

# **HDA-3962**

**Single/Dual 12G/3G/HD/SD SDI Distribution  
Amplifier (DA) with Optional Fiber Connectivity**

**Guide to Installation and Operation**

13-03070-011-AA-M00

2021-02-19

## Document History

Document Number	Publication Date	Notes
13-03070-011-AA-M00	2021-02-19	Initial release

In order to comply with FCC/CFR47: Part 15 regulations, it is necessary to use high-quality, triple-screened Media or Monitor cable assemblies with integrated ferrite suppression at both ends.

## Patent Information

This product may be protected by one or more patents. For further information, please visit:

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## Electrostatic Discharge (ESD) Protection

Electrostatic discharge occurs when electronic components are improperly handled and can result in intermittent failure or complete damage adversely affecting an electrical circuit. When you remove and replace any card from a frame always follow ESD-prevention procedures:

- Ensure that the frame is electrically connected to earth ground through the power cord or any other means if available.
- Wear an ESD wrist strap ensuring that it makes good skin contact. Connect the grounding clip to an *unpainted surface* of the chassis frame to safely ground unwanted ESD voltages. If no wrist strap is available, ground yourself by touching the *unpainted* metal part of the chassis.

- For safety, periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms.
- When temporarily storing a card make sure it is placed in an ESD bag.
- Cards in an earth grounded metal frame or casing do not require any special ESD protection.

## Protection contre les décharges électrostatiques (DES)

Une décharge électrostatique peut se produire lorsque des composants électroniques ne sont pas manipulés de manière adéquate, ce qui peut entraîner des défaillances intermittentes ou endommager irrémédiablement un circuit électrique. Au moment de remplacer une carte dans un châssis, prenez toujours les mesures de protection antistatique appropriées :

- Assurez-vous que le châssis est relié électriquement à la terre par le cordon d'alimentation ou tout autre moyen disponible.
- Portez un bracelet antistatique et assurez-vous qu'il est bien en contact avec la peau. Connectez la pince de masse à une *surface non peinte* du châssis pour détourner à la terre toute tension électrostatique indésirable. En l'absence de bracelet antistatique, déchargez l'électricité statique de votre corps en touchant une surface métallique *non peinte* du châssis.
- Pour plus de sécurité, vérifiez périodiquement la valeur de résistance du bracelet antistatique. Elle doit se situer entre 1 et 10 mégohms.
- Si vous devez mettre une carte de côté, assurez-vous de la ranger dans un sac protecteur antistatique.
- Les cartes qui sont reliées à un châssis ou boîtier métallique mis à la terre ne nécessitent pas de protection antistatique spéciale.

## Environmental Information

European (CE) WEEE directive.



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## Laser Safety - Fiber Output SFP and QSFP Modules Warning

# LASER SAFETY



The average optical output power does not exceed 0 dBm (1mW) under normal operating conditions. Unused optical outputs should be covered to prevent direct exposure to the laser beam.

Even though the power of these lasers is low, the beam should be treated with caution and common sense because it is intense and concentrated. Laser radiation can cause irreversible and permanent damage of eyesight. Please read the following guidelines carefully:

- Make sure that a fiber is connected to the board's fiber outputs before power is applied. If a fiber cable (e.g. patchcord) is already connected to an output, make sure that the cable's other end is connected, too, before powering up the board.
- **Do not** look in the end of a fiber to see if light is coming out. The laser wavelengths being used are totally invisible to the human eye and can cause permanent damage. Always use optical instrumentation, such as an optical power meter, to verify light output.

## Safety and EMC Standards

This equipment complies with the following standards:

### Safety Standards



#### Information Technology Equipment - Safety Part 1

##### EN60950-1: 2006

Safety of Information Technology Equipment Including Electrical Business Equipment.

##### UL1419 (4<sup>th</sup> Edition)

Standard for Safety – Professional Video and Audio equipment (UL file number E193966)

### EMC Standards

This unit conforms to the following standards:

##### EN55032:2015 (Class A)

Electromagnetic Compatibility of multimedia equipment - Emission requirements

##### EN61000-3-2:2014 (Class A)

Electromagnetic Compatibility - Limits for harmonic current emissions

##### EN61000-3-3:2013

Electromagnetic Compatibility - Limits of voltage changes, voltage fluctuations and flicker

##### EN55103-2:2009 (Environment E2)

Electromagnetic Compatibility, Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 2. Immunity

#### WARNING

This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.

#### FCC / CFR 47: Part 15 (Class A)

Federal Communications Commission Rules Part 15, Subpart B

Caution to the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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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## EMC Performance of Cables and Connectors

Grass Valley products are designed to meet or exceed the requirements of the appropriate European EMC standards. In order to achieve this performance in real installations it is essential to use cables and connectors with good EMC characteristics.

All signal connections (including remote control connections) shall be made with screened cables terminated in connectors having a metal shell. The cable screen shall have a large-area contact with the metal shell.

### SIGNAL/DATA PORTS

For unconnected signal/data ports on the unit, fit shielding covers. For example, fit EMI blanking covers to SFP+ type ports; and fit 75  $\Omega$  RF terminators to BNC type ports.

### COAXIAL CABLES

Coaxial cables connections (particularly serial digital video connections) shall be made with high-quality double-screened coaxial cables such as Belden 8281 or BBC type PSF1/2M, Belden 1694A (for 3Gbps) and Belden 4794R (for 12Gbps).

### D-TYPE CONNECTORS

D-type connectors shall have metal shells making good RF contact with the cable screen. Connectors having “dimples” which improve the contact between the plug and socket shells, are recommended.

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# 1 HDA-3962 Single/Dual 12G/3G/HD/SD SDI Distribution Amplifiers

## 1.1 Introduction

The HDA-3962 from Grass Valley, a Belden Brand, provides single and dual channel distribution for 12G/3G/HD/SD-SDI signals with flexible routing of inputs to outputs. Flexible output selection enables the HDA-3962 to be used either as a single channel DA with up to 10 outputs, or in dual channel mode with up to five outputs per input.

The HDA-3962 provides up to ten reclocked outputs with automatic cable equalization.

Certain rear panels have fiber connectivity, making them ideal for longer reach. The HDA-3962 card provides a user-configurable fiber optic transceiver for bidirectional conversion of 12G, 3G, HD and SD-SDI signals to 1310 nm optical signals. Ideal for mixed coax and fiber workflows, the HDA-3962 allows users to configure the inputs and outputs to match their infrastructure needs.

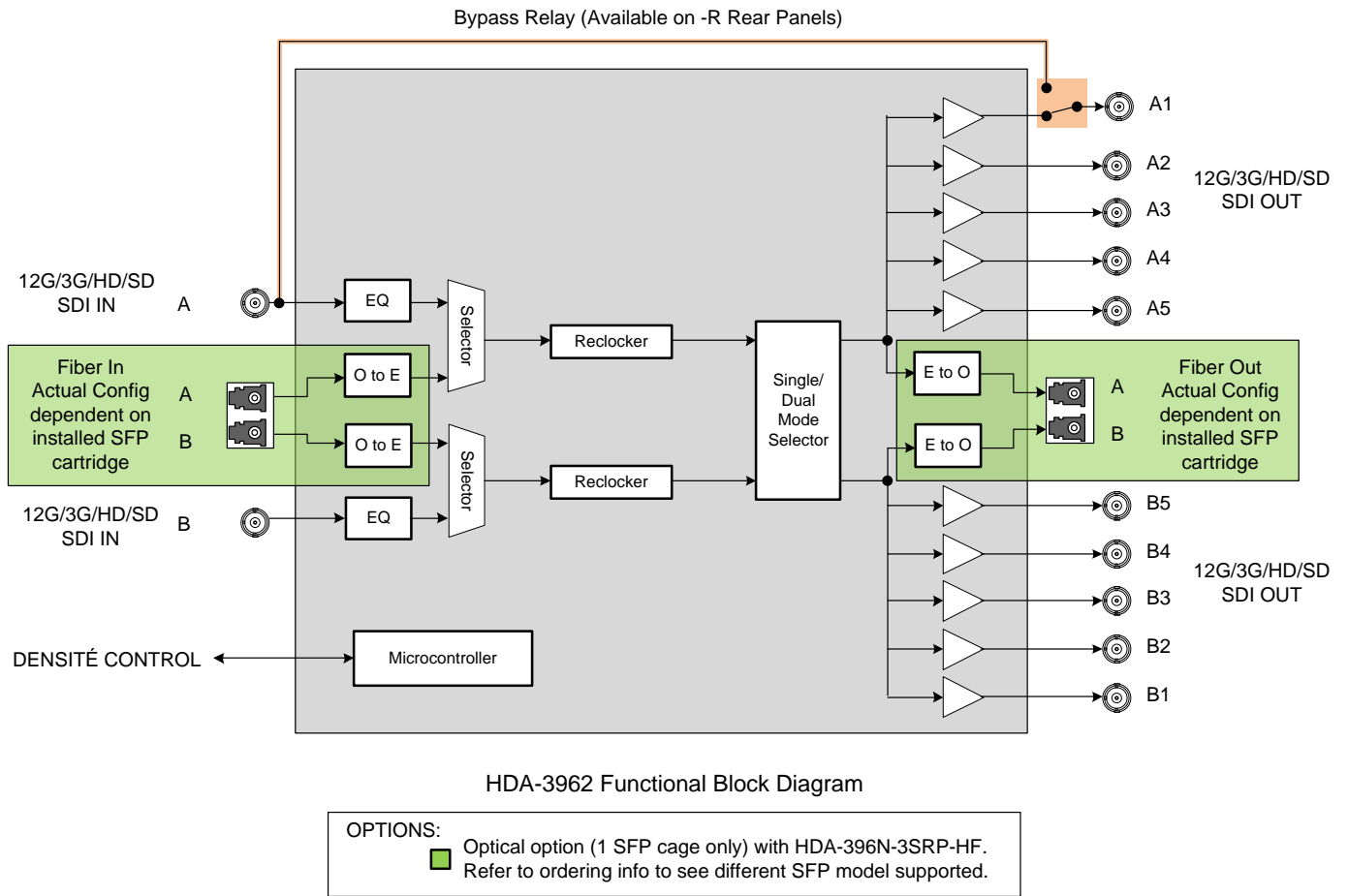
Critical applications protection is provided by a bypass relay available with the HDA-3962-3DRP-HR rear.

## 1.2 Features

- Single/dual 12G/3G/HD/SD-SDI inputs
- Flexible selection of inputs allows single or dual channel operation
- Supports bitrates up to 11.88 Gb/s
- Automatic format detection and cable equalization
- Up to 10 × 12G/3G/HD/SD-SDI with one bypass HD-BNC outputs on the HDA-3962-3DRP-HR rear
- Up to 6 × 12G/3G/HD/SD-SDI BNC outputs on the HDA-396N-3SRP-2IN rear
- Up to 10 × 12G/3G/HD/SD-SDI HD-BNC outputs on the HDA-396N-3SRP-HF rear
- Up to 7 × 12G/3G/HD/SD-SDI HD-BNC outputs on the HDA-396N-3SRP rear
- Optional fiber I/O on the HDA-396N-3SRP-HF rear



### 1.3 Block Diagrams



**Figure 1 HDA-3962 Functional Block Diagram**

When using rear panel	The HDA-3962 card
HDA-396N-3SRP	Operates in single mode with the following available outputs: A1, A2, A3, A4, A5, B1, and B2. Only input SDI IN A is available. Fiber inputs/outputs are unused.
HDA-396N-3SRP-2IN	Operates in either of the following modes: <ul style="list-style-type: none"> <li>• Single mode 1x6 with the following available outputs: A1, A2, A3, A4, A5, and B1. Only input SDI IN A is available.</li> <li>• Dual mode 2x3 with the following available outputs:                             <ul style="list-style-type: none"> <li>○ A1, A2, and A3 for use with input SDI IN A.</li> <li>○ B1, B2, and B3 for use with input SDI IN B.</li> </ul> </li> </ul>

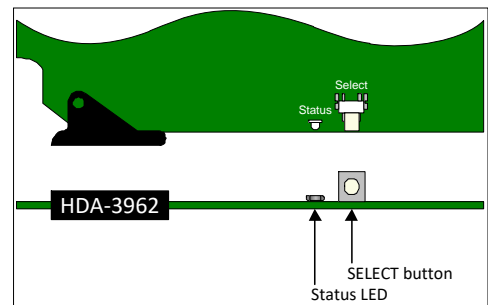
When using rear panel	The HDA-3962 card
HDA-396N-3SRP-HF	Operates in either of the following modes: <ul style="list-style-type: none"> <li>• Single mode 1x10 with the following available outputs: A1, A2, A3, A4, A5, B1, B2, B3, B4, and B5. Only input SDI IN A is available.</li> <li>• Dual mode 2x5 with the following available outputs:                             <ul style="list-style-type: none"> <li>○ A1, A2, A3, A4, and A5 for use with input SDI IN A.</li> <li>○ B1, B2, B3, B4, and B5 for use with input SDI IN B.</li> </ul> </li> </ul>
HDA-3962-3DRP-HR	Operates in single mode and the following outputs are available: A1, A2, A3, A4, A5, B1, B2, B3, B4, and B5. Only input SDI IN A is available with a bypass relay on output A1. Fiber inputs/outputs are unused.

The actual connections available are supported by the chosen rear panel. See 2.3 - Rear Connector Panels.

### 1.4 Front Card-edge Interface

The front card-edge of the HDA-3962 incorporates two elements:

- Status LED (see section 3.2)
- Select Button (see section 4)



**Figure 2 Front card-edge layout**

## 2 Installation

### 2.1 Installation of Rear Connector Panels

The HDA-3962 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.

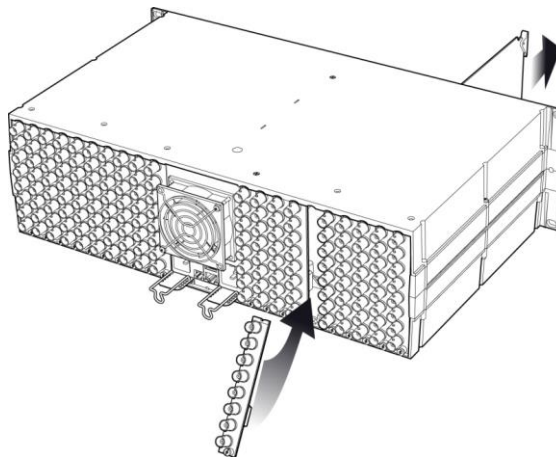
The following rear connector panels are available for the HDA-3962:

- HDA-396N-3SRP Single slot rear panel with single 1x7 BNCs.
- HDA-396N-3SRP-2IN Single slot rear panel with single 1x6 or dual 2x3 BNCs.
- HDA-396N-3SRP-HF Single slot rear panel with single 1x10 or dual 1x5 HD-BNC with fiber option support.
- HDA-3962-3DRP-HR Double slot rear panel with single 1x10 HD-BNC with Bypass Relays.

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.



**Figure 3 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-3962 card as follows:

1. Open the front panel of the frame.
2. Slide the HDA-3962 card into the slot and push gently on the handle to seat the connectors.

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.

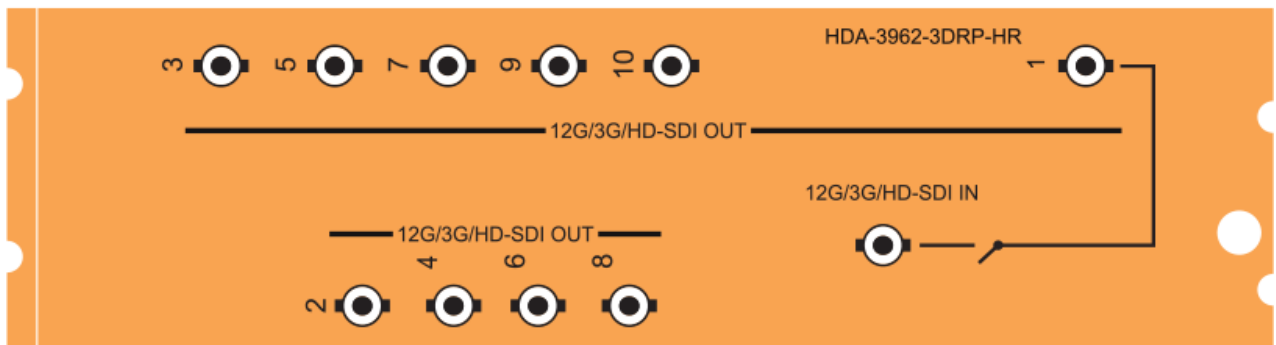
### 2.3 Rear Connector Panels

The following diagrams illustrate the layout and connectors on the available HDA-3962 rear panels. Note that:

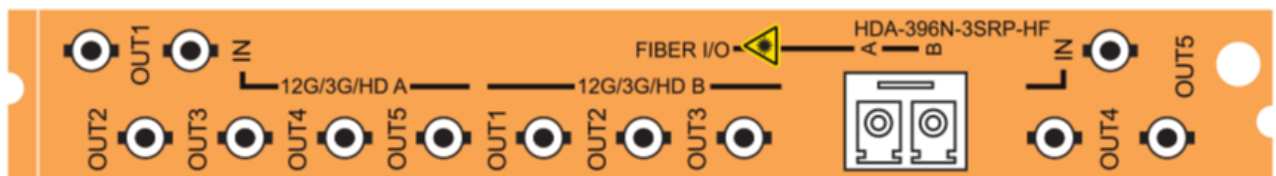
- The HDA-3962 card's functionality is determined by the rear panel that is installed.
- The HDA-3962 card can be used with rear panels created for the HDA-3961 card.

#### HDA-3962 Rear Panels:

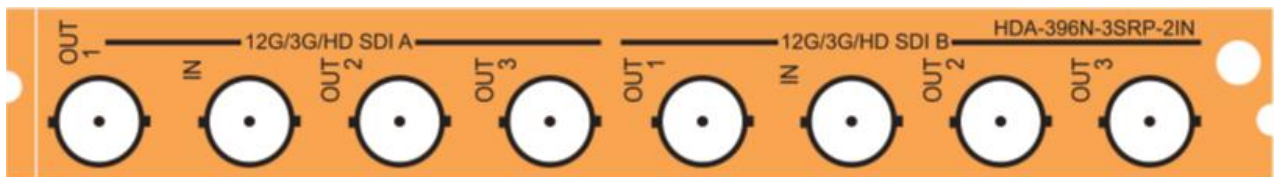
- **HDA-3962-3DRP-HR** Double rear panel with single 1x10 HD-BNCs with bypass.



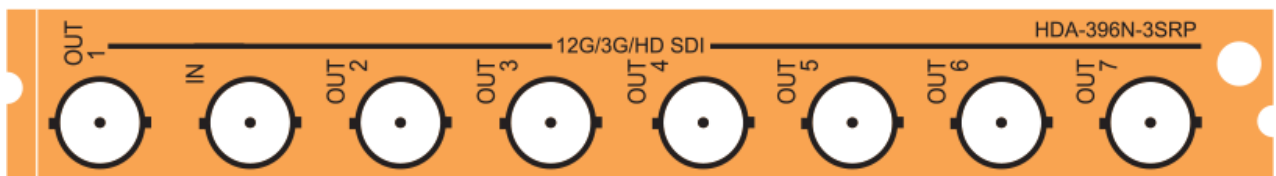
- **HDA-396N-3SRP-HF** Single rear panel with single 1x10 or dual 2x5 HD-BNCs with fiber option support.



- **HDA-396N-3SRP-2IN** Single rear panel with single 1x6 or dual 2x3 BNCs.



- **HDA-396N-3SRP** Single rear panel with single 1x7 BNCs.



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

Rear panel type	I/O Connections			
	12G/3G/HD/SD SDI IN	12G/3G/HD/SD SDI OUT	BYPASS	FIBER I/O
HDA-3962-3DRP-HR	1 x HD-BNC	10 x HD-BNC	1	
HDA-396N-3SRP-HF	2x HD-BNC	10x HD-BNC		●
HDA-396N-3SRP-2IN	2 x BNC	6 x BNC		
HDA-396N-3SRP	1 x BNC	7 x BNC		

### 12G/3G/HD/SD IN – Serial digital Video Inputs

Connect a serial digital video signal, conforming to the ST 2082-1 for 12G-SDI, ST 424 for 3G-SDI, SMPTE 292M standard for HD input signals or SMPTE 259M standard for SD input signals, to the BNC labeled **12G/3G/HD SDI IN**. The HDA-3962 will automatically switch to the detected video line format.

### 12G/3G/HD/SD OUT – Serial Digital Video Outputs

The HDA-3962 provides multiple 12G/3G/HD/SD SDI video outputs on BNC or HD-BNC connectors, labeled **12G/3G/HD OUT 1, 2**, etc. The SDI video signal conforms to the SMPTE 292M and SMPTE 259M-C standard.

For the HDA-3962-3DRP-HR, **12G/3G/HD-SDI OUT 1** provides bypass protection.

### Fiber I/O connector

SFP optical modules are small, hot-pluggable cartridges which provide fiber connectivity to the HDA-3962 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-3962 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, or dual Rx or Tx.

The fiber I/O connector accepts any of the following SFP cartridges.

SFP Modules	Description
SFP-U-R-LC	12G Single RX Fiber with LC/PC
SFP-U-RR-LC	12G Dual Rx Fiber with LC/PC
SFP-U-RT-S13-LC	12G Dual Rx/Tx Fiber 1310 nm with LC/PC
SFP-U-T-S13-LC	12G Single Tx Fiber 1310 nm with LC/PC
SFP-U-TT-S13S13-LC	12G Dual Tx Fiber 1310 nm with LC/PC
SFP-R-LC	Single fiber RX cartridge with LC/PC connector
SFP-RR-LC	Dual fiber Rx cartridge with LC/PC connector
SFP-T-S13-LC	Single fiber TX cartridge at 1310 nm with LC/PC connector
SFP-TT-S13S13-LC	Dual fiber Tx cartridge at 1310 nm with LC/PC connector
SFP-RT-S13-LC	Dual fiber Rx/Tx cartridge 1310 nm with LC/PC connector

**Note:** The HDA-3962 can also make use of SFP optical plug-in cartridges from the WDM and CWDM series. Other types of SFP optical plug-in cartridges may be available.

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 31 for a detailed description of the installation & removal procedure.**

## **2.4 Bypass Relay**

The HDA-3962-3DRP-HR rear panel has an integrated bypass relay. The relay automatically activate if the card loses power, or is removed from the frame.

When activated, the relays connect the 12G-3G-HD-SDI IN directly to 12G-3G-HD-SDI OUT 1, ensuring that the signal is available to downstream equipment.

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

## 3 Operation

### 3.1 Control Options

The HDA-3962 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 4).
- 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 5)

### 3.2 Card-Edge Status LED

The status monitor LED is located on the front card-edge of the HDA-3962, and is visible through the front access door of the DENSITÉ 3 frame. This multi-color LED indicates the status of the HDA-3962 by color, and by flashing/steady illumination.

The chart shows how the various error conditions that can be flagged on the HDA-3962 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 5.7 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 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 4 for details.

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

## 4 Local Control Using the Frame’s Control Panel

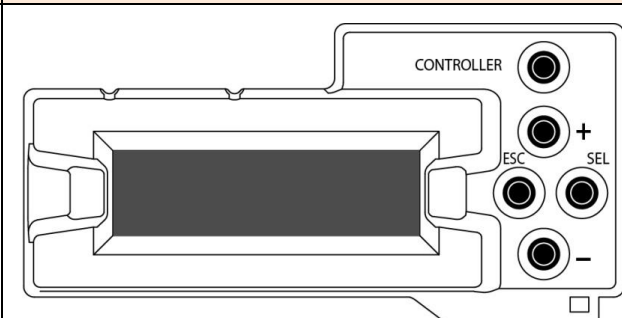
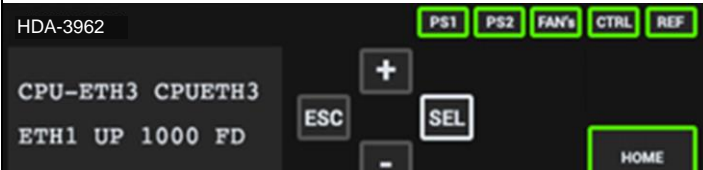
Push the SELECT button on the HDA-3962 card edge (see Section 1.4) to assign the local control panel to operate the HDA-3962.

- The STATUS LED on the HDA-3962 card edge flashes yellow.

Use the control panel buttons to navigate through the menu, as described below.

- The complete menu structure is shown in ANNEX 1 – HDA-3962 Local User Interface on page 30.

Two versions of the local control panel exist:

Panel type	Frame models	Appearance
Physical	Densité-2, Densité-3, Densité-3+FR1,	
Touch screen	Densité 3+FR4, GV Node	

The local control panel is fastened to the front of the frame’s controller card.

- The physical panel is accessed by opening the front door of the frame.
- The touch screen panel is accessed through an aperture in the frame door.

The panel incorporates a display capable of displaying two lines of text, each 16 characters in length, and four pushbuttons. 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.

- Notes:
1. If you do not touch any buttons on the local control panel, the controller will revert to its normal standby mode after 30 seconds.
  2. If you changed a parameter from the control menu, but have not applied your change (you did not touch the SEL button on the control panel), once the 30-second timeout has occurred, the parameters will be confirmed as if you had touched the SEL button



## 5 Remote Control Using iControl

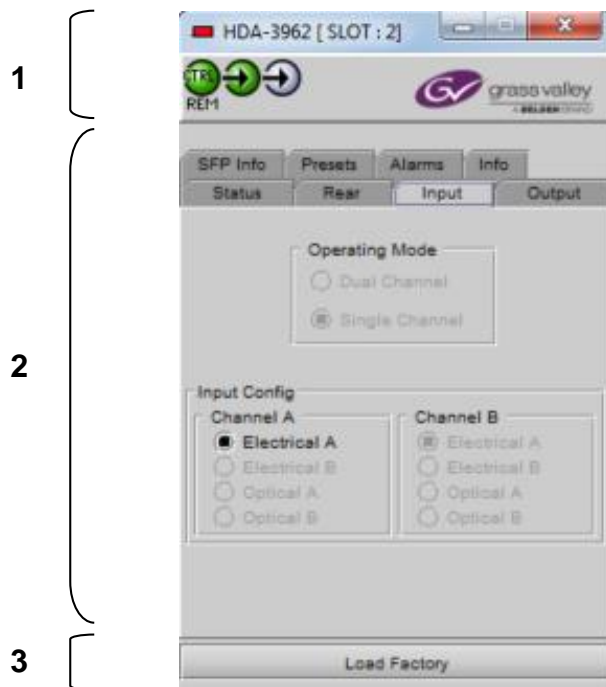
The operation of the HDA-3962 may be controlled using Grass Valley's iControl system.

- This manual describes the control panels associated with the HDA-3962 and their use.
- Please consult the iControl User's Guide for information about setting up and operating iControl.

In iControl Navigator or iControl Websites, double-click on the HDA-3962 icon to open the control panel.

### 5.1 The iControl Graphic Interface Window

The basic window structure for the HDA-3962 is shown in figure 3.2. The window identification line gives the card type (HDA-3962) and the slot number where the card is installed in its Densité frame.



**Figure 4 HDA-3962 iControl graphic interface window**

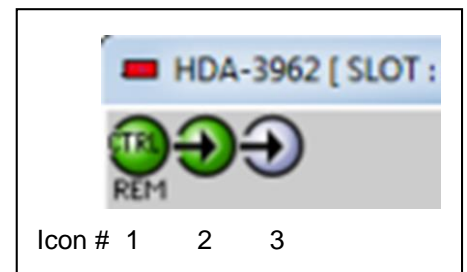
There are three main sections in the window itself, shown in Figure 3.2:

1. The top section displays icons on the left. These icons report the status of some parameters associated with this HDA-3962. 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 5 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 4. 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 12G, 3G, HD or SD, and the specific format details will be listed if the cursor is moved over the icon.</li> </ul>
 (red)	No signal or Input signal error No rear
<b>Icon #3 – Input B status</b>	
 (green)	Signal detected and valid. <ul style="list-style-type: none"> <li>• Beneath the icon, the format will be indicated as 12G, 3G, HD or SD, and the specific format details will be listed if the cursor is moved over the icon.</li> </ul>
 (blue)	Channel is disabled.
 (red)	No signal or Input signal error No rear

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-3962 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 30.

## 5.2 The *Input* panel

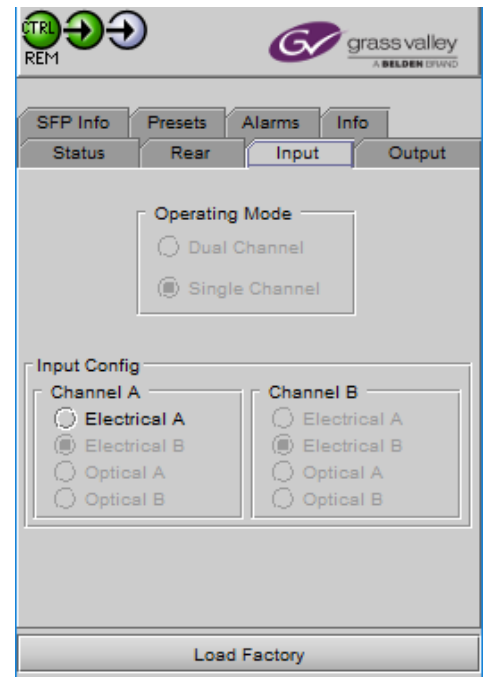
This panel allows the user to select the input that will be processed through the available channels in the HDA-3962.

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.

### Input Config

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

- 1- Select Operating Mode (DUAL/SINGLE)
- 2- DUAL mode, if available:
  - a. Select Electrical A or Optical A for channel A
  - b. Select Electrical B or Optical B for channel B
- 3- SINGLE mode:
  - a. Select input: Electrical A, Electrical B, Optical A or Optical B if available.



**Figure 6** *Input panel – HDA-3962*

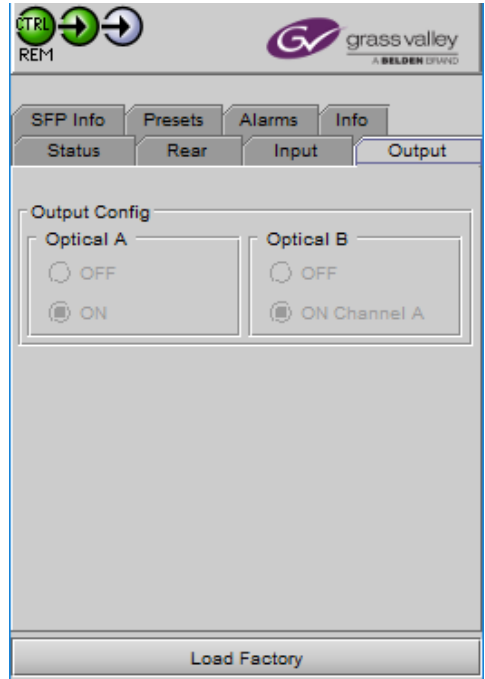
## 5.3 The *Output* panel

This panel controls the optical output functions (when equipped; see the Status tab) related the HDA-3962 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-3962, 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



**Figure 7** *Output panel – Dual Channel Operating Mode*

### 5.4 The Rear panel

This panel identifies the type of rear panel installed with this HDA-3962.

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

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

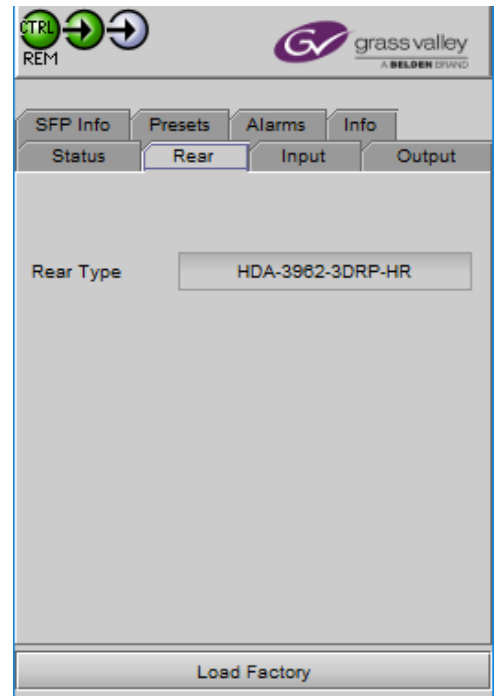


Figure 8 Rear Panel

### 5.5 The Status panel

This panel shows the status of the various inputs to this HDA-3962.

#### Electrical inputs (A and B)

Data rate (270 Mbps / 1.5 Gbps / 3 Gbps/12 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

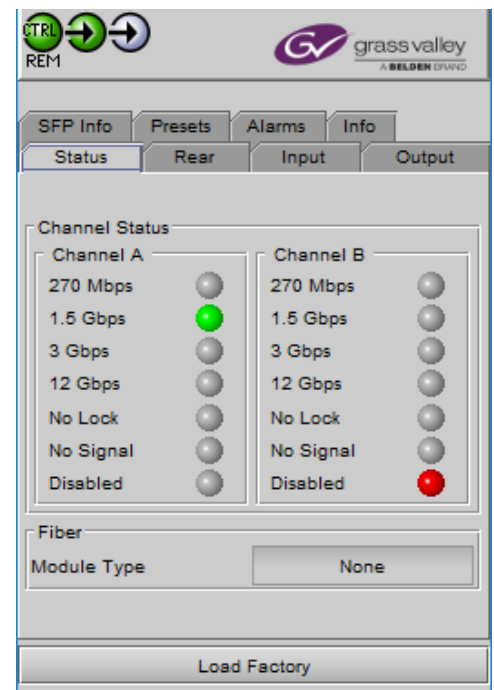


Figure 9 Status panel

### 5.6 The SFP Info panel

This panel shows information about the currently-installed SFP optical module. See Rear Connector Panels on page 12.

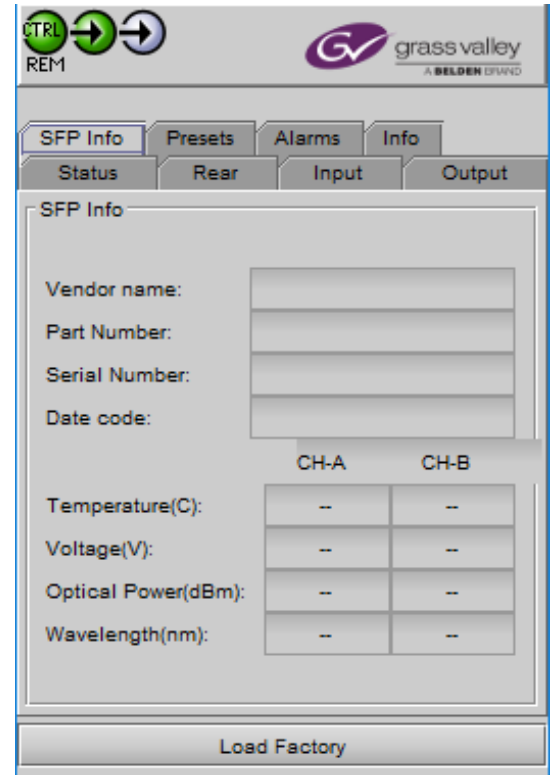


Figure 10 SFP Info panel

## 5.7 The Alarms panel

This panel allows the alarm reporting of the HDA-3962 to be configured.

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

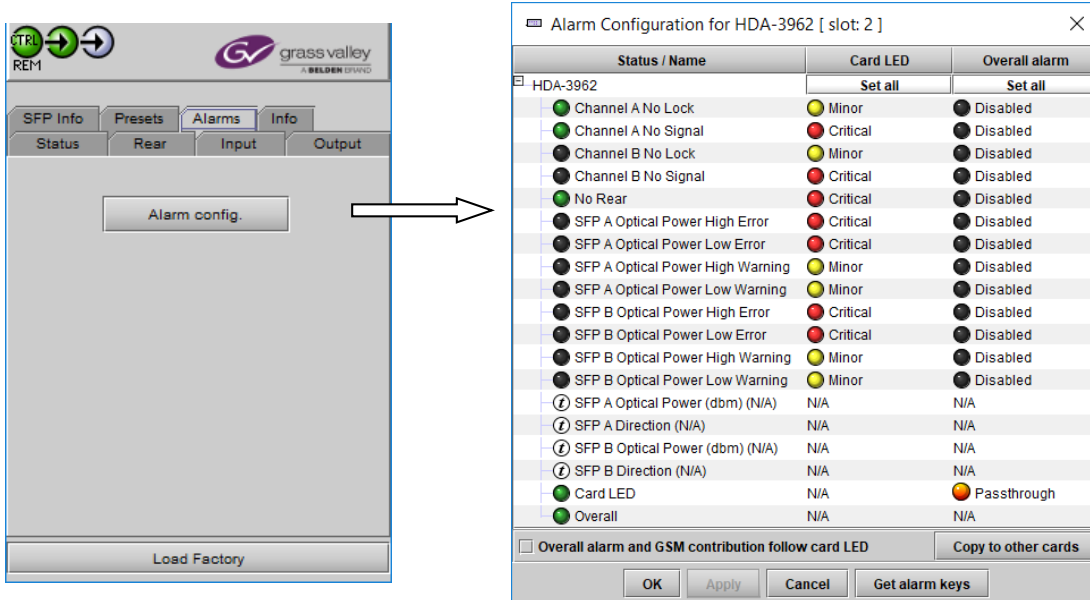


Figure 11 Alarms panel and Alarm Configuration window

The Alarm Configuration window is organized in columns

### Status/Name

This contains an expandable tree listing all the alarms reported by this HDA-3962 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-3962 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 LED 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**

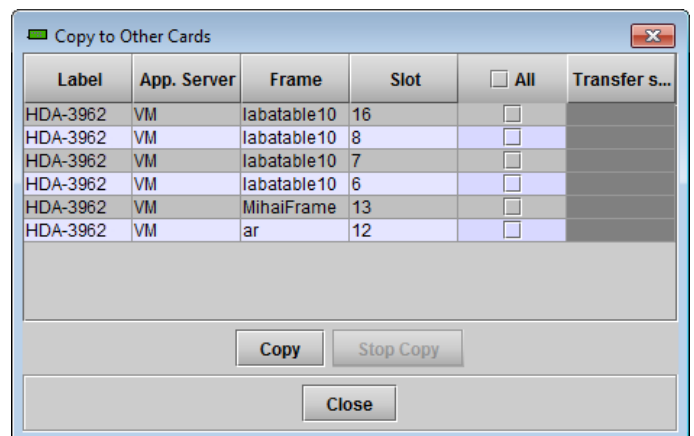
iControl maintains a log of alarm events associated with the card. The log is useful for troubleshooting and identifying event sequences. Click in the checkbox to enable logging of alarm events for each individual alarm.

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-3962 card.

- Select one or more destination cards from the list in the window by setting in the checkboxes, or set all of them by setting in the *All* checkbox at the top of the column



**Figure 12 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

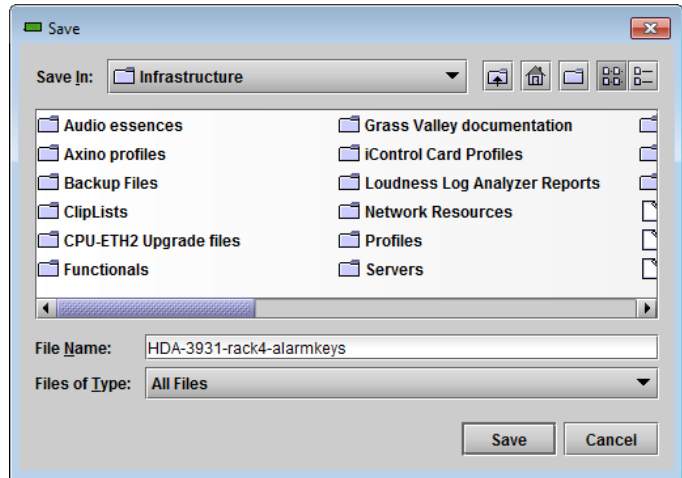


Figure 13 Save dialog for Get Alarm Keys

### 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.

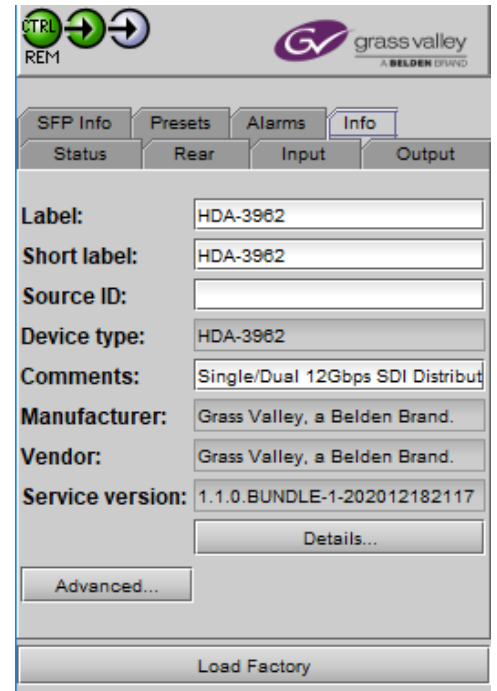


## 5.8 The *Info* panel

When the HDA-3962 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-3962 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-3962
- Comments:** type any desired text

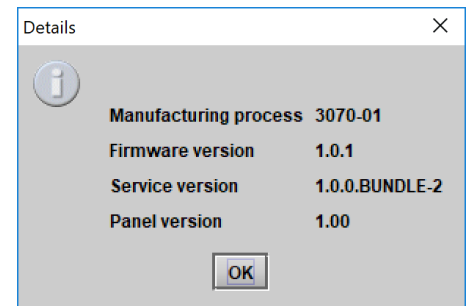
The remaining data boxes show manufacturing information about this card.



**Figure 14 Info panel**

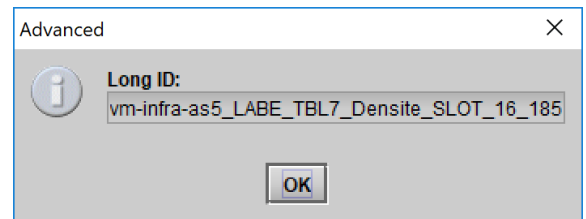
Three buttons in the panel give access to other information.

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



**Figure 15 Details window**

- **Advanced...:** Shows the Long ID, which is the address of this HDA-3962 in the iControl network.



**Figure 16 Advanced window**

- **Remote System Administration:** opens the Joining Locators data box, which lists remote lookup services to which this HDA-3962 is registered.

**Add:** Force the iControl service for this HDA-3962 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

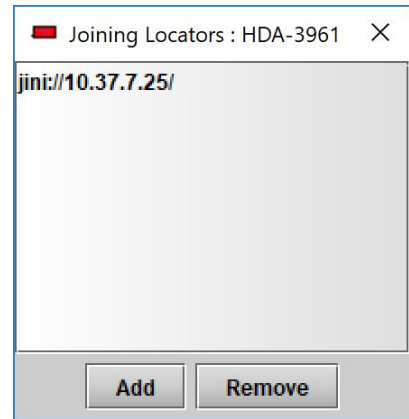
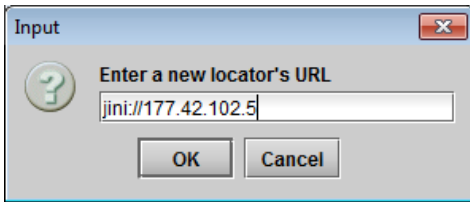
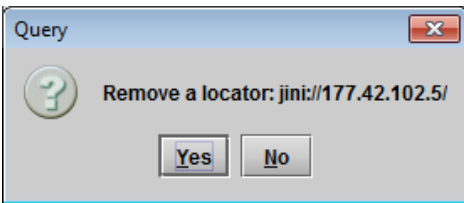


Figure 17 Joining Locators window

**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.



## 5.9 The Presets panel

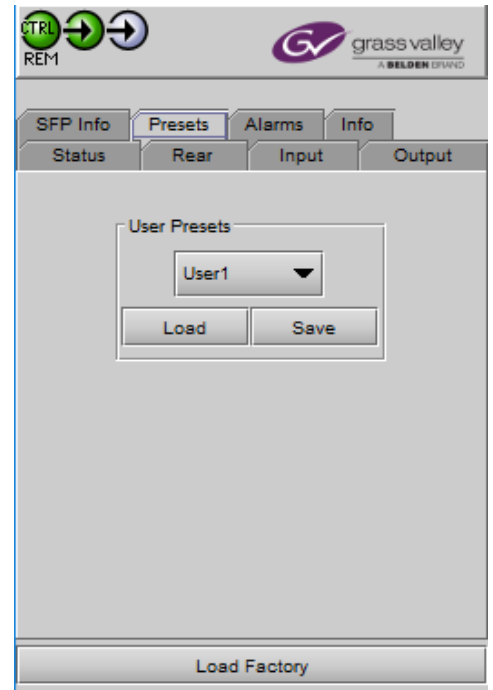
### User Presets

The HDA-3962 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-3962. 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-3962 into the selected User Preset. The existing contents of the preset will be overwritten without asking for confirmation.



**Figure 18 Presets panel**

## 6 Specifications

### Electrical Inputs and Outputs

#### Physical:

11 HD-BNC connectors: 1 In, 10 Out (HDA-3962-3DRP-HR)

8 BNC connectors: 2 In, 6 Out (HDA-3962- 3SRP-2IN)

12 HD-BNC connectors: 2 In, 10 Out (HDA- 3962-3SRP-HF)

8 BNC connectors: 1 In, 7 Out (HDA-3962- 3SRP)

#### SDI standards:

SMPTE ST 259-C (270 Mb/s)

SMPTE ST 292 (1.485, 1.485/1.001 Gb/s)

SMPTE ST 424 (2.970, 2.970/1.001 Gb/s)

SMPTE ST 2082-1:2015 (11.88Gb/s and 11.88/1.001 Gb/s)

#### Cable length (Belden 1694A cable):

365m (1197 ft.) at 270 Mb/s

150m (492 ft.) at 1.485 Gb/s

100m (197 ft.) at 2.970 Gb/s

#### Cable length (Belden 4794R cable):

60m (197 ft.) at 11.88 Gb/s

#### Return loss:

>15 dB up to 1.5 GHz

>10 dB from 1.5 GHz to 3 GHz

**NOTE:** When using a rear panel that is equipped with a bypass relay (model: HDA-3962-3DRP-HR), performance will be reduced for equipment connected to the output protected by the bypass relay (1).

- The total cable length of the bypass relay protected path must not be greater than the maximum input cable length requirement of the receiving equipment. For this, add the cable length of the equipment connected to the card's input to the cable length of the receiving equipment connected to the output protected by the bypass relay.
- The return loss specifications of the bypass relay protected path will be reduced as it depends on the return loss of the receiving equipment connected to the output protected by the bypass relay.

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

#### Rise/fall time:

<135 ps for all formats (12G, 3G, HD, SD)

### Processing Performance

Processing delay: 7 ns typical

### Electrical

**Power:** 12.5W max

## 7 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

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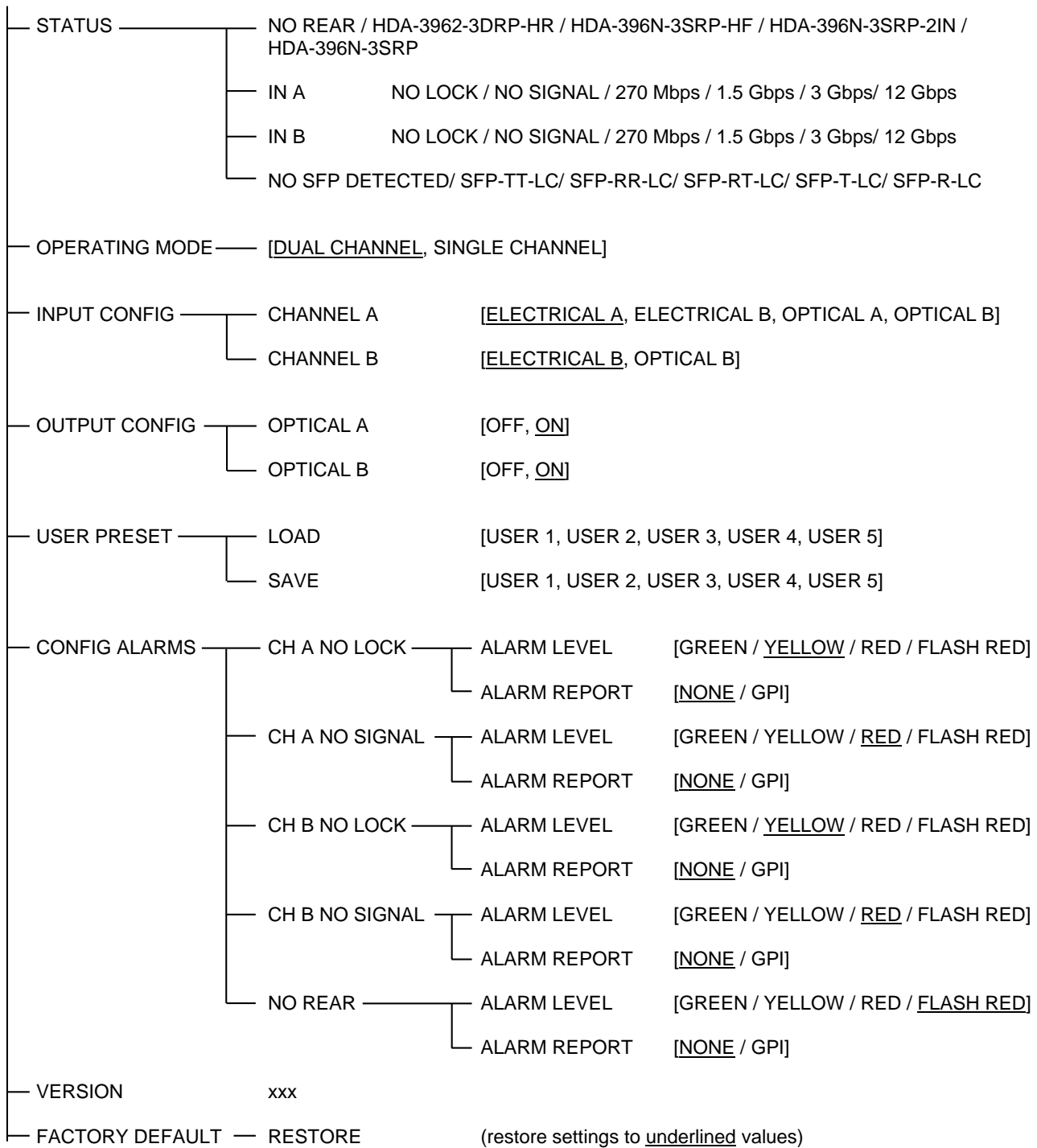
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Fax: +1 514 333 9828

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

## ANNEX 1 – HDA-3962 Local User Interface



## 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-3962 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.



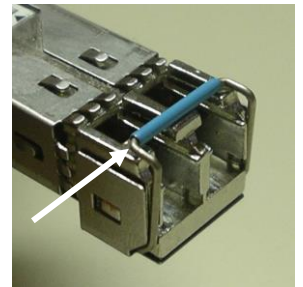
Never remove or install an SFP module with the fiber optic cables connected. Damage to the cables could result.



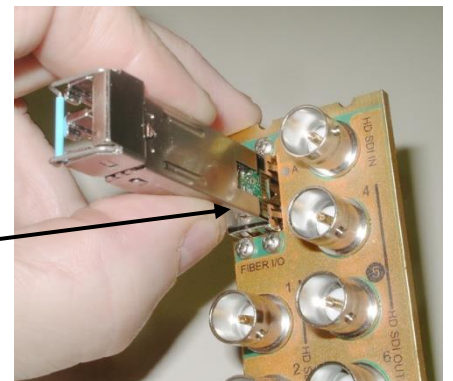
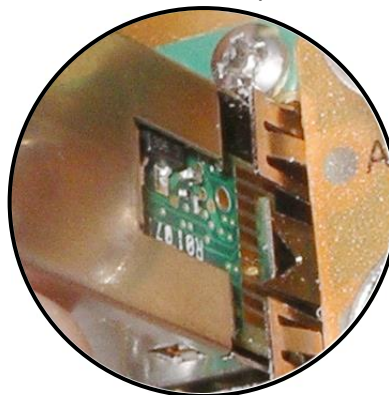
The presence of dust and debris can seriously degrade the performance of an optical interface. It is recommended that you insert a dust plug into the SFP module whenever a fiber optic cable is not connected.

### Installing an SFP module

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

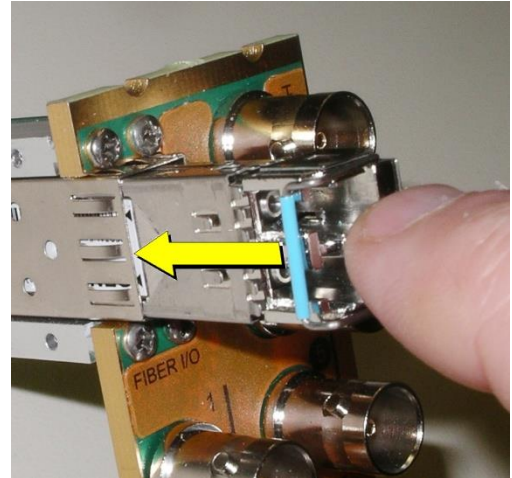


2. Position the SFP module so that the recessed slot is lined up with the tab side of the socket.



## GUIDE TO INSTALLATION AND OPERATION

3. Slide the module straight into the socket, and push gently until it clicks into position.



### Connecting the fiber optic cables

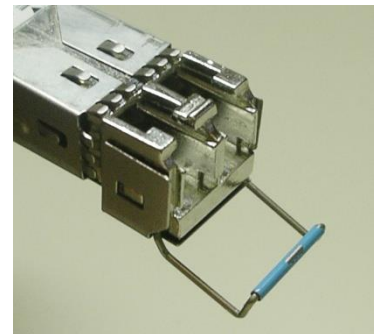
1. Remove the dust plug from the SFP module if present
2. Verify that the exposed end of the optical fiber in the LC connector is clean
  - Carefully remove any debris if necessary.
3. Plug the LC-terminated fiber optic cable into the SFP module

### 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.





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.

