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VAMP2-S8MDA / 58W

2RU Multi-Format, Video and Multi-Channel Audio Monitor

User Guide

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VAMP2-S8MDA/58W

User Guide

Introduction

Overview

The VAMP2-S8MDA/58W video/audio monitor is a complete, exceptionally high quality HD/SDI/AES/CVBS monitoring solution available in a compact two rackspace chassis. There are numerous input and output features that make this unit ideal for facility-wide monitoring of analog/digital audio and video signals.

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Safety Instructions

1. Read, keep, and follow all of these instructions; heed all warnings.
2. Do not use this equipment near water or moisture.
3. Use only a dry cloth to clean the equipment.
4. Do not block any ventilation openings. Install only in accordance with the instructions in the section entitled, "[Installation Recommendations](#)" on [page 3](#).
5. Do not install near any heat source such as a radiator, heat register, amplifier, or stove.
6. Do not attempt to plug the unit into a two-blade outlet (with only two prongs of equal width).

IMPORTANT: By design, these monitors will only plug into a three-prong outlet for your safety. If the plug does not fit into your outlet, contact an electrician to replace the obsolete outlet.

7. Protect the power cord from being walked on or pinched, particularly at plug's source on the equipment and at the socket.
8. Use only the attachments/accessories specified by the manufacturer.
9. Unplug the equipment during lightning storms or when unused for long periods of time.
10. Refer all servicing to qualified service personnel. Servicing will be required under all of the following conditions:
 - The equipment has been damaged in any way, such as when the power-supply cord or plug is damaged.
 - Liquid had been spilled or objects have fallen onto the equipment.
 - The equipment has been exposed to rain or moisture.
 - The equipment does not operate normally.
 - The equipment has been dropped.

Installation Recommendations

Mounting

The unit is designed to install into a standard 19" rack mounted at eye level for best visual observation of the monitor screens.

Heat Dissipation

The ambient temperature inside the mounting enclosure should not exceed 40° Celsius (104° Fahrenheit). Adjacent devices can be rack mounted (or stacked) in proximity to the unit if the above temperature is not exceeded. Allow a 1RU (1.75"/44.45mm) space above and below the unit for air circulation.

Important: To reduce noise, the monitor have any fans. As a result, the heat generated by the class D power amplifiers, power supplies, and other components is vented by slots in the side of the unit. Therefore, as a safety precaution, we advise you to be sure to allow proper ventilation on both sides of the unit.

Electrostatic Discharge (ESD)

As with most electronic equipment, static discharges can damage components within the unit. Take precautions to ensure your installation environment is not subject to static discharges.

Power

The unit comes with a standard 24VDC/3.0A internal power supply and connects an A/C mains power source (65W, 100 to 240 VAC, 50/60Hz) to the IEC connector provided on the rear panel of the unit.

Cable Recommendations

Table 1-1 I/O Cable Recommendations

Signal Type	Cable Type (Belden)
Analog Audio	9451
Analog Video	8281 or 1694A
Digital Audio	1800B
Digital Video	1694A

Description

The VAMP2-S8MDA offers a solution to the common problem of poor off-axis viewing angle of LCD video display monitors; the LCD video display screen resides in a separate module which is mounted to the front panel by a length of flexible goose-neck tubing. The display is manually adjusted for viewing angle separately from the fixed position of the rackmounted front panel thus allowing the operator to position the video display for an optimal angle for view. The LCD is a 5.8" wide-format high-resolution display, and is selectable for a 4:3 or 16:9 aspect ratio.

The unit is capable of monitoring AES, and Analog audio signals in conjunction with HD/SD-SDI, and CVBS video signals. In "Mix Mode" the individual input channels may be separately selected to be monitored through the left and/or right speakers. Color coded LEDs above each level meter bargraph display indicate which channels are selected for monitoring to which speaker they are assigned. Audio phase relationships are indicated by a bi-color (red/green) LED on the front panel. Audio input selection status is indicated by LEDs in close proximity to the selection buttons. Two of four SDI sub-groups are selectable via a front panel button when monitoring digital SDI audio signals.

Eight high-resolution 26-segment LED bargraph level meters exhibit simultaneous VU and PPM display characteristics to provide wide-range visual monitoring of audio signals. Meters are tri-color (red/amber/green) and have a dynamic range of 48 dB.

Features

- 2RU, highest fidelity in minimum rack space
- 5.8" video monitor, 4:3 or 16:9 aspect ratio selectable
- LCD video pod mounted on flexible gooseneck on front panel slides in and out and is adjustable $\pm 60^\circ$ in any direction
- NTSC and PAL video formats, switch selectable
- Eight 26-segment tri-color LED bar graph level meters displaying simultaneous VU and PPM characteristics
- Two CVBS video inputs with loop-through outputs
- Two HD/SD-SDI inputs with re-clocked output
- HD-SDI and SD-SDI identification and lock status LED
- HD/SD-SDI conversion to CVBS video
- De-embeds and monitors eight audio channels and one video channel simultaneously
- Converts SDI embedded audio to AES and/or analog audio outputs
- Flexible assignment of source signals to left and right speakers with indication LEDs.
- Audio source selection of SDI, AES, analog, and AFV (Audio Follows Video) source signals
- Select two of four SDI groups (8 channels) for monitoring
- LED indication of selection and mixing settings
- Analog outputs of selected source on two XLR connectors
- External speaker connections (no external amp required)
- Headphone output
- Auxiliary analog or AES audio inputs may be monitored separately or in conjunction with the video inputs

Specifications

Table 1–2 General Specifications

Specification	Value
Power Requirements	100 to 240 VAC $\pm$ 10%, 50/60Hz or 12 to 24 VDC
Power Consumption	Approximate 70 Watts
Dimensions (H x W x D)	3.5" x 19" x 12.5" (89 mm x 483 mm x 317.5 mm)
Weight (approximate)	12 lbs / 5.5 kg
Space Required	2 rack units of EIA-19 standard equipment rack
Magnetic Shielding	< 0.8 Gauss any adjacent surface

Table 1–3 Audio Specifications

Specification	Value
Inputs	8 balanced analog audio (DB-25) 27k Ω 4 unbalanced AES/EBU digital audio (BNC) 75 Ω , Hi-Z
Outputs	2 pair powered speaker outputs (5-way binding posts) 2 balanced analog selected audio (XLR-M) 8 metered balanced analog audio (DB-25) 4 balanced AES/EBU digital pair (DB-25)
Electric Frequency Response	20 Hz - kHz $\pm$ 1dB
Acoustic Frequency Response	(1/6 Octave) - 170 Hz - 16 kHz ($\pm$ dB) (-10dB @ 140 Hz, 20 kHz)
Distortion, Electric	<0.15% at any level below input threshold
Distortion, Acoustic	Typically less than 1.5% at frequencies above 200 Hz
Hum & Noise	More than 70 dB below full output

Table 1–4 Video Specifications

Specification	Value
Inputs	2 HD/SD-SDI (BNC) 75 Ω 2 CVBS (BNC) 75 Ω
Outputs	2 CVBS (BNC) 1 CVBS selected (BNC) 1 CVBS (BNC) converted from SDI 1 HD/SD-SDI selected re-clocked (BNC)
LCD Diagonal	5.8 (inches)
Aspect Ratio	16:9
Resolution (dots x lines)	960 x 234
Dot Pitch	0.118 x 0.362 (mm)
LCD Active Area	113.3 x 84.7 (mm)
Contrast Ratio	150
Brightness	300 NITs (cd/m ²)
LCD Lamp Life	15,000 Hours (avg.)
Viewing Angle	Top = 10°, Bottom = 30°, Left = 45°, Right = 45°

The other rear panel connectors are listed in [Table 1–5](#) below.

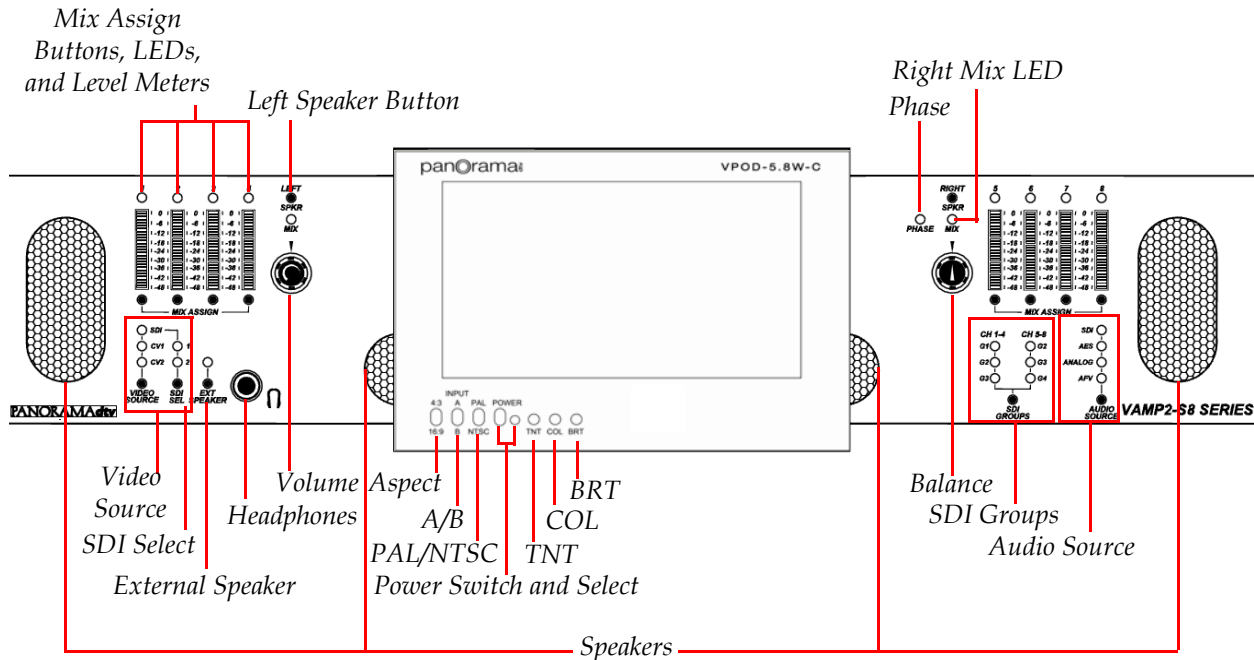
Table 1–5 Additional Rear Panel Connectors

Purpose	Connector
AES Termination	2 (4-position DIP switch)
Software Upgrade	2 RS-232 (DB-9)
RS-232 #2 Select	1 (2-position DIP switch)

Front Panel Controls

Common Controls and Indicators

Figure 1-1 VAMP2-S8MDA/58W Front Panel



- **Speakers:** Two high-range and two low-range speakers (left and right).
- **SDI Input Select Button and LEDs:** This button (**SDI Sel**) toggles the selection between the two SDI inputs (**SDI In1** or **SDI In2**) when the **Video Source Select** button is set to SDI or the **Audio Source Select** button is set to SDI. The appropriate indication LED (1 or 2) will glow green to indicate which SDI input is selected (**SDI In1** or **SDI In2**).
- **Ext/Int Speaker Select Button and LED:** When external speakers are connected to the **External Speaker** connectors on the rear panel, this toggle button selects which speakers (internal or external) will monitor the selected audio channels. If internal speakers are selected, the LED will be unlit. When the external speakers are selected, the LED will glow green.

- **Headphone Jack:** Select the headphone audio sources as you would for the speakers. Plugging in headphones, mutes the internal speakers. Jack receives 1/4" stereo (ring/tip/sleeve) plug.
- **Volume:** This controls the loudness of the audio reproduced by the internal speakers or connected headphone. Clock-wise rotation of this control increases the loudness of the monitored audio.
- **Balance Control:** This pans the volume balance between the left and right speakers.
- **SDI Group Select Button and LEDs:** This button (SDI GROUPS) selects which two SDI Groups will be assigned for monitoring through the eight level meters when either the Video Source Select button or Audio Source Select Button is set to SDI. SDI group selections are indicated by the appropriate LEDs glowing green. When SDI is not selected, these LEDs will be unlit. When SDI is selected, but there is no signal entering the selected inputs, the SDI group LEDs will turn red. The following SDI group assignments are selected with each push of the button.

Table 1–6 SDI Group Selections

Selection Sequence	Channels 1 through 4	Channels 5 through 8
1	Group 1	Group 2
2	Group 1	Group 3
3	Group 1	Group 4
4	Group 2	Group 3
5	Group 2	Group 4
6	Group 3	Group 4

- **Audio Source Select Button and Indication LEDs:** This push button (AUDIO SOURCE) is used to step through the four audio sources as follows:
 - SDI = Monitors the audio as input to the SDI inputs on the rear panel.
 - AES = Monitors the audio as input to the AES inputs on the rear panel.
 - Analog = Monitors the audio as input to the Analog inputs on the rear panel.

- **AFV (Audio Follows Video)** = This setting will monitor the audio source associated with the selected video source as shown below in the table.

Table 1–7 Audio Follows Video

Video Source	Audio Source
SDI	SDI
CV 1	AES
CV 2	Analog

- **Mix Assign Buttons** (1 through 4 and 5 through 8): Each of these eight push buttons (**Mix Assign**) is separately associated with one of each of the eight level meters (1 through 8). Each button is used to assign the channel monitored by the associated level meter to the left or right speaker channel mix only when both the left and right Speaker Assign Buttons are in "Mix Mode" (the 5th push button cycle). When in "Mix Mode" the right and/or left Mix LEDs will glow either green (left Mix LED) or amber (right Mix LED). When a channel is selected using these buttons, the Channel LED above the associated level meter will glow green when assigned to the left speaker channel, amber when assigned to the right speaker channel, or alternately green/amber if assigned to both speaker channels.
- **Channel LEDs** (1 through 8): These LEDs indicate when the associated channel is assigned to one or both speaker channels. When LEDs glow green the channel is assigned to the left speaker channel, when glowing amber the channel is assigned to the right speaker channel, and when it glows alternately green and amber then the channel is assigned to both left and right speaker channels. The LEDs are unlit when the channel is not assigned to either speaker channel.
- **Speaker Assign Buttons and Mix LEDs** (Left and Right): These two buttons (Left Speaker and Right Speaker) are used to assign any single channel or group of channels separately to each of the two speaker channels (left and right). When the left and/or right button is pushed a 4th time in it's cycle, its associated Mix LED will light up green to indicate that channels may be added to that speaker mix by pushing the **Mix Assign Buttons** located under the **Level Meter Bar Graph** displays.

Note: Pressing either the **Left** or **Right Speaker Assign** buttons a tenth time has the same function as pressing it for the first time.

Note: Both left and right banks must be in mix mode to allow mixing.

- **Phase Indication LED:** This LED (**Phase**) indicates the phase status of the audio signals assigned to the speakers. This LED indicates the *average* phase condition by glowing green for *in-phase* conditions, or red for *out-of-phase* conditions. While it is normal for stereo signals to contain some intermittent instantaneous out-of-phase and in-phase conditions, a steady red glow of this LED almost always indicates an out-of-phase alarm condition.
- **Audio Level Meter LED Bar Graph Displays** (1 through 8): Audio levels are visually displayed via these two banks of high-resolution, 26-segment, tri-color (red/amber/green) LED bar graph display meters. There are *eight* level meters labeled 1 through 8 and they correlate to the *eight* channels of the selected source. Dynamic range for these 26-segment meters is -48 dB and they display both VU and PPM ballistic characteristics simultaneously. Contact the factory for additional information concerning level meter scales and ballistics.

VPOD

Video signals entering the unit are monitored through the VPOD LCD video display. The VPOD module is attached to the front panel by a length of flexible gooseneck tubing allowing angle viewing adjustment in all directions.

Note: Note that when no source signal is being input to a powered display, a "NO SIGNAL" message will show in the display screen until a source signal is applied.

LCD screen viewing angle is adjustable by about $\pm 60^\circ$ from the vertical and horizontal plane of the front panel. When adjusting the LCD angle, grasp the VPOD module at the right/left or top/bottom sides.

CAUTION: Do not rotate (twist) the VPOD module around the gooseneck axis; the torque may damage the gooseneck and/or internal wiring. Also, avoid touching the LCD video screen itself with the fingers or other objects.

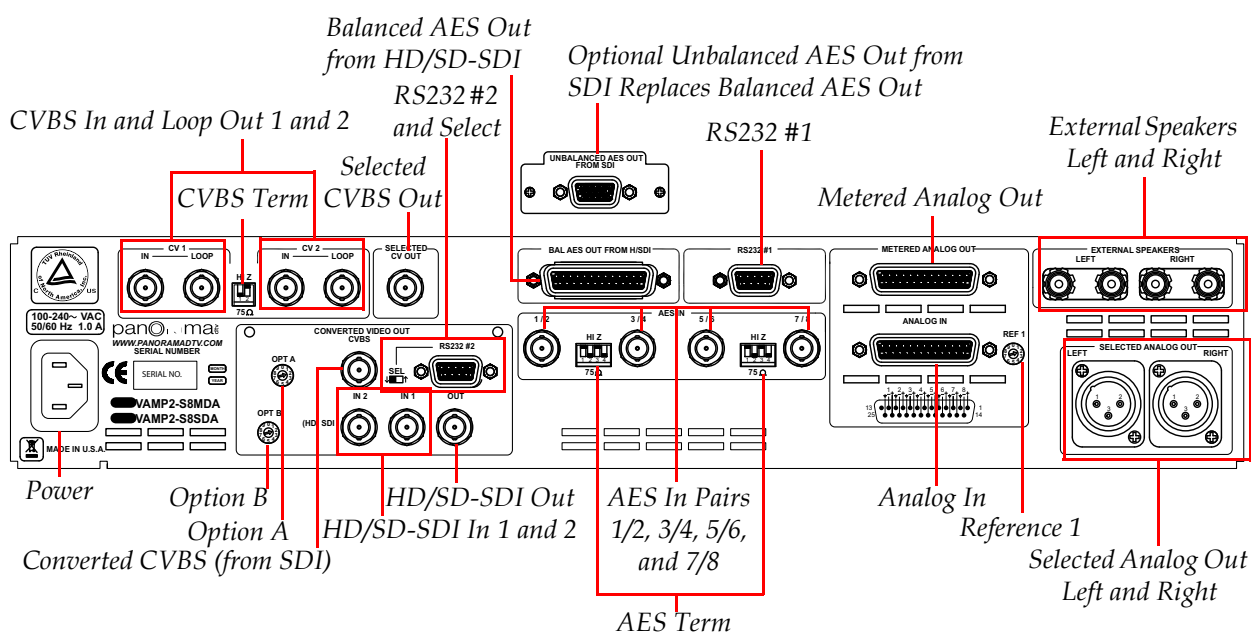
- **4:3/16:9 (Aspect Ratio Switch):** Selects the image aspect ratio displayed. The horizontal axis is narrow for 4:3 and full width for 16:9.
- **Input A/B (Switch):** Pressing the switch up selects input A; pressing it down selects input B.

Rear Panel Connectors

- **PAL/NTSC (Switch):** This switch selects the video format type being monitored, either NTSC or PAL. Note that if using the CVBS analog video inputs, you must manually set this switch to the appropriate format (PAL or NTSC). If you are using the HD/SD-SDI inputs, you should set the switch to NTSC, as all SDI signals are converted to that format in this unit.
- **Power (Switch and Indicator):** Pressing the switch up powers the video display monitor
- **TNT (Rotary Knob):** Adjusts the video display hue (for NTSC only).
- **COL (Rotary Knob):** Adjusts the video display color saturation.
- **BRT (Rotary Knob):** Adjusts the video display brightness.

Rear Panel Connectors

Figure 1-2 VAMP2-S8MDA/58W Rear Panel



- **Power Connector:** Attach a standard IEC-320 power cord between this connector and mains power.

- **CVBS Video In and Loop-Out (CV1 and CV2):** These BNC connector inputs accept standard CVBS (Composite Analog) video signals. There are two CVBS input sections (CV1 and CV2) and each section has an input and loop-through connector.

To monitor the video from these inputs, the **Video Source Select** button must be set to the CVBS input section of choice (**CV1** or **CV2**).

- **CVBS Video (Analog) In Termination DIP Switch:** Termination for the CVBS (Composite Analog) input connectors is adjustable via the 2-position DIP switch module located between the two CVBS input sections (**CV1** and **CV2**). The switch section nearest the associated connector is responsible for setting the termination for that connector (CV1 = Left, CV2 = Right). Press the switch Down to terminate the connector and Up to unterminate the connector.
- **Selected CV (Composite) Out:** This female BNC connector outputs a CVBS (composite) video signal derived from the HD-SDI, SD-SDI, or CVBS video source selected for monitoring in the video display.
- **Option A Rotary Switch:** This opening features a 10-position rotary switch for selecting related functions as shown in [Table 1-8](#) below. When set to positions 1, 2, 3, or 4, the signals from the **CVBS Video Output** option and the video supplied to the internal LCD will be the format described for each position in the table (NTSC or PAL) regardless of the input format. When set to positions 3 or 4, HD-SDI input signals are letterboxed, but SD-SDI input signals are not. Setting the switch to positions 8 or 9, will force a hardware reset on the video scaler and audio de-embedder modules.

Table 1-8 Option A Switch Settings and Descriptions

Setting	Description
0	Bootload
1	CVBS output is NTCS.
2	CVBS output is PAL.
3	CVBS output is NTCS and letterboxed when input is HD.
4	CVBS output is PAL and letterboxed when input is HD.
5	Reserved
6	
7	
8	Hardware Reset Mode
9	

- **Option B Rotary Switch:** The OPT B access opening features a 10-position rotary switch, which is reserved for future options and should be left at the factory position of 1.
- **CVBS Video Out** (from SDI) Outputs CVBS (composite) video encoded from the selected SDI input. HD-SDI signals are down-converted for proper representation in composite video format.

Note: See Option A Rotary Switch for selecting the type of CVBS video output. When this option is installed, a select switch is also installed to allow selection of the 910213 video scaler module for communication through the RS232 #2 connector.

This output functions regardless of other selection settings. This feature enables encoding of the SDI signal to CVBS independent of other monitoring functions (as long as a valid SDI signal is present at the associated input).

- **SDI In** (1 and 2): These two BNC connectors (IN1 and IN2) accept both high-definition HD-SDI and standard SD-SDI audio/video signals (HD-SDI signals are automatically down converted for monitoring).

To monitor video from these inputs, the **Video Source Select** button should be set to SDI, the **SDI Input Select** button should be set to the SDI input of choice (**SDI In 1** or **SDI In 2**), and the **SDI Group Select** button should be used to select the two SDI Group(s) of choice.

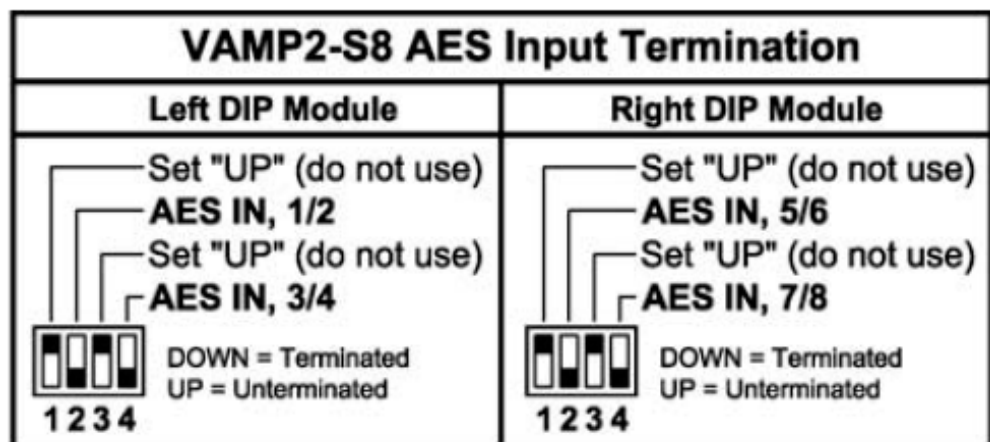
To monitor audio (only) from these inputs, the **Audio Source Select** button should be set to SDI, the **SDI Input Select** button should be set to the SDI input of choice (**SDI In 1** or **SDI In 2**), and the **SDI Group Select** button should be used to select the SDI Group(s) of choice.

- **SDI Re-Clocked Out:** This connector outputs a re-clocked (buffered) copy of the SD-SDI or HD-SDI signal fed to the SDI Input Connector selected for monitoring (**In 1** or **In 2**).

This output functions regardless of other selection settings. This feature enables the output of the re-clocked SDI signal independent of the units other monitoring functions (as long as a valid SDI signal is present at the associated input).

- **RS232 #2:** This DB-9 connector is used for downloading programming, setup, and diagnostic information into and out of either the video scaler or audio de-embedder modules. A 2-position slide switch is used to select between the two modules for communication through this connector.
 - **Select Switch for RS232 #2:** This 2-position slide switch is used to select the video scaler (**Up** Arrow) or audio de-embedder (**Down** Arrow) modules for communication through the RS232 #2 connector.
 - **AES Audio In** (1/2, 3/4, 5/6, and 7/8): These four female unbalanced BNC connectors accept standard AES audio signals. These inputs are selected for monitoring by setting the **Audio Source Select** button to AES.
 - **Hi-Z/75 Ω :** Termination for all four AES inputs is adjustable via the two 4-position DIP switch modules located between each of two pairs of input connectors. The switch section nearest the associated connector is responsible for setting the termination for that connector. The appropriate switch is moved Down to terminate the connector and Up to unterminate the connector. See diagram at right for DIP settings. Refer to [Figure 1-3 on page 15](#) for setting descriptions.
- Note:** Sections 1 and 3 of both DIP modules should be left in the Up position.

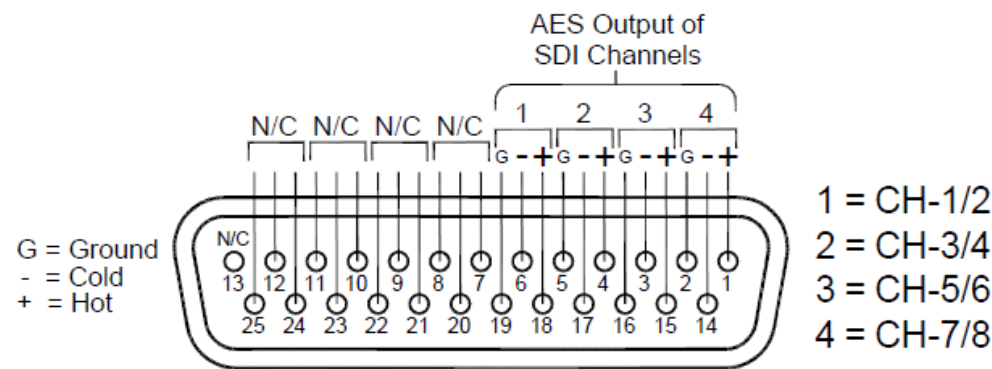
Figure 1-3 AES Input Termination Settings



- **AES Balanced Out** (from SDI Input): AES signals de-embedded from the selected SDI input are output from this balanced DB-25 connector (110 Ω impedance). When installed, this connector

replaces the standard unbalanced HD-15 connector. Pinout information for the balanced DB-25 connector is shown at right. Instructions for installing this optional connector are in the box below.

Figure 1-4 AES Balanced Out DB-25 Pin-Out

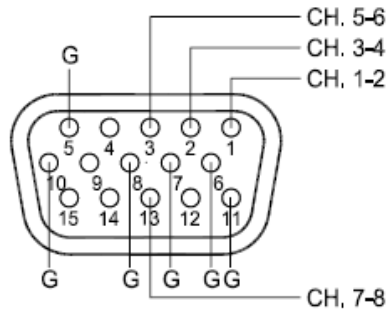


- **AES Unbalanced Out** (from SDI): AES signals de-embedded from the selected SDI input are output from this HD-15 connector, which is configured for unbalanced connections. See the table and diagram below for pinout information.

Table 1-9 Pin, Channel, Color Relationships for the HD-15

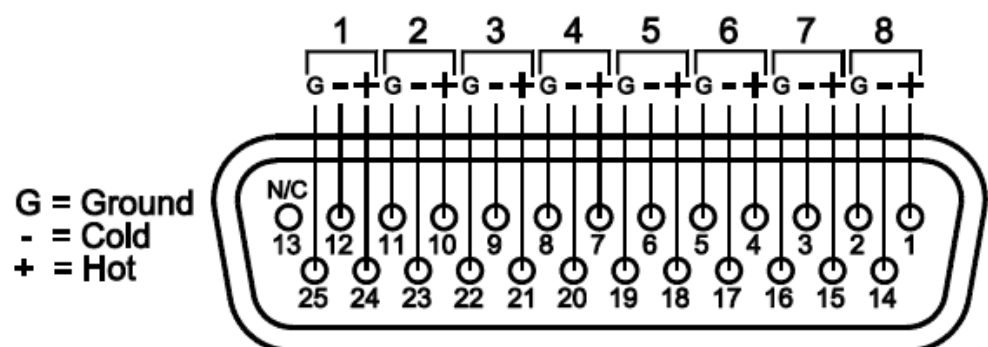
Pin	Channel	Typical VGA to BNC Color
1	1 and 2	Red
2	3 and 4	Green
3	5 and 6	Blue
13	7 and 8	Black
5	Grounds	—
6		
7		
8		
10		
11		

AES Unbalanced Out HD-15 Pin-Out



- **RS232 #1:** This DB-9 connector is used for downloading/uploading programming information into and out of the VAMP2-S8 Series unit.
- **Metered Analog Out:** This DB-25 connector outputs the Analog signals which are selected for display in the level meters. See diagram on page 20 for pin-out information.
- **Analog In:** This DB-25 connector accepts standard Analog audio signals and is configured for a balanced connection. The Audio Source Button must be set to analog to select this input for monitoring. See [Figure 1-6](#) below for the pin-out.

Analog Input Pin-Out



- **Reference Select Rotary Switch:** This recessed 10-position rotary switch sets the reference level for the unit. See below for setting information.

Table 1–10 Reference Select Rotary Switch Settings

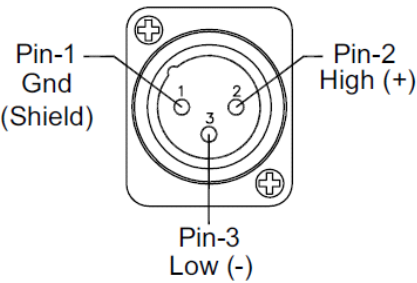
Setting	Function	
	Analog (dBU)	Digital (dBFS)
0	+8	-20
1	+4	-20
2	0	-20
3	0	-18
4	+6	-9
5 thru 7	Not Used	
8 thru 9	Software Upgrade	

- **External Speaker** (Left and Right): Connect external speakers here using these terminal posts. The left pair outputs the signals as selected for the left speaker, and the right pair outputs the signals as selected for the right speaker. Terminal posts in each output pair are color coded for polarity; red is positive (left post) and black is negative (right post). An external amplifier is not needed to drive the external speakers.

To monitor audio through the external speakers, the **Speaker Select** button on the front panel must be used to select external and the LED will glow green.

- **Selected Analog Out:** These two male 3-pin XLR connectors are analog outputs of the source as selected for the left and right speaker channels. Output is not affected by the volume and balance controls. See [Figure 1–7](#) below for pinout information.

Figure 1–7 Selected Analog Output Pin-Out



Technical Functional Overview

[Figure 1–8 on page 19](#) illustrates the functionality of the VAMP2-S8MDA/58W.

Figure 1–8 VAMP2-S8MDA/58W Block Diagram

