



grass valley

A **BELDEN** BRAND

# **DDA-1133**

## **Digital Audio Distribution Amplifier**

### **Guide to Installation and Operation**

M470-9200-102

20 April 2017

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

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- EN 55022 Class A radiated and conducted emissions
- EN 55024 Immunity of Information Technology Equipment
- EN 61000-3-2 Harmonic current injection
- EN 61000-3-3 Limitation of voltage changes, voltage fluctuations and flicker
- EN 61000-4-2 Electrostatic discharge immunity
- EN 61000-4-3 Radiated electromagnetic field immunity – radio frequencies
- EN 61000-4-4 Electrical fast transient immunity
- EN 61000-4-5 Surge immunity
- EN 61000-4-6 Conducted immunity
- EN 61000-4-8 Power frequency magnetic field immunity
- EN 61000-4-11 Voltage dips, short interruptions and voltage variations immunity

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# 1. DDA-1133 Digital Audio Distribution Amplifier

## 1.1 Introduction

The Digital Audio Distribution Amplifier DDA-1133 supports AES3-110  $\Omega$  and provides up to 9 outputs. The input features clock regeneration for reduced jitter and signal restoration. A signal detection stage allows control of the content of the audio signal.

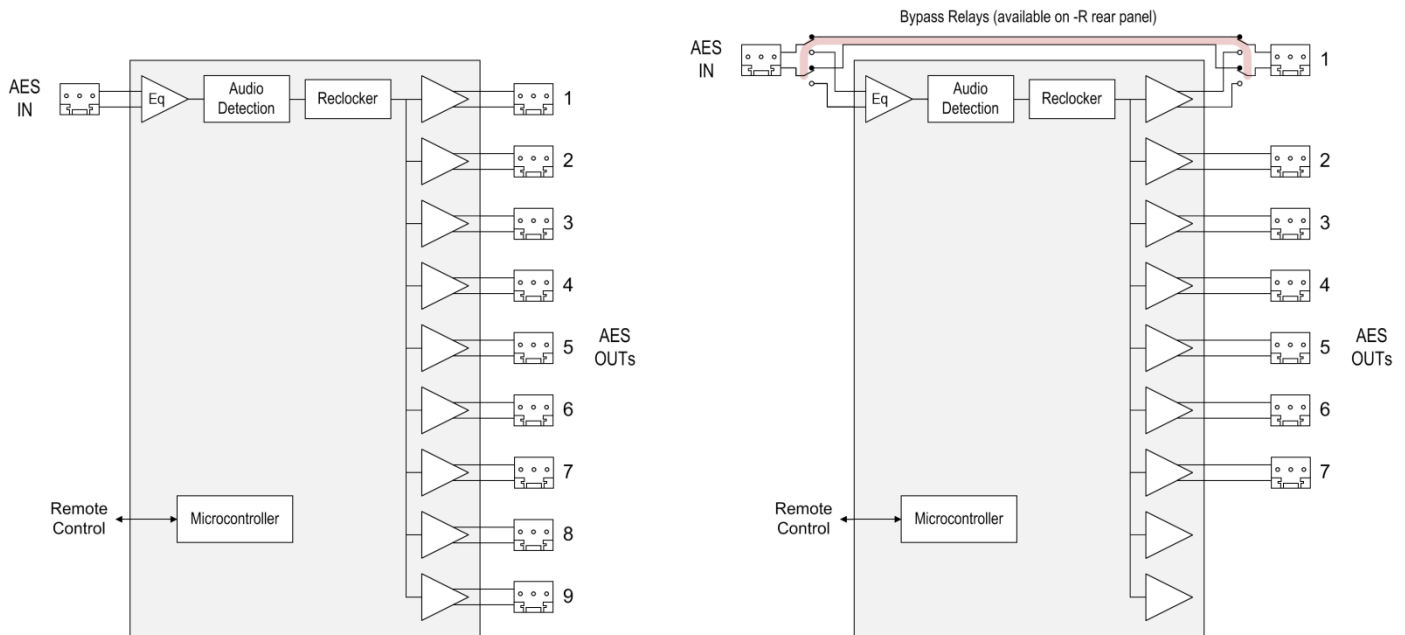
A multi-colored LED, visible with the frame door closed, reports the card status. The DDA-1133 requires a "single" or a "double" rear connector panel.

## 1.2 Features

- Digital audio distribution amplifier - 1 input to 4, 7 or 9 outputs
- AES3 audio balanced input
- Remote control of carrier quality
- Silence detect with user adjustable delay and threshold
- Status LED and remote reporting
- Signal regeneration
- V, U, C, P bits transparency

## 1.3 Block Diagram

The following block diagrams show the functionality of the **DDA-1133**. Note that the number of available outputs depends on the rear panel in use. See [Section 2.1 - Preliminary](#) for more details



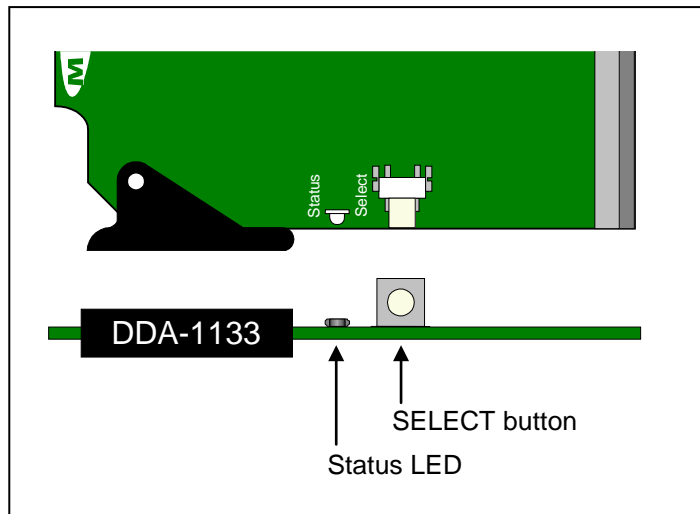
. **Figure 1-1** Functional Block Diagram

The **bypass relay**, available on the -R rear panel, connects OUT1 to the INPUT, bypassing the DDA-1133. This will occur only when the DDA-1133 is removed from the frame, or in the event of a power supply failure.

## 1.4 Front Card-edge Interface

The front card-edge of the DDA-1133 incorporates two elements:

- Status LED (see section 3.1)
- Select Button (see section 3.2)



**Figure 1.2** Card-edge controls and indicators

## 2 Installation

### 2.1 Preliminary

The DDA-1133 module is sized to fit into a Grass Valley Densité 2 frame.

The DDA-1133 can be configured to fit into Densité 3 series frames, when fitted with an adapter.

Rear connector panels are available for each frame size:

Densité-series Frame	Rear Panels	Size (slots)	I/O
Densité 2	DDA-1133-SRP DDA-1133-DRP	Single Double	1 input - 4 outputs 1 input - 9 outputs
Densité 3 Densité 3 mini Densité 3+ FR1 Densité 3+ FR4 GV Node	DDA-1133-3SRP DDA-1133-3SRP-R <i>You can also use one of the Densité-2 rears with an available adapter.</i>	Single Single	1 input - 9 outputs 1 input - 7 outputs with bypass relay (IN to OUT 1)

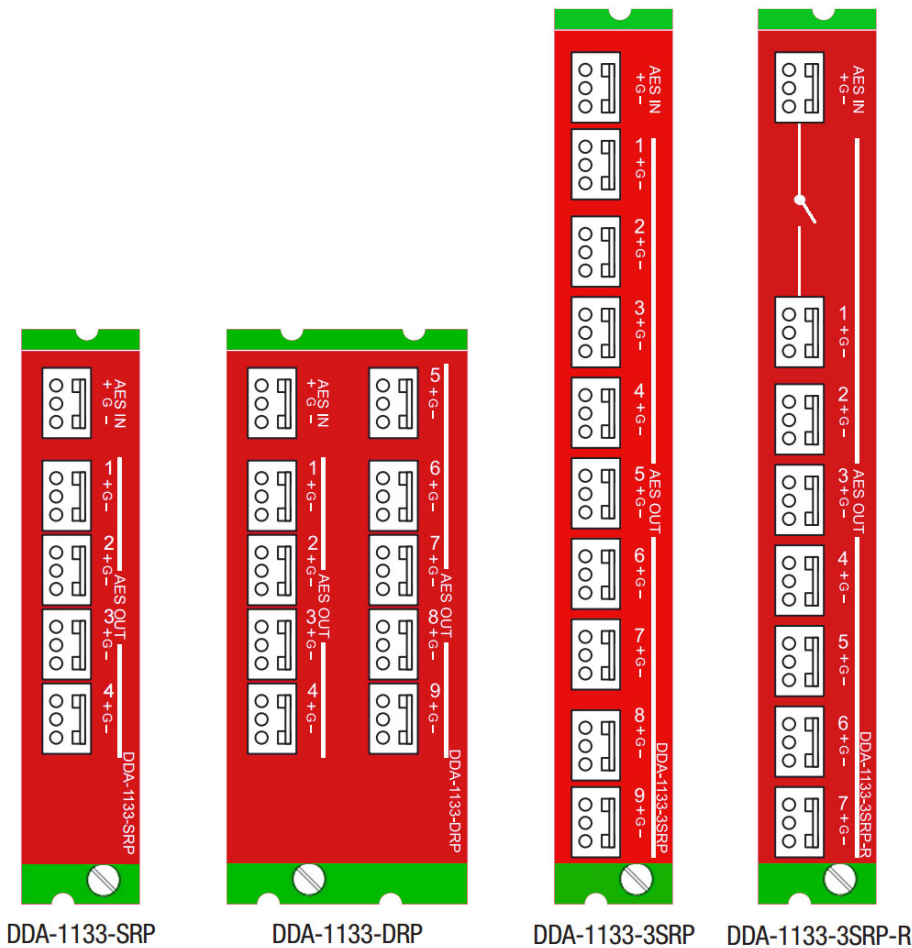


Figure 2-1 DDA-1133 rear panels

## 2.2 Installation in the Densité frame

The DDA-1133 and its associated connector rear panel must be mounted in a DENSITÉ-2 or DENSITÉ-3-series frame. It is not necessary to switch off the frame's power when installing or removing the card. See the appropriate DENSITÉ Frame manual for detailed instructions for installing cards and their associated rear panels.

- **The rear panel must be installed first, before the card is inserted into the frame.**
- When used with a dual-slot rear panel, the DDA-1133 must be installed in the right-most of the two slots covered by the panel in order to mate with the panel's connectors. If it is placed in the wrong slot, the front panel LED will flash red. Move the card to other slot for correct operation. No damage will result to the card if this occurs.

## 3 Operation

### 3.1 Card-Edge Controls and Indicators – Status LED

The status monitor LED is located on the front card-edge of the DDA-1133, and is visible through the front access door of the DENSITÉ frame. This multi-color LED indicates the status of the DDA-1133 by color, and by flashing/steady illumination.

The chart shows how the various error conditions that can be flagged on the DDA-1133 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 3.2.2 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 errors	⚙️			
No input lock			⚙️	
Biphase Coding Error			⚙️	
Parity Error			⚙️	
CRCC Error		⚙️		
Slipped sample		⚙️		
Confidence		⚙️		
Invalid		⚙️		
Non audio		⚙️		
No signal input 1		⚙️		
No signal input 2		⚙️		
Hardware Failure / No Rear				⚙️

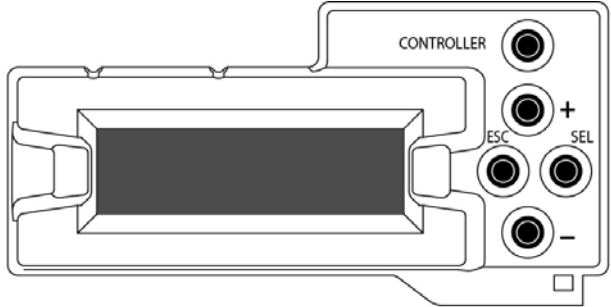
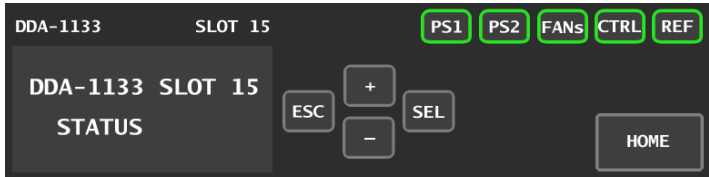


If the LED is Flashing Yellow, it means that the card is selected for local control using the Densité frame’s control panel. See Section 3.2 for details.

When the DDA-1133 is installed in the Densité 3+ FR4 frame or the GV Node, the card status is shown on the touch-screen display’s home page by the colored outline of the DDA-1133 access button.

### 3.2 Local control using the Densité frame control panel

There are two types of local control panel:

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 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 consists of 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

[SEL] 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 [SEL] 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 reverts to its normal operating mode.

#### To assign the local control panel to the DDA-1133:

- Physical Panel: Push the SELECT button on the DDA-1133 card edge (see Section 1.4).

- Touch-screen panel: In the home screen, touch the virtual button corresponding to this DDA-1133.

The STATUS LED on the DDA-1133 flashes yellow, and the touch-screen status shows yellow for the DDA-1133.

Use the control panel buttons to navigate through the menu, as described above. The complete menu structure is shown below.

### 3.2.1 Menu for local control

Using the menu, the user can:

- Display the error status if any is present
- Adjust the **No Signal Delay** and **Signal Threshold** to set the conditions of a No Signal alarm. A signal absence is declared when the level is lower than the threshold during the selected delay.
- Adjust the correction applied to the input signal:
  - AUTO** A *START* will initiate an automatic sequence, indicated by *PROCESS*. When the input status becomes correct it will stop and *SUCCESS* will be displayed. *FAIL* will be displayed to indicate that no correction has been found that will yield to a correct input status.
  - LENGTH** This command allows a manual adjustment of the correction applied to the input signal. The input status is displayed at the same time to ease the setting.
- Enable or disable the internal **Reclocker**..
- Configure the different alarms, setting the alarm level (color displayed on the front panel status LED, and severity reported to the frame controller) and selecting whether the alarm is to be reported on the frame's GPI interface.
- Access the firmware version of the card programmable devices.

**DDA-1133**

STATUS	[REAR PANEL ERROR, NO LOCK, BIPHASE CODING, PARITY, CRCC, SLIPPED, CONFIDENCE, INVALID, NON AUDIO, DOLBY E, AC3, NO SIGNAL 1, NO SIGNAL 2, NO SIGNAL 1&2, ALL OK]		
NO SIGNAL DELAY	[0, ..., <b>15</b> , ..., 255]	( s )	
SIGNAL THRESHOLD	[-72, -66, <b>-60</b> , -54, -48]	( dBFS )	
CABLE CORRECTION	AUTO	[START, PROCESS, SUCCESS, FAIL]	
	LENGTH	[ <b>0</b> , 1000]	
RECLOCKER	[ <b>OFF</b> , ON]		
CONFIGURE ALARM	NO LOCK	ALARM LEVEL	[GREEN, YELLOW, <b>RED</b> , FLASH RED]
		ALARM REPORT	[ <b>NONE</b> , GPI]
	BIPHASE CODING	ALARM LEVEL	[GREEN, YELLOW, <b>RED</b> , FLASH RED]
		ALARM REPORT	[ <b>NONE</b> , GPI]
	PARITY	ALARM LEVEL	[GREEN, YELLOW, <b>RED</b> , FLASH RED]
		ALARM REPORT	[ <b>NONE</b> , GPI]
	CRCC ERROR	ALARM LEVEL	[GREEN, <b>YELLOW</b> , RED, FLASH RED]
		ALARM REPORT	[ <b>NONE</b> , GPI]
	CONFIDENCE	ALARM LEVEL	[ <b>GREEN</b> , YELLOW, RED, FLASH RED]
		ALARM REPORT	[ <b>NONE</b> , GPI]
INVALID	ALARM LEVEL	[GREEN, <b>YELLOW</b> , RED, FLASH RED]	
	ALARM REPORT	[ <b>NONE</b> , GPI]	
NON AUDIO	ALARM LEVEL	[GREEN, <b>YELLOW</b> , RED, FLASH RED]	
	ALARM REPORT	[ <b>NONE</b> , GPI]	
NO SIGNAL 1	ALARM LEVEL	[GREEN, <b>YELLOW</b> , RED, FLASH RED]	
	ALARM REPORT	[ <b>NONE</b> , GPI]	
NO SIGNAL 2	ALARM LEVEL	[GREEN, <b>YELLOW</b> , RED, FLASH RED]	
	ALARM REPORT	[ <b>NONE</b> , GPI]	
FIRMWARE VERSION	[ UC = Vxxx, FPGA = Vx]		
FACTORY DEFAULT	RESTORE		

### 3.3 iControl Interface

The operation of the DDA-1133 may be controlled using Grass Valley's iControl system.

This section describes the control panels associated with the DDA-1133 and their uses.

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 DDA-1133 icon to open the control panel.

#### Status Icons

At the top, to the left of the Grass Valley logo, are two status icons that report various aspects of the card's operation.

The leftmost (CTRL) icon shows whether card configuration is manual [LOC] or via iControl [REM]. The second icon reports the input status.

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

#### Load Factory

The Factory profile is a read-only set of factory-selected values that can be used to return your DDA-1133 to a standard operating condition.

- The default values are shown as underlined in the DDA-1133 Menu on page 7.

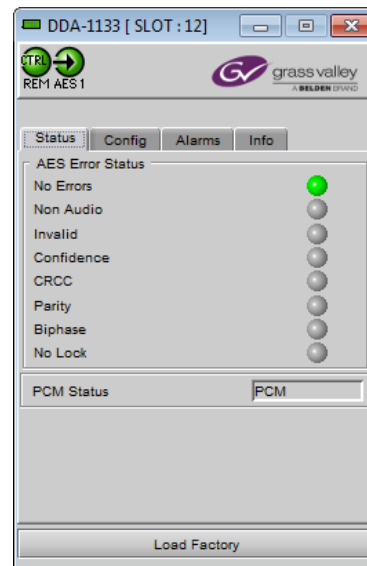


Figure 3-1 Status Tab

#### 3.3.1 Status Tab

This tab displays the status of the various errors that could be associated with the input signal.

The PCM Status box will display either PCM, non-audio, Dolby-E or AC-3 according to the type of audio signal.

#### 3.3.2 Config Tab

##### No Signal Delay

This tab sets the card's behavior in the event of a loss or absence of audio signal content.

A signal absence is declared when the signal level is lower than the signal threshold during the selected period.

The threshold can be set through the pull-down box to -72, -66, -60, -54 or -48 dBFS, the default value is -60 dBFS.

The signal absence period can be adjusted from 0 to 255 seconds. The default value is set to 15 s. An input box is available to enter a numerical value directly.

##### Cable Correction

###### Mode MANUAL

This mode allows a manual adjustment of the correction applied to the input signal. Look at the input status icon to facilitate the setting. An input box is available to enter a numerical value directly.

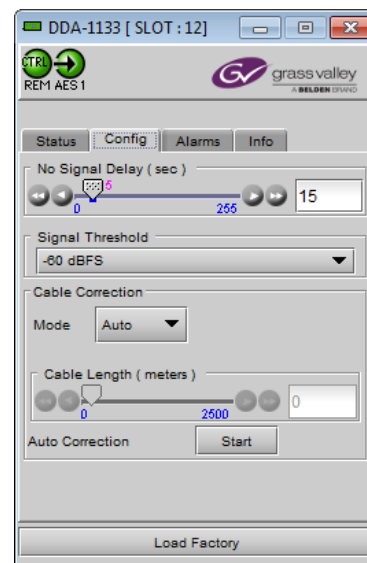
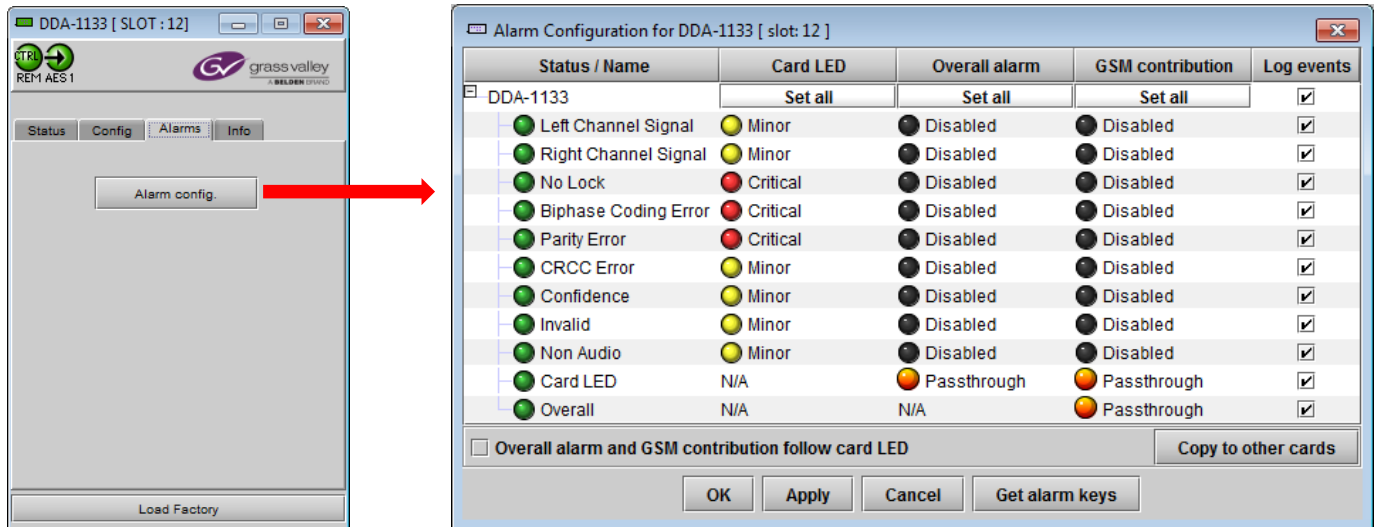


Figure 3-2 Config Tab

### Mode AUTO

A START will initiate an automatic sequence, indicated by PROCESS. When the input status becomes correct it will stop and SUCCESS will be displayed. FAIL will be displayed to indicate that no correction has been found that will yield a correct input status

### 3.3.3 Alarms Tab



**Figure 3-3** Alarms Tab and Alarms Configuration panel

Selecting the **Alarm config** button opens a separate window for error status reporting. The Alarm Configuration Panel shows a listing of the alarms reported by the card.

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

#### Card LED

This column allows configuration of the contribution of selected individual alarms to the status LED located on the front card edge. The Card LED status is shown at the bottom of the alarm tree in the Status/Name column.

#### Overall Alarm






This column allows configuration of the contribution of each individual alarm to the Overall Alarm associated with this card. The Overall Status is reflected by the color of the indicator attached to the card in iControl Navigator. It is also displayed in the upper left corner of the iControl Interface of the DDA-1133.

#### 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 set to 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 pull-down lists may contain some or all of the following options:

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

**Shortcut:** if you click in one of the Set all command under each major heading in the Status/Name line, you will open a pull-down that lets you assign a level to all alarms in that 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.

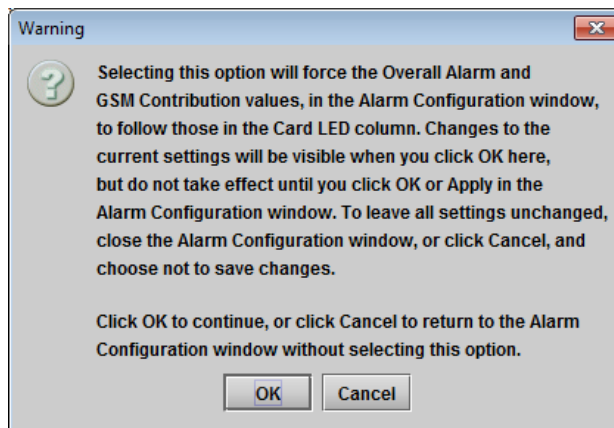
At the bottom of the window are several other controls:

**Overall alarm and GSM contribution follow card LED**

Click in the checkbox to force the Overall alarm and GSM contribution to be identical to the Card LED status

- All Overall alarms for which there is a Card LED alarm will be forced to match the Card LED alarm
- All Overall Alarms for which there is no Card LED alarm will be forced to Disabled

A warning box will open allowing you to confirm the action, since it will result in changes to the configuration and there is no *undo* function.

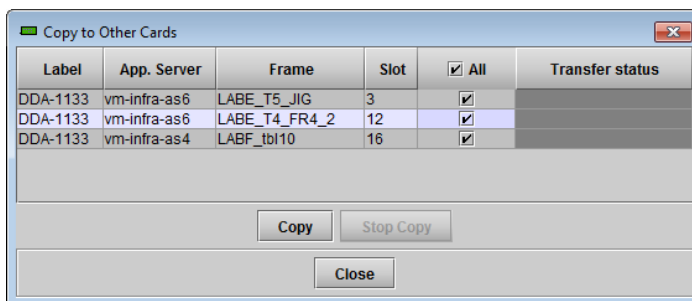


**Figure 3-4 Overall Follow Card LED - Warning Box**

**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 DDA-1133 card.

Select one or more destination cards from the list in the window by clicking in check boxes, or all of them by clicking in the *All* checkbox.

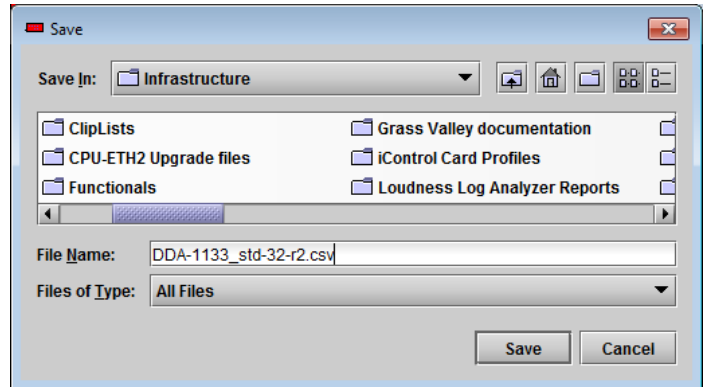


**Figure 3-5 Copy to Other Cards**

**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 3-6** Get Alarm Keys

**3.3.4 Info Tab**

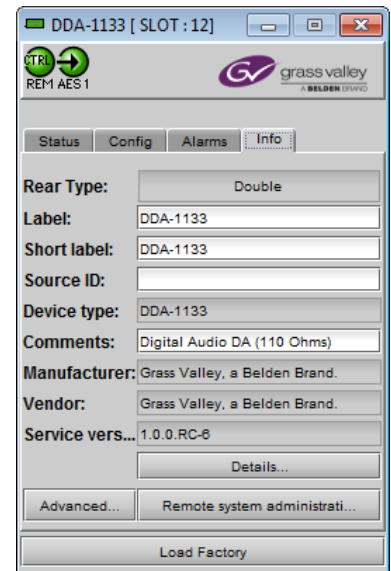
The Info panel displays information about the DDA-1133.

The boxes titled *Label*, *Short Label*, *Source ID* and *Comments* are editable; you can enter your own information.

The Advanced button displays LongID of this card, which is its address in the iControl system.

The Details button displays the card firmware version.

The Remote System Administration button at the bottom of the window opens the Joining Locators data window, which lists remote lookup services to which this DDA-1133 is registered. The ADD button in that window allows new lookup services to be added.



**Figure 3-7** Info Tab

## 4 Specifications

### Input

Signal	AES3 (ANSI S4.40)
Level	0.1 to 7.0 Vpp
Impedance	110 $\Omega$ balanced
Equalization	up to 1000 m (DRAKA ref. KFB Audio PBG110)

### Outputs

Signal	AES3 (ANSI S4.40)
Level	4 Vpp
Impedance	110 $\Omega$ balanced
Rise/fall time	25 ns
Over/under shoot	5.5%
Jitter reduction	6 dB (@ 20 kHz)
Specific jitter	<0.005 UI pp (700 Hz to 100 kHz)

### Signal Processing

Sampling:	28 to 100 kHz
Processing delay:	
- Reclocker ON	<60.7 $\mu$ s @ 48kHz (< 3 samples)
- Reclocker OFF	75 ns typ.
Signal absence threshold	-48 / -72 dBFS (6 dB steps)
Signal absence delay	from 0 to 255 s
V, U, C, P bits transparency	

### Miscellaneous

Power	with 4 outputs:	1.5 W
	with 7 outputs:	2.0 W
	with 9 outputs:	2.0 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.

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