

# (DENSITÉ) SERIES

# HCP-1801

## DESCRIPTION

The HCP-1801 is a probe for the quality control of HD SDI (SMPTE 292 M) and SD SDI (SMPTE 259M-C) digital video signals. The HCP-1801 probe integrates several advanced features for monitoring both video and embedded audio signals. It offers complete real-time measurement and analysis of all relevant signal parameters as well as flexible alarm thresholds and user-defined profiles. In addition, the HCP-1801 probe functions as a distribution amplifier, with its HD/SD SDI input and four relocked outputs. Used in conjunction with Miranda's iControl family of products, the HCP-1801 allows users to see the signals they are monitoring. The probe generates real-time video thumbnails and audio level meters for transmission over IP networks. As part of the Miranda Densité series, the probe can be used along with a wide variety of interface and distribution amplifiers, and allows users to benefit from extensive flexibility and ease of use so unique to Miranda's Densité platform.

### Input/output

- Single input supports both SMPTE 259M-C digital video signal (SD) with embedded 272M digital audio, and SMPTE 292M digital video (HD)
- Four outputs

### VBI signal extraction and analysis

- 24-bit digital audio disembedding

### Remote control and status

- On card status Led
- Current & latch status for remote reporting

### Monitoring of embedded audio

- Signal presence detection and format validation
- Presence control for each group
- Adjustable level, phase and mono signal alarms
- Selectable group, pair or individual channel monitoring

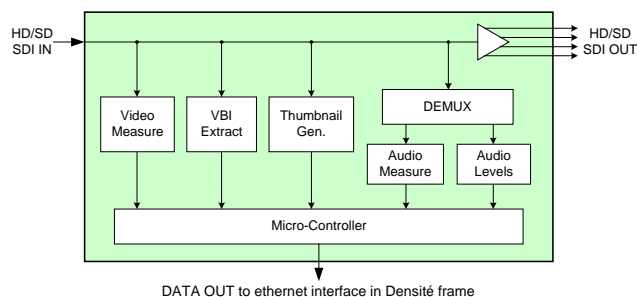
### Transmission over IP for display

- Thumbnails with adjustable picture format, quality and transmission rate
- Alarms and status
- VITC, Closed captioning, V-chip, WSS and XDS
- Audio level meters and phase meter
- Audio overload counter
- Video test pattern

### Video standard and presence monitoring

- Video format detection
- Carrier detect
- Freeze detection (multi-zone)
- Black detection (multi-zone)
- Ancillary data detection and identification
- Luma min and max
- White max
- CC presence
- VITC presence
- VLI
- WSS
- Macro-block Detection (MBD) Option

## FUNCTIONAL BLOCK DIAGRAM



## SPECIFICATIONS

### VIDEO INPUT

Signal: HD SDI: SMPTE 292M (1.485,1.485/1.001 Gbps)  
 SD SDI: SMPTE 259M-C (270Mbps)  
 Cable length: HD 110m. Belden 1694A at 1.485 Gbps  
 SD 250m. Belden 8281 at 270 Mbps  
 Return loss: > 12 dB up to 1.5 GHz

### SERIAL DIGITAL OUTPUTS (4)

Signal: SMPTE 292M (1.485,1.485/1.001 Gbps)  
 SMPTE 259M (270 Mbps)  
 (same format as input)  
 Cable length: HD 110m. Belden 1694A at 1.485 Gbps  
 SD 250m. Belden 8281 at 270 Mbps  
 Return loss: > 12 dB up to 1.5 GHz  
 Added jitter <0.2UI p-p (wideband)

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Guide to Installation and Operation*

**SPECIFICATIONS(cont'd)**

**PROCESSING PERFORMANCE**

Signal Path: 10 bits  
Processing Delay: <6 ns

**STREAMING PERFORMANCE**

Video sustained Minimum : 9 kbits/sec  
Bit rate: Maximum : 45 kbits/sec

**THUMBNAILS**

Picture size (525): 352x240; 176x120; 88x56  
Picture size (625): 352x288; 176x144; 88x72  
Picture size (720p): 408x240; 204x120; 102x60  
Picture size (1080i): 384x270; 192x135; 96x67

**IP TRANSPORT**

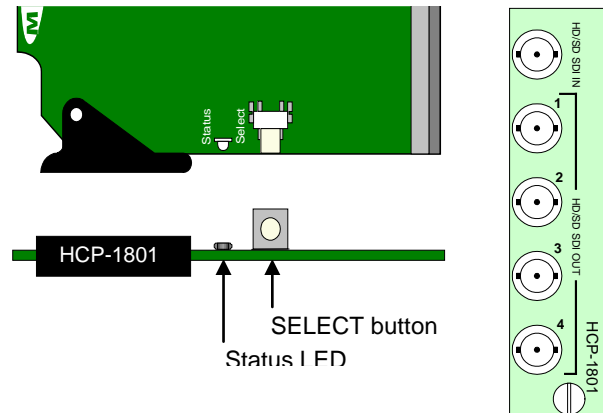
Data compression Proprietary  
Power: 4 W

**INSTALLATION**

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

- \* HCP-1801 HD/SD SDI Control Probe w. Embedded Audio
- \* HCP-1801 Rear Panel (see figure)

The HCP-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 HCP-1801. See the DENSITÉ Frame manual for detailed instructions for installing cards and their associated rear panels.



**HCP-1801  
Front card edge and Rear Connector Panel**

**OPERATION**

**Overview**

The DENSITÉ frame incorporates a central controller card, located in the center of the frame, it is equipped with an LCD display and a control panel. The controller handles error reporting and local and remote control for all cards installed in the frame. The display and control panel are assigned to the card in the frame whose SELECT button has been pushed.

**User Interface**

Pushing the SELECT button will cause the on-card STATUS LED to flash yellow, and the card identification and the current status will be shown on the controller card's display. The STATUS LED will revert to it's normal state upon a second push of the button, or after a short delay. The messages which may appear are shown in the chart on page 4.

**Status Monitor LED**

The status monitor LED is located on the front card-edge of the HCP-1801 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 (which also

indicates fault reporting for this card on the DENSITÉ frame's serial and GPI interfaces).

A "Flashing Yellow" Status LED indicates that the SELECT button on the front panel has been pushed, and the controller display and control panel are now assigned to this card.

The LED color assignments for some error conditions can be reconfigured by the user (see the chart and menu for details).

**Example :**

SELECT button pushed twice when there is no input signal connected to the rear panel and the LED is steady red:

H	C	P	-	1	8	0	1								
N	O	S	I	G	N	A	L								

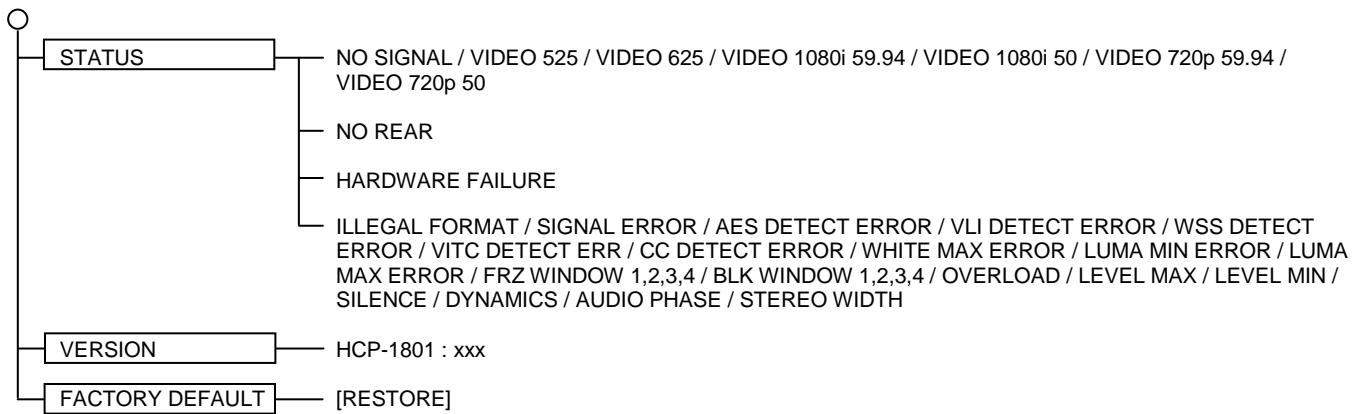
Use the local control panel to access the detailed status report shown in the STATUS menu on page 4.

	Serial Report	GPI Report	Green	Yellow	Red	Flashing Red
No input signal presence					☒	
Illegal format					☒	
White limit max					☒	
Luma min					☒	
Luma max					☒	
Multi-window Freeze detection					☒	
Multi-window Black detection					☒	
VLI detection					☒	
Close caption detection					☒	
VITC detection					☒	
WSS detection					☒	

☒ : Factory default.

### Local Display of Error Messages

When the Status LED indicates an error, you can press the SELECT button on the card-edge interface to show error details on the Densité frame's on-board display. After pressing the SELECT button on the HCP-1801 card, use the keys on the local control panel (described in the Controller card manual) to step through the displayed error messages. The menus are shown below.



### STATUS menu

**NO SIGNAL/VIDEO 525/VIDEO 625 NO SIGNAL / VIDEO 525 / VIDEO 625 / VIDEO 1080i 59.94 / VIDEO 1080i 50 / VIDEO 720p 59.94 / VIDEO 720p 50:** Displays presence and format of the SDI input signal.

**NO REAR:** Indicates an absence of the rear panel or an incompatibility between the module and the rear panel. The STATUS led turns on flashing red.

**HARDWARE FAILURE:** Indicates a general hardware failure.

**ALARMS:** Displays status of the different board alarms, even if not configured to activate the STATUS Led:

**ILLEGAL FORMAT** Indicates a video signal format not supported by the card

**SIGNAL ERROR** Indicates an error in the video input signal

<b>AES DETECT ERROR</b>	Indicates absence of AES audio groups in the video input signal
<b>VLI DETECT ERROR</b>	Indicates absence of Video Line Index data in the VBI portion of the input signal.
<b>WSS DETECT ERROR</b>	Indicates absence of Wide Screen Signaling data in the VBI portion of the input signal
<b>VITC DETECT ERROR</b>	Indicates absence of Vertical Interval Time Code data in the VBI portion of the input signal
<b>CC DETECT ERROR</b>	Indicates absence of Close Caption data in the VBI portion of the input signal
<b>WHITE MAX ERROR</b>	Indicates a peak maximum luminance error of the input video signal

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LUMA MIN ERROR	Indicates an average minimum luminance error of the input video signal
LUMA MAX ERROR	Indicates an average maximum luminance error of the input video signal
FREEZE ERROR	Indicates that a frozen image has been detected on the input signal
BLACK ERROR	Indicates that a video black has been detected on the input signal
OVERLOAD	Indicates a peak level error in one or both channels

LEVEL MAX	Indicates an average maximum level error in one or both channels
LEVEL MIN	Indicates an average minimum level error in one or both channels
SILENCE	Indicates audio silence in one or both channels
DYNAMICS	Indicates lack of dynamics in one or both channels
SLICING	Indicates sounds with cuts in one or both channels
AUDIO PHASE	Indicates a phase error
STEREO WIDTH	Indicates a stereo width error

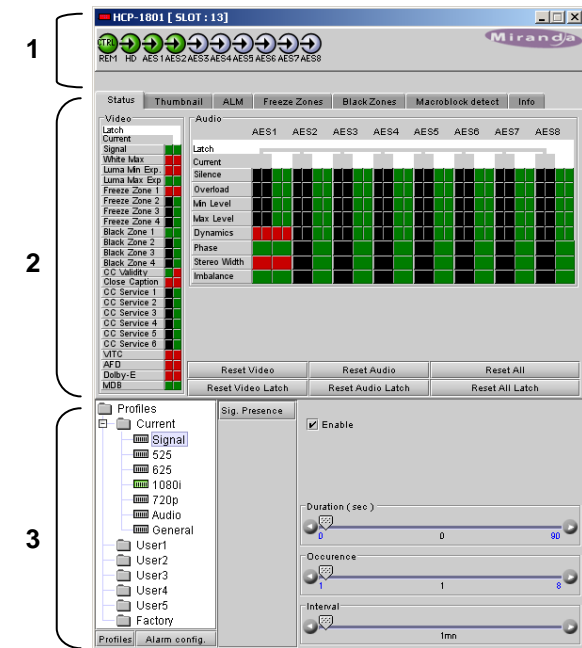
## iCONTROL INTERFACE

The operation of the HCP-1801 is controlled using Miranda's iControl system. This manual describes the control panels associated with the HCP-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 HCP-1801 icon to open the control panel.

1801's operation. A complete description of these displays begins on page 5.

**3. Parameters Area:** gives access to all controls and adjustments associated with this probe. A complete description of the how to set up the probe using the Parameters Area begins on page 8.



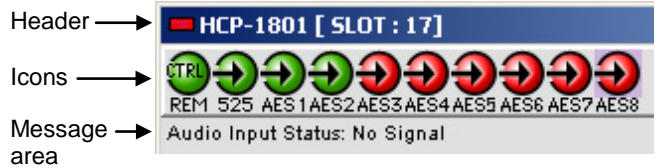
The control panel has three sections:

**1. Card Status Area:** at the top of the panel, shows status icons for several key items, and text messages describing detected errors. A complete description of the Card Status Area begins below

**2. Display Area:** this area has seven tabs, each giving access to a visual display of some aspect of the HCP-

## Card Status Area

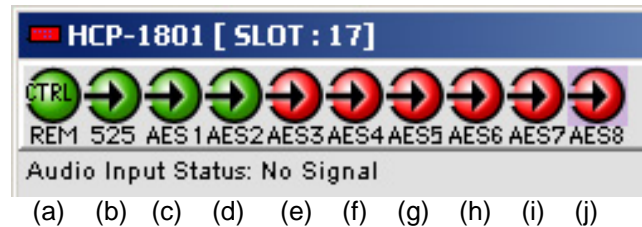
The Card Status Area provides a continuous update of the status of the HCP-1801. This area includes three sections:



The **header** gives the product name, and identifies the slot in which it is installed in its Densité frame. At the left is a status icon whose color shows the overall status of the probe:

- Green = OK
- Yellow = warning
- Red = error

The ten **icons** monitor some specific aspects of the HCP-1801's operation:



- (a) this icon shows whether this HCP-1801 is being operated by remote control (green icon) or local control (yellow icon).
- (b) this icon identifies the video standard detected on the probe's SDI input. The line rate is shown under the icon; a more detailed description is seen in the message area if you move the cursor over the icon.
- (c) through (j) these icons show the status of the eight AES audio channels in the SDI input to this probe

Move the cursor over an icon to see its current status in the **message area** below the icons. If one of the icons is reporting an error status, the message will appear automatically, as shown in the example above. If there are multiple error messages, the display will cycle through them.

**Display Area**

The Display Area gives access to the various visual displays associated with the HCP-1801. Use the seven tabs at the top of the area to show the display of interest:

**Status** – a visual presentation of the current error status of all the parameters measured by the HCP-1801

**Thumbnail** – a display of the streaming video being received from the HCP-1801

**ALM** – a display of audio level meters for each of the eight AES stereo pairs being monitored by the HCP-1801

**Freeze Zones** – a display of the areas within which the HCP-1801 will detect a video freeze

**Black Zones** – a display of the areas within which the HCP-1801 will detect video black

**Info** – a listing of various information about the HCP-1801 card itself.

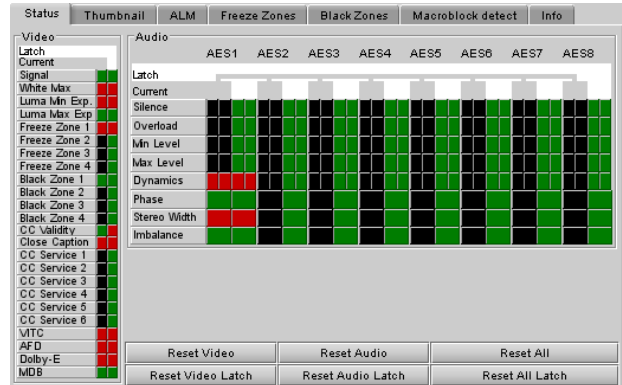
**Macroblock Detect** – a display of the Block Artifact Index (BAI) for the past five minutes.

Each of these displays is described in detail in the following sections.

<b>Display Area</b>	<b>Status</b>	
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The Status tab in the display area displays a chart showing the status of the various parameters measured by the probe. The status is represented by the color of the chart element, which is determined by the settings established in the Parameters Area. Two separate status columns are shown:

- *Current* shows the status now.
- *Latch* shows the status as affected by latching.



associated with

When an error is detected, it is flagged in both columns. When the error disappears, the current status returns to OK. However, the Latched status shows the error until it is manually cleared using the Reset Latch buttons (Video, Audio or All) at the bottom of the display. You can also reset the Current by clicking the Reset Video, Reset Audio or Reset All buttons, to confirm the presence of displayed errors.

Video and Audio are shown separately

<b>Display Area</b>	<b>Thumbnail</b>	
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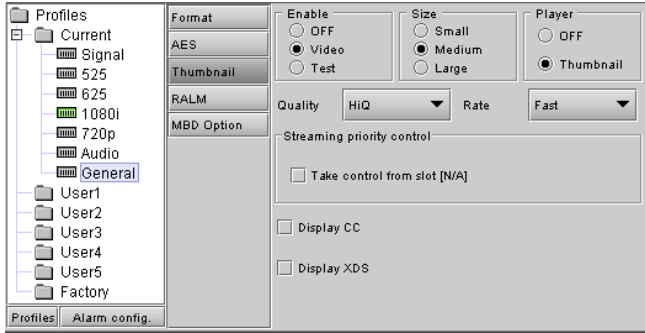
The display shows the thumbnail associated with the SDI video stream that is being monitored by the HCP-1801.



Note: you must turn the thumbnail streaming ON to see the video image. To do this:

- Open the *Current* folder in the Parameters area
- Click on the *General* icon
- Click on *Thumbnail* in the list of buttons
  - In the boxes at the top, select Video – (any size) – Thumbnail

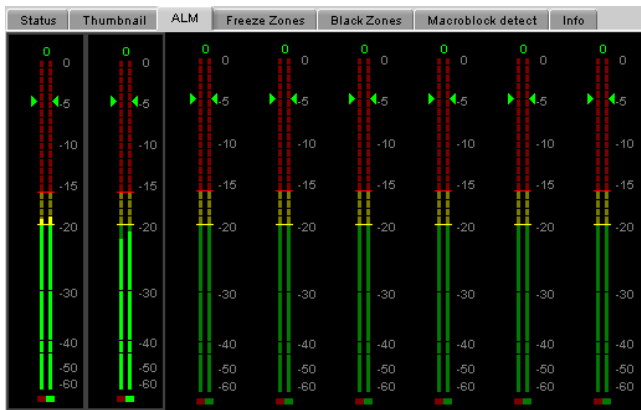
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See page 23 for a detailed description of this panel.

## Display Area    ALM

The ALM display shows audio meters for each of the eight possible audio pairs that may exist in the video stream being monitored by the HCP-1801.

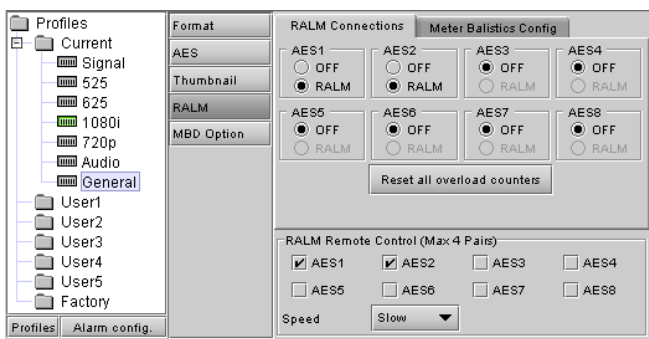


Note that only 4 pairs can be active at once, although the meters for all eight pairs are always displayed.

The display incorporates a phase meter at the bottom of each meter, and an overload counter at the top.

You can set up the meter displays by accessing the Audio-ALM panel in the Parameters Area. To do this:

- Open the *Current* folder in the Parameters area
- Click on the *General* icon
- Click on *RALM* in the list of buttons

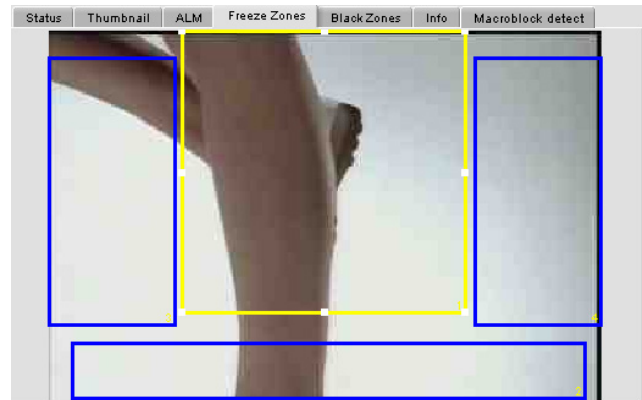


See page 24 for a detailed description of this panel.

## Display Area    Freeze Zones

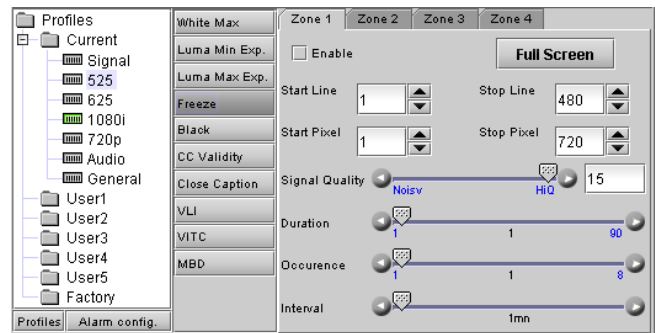
The display shows the current video thumbnail, overlaid with boxes showing the four zones in which the HCP-1801 can detect a video freeze.

You can click on any box and drag its control points to resize and reposition it.



Note that the four FREEZE zones are the same as the four BLACK zones. Changing them in one area will also change them in the other.

Full control of these boxes and their configuration is accessed from the Freeze panel associated with the current format. Access it as shown in here:



See page 11 for a full description of this panel.

## Display Area    Black Zones

The display shows the current video thumbnail, overlaid with boxes showing the four zones in which the HCP-1801 can detect a video black.

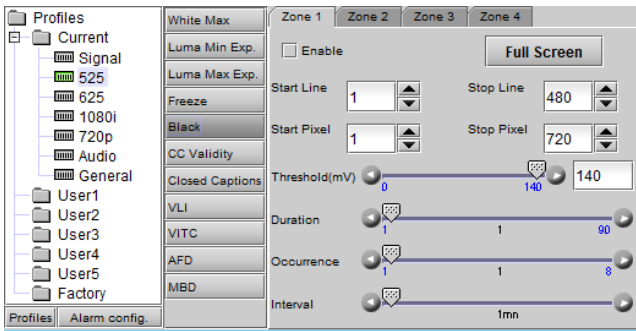
You can click on any box and drag its control points to resize and reposition it.

Note that the four BLACK zones are the same as the four FREEZE zones. Changing them in one area will also change them in the other.





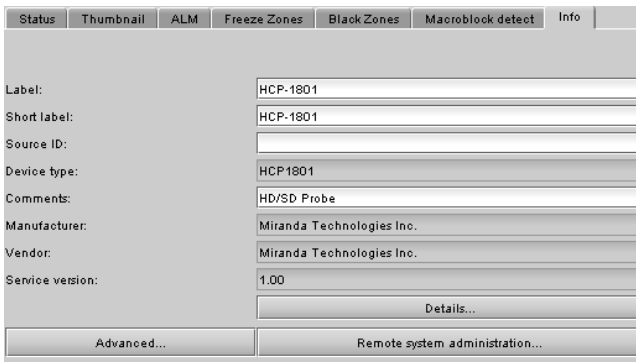
Full control of these boxes and their configuration is accessed from the Black panel associated with the current format. Access it as shown in here:



See page 18 for a full description of this panel.

<b>Display Area</b>	<b>Info</b>	
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The **Info** tab provides information about the HCP-1801, and provides some data entry options.



**Label:** Type an identifier for this device into the data entry box. HCP-1801 is the default value.

**Short Label:** Type a short-form identifier for this device into the data entry box. HCP-1801 is the default value.

**Source ID:** Enter some descriptive text that will help you identify this HCP-1801 in an iControl application

**Comments:** Type any desired text into this box

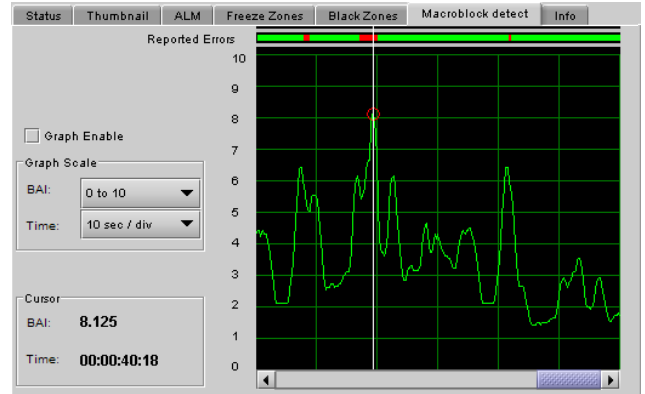
**Details...:** click on this button to get information about the manufacturing process and panel version.

**Advanced...:** Click on this button to get the Miranda Long ID of this HCP-1801. The Miranda Long ID is the address of this probe in the iControl network, and is required by some devices, e.g. Kaleido, to access this probe.

**Remote System Administration...:** Click on this button to open the *Joining Locators: HCP-1801* data entry box.

<b>Display Area</b>	<b>Macroblock</b>	
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The display shows a graph of the block artifact index (BAI) for the past 5 minutes. This functionality is not available if the macroblock detection (MDB) option is not activated.



**Enable:** Enable the display of the BAI values on the graph. When the box is checked, the graph is cleared and the new values will be displayed. When the box is unchecked, the display stops and the user may click on the graph to see the current BAI and the time in the cursor area.

**Graph Scale - BAI:** Selects the vertical axis scale on the graph.

**Graph Scale - Time:** Selects the horizontal axis scale on the graph.

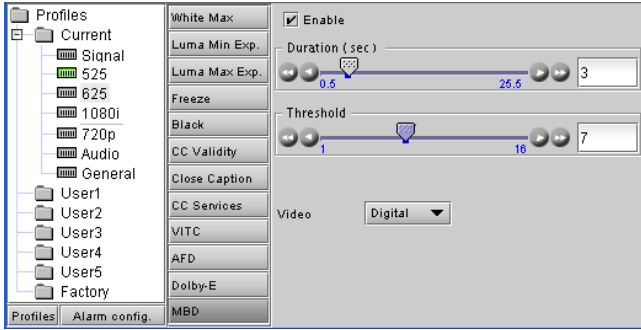
**Cursor - BAI:** When the graph is disabled, this will display the BAI at the cursor position.

**Cursor - Time:** When the graph is disabled, this will display the BAI time at the cursor position. The time value is zero on the right of the graph and represents the time at which the graph was disabled.

**Reported Errors:** When a BAI alarm is raised, a red indication appears in that area.

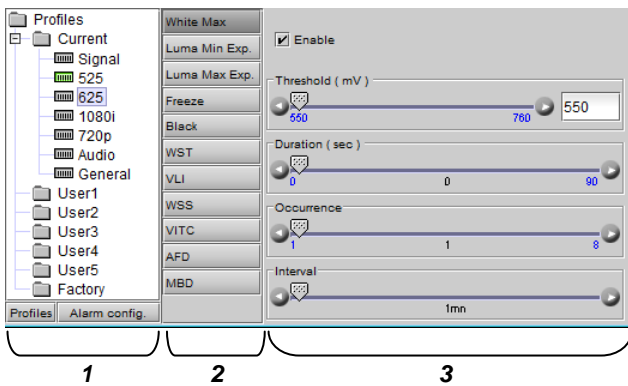
Error detection is configured in the MBD panel associated with the current format in the Parameters area. Access it as shown in here (full description on page 13):

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## Parameters Area

The Parameters area has three sections:



**Section 1.** On the left, there is a tree chart of the Profiles available on the probe. A **Profile** is a set of values for all adjustable parameters and settings for the probe.

The top Profile in the list is the Current Profile.

You always work with the current profile. As explained below, you can access and change all of the parameters and settings in the current profile.

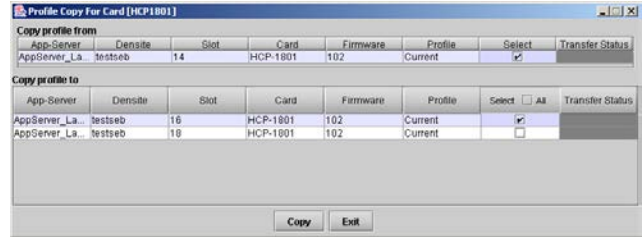
The five User Profiles are read-write data registers that allow you to save the contents of the Current Profile for later recall.

- Once you have configured a set of parameters that you want to save and reuse, right-click on the Current folder in the tree chart. A dialog will appear permitting you to save the current profile into one of the five User profiles. *Note that you will overwrite the current contents of that User profile without additional warning.*
- To load a saved profile back into the Current profile, right-click on the User profile in the tree, then right or left click on the *Load in Current* text that appears.

The Factory Profile is a read-only data set of factory-selected values that can be used to return your probe to a standard operating condition.

- To load it into the Current Profile, right-click on the Factory Profile icon, then right or left click on the *Load in Current* text that appears.

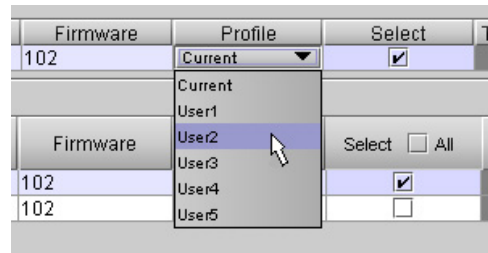
The **Profiles** button at the bottom allows the user to export profiles to other HCP-1801 cards. Click to open the panel.



The *Copy Profile From* line shows the current HCP-1801.

The *Copy Profile To* table shows all other HCP-1801 cards available in the iControl environment

- Click in the individual *Select* boxes to select one or more destination HCP-1801 cards, or click *Select All* to select all of them at once.
- Click on the *Profile* entry in the source HCP-1801 line to see a pulldown listing the Current profile and all 5 user profiles



- Click on one to select it as the source profile
- Click Copy to copy the contents of the selected profile into the same-named profile on the destination HCP-1801 cards.

The **Alarm Config** button at the bottom opens a new window in which the card's on-board alarms can be configured. See page 25 for detailed instructions.

Double-click on the Current folder to open it if necessary. You will see seven icons, each identifying a topic area:

- Signal – signal presence detection
- 525 – 525-line SD system signal parameters
- 625 – 625-line SD system signal parameters
- 1080i – 1080i HD system signal parameters
- 720p – 720p HD system signal parameters
- Audio – audio parameters
- General – miscellaneous other parameters



When you click on one of these, you will change the contents of sections 2 and 3.

- Select a topic area by clicking on it
- The selected topic is highlighted

Note that the icon representing the current input format (i.e. 525, 625, 1080i or 720p) in the topic area list is colored, with the color indicating its status.

NB – selecting a topic area in this tree does *not* change the input format selection

**Section 2.** This section contains a list of parameters associated with the topic selected in section 1.

- Select one by clicking on it
- The selected parameter is highlighted

**Section 3.** This area contains all the controls and adjustments for the topic area and parameter selected in sections 1 and 2.

A complete description for all of these is given below.

In most cases, controls are provided in section 3 to configure the probe's features. Types of controls that may be found are:

**Slider:**



The current value is displayed beneath the center of the slider bar (e.g. 39 in the example shown). To change the value

- move the slider by clicking and dragging it
- move the slider by clicking the arrow icon at either end

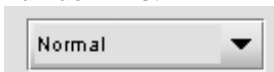
**Slider with data box:**



The current value is displayed in the data box at the right hand side (e.g. 50 in the example shown). To change the value:

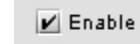
- move the slider by clicking and dragging it
- move the slider by clicking the arrow or double-arrow icon at either end
- type a new value directly into the data box, and hit "enter" from your keyboard. If you enter a value outside the permitted range (as shown beneath the slider), the data box will flash red and the value will not be changed.

**Pull-down list:**



The current selection is shown on the icon. To change it, click on the down arrow at the right of the box, and click on the desired option in the list that appears below the box.

**Check box (with label):**



A selected box has a checkmark in it, as shown in the example, while an unselected box is blank. Click on the box to change its status.

Because the HCP-1801 is concerned with detecting the presence of errors, much of its configuration involves setting limits and thresholds against which the measured parameter values will be compared. Many of the adjustment panels contain similar elements, and these will be described in detail here, to avoid considerable repetition.

The parameter configuration pane usually includes, from top to bottom:

- **Enable:** a checkbox to enable the alarm associated with this parameter
- **Threshold:** a threshold value for detection of an error. The error will be detected when the measured parameter falls above (or below, depending on the nature of the parameter) the indicated threshold value. The values are those of the equivalent analog signal. In most cases this is a slider with data entry box.
- **Conditions:** indicates the conditions under which a detected error is flagged and reported.
  - ◇ **ERROR DURATION** – the length of time during which a parameter is allowed to be out-of-tolerance without being identified as an error. This is useful for situations such as a hard switch or patch of a video signal where there is a discontinuity in the signal which the user has deliberately caused and does not need to be flagged as an error. If a parameter is continuously out of tolerance for the specified duration, then an error is considered to have been detected. However, this error will not be flagged (causing the status LED to change color and an error message to be sent out on the frame's interface) until the OCCURRENCE / DETECTION WINDOW conditions have been satisfied.  
(Range: 0 to 90 seconds)
  - ◇ **OCCURRENCE:** the number of times that a detected error is allowed to occur in a specified DETECTION WINDOW before an error flag is set, and the error is reported (status LED changes color, and message sent on the interface)  
(Range: 1 to 8 for video / 1 to 4 for audio)
  - ◇ **DETECTION WINDOW:** the time interval during which errors are counted to determine if the error flag should be set. This is a moving window, e.g.

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the previous 2 minutes, and only errors falling within that window are counted.  
(Range: 1 min to 24 hours)

In all cases except one (CC presence), all three conditions are defined:

- ◇ The CC Presence parameter has only ERROR DURATION, with a range of 1 to 250 seconds.

The HCP-1801 monitors the following parameters. They are all identified by the path Topic-Parameter

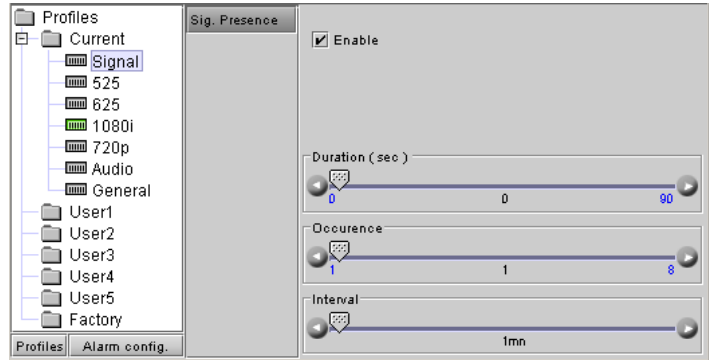
## Signal – Sig. Presence

Detect the presence of the carrier signal in the channel

*Enable:* check to enable this test

*Duration, Occurrence and Interval:* Set up the error detection window using the sliders.

- See page 9 for definitions of these parameters



## 525 – White Max

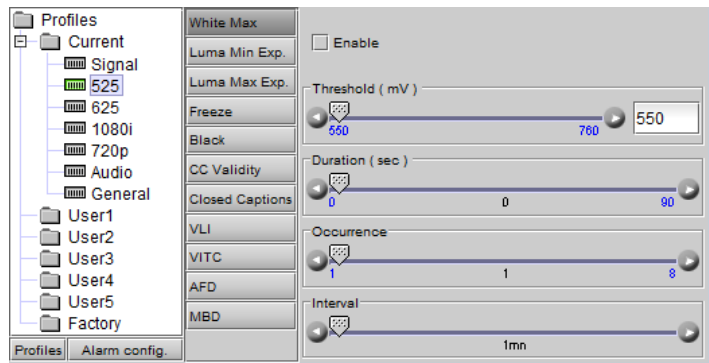
Check whether the luma content of the video signal is going higher than the specified threshold

*Enable:* check to enable this test

*Threshold:* set the level above which the video signal luma level will trigger an error message.

*Duration, Occurrence and Interval:* Set up the error detection window using the sliders.

- See page 9 for definitions of these variables



## 525 – Luma Min Exp.

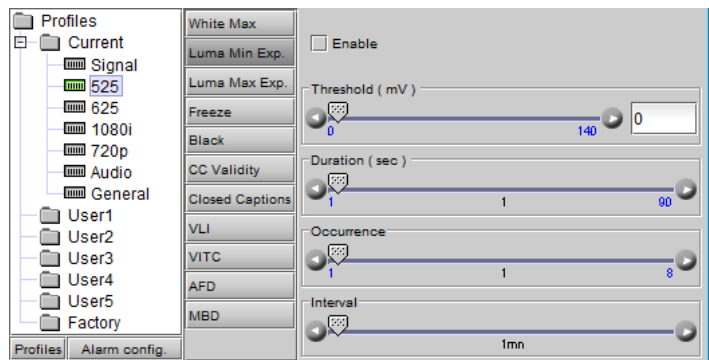
This measure verifies that the luma content of the video signal regularly traverses a nearly-black level. This level is set by the user with the threshold slider.

*Enable:* check to enable this test

*Threshold:* set the level (in mV) above which this condition will be flagged

*Duration, Occurrence and Interval:* Set up the error detection window using the sliders.

- See page 9 for definitions of these variables



### 525 – Luma Max Exp.

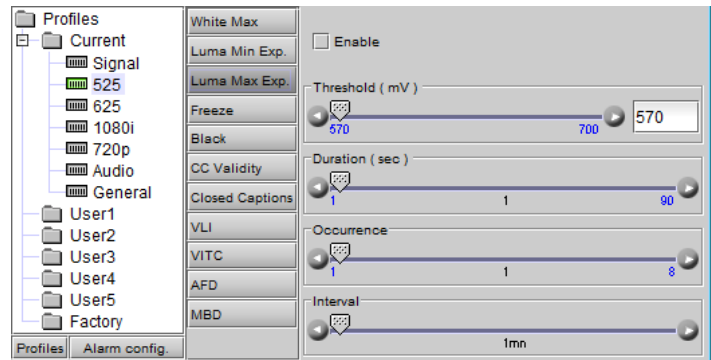
This measure verifies that the luma content of the video signal regularly traverses a nearly-white level. This level is set by the user with the threshold slider.

**Enable:** check to enable this test

**Threshold:** set the level (in mV) below which this condition will be flagged

**Duration, Occurrence and Interval:** Set up the error detection window using the sliders.

- See page 9 for definitions of these variables



### 525 – Freeze

Detect whether selected portions of the video image are static for a period of time. Four independent zones are set up and checked, each accessed from a tab.

**Note:** these four zones are common between the *Freeze* and *Black* parameters, so they can be set up in either panel.

**Enable:** check to enable this test

**Full Screen:** click this button to set the selected zone to full screen size.

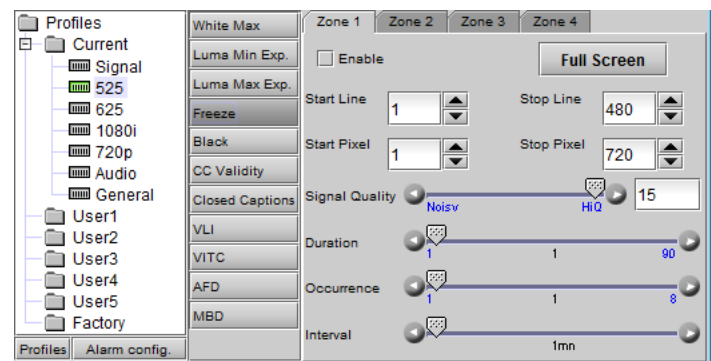
**Start & Stop / Line & Pixel:** define the size of the zone by identifying its top left corner (Start line & pixel) and bottom right corner (Stop line & pixel).

**Note:** you can also set the zone size and position by clicking the Freeze tab in the display area, and using your mouse to drag the outline of the zone

**Signal Quality:** Select a quality level appropriate to the signal being monitored, over the range “Noisy” to “HiQ”, so that the Freeze algorithm will know how to treat noise when attempting to detect a frozen image. Some experimentation may be required.

**Duration, Occurrence and Interval:** Set up the error detection window using the sliders.

- See page 9 for definitions of these variables



### 525 – Black

Detect whether selected portions of the video image are continuously black for a period of time. Four independent zones are set up and checked, each accessed from a tab.

**Note:** these four zones are common between the *Black* and *Freeze* parameters, so they can be set up in either panel.

*Enable:* check to enable this test

*Full Screen:* click this button to set the selected zone to full screen size.

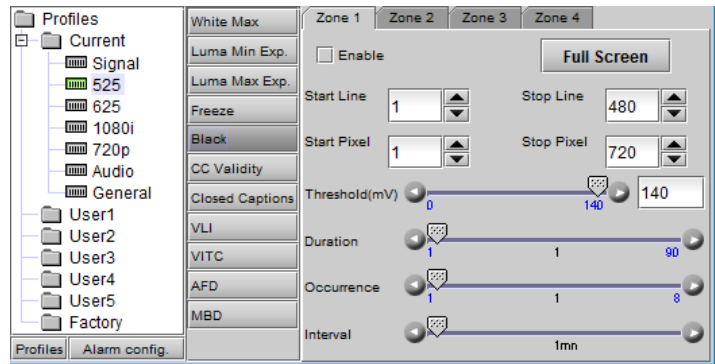
*Start & Stop / Line & Pixel:* define the size of the zone by identifying it's top left corner (Start line & pixel) and bottom right corner (Stop line & pixel).

**Note:** you can also set the zone size and position by clicking the *Black* tab in the display area, and using your mouse to drag the outline of the zone

*Threshold:* set the level (in mV) below which the signal will be considered to be black.

*Duration, Occurrence and Interval:* Set up the error detection window using the sliders.

- See page 9 for definitions of these variables

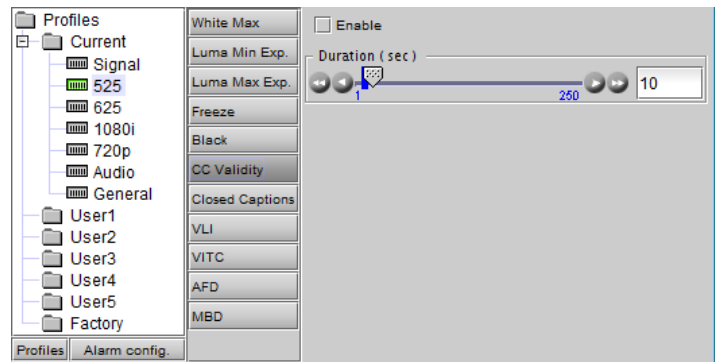


### 525 – CC Validity

Detect the validity of the CC signal on line 21

*Enable:* check to enable this test

*Duration:* Set the time for which the CC must be continuously detected as invalid in order for this condition to be flagged

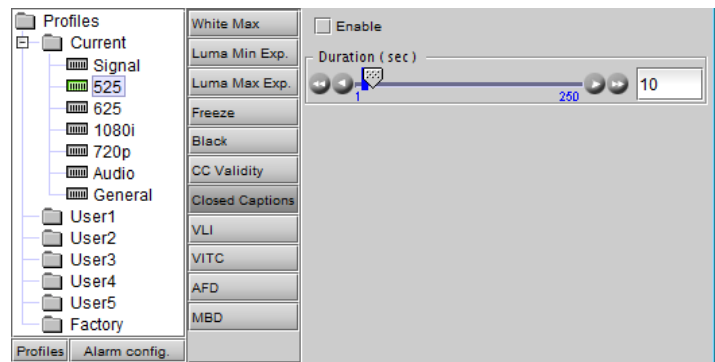


### 525 – Close Caption

Detect

*Enable:* check to enable this test

*Duration:* Set the time for which the CC carrier must be continuously detected as absent in order for this condition to be flagged



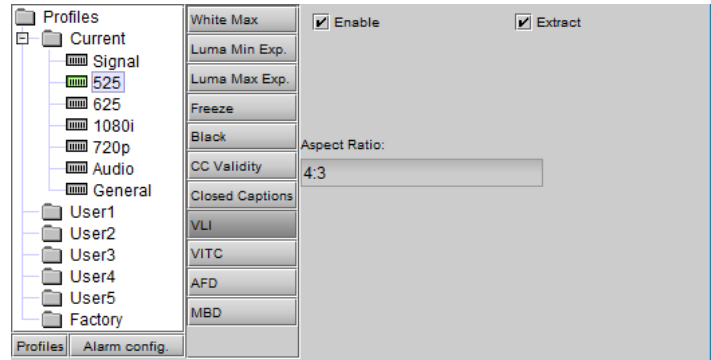
### 525 – VLI

Detect the presence of Video Line Index (VLI) data in the SDI video signal

*Enable:* check to enable this test

*Extract:* extract the aspect ratio value and display it in the text box below

*Aspect Ratio:* The text box reports the detected aspect ratio.



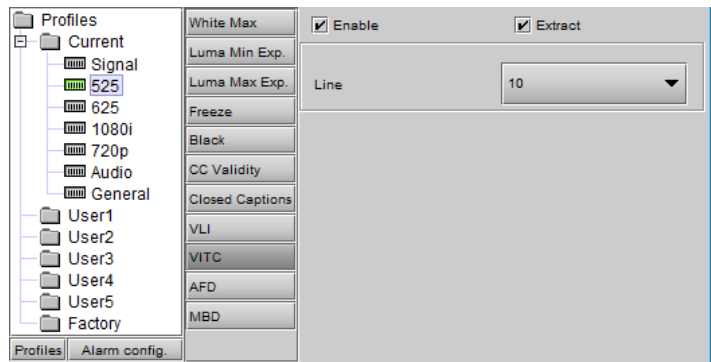
### 525 – VITC

Detect the presence of Vertical Interval Time Code (VITC) on a selected line in the SDI data stream, and choose whether to extract it.

*Enable:* check to enable this test

*Extract:* extract the VITC and display it in the thumbnail.

*Line:* select the line in the vertical interval from which VITC will be extracted. The available range is: [11,12,13,.....,19, 20]



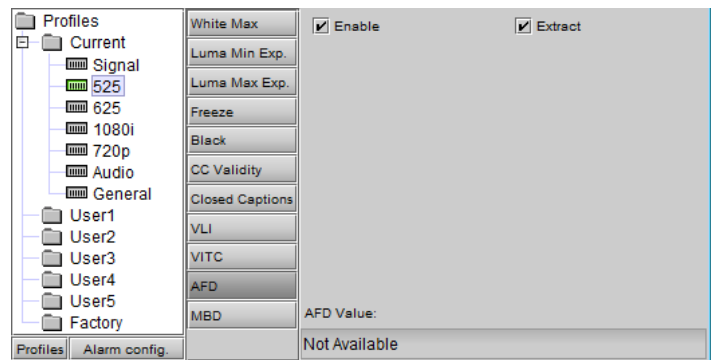
### 525 – AFD

Detect the presence of Active Format Descriptor (AFD) data in the SDI video signal

*Enable:* check to enable this test

*Extract:* extract the AFD value and display it in the text box below

*AFD Value:* the extracted AFD value is displayed in the box.



### 525 – MBD

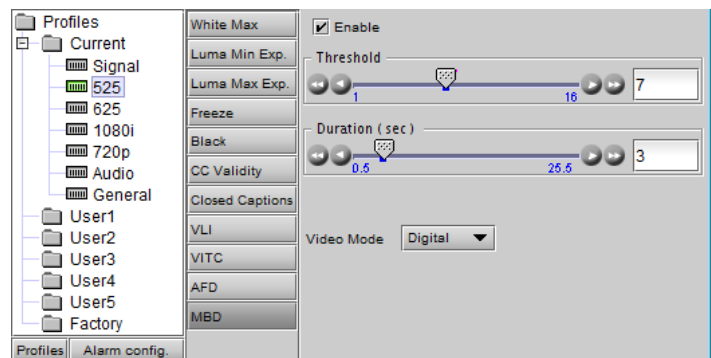
Analyze the active picture to detect MPEG macro-block artifacts in the SDI video signal

*Enable:* check to enable this test

*Duration:* Set the time for which the block artifact index must be continuously above the threshold in order for this condition to be flagged as an error.

*Threshold:* set the level above which this condition will be flagged.

*Video Mode:* Digital should be used for video coming out directly from an MPEG decoder in SDI. Analog should be used when the signal has been decoded from analog to SDI after an MPEG decoder.





### 625 – White Max

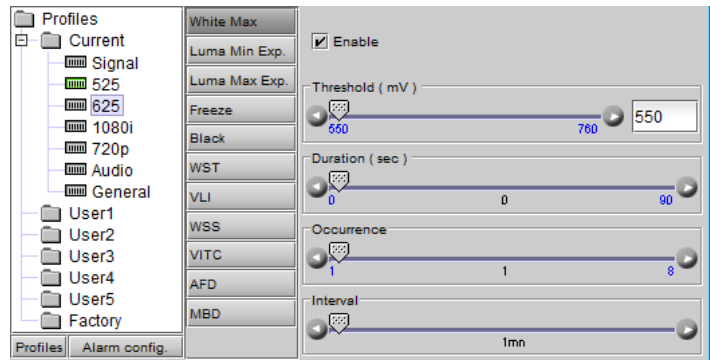
Check whether the luma content of the video signal is going higher than the specified threshold

*Enable:* check to enable this test

*Threshold:* set the level above which the video signal luma level will trigger an error message.

*Duration, Occurrence and Interval:* Set up the error detection window using the sliders.

- See page 9 for definitions of these variables



### 625 – Luma Min Exp.

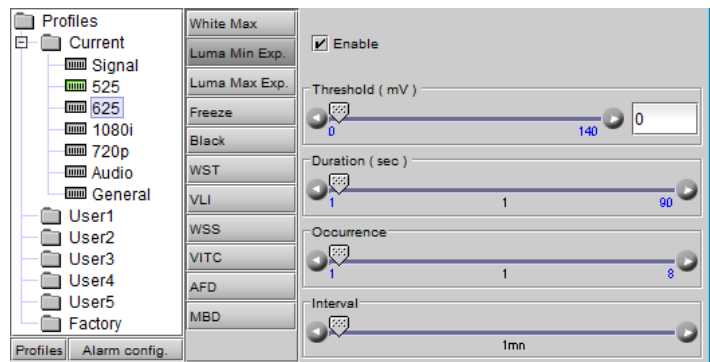
This measure verifies that the luma content of the video signal regularly traverses a nearly-black level. This level is set by the user with the threshold slider.

*Enable:* check to enable this test

*Threshold:* set the level (in mV) above which this condition will be flagged

*Duration, Occurrence and Interval:* Set up the error detection window using the sliders.

- See page 9 for definitions of these variables



### 625 – Luma Max Exp.

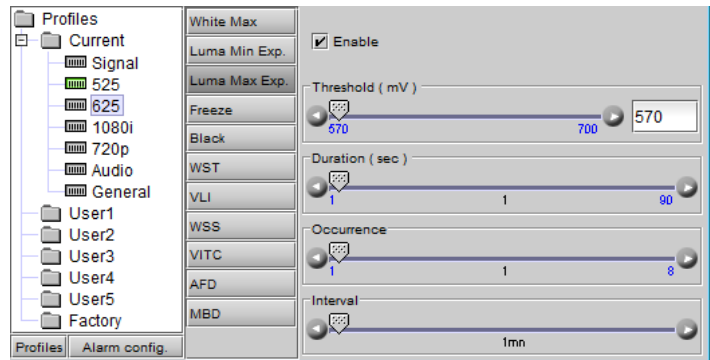
This measure verifies that the luma content of the video signal regularly traverses a nearly black level. This level is set by the user with the threshold slider.

*Enable:* check to enable this test

*Threshold:* set the level (in mV) above which this condition will be flagged

*Duration, Occurrence and Interval:* Set up the error detection window using the sliders.

- See page 9 for definitions of these variables



### 625 – Freeze

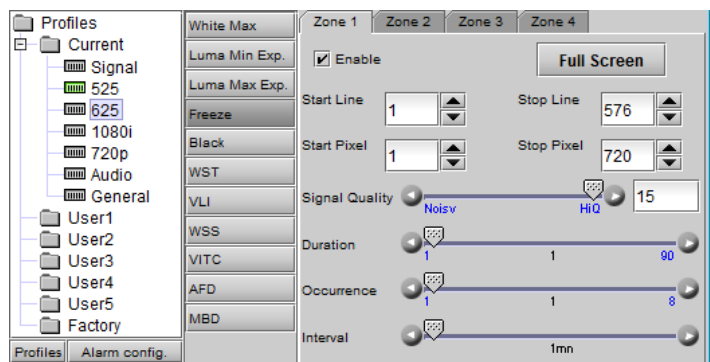
Detect whether selected portions of the video image are static for a period of time. Four independent zones are set up and checked, each accessed from a tab.

**Note:** these four zones are common between the *Freeze* and *Black* parameters, so they can be set up in either panel.

*Enable Alarm:* check to enable this test

*Full Screen:* click this button to set the selected zone to full screen size.

*Start & Stop / Line & Pixel:* define the size of the



zone by identifying its top left corner (Start line & pixel) and bottom right corner (Stop line & pixel).

**Note:** you can also set the zone size and position by clicking the Freeze tab in the display area, and using your mouse to drag the outline of the zone

*Signal Quality:* Select a quality level appropriate to the signal being monitored, over the range “Noisy” to “HiQ”, so that the Freeze algorithm will know how to treat noise when attempting to detect a frozen image. Some experimentation may be required.

*Duration, Occurrence and Interval:* Set up the error detection window using the sliders.

- See page 9 for definitions of these variables

### 625 – Black

Detect whether selected portions of the video image are continuously black for a period of time. Four independent zones are set up and checked, each accessed from a tab.

**Note:** these four zones are common between the *Black* and *Freeze* parameters, so they can be set up in either panel.

*Enable:* check to enable this test

*Full Screen:* click this button to set the selected zone to full screen size.

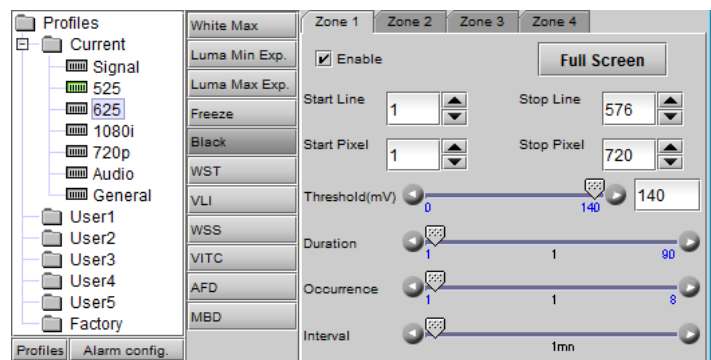
*Start & Stop / Line & Pixel:* define the size of the zone by identifying its top left corner (Start line & pixel) and bottom right corner (Stop line & pixel).

**Note:** you can also set the zone size and position by clicking the Black tab in the display area, and using your mouse to drag the outline of the zone

*Threshold:* set the level (in mV) below which the signal will be considered to be black.

*Duration, Occurrence and Interval:* Set up the error detection window using the sliders.

- See page 9 for definitions of these variables



### 625 – WST

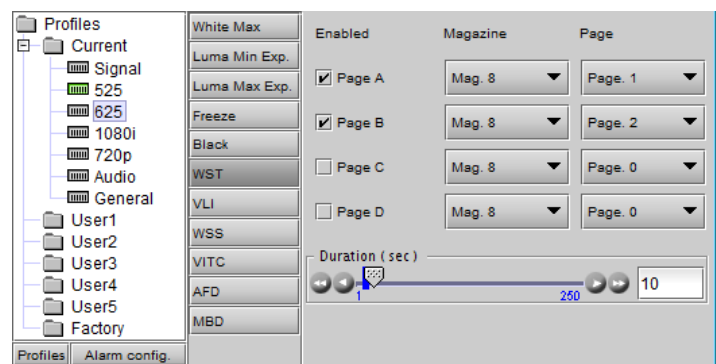
Detect the presence of WST (Teletext) data in the SDI video signal

*Enabled - Page:* check the Page boxes (A, B, C, D) to activate them as desired.

*Magazine:* Select the desired Magazine from the pull-down

*Page:* Select the desired page from the selected Magazine

*Duration:* Set up the error detection window using the slider.



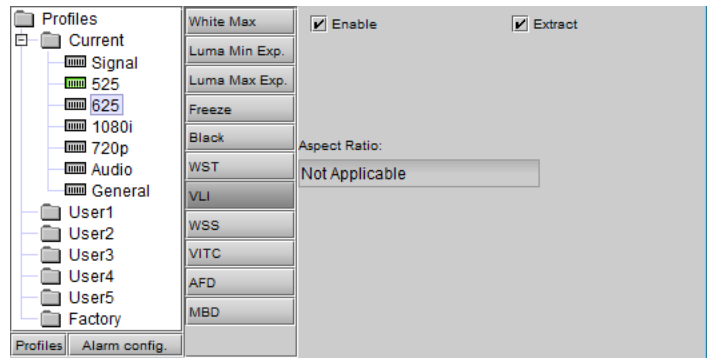
**625 – VLI**

Detect the presence of Video Line Index (VLI) data in the SDI video signal

*Enable:* check to enable this test

*Extract:* extract the aspect ratio value from the VLI and display it in the text box below

*Aspect Ratio:* The text box reports the detected aspect ratio.



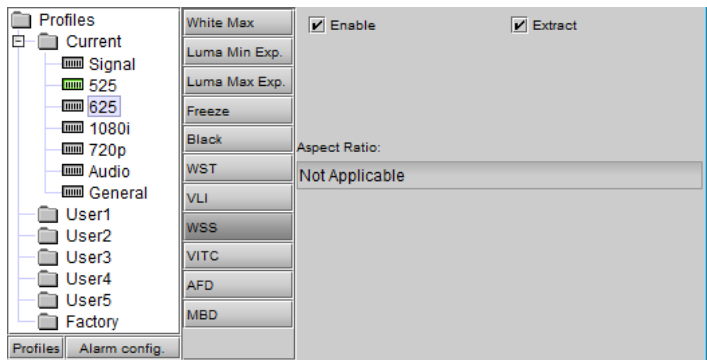
**625 – WSS**

Detect the presence of Wide Screen Signaling (WSS) data in the SDI video signal

*Enable:* check to enable this test

*Extract:* extract the aspect ratio value from the WSS and display it in the text box below

*Aspect Ratio:* The text box reports the detected aspect ratio.



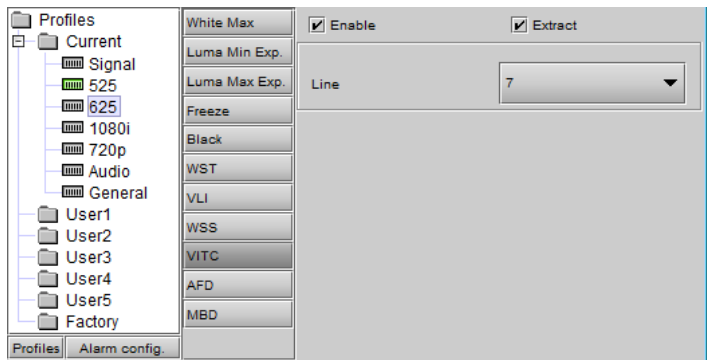
**625 – VITC**

Detect the presence of Vertical Interval Time Code (VITC) on a selected line in the SDI data stream, and choose whether to extract it.

*Enable:* check to enable this test

*Extract:* extract the VITC and display it in the thumbnail.

*Line:* select the line in the vertical interval from which VITC will be extracted. The available range is: [7,8, 9,....., 21, 22]



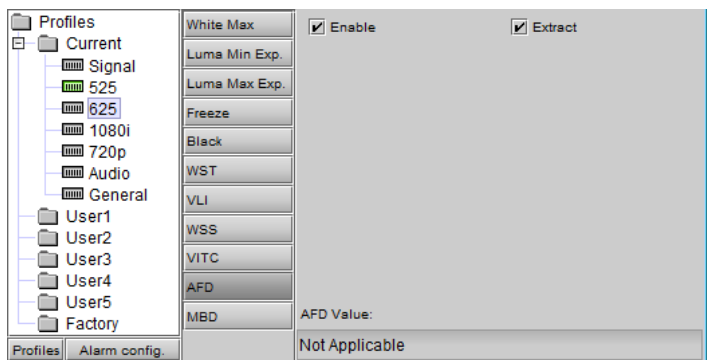
**625 – AFD**

Detect the presence of Active Format Descriptor (AFD) data in the SDI video signal

*Enable:* check to enable this test

*Extract:* extract the AFD value and display it in the text box below.

*AFD Value:* the extracted AFD value is displayed in the box.



### 625 – MBD

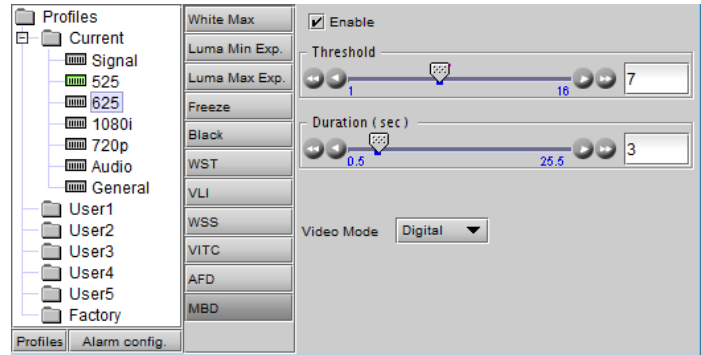
Analyze the active picture to detect MPEG macro-block artifacts in the SDI video signal

**Enable:** check to enable this test

**Duration:** Set the time for which the block artifact index must be continuously above the threshold in order for this condition to be flagged as an error.

**Threshold:** set the level above which this condition will be flagged.

**Video Mode:** Digital should be used for video coming out directly from an MPEG decoder in SDI. Analog should be used when the signal has been decoded from analog to SDI after an MPEG decoder.



### 1080i & 720p – White Max

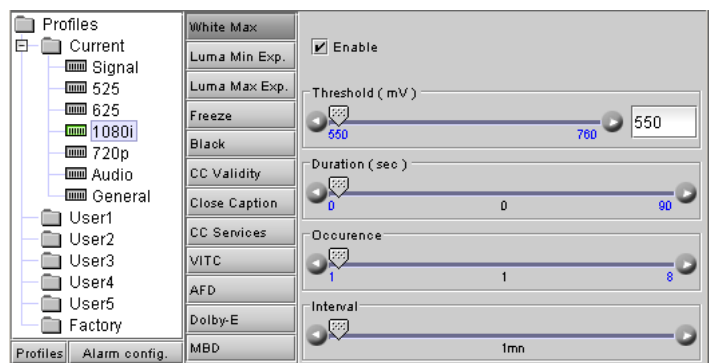
Check whether the luma content of the video signal is going higher than the specified threshold

**Enable:** check to enable this test

**Threshold:** set the level above which the video signal luma level will trigger an error message.

**Duration, Occurrence and Interval:** Set up the error detection window using the sliders.

- See page 9 for definitions of these variables



### 1080i & 720p – Luma Min Exp.

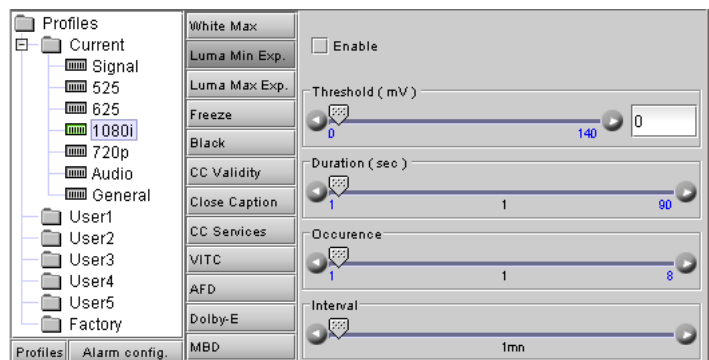
This measure verifies that the luma content of the video signal regularly traverses a nearly-black level. This level is set by the user with the threshold slider.

**Enable:** check to enable this test

**Threshold:** set the level (in mV) above which this condition will be flagged

**Duration, Occurrence and Interval:** Set up the error detection window using the sliders.

- See page 9 for definitions of these variables



### 1080i & 720p – Luma Max Exp.

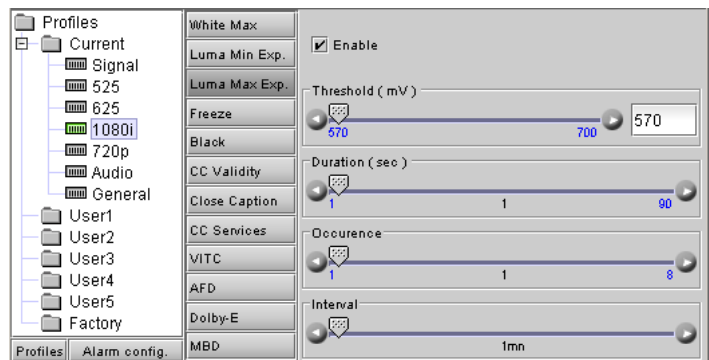
This measure verifies that the luma content of the video signal regularly traverses a nearly-white level. This level is set by the user with the threshold slider.

**Enable:** check to enable this test

**Threshold:** set the level (in mV) below which this condition will be flagged

**Duration, Occurrence and Interval:** Set up the error detection window using the sliders.

- See page 9 for definitions of these variables



### 1080i & 720p – Freeze

Detect whether selected portions of the video image are static for a period of time. Four independent zones are set up and checked, each accessed from a tab.

**Note:** these four zones are common between the *Freeze* and *Black* parameters, so they can be set up in either panel.

*Enable Alarm:* check to enable this test

*Full Screen:* click this button to set the selected zone to full screen size.

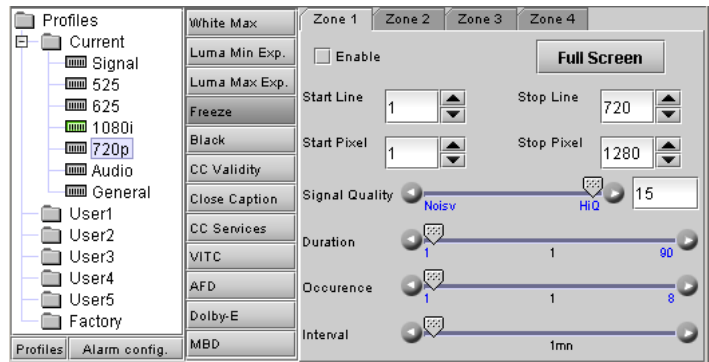
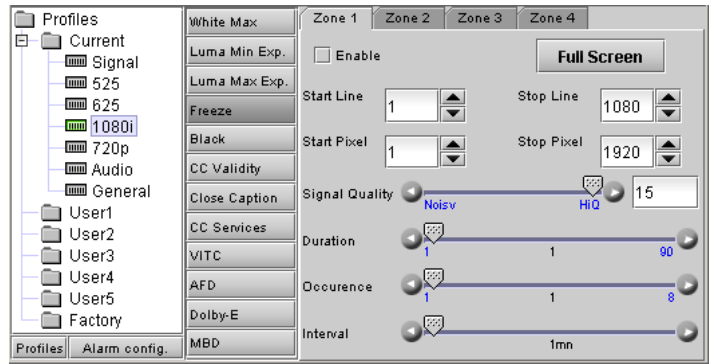
*Start & Stop / Line & Pixel:* define the size of the zone by identifying it's top left corner (Start line & pixel) and bottom right corner (Stop line & pixel). The range of lines and pixels is different for 720p and 1080i formats.

**Note:** you can also set the zone size and position by clicking the Freeze tab in the display area, and using your mouse to drag the outline of the zone

*Signal Quality:* Select a quality level appropriate to the signal being monitored, over the range “Noisy” to “HiQ”, so that the Freeze algorithm will know how to treat noise when attempting to detect a frozen image. Some experimentation may be required.

*Duration, Occurrence and Interval:* Set up the error detection window using the sliders.

- See page 9 for definitions of these variables



### 1080i & 720p – Black

Detect whether selected portions of the video image are continuously black for a period of time. Four independent zones are set up and checked, each accessed from a tab.

**Note:** these four zones are common between the *Black* and *Freeze* parameters, so they can be set up in either panel.

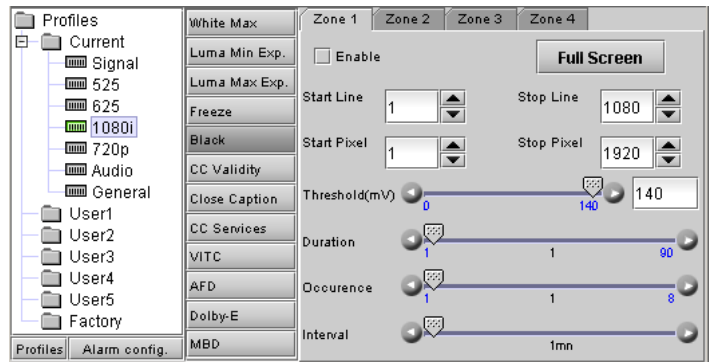
*Enable:* check to enable this test

*Full Screen:* click this button to set the selected zone to full screen size.

*Start & Stop / Line & Pixel:* define the size of the zone by identifying it's top left corner (Start line & pixel) and bottom right corner (Stop line & pixel). The range of lines and pixels is different for 720p and 1080i formats.

**Note:** you can also set the zone size and position by clicking the Black tab in the display area, and using your mouse to drag the outline of the zone

*Threshold:* set the level (in mV) below which the

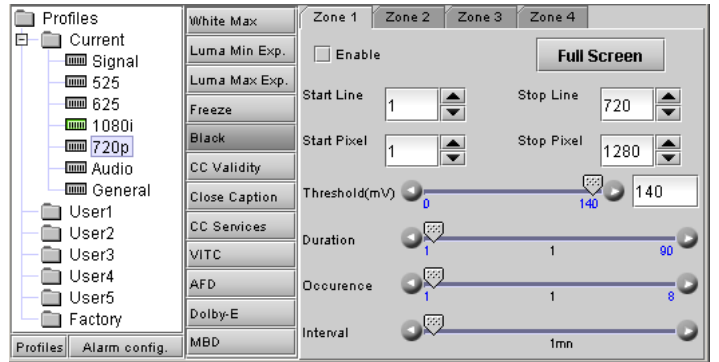




signal will be considered to be black.

*Duration, Occurrence and Interval:* Set up the error detection window using the sliders.

- See page 9 for definitions of these variables

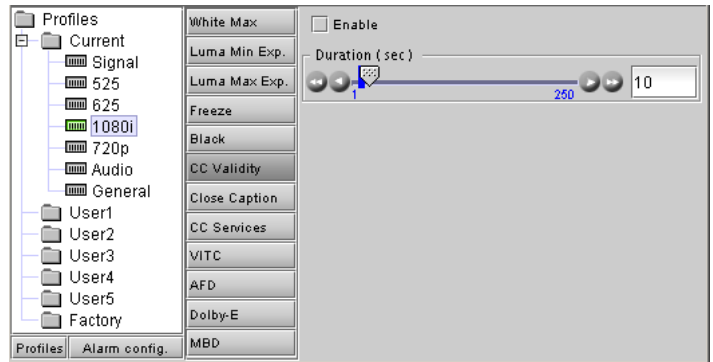


### 1080i & 720p – CC Validity

Detect the validity of Closed Caption (CC) data in the SDI video signal

*Enable:* check to enable this test

*Duration:* Set the time for which the CC must be continuously detected as invalid in order for this condition to be flagged

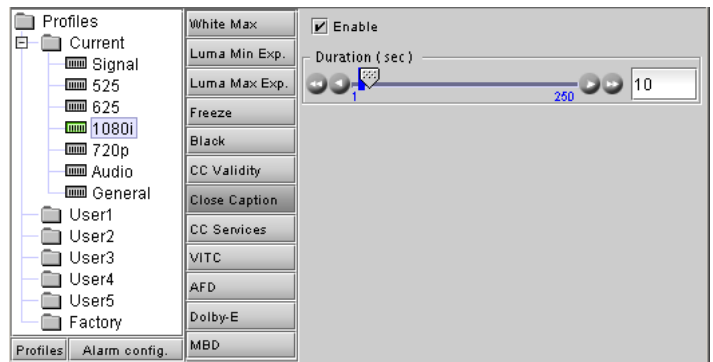


### 1080i & 720p – Close Caption

Detect the presence of Closed Caption (CC) data in the SDI video signal

*Enable:* check to enable this test

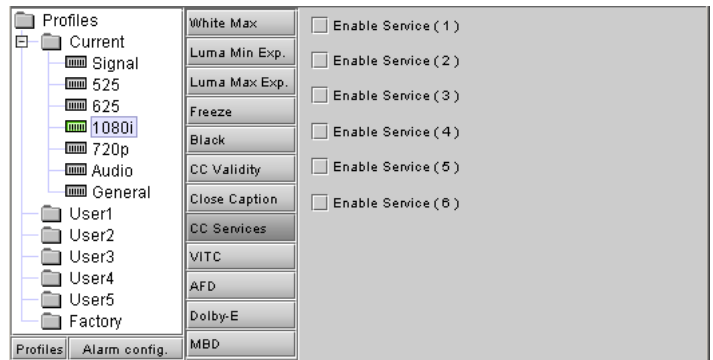
*Duration:* Set up the error detection window using the slider.



### 1080i & 720p – CC Services

Select the CC services available under the CEA-708-B standard that will be detected.

- Service 1 is the primary caption service
- Service 2 is the secondary language service
- Services 3-6 are unassigned

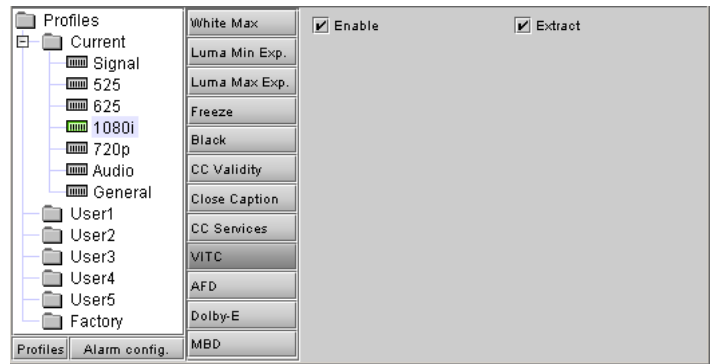


### 1080i & 720p – VITC

Detect the presence of Vertical Interval Time Code (VITC) in the SDI data stream, and choose whether to extract it.

**Enable:** check to enable this test

**Extract:** extract the VITC and display it in the thumbnail.



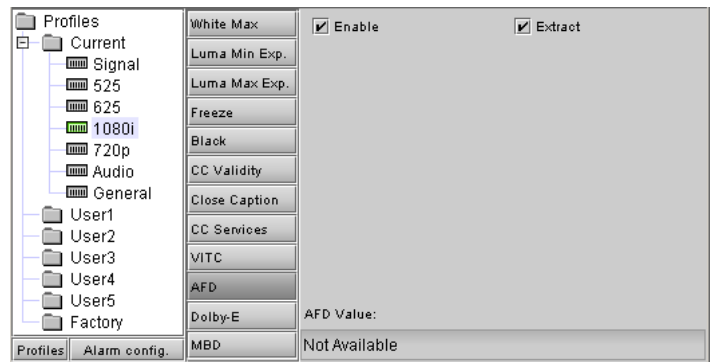
### 1080i & 720p – AFD

Detect the presence of Active Format Descriptor (AFD) data in the SDI video signal

**Enable:** check to enable this test

**Extract:** extract the AFD value and display it in the text box below

**AFD Value:** the extracted AFD value is displayed in the box.



### 1080i & 720p – Dolby E

Detect the presence of Dolby E encoded data in the SDI video signal

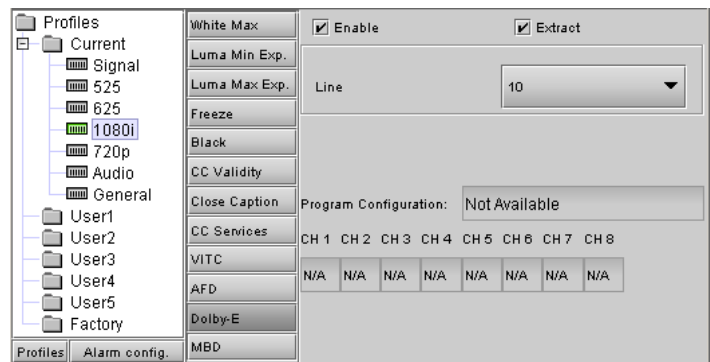
**Enable:** check to enable this test

**Extract:** extract the Dolby-E program configuration and channel status, and display them in this panel

**Line:** select the line on which to search for Dolby E metadata

**Program Configuration:** Display the extracted program configuration information

**Ch1...Ch8:** display the status of the audio channels



### 1080i & 720p MBD

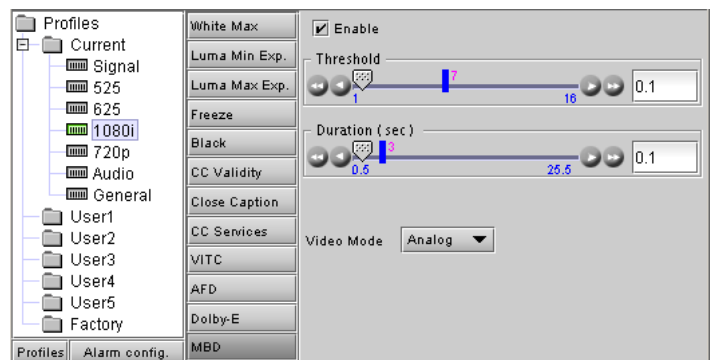
Analyze the active picture to detect MPEG macro-block artifacts in the SDI video signal

**Enable:** check to enable this test

**Duration:** Set the time for which the block artifact index must be continuously above the threshold in order for this condition to be flagged as an error.

**Threshold:** set the level above which this condition will be flagged.

**Video Mode:** Digital should be used for video coming



out directly from an MPEG decoder in SDI. Analog should be used when the signal has been decoded from analog to SDI after an MPEG decoder.

### Audio – Silence

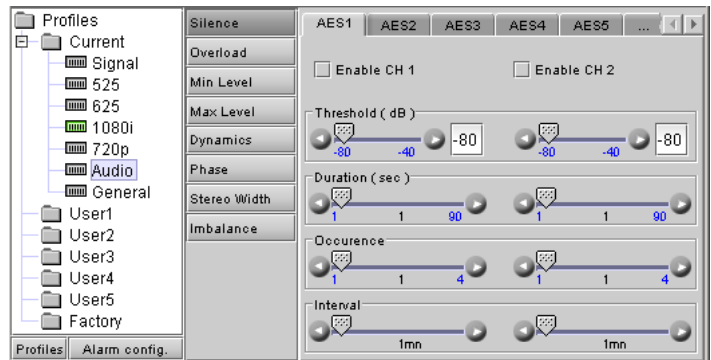
Check whether the instantaneous audio level remains below a low-level threshold (both channels checked separately)

*Enable Ch1 / Enable Ch2:* check to enable this test

*Threshold:* set the level (in dB) below which an audio silence error will be flagged

*Duration, Occurrence and Interval:* Set up the error detection window using the sliders.

- See page 9 for definitions of these variables



### Audio – Overload

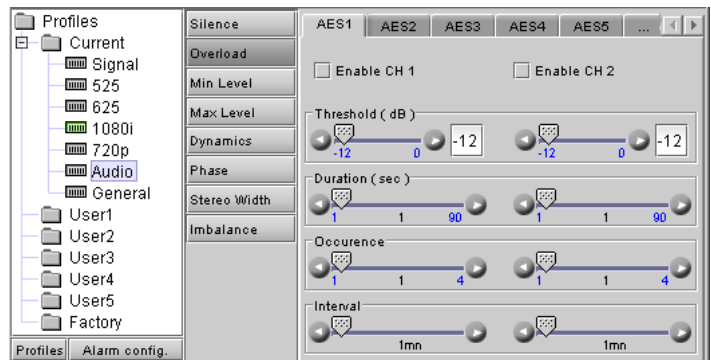
Detect the highest level present in the signal (both channels checked separately)

*Enable Ch1 / Enable Ch2:* check to enable this test

*Threshold:* set the level (in dB) above which an overload will be flagged

*Duration, Occurrence and Interval:* Set up the error detection window using the sliders.

- See page 9 for definitions of these variables



### Audio – Min Level

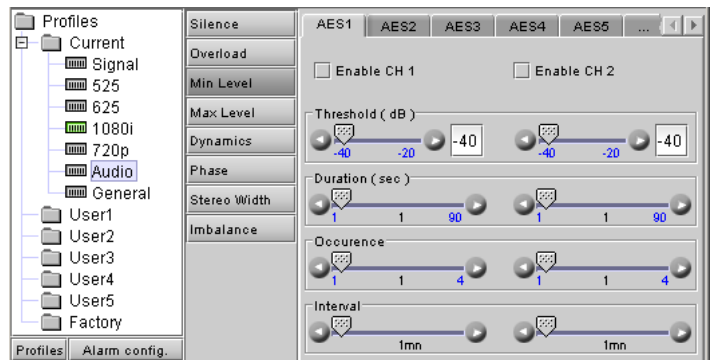
Check whether the mean audio level remains below a low-level threshold (both channels checked separately)

*Enable Ch1 / Enable Ch2:* check to enable this test

*Threshold:* set the level (in dB) below which an Audio Min Level error will be flagged

*Duration, Occurrence and Interval:* Set up the error detection window using the sliders.

- See page 9 for definitions of these variables



### Audio – Max Level

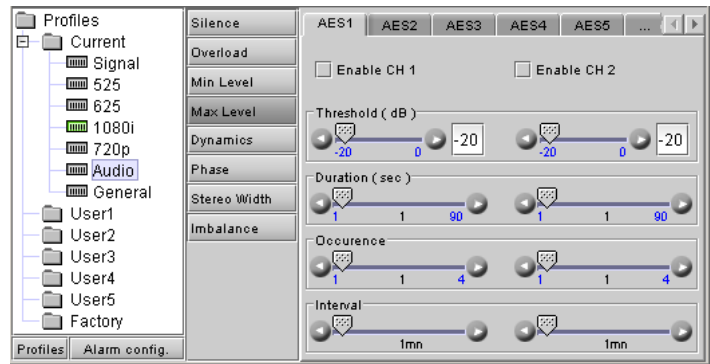
Check whether the mean audio level remains above a high-level threshold (both channels checked separately)

*Enable Ch1 / Enable Ch2:* check to enable this test

*Threshold:* set the level (in dB) above which an Audio Max Level error will be flagged

*Duration, Occurrence and Interval:* Set up the error detection window using the sliders.

- See page 9 for definitions of these variables



### Audio – Dynamics

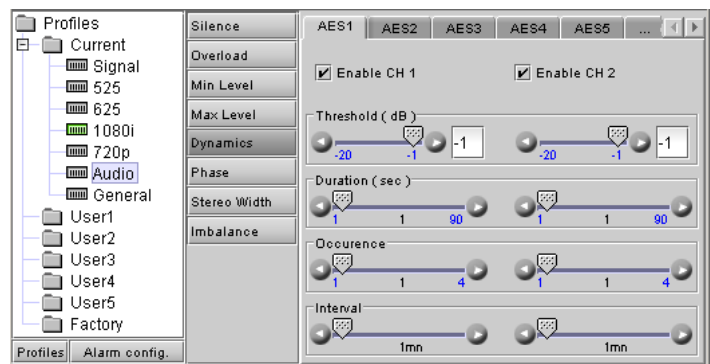
Determine whether the difference between the maximum and minimum mean levels remains below a given threshold (both channels checked separately)

*Enable Ch1 / Enable Ch2:* check to enable this test

*Threshold:* set the level (in dB) below which an Audio Dynamics error will be flagged

*Duration, Occurrence and Interval:* Set up the error detection window using the sliders.

- See page 9 for definitions of these variables



### Audio – Phase

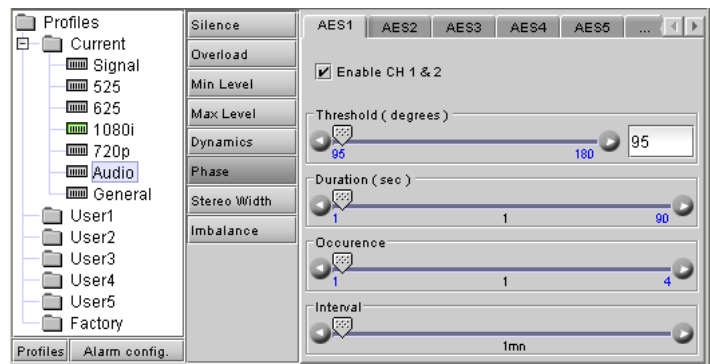
Detect phase errors (channels checked together)

*Enable Ch 1 & 2:* check to enable this test

*Threshold:* set the level (in degrees) above which an audio phase error will be flagged

*Duration, Occurrence and Interval:* Set up the error detection window using the sliders.

- See page 9 for definitions of these variables



### Audio – Stereo Width

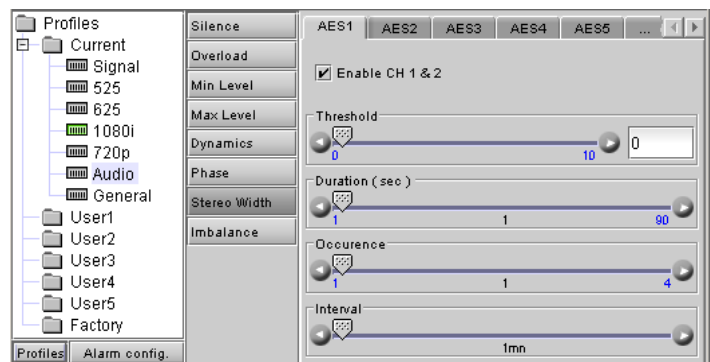
Detect stereo width errors (channels checked together)

*Enable Ch 1 & 2:* check to enable this test

*Threshold:* set the level below which this condition will be flagged

*Duration, Occurrence and Interval:* Set up the error detection window using the sliders.

- See page 9 for definitions of these variables.



### Audio – Imbalance

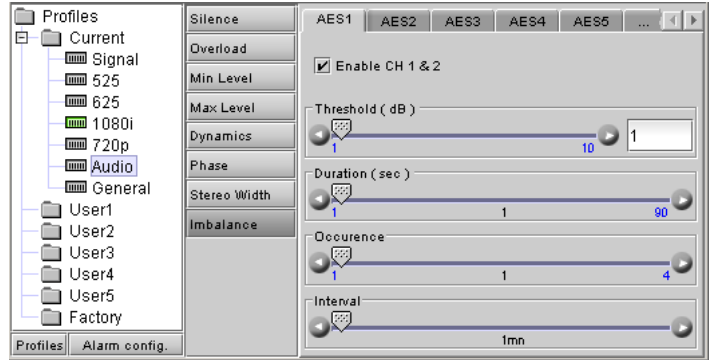
Detect stereo imbalance errors by comparing the average levels in the two channels (channels checked together)

*Enable Ch 1 & 2:* check to enable this test

*Threshold:* set the level (in dB) above which an audio imbalance error will be flagged

*Duration, Occurrence and Interval:* Set up the error detection window using the sliders.

- See page 9 for definitions of these variables



### General – Format

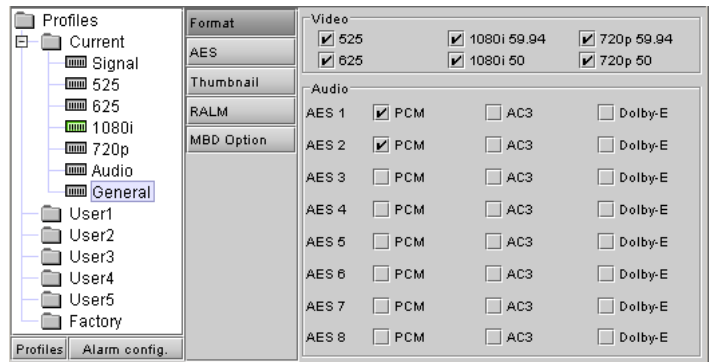
Use the checkboxes to select the Video and Audio formats that this HCP-1801 will identify as “wanted”.

Format detection is automatic, and the HCP-1801 will process all received formats on this list.

Formats that are not checked will cause an error flag to be generated.

detection window using the sliders.

- See page 9 for definitions of these variables



### General – AES

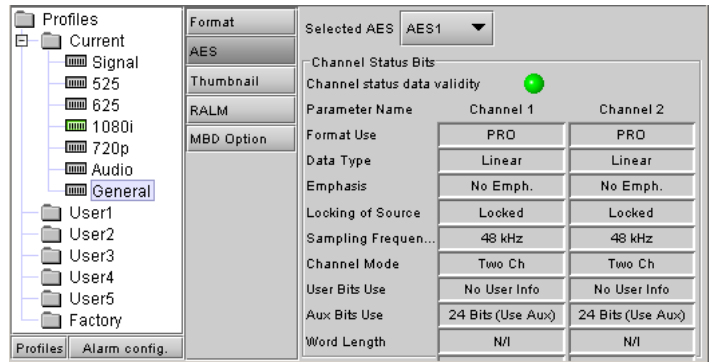
Shows the contents of the AES channel status bits and the channel status data validity.

Use the pull-down to select one of the eight AES channels

The colored icon shows the channel status data validity:

- ♦ Green = ok
- ♦ Red = error

The chart shows the details of the channel status data for Channels 1 and 2 of the selected AES.



### General – Thumbnail

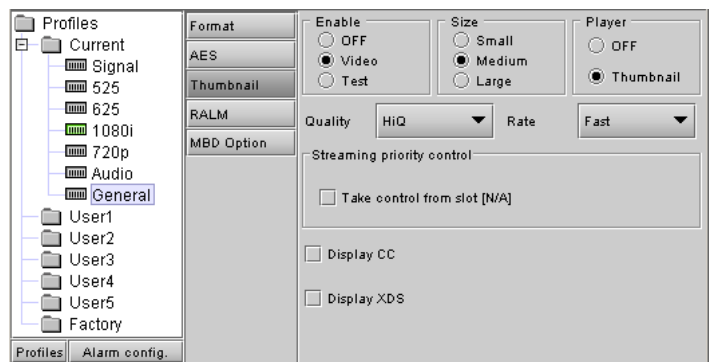
Set up the presentation of the streaming video in the Thumbnail tab in the Display Area

*Enable* – select the contents of the thumbnail image (Video or Test) or turn thumbnails OFF

*Size* – select the size of the Thumbnail image (small, medium or large) Note: when *Test* is selected under *Enable*, the test image size will always be medium.

*Player* – turn the player function OFF or ON (“thumbnail”)

*Quality* – choose the quality of the displayed image by selecting Poor, Normal or HiQ from the pull-down 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.]

**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.

**Display CC** – select the checkbox to display closed captioning in the thumbnail display.

**Display XDS** – select the checkbox to display XDS in the thumbnail display.

**General – RALM**

Set up the characteristics of the Remote Audio Level Meter (RALM) that is shown in the ALM tab in the Display Area.

**RALM Connections**

Each of the eight AES signals can be sent to the RALM or not (OFF)

**Reset All Overload Counters:** click this button to reset all the overload counters on the ALM display to zero. See the next section for instructions on setting up the overload counters.

**Meter Ballistics Config**

**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)

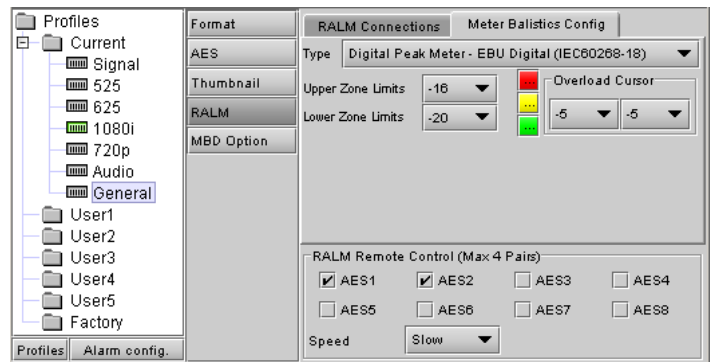
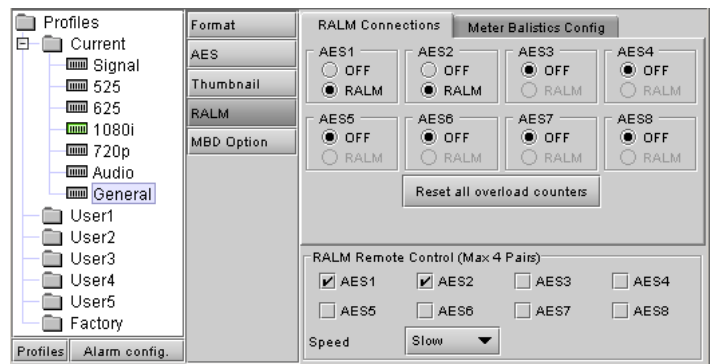
**Color samples** – the three samples show the current selected color for the upper, middle and lower zones of the meter.

- 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**

**AES1 to AES8** – check the boxes to turn the



individual meters off or on

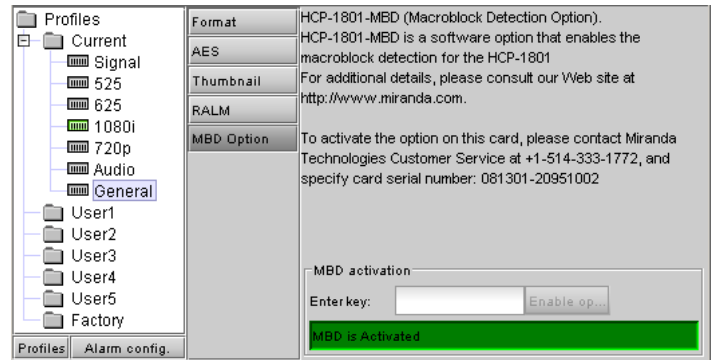
**Note:** only four meters can be active at once, so only four of these checkboxes can be selected.

*Speed* – select the meter response from the pull-down list, either fast, medium or slow.

### General - MBD Option

The MDB option enables macroblock detection (MBD) in the probe. It will detect MPEG type block artifacts in the input video and it will report an alarm when the signal degrades.

To activate this option, you must obtain a licence key from Miranda Technologies Inc. Type the licence key in the box and then click on ENABLE OPTION to enable the option's features.



### ALARM CONFIGURATION

The alarm reporting of this HCP-1801 can be configured by the user.

- Click the Alarm Config button at the lower left of the window to open the Alarm Configuration panel in a new window, which 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 HCP-1801 card.

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

The **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

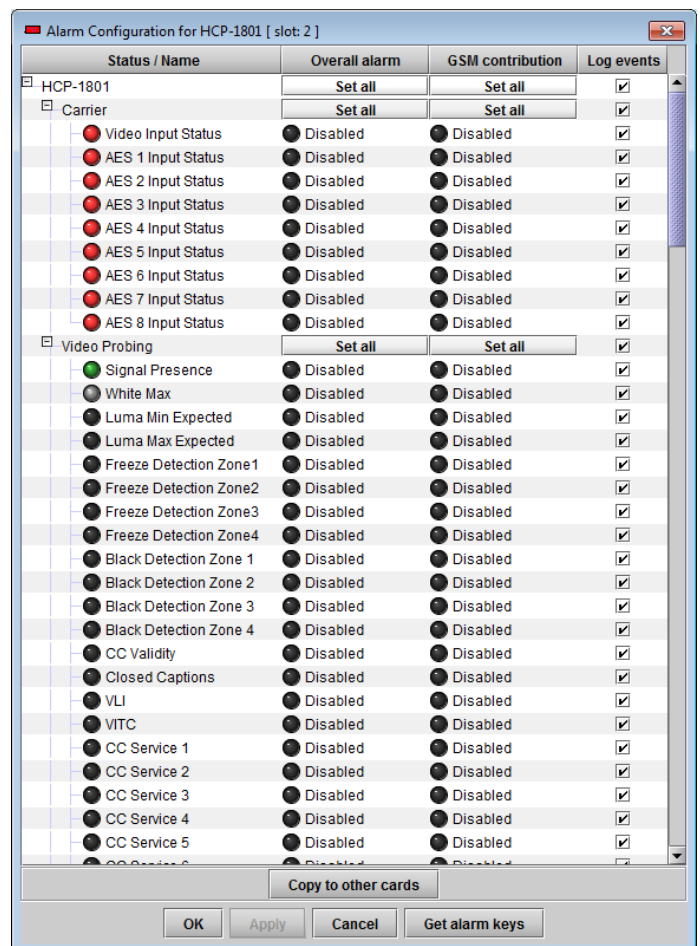
#### Overall Alarm

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








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- 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 Set All boxes beside a section heading, you will open a pulldown that lets you assign a level to all alarms in that section of the column simultaneously.

### Log Events

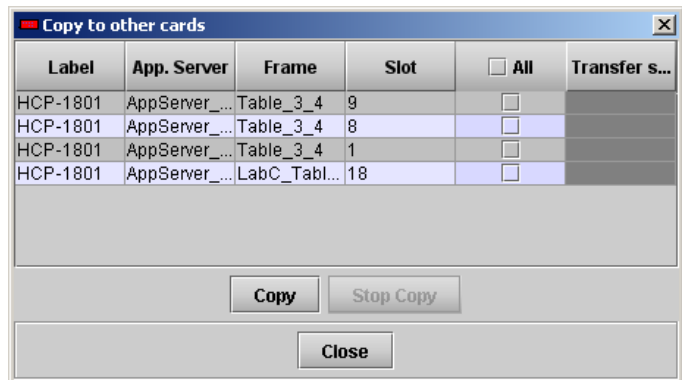
iControl maintains a log of alarm events associated with the card. The log is useful for troubleshooting and identifying event sequences. Click in the checkbox to enable logging of alarm events for each individual alarm.

At the bottom of the window are several other controls

### 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 HCP-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 Page 8), the alarm configuration is copied along with all the other settings.



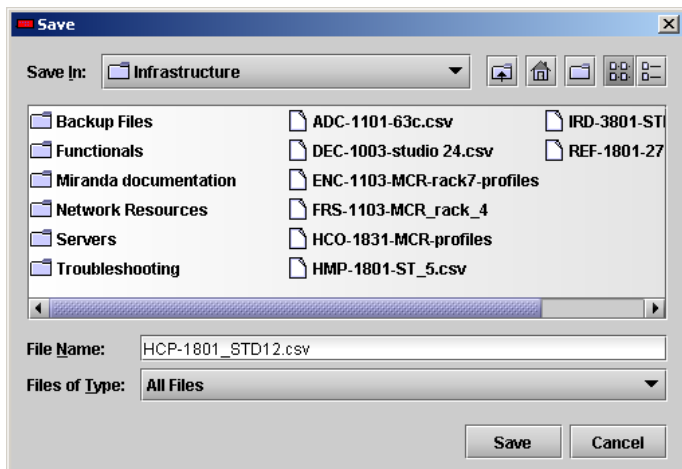
### Get alarm keys

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

### 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.



## Electromagnetic Compatibility



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

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**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.

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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
- EN 55024 Immunity of Information Technology Equipment
- EN 61000-3-2 Harmonic current injection
- EN 61000-3-3 Limitation of voltage changes, voltage fluctuations and flicker
- 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 immunity
- EN 61000-4-6 Conducted immunity
- EN 61000-4-11 Voltage dips, short interruptions and voltage variations immunity

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