

# HDC-1861

## DESCRIPTION

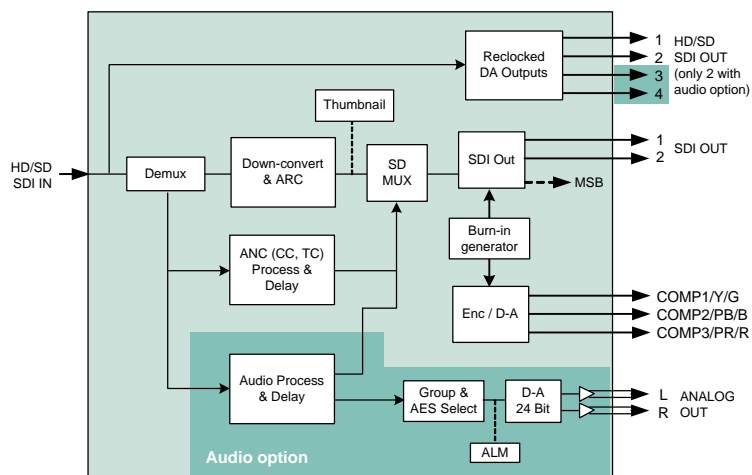
The HDC-1861 is an HD downconverter as well as a distribution amplifier, with an analog monitoring output. The HDC series cards are dual rate for hybrid HD/SD facilities. The DA section provides up to 4 HD re-clocked outputs, and the HD downconverter supports multiple formats of signals, such as 1080i, 720p, 23.98 psf. All Metadata (TC, CC) and audio (2 groups) are processed in HD and SD. When SD is set at the input, the card offers Aspect Ratio Conversion (ARC) with five presets. The SDI output can add on screen display of Time code, input format as well as graticules and markers.

This card operates with the MSB-1121 Monitoring Switching Bridge which allows the output of any module in the Densité frame to be monitored. Multiple MSB equipped frames may be cascaded to form a large monitoring bus, eliminating the need for dedicated monitoring routers.

## FEATURES

- HD/SD dual rate auto-detect input with up to 4 re-clocked outputs
- Up to 2 SDI down-converted/ARC outputs
- 12-Bit D to A conversion for the analog video outputs
- 3 Composite, RGB or Y, B-Y, R-Y analog outputs
- Two analog audio channels (with audio option and HDC-1861-A-DRP rear panel)
- HD 10-bit downconverter processing
- SD 10-bit ARC processing with 5 presets
- Time Code processing and delay
- Selectable OSD for input format and SD output Time Code
- Selectable Graticules and Markers insertion
- Audio de-embedding/embedding of 2 groups in HD to SD (option)
- VBI by-pass in SD to SD mode
- Thumbnails and audio level meters (ALM) (With audio option)
- Signal presence detection and remote reporting
- Provides output to Monitoring Switching Bridge option (MSB-1121)

## FUNCTIONAL BLOCK DIAGRAM



**SPECIFICATIONS**

**INPUT**

Signal: SMPTE 292M (1.485, 1.485/1.001 Gbps)  
 SMPTE 259M (143, 177, 270 & 360 Mbps)

Formats: HD: 1080i 59.94, 50, 23.98psf,  
 720p 59.94, 50  
 SD: 525, 625

Cable Length  
 HD: 110 m (350') for Belden 1694A  
 SD: 250 m (850')

Return Loss: > 15 dB up to 1.5 GHz

**DA OUTPUTS (4)**

Signal: SMPTE 292M (1.485,1.485/1.001 Gbps)  
 SMPTE 259M (143, 177, 270 & 360 Mbps)

Return loss: > 15 dB up to 1.5 GHz

Added Jitter: < 0.2 UI p-p (wideband)

**PROCESSING PERFORMANCE**

Signal path: 10 bits

Processing delay: < 6 ns

**SDI OUTPUTS**

Signal (2): SMPTE 259M-C (270 Mbps)

Return Loss: > 15 dB up to 270 MHz

Added Jitter: <0.2 UI p-p (WIDEBAND)

**ANALOG VIDEO OUTPUTS**

Signal (2): NTSC (525/60) SMPTE 170M  
 PAL (625/50) ITU 624-4  
 G/Y, B/B-Y, R/R-Y

Return Loss: > 35 dB up to 5.75 MHz

**AUDIO OUTPUTS**

Analog signal: Balanced analog stereo audio

Impedance: < 55Ω

Max level: + 24 dBu

**DIGITAL VIDEO PROCESSING PERFORMANCE**

Signal path: 10 bits

Processing delay:

HD input to HD SDI output: < 2uS

HD input to SD SDI and

COMPOSITE outputs:

Frame rate of 59.94Hz 34ms

Frame rate of 50Hz 41ms

Frame rate of 23.98Hz 83ms

**ANALOG VIDEO PROCESSING PERFORMANCE**

Quantization: 10 bits

DACS: 12 bits

Sampling: 108 MHz (8X over sampling)

Frequency response: ± 0.2 dB to 5.0 MHz

Noise : < -60 dB to 5.75 MHz (UNWEIGHTED)

VBI: Passed

**ANALOG AUDIO PROCESSING PERFORMANCE**

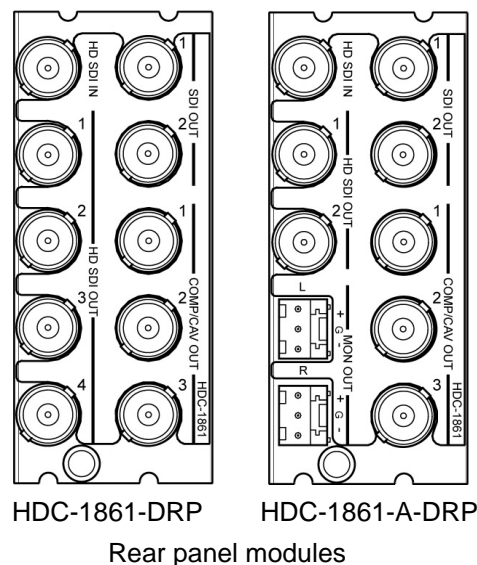
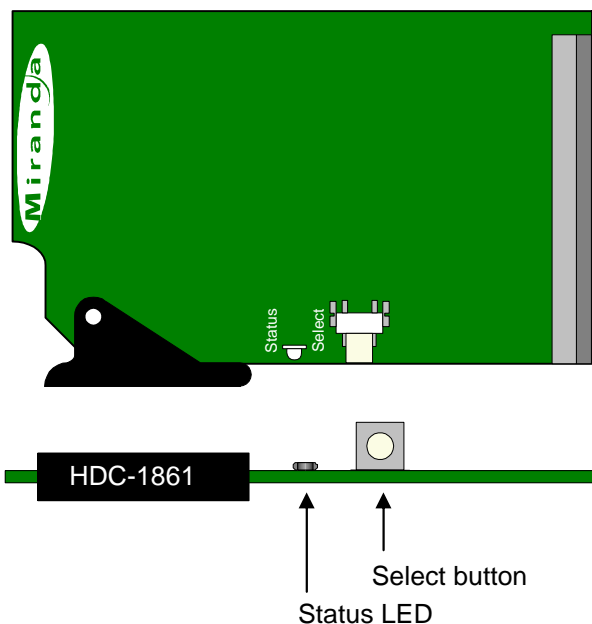
Quantization: 20-24 bits

Sampling: 48 kHz

Frequency response: ± 0.2dB (20 Hz to 20 kHz)

SNR: 90 dB (A WEIGHTED)

Power: 10 W



**UNPACKING**

Make sure the following items have been shipped with your HDC-1861. If any of the following items are missing, contact your distributor or Miranda Technologies Inc.

- \* HDC-1861 HD Downconverter & DA w/ audio mon.
- \* HDC-1861-DRP or HDC-1861-A-DRP rear panel

**INSTALLATION**

The HDC-1861 must be mounted in a DENSITÉ frame. The installation includes both the HDC-1861 module, and the rear panel module. It is not necessary to switch off the frame’s power when installing or removing the HDC-1861.

Detailed instructions for installing cards and their associated rear panels in the Densité frame are given in the Densité Frame manual.

**Rear panel installation**

Note that the HDC-1861 has ten input & output connectors, and making these available at the rear of the frame requires a double-width rear panel.

When a double-width rear panel is used, the module must be installed in the right-most of the two slots associated with the rear panel in order to mate with the rear-panel connectors. If it is placed in the wrong slot, the front panel LED will flash red. Move the card to other slot for correct operation. No damage will result to the card should this occur.

**OPERATION**

**Overview**

The HDC-1861 is equipped with an on-board LED status indicator, mounted on the front edge of the card so as to be visible from the front of the card frame, even when the frame door is closed. The functionality of this status monitor is described below. The DENSITÉ frame incorporates a central controller card, located in the center of the frame, which is equipped with an LCD display. The card handles error reporting and remote control for all cards installed in the frame. The display shows the error status of any card in the frame whose SELECT button has been pushed.

The HDC-1861 is also equipped with the remote reporting and control capabilities of the DENSITÉ series. Fault reporting is carried out on a frame-wide basis. There is no individual rear-panel access to the fault and status reporting port of the HDC-1861. Interfacing to the outside world is handled by the frame’s controller card. The fault reporting protocol is standardized across the DENSITÉ series of modules.

**Status Monitor LED**

The status monitor LED is located on the front card-edge of the HDC-1861 module, and is visible through the front access door of the DENSITÉ frame.

This multi-color LED indicates module status by color, and by flashing/steady illumination, according to the following chart. The chart also indicates fault

reporting for this card on the DENSITÉ frame’s serial and GPI interfaces.

**Status Indicator**

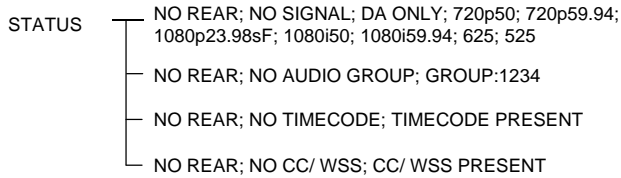
	REPORT		COLOR (F=flashing)			
	SERIAL	GPI	G	Y	R	FR
No errors			⊛			
No input signal or input signal error	⊛				⊛	
DA only mode	⊛				⊛	
No audio group 1	⊛			⊛		
No audio group 2	⊛			⊛		
No audio group 3	⊛			⊛		
No audio group 4	⊛			⊛		
No CC (HD/525) or WSS (625)	⊛			⊛		
No timecode	⊛			⊛		
Test pattern	⊛			⊛		

⊛ : Factory default.

NOTE: A “Flashing Yellow” Status LED indicates that the SELECT button on the front panel has been pushed, and the card is being accessed by the controller. The LED color assignments for the various error conditions can be reconfigured by the user.

**Local User Interface**

Push the SELECT button on the front edge of the HDC-1861 to see a report of the current error status on the DENSITÉ frame's controller card display. The display will cycle through these four status messages:



The STATUS LED will revert to its normal state upon a second push of the button, or after a short delay otherwise.

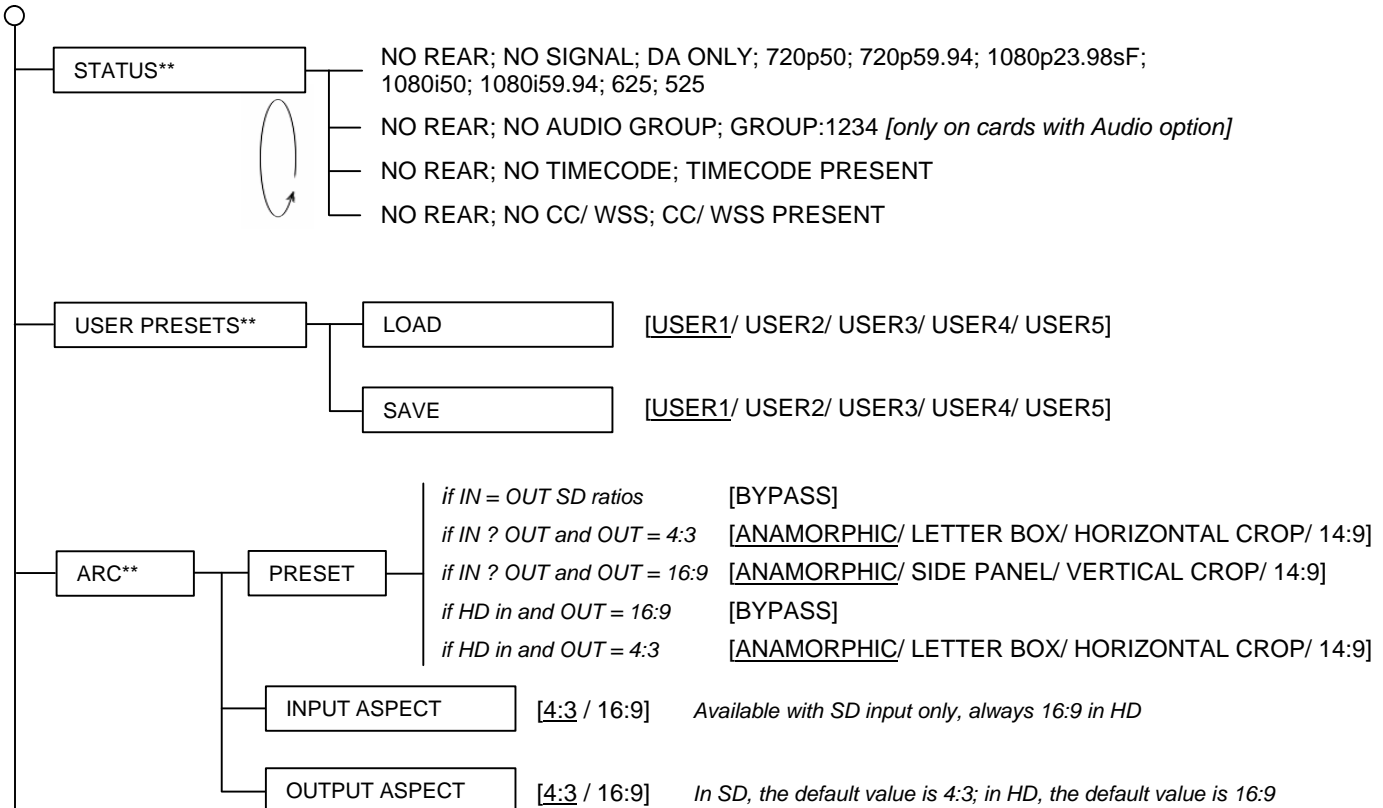
The HDC-1861 has operating parameters which may be adjusted using menus operated at the controller card interface. After pressing the SELECT button on the HDC-1861 card, use the keys on the local control panel to step through the menu and adjust these parameters.

The use of the local control panel is described in more detail in the controller card manual.

The menus, including the parameters which can be adjusted, and the options which are available, are shown in the following figure.

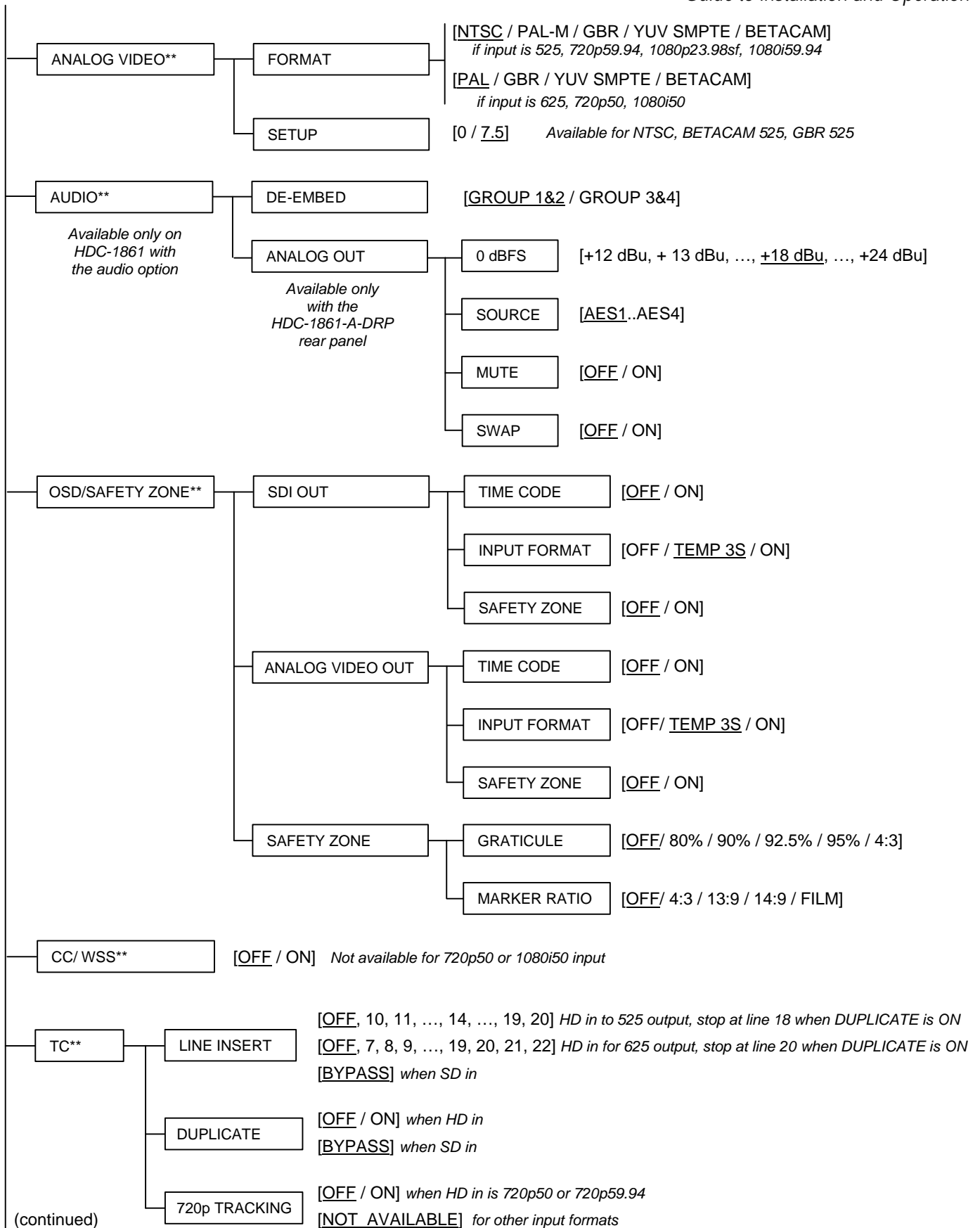
For a complete explanation of the parameters and values shown in the menus, see the section on the iControl Interface for the HDC-1861 which follows the menu chart.

**HDC-1861 Menus**

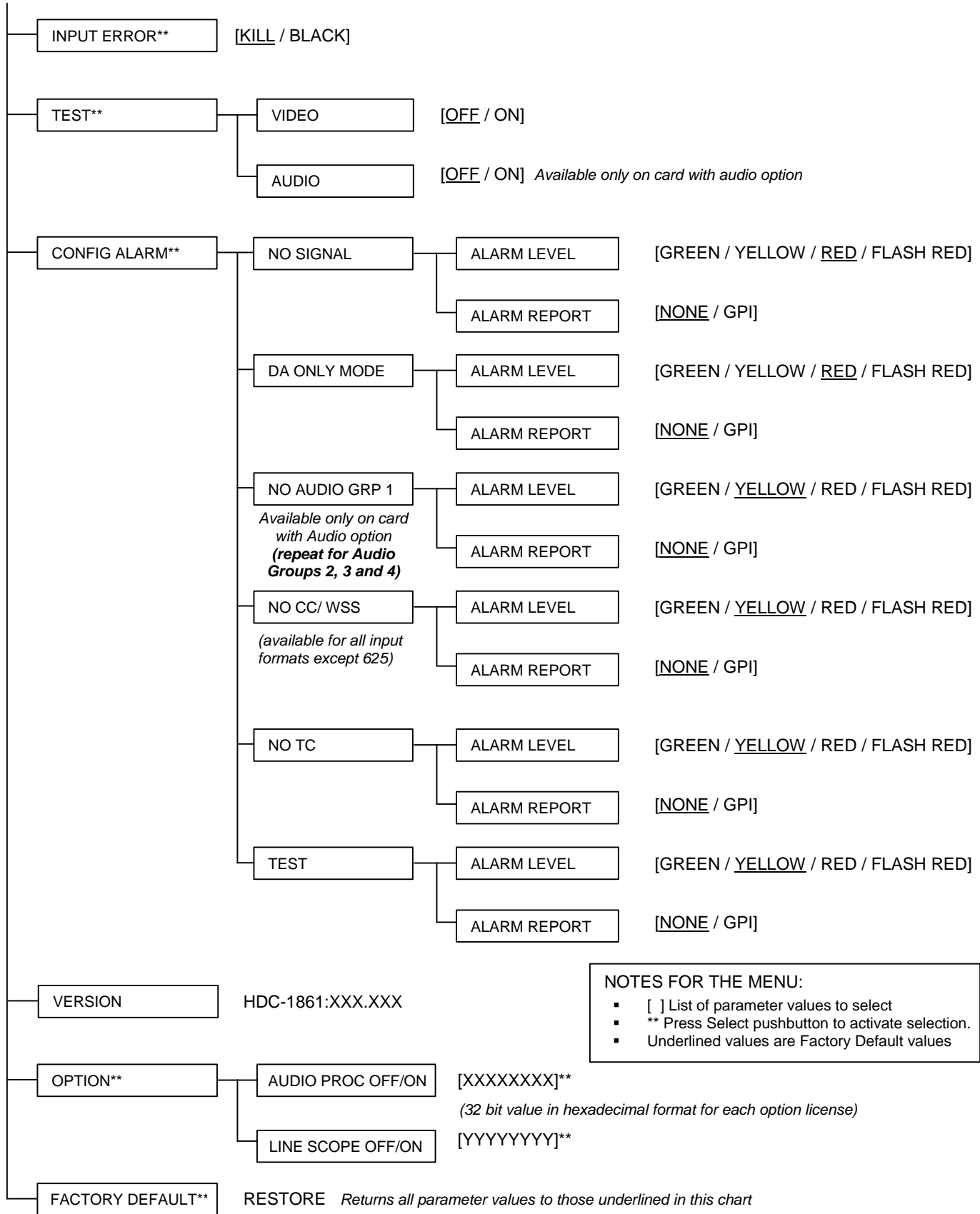


(continued)

HDC-1861 HD Downconverter & DA with Analog Monitoring Output  
Guide to Installation and Operation



HDC-1861 HD Downconverter & DA with Analog Monitoring Output  
 Guide to Installation and Operation



## iCONTROL INTERFACE

In addition to local control through the menus, the HDC-1861 can be remotely controlled using Miranda's iControl system. This manual describes the control panels associated with the HDC-1861 and their use. Please consult the iControl User's Guide

for information about setting up and operating iControl.

In iControl Navigator, double-click on the HDC-1861 icon to open the control panel. Click on an entry in the left-hand pane to open the associated control panel. The available controls are described in the following section.

## ARC (Aspect Ratio)

This panel configures the details of aspect ratio conversion between input and output. The two preview windows model the ARC function.

- The INPUT window shows the portion of the input that will be sent to the output. The complete input would be a full white screen with a full-height green circle in the center. Any part of the input that will be cropped is shown in black. The circular shape is the full height of the original input.
- The OUTPUT window shows the actual format of the video output from the HDC-1861. The white portion with the green shape corresponds to the contents of the INPUT window. Grey areas surrounding it are inserted into the output by the HDC-1861. If anamorphic processing has been applied, the green shape shows the type of distortion that will be introduced.

Select input and output aspect ratios using the pull-down in the upper corner of the window. Then select the desired ARC processing using the radio buttons in the Aspect Ratio box beneath the windows. The contents of the box change depending on the aspect ratios selected. The box is disabled when the input and output aspect ratios are the same.

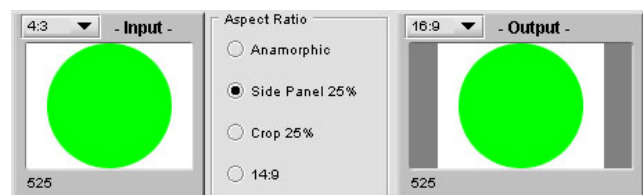
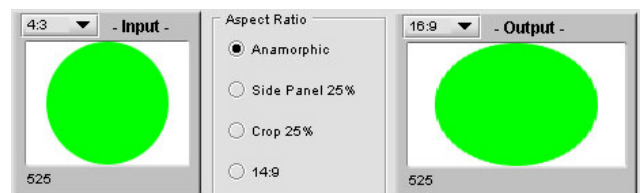
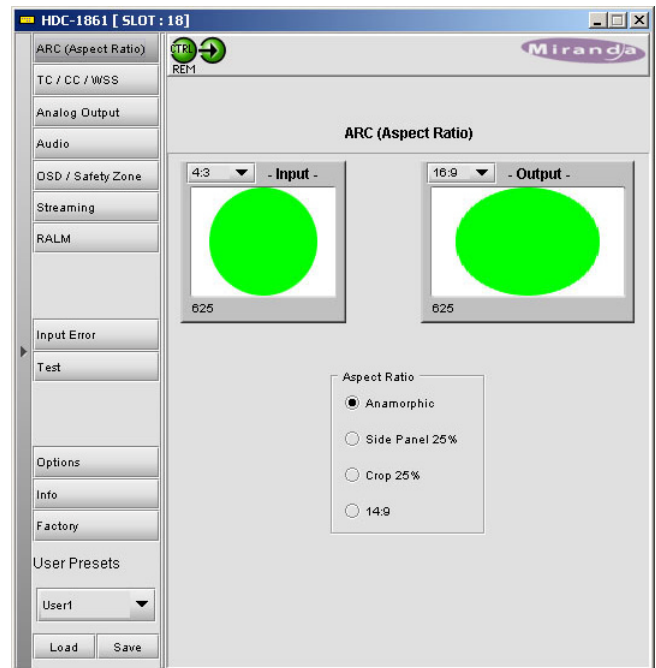
The following conversions are possible:

### 4:3 → 16:9 Anamorphic

- The input is stretched horizontally to fill the wider output screen. The green circle is distorted into an oval, showing how shapes in the video image will be distorted.

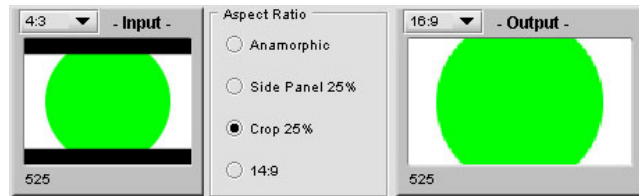
### 4:3 → 16:9 Side Panel 25%

- The input image is placed into the centre of the wider output screen, and the remaining space on each side is filled with black.



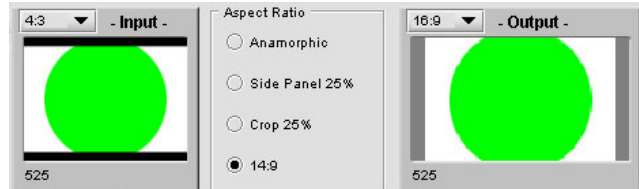
#### 4:3 → 16:9 Crop 25%

- The top and bottom of the input image are cut off so that its cropped aspect ratio is 16:9. The cropped input is then symmetrically resized to fill the entire output screen.



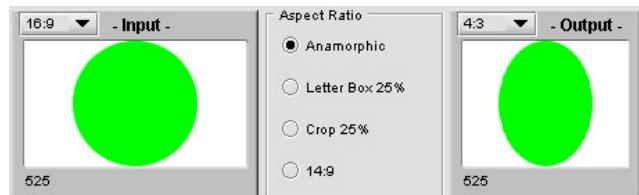
#### 4:3 → 16:9 14:9

- The top and bottom of the input image are cut off so that its cropped aspect ratio is 14:9. The cropped input is then symmetrically resized to the full height of the output screen. Because its aspect ratio is 14:9, the resized picture does not completely fill the width of the screen. The remaining space on each side is filled with black.
- This option is approximately midway between the Side Panel and Crop options.



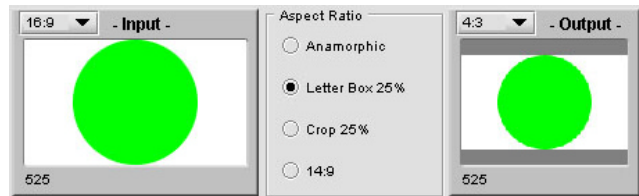
#### 16:9 → 4:3 Anamorphic

- The input is squeezed horizontally to fill the narrower output screen. The green circle is distorted into an oval, showing how shapes in the video image will be distorted.



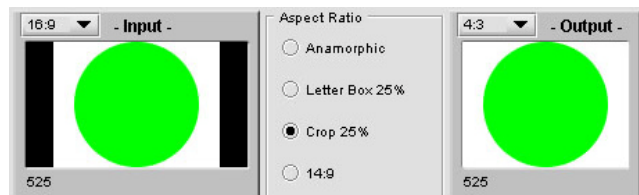
#### 16:9 → 4:3 Letter Box 25%

- The input image is symmetrically resized to fit into the width of the narrower output screen and the remaining space on top and bottom is filled with black.



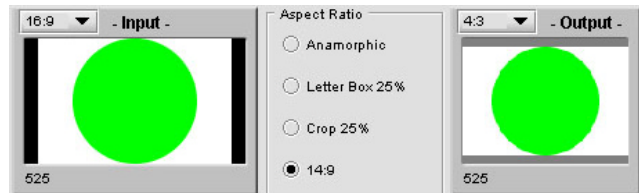
#### 16:9 → 4:3 Crop 25%

- The sides of the input image are cropped so that its aspect ratio is 4:3. The cropped input is then placed to fill up the output screen.



#### 16:9 → 4:3 14:9

- The sides of the input image are cut off so that its cropped aspect ratio is 14:9. The cropped input is then symmetrically resized to the full width of the output screen. Because its aspect ratio is 14:9, the resized picture does not completely fill the height of the screen. The remaining space on top and bottom is filled with black.
- This option is approximately midway between the Letter Box and Crop options.





## TC / CC / WSS

The current ARC status is shown in the two preview windows at the top of the panel. Click on the ARC (Aspect Ratio) option to make changes

### Time Code

*Time Code Presence:* the icon is Green if time code is currently being detected in the input signal, and grey if not.

*Insertion:* use the pulldown list to select whether time code will be inserted in the output.

*Insert Line:* use the pull-down list to select the line into which time code will be inserted when insertion is ON.

*Duplicate:* from the pulldown list, select whether Duplication is ON or OFF.

DUPLICATION inserts a second copy of the time code two lines after the *Insert Line*, when possible. For example, if the *Insert Line* is 16 and duplication is ON, lines 16 and 18 will both contain the same time code.

*720p Tracking:* from the pulldown list, select whether 720p tracking is ON or OFF (available only when input is 720p50 or 720p59.94).

720p tracking is a way to lock the field sequence of the downconverted interlaced video output with the input time code. Since there is no "field" in a progressive format such as 720p, enabling this option is the only way to ensure that the output video will follow a specific field sequence. Note that a discontinuity in the input time code sequence can cause a break in the output video signal, so this option should only be used when tracking a field sequence is a major issue.

### CC / WSS

*CC / WSS Presence:* the icon is Green if Closed Captioning (for 59.94 Hz signals) or Wide Screen Signaling (for 625 line 50 Hz signals) is currently being detected in the input signal, and grey if not.

*CC / WSS Enable:* click in the checkbox to enable the insertion of the CC / WSS information into the HDC-1861 output.



## Analog Output

The current ARC status is shown in the two preview windows at the top of the panel. Click on the ARC (Aspect Ratio) option to make changes

**Output Format:** Select the desired analog output format using the radio buttons. The available options depend on the output frame rate, which matches the input frame rate.

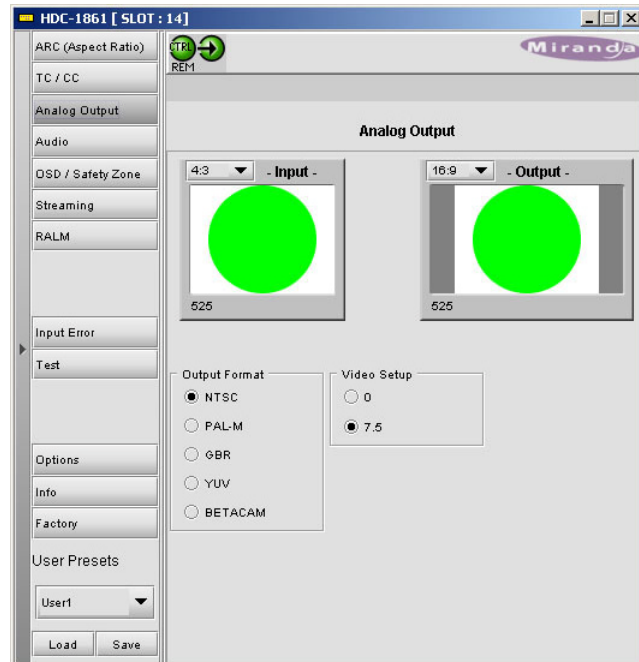
For 59.94 Hz inputs / outputs:

- NTSC (encoded video)
- PAL-M (encoded video)
- GBR (component video)
- YUV (component video)
- BETACAM (special format for Betacam recorders)

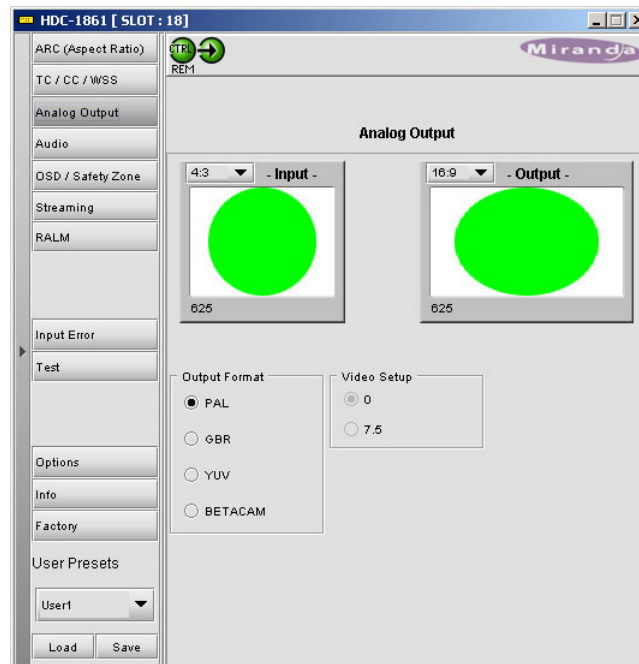
For 50 Hz inputs / outputs:

- PAL (encoded video)
- GBR (component video)
- YUV (component video)
- BETACAM (special format for Betacam recorders)

**Video Setup (59.94 Hz input only):** Select whether to use video setup of 7.5 IRE or no setup, i.e. 0 IRE. This option is enabled only if the selected output format is NTSC, GBR or BETACAM.



59.94 Hz input



50 Hz input

## Audio

[This panel is only available if the Audio Option has been activated. See the Options panel]

The current ARC status is shown in the two preview windows at the top of the panel. Click on the ARC (Aspect Ratio) option to make changes.

**Group Detected:** If an embedded audio group is detected on the input signal, its icon is green.

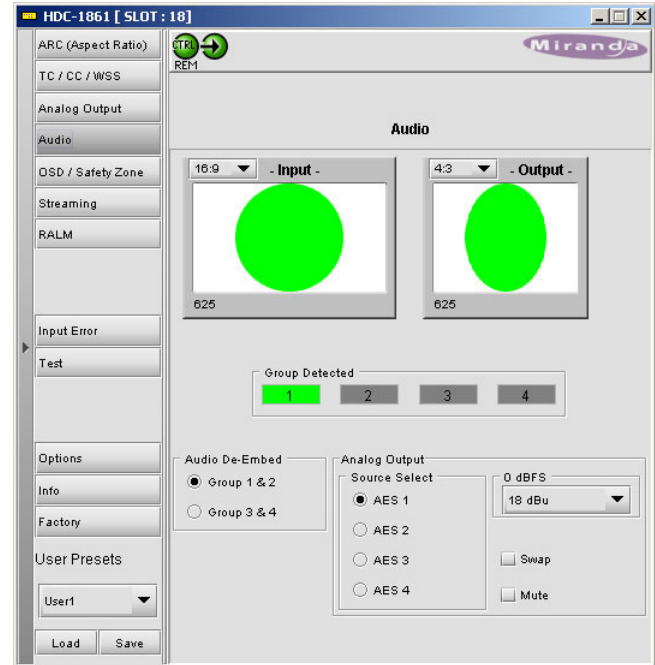
**Audio De-embed:** Select whether to de-embed either Groups 1 & 2, or Groups 3 & 4.

**Analog Output:** Select which of the four AES audio streams will be monitored at the analog output of the HDC-1861.

**0 dBFS:** From the pulldown list, select the output level that will correspond to 0 dBFS. The range is +12 dBu to +24 dBu.

**Swap:** Click on the checkbox to place the Left audio channel on the right audio output, and the right audio channel on the left audio output.

**Mute:** Click on the checkbox to mute the output.



## OSD / Safety Zone

The current ARC status is shown in the two preview windows at the top of the panel. Click on the ARC (Aspect Ratio) option to make changes.

### SDI Output

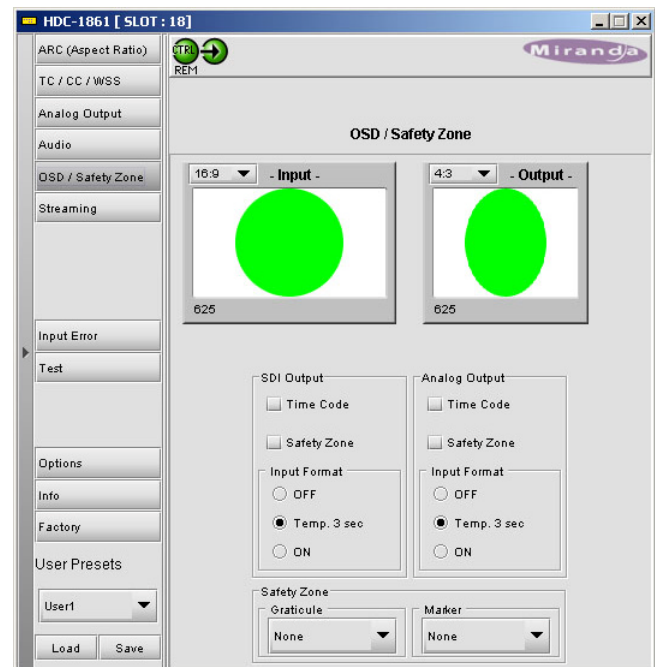
**Time Code:** Click on the checkbox to display time code on the SDI output.

**Safety Zone:** Click on the checkbox to display the Safety Zone graticule and marker on the SDI output.

**Input Format:** Select whether to display the input format in the SDI output, and whether it should be displayed all the time (ON) or just for three seconds when the format changes (TEMP 3 sec).

### Analog Output

**Time Code:** Click on the checkbox to display time code on the analog output.



**Safety Zone:** Click on the checkbox to display the Safety Zone on the analog output.

**Input Format:** Select whether to display the input format and frame/field rate in the analog output, and whether it should be displayed all the time (ON) or just for three seconds when the format changes (TEMP 3 sec).

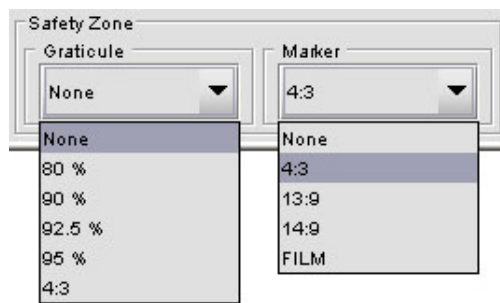
### Safety Zone

**Graticule:** From the pull-down list, choose the size of the Safety Zone to be displayed on the down converted output. Those listed in percentage maintain the aspect ratio of the input. The 4:3 graticule is 90% of a 4:3 screen, and is useful when shooting 16:9 which could be distributed in 4:3.

Graticules are rectangles of the selected size, applied to the input and processed through the downconversion. The appearance of the graticule on the output shows the effect of any cropping and anamorphic distortion that has been applied.

**Marker:** From the pull-down list, select the aspect ratio of the marker that will be shown at the output. Film refers to an aspect ratio of 1.85:1, typical of 35mm film footage.

**Markers** are pairs of lines that cross the screen to show the boundaries corresponding to the selected aspect ratio (i.e. 100%). They are applied to the input and processed through the downconversion. The appearance of the marker on the output shows the effect of any cropping and anamorphic distortion that has been applied.



## Streaming

**Enable:** Click on the Video radio button enable the Video streaming function of the HDC-1861.

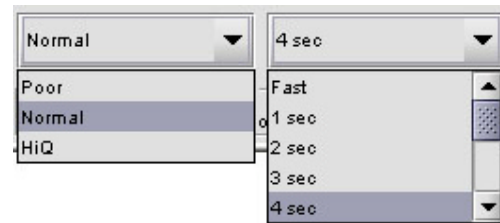
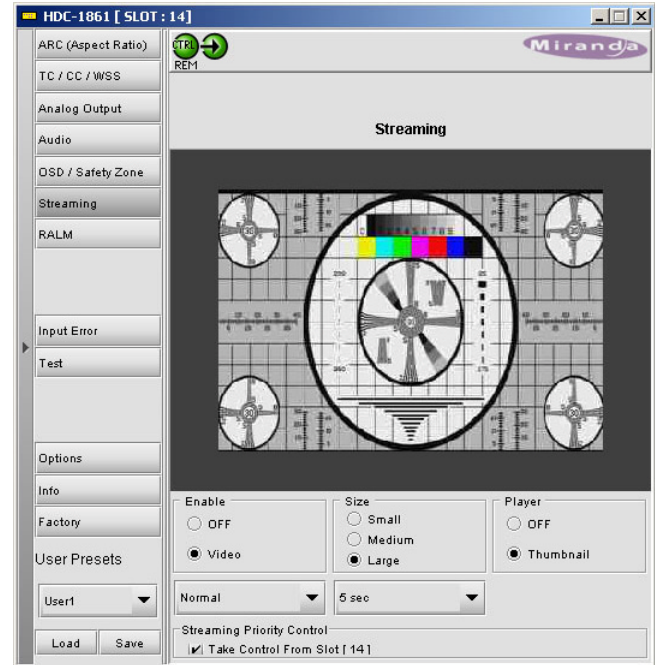
**Size:** Select the size of image to be sent by the streaming encoder

**Player:** Click on the Thumbnail radio button to enable the display of video thumbnails on this control panel.

**Quality and Refresh Rate:**

- Use the left-hand pulldown to select the video quality to be sent by the streaming encoder. The choices are Poor, Normal and HiQ (e.g. high quality).
- Use the right-hand pulldown to select the refresh rate for the transmitted thumbnails. The choices are Fast, 1 sec, 2 sec, ... 10 sec.

**Streaming Priority Control:** Click the *Take control from Slot [##]* checkbox to force the Density 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.



## RALM

The Remote Audio Level Meter (RALM) displays the sampled audio level data received from the HDC-1801 card.

### RALM Connections tab

**CH 1&2:** Click RALM to connect the left-hand meter to AES channels 1 and 2.

**CH 3&4:** Click RALM to connect the right-hand meter to AES channels 3 and 4.

An unconnected meter is dimmed.

**Reset Counter:** Click the Reset Counter button to reset the overload counter for the indicated channels. The counter's current value appears above the meter scale.

### 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)

**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.

### RALM Remote Control

Click in a checkbox to connect the meter display on this panel to the indicated channels on the HDC-1801 card.

**Speed** – select the meter refresh rate from the pulldown list (fast, medium or slow)



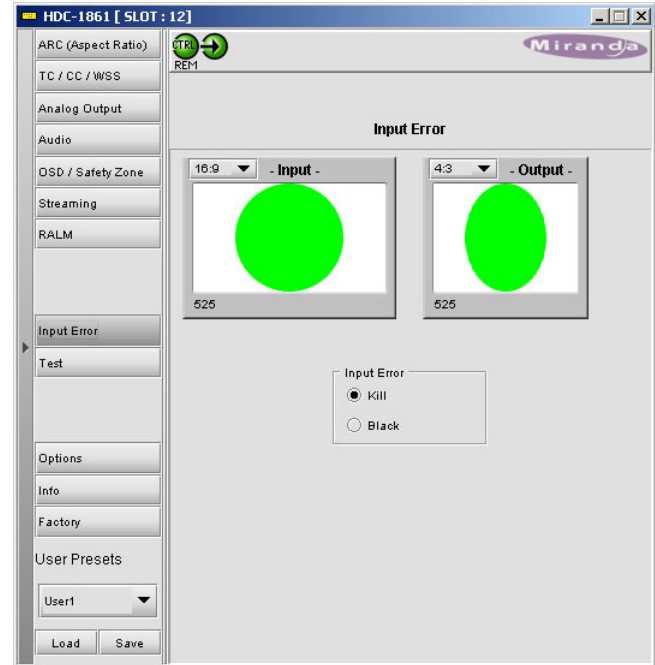
## Input Error

The current ARC status is shown in the two preview windows at the top of the panel. Click on the ARC (Aspect Ratio) option to make changes.

### Input Error

Select the behavior of the SDI output in the event of an error in the input signal.

- If the KILL radio button is selected, the SDI output will be disconnected in case of an input error. The connector will carry no signal.
- If the BLACK button is selected, the SDI output connector will carry a signal with BLACK in the active picture area.



## Test

The current ARC status is shown in the two preview windows at the top of the panel. Click on the ARC (Aspect Ratio) option to make changes.

### Video

Click on the Color Bars (75%) checkbox to place a 75% color bar signal on the video output.

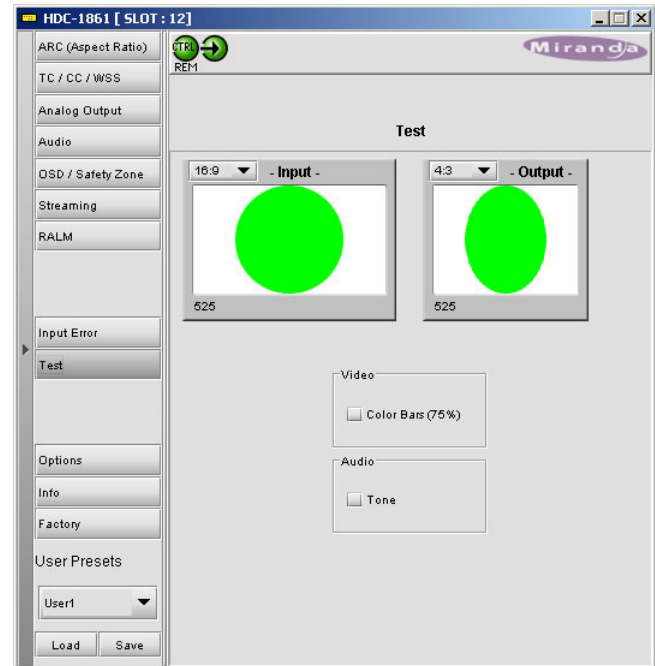
### Audio

Click on the Tone checkbox to place audio test tones on the audio outputs (if the Audio option has been enabled).

The test tone is a 1 KHz sine wave:

- left channel – pulsed 3 seconds ON, 250 ms OFF
- right channel – steady tone

The test tone will be placed on the analog, AES and embedded outputs. The input groups that were not disembedded are blanked.



## Options

### Audio Option

Activate the Audio option on the HDC-1861 card by entering the **activation key** into the Enter Key data box, and clicking the **Enable Option** button.

The current status of the Audio option is shown in the status box below the Enter Key data box.

See the text message at the top of the tab for information about purchasing the Audio option and obtaining the activation key.

### IP Scope Option

The IP Scope option adds a line scope output to the HDC-1861. This output can be viewed on a standard PC using the iControl Streaming Player, which shows waveform monitor and vectorscope displays.

Activate the IP Scope option on the HDC-1861 card by entering the **activation key** into the Enter Key data box, and clicking the **Enable Option** button.

The current status of the IP Scope option is shown in the status box below the Enter Key data box.

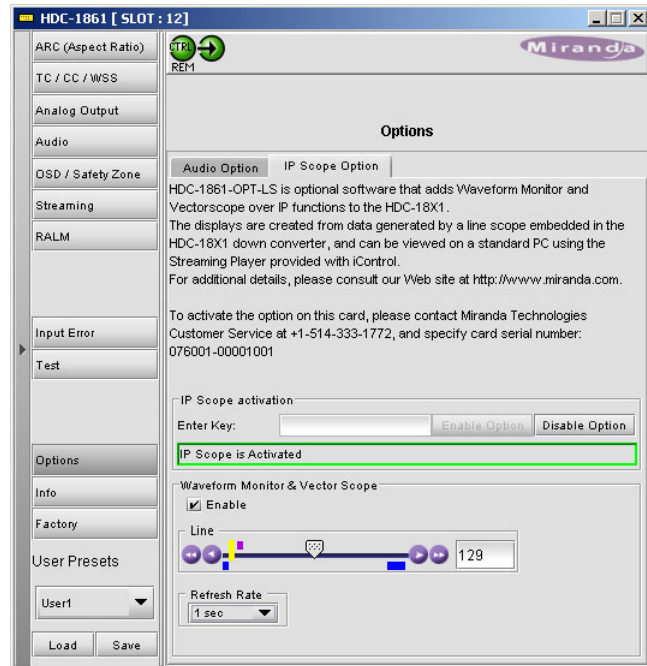
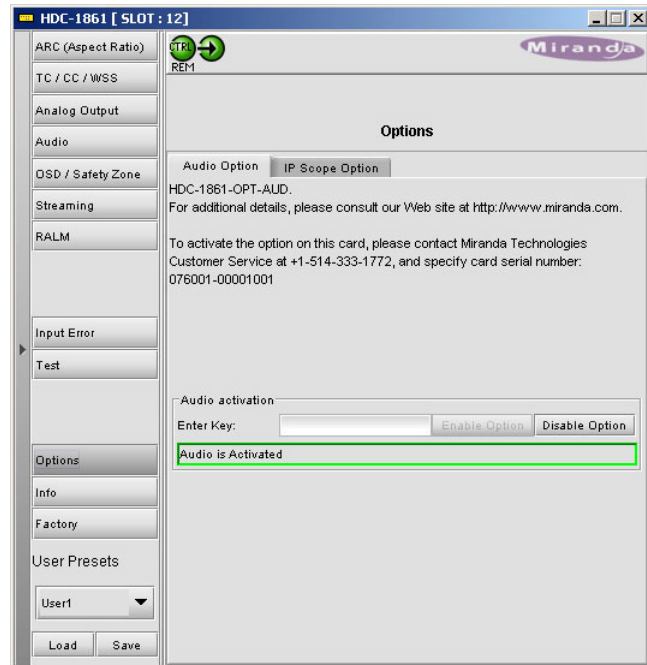
See the text message at the top of the tab for information about purchasing the IP Scope option and obtaining the activation key.

### Waveform Monitor and Vectorscope

**Enable:** Click on the checkbox to turn the IP Scope output ON.

**Line:** Use the slider or type in the data box to select the video line that will be used by the line scope. The current selection is shown in the data box.

**Refresh Rate:** choose how often the line scope display will be refreshed. Options are 1 sec to 10 sec, and Fast.





## Info

The Info panel provides information about the HDC-1861, and provides some data entry options.

*Label:* Type a name for this device into the data entry box (e.g. Studio 46 Video FX output)

*Short Label:* Type a shorter version of the name (e.g. ST46VFX)

*Source ID:* Type text identifying the video input to the HDC-1861, if desired.

*Comments:* Type any desired text into this box

*Details...:* click on this button to get information about the manufacturing process and panel version.

*Advanced...:* Click on this button to get the Miranda Long ID of this HDC-1861. The Miranda Long ID is the address of this device in the iControl network, and is required by some devices, e.g. Kaleido, to access it.

*Remote System Administration...:* Click on this button to open the Joining Locators: HDC-1861 data entry box.



## Factory

Click on the Load Factory button to restore all parameter settings on the HDC-1861 to their factory default values.

The Menu shown in this manual lists all possible values for these parameters. The Factory Default values are underlined in the Menu.



## User Presets

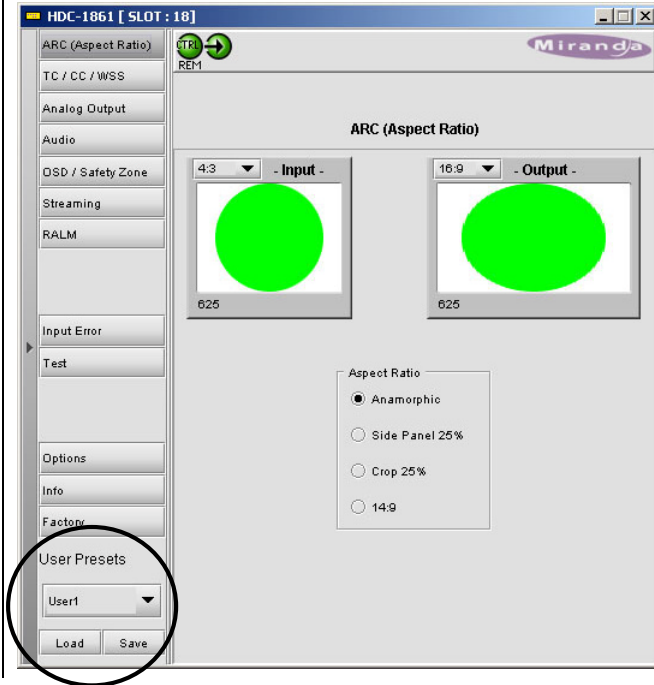
The User Presets are a set of five registers, each of which can store a complete set of parameter settings.

The User preset registers are accessed from the User Presets controls at the bottom left of the control panel.

**Select** any one of the five presets using the pulldown list. The name of the currently-selected User Preset is shown on the on the pulldown icon (e.g. User1, User2,... User5)

Click **Load** to load the contents of the selected User Preset into the HDC-1861. 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 HDC-1861 into the selected User Preset. The existing contents of the preset will be overwritten.



## Error/Warning Configuration

In iControl Navigator, right-click on the HDC-1861 icon, and select the Error/Warning Configuration option from the pop-up menu. The Log Config panel opens.

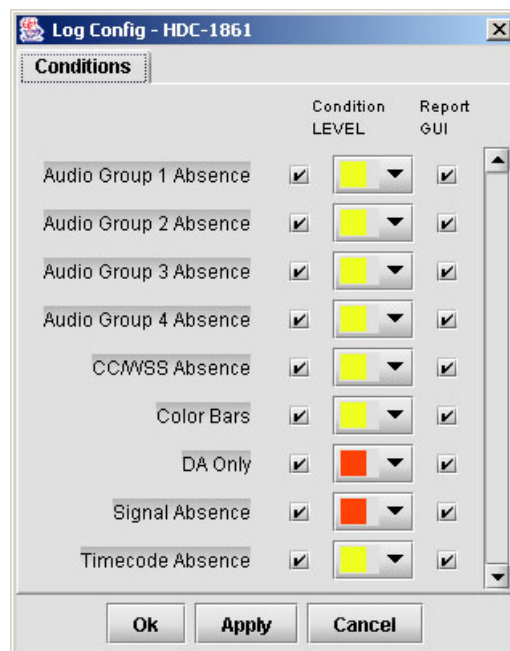
For each of the nine Conditions shown in the panel, select:

**Detection:** the checkbox to the immediate right of the condition name enables detection of the condition. If it is unchecked, the other options are disabled and grayed-out in this panel

**Condition LEVEL:** From the pulldown box, assign a level of severity to this condition. The choices are:

- YELLOW = warning
- RED = error

**Report GUI:** a check in this box enables an error report from this card on the Densité frame's GUI output.



## COMPLIANCE

### Radio Frequency Interference and Immunity

This unit generates, uses, and can radiate radio frequency energy. If the unit is not properly installed and used in accordance with this guide, it may cause interference with radio communications. Operation with non-certified peripheral devices is likely to result in interference with radio and television reception. This equipment has been tested and complies with the limits in accordance with the specifications in:

- FCC Part 15, Subpart B
- CE EN50081-1:1992
- CE EN50082-1:1992.

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