

# DENSITÉ series

## HRS-1801 HD/SD Routing Switcher Guide to Installation and Operation

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## Safety Compliance Information

### Safety Compliance

This equipment complies with:

- CSA C22.2 No. 60950-1-03 / Safety of Information Technology Equipment, Including Electrical Business Equipment.
- UL 60950-1 (1<sup>st</sup> Edition) / Safety of Information Technology Equipment, Including Electrical Business Equipment.
- IEC 60950-1 (1<sup>st</sup> Edition) / Safety of Information Technology Equipment, Including Electrical Business Equipment.

### CAUTION

These servicing instructions are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel. Servicing should be done in a static-free environment.

### Electromagnetic Compatibility

- This equipment has been tested for verification of compliance with FCC Part 15, Subpart B, class A requirements for Digital Devices.
- This equipment complies with the requirements of:  
EN 55022 Class A, Electromagnetic Emissions,  
EN 61000-3-2 & -3-3, Disturbance in Supply Systems  
EN 61000-4-2, -3, -4, -5, -6, -8 & -11 Electromagnetic Immunity

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# 1 HRS-1801 HD/SD Routing Switcher

## 1.1 Introduction

The HRS-1801 is a series of expandable 10x4 routing switchers capable of switching HD and SD SDI as well as compressed domain signals such as ASI or SSI/SMPTE-310M.

The HRS-1801 is available in non-reclocked, reclocked and clean/silent switching configurations.

It can be configured as Nx3 or Nx4 switcher. In the Nx3 setup, outputs 1 and 2 are tied together.

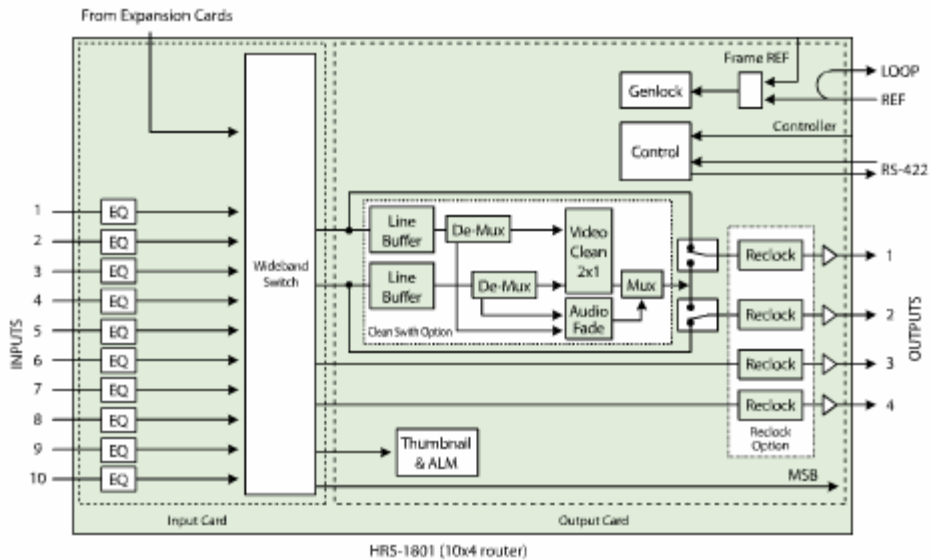
The basic HRS-1801 includes 10 inputs but can be expanded in increments of 10 additional inputs to cover configurations of 20x4, 30x4 and 40x4. It can be controlled over Ethernet or RS-422, in a variety of ways that provide maximum flexibility to the user: iControl, RCP-10x0 control panel, automation systems.

This small routing switcher is the ideal solution for a variety of monitoring, protection and master control applications.

## 1.2 Features

- Switches HD-SDI, SD-SDI, ASI and SSI/SMPTE-310
- Reclocked or non-reclocked outputs (Optional)
- Clean switch option (offers one independent or two identical clean switch outputs)
- Expandable up to 40x4 in increments of 10 inputs
- Ethernet or serial control available: RCP-10x0 control panel series, automation systems, iRouter, iControl

## 1.3 Functional Block diagram



## 1.4 Clean Switch Option

The Clean Switch option enables a clean, glitch-free video and audio transition between sources that are not absolutely aligned.

### Video

- Clean switching will provide glitch free switching of any two sources as long as they are within 2 lines from the reference position.
- Video switching will be done using a vertical interval cut
- All 16 channels of audio will be extracted, V-faded and then re-embedded into the output signal

### Audio

- The HRS-1801 automatically detects the format of an audio channel
- The audio transition between audio channels of the same format will consist of a V fade.
- If the audio is non-PCM, the audio transition will be a cut
- As a general rule, two audio inputs which are different won't be V-faded but instead will be cut

## 2 Installation

### 2.1 Unpacking

Make sure the following items have been shipped with the HRS-1801 HD/SD Routing Switcher. If any of the following items are missing, contact your distributor or Miranda Technologies Inc.

- HRS-1801 Output Card
- HRS-1801 Input Cards (1 required, up to three additional cards optional) + lexans
- Cross-coupler boards (1 for each input card)
- Rear panels (1 for Output card and input 1 Card, plus one for each additional input card)
- This manual

### 2.2 Installation in the Densité frame

The HRS-1801 is a multi-card Densité system, which must occupy adjacent slots in the Densité Frame. The number of slots depends on the number of inputs:

Inputs	Slots	
	Triple Rear	Quad Rear
10	3	4
20	5	6
30	7	8
40	9	10

A full 40-input system occupies one half of a Densité frame (9 or 10 slots, depending on the rear panel option). A basic 10-input system should be installed in the leftmost slots of one half of the frame (seen from the front) so that expansion modules can be added to the right without removing and reinstalling the original 10-input system.

The HRS-1801 system consists of:

- One OUTPUT card, which must be the left-most card as seen from the front of the frame.
- One to four INPUT cards, which must be installed to the right of the OUTPUT card (note that an empty slot must be left between each pair of cards)
- Cross-coupler boards, one for each input card, which install on the front of the cards, and connect adjacent cards together

**NOTE – be careful to install these boards correctly – the lettering must be right-side-up**

- Rear panels, which install from the rear of the frame, and provide input and output connectors.

The OUTPUT card and the INPUT card for inputs 1-10 share the same rear panel. Two different versions are available, and they affect how the cards will be placed in the slots.

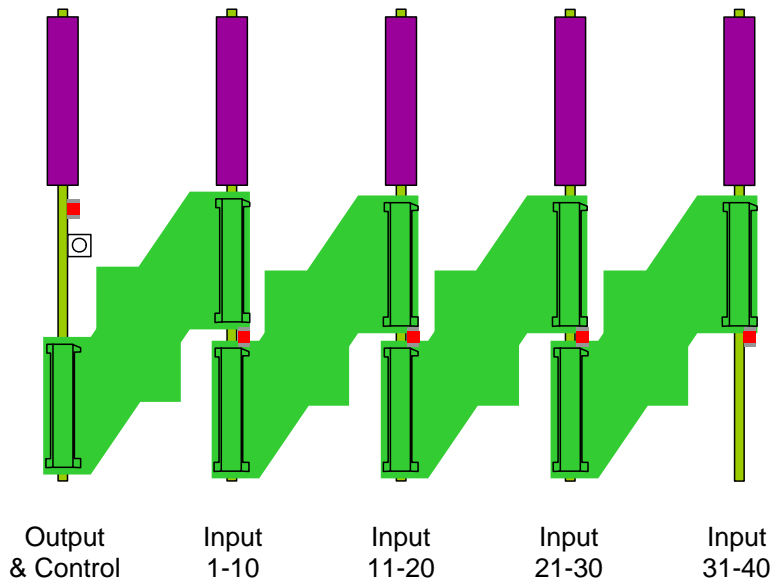
- Basic version (TRP) – panel has 10 inputs, 4 outputs and a reference input, The rear panel is 3 slots wide.
- Extended Control Version (QRP) – the panel has 10 inputs, 4 outputs, REF input plus loop-through (all on BNC connectors) plus 2 control ports (RS422/485) on RJ-45 connectors. The rear panel is 4 slots wide.

The following card placement scheme is optimal for a 40-input router, depending on the rear panel in use:

Router Installation	Slots 1-10		Slots 11-20	
Rear panel	TRP REAR	QRP REAR	TRP REAR	QRP Rear
Card	Slot #	Slot #	Slot #	Slot #
Output	1	2	11	12
Input 1-10	3	4	13	14
Input 11-20	5	6	15	16
Input 21-30	7	8	17	18
Input 31-40	9	10	19	20

- Note that with the TRP rear, there is a free slot at the right-hand side that can be used for other cards (e.g. REF-1701 in slot 10, or MSB-1121 in slot 20)
- Note also that the REF-1701 and MSB-1121 must be situated in slots 10 and 20, so place the router appropriately if you need to use these cards.

Here is a front view of a full 4-input-card system, showing the placement of the cross-coupler boards, and the card-front status LEDs.



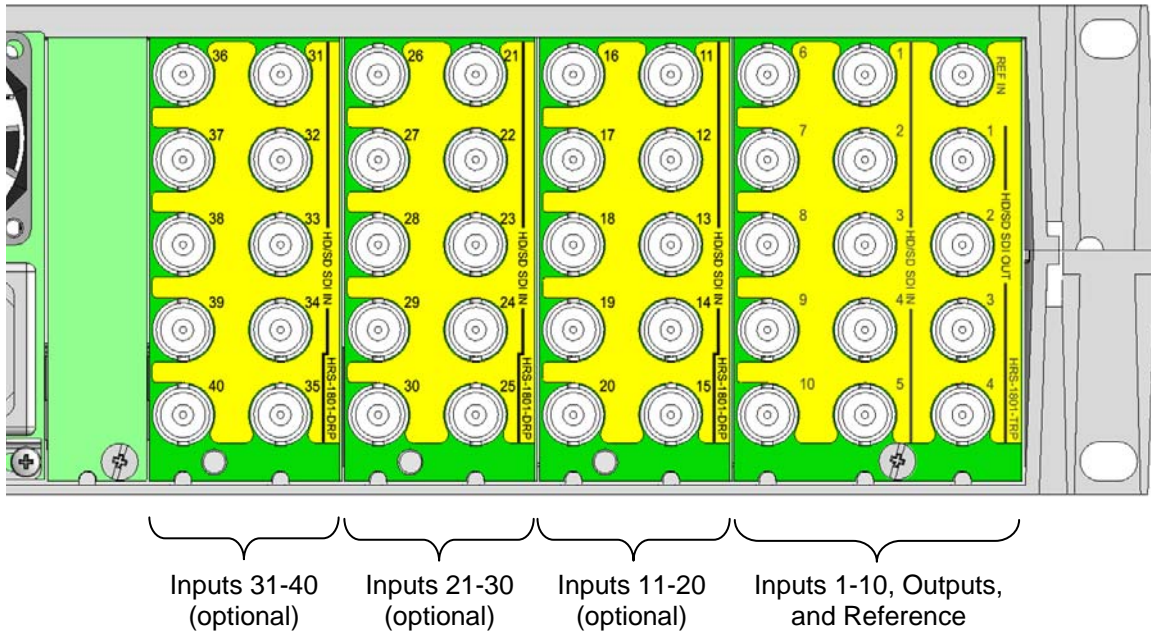
**Figure 2.3** HRS-1801 card configuration and cross-coupler boards

- Note that the status LEDs on the input cards are not visible through the frame door. The output card status LED displays all status information for the HRS-1801

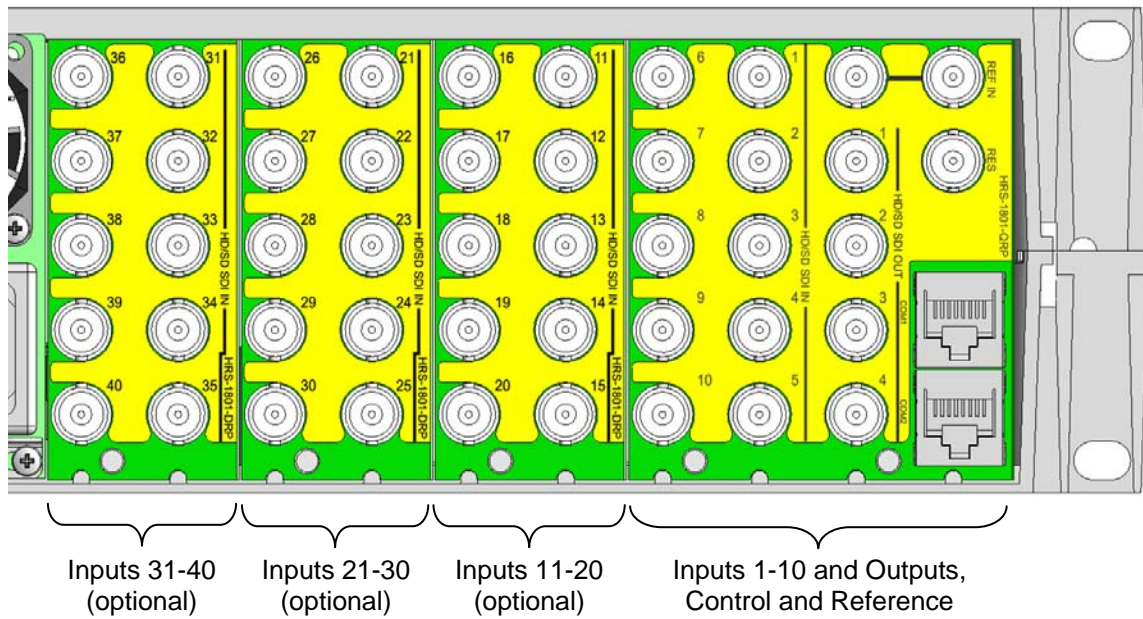
Here are views of the rear of the Densité frame showing the rear panels installed for a full 40-input (4-input-card) HRS-1801 system. Two versions are shown:

- Basic version (TRP), requiring a 3-slot-width rear panel for the output and input 1 cards (figure 2.4)
- Extended Control version (QRP), requiring a 4-slot-width rear panel for the output and input 1 cards (figure 2.5)
  - Note: When using the QRP rear module, be sure to terminate the Reference loop if not used





**Figure 2.4** HRS-1801 rear panels (TRP basic version)



**Figure 2.5** HRS-1801 rear panels (QRP extended control version)

### 2.3 Connection

Refer to Figures 2.4 and 2.5 above for rear panel connector locations.

**REF IN – Studio reference input**

For external synchronization, connect the studio reference signal to the BNC labeled **REF IN**.

- The QRP version provides a loop-through connector

The table shows the reference formats that are valid for the various input formats supported by the HRS-1801.

<b>REFERENCE &amp; INPUT SIGNAL COMPATIBILITY</b>		Reference Formats					
		525	625	1080i59.94	1080i50	720p59.94	720p50
Supported Input Formats	525	X					
	625		X				
	1080i59.94	X		X			
	1080i50		X		X		
	720p59.94	X				X	
	720p50		X				X
	ASI						

The line switching standard will be chosen according to the current reference connected to the output card. This implies that on an HD installation that uses composite black burst for reference, the switch will occur on the SD switch line, not on the HD line.

- The reference used by the HRS-1801 will come from the output rear or from the URS input line.
- For all the options available on the HRS-1801 (reclock & clean switch), the reference will be used to switch according to the SMPTE line switching standard.
- In AUTO mode, the card can automatically select which source to use as the reference. When the currently-used reference choice is no longer available then the card will automatically jump to the next choice. The order of choices is as follows:
  1. Ref input
  2. Frame Ref (URS)

*Note: The frame reference module is only available in a Densité 2 frame. The generation of URS requires a dedicated card.*

The URS protocol contains a lot of reference signals; the standard used by the HRS will be selected with the menu or messages.

- If reference frame rate does not match the selected input/output, a REF MISMATCH error will be reported.

**HD/SD SDI INPUTS – serial digital HD/SD inputs (up to 40)**

Connect serial digital video signals, conforming to the SMPTE 292M standard for HD input signals and SMPTE 259M standard for SD input signals, to the BNC connectors labeled **HD/SD SDI IN**.

The HRS-1801 also supports ASI and SMPTE-310M in a non-reclock and non-clean switch configuration.

**HD/SD SDI OUTPUTS – serial digital video outputs (4)**

The HRS-1801 provides four HD/SD SDI video outputs on BNC connectors, labeled **HD/SD SDI OUT 1, 2, 3, 4**. The SD SDI video signal conforms to the SMPTE 259M-C standard, while the HD SDI video signal conforms to the SMPTE 292M standard.

The HRS-1801 also supports ASI and SMPTE-310M formats, but only in a non-reclock and non-clean switch configuration.

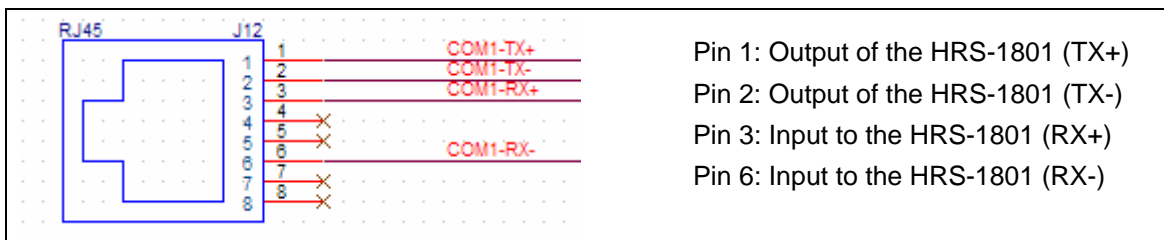
- Outputs 3 and 4 are always independent
- Outputs 1 and 2 may be independent or identical, depending on the mode of operation (Nx3 or Nx4)

	Operating mode	
	Nx3	Nx4
<b>Relationship between Outputs 1 and 2</b>	Identical	Independent

**COM1 and COM2 (QRP rear panel only)**

These two RS422 ports are completely independent, and can be configured separately.

The RS422 interface is usually accomplished using DE9 connectors, but the compact configuration of the Densité package requires the use of a more space-efficient connector. The pinout of the RJ45 connectors found in the QRP rear is shown the following diagram.



**Figure 2.6** RS422 pinout on RJ45 connector

Here are the configurable parameters, and the available options for each (default values in **bold**)

Baud Rates	<b>9600</b> , 19200, 38400, 57600, 76800, 115200
Data	<b>8 bits</b>
Parity	<b>None</b> , Even, Odd
Stop bit	<b>1</b> , 1.5, 2
Protocol	<b>PRO-BEL SW-P-02</b> , PRO-BEL SW-P-08

### 3 Configuration

The HRS-1801 can be controlled in four different ways:

- The Densité frame's local control panel gives access to an on-board menu that allows the various features of the HRS-1801 to be configured and operated.
- Miranda's RCP-10x0 remote control panel can be used to operate the HRS-1801 from a remote location.
- Miranda's iControl system can be used to configure and operate the HRS-1801 from a remote computer, using a convenient graphical user interface (GUI).
- Automation via RS-422 ports (iRouter, Presmaster, etc.)

As the graphical interface is the most intuitive and easy-to-use method, it will be used as the basis for describing the functionality of the HRS-1801. A full description of how to use the local control panel and menu is given in section 3.2 beginning on page 24.

The RCP-10x0 remote control panel is described in its own manual.

#### 3.1 Configure the HRS-1801 using the iControl Interface

iControl is Miranda's graphical user interface. Users can remotely access and operate many Miranda products from a remote computer via an IP interface.

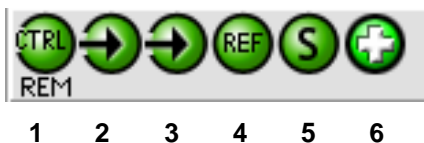
Establish the IP connection between the computer and the Densité frame containing the HRS-1801 system.
















##### 3.1.1 The iControl graphic interface window

The basic window structure for the HRS-1801 is shown in figure 3.1. The window identification line shows the Label assigned to this card – default is the card type (*HRS-1801*) – and the slot number for this card in its Densité frame. The label can be changed in the Info tab.

There are three main sections in the window itself, identified in figure 3.1:

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



Icon #	Indicates	appearance	interpretation
1	Card control status	 	Green if the card is controlled remotely Yellow when locally controlled
2	Input error	  	Green if OK, Red if error detected Grey if detection is disabled <i>Note: Each input error can be masked independently</i>
3	Timing error	  	Green if OK Red if error detected Grey if detection is disabled, clean switch disabled or reference not present <i>Note: Each timing error can be masked independently</i>
4	Reference status	  	Green if OK, Red if an error has been detected or there is no reference connected Grey if reference error reporting is disabled
5	Scan all inputs	 	Green if full scan is activated Yellow if one specific input has been selected <i>(Note: Some status may not be reported correctly in the single-input mode)</i>
6	Card Monitoring	 	Green if OK Red if an error has been detected (fan error, for example)

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

2. The left portion of the window contains all the parameter groups, which become highlighted when they are selected; the main panel (3) then displays the group's set of parameters. Each of the groups is described in detail below.

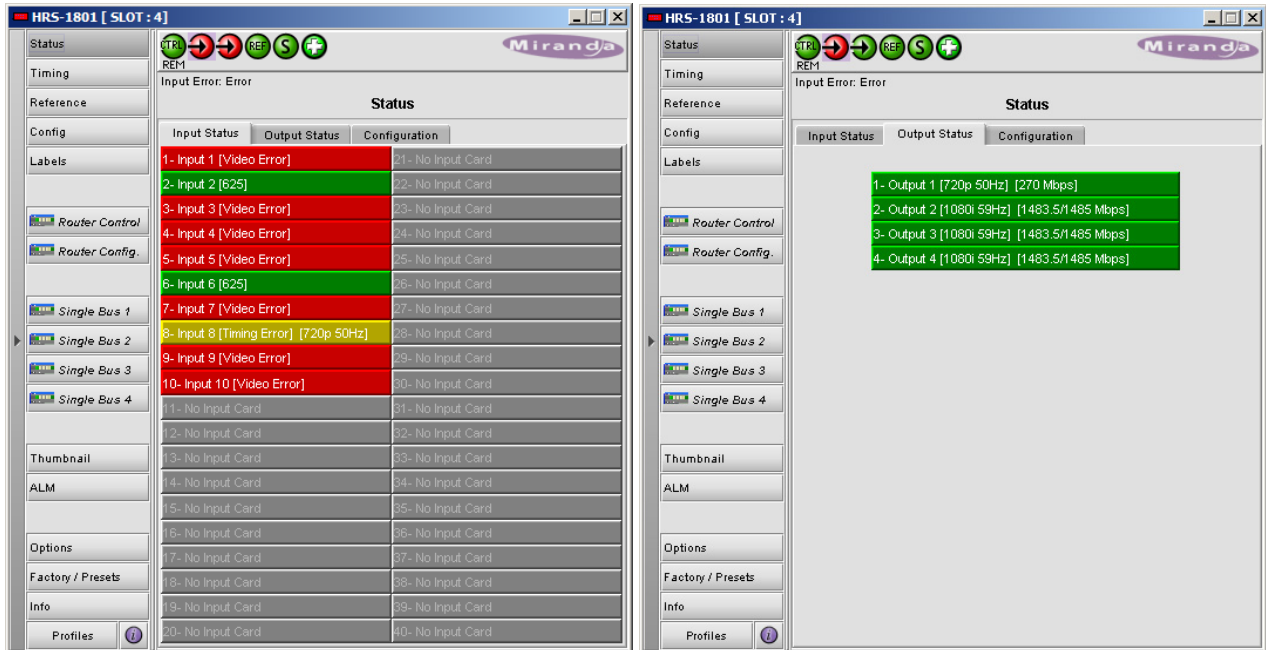
3. The main panel contains all the parameters specific to the group selected. It may contain several tabs to help manage the different parameters.



Figure 3.1 HRS-1801 iControl graphic interface window

### 3.1.2 Status

Access the Status panel to see a report of the status of all inputs and outputs of this HRS-1801 system. Select the Input Status tab or the Output Status tab as required. Status is reported by the text and the color.

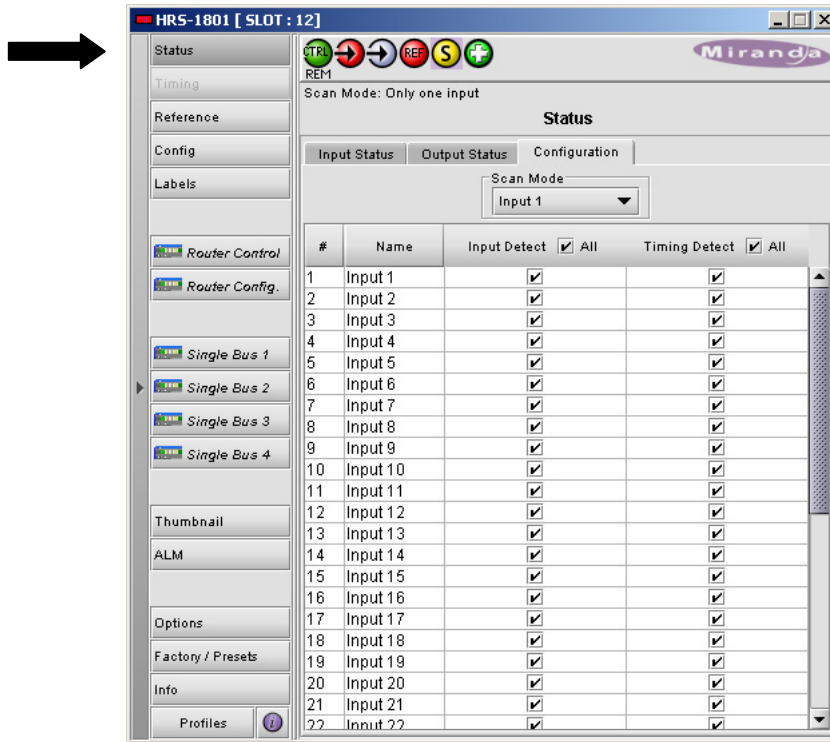


The background color is used to convey the status to the viewer.

Status of...	Color	Text & notes
INPUT	Green	Input Name [detected signal format]
	Red	Input Name [Video Error]
	Yellow	Input Name [Timing Error] [detected signal format] <i>In clean switch mode only, indicates that the input is outside the timing window</i>
	Light Grey	Not scanned. <i>This means that the HRS-1801 is in the single-input scan mode and is unable to retrieve the status of this input</i>
	Dark Grey	No input card
OUTPUT	Green	Output Name [signal format] [bit-rate]
	Red	No signal

Select the Configuration tab to select whether Input and Timing errors are to be detected and reported for the individual inputs. This allows you to disable these error reporting mechanisms for selected inputs where errors are not important and error reports would not be useful.

- Click in the individual *Input Detect* and *Timing Detect* checkboxes beside each input to enable or disable the indicated mechanism
- Click in the *All* checkbox at the head of a column to enable or disable that mechanism for all inputs

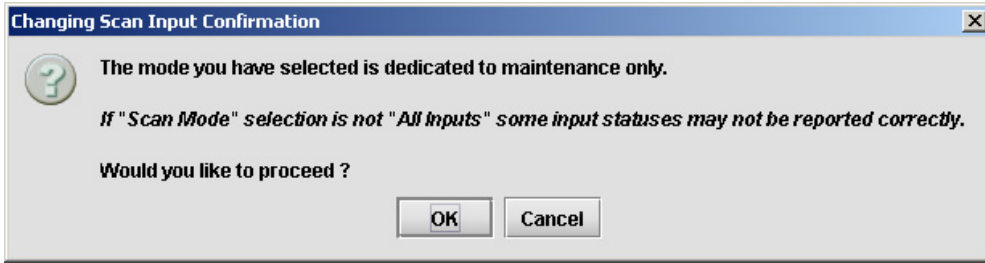


Note that if you disable an error reporting mechanism, then the input presence or timing will be reported as OK (i.e. green) to iControl or RCP-10x0 in all cases, even when an error is present.

### Scan Mode

Choose the inputs to scan for format detection

- All inputs: this is the normal operating mode
- Input X: This feature is available especially for maintenance. Because input detection takes about ½ second per input, the “round-robin” input scanning scheme in use can take about 20 seconds for a 40-input router. If you select a single input, the status is essentially displayed in real time. However, the status report is not updated on the unscanned inputs. Because the system needs to know the type of all the inputs in order to make appropriate switching decisions, the “All inputs” mode should be selected in normal operation. When a single input is selected, iControl will display the following message:



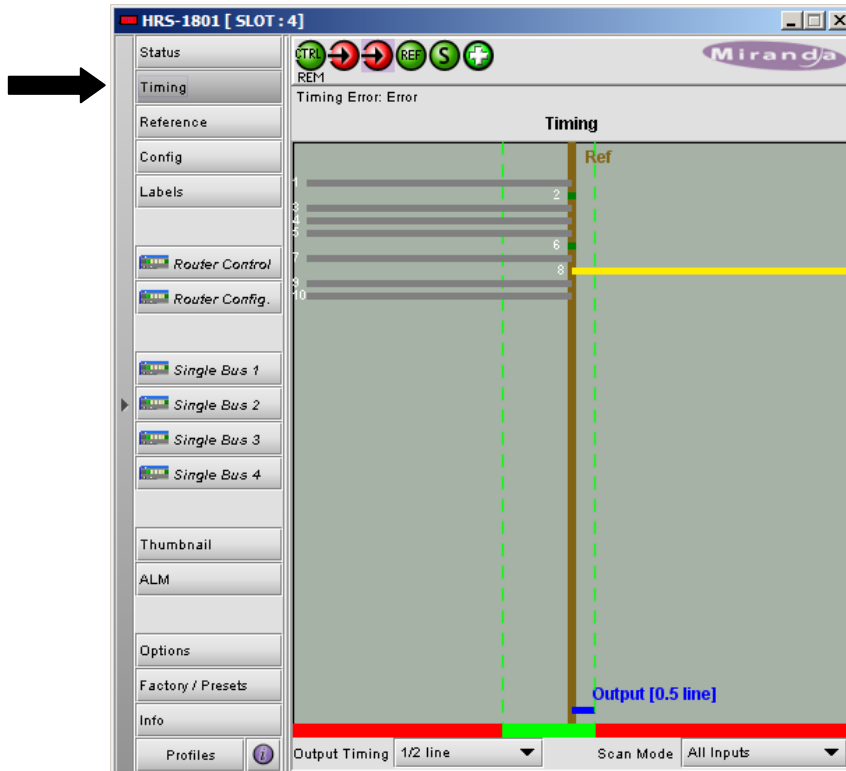
Note 1: The “Scan all inputs” icon at the top of the iControl window is yellow in the “Input X” mode

Note 2: Only the selected input is displayed in the Input Status panel. All others are grayed out and marked “Not Scanned”.

Note 3: A duplicate of this Scan Mode selection control is provided on the Timing panel (see section 3.1.3)

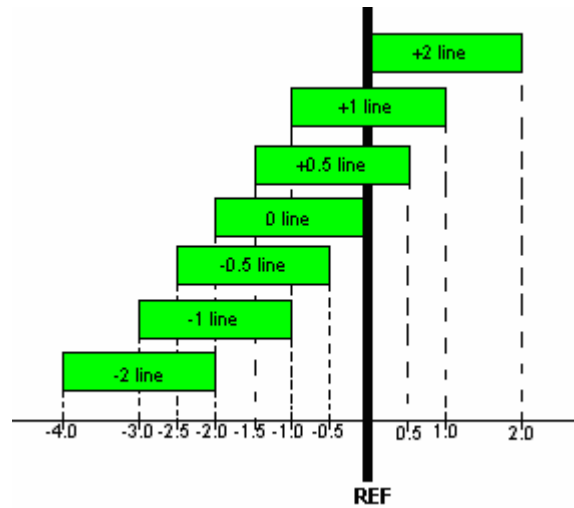
### 3.1.3 Timing

Open the Timing panel to see a graphical display of the timing of the individual channels with respect to the reference.





The HRS-1801 offers a 2-line adjustable buffer. The following graph shows how the HRS-1801 timing configuration works.



The regions in green (on the iControl Timing panel and on the graph) show the interval where a signal should appear in order to be considered as valid for a clean switch.

The HRS-1801 offers the possibility to add or remove an offset in order to use misaligned sources without having to adjust them at the front end. If there is not enough range in the buffer, a Timing Error will be reported and the user will have to retime the input signals before feeding the HRS-1801 inputs.

In the iControl Timing panel shown above, inputs 2 and 6 are valid for a clean switch but input 8 is totally out of the timing window. The input position measured, with respect to the reference, will be displayed when a specific input is selected.

- For example, when the reference position is set to 0, the input signal must be located between -1 and 1 line from the reference

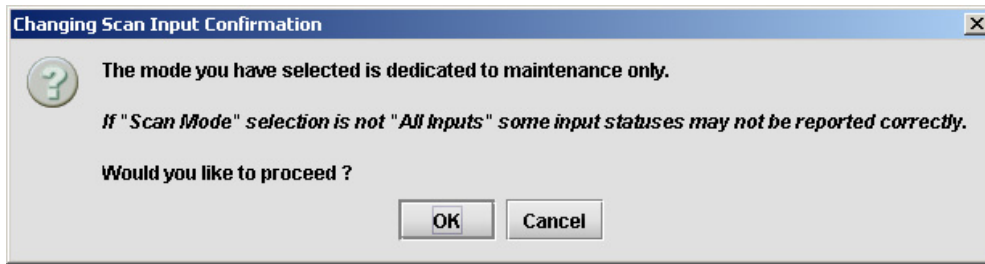
### Output Timing

Use the pulldown to manually select the timing offset, and view the graphical display to see if the inputs all fall within the timing window that will allow a clean switch

### Scan Mode

Choose the inputs to scan for format detection

- All inputs: this is the normal operating mode
- Input X: This feature is available especially for maintenance. Because input detection takes about ½ second per input, the “round-robin” input scanning scheme in use can take about 20 seconds for a 40-input router. If you select a single input, the status is essentially displayed in real time. However, the status report is not updated on the unscanned inputs. Because the system needs to know the type of all the inputs in order to make appropriate switching decisions, the “All inputs” mode should be selected in normal operation. When a single input is selected, iControl will display the following message:



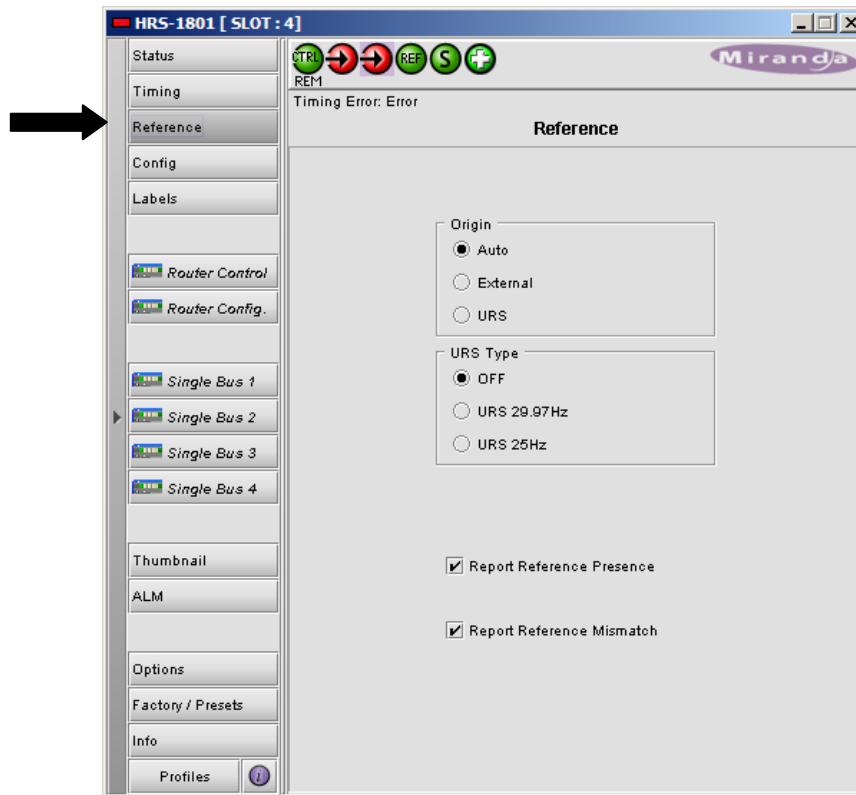
- Note 1: The "Scan all inputs" icon at the top of the iControl window is yellow in the "Input X" mode
- Note 2: Only the selected input is displayed in the Input Status panel. All others are grayed out and marked "Not Scanned".
- Note 3: A duplicate of this Scan Mode selection control is provided on the Configuration tab of the Status panel (see section 3.1.2)

Note: This Timing panel will be disabled if:

- Clean Switch is not enabled
- A reference is not present

### 3.1.4 Reference

The HRS-1801 output signals should always be genlocked to some reference source. The genlock source is selected in the Reference control panel.



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

- Auto – this mode selects the first source detected in this order of priority:
  - Reference input (External)
  - URS
- Reference input – selects the signal connected to the rear-panel REF IN connector
- URS (Universal Reference Signal) – selects the internal reference from the backplane
  - Note: URS was made available from the Densité2 and following chassis (it is not available in the first release of the chassis)

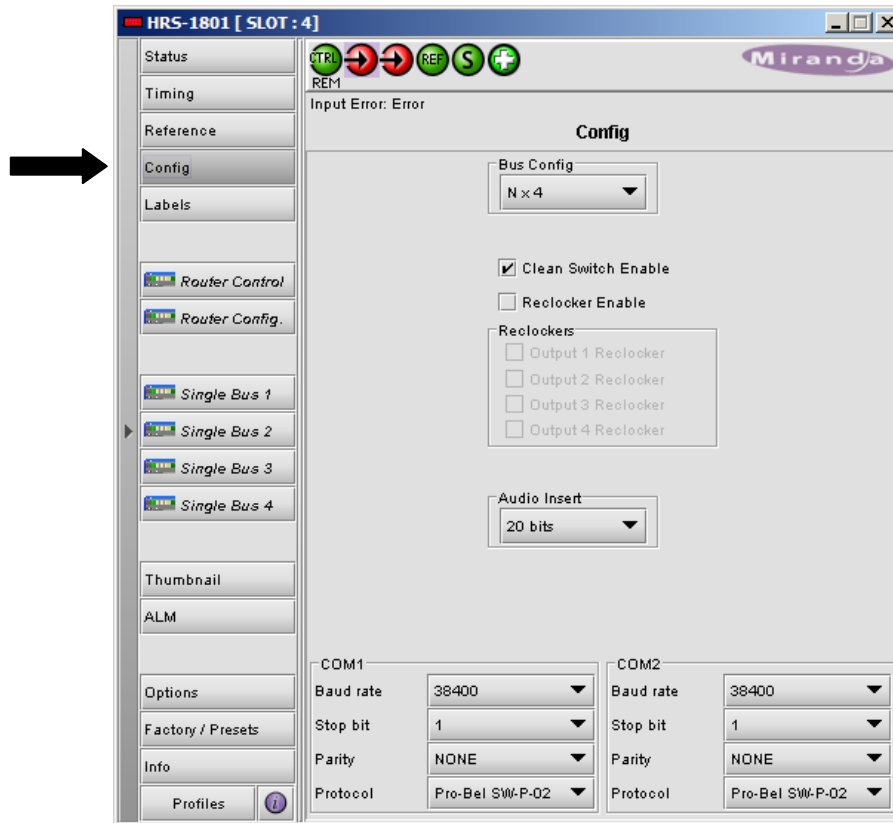
URS Type – use the radio buttons in the URS Type area to select URS OFF, 29.97 Hz or 25 Hz.

*Report Reference Presence* – select this checkbox to turn on error reporting for reference presence detection. This reports the presence of the rear-panel REF IN signal

*Report Reference Mismatch* – select this checkbox to turn on error reporting for reference mismatch detection. This reports a mismatch in format between the rear-panel REF IN signal and the selected input video signal.

### 3.1.5 Config

Open the Config panel to gain access to controls to set up the operating parameters for this HRS-1801.

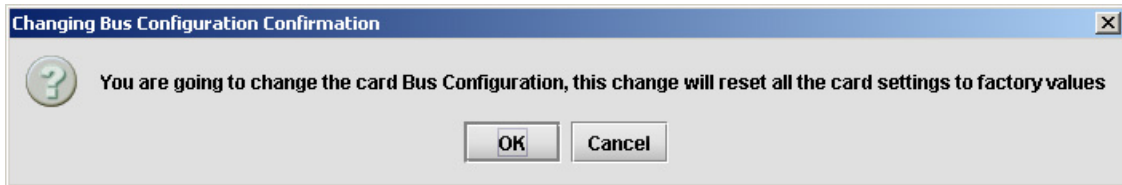


**Bus Config**

Select the bus configuration as (Nx4, Nx3)

- If Nx4 is selected, all outputs are independent
- If Nx3 is selected, outputs 1 and 2 are identical

NOTE 1: if you change configurations, you will reset the card parameters to the factory default values. A warning message will be displayed, and you must click “OK” to confirm the change, or “Cancel” to remain in the current configuration.



NOTE 2: If Nx3 is selected, all router controls will show only 3 busses. The *Single Bus 4* selection button at the left side of the control panel will be greyed-out.

NOTE 3: the following chart shows the relationship between bus designations in iControl and output connectors for the two possible bus configurations:

Rear Connector (BNC)	Bus designation in iControl	
	(Nx4)	(Nx3)
Out 1	1	1
Out 2	2	1
Out 3	3	2
Out 4	4	3

**Clean Switch Enable**

Enable or disable the Clean Switch option. This box is only active if the Option is installed (see section 3.1.9)

**Reclocker Enable**

Enable or disable the Reclocker option. This box is only active if the Option is installed (see section 3.1.9)

**Reclockers**

If the Reclocker option is installed and enabled, you can turn the four individual output reclockers on or off using these checkboxes.

**Audio Insert**

Choose the audio insertion mode from the pulldown list:

- 20 bits
- 24 bits

**COM1 & COM2**

Configure the two RS422 communication ports COM1 and COM2, selecting values from the pulldown lists.

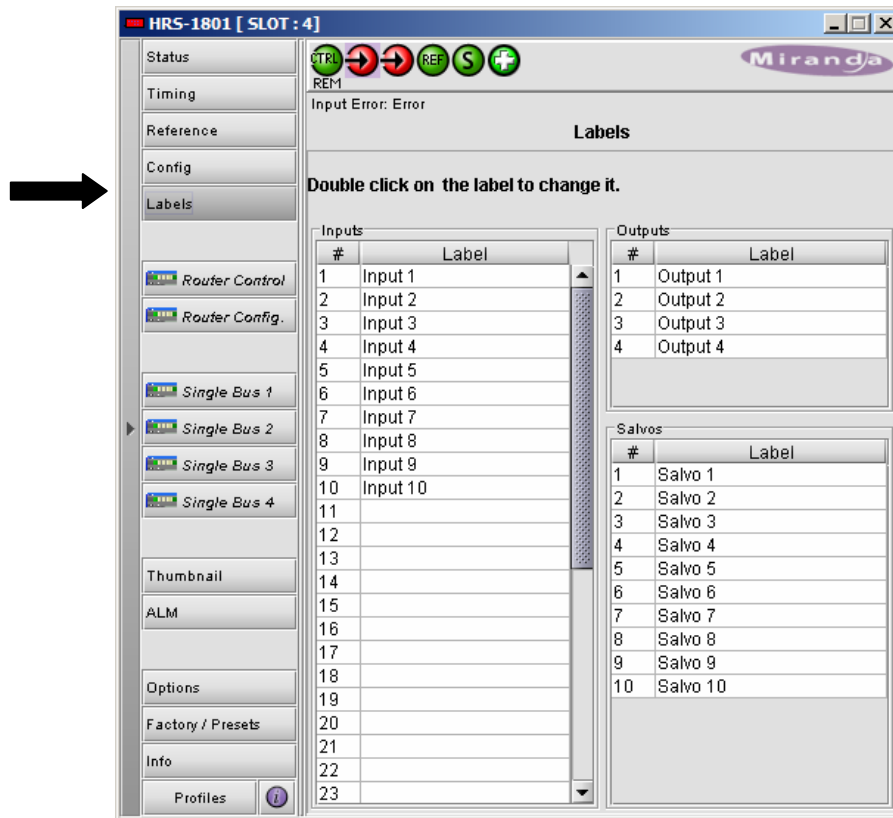
- Baud rate (115200, 76800, 57500, 38400, 19200, 9600)

- Stop bit (1, 1.5, 2)
- Parity (None, Even Odd)
- Protocol (Pro-Bel SW-P-02, Pro-Bel SW-P-08)

### 3.1.6 Labels

Open the Labels panel to set the labels that will be displayed for the various inputs, outputs and salvos of this HRS-1801. Label names for salvos stored in the system (see section 4.1.1.2) can also be set in this panel.

- Click in the Label column beside the input, output or salvo number of interest, and type the desired name. The labels are limited to 16 characters.
- Labels cannot be edited for unavailable inputs, outputs or salvos.



### 3.1.7 Thumbnail

Open the Thumbnails panel to set up the HRS-1801 to send thumbnail images of the video signals, usable in iControl applications.

- move the cursor over the player window to see the IP address of the router

The following controls are available:

*Enable* – Turn thumbnail generation ON (Video) or OFF

*Size* – select the size of the Thumbnail image (small, medium or large)

*Player* – turn the player function (i.e. display in this panel) OFF or ON (Video)

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

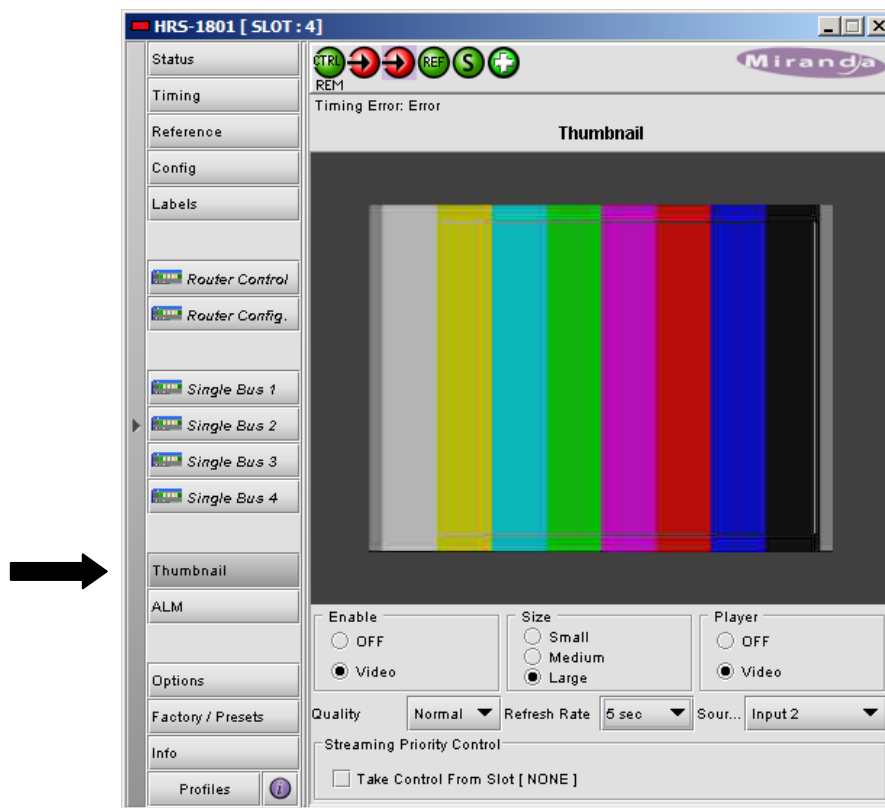
*Refresh Rate* – select the desired refresh rate from the pull-down box. The choices are:

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

*Source* – Select the desired input or output to thumbnail.

- In the drop down menu, the name in green indicates that a signal is present on this particular input. If the text is red, no input is present

*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.



Note: Labels in the thumbnail sources drop down menu will report the status of the input:

- Green: Valid input
- Red: No Source
- Yellow: Valid input but out of the timing window

### 3.1.8 Audio Level Meters (ALM)

Open the ALM panel to set up the audio level meters that can be streamed from this HRS-1801 and viewed in iControl applications.

Eight meters are supported.

At the bottom of the main panel is a section titled RALM Remote Control (Max 4 Pairs):

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: fast, medium or slow.

#### RALM Connections (tab)

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 (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.



### 3.1.9 Options

The Options panel has two tabs, one for each of the available options:

- Clean Switch option
- Reclocker option

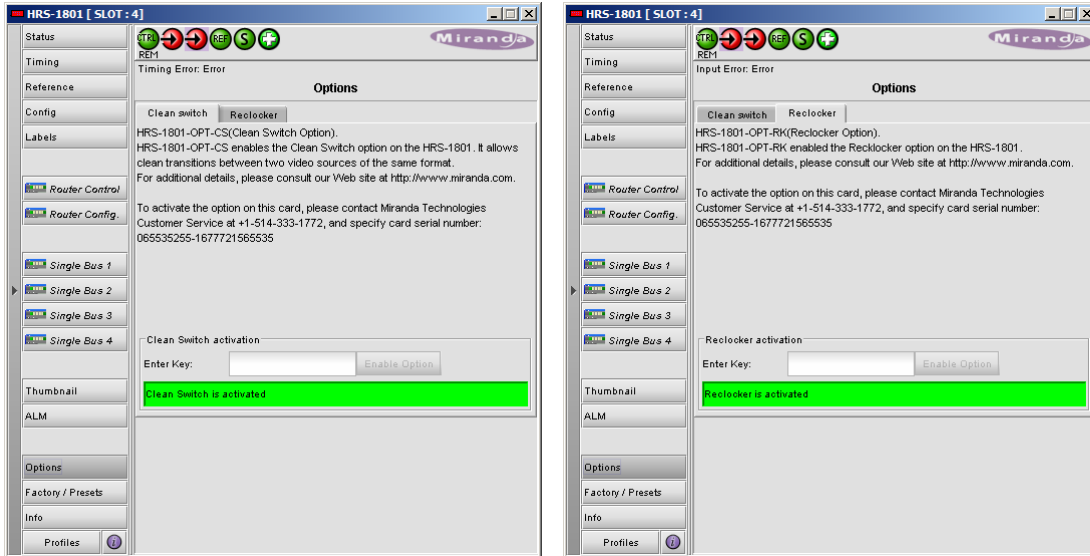
Select the tab for the option you wish to install, and follow the instructions given in the text.

The options are enabled by entering a code, which can be purchased from Miranda.

- Type the code into the Enter Key data box, then click the Enable Option key.
- Text indicating the option is enabled will be shown in the text box at the bottom of the panel, against a green background.

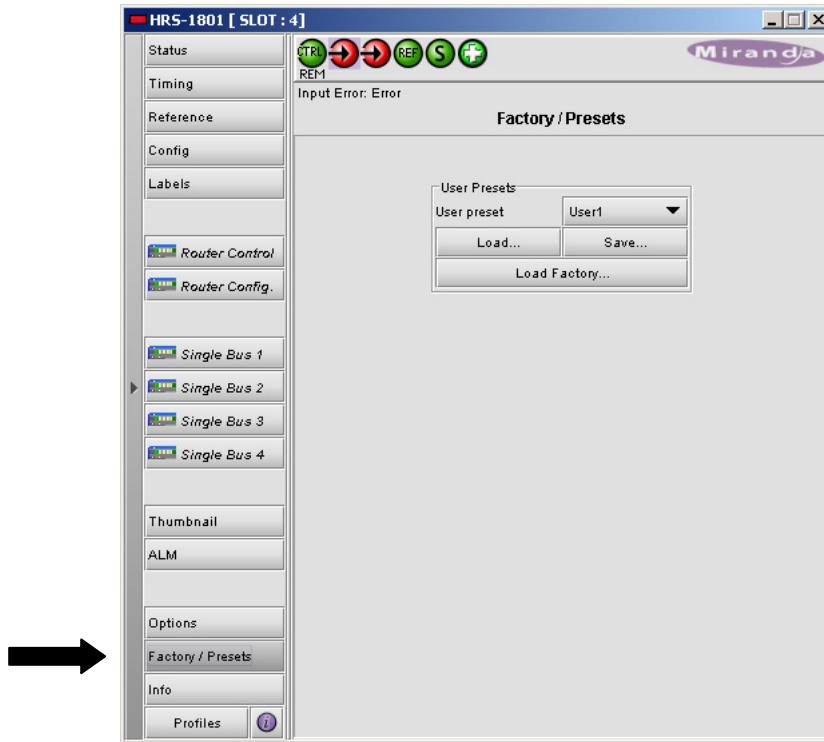


Once enabled, the option will always be available, even if the HRS-1801 is disconnected and powered down. The options can be turned on or off via checkboxes in the Config panel (see section 3.1.5)



### 3.1.10 Factory / Presets

Open this panel to access the User Preset controls, and the Load Factory button.



**User Presets**

The User Presets allow you to store the current settings and configuration of the HRS-1801 into one of 5 available storage bins, and to recall and reinstall them later. The contents of the user presets are preserved if the unit is powered down.

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*)

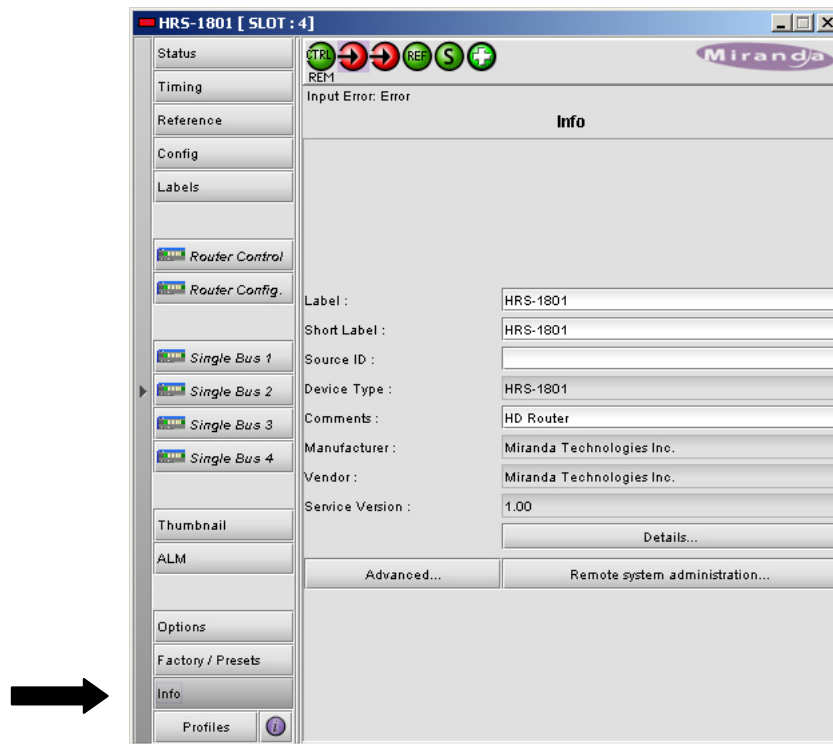
- Click *Load* to load the contents of the selected User Preset into the HRS-1801. All parameter settings and values will be replaced by the contents of the selected User Preset.
- Click *Save* to store the current parameter settings and values from the HRS-1801 into the selected User Preset. The existing contents of the preset will be overwritten.

**Load Factory**

Click this button to return the HRS-1801 to its factory preset configuration. A confirmation panel will open, requiring a second click to complete this action.

**3.1.11 Info**

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



Label: type the label that will appear for this HRS-1801 when displayed in iControl applications

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

Source ID type a descriptive name for this HRS-1801

Comments: type any desired text

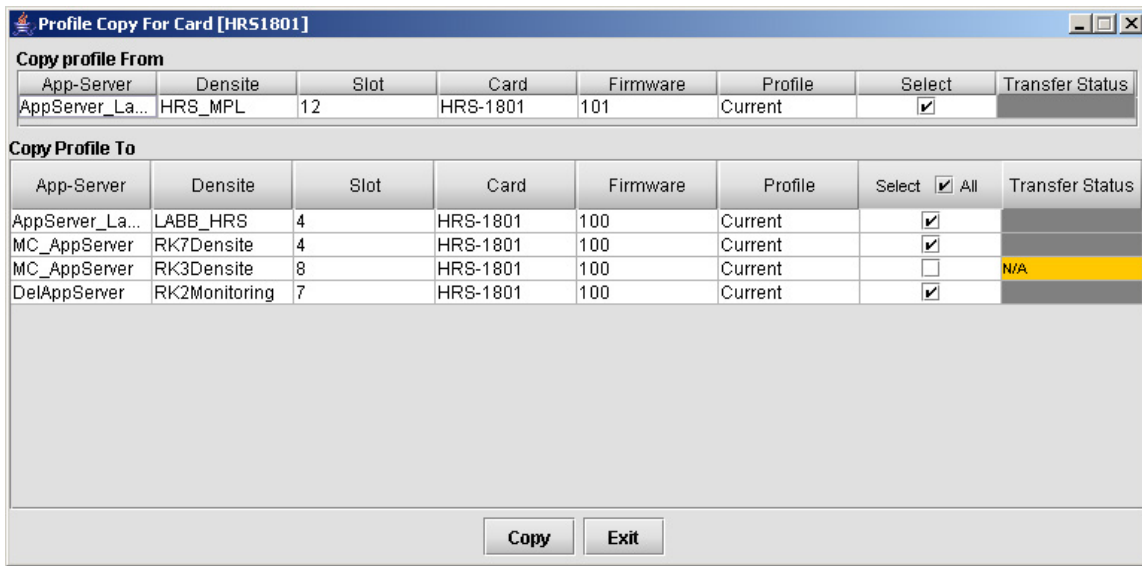
The remaining data boxes show manufacturing information about this card.

Three buttons in the panel give access to other information.

- Details...: Reports the Firmware version, service version, and panel version for this card
- Advanced...: Shows the Miranda LongID for this card. The Miranda LongID is the address of this HRS-1801 in the iControl network.
- Remote System Administration – opens the Joining Locators data box.

### 3.1.12 Profiles

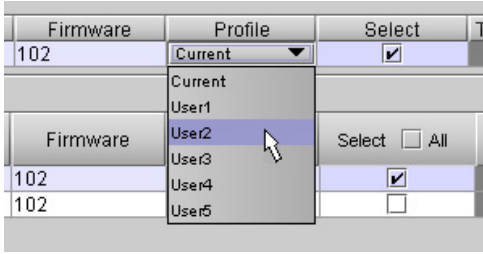
The *Profiles* button at the bottom allows the user to export profiles to other HRS-1801 routers. Click to open the panel.



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

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

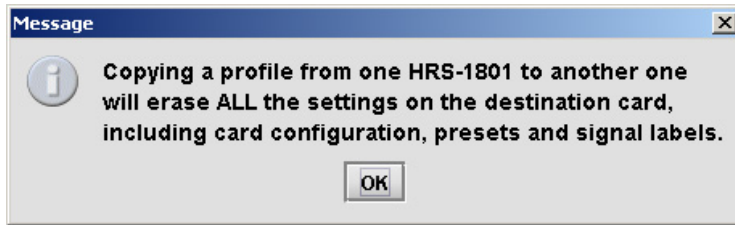
- Click in the individual *Select* boxes to select one or more destination HRS-1801 cards, or click *Select All* to select all of them at once. Those noted as not available (N/A) in the Transfer Status column cannot be selected.
- Click on the *Profile* entry in the source HRS-1801 line to see a pulldown 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 HRS-1801 cards.

**WARNING:** Copying a profile from one HRS-1801 to another will erase ALL settings from the destination card, including card configuration, presets and signal labels. If you copy the profile of a small router to a larger one (e.g. source is 10x4, while destination is 20x4 or larger) you may lose information regarding the existing router configuration for the additional inputs. For example, labels for inputs 11 to 40 will be erased when copying a 10x4 profile onto a 40x4 router.

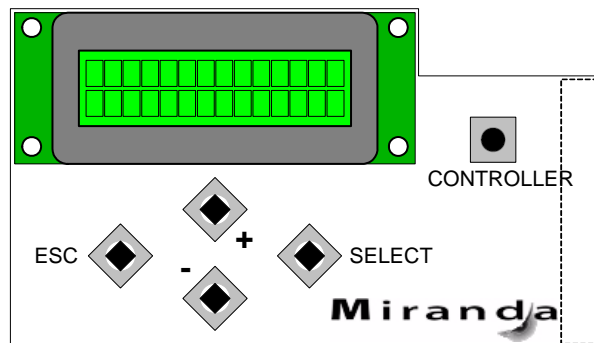
Clicking the purple information icon beside the *Profiles* button brings up a warning message to this effect.



### 3.2 Configure the HRS-1801 using the local control panel

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

The panel is assigned to operate any card in the frame by pushing the SELECT button on the front edge of that card. Pushing the CONTROLLER button on the control panel selects the Controller card itself. The STATUS LED on the selected card flashes yellow.



The local control panel displays a menu that can be navigated using the four pushbuttons located beneath the display.

The functionality of the five pushbuttons is as follows:

- [CTRL]      Selects the controller card for status monitoring and adjustment
- [+] [-]      Used for menu navigation and value modification
- [SELECT]    Gives access to the next menu level. When a parameter value is shown, pushing this button once enables modification of the value using the [+] and [-] buttons; a second push confirms the new value
- [ESC]        Cancels the effect of parameter value changes that have not been confirmed; pushing [ESC] causes the parameter to revert to its former value.

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

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

Here is the menu for the HRS-1801 system.

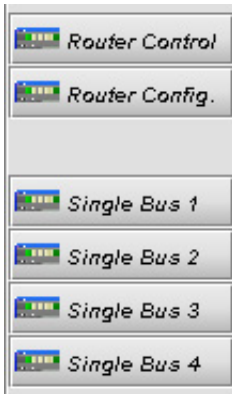
# GUIDE TO INSTALLATION AND OPERATION

STATUS	REF PRESENCE	NO EXTERNAL REF, EXT. REF 525, EXT. REF 625, EXT. REF 1080i60, EXT. REF 1080i50, EXT. REF 720p60, EXT. REF 720p50		
	URS PRESENCE	NO URS, URS 29.97, URS 25	*Disabled if no URS card is present in the Densite chassis	
	ROUTER SIZE	SIZE NO REAR, TRIPLE REAR, QUAD REAR HARDWARE FAILURE FAN ERROR	*Size: N/A, 10x4, 20x4, 30x4, 40x4, 10x3, 20x3, 30x3, 40x3	
	IP LOSS	1, 2, 3, ..., 10 11, 12, 13, ..., 20 21, 22, 23, ..., 30 31, 32, 33, ..., 40		*Inputs 11 to 40 are enabled only when corresponding input cards are present
	IP TIMING ERROR	1, 2, 3, ..., 10 11, 12, 13, ..., 20 21, 22, 23, ..., 30 31, 32, 33, ..., 40		*Inputs 11 to 40 are enabled only when corresponding input cards are present
	REF MISMATCH ERROR	1, 2, 3, ..., 10 11, 12, 13, ..., 20 21, 22, 23, ..., 30 31, 32, 33, ..., 40		*Inputs 11 to 40 are enabled only when corresponding input cards are present
	USER PRESET	LOAD SAVE	USER 1, USER 2, USER 3, USER 4, USER 5 USER 1, USER 2, USER 3, USER 4, USER 5	
ROUTER CONFIG	ROUTER ID	1, 2, ..., 250		
	ROUTER MODE	10x4, 10x3		
	SCAN MODE	AUTO, FIXED		
	SCAN SOURCE		CH1..40	*This submenu is available only if Scan Mode is "fixed"
ROUTER OPERATION	DEST SELECT			
	DEST 1	CHANNEL SELECT LOCK MODE INHIBITS	CH1..40	1..40 OFF, LOCK, PROTECT
	DEST 2	CHANNEL SELECT LOCK MODE INHIBITS	CH1..40	OFF, ON 1..40 OFF, LOCK, PROTECT
	DEST 3	CHANNEL SELECT LOCK MODE INHIBITS	CH1..40	OFF, ON 1..40 OFF, LOCK, PROTECT
	DEST 4	CHANNEL SELECT LOCK MODE INHIBITS	CH1..40	OFF, ON 1..40 OFF, LOCK, PROTECT
			CH1..40	OFF, ON
	RECLOCKER MODE	OFF, ON		*This submenu is available only if reclock option has been enabled
	RECLOCKER 1..4	OFF, ON		*These submenus are available only if reclock mode is ON
	CLEANSWITCH MODE	OFF, ON		*This submenu is available only if clean switch option has been enabled
	AUDIO EMBED SIZE	20 BITS, 24 BITS		*This submenu is available only if clean switch option has been enabled
REFERENCE	SOURCE	AUTO, EXTERNAL, URS		*(AUTO= external, URS)
	URS FORMAT	OFF, 29.97, 25		
	VERT OUT TIMING	-2 LINES, -1 LINE, -0.5 LINE, 0 LINE, +0.5 LINE, +1 LINE, +2 LINES		
MASK IP LOSS*	MASK IP1 LOS ERR	ON, OFF		*This submenu is available only when at least 1 input card is present
	MASK IP2 LOS ERR	ON, OFF		
	...			
	MASK IP40 LOS ERR	ON, OFF		
MASK TIMING ERROR*	MASK IP1 TIM ER	ON, OFF		*This submenu is available only when at least 1 input card is present
	MASK IP2 TIM ER	ON, OFF		
	...			
	MASK IP40 TIM ER	ON, OFF		
CONFIG ALARMS	NO INPUT SIGNAL	ALARM LEVEL ALARM REPORT		GREEN, YELLOW, RED, FLASH RED NONE, GPI
	TIMING ERROR	ALARM LEVEL ALARM REPORT		GREEN, YELLOW, RED, FLASH RED NONE, GPI
	REF MISMATCH	ALARM LEVEL ALARM REPORT		GREEN, YELLOW, RED, FLASH RED NONE, GPI
	NO REF	ALARM LEVEL ALARM REPORT		GREEN, YELLOW, RED, FLASH RED NONE, GPI
CONFIG EXT COMs	COM1	BUADRATE STOPBIT PARITY PROTOCOL		115200, 76800, 57600, 38400, 19200, 9600 1.5 STOP BIT, 1 STOP BIT, 2 STOP BITS NONE, EVEN, ODD PRO-BEL SW-P-02, PRO_BEL SW-P-08
	COM2	(SAME AS "COM1" SUBMENU)		
VERSION	HRS-1801: xxx			
OPTIONS	RECLOCK ON/OFF	KEY: XX.XX.XX.XX		
	CLEAN SWITCH ON/OFF	KEY: XX.XX.XX.XX		
FACTORY DEFAULT	RESTORE			

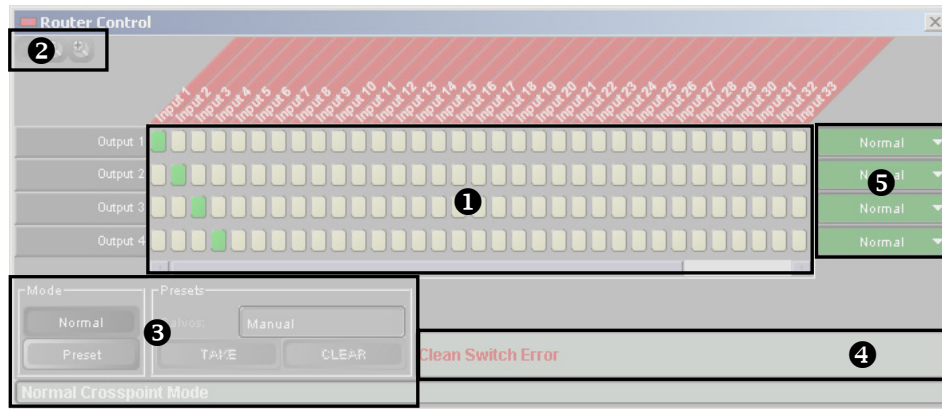
## 4 Operation

### 4.1 Operate the HRS-1801 using the iControl Interface

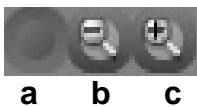
The iControl interface provides resources for operating the HRS-1801. These resources are accessed from the main control panel, using the six left-side buttons displaying the Control Panel logo:



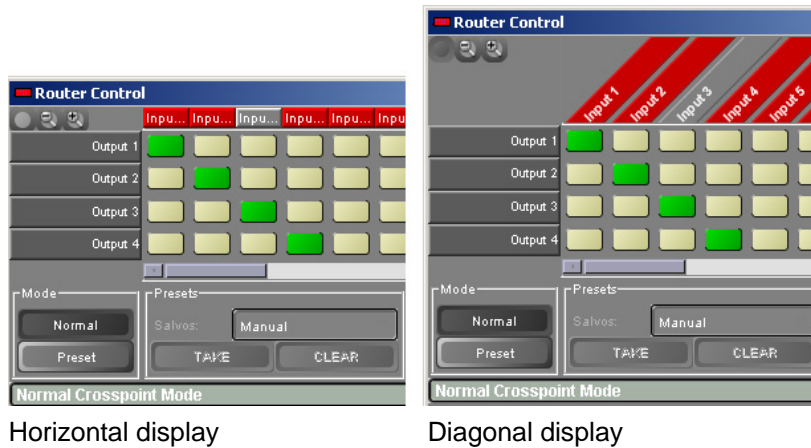
Clicking any of these buttons opens a Router Control Panel window that is quite different from the iControl windows used to configure the router. Each panel will be discussed separately, but they share common features that are highlighted in the figure below.



1. Crosspoint selector buttons, with labels at left to identify outputs, and labels above to identify inputs. The color of the label reflects the status of the associated input or output
2. View modifier buttons  
These buttons change the view of the crosspoint selector buttons and labels



- a switch the input labels between horizontal and diagonal display. Select the option that best suits your needs.



Horizontal display

Diagonal display

- b zoom out
  - c zoom in
- These two buttons allow you to zoom in and out on the crosspoint selector buttons and input labels. Zooming in makes the horizontal scale wider, so fewer buttons appear in the button window. The input labels are larger, so more text is visible.

When the selector buttons expand to the point where they cannot all be visible in the window, a slider bar appears below the buttons, allowing you to move your view to the inputs of interest.

3. Mode and Presets operating controls

The contents vary depending on whether you are in Configuration or Operating mode, and are described in the appropriate sections below.

4. Clean switch option status window

5. Lock/Protect controls

These controls are available in both Configuration and Operating modes, and are described in section 4.1.1.3

### 4.1.1 Operational Set-up

In the iControl main window, click the **Router Config** button in the left column. A new window will open giving access to operational setup controls for exclusions and presets.



### 4.1.1.1 Exclusions

In the lower left of this window, click the Exclusions button.



In the matrix display, click on crosspoints that you wish to exclude.

- Selecting a crosspoint in this display effectively disables it. It will be displayed in yellow with an X in the window. Once excluded, it can no longer be operated.

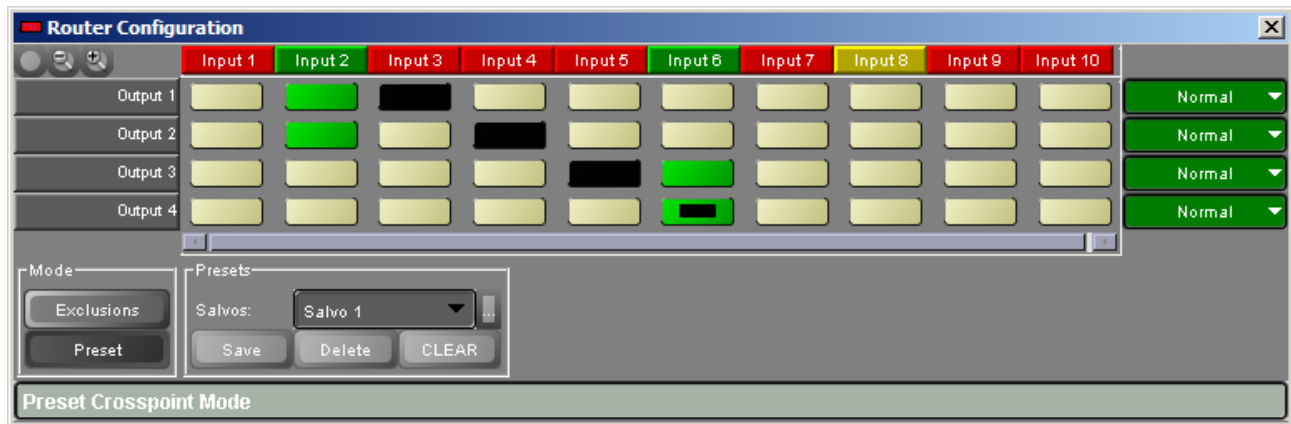
Click it again to deselect it.

- In this example, for instance, inputs 3, 4 and 5 will not be selectable on output 4 when the router is in operation.

### 4.1.1.2 Presets

In the lower left of the window, click the Preset button. This will put the system in Preset Crosspoint mode so that you can create and edit salvos.

- A **salvo** is a set of crosspoint selections on multiple output busses that will be executed simultaneously. The HRS-1801 offers a maximum of 10 salvos.



To create or edit a salvo:

1. Select it using the *Salvos* pull-down in the Presets section.

2. Click on the crosspoints you want to trigger when the salvo is executed. The crosspoint buttons will appear black when selected. Currently active crosspoints are shown in green, and will show a smaller black insert when selected in the salvo. See the figure above.
3. When finished selecting crosspoints, click Save to save the salvo configuration

To empty the contents of a Salvo:

1. Select it using the *Salvos* pull-down in the Presets section.
2. Click the Delete button
3. A pop-up window will ask you to confirm the deletion (options: yes, no, cancel)

Executing a salvo whose contents have been deleted will not change any of the crosspoints.

In the example shown in the figure above, executing Salvo 1 when the router is in operating mode will select Input 3 on Output 1, Input 4 on Output 2, Input 5 on Output 3 and Input 6 on output 4.

### 4.1.1.3 Lock/Protect Outputs

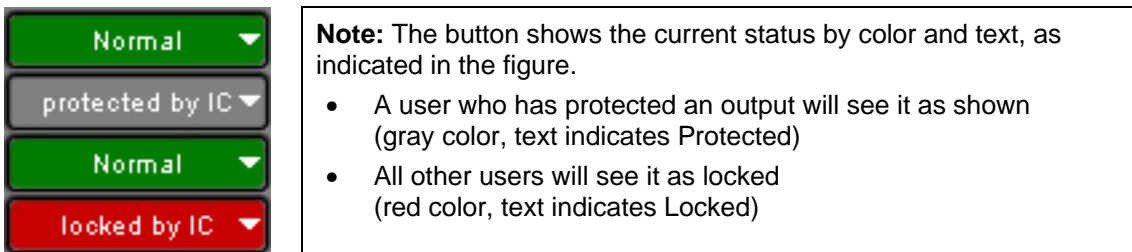
The HRS-1801 can have multiple users through its iControl interface. Each user can control the router independently. In order to provide some security for a user who is operating the router in a critical task, the HRS-1801 provides a means to moderate the crosspoint selection process.

The HRS-1801 allows any user to lock or protect outputs. The user who implements the lock or protect is the **owner** of the lock or protect

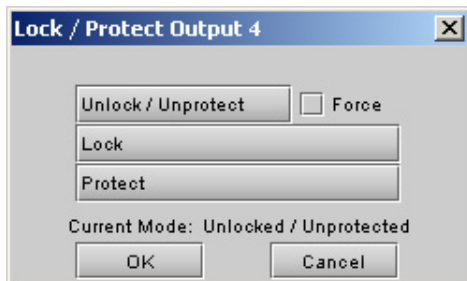
- **Lock** disables all the crosspoints until the owner unlocks the output.
- **Protect** disables the crosspoints to all users except the owner of the protect.

Each output bus is locked or protected independently, so each can be owned by a different user.

To manage the lock/protect process, click on the lock/protect status button at the right side of the control panel for the output bus of interest.



The following dialog will appear



Proceed as follows:

- Click *Lock* or *Protect* and then *OK* to place this output in the locked or protected state
- Click *Unlock/Unprotect* and then *OK* to remove the lock or protect and give all users access to this bus

There may be circumstances where a lock/protect exists that needs to be removed and the owner is not available (e.g. an RCP-10x0 is the owner, but the panel has been disconnected from the network). In such a case, the lock/protect can be removed by another user using the **Force** feature.

To remove a lock when you are not the owner:

1. Click in the Force box to select it – a check mark will appear
2. Click *Unlock/Unprotect* and then *OK* to remove the lock and give all users access to this bus

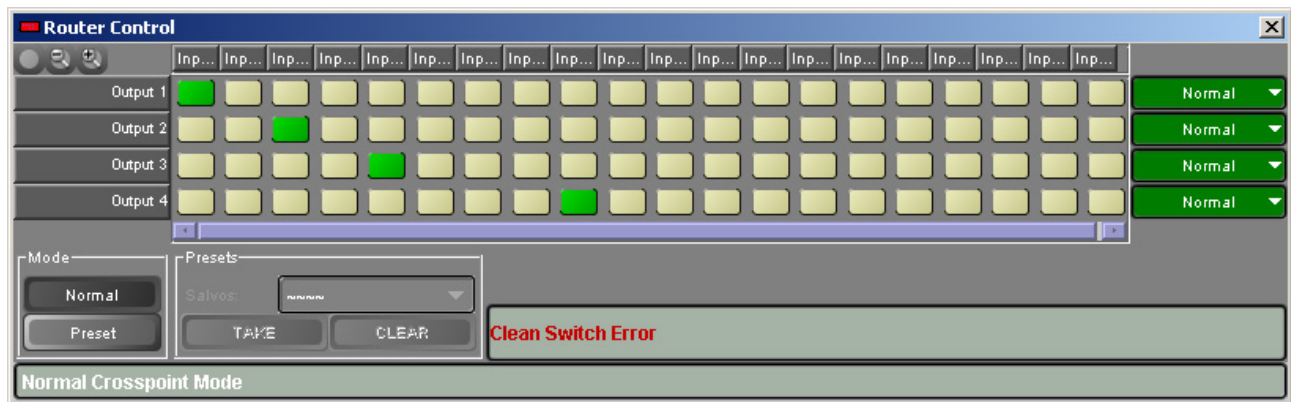
## 4.1.2 Operation

In the iControl main window, click the **Router Control** button in the left column. A new window will open giving access to operating controls for the HRS-1801.

- If you click one of the four **Single Bus** buttons, you will open a control panel that shows only that bus. It is operated like the full Router Control panel described in this section, except that
  - There is no Salvo operation, so the Preset mode operates like the Manual Preset on the full Router Control panel.

### 4.1.2.1 Normal Operation Mode

In the Mode area at the lower left of the control panel, click the **Normal** button



Note: Input labels at the top will reflect the status of the inputs (Green = valid signal, Red = No signal, Yellow = Valid signal but out of timing window)

This is the manual mode of operation. Activate any available crosspoint by clicking on it.

A cross point may be unavailable because:

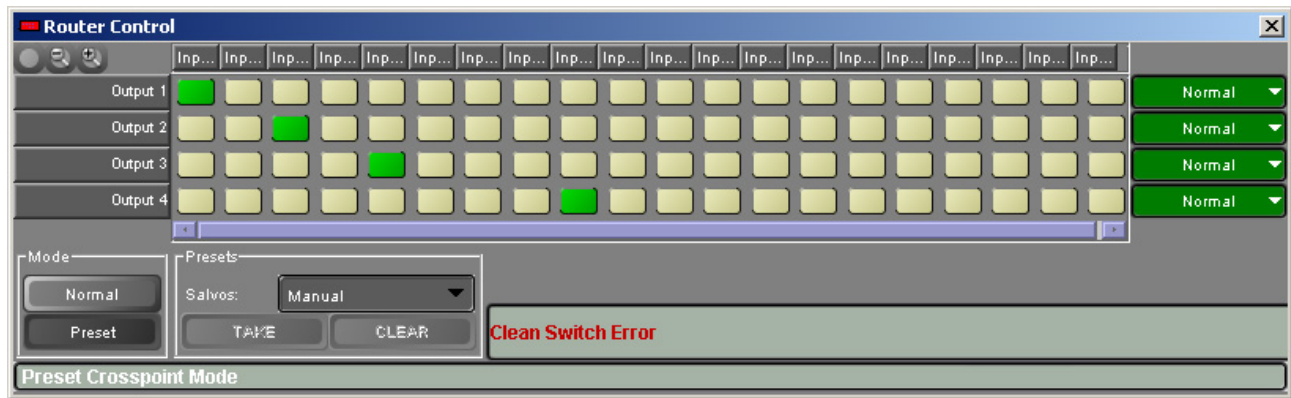
- It has been excluded using the Router Configuration Exclusions mode (see section 4.1.1.1). Excluded crosspoints are yellow with an X across their icon.

- The bus has been locked, or has been protected by another user. The Lock/Protect icon at the right side will be Red for that output, and marked “Locked by ...” (See section 4.1.1.3)

If the Clean Switch option is installed, and the two inputs (previous selection and new selection) meet the timing requirements for the clean switch option (see section 3.1.3) then the output switch will be glitch-free. If some inputs do not meet the clean switch timing requirement, the error notification box on the lower right side of the control panel will indicate a Clean Switch Error in red text.

### 4.1.2.2 Preset Operation Mode

In the Mode area at the lower left of the control panel, click the **Preset** button



The Presets area at the lower left beside the Modes selection buttons becomes active.

You may now set up a new router configuration, in either Manual or Salvo mode.

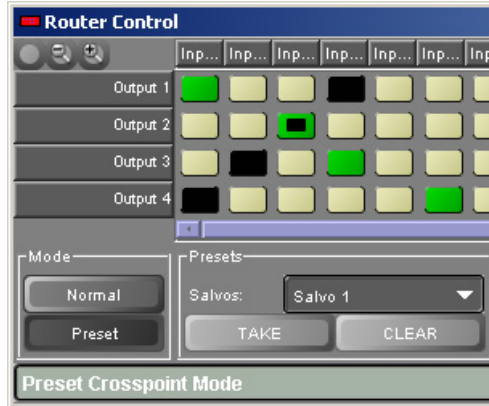
#### Manual Mode:

1. Select *Manual* using the Salvos pulldown.  
*This is the only mode available on the Single Bus control panels – there is no Salvos pulldown*
2. Manually set up the new configuration by clicking on crosspoints. Those you select will change to black. If you reselect a crosspoint that is currently active (shown in green), a small black box will appear within the green icon
3. You will not be able to select unavailable crosspoints. A cross point may be unavailable because:
  - It has been excluded using the Router Configuration Exclusions mode (see section 4.1.1.1). Excluded crosspoints are yellow with an X across their icon.
  - The bus has been locked, or has been protected by another user. The Lock/Protect icon at the right side will be Red for that output, and marked “Locked by ...” (See section 4.1.1.3)
4. Once you have selected one or more crosspoints, the Take and Clear buttons will become active.
5. Click Take to activate all the crosspoints that you have selected.
6. Click Clear to clear your selections without activating them.

#### Salvo Mode:

*(not available on the Single Bus control panels)*

1. Select one of the ten available Salvos using the Salvos pulldown. Any crosspoints that have been stored there will appear as black. If the selection is a currently-active crosspoint, a small black box will appear within the green icon.



2. Any crosspoints that are currently unavailable will not be selected, even if they were available and included when the salvo was saved. The existing selection will remain after the salvo is executed. A cross point may be unavailable because:
  - It has been excluded using the Router Configuration Exclusions mode (see section 4.1.1.1). Excluded crosspoints are yellow with an X across their icon.
  - The bus has been locked, or has been protected by another user. The Lock/Protect icon at the right side will be Red for that output, and marked "Locked by ..." (See section 4.1.1.3)
3. Once you have selected a Salvo, the *Take* and *Clear* buttons will become active
4. Click *Take* to activate all the crosspoints that you have selected.
5. Click *Clear* to clear your selections without activating them.

## 4.2 Operate the HRS-1801 using the RCP-10x0 Remote Control Panel

The HRS-1801 can be controlled using Miranda's RCP-10x0 remote control panel.

Please refer to the RCP-10x0 Guide to Installation and Operation for detailed instructions on installing and operating the RCP-10x0, and for instructions on how to connect the RCP-10x0 to the HRS-1801 (or any other supported card).

## 5 Specifications

### VIDEO INPUTS (10-40)

SIGNAL	SMPTE-259M-C (270Mbps) and SMPTE-292M (1.485, 1.485/1.001 Gbps) DVB-ASI, SMPTE-310M
SUPPORTED FORMATS	SD: 480i59.94, 576i50 HD: SMPTE-274M: 1080i59.94, 1080i50 HD: SMPTE-296M: 720p59.94, 720p50
CABLE LENGTH	275 m (900') Belden 8281 at 270 Mbps 110 m (350') Belden 1694A at 1.485 Gbps
RETURN LOSS	>15 dB up to 1.0 GHz >12 dB between 1.0 GHz & 1.5GHz

### VIDEO OUTPUT

#### SD MODE:

SIGNAL (4)	SMPTE-259-C (270 Mbps)
SUPPORTED FORMATS	SD: 480i59.94, 576i50
RETURN LOSS	>15 dB up to 270 MHz

#### HD MODE:

SIGNAL (4)	SMPTE 292M (1.485, 1.485/1.001 Gbps)
SUPPORTED FORMATS	HD: SMPTE 274M: 1080i59.94, 1080i50 HD: SMPTE 296M: 720p59.94, 720p50
RETURN LOSS	>15 dB up to 1.0 GHz >12 dB between 1.0 GHz & 1.5GHz
JITTER	< 0.2UI as per SMPTE-292M

### REFERENCE INPUT

Refer to section 2.3

### SERIAL CONTROL

CONNECTOR	RJ-45
SIGNAL	RS-422/485
DATA RATE	9600, 19200, 38400, 57600, 76800, 115200
PROTOCOL	PRO-BEL SW-P-02, PRO-BEL SW-P-08

**VIDEO PROCESSING PERFORMANCE**

SIGNAL PATH	10 bits
PROCESSING DELAY	Non Clean Switch: 30 ns Clean Switch: 2 Lines Maximum

**EMBEDDED AUDIO PROCESSING PERFORMANCE (Clean Switch Only)**

QUANTIZATION	20-24 bits
SAMPLING	48 KHz, synchronous
NUMBER OF CHANNELS PER BUS	16, 4 Groups

Note: Audio is supported in non-clean switch configuration, but no audio processing is performed (signal is passed through).

**POWER**

10x4	13 Watts
20x4	17 Watts
30x4	21 Watts
40x4	25 Watts