



# ***HDA-3911/-3931***

***Single/Dual 3G-HD-SD SDI Distribution Amplifiers***

***Guide to Installation and Operation***

***M3056-9900-101***

***2018-12-05***

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

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# 1 HDA-3911/3931 Single/Dual 3G-HD-SD SDI Distribution Amplifiers

## 1.1 Introduction

The HDA-3911/3931 is a 3G-HD-SD SDI video Distribution Amplifier supporting a variety of compressed and uncompressed serial digital video signals. The HDA-3911/3931 provides 9 reclocked outputs with automatic equalization for up to 140 meters of cable (Belden 1694A) at 1.485 Gbps and up to 90 meters at 2.97 Gbps. The HDA-3931 also offers the added benefit of implementing a dual 1x4 amplifier instead of a single 1x9.

When longer cable lengths are required, the HDA-3911/3931 are ideal since they can natively offer fiber connectivity.

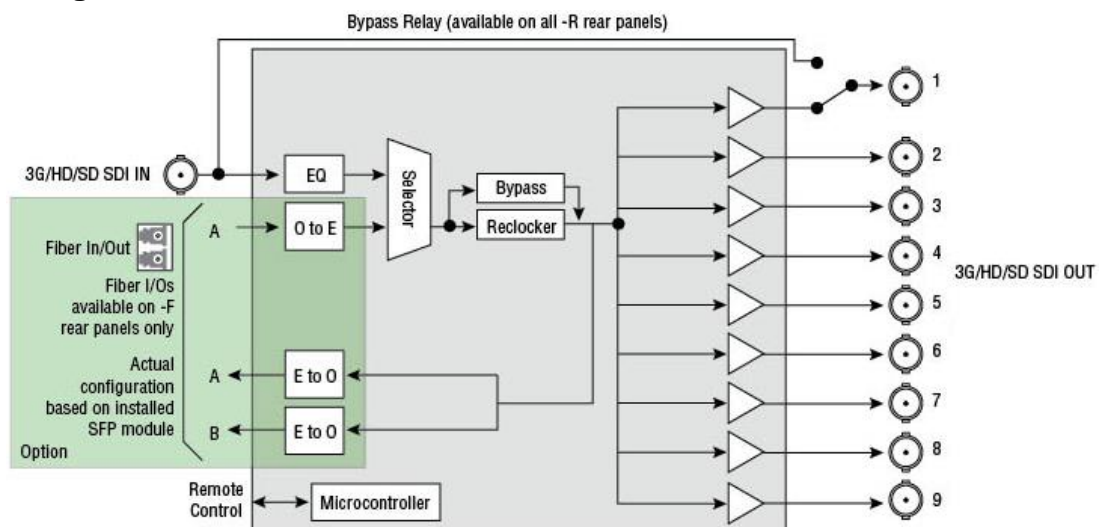
Additional protection for critical applications is provided by an optional protection bypass relay available on selected rears.

The HDA-3911/3931 will also support DVB-ASI on selected outputs.

## 1.2 Features

- One (HDA-3911) or two (HDA-3931) inputs
- Up to nine 3G HD-SD SDI outputs
- Supports bit-rates all the way up to 2.97 Gbps
- Maximum flexibility offered by HDA-3931 with two operation modes: single and dual within Densité-3
- Automatic format detection and cable equalization
- Optional fiber I/O
- Optional bypass relay protection
- DVB-ASI format is also supported (not on all outputs – see rear panel drawings in Fig. 2.1 for details)

## 1.3 Block Diagrams



**Figure 1.1(a)** HDA-3911 Functional Block Diagram

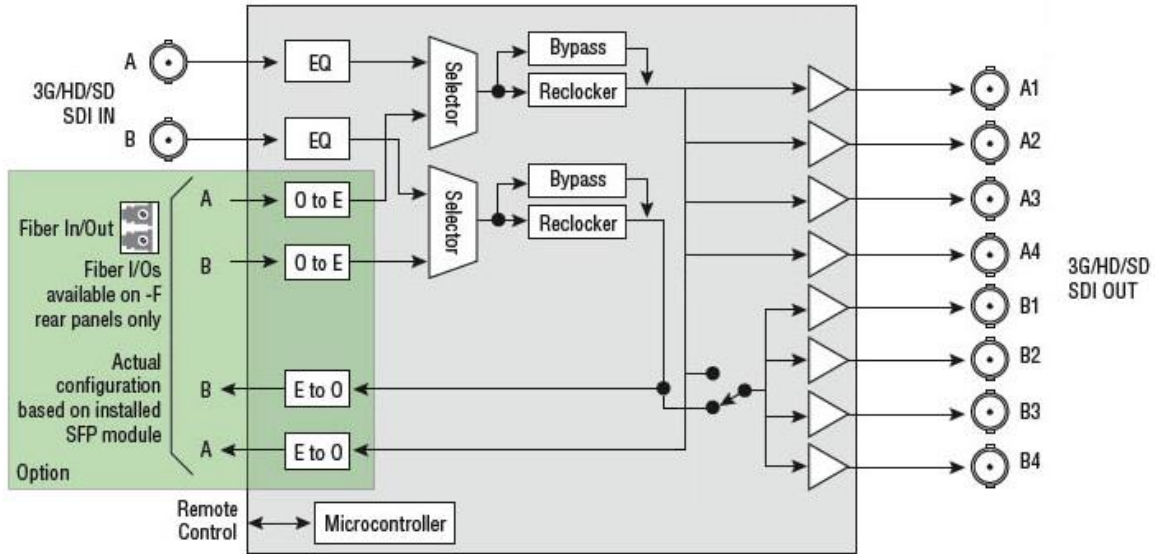


Figure 1.1(b) HDA-3931 Functional Block Diagram

### 1.4 Front Card-edge Interface

The front card-edge of the HDA-3911/31 incorporates two elements:

- Status LED (see section 3.2)
- Select Button (see section 3.3)

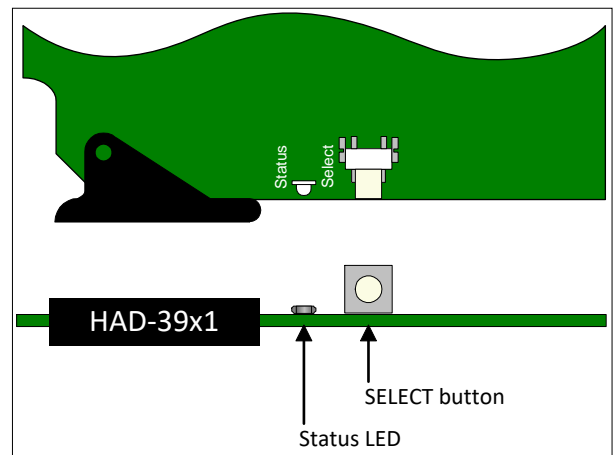


Figure 1.2 Front card-edge layout

## 2 Installation

### 2.1 Installation of Rear Connector Panels

The HDA-3911/31 card is sized to fit into Grass Valley's Densité 3 frame. Grass Valley Densité-series cards are each associated with a rear connector panel, which must be installed in the Densité 3 frame before the card can be inserted.

The following rear connector panels are available:

For the HDA-3911:

- HDA-391N-3SRP      Single rear for 1x7 operating mode.
- HDA-391N-3SRP-R      Single rear for 1x7 operating mode with bypass protection relay.
- HDA-391N-3SRP-F      Single rear for 1x5 operating mode with fiber option support.

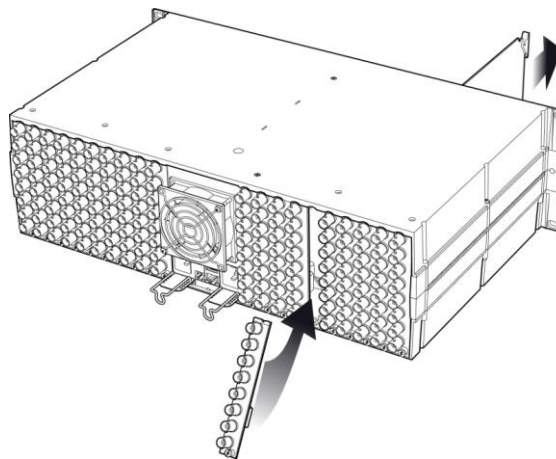
For the HDA-3931:

- HDA-393N-3SRP      Single rear for dual 1x3 operating mode.
- HDA-393N-3SRP-F      Single rear for dual 1x3 operating mode with fiber option support.
- HDA-393N-3DRP      Double rear for dual 1x4 operating mode.

All cards and rear panels can be installed with the frame power on. The card has connectors which plug into a mid-frame mother board for distribution of power and for connection to the controller card, and a second connector which plugs directly into the rear connector panel for input and output.

***The rear connector panel must be installed with the card out of the frame.***

- To remove an existing card from the slot, tilt up the swivel handle on the front of the card to lever the connectors apart, then use the handle to pull the card straight out of the slot.



***Densité 3 frame – rear panel installation***

***To install the connector panel:***

1. If a card is installed in the slot whose rear panel is being changed, remove it as described above.
2. Remove the existing panel (either blank or belonging to an existing card that is being changed) by releasing the captive screw(s) at the bottom.
3. Position the new panel and secure it in place with the captive screw(s) at the bottom.

## 2.2 Card Installation

Once a matching rear connector panel has been installed, install the HDA-39x1 card as follows:

1. Open the front panel of the frame.
2. Slide the HDA-39x1 card into the slot and push gently on the handle to seat the connectors.

If the card is used with a double-width rear panel (3DRP), it should be inserted into the right-hand slot. Inserting the card into the wrong slot will not damage the card, and will be flagged by the on-card status LED flashing red to indicate that there is no connection to the rear panel.

3. Close the front panel of the frame.

## 2.3 Rear Connector Panels

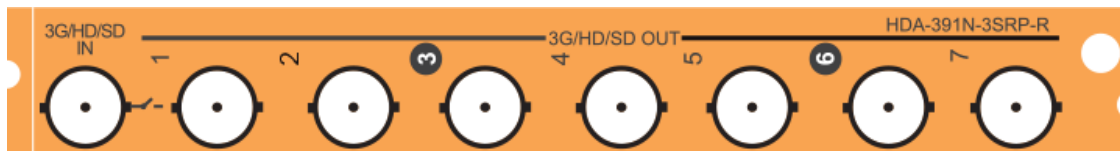
The following diagrams illustrate the layout and connectors on the available HDA-3911 and HDA-3931 rear panels.

### HDA-3911 Rear Panels:

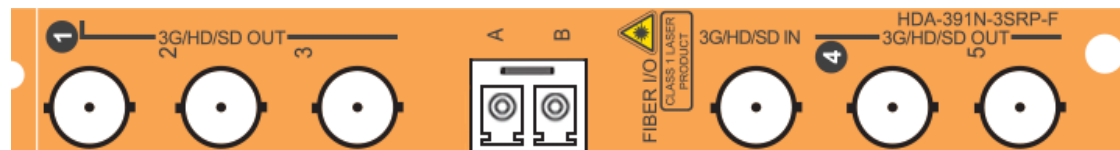
- **HDA-391N-3SRP** Single rear for 1x7 operating mode.



- **HDA-391N-3SRP-R** Single rear for 1x7 operating mode with bypass protection relay.



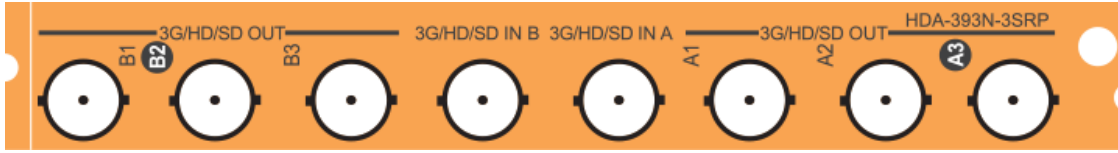
- **HDA-391N-3SRP-F** Single rear for 1x5 operating mode with fiber option support.



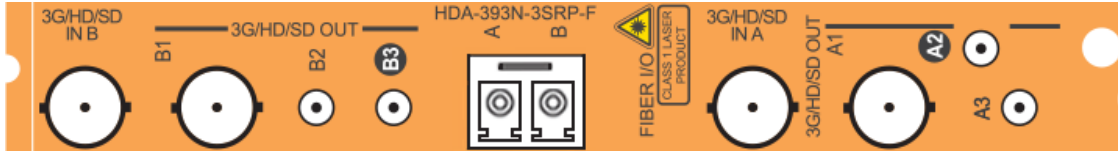
### HDA-3931 Rear Panels:



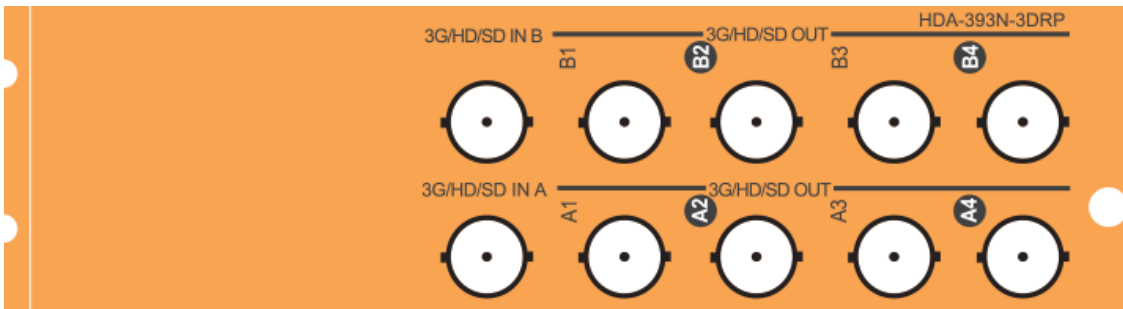
- **HDA-393N-3SRP** Single rear for dual 1x3 operating mode.



- **HDA-393N-3SRP-F** Single rear for dual 1x3 operating mode with fiber option support.



- **HDA-393N-3DRP** Double rear for dual 1x4 operating mode.



**NOTE - The outputs labeled with white letters on a black circle DO NOT support ASI output**

This table summarizes the input/output connections on the various rear panels shown above:

Rear panel type	I/O Connections			Bypass	Use with	
	3G-HD-SD SDI IN	3G-HD-SD SDI OUT	FIBER I/O		HDA-3911	HDA-3931
HDA-391N-3SRP	1	7			✓	
HDA-391N-3SRP-R	1	7		✓	✓	
HDA-391N-3SRP-F	1	5	✓		✓	
HDA-393N-3SRP	2	2 x 3				✓
HDA-393N-3SRP-F *	2	2 x 3	✓			✓
HDA-393N-3DRP	2	2 x 4				✓

\* Note that the **HDA-393N-3SRP-F** panel uses DIN1.0/2.3 connectors on outputs A2/A3 and B2/B3. All other electrical connectors on all panels are BNC.

### 3G-HD-SD IN – serial digital video inputs

Connect a serial digital video signal, conforming to the SMPTE 424M for 3 Gbps input signals, the SMPTE 292M standard for HD input signals or SMPTE 259M standard for SD input signals, to the BNC labeled **3G-HD-SD IN**. DVB-ASI is also supported. The HDA-39x1 will automatically switch to the detected video line format.

### 3G-HDSD OUT – serial digital video outputs

The HDA-39x1 provides multiple 3G/HD/SD SDI video outputs, labeled **3G-HD-SD OUT 1, 2**, etc. The SDI video signal conforms to the SMPTE 424M, SMPTE 292M or SMPTE 259M-C standard. Not all outputs support DVB-ASI – see the note on page 9.

### Fiber I/O connector

SFP optical modules are small, hot-pluggable cartridges which provide fiber connectivity to the HDA-3911/3931 distribution amplifiers. By using fiber instead of coaxial cable, these interfaces can be used over much longer distances without impacting signal quality.

SFP Modules can be installed into HDA-3911/3931 rear panels that offer SFP connectivity, easily identifiable by a -F extension in the Grass Valley Rear part number. A single SFP optical module offers either 1 or 2 fiber connections, available as single Tx or Rx, dual Rx or Tx or as a bidirectional Rx/Tx. Dual Rx or Dual Tx on single fiber can be achieved with the WDM SFP modules.

The fiber I/O connector accepts any of the available SFP cartridges. At the time of publication of this document, the following cartridges were available:

- SFP-R-LC Single fiber Rx (input) cartridge with LC/PC connector
- SFP-RR-LC Dual fiber Rx (input) cartridge with LC/PC connector
- SFP-T-S13-LC Single fiber Tx (output) cartridge at 1310 nm with LC/PC connector
- SFP-TT-S13S13-LC Dual fiber Tx (output) cartridge at 1310 nm with LC/PC connector
- SFP-RT-S13-LC Dual fiber Rx/Tx (input/output) cartridge at 1310 nm with LC/PC connector
- SFP-RR-W-LC Single fiber dual Rx (2 inputs) cartridge with WDM - LC/PC connector
- SFP-TT-W13W15-LC Single fiber dual Tx (2 outputs) cartridge at 1310 and 1550 nm with WDM - LC/PC
- SFP-TT-CxxCyy-LC Dual optical CWDM Tx cartridge, xx/yy nm with LC/PC connector
- SFP-THTH-CxxCyy-LC Dual optical hi-power CWDM Tx cartridge, xx/yy nm with LC/PC connector

Note – for CWDM cartridges, xx and yy are the wavelengths of the two lasers.

Insert the appropriate cartridge for your application into the Fiber I/O connector, and then connect the fibers to the cartridge via the LC connectors.

- **See ANNEX 2 on page 28 for a detailed description of the installation & removal procedure.**

## 2.4 Bypass Relay

Rear panels with an integrated bypass relay are identified by a –R designation. The relay activates automatically if the card loses power, or is removed from the frame.

When activated, the relay connects the 3G-HD-SD SDI input directly to 3G-HD-SD SDI output **1**, ensuring that the signal is available downstream.

When the card is re-activated, the relay disengages.

### 3 Operation

#### 3.1 Control Options

The HDA-39x1 can be controlled in two different ways:

- The local control panel and its push-buttons can be used to move through a menu of parameters and to adjust parameter values (see section 3.3).
- Grass Valley’s iControl system can be used to access the card’s operating parameters from a remote computer, using a convenient graphical user interface (GUI). (see section 3.4)

#### 3.2 Card-Edge Status LED

The status monitor LED is located on the front card-edge of the HDA-39x1, and is visible through the front access door of the DENSITÉ 3 frame. This multi-color LED indicates the status of the HDA-39x1 by color, and by flashing/steady illumination.

The chart shows how the various error conditions that can be flagged on the HDA-39x1 affect the LED status.

- If a cell is gray, the error condition cannot cause the LED to assume that status
- If more than one LED status is possible for a particular error condition, the status is configurable. See Section 3.4.6 for details.
- The factory default status is shown by a ⚙

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

Error Condition	LED Status			
	Green	Yellow	Red	Flashing Red
No input signal presence			⚙	
No lock on input signal		⚙		
No fiber present when needed	⚙			
No rear				⚙

⚙ : Factory default.

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

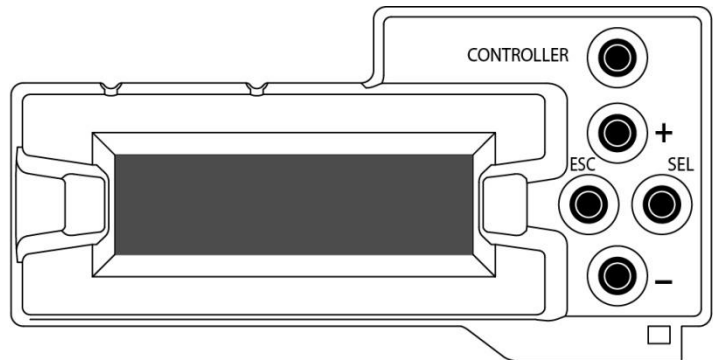
The LED will be Yellow when the card is in the “Firmware Update” mode.

### 3.3 Local control using the Densité 3 frame control panel

#### 3.3.1 Overview

Push the SELECT button on the HDA-39x1 card edge (see Section 1.4) to assign the local control panel to operate the HDA-39x1. Use the control panel buttons to navigate through the menu, as described below.

All of the cards installed in a Densité 3 frame are connected to the frame's controller card, which handles all interaction between the cards and the outside world. There are no operating controls located on the cards themselves. The controller supports remote operation via its Ethernet ports, and local operation using its integrated control panel.



**Figure 3.1** Densité 3 Frame local control panel

The local control panel is fastened to the front of the CPU-ETH2 controller card, 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 beside the display. The functionality of the pushbuttons is as follows:

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

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

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

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

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

#### 3.3.2 Menu for local control

The HDA-39x1 has operating parameters which may be adjusted locally at the controller card interface.

- Press the SELECT button on the HDA-39x1 front card edge to assign the Densité 3 frame's local control panel to the HDA-39x1
- Use the keys on the local control panel to step through the displayed menu to configure and adjust the HDA-39x1.

The complete menu structure is shown in Annex 1 to this document, beginning on page 26.

### 3.4 Remote control using iControl

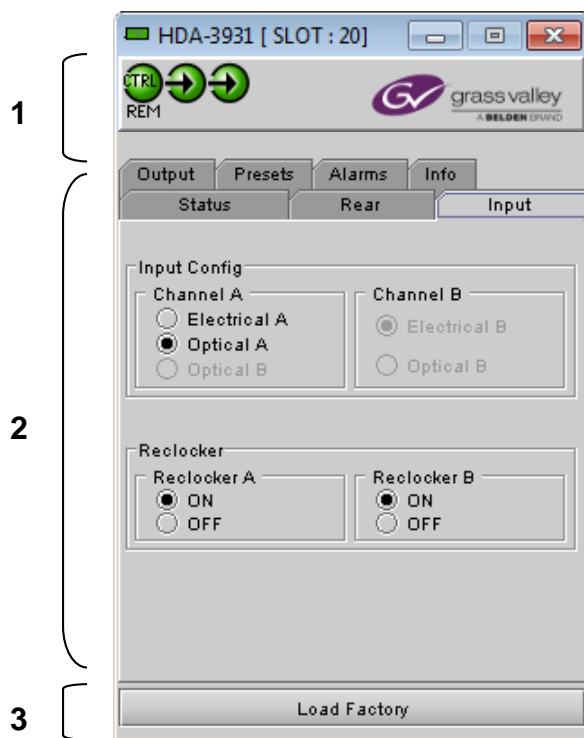
The operation of the HDA-39x1 may be controlled using Grass Valley's iControl system.

- This manual describes the control panels associated with the HDA-39x1 and their use.
- Please consult the iControl User's Guide for information about setting up and operating iControl.
- *Exception:* At the time of printing, the HDA-39x1 was not supported by iControl Solo

In iControl Navigator or iControl Websites, double-click on the HDA-39x1 icon to open the control panel.

#### 3.4.1 The iControl graphic interface window

The basic window structure for the HDA-39x1 is shown in figure 3.2. The window identification line gives the card type (*HDA-3911* or *HDA-3931*) and the slot number where the card is installed in its Densité frame.



**Figure 3.2** HDA-3931 iControl graphic interface window:

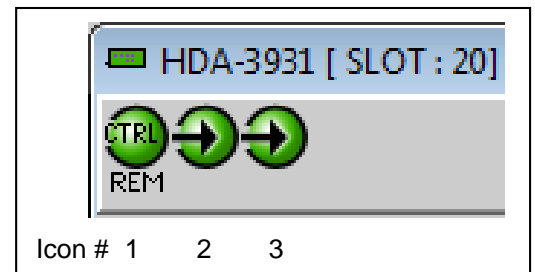
There are three main sections in the window itself, shown in Figure 3.2:

1. The top section displays icons on the left. These icons report the status of some parameters associated with this HDA-39x1. Figure 3.3 shows the three icons that may appear.

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

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

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











**Figure 3.3** iControl Status Icons

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

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

**Table – iControl Status Icon interpretation**

<b>Icon #1 – Manual Card Configuration</b>	
 (green)	Remote card control activated. The iControl interface can be used to operate the card
 (yellow)	Local card control active. The card is being controlled using the Densité 3 frame control panel, as described in section 3.3. Any changes made using the iControl interface will have no effect on the card.
<b>Icon #2 – Input A status</b>	
 (green)	Signal detected and valid. <ul style="list-style-type: none"> <li>• Beneath the icon, the format will be indicated as 3G, HD or SD, and the specific format details will be listed if the cursor is moved over the icon.</li> </ul>
 (red)	Input signal error No rear
 (grey)	No electrical input
<b>Icon #3 – Input B status (only on HDA-3911)</b>	
 (green)	Signal detected and valid. <ul style="list-style-type: none"> <li>• Beneath the icon, the format will be indicated as 3G, HD or SD, and the specific format details will be listed if the cursor is moved over the icon.</li> </ul>
 (red)	Input signal error No rear
 (grey)	No electrical input

2. The center portion of the iControl graphic interface window contains a series of control and information panels, selected by tabs.
  - Click on a tab to display the associated panel.
  - Each of these panels is described individually in the following sections.

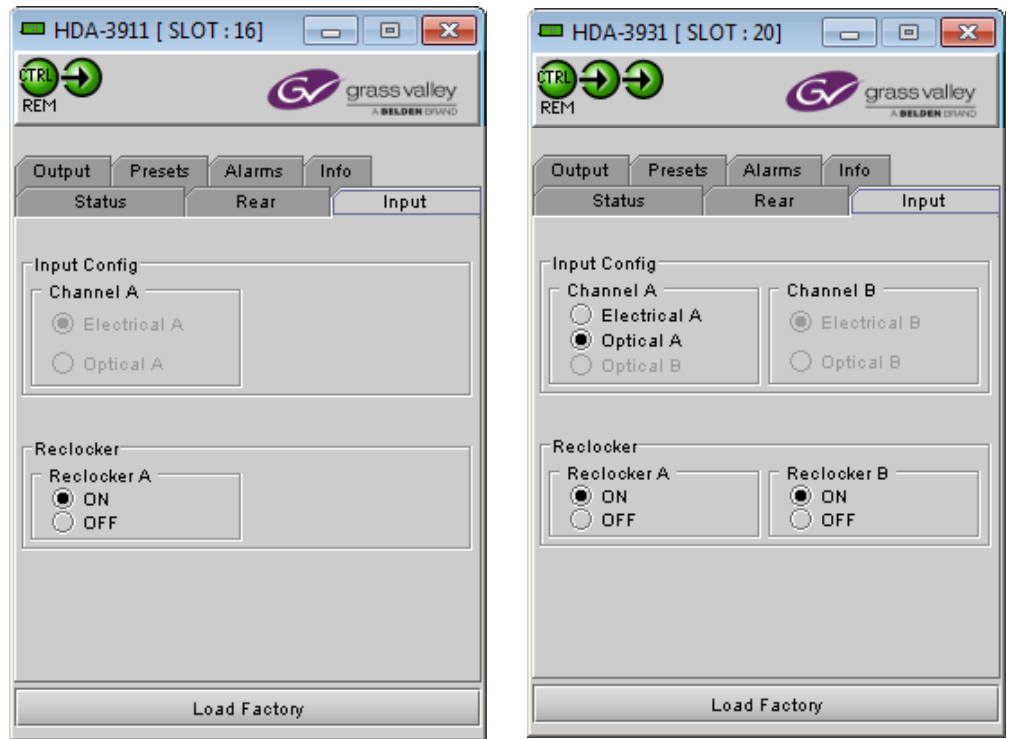
3. The Load Factory button is always visible at the bottom of the panel. Click the **Load Factory** button to reset all parameters on this HDA-39x1 card to factory default values.
  - The factory default values are shown underlined in the menus found in the Annex to this document, beginning on page 26.

### 3.4.2 The *Input* panel

This panel allows the user to select the input that will be processed through the available channels in the HDA-39x1.

HDA-3911: Only one channel is available, so channel B does not appear in the panel

HDA-3931: Two channels are available. The rear panel may have one or two electrical inputs, and may have two optical inputs. Channel B will be greyed out if no signal is available for it.



**Figure 3.4** Input panel – HDA-3911 (left) and HDA-3931 (right)

#### Input Config

Select the input for Channel A and Channel B, using the radio buttons.

- Electrical Input A and Optical Input A can only go to Channel A
- Electrical Input B can only go to Channel B
- Optical Input B can go to either Channel A or Channel B

#### Reclocker

Use the radio buttons to independently turn the reclockers for Channels A and B ON or OFF

### 3.4.3 The Rear panel

This panel identifies the type of rear panel installed with this HDA-39x1.

The name of the installed rear panel appears in the data box.

- If no rear is installed, “No Rear” appears in the data box.

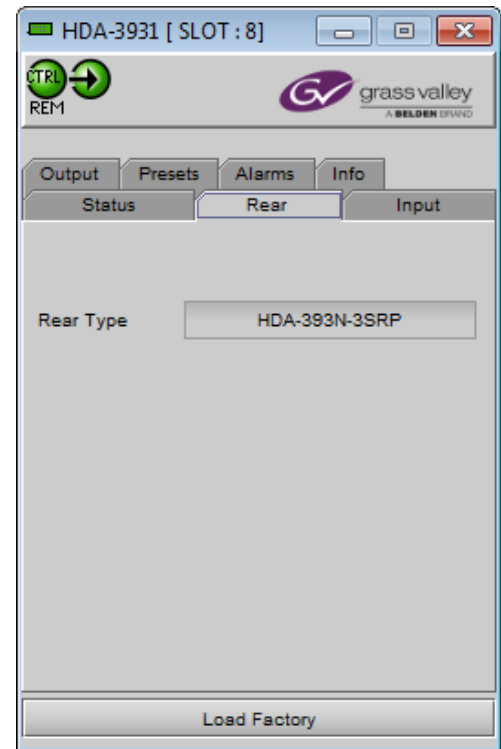


Figure 3.5 Rear panel

### 3.4.4 The Status panel

This panel shows the status of the various inputs to this HDA-39x1. For HDA-3911, only IN A is shown, because there is no IN B,

#### Electrical inputs (A and B)

Data rate (270 Mbps / 1.5 Gbps / 3 Gbps) – the detected input data rate is indicated by a green status icon

No Lock / No Signal – either of these conditions is indicated by a red status icon

#### Fiber

Module type: the type of fiber module installed in the rear panel will be shown in the text box:

- None
- Single RX
- Single TX
- Dual RX
- Dual TX
- Bidirectional

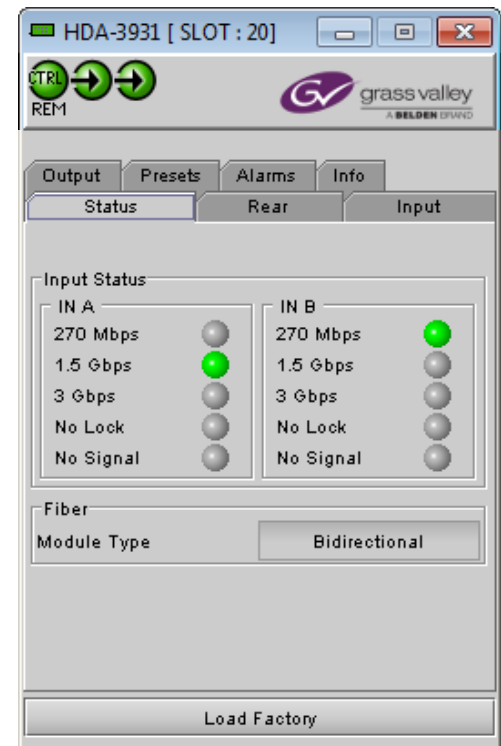


Figure 3.6 Status panel



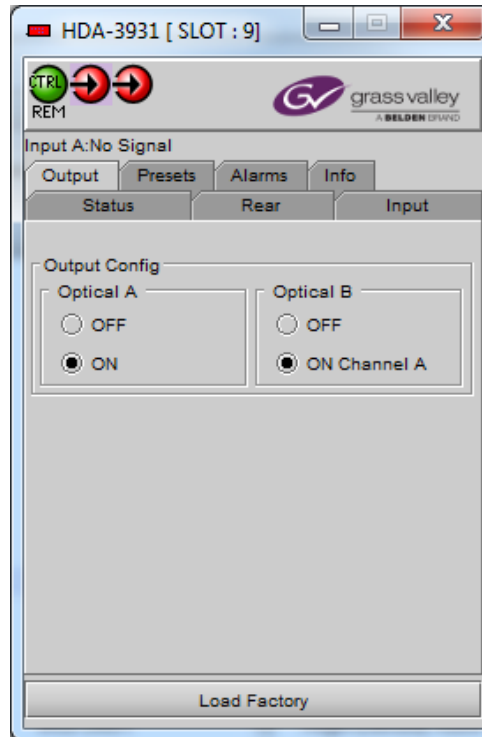
### 3.4.5 The *Output* panel

This panel controls the optical output functions (when equipped; see the Status tab) related the HDA-39x1 output:

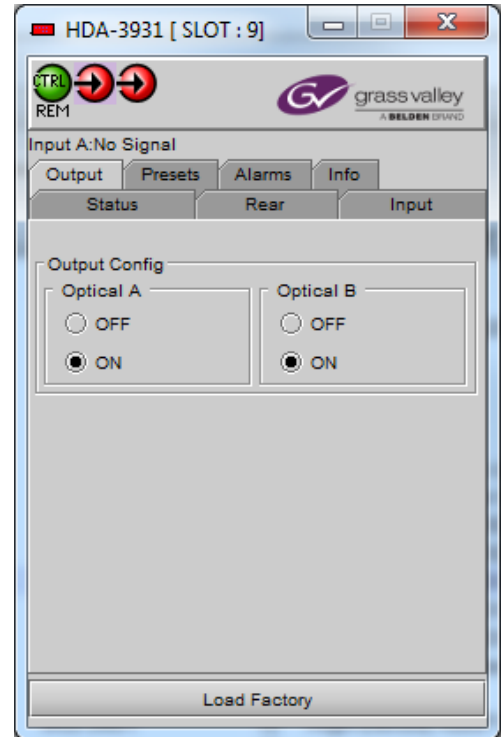
#### Output Config

If an optical output is available, use the radio buttons to independently turn the two optical outputs OFF or ON:

- Optical output is only available for rear panels with a Fiber I/O connector and an installed single or dual output (TX) cartridge
- Optical output A, can only carry channel A
- On an HDA-3931, optical output B can carry Channel A when the Operating Mode is set to Single Channel (see the Input tab), or it carries Channel B when the Operating Mode is set to Dual Channel
- On an HDA-3911, only optical output A can be configured. With a dual output (TX) cartridge, channel A is made available at both optical outputs A and B



**Figure 3.7** Output panel – Single Channel Operating Mode

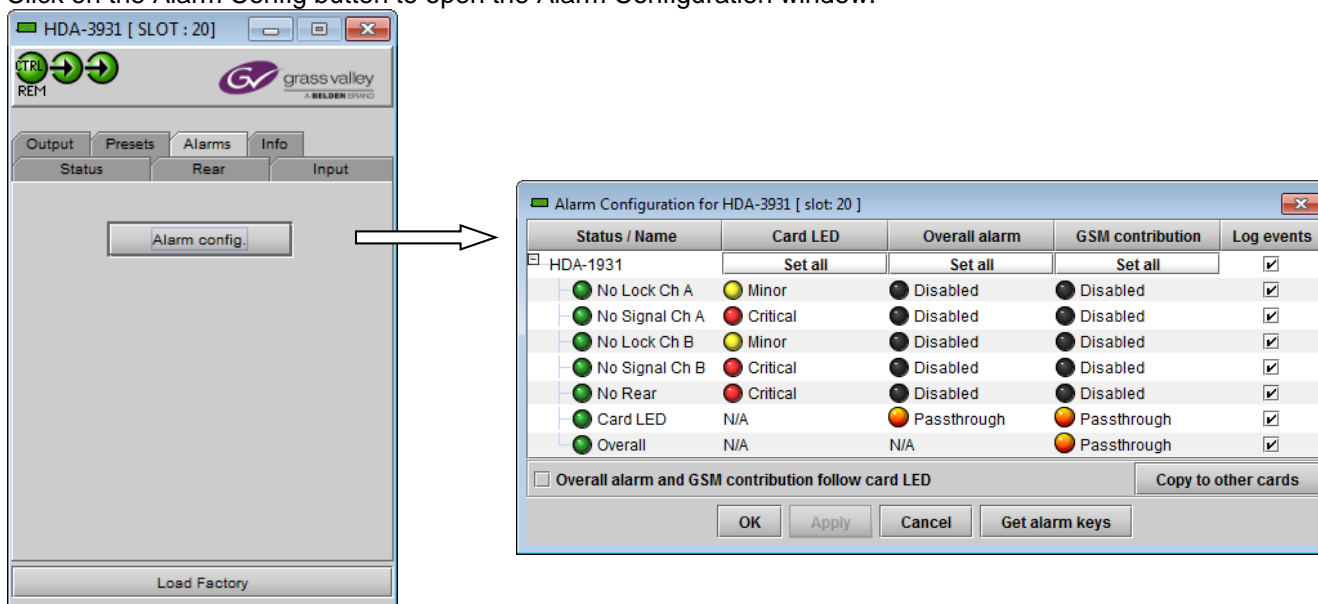


**Figure 3.8** Output panel – Dual Channel Operating Mode

### 3.4.6 The Alarms panel

This panel allows the alarm reporting of the HDA-39x1 to be configured.

Click on the Alarm Config button to open the Alarm Configuration window.



**Figure 3.9** Alarms panel and Alarm Configuration window

The Alarm Configuration window is organized in columns

#### **Status/Name**

This contains an expandable tree listing all the alarms reported by this HDA-39x1 card.

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

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

- If there is no arrowhead in the box, there is no pulldown and the alarm is not user-configurable

#### **Card LED**

This column allows configuration of the contribution of each individual alarm to the status reported by the Status LED on the front edge of the HDA-39x1 card, visible through the front door of the Densité frame.

#### **Overall Alarm**

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






#### **GSM Contribution**

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

- If the Overall alarm contribution is selected as Disabled, the GSM alarm contribution can be set to any available value
- If the Overall alarm contribution is selected as any level other than disabled, the GSM contribution is forced to follow the Overall Alarm.

**Levels associated with these alarms:**

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

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

**Shortcut:** if you click on one of the “Set All” boxes in the Card LED, Overall Alarm or GSM Contribution columns, you will open a pulldown that lets you assign a level to all alarms in that section of the column simultaneously.

**Log Events**

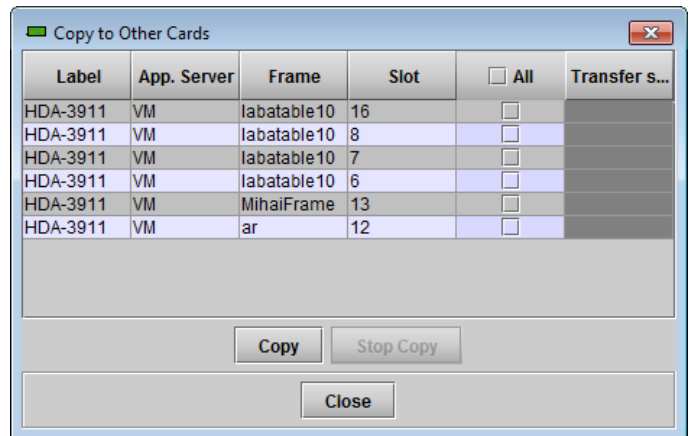
iControl maintains a log of alarm events associated with the card. The log is useful for troubleshooting and identifying event sequences. Click in the checkbox to enable logging of alarm events for each individual alarm.

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 HDA-39x1 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

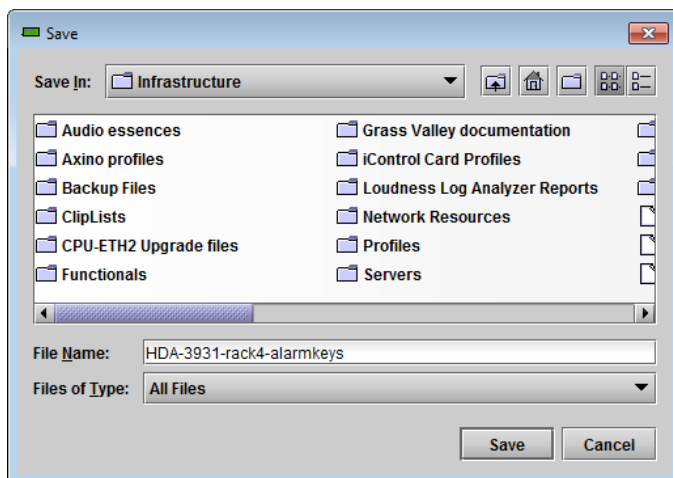


**Figure 3.10** Copy to Other Cards

### Get alarm keys

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

- The file is saved in .csv format



**Figure 3.11** Save dialog for Get Alarm

### OK, Apply, Cancel

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

### 3.4.7 The Info panel

When the HDA-39x1 is included in an iControl environment, certain information about the card should be available to the iControl system. The user can enter labels and comments that will make this card easy to identify in a complex setup. This information is entered into data boxes in the Info control panel.

- Label: type the label that is shown for this HDA-39x1 when it appears in iControl applications
- Short Label type the short-form label that iControl uses in some cases (8 characters)
- Source ID type a descriptive name for this HDA-39x1
- Comments: type any desired text

The remaining data boxes show manufacturing information about this card.

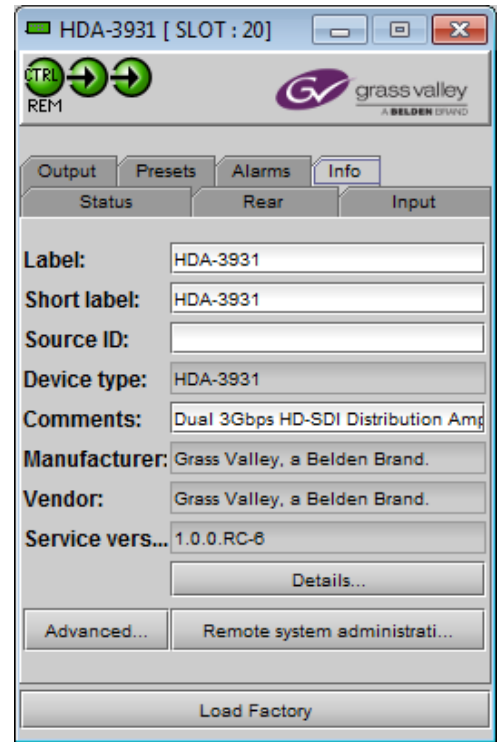


Figure 3.12 Info panel

Three buttons in the panel give access to other information.

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

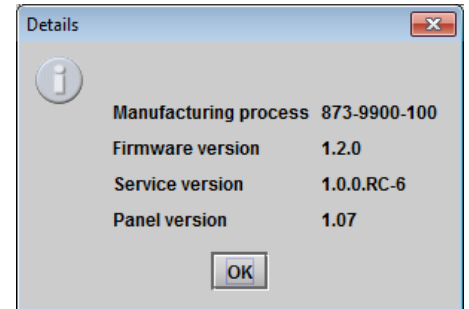


Figure 3.13 Details window

- **Advanced...:** Shows the Long ID, which is the address of this HDA-39x1 in the iControl network.

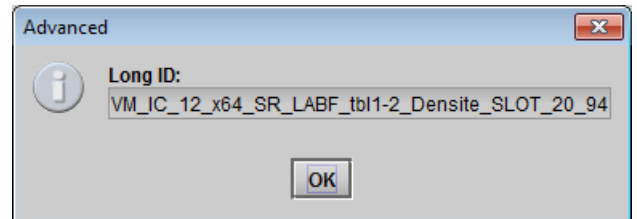


Figure 3.14 Advanced window

- **Remote System Administration:** opens the Joining Locators data box, which lists remote lookup services to which this HDA-39x1 is registered.

**Add:** Force the iControl service for this HDA-39x1 to register itself on a user-specified Jini lookup service, using the following syntax in the Input data box:

jini://<ip\_address>

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

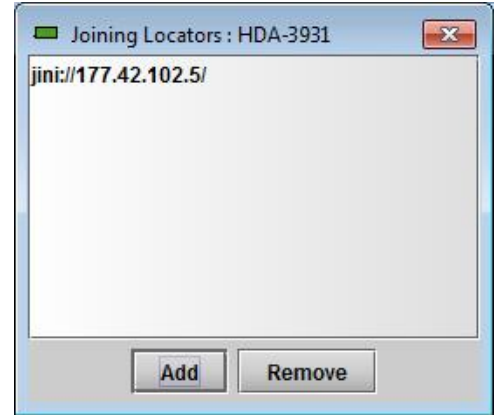
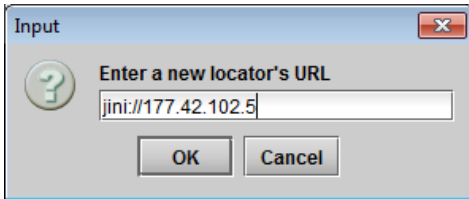
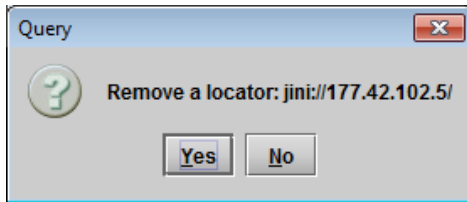


Figure 3.15 Joining Locators window

**Remove:** select one of the services listed in the Joining Locators window by clicking on it, and click *Remove* to delete it from the window. You will be asked to confirm the removal in a Query box.



### 3.4.8 The Presets panel

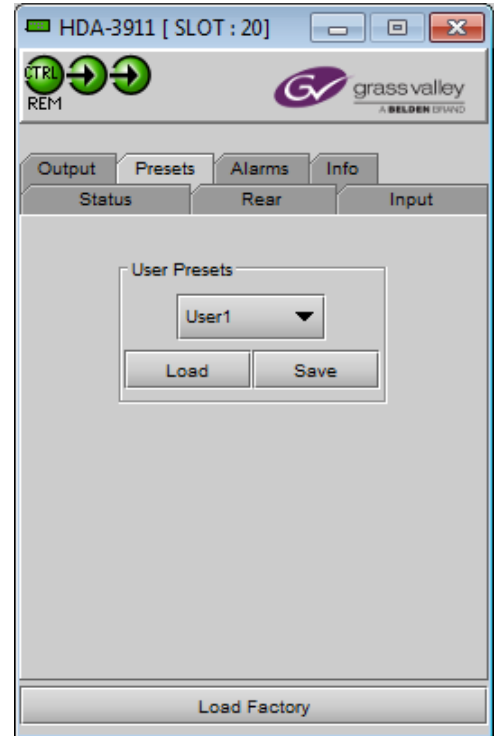
#### User Presets

The HDA-39x1 has memory registers which can hold up to 5 user-defined parameter settings.

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

Click **Load** to load the contents of the selected User Preset into the HDA-39x1. 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 HDA-39x1 into the selected User Preset. The existing contents of the preset will be overwritten without asking for confirmation.



**Figure 3.16** Presets panel

## 4 Specifications

### ELECTRICAL INPUTS (2)

Signal:	3G/HD/SD SDI SMPTE 424M, 292M, and 259M-C compliant <ul style="list-style-type: none"><li>➤ Supports data rates of 270, 1483.5, 1485, 2967, 2970Mb/s</li></ul> EN50 83-9 DVI-ASI 270 Mbps
Cable length:	90 m (180') @ 3 Gbps for Belden 1694A 140 m (360') @ 1.5 Gbps for Belden 1694A 300 m (1000') @ 270 Mbps for Belden 1694A
Return loss:	> 15 dB for up to 1.5GHz, > 10 dB from 1.5GHz to 3GHz

### OPTICAL INPUTS (2)

Signal:	SMPTE 297M-2006 compliant HD/SD-SDI SMPTE 424M, 292M, and 259M-C compliant <ul style="list-style-type: none"><li>➤ Supports data rates of 270, 1483.5, 1485, 2967, 2970Mb/s</li></ul> EN50 83-9 DVI-ASI 270 Mbps
Cable length:	15km of SMF fiber (9/125) at wavelengths between 1260nm and 1600nm.

### ELECTRICAL OUTPUTS (9)

Signal:	3G/HD/SD SDI SMPTE 424M, 292M, and 259M-C compliant <ul style="list-style-type: none"><li>➤ Supports data rates of 270, 1483.5, 1485, 2967, 2970Mb/s</li></ul> EN50 83-9 DVI-ASI 270 Mbps (5 outputs only)
Return loss:	> 15 dB for up to 1.5GHz, > 10 dB from 1.5GHz to 3GHz
Jitter (wideband):	< 0.2 UI p-p
Rise / Fall time	135 ps max., 20% to 80%, for HD 400 – 800 ps, 20% to 80%, for SD

### OPTICAL OUTPUTS (2)

Signal:	3G/HD/SD SDI SMPTE 424M, 292M, and 259M-C compliant <ul style="list-style-type: none"><li>➤ Supports data rates of 270, 1483.5, 1485, 2967, 2970Mb/s</li></ul> EN50 83-9 DVI-ASI 270 Mbps (AFV only)
Wavelength	1310 nm
Optical output power	-6 dBm typical

### PROCESSING PERFORMANCE

Signal path:	10 bits
Processing delay:	< 6 ns
Power:	< 5 W



## 5 Contact Us

### Grass Valley Technical Support

For technical assistance, contact our international support center, at 1-800-547-8949 (US and Canada) or +1 530 478 4148.

To obtain a local phone number for the support center nearest you, please consult the *Contact Us* section of Grass Valley's website ([www.grassvalley.com](http://www.grassvalley.com)).

An online form for e-mail contact is also available from the website.

### Corporate Head Office

Grass Valley  
3499 Douglas-B.-Floreani  
St-Laurent, Quebec H4S 2C6  
Canada

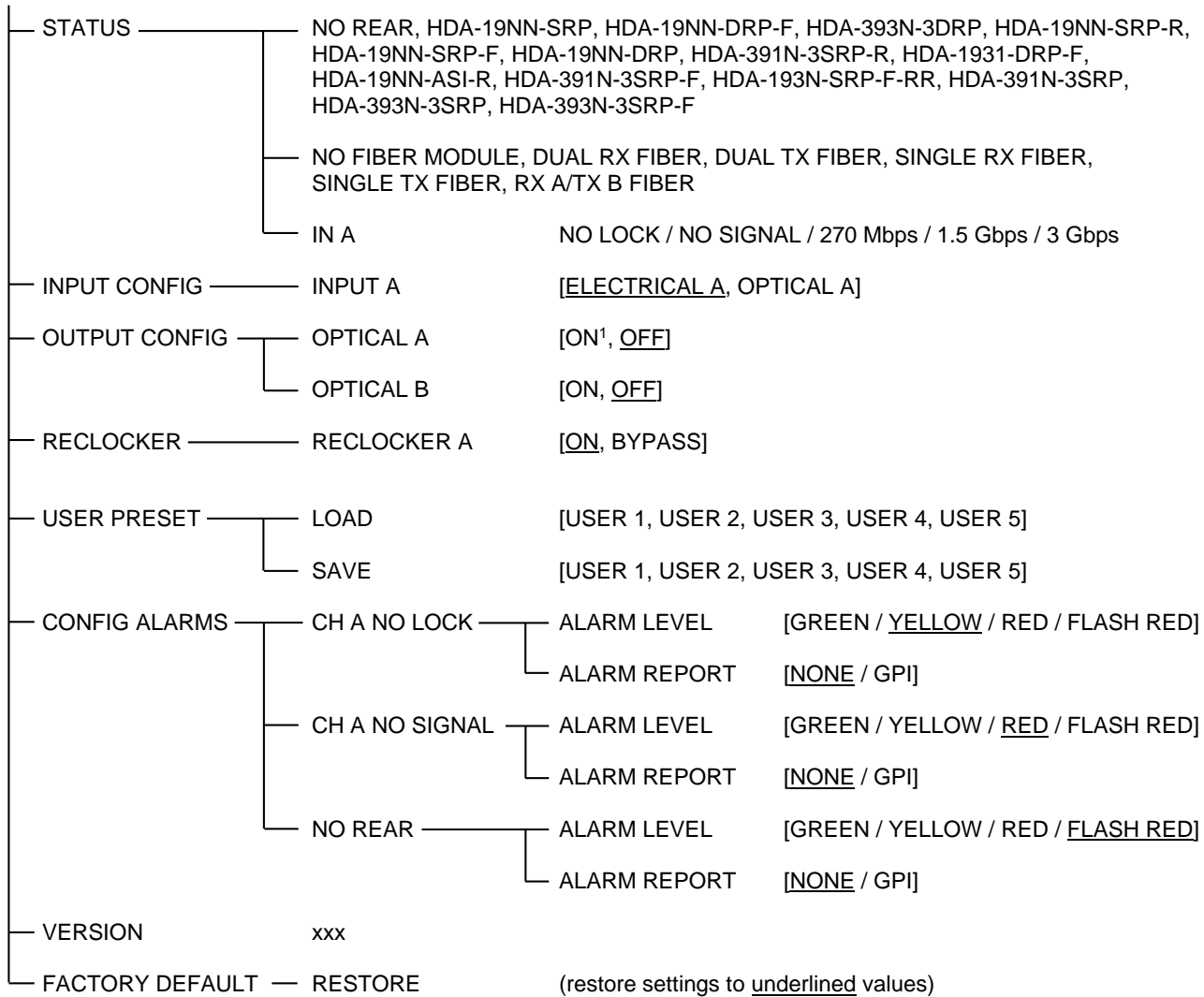
Telephone: +1 514 333 1772

Fax: +1 514 333 9828

[www.grassvalley.com](http://www.grassvalley.com)

## ANNEX 1 – HDA-3911/3931 Local User Interface

### HDA-3911



<sup>1</sup> Only optical output A can be configured. With a dual output (TX) cartridge, channel A is made available at both optical outputs A and B.

## HDA-3931

STATUS	NO REAR, HDA-19NN-SRP, HDA-19NN-DRP-F, HDA-393N-3DRP, HDA-19NN-SRP-R, HDA-19NN-SRP-F, HDA-19NN-DRP, HDA-391N-3SRP-R, HDA-1931-DRP-F, HDA-19NN-ASI-R, HDA-391N-3SRP-F, HDA-193N-SRP-F-RR, HDA-391N-3SRP, HDA-393N-3SRP, HDA-393N-3SRP-F
	IN A NO LOCK / NO SIGNAL / 270 Mbps / 1.5 Gbps / 3 Gbps
	IN B NO LOCK / NO SIGNAL / 270 Mbps / 1.5 Gbps / 3 Gbps
	NO FIBER MODULE, DUAL RX FIBER, DUAL TX FIBER, SINGLE RX FIBER, SINGLE TX FIBER, RX A/TX B FIBER
INPUT CONFIG	INPUT A [ <u>ELECTRICAL A</u> , OPTICAL A, OPTICAL B]
	INPUT B [ <u>ELECTRICAL B</u> , OPTICAL B]
OUTPUT CONFIG	OPTICAL A [ <u>OFF</u> , ON]
	OPTICAL B [ <u>OFF</u> , ON <sup>2</sup> ]
RECLOCKER	RECLOCKER A [ <u>ON</u> , BYPASS]
	RECLOCKER B [ <u>ON</u> , BYPASS]
OPERATING MODE	[ <u>DUAL CHANNEL</u> , SINGLE CHANNEL]
USER PRESET	LOAD [USER 1, USER 2, USER 3, USER 4, USER 5]
	SAVE [USER 1, USER 2, USER 3, USER 4, USER 5]
CONFIG ALARMS	CH A NO LOCK — ALARM LEVEL [GREEN / <u>YELLOW</u> / RED / FLASH RED]
	ALARM REPORT [ <u>NONE</u> / GPI]
	CH A NO SIGNAL — ALARM LEVEL [GREEN / YELLOW / <u>RED</u> / FLASH RED]
	ALARM REPORT [ <u>NONE</u> / GPI]
	CH B NO LOCK — ALARM LEVEL [GREEN / <u>YELLOW</u> / RED / FLASH RED]
	ALARM REPORT [ <u>NONE</u> / GPI]
	CH B NO SIGNAL — ALARM LEVEL [GREEN / YELLOW / <u>RED</u> / FLASH RED]
	ALARM REPORT [ <u>NONE</u> / GPI]
	NO REAR — ALARM LEVEL [GREEN / YELLOW / RED / <u>FLASH RED</u> ]
	ALARM REPORT [ <u>NONE</u> / GPI]
VERSION	xxx
FACTORY DEFAULT	RESTORE (restore settings to <u>underlined</u> values)

<sup>2</sup> Optical output B can carry Channel A when the Operating Mode is set to SINGLE CHANNEL, or it carries Channel B when the Operating Mode is set to DUAL CHANNEL.

## ANNEX 2 – Installing the Optical Interface

*Installing and removing the Fiber I/O interface cartridge requires special care. This annex describes the process.*

Some rear panels used with the HDA-39x1 incorporate a fiber optic interface. The interface consists of two parts:

- A socket on the rear panel into which an interface module is plugged
- An SFP (Small Form-factor Pluggable) module into which the optical fibers are plugged, and which incorporates the optical/electrical interface

### Cautions and Warnings



SFP Transmitter modules contain a class 1 laser, which emits invisible radiation whenever the module is powered up. Because the SFP is hot-swappable, the module may be powered up as soon as it is installed.

**DO NOT LOOK INTO AN OPERATING SFP MODULE'S CONNECTORS, AS EYE DAMAGE MAY RESULT.**



The SFP module is sensitive to electrostatic discharge (ESD). It is recommended that you use an ESD-preventive wrist strap grounded to the Densité 3 chassis while handling the SFP module.



SFP modules are subject to wear, and their useful lifetime is reduced each time they are inserted or removed. Do not remove them more often than is absolutely necessary.



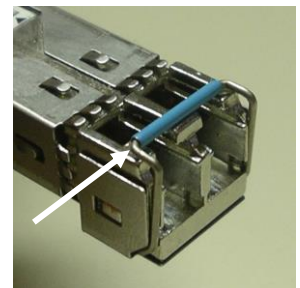
Never remove or install an SFP module with the fiber optic cables connected. Damage to the cables could result.



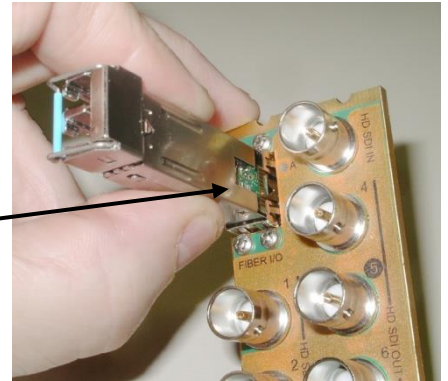
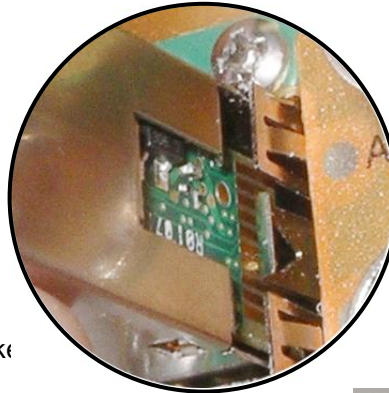
The presence of dust and debris can seriously degrade the performance of an optical interface. It is recommended that you insert a dust plug into the SFP module whenever a fiber optic cable is not connected.

### Installing an SFP module

1. Make sure that the latch is in the closed position



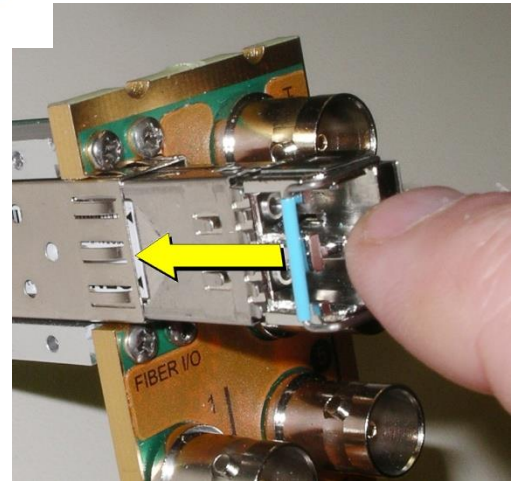
2. Position the SFP module so that the recessed slot is lined up with the tab side of the socket.



3. Slide the module straight into the socket and it clicks into position.

### Connecting the fiber optic cables

1. Remove the dust plug from the SFP module if present
2. Verify that the exposed end of the optical fiber in the LC connector is clean
  - Carefully remove any debris if necessary.
3. Plug the LC-terminated fiber optic cable into the SFP module

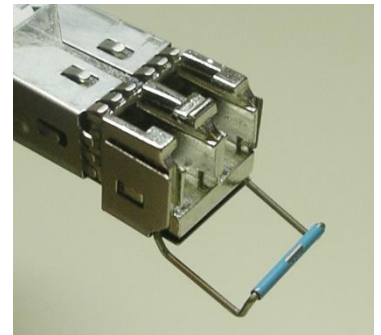


### Removing the fiber optic cables

1. Grasp the LC fiber optic connector that is plugged into the SFP module, and pull it straight out to disengage the optical fiber from the SFP.
  - Never pull the fiber optic cable itself, as catastrophic damage may occur.
2. Insert a dust plug into the SFP module.

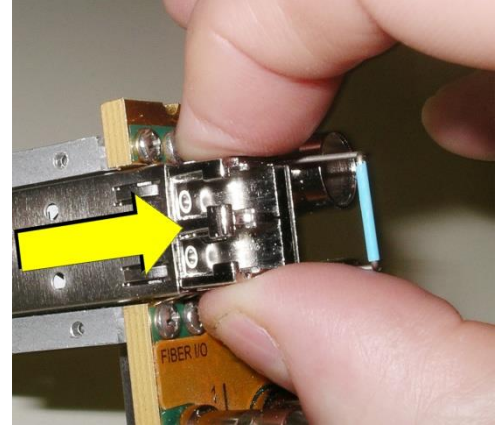
### Removing the SFP module

1. Move the latch to the open position.



## GUIDE TO INSTALLATION AND OPERATION

2. Grasp the SFP module between your thumb and forefinger, and pull it straight out of the slot.
  - Do NOT pull on the latch to remove the module, as it is easily damaged
  - You may find that you need to wiggle the module, or perhaps push it into the slot a bit, before it will release and slide out.



3. Insert a dust plug into the SFP module.