			[-100,...,0, 1, ..., 100] no unit	
		HUE			[-180,...,0, 1, ..., 180] unit = DEG	
RGB gamut legalization		RGB GAMUT			[OFF, ON]	
ARC presets	VIDEO	PRESET			[CUSTOM, BYPASS]	SD input
					[CUSTOM, LETTERBOX, CROP, ANAMAMORPHIC, 14:9]	4:3 -> 4:3, 16:9 ->16:9
					[CUSTOM, SIDE, CROP, ANAMORPHIC, 14:9]	16:9 -> 4:3 / 4:3 -> 16:9
Output format		FORMAT			[1080i, 720p, 480i]	59.94Hz
					[1080i, 720p, 576i]	50 Hz
Output aspect ratio		ASPECT			[4:3, 16:9]	SD out only, 16:9 in HD
Input vert crop		ARC	V CROP (IN)		[0, ..., 25] step=4 lines unit=%	
Input horiz crop			H CROP (IN)		[0, ..., 25] step=8 pixels unit=%	
Input vert position			TILT (IN)		[0, ..., 25] step=2 unit=lines	
Input horiz position			PAN (IN)		[0, ..., 25] step=4 unit=lines	
Output vert size			LETTERBOX (OUT)		[0, ..., 25] step=4 lines unit=%	16:9 -> 4:3
Output horiz size			SIDE PANELS (OUT)		[0, ..., 25] step=8 pixels unit=%	4:3 -> 16:9
Output Mask		MASK	TOP		[0, 2,...,xx] unit =LINE	Format dependant min range > 25%
			BOTTOM		[0, 2,...,xx] unit =LINE	
			LEFT		[0, 2,...,xx] unit =PIXL	

Description	Menu	Group	Item	Sub-item	Options	Notes
	ADVANCED	RIGHT			[0, 2,...,xx] (unit = PIXL)	
MPEG mode			MPEG		[OFF, ON]	HD out only
HD Detail enhancer level			DETAIL		[OFF,1,...,7]	HD out only
Hor. detail enhancer mode			H DETAIL MODE		[MED, HIGH]	SD out only
Vert. detail enhancer mode			V DETAIL MODE		[MED, HIGH]	SD out only
SD Horizontal detail enhancer level			H DETAIL		[OFF,...,7]	SD out only
SD Vertical detail enhancer level			V DETAIL		[-8,...,OFF,...,7]	SD out only
Background color (8-bit)			BKGND COLOR	Y	[1,...,16,...254]	SD out
				Cb	[1,...,128,...254]	
				Cr	[1,...,128,...254]	
HD Audio embedding	METADATA		AUDIO		[OFF, AUTO]	HD out
SD Audio embedding					[OFF, AUTO 20 BITS, AUTO 24 BITS]	SD out
Timecode Insertion			TIMECODE	INSERTION	[OFF, AUTO]	
SD Timecode line detection				LINE DETECT	[AUTO, 10,...,14,...,20]	525 SD in
					[AUTO, 7,...,14,...,22]	625 SD in
SD timecode line insertion				LINE INSERT	[10, 11,...,14,...,20]	525 SD out
					[7,...,14,...,22]	625 SD out
SD Timecode Duplicate				DUPLICATE	[OFF, ON]	SD out
Closed Captioning Insertion			CLOSED CAPTION	INSERTION	[OFF, AUTO]	SD in and/or out 525
Line 21 mode				LINE 21	[ACTIVE, BLANKING]	SD in and/or out 625
Line 23 mode			LINE 23		[ACTIVE, BLANKING]	HD->HD, SD->SD
VBI passthrough			VBI		[OFF, ON]	525 SD in
AFD Source			AFD	SOURCE	[AFD, VLI]	625 SD in
					[AFD, VLI, WSS]	HD in
					[AFD]	
AFD Insertion				INSERTION	[OFF, AFD, VLI]	525 SD out
					[OFF, AFD, VLI, WSS]	625 SD out
					[OFF, AFD]	HD out
AFD Line Insert				LINE INSERT	[12,...19]	525/625 SD out
					[9, 10, 11,...,19]	HD out only
Alternate AUTO AFD processing Custom ARC config.				ALTERNATE ARC 16:9_8 to 4:3	[Letterbox, Center Cut]	AFD mode only
Dolby Metadata Mode			DOLBY	MODE	[OFF, FROM ABUS, FIXED PCM]	Mode PCM only
Dialnom for PCM				DIALNORM	[-20,-22,-24,-26,-27,-28,-30,-31] dB	
Dolby Line Detection				LINE DETECT	[9, 10,...,20] unit=Lines	HD in
Dolby Line Insertion				LINE INSERT	[9, 10,...,20]	HD out
Additional Frame Delay	TIMING		FRAME		[0, 1,...,6] step = 33ms or 40 ms	HD output
Timing in line steps			VERT		[-16,-15,...,0,...,15] unit=LINE	SD output
Timing in pixel steps			HOR		[0,...,29.65] step=13.5ns unit=µs	
					[0,...,65.5] step=37ns unit=µs	
Input Timing to REF			IN TIMING TO REF		[display timing]	
	DE-INTERLACER		FILM MODE		[OFF, ON]	
			VIDEO OVER FILM		[OFF, ON]	Film mode must be ON
Audio Embed/Discrete	AUDIO	CHANNEL 09 - 16 PROC	CHANNEL 1	LOCK	[EMBED CH 9-16, AES IN 1-4]	All the audio parameters are available only if the audio option is activated and if an audio card is present.
Level and Delay lock				LEVEL	[OFF, CH01,...,CH16]	
Audio Level					[-96,...,0,...,12] step = .5dB	
Channel Phase Invertion				PHASE INVERT	[OFF, ON]	
Channel Mute				MUTE	[OFF, ON]	
Lip-Sync Correction				DELAY MSEC	[0, 2000] unit=ms	
Fine Audio Alignment				DELAY SAMPLES	[-100, 0, 100] unit=sample	
			– – CHANNEL 16	– – –		
Audio Silence Enable		NSD	CHANNEL 1	SILENCE DETECT	[OFF, ON]	
Audio Silence Threshold				THRESHOLD	[-72,-66,-60,-54,-48] dB	
Audio Silence Delay				DELAY	[3, 5, 7, 10, 15, 20, 30, 40, 50, 60, 90, 120, 180, 210, 240, 255] sec.	
			– – CHANNEL 16	– – –		
5.1 Downmix Mode		DOWNMIX	MODE		[OFF, LtRt, LoRo]	
Output Channels Selection			OUTPUT CHANNELS		[7&8, 15&16]	
Input Channels Selection			INPUT CHANNELS	LEFT	[V-1,...,V-16]	
				RIGHT	[V-1, V-2,...,V-16]	

Description	Menu	Submenu	Item	Values	Notes
Downmix Levels Source			CENTER	[V-1,..., V-3, ..., V-16]	
			Ls	[V-1,..., V-5, ..., V-16]	
			Rs	[V-1,..., V-6, ..., V-16]	
Manual/Default Center Level			LEVEL MODE	[AUTO, MANUAL]	
Manual/Default Surround Level			CENTER	[+3.0, +1.5, 0, -1.5, -3.0, -4.5, -6.0, MUTE] dB	
Manual LFE Level			SURROUND	[+3.0, +1.5, 0, -1.5, -3.0, -4.5, -6.0, MUTE] dB	
Downmix Level Normalization			LFE	[+10, +9.0, +7.5, +6.0, +4.5, +3.0, +1.5, 0, -1.5, -3.0, -4.5, -6.0, MUTE] dB	
			NORMALIZE LEVEL	[OFF, ON]	
Embedded Output Shuffler/Mixer	EMBED OUTPUT	CHANNEL 1	MODE	[OFF, A, A+B, MIX]	
			SRCA	[V, A1, A2]	
			CHNA	[CH01, ..., CH16]	
			MIXA	[-96, ..., 12] step = .5dB	
			SRCB	[V, A1, A2]	
			CHNB	[CH01, ..., CH16]	
			MIXB	[-96, ..., 12] step = .5dB	
			SWAP	[N/A, OFF, ON]	
		CHANNEL 2	MODE	[OFF, A, A+B, MIX, MIX 4CH]	
			SRCA	[V, A1, A2]	
			CHNA	[CH01, CH02, ..., CH16]	In MIX 4CH mode
			MIXA	[-96, ..., 12] step = .5dB	
			SRCB	[V, A1, A2]	
			CHNB	[CH01, ..., CH16]	
			MIXB	[-96, ..., 12] step = .5dB	
			SWAP	[N/A ODD CHN ONLY]	In MIX 4CH mode
		– – CHANNEL16	– – – –		
Discrete AES Output Shuffler/Mixer	AES OUTPUT	CHANNEL 1	MODE	[OFF, A, A+B, MIX]	
			SRCA	[V, A1, A2]	
			CHNA	[CH01, ..., CH16]	
			MIXA	[-96, ..., 12] step = .5dB	
			SRCB	[V, A1, A2]	
			CHNB	[CH01, ..., CH16]	
			MIXB	[-96, ..., 12] step = .5dB	
			SWAP	[N/A, OFF, ON]	
		CHANNEL 2	MODE	[OFF, A, A+B, MIX, MIX 4CH]	
			SRCA	[V, A1, A2]	
			CHNA	[CH01, CH02, ..., CH16]	In MIX 4CH mode
			MIXA	[-96, ..., 12] step = .5dB	
			SRCB	[V, A1, A2]	
			CHNB	[CH01, ..., CH16]	
			MIXB	[-96, ..., 12] step = .5dB	
			SWAP	[N/A ODD CHN ONLY]	In MIX 4CH mode
		– – CHANNEL 8	– – – –		
Audio/Video Card Config.	CARD SYSTEM			[VIDEO, VIDEO/A1, VIDEO/A1/A2]	
Freeze Type	FREEZE		TYPE	[FIELD1, FIELD2, FRAME, BLACK]	
Automatic Freeze on Error			AUTO	[OFF, ON]	
Manual Freeze			MAN	[OFF, ON]	
Audio/Video Test	TEST PATTERN			[OFF, ON]	
Input 2 Failover Error	CONFIG ALARMS		IN2 FAILOVER	[GREEN, YELLOW, RED]	Failover mode only
Carrier Detect 2 Error			CD2 ERROR	[GREEN, YELLOW, RED]	2x1 Switch mode only
AES Presence Error			AES [1..4] PRES ERROR	[GREEN, YELLOW, RED]	Audio Option required
Audio Silence Error			SILENCE CH [1..16]	[GREEN, YELLOW, RED]	Audio Option required
Firmware Version	VERSION			XVP-1801 : XXX	
Audio Options	OPTIONS		AUDIO ON/OFF	Key:XX.XX.XX.XX	
Key/Fill Option			KEY/FILL ON/OFF	Key:XX.XX.XX.XX	
Full Model Card Option			UPG2FULL ON/OFF	Key:XX.XX.XX.XX	
Factory Card Parameters	FACTORY RESET		CARD PARAMETERS	[NO, YES]	
Factory Led Alarms			CARD LED ALARMS	[NO, YES]	

Note: Some menu items may not be present depending on card model, input format, or card configuration.
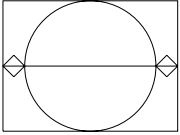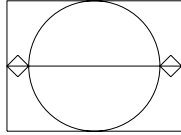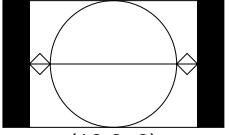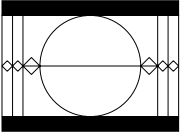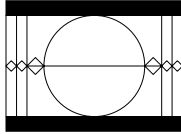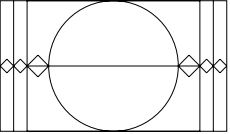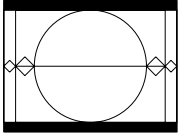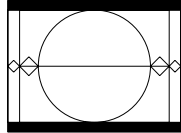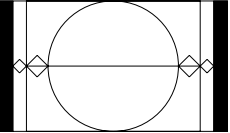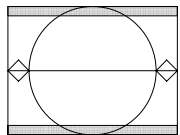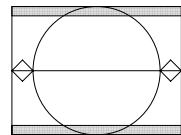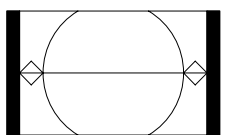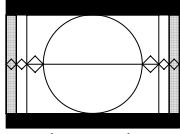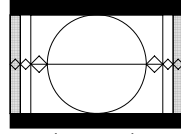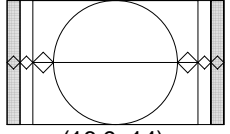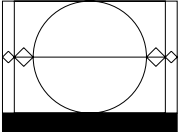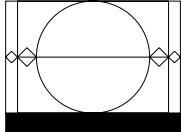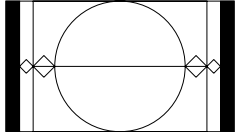
ANNEX 2 – AFD FUNCTIONS
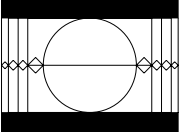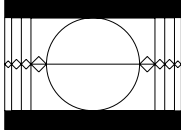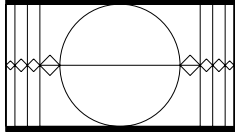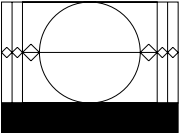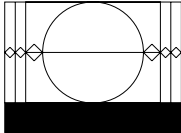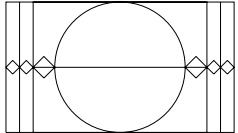
The charts below show the conversions that will be performed by the XVP-1801 when the Active Format Descriptor (AFD) processing is activated by selecting AUTO in the *AFD Mode* pulldown on the input screen of the HD Video Output or SD Video Output panels.
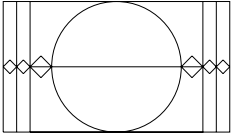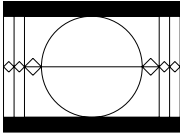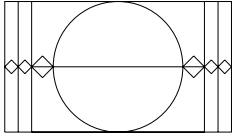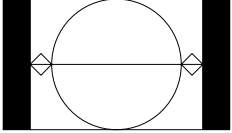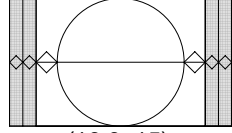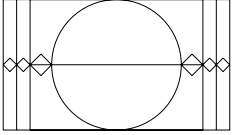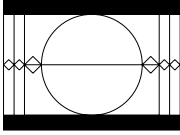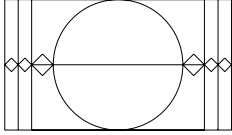
In the images shown in the chart:
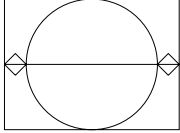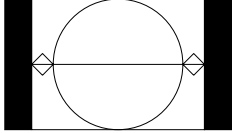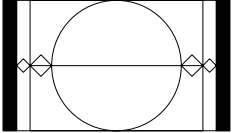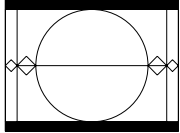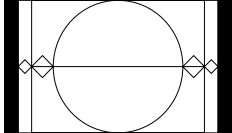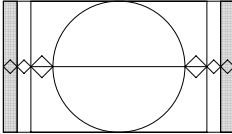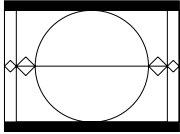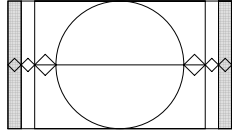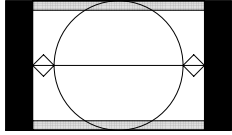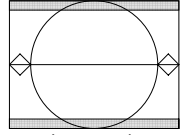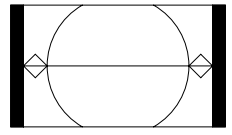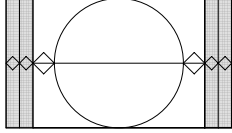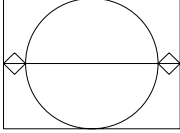
BLACK ██████ Indicates that this portion of the transmitted image will be black

GREY ▭ indicates Protected Area, consisting of picture content which may be cropped for optimum display on screens with a different aspect ratio.

Input signal	4:3 Output signal 16:9	
4:3 Full frame image in a 4:3 frame	4:3 Full frame image in a 4:3 frame	4:3 Pillar-box image in 16:9 frame
(4:3_8)	(4:3_8)	(16:9_9)
16:9 Letterbox image in 4:3 frame	16:9 Letterbox image in 4:3 frame	16:9 Full frame image in a 16:9 frame
(4:3_10)	(4:3_10)	(16:9_8)
14:9 Letterbox image in a 4:3 frame	14:9 Letterbox image in a 4:3 frame	14:9 Pillar-box image in a 16:9 frame
(4:3_11)	(4:3_11)	(16:9_11)
4:3 Image shoot and protect 14:9 in a 4:3 frame	4:3 Image shoot and protect 14:9 in a 4:3 frame	14:9 Pillar-box image in a 16:9 frame
(4:3_13)	(4:3_13)	(16:9_11)
16:9 Letterbox image shoot and protect 14:9 in a 4:3 frame	16:9 Letterbox image shoot and protect 14:9 in a 4:3 frame	16:9 Image shoot and protect 14:9 in a 16:9 frame
(4:3_14)	(4:3_14)	(16:9_14)

Input signal	4:3 Output signal 16:9	
> 16:9 Letterbox (center) image in a 4:3 frame (4:3_4)	> 16:9 Letterbox (center) image in a 4:3 frame (4:3_4)	16:9 Full frame image in a 16:9 frame (16:9_8)
16:9 Letterbox (top) image in a 4:3 frame (4:3_2)	16:9 Letterbox (top) image in a 4:3 frame (4:3_2)	16:9 Full frame image in a 16:9 frame (16:9_8)
14:9 Letterbox (top) image in a 4:3 frame (4:3_3)	14:9 Letterbox (top) image in a 4:3 frame (4:3_3)	14:9 Pillar-box image in a 16:9 frame (16:9_11)

Input signal	4:3 Output signal 16:9	
16:9 Full frame image in a 16:9 frame (16:9_8)	16:9 Letterbox image in 4:3 frame Either (4:3_10) as shown here, or (4:3_8) as in box below	16:9 Full frame image in a 16:9 frame (16:9_8)
4:3 Pillar-box image in 16:9 frame (16:9_9)	4:3 Full frame image in a 4:3 frame (4:3_8)	4:3 Pillar-box image in 16:9 frame (16:9_9)
14:9 Pillar-box image in a 16:9 frame (16:9_11)	14:9 Letterbox image in a 4:3 frame (4:3_11)	14:9 Pillar-box image in a 16:9 frame (16:9_11)
16:9 Image shoot and protect 14:9 in a 16:9 frame (16:9_14)	14:9 Letterbox image in a 4:3 frame (4:3_11)	16:9 Image shoot and protect 14:9 in a 16:9 frame (16:9_14)
4:3 Pillar-box image Shoot and protect 14:9 in a 16:9 frame (16:9_13)	4:3 Image shoot and protect 14:9 in a 4:3 frame (4:3_13)	14:9 Pillar-box image in a 16:9 frame (16:9_11)
16:9 Image shoot and protect 4:3 in a 16:9 frame (16:9_15)	4:3 Full frame image in a 4:3 frame (4:3_8)	16:9 Image shoot and protect 4:3 in a 16:9 frame (16:9_15)
16:9 Full frame image in a 16:9 frame (16:9_10)	16:9 Letterbox image in 4:3 frame (4:3_10)	16:9 Full frame image in a 16:9 frame (16:9_10)