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REVISION HISTORY

<u>REVISION</u>	<u>DESCRIPTION</u>	<u>DATE</u>
0.1	Preliminary Version	Dec 02
1.0	First release version	Feb 03

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1. OVERVIEW

The 500ADA-AUD Analog Audio distribution amplifier is a general purpose 1x4 amplifier for distributing analog audio signals.

The 500ADA-AUD can be operated with either differential or single ended inputs and offers a wide range of gain adjustment to handle a wide variety of input signals.

The 500ADA-AUD is housed in the 500FR **exponent** Frame that will hold up to 16 modules.

Features:

- Differential and single ended input (automatic single ended to differential conversion)
- High impedance inputs
- Low impedance outputs
- Wide gain adjustment range
- High common mode range and common mode rejection ratio
- Very high SNR
- Very low THD+N

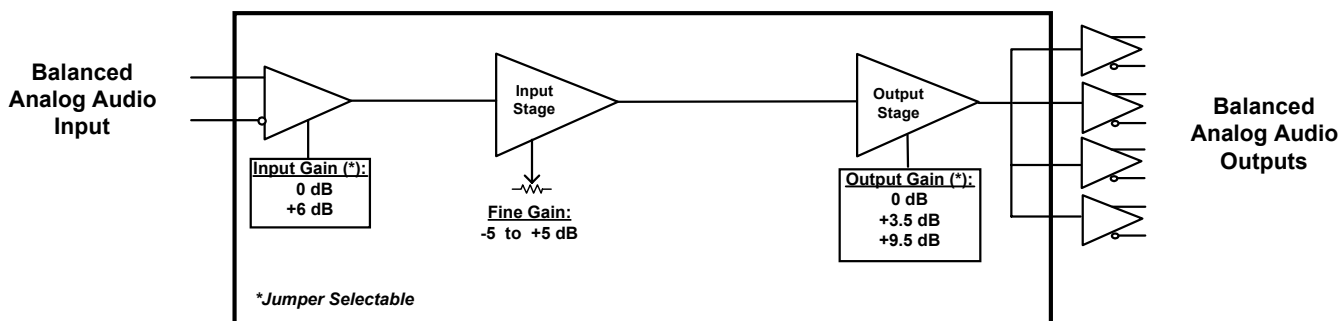


Figure 1: 500ADA-AUD Block Diagram

2. INSTALLATION

The 500ADA-AUD comes with a companion rear panel overlay that can be placed over the rear panel BNC connectors to identify their function. For information on inserting the module into the frame see the 500FR chapter section 3. The 500ADA-AUD is shipped with a 500BAL-IO terminal block adapter that must be installed to the rear panel of the frame.

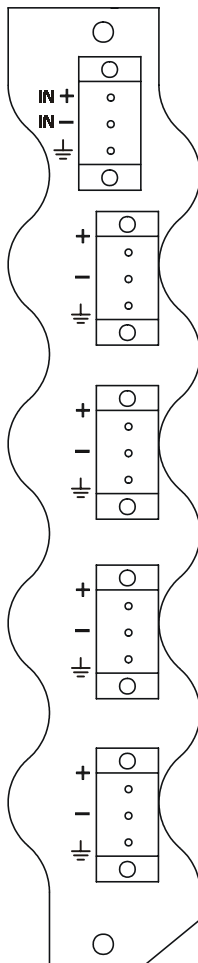
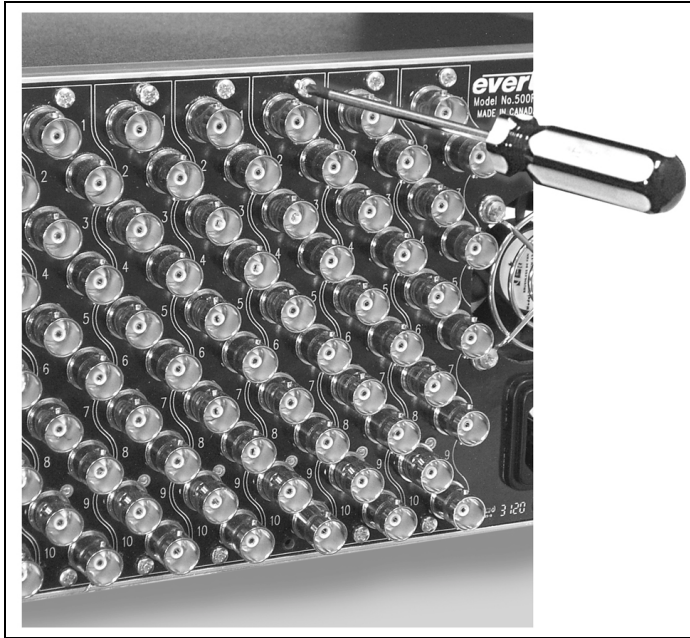


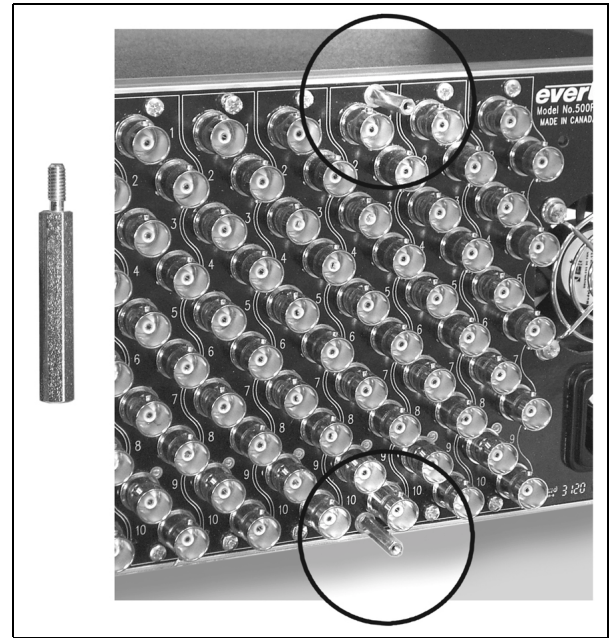
Figure 2: 500BAL-IO Rear Panel Adapter for 500ADA-AUD

Refer to the pictures in Figure 3 for additional information on installing the panel adapter.

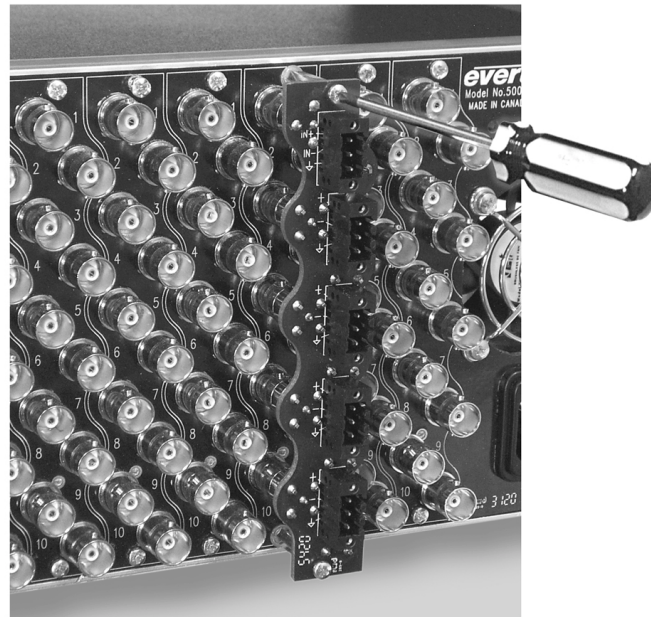
1. Using a Philips screwdriver, remove the screws above and below the slot where you want to install the panel adapter. (Figure 3a)
2. Install the two jack posts that were supplied with the panel adapter. Tighten with pliers or a hex wrench. (Figure 3b)
3. Slide the BNC connectors of the panel adapter over the BNC connectors on the rear of the frame. The panel adapter should go all the way in until it touched the jack posts.
4. Reinstall the screws and tighten with a Philips screwdriver. Figure 3c.



(a) Removing the screws



(b) Installing the Jack Posts



(c) Securing the Panel Adapter screws

Figure 3: 500BAL-IO Rear Panel Adapter Installation

The balanced audio cables can be secured into the removable portion of the terminal strips using a small screwdriver. The removable part of the terminal strip is then inserted into the terminal strips on the rear panel.

ANALOG AUDIO IN Balanced analog audio inputs for 1 channel. Each input (+, -, GND) is on a 3 pin removable terminal strip connector.

ANALOG AUDIO OUT There are four balanced analog audio outputs for each of the 2 input channels. Each output (+, -, GND) is on a 3 pin removable terminal strip connector.

3. SPECIFICATIONS

3.1. ANALOG AUDIO INPUT

Standards: Any analog audio signal
Number of inputs: 1 (Balanced or Single ended)
Connectors: 3 pin removable terminal strips
Input step gain: 0 dB or +6 dB (configurable with jumpers)
Fine gain control: -5 to +5 dB (card edge pot adjustable)
Maximum input level:
 0 dB input gain +34 dBu
 +6 dB input gain +28 dBu
Common mode rejection: > 105 dB @ 60 Hz
Common mode range:
 0 dB input gain: > ± 22 V
 +6 dB input gain: > ± 7 V
Input impedance:
 0 dB input gain: 44 k Ω
 +6 dB input gain: 26 k Ω

3.2. ANALOG AUDIO OUTPUTS

Number of Outputs: 4
Connectors: 3 pin removable terminal strips
Output step gain: 0, 3.5 or 9.5 dB (configurable with jumpers)
Max. output level: +28 dBu across hi-impedance load
 +24 dBu into 600 ohm load
Output impedance: 66 ohms
Freq. Response: +/-0.03 dB 20 Hz to 20 kHz
THD+ Noise: 0.001% 20 Hz to 20 kHz @ 28 dBu, unweighted RMS
Output Isolation: > 100 dB @ 1 kHz, 100 dB @ 20 kHz

3.3. ELECTRICAL

Voltage: + 12VDC
Power: 6 Watts

3.4. PHYSICAL

Number of slots: 1

4. STATUS LEDs

The 500ADA-AUD has four LED Status indicators on the front card edge to show operational status of the card at a glance. Figure 4 shows the location of the LEDs.

Two large LEDs on the front of the board indicate the general health of the module.

LOCAL FAULT: This Red LED indicates poor module health and will be On if a local input power fault exists (i.e.: a blown fuse) or the PS OVERCURRENT LED is On indicating a possible short on one of the audio outputs. The LOCAL FAULT indication can also be reported to the frame through the FRAME STATUS jumper.

MODULE OK: This Green LED indicates good module health. It will be On when the board power is good.

Two small LEDs on the front of the board indicate the status of the module power supply.

PS STATUS: This Green LED will be On when the board power is good.

PS OVERCURRENT This Red LED indicates that there is too much current being drawing from the module power supply. This condition is most common when there is a short on one of the outputs. This condition will also cause the LOCAL FAULT LED to come On.

5. JUMPERS AND USER ADJUSTMENTS

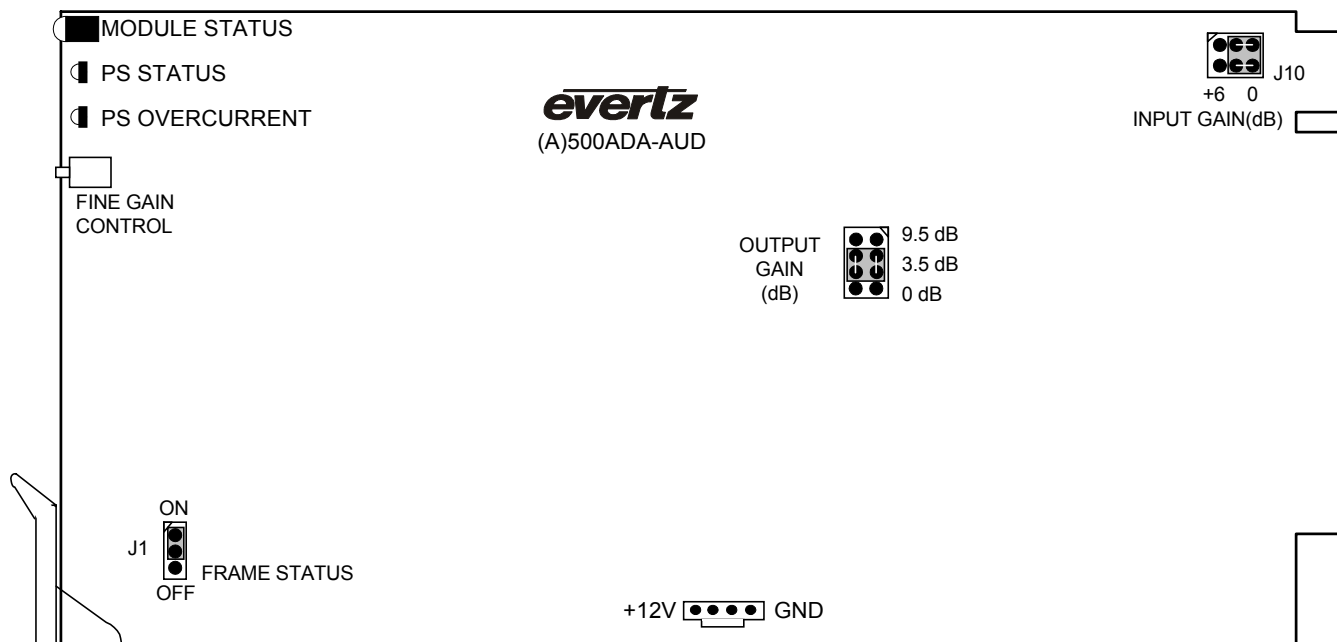


Figure 4: LED and Jumper Locations

5.1. SETTING THE AMPLIFIER GAIN

The overall gain of the 500ADA-AUD is set in three stages:

- input gain control (2 levels of gain)
- linear (fine-adjust) gain control
- output gain control (3 levels of gain)

Depending on the setup of the input and output gain jumpers, the overall gain can be trimmed with the linear (fine-adjust) gain control within the following ranges:

INPUT GAIN JUMPER SETTING	OUTPUT GAIN JUMPER SETTING	OVERALL GAIN RANGE AVAILABLE WITH THE CARD-EDGE TRIM POT
0 dB	0 dB	-5 dB to +5 dB
0 dB	+3.5 dB	-1.5 dB to +8.5 dB
0 dB	+9.5 dB	+4.5 dB to +14.5 dB
+6 dB	0 dB	+1 dB to +11 dB
+6 dB	+3.5 dB	+4.5 dB to +14.5 dB
+6 dB	+9.5 dB	+10.5 dB to +20.5 dB

Table 1: Setting the Amplifier Gain

Note that the card achieves its lowest noise floor and harmonic distortion, when the input is setup with its +6 dB gain. Use it in preference to other gain stages.

The following sections describe how to set each of the gain stages.

5.1.1. Setting The Input Gain Level

There is a 6 pin header used to set the input gain for the input channels. The dual shorting jumper provided can be placed in one of the two locations to select different input gain levels. When placing the jumper make sure that the brass contacts of the jumper are oriented as shown in Figure 5.

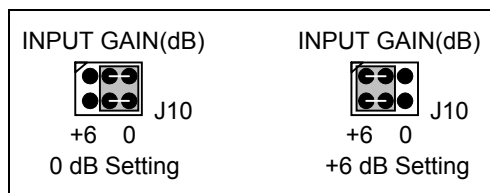


Figure 5: Setting the Input Gain Level

5.1.2. Setting The Output Gain Level

There is a 8 pin header used to set the output gain level for all four outputs. The dual shorting jumper provided can be placed in one of the three locations to select different output gain levels. When placing the jumper make sure that the brass contacts of the jumper are oriented as shown in Figure 6.

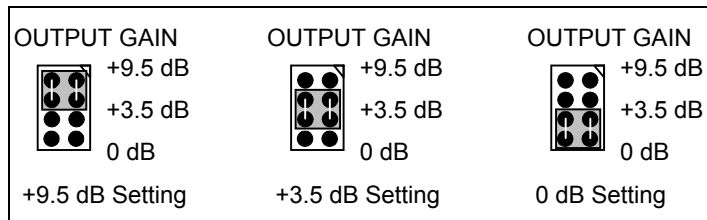


Figure 6: Setting the Output Gain Level

5.1.3. Fine-Tuning The Gain Level

A trim potentiometer located at the front edge of the card is used to fine-tune the input gain levels. On the Rev (1) circuit boards the gain increases when the pot is turned counter-clockwise. On the Rev (A) circuit boards the gain increases when the pot is turned clockwise.

5.2. SELECTING WHETHER LOCAL FAULTS WILL BE MONITORED BY THE GLOBAL FRAME STATUS

The FRAME STATUS jumper J1, located at the front of the module determines whether local faults (as shown by the Local Fault indicator) will be connected to the 500FR frame's global status bus.

FRAME STATUS: To monitor faults on this module with the frame status indicators (on the power supply's FRAME STATUS LED's and on the Frame's Fault Tally output) install this jumper in the On position.

When this jumper is installed in the Off position local faults on this module will not be monitored.

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