DA4011
AES Processing DA
User Guide

INTRODUCTION

The DA4011 provides eight AES outputs of exceptional quality from an AES input. This loop-thru input is jumper configurable for 75Ω, 110Ω, or Hi-Z impedance. The module includes:

- Reclocking capabilities for 44.1, 48, 88.2, and 96kHz sample rates.
- Selectable automatic or manual cable equalization.
- Support for 28kHz-96kHz input sample rate.

On-board circuits provide detection and front panel indicators for:

- Power
- Signal presence
- Varispeed mode
- Reclocking frequency

The DA4011 module consists of a Processing Card and an I/O Card. The Processing Card, installed at the front of the 4000 Series frame and connected to the motherboard, occupies one slot. This card receives ±15VDC through the motherboard and generates the ±12 and +5 VDC power for the module.

Installed at the 4000 Series frame rear panel, the I/O Card occupies the slot opposite the slot for the Processing Card and connects to the motherboard. The I/O card provides the interface between external devices and the Processing card. Two configurations of I/O cards are available to provide for either an AES balanced or unbalanced interface.

Processing Card Panel Description

Figure 1 illustrates the DA4011 Processing Card front panel. The front panel, visible when the 4000 Series frame door is open, is described below.

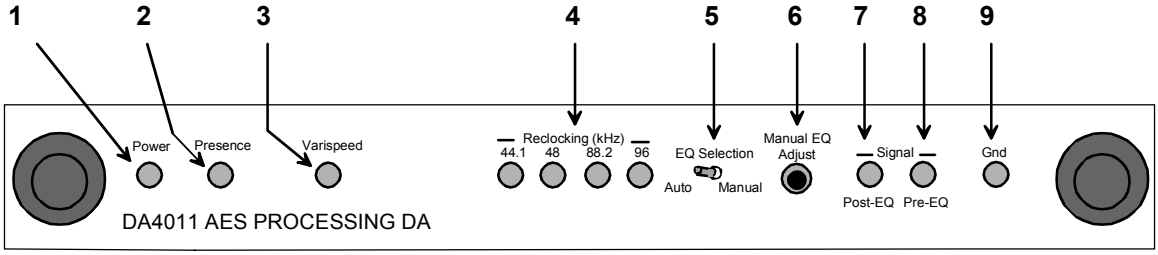


Figure 1. DA4011 Processing Card Panel

1 This green LED is normally On to indicate that the module is receiving power from the NV4001/2 frame power supply through the mother-board. On-board supplies then generate the ±12VDC and +5VDC required by the module.

2 This green LED is normally On to indicate that the module is receiving an input signal.

3 This green LED is On when the module is in the varispeed mode. (See *Configuration* for details.)

4 The green LED corresponding to the reclocking frequency will be On and the other three will be Off. (See *Configuration* for details.)

5 This toggle switch allows you to select either automatic or manual cable equalization. The Manual position enables the Manual EQ Adjust pot (**6** below). (See *Configuration* for details.)

6 This pot allows you to adjust for cable equalization when the toggle switch (**5** above) is in the **Manual** position.

7 The **Post-EQ** test point allows you to monitor the AES input signal after on-board equalization.

8 The **Pre-EQ** test point allows you to monitor the AES signal as it enters the module.

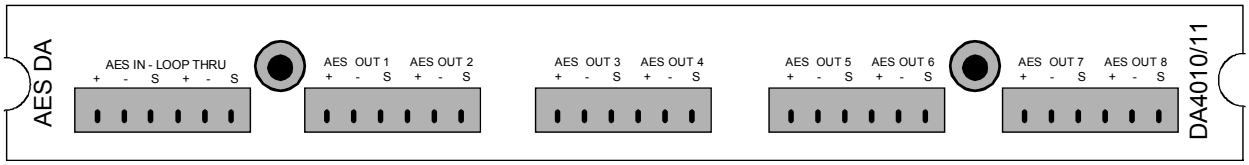
9 The **Gnd** (ground) lug is for use with the **Post-EQ** and **Pre-EQ** monitoring test points.

I/O Card Panel Descriptions

The I/O cards are designed to support balanced (twisted pairs) or unbalanced (coaxial) AES inputs and outputs. This selection, made at the time the DA4011 is ordered, depends on the requirements of

your facility. Figure 2 illustrates the balanced and unbalanced DA4011 I/O card panels.

Balanced I/O Card (Rear Panel)



Unbalanced I/O Card (Rear Panel)

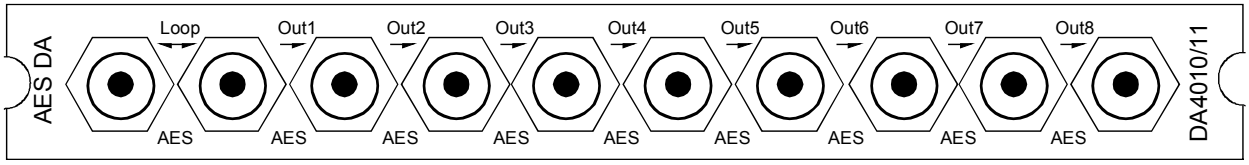


Figure 2. DA4011 Balanced and Unbalanced I/O Card Panels

The balanced I/O Card provides a Phoenix connector for an AES input (with loop-thru) and four Phoenix connectors for AES balanced Outputs 1 through 8 (with two outputs per connector).

The unbalanced I/O Card consists of a BNC connector for an AES input (with loop-thru) and eight BNC connectors for AES Outputs 1 through 8.

Specifications

Table 1 lists specifications for the DA4011 Distribution Amplifier module.

Table 1. DA4011 DISTRIBUTION AMPLIFIER SPECIFICATIONS

TYPE	PARAMETER
General	
Power	±15VDC input from 4000 Series frame, ±12 and +5 VDC on-board.
Power Consumption	5 Watts.
Size	Processing Card: 0.563” (14.3mm) H x 6.125” (155.6mm) W x 12.375” (314.3mm) D.
	I/O Card: 0.563” (14.3mm) H x 6.125” (155.6mm) W x 2.938” (76.6mm) D.
Weight	1.25 lbs (0.6kg) max.
Inputs	
1 AES3, Loop-thru (balanced)	Input Impedance: 110Ω, ±20%, 0.1MHz to 6.0MHz. Data Rate: 28–96 kHz, reclock at 44.1, 48, 88.2, and 96 kHz Minimum Input signal: 200mV for 50% of cell period. Maximum input signal: 10Vpp.
OR	
1 AES-3ID, Loop-thru (unbalanced)	Input Impedance: 75Ω, ±5%. Data Rate: 28–96 kHz, reclock at 44.1, 48, 88.2, and 96 kHz Minimum input signal: 320mV for 50% of cell period. Maximum input signal: 1Vpp, ±20%. Return Loss: >15dB, 0.1MHz to 6.0MHz.
Outputs	
8, AES3 (balanced)	Output Impedance: 110Ω, ±20%, 0.1MHz to 6.0MHz Output Voltage: 2.0 to 7.0 Vpp onto 110Ω Rise/Fall Time: 5 to 30 ns (10% to 90%).
OR	
8 AES-3ID (unbalanced)	Output Impedance: 75Ω, 0.1MHz to 6.0MHz. Output Voltage: 1Vpp, ±20%, onto 75Ω. DC Offset: <50mV, nominal. Return Loss: >15dB, 0.1MHz to 6.0MHz

CONFIGURATION

Use the information here to configure your DA4011 when you receive the module (either separately or as part of your 4000 Series Processing Equipment frame) and when you are changing your use of the module. Configuring the DA4011 entails a jumper placement, setting a DIP switch, and a manual EQ adjustment pot.

Note: To properly set the jumper, you must first know if you are using a Balanced or Unbalanced DA4011 I/O Card and if you want loop-thru on the AES input. To set the DIP switch, you must also know the requirements of your facility. In configuration setup you will be making decisions which effect how your system functions.

Jumper Placement

Figure 3 illustrates the DA4011 Processing Card with the configuration jumper, J1, highlighted. Referring to Figure 3, place a jumper on J1 to select the termination impedance of the AES input per the following:

PINS	TERMINATION	USE
1-2	75 ohms	No loop-thru, unbalanced I/O card.
2-3	110 ohms	No loop-thru, balanced I/O card.
3-4	Hi-Z	Loop-thru, termination downstream.

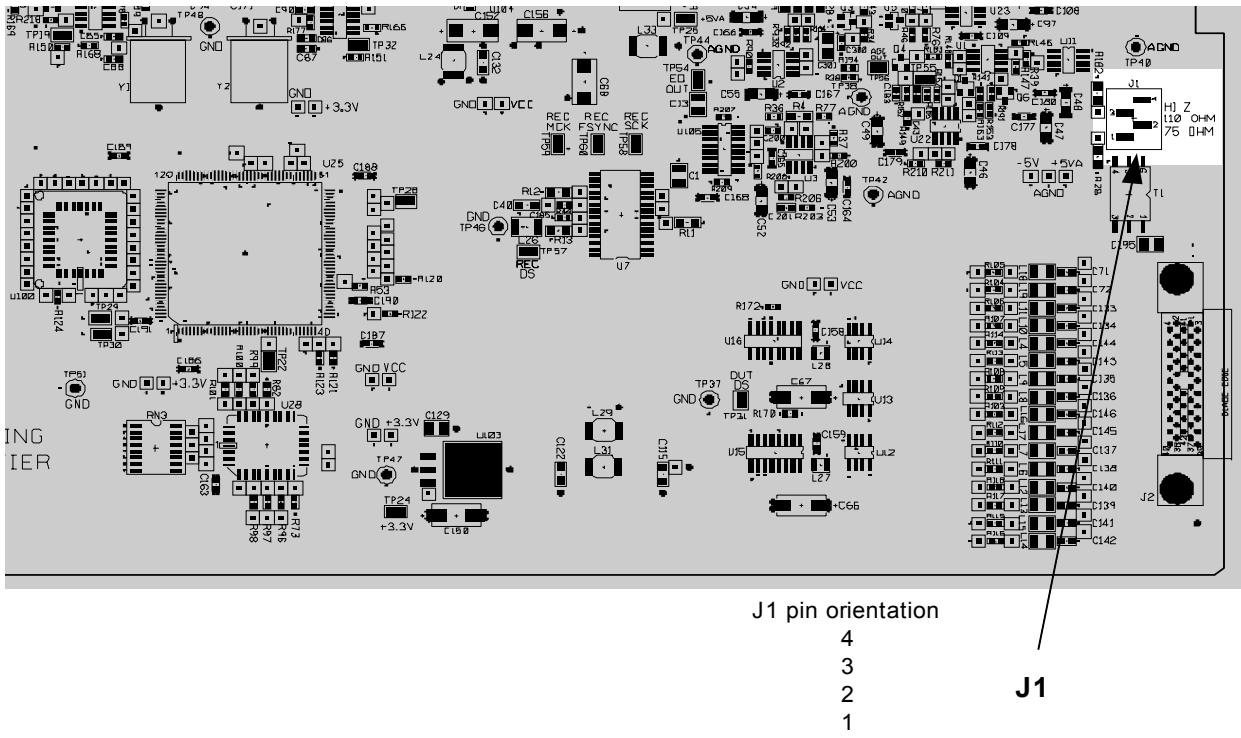


Figure 3. DA4011 Processing Card Jumper

Switch Setting

Figure 4 illustrates the DA4011 Processing Card with the DIP switch, S1, highlighted. Referring to Figure 4, set S1 per the following:

S1-1 AUTO FREQ SEL/MAN FREQ SEL - not used

S1-2 VARISPEED/XTAL

VARISPEED: Selects the Varispeed mode where the output is not reclocked and carries the same sampling rate frequency as the input.
XTAL: Selects the reclocking mode where the reclocking frequency is determined by the following switches.

S1-3 48kHz/44.1kHz
S1-4 FULL FREQ/HALF FREQ

48kHz/FULL FREQ selects 96kHz as the reclocking frequency.
48kHz/HALF FREQ selects 48kHz as the reclocking frequency.

44.1kHz/FULL FREQ selects 88.2kHz as the reclocking frequency.
44.1kHz/HALF FREQ selects 44.1kHz as the reclocking frequency.

The remaining switches for S1 (5–8) are reserved for future use.

EQ Pot

Figure 4 illustrates the DA4011 Processing Card with the EQ pot, R1, highlighted. After installation, as necessary, refer to Figure 1 and Figure 4:

1. Set the front panel EQ Selection switch to Manual.
2. Connect a 2-channel oscilloscope to the Post-EQ and Pre-EQ test jacks on the module front panel.
3. Use the EQ pot R1 to adjust for optimum cable equalization.

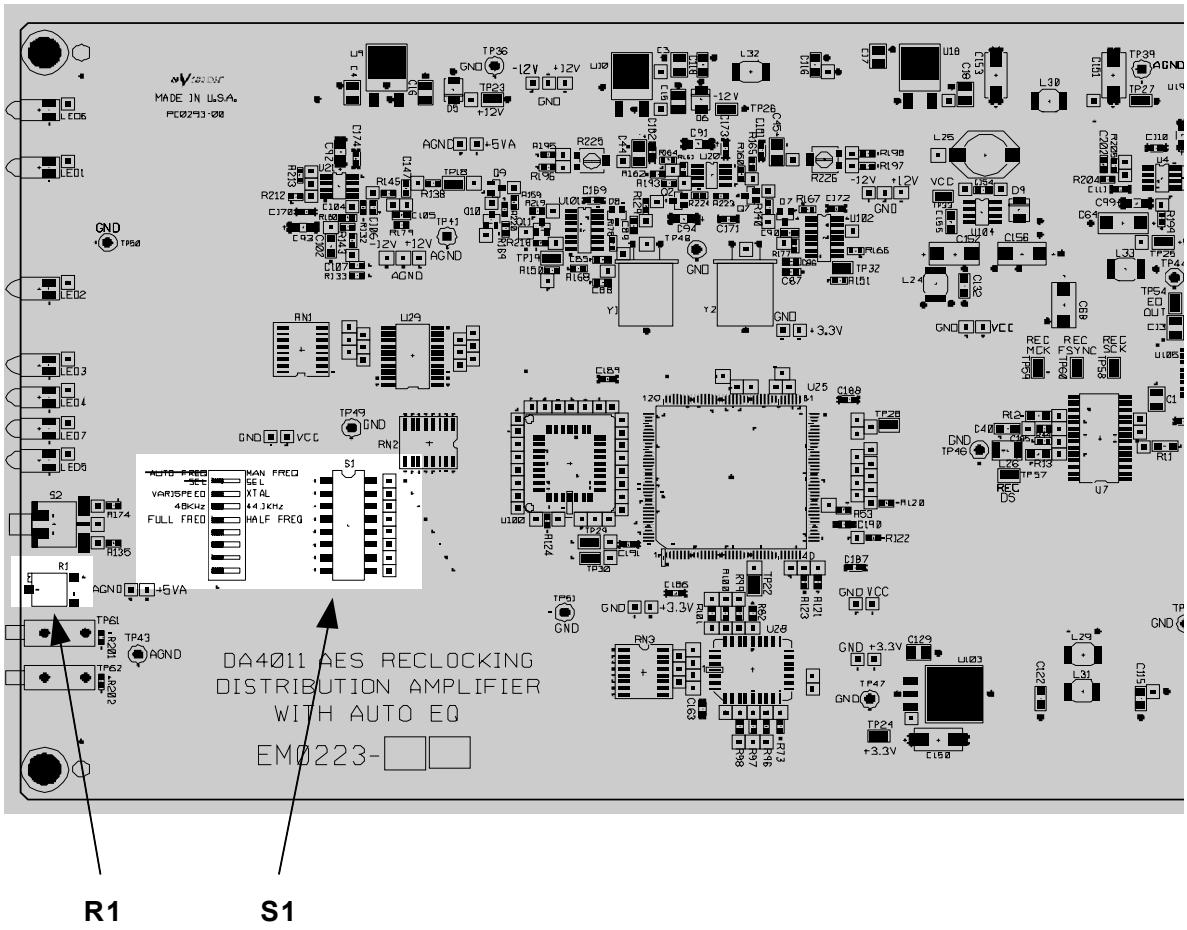


Figure 4. Processing Card DIP Switch and Adjustment Pot

INSTALLATION

The module can be installed (by qualified personnel only) with frame power on. Installation entails inserting the processing module into an available front slot of the 4000 frame and inserting the I/O module in the rear slot directly behind the processing module.

Using 75 ohm unbalanced coaxial cables for BNC connectors or 110 ohm balanced twisted pair cables for Phoenix connectors, connect an AES audio source to the I/O Card input connector. Connect the I/O card outputs to other devices using 75 ohm cables for BNCs or 110 ohm cables for Phoenix connectors.

TROUBLESHOOTING & MAINTENANCE

The module requires no routine maintenance. If it does not appear to operate correctly, first reseat the module in the frame to ensure good internal connections and then check that the Power indicator on the front of the module is lit. If the signal exhibits problems, check signal sources and cables and terminations. For additional information, please refer to the 4000 Series Processing Equipment Instruction Manual. For technical assistance, call 1-530-265-1000 or send email to *nvsupport@nvision1.com*.