AMS81

8 CHANNEL AUDIO MONITORING SYSTEM

by Ward-Beck Systems

Rev:Oct.01 2014

AMS81 (version 2.1.1.7 and above)

Carefully unpack your AMS81 and make sure that damage has not occurred during shipping. The unit should be ready for use as soon as it is plugged in to the AC power source and a signal is connected to it.

Please note:

The default MODE setting for a unit that includes a Dolby Decoder is MODE 1 in this mode inputs may be a mix of Dolby E, Dolby AC-3 or PCM and it is recommended that the unit be operated in this mode only.

The default mode for units without a Dolby Decoder is MODE 2. In this mode inputs can only be PCM and the unit should only be operated in this mode.

MODE 4 is a task specific application that may be used when the unit is equipped with a Dolby Decoder. Please refer to the set up for MODE 4 in this manual.

An optional DEMUXER may be installed in your AMS8. This increases the input capability of your unit. The DEMUXER is capable of extracting all embedded groups (a maximum of eight AES signal pairs) from each of the two digital video signals.

FRONT PANEL DISPLAYS AND CONTROLS

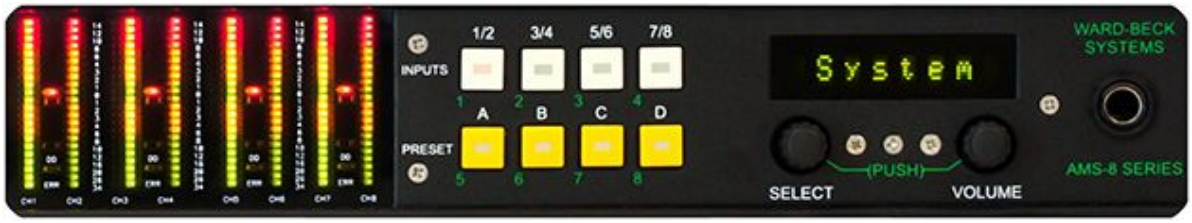
Please note that primary functions for controls are designated in white, while secondary functions are designated in green.

FRONT PANEL DISPLAYS

Eight 22 segment LED bar graph meters display VU and Peak Program information simultaneously. A reference LED (red) at the zero mark is continuously illuminated.

An eight-character dot-matrix display located above the SELECT and VOLUME controls display signal parameters and status information. During setup, this display is used to guide the user in making selections.

FRONT PANEL CONTROLS



There are eight illuminated push button switches arranged in two rows of four. The upper row designated INPUTS selects the input source to be monitored. The lower row designated PRESETS selects a preset configuration or condition under which the signal is monitored.

The two control knobs designated SELECT and VOLUME are rotary shaft encoders with integral push switches. In the simplest mode of operation, the SELECT knob allows the user to scroll through available options while the VOLUME button adjusts the listening level of the AMS8's speakers.

All eight push buttons, as well as the two knobs with integral push switches, are used in conjunction with the eight-segment read out when the unit is configured during SYSTEM SETUP.

SYSTEM SETUP

To enter system setup, press and hold INPUT buttons 1/2 and 7/8 with one hand and press the SELECT knob. The readout will display **System**. Press the SELECT button again to enter the mode of operation selection. The readout will display **Mode X**, where **X** is 1, 2, or 4.

The VOLUME knob may be rotated, in either direction, to select the appropriate mode of operation.

Rotate the SELECT knob one step clockwise to enter the reference signal setup. The readout will display **Ref** above the SELECT knob and **Int, 75Ω** or **110Ω** above the VOLUME knob.

Ref Int - means that the internal 48 kHz reference is used
Ref 75Ω - means that an external unbalanced reference will be used
Ref 110Ω - means that an external balanced reference will be used

Rotating the VOLUME knob in either direction selects the appropriate reference source.

Rotate the SELECT knob another step clockwise to enter the AES OUTPUT #4 Setup. The readout will display **Out4** above the SELECT knob and **In4** or **Mon** above the VOLUME knob.

Out4 In4- means that AES input #4 will be routed to AES output #4.
Out4 Mon - means that the Monitor Output will be routed to AES output #4.

Rotate the SELECT knob another step clockwise to enter the Dialogue Normalization setup. The readout will display **Dn** above the SELECT knob and **Enbd** or **Dsbd** above the VOLUME knob.

Dn Enbd - means that the dialogue normalization level in the metadata will be applied to the dolby signal.
Dn Dsbd - means that the dialogue normalization level in the metadata will not be applied to the dolby signal.

Rotate the SELECT knob another step clockwise. The readout will display **Vol** over the SELECT knob and a default volume level reading between **OFF, -60db** and **+15dB** above the VOLUME knob.

The VOLUME control is used to set the default volume level, in one dB steps, for monitoring audio.

Rotate the SELECT knob another step clockwise. The readout will display **O/P** above the SELECT knob and either **Var** or **Fix** above the VOLUME knob. Rotating the VOLUME knob in either direction will toggle between **Var** and **Fix**.

O/P Var - means that all the outputs of the unit will be level controlled and follow the action of the VOLUME control
O/P Fix - means that all the outputs will be a fixed line level (-20 dBFs for digital outputs and +4dBu for analog outputs) the VOLUME control will only affect the level of the internal speakers and also the two monitor outputs on the back of the unit.

Rotate the SELECT knob another step clockwise. The readout will display **Cal** over the SELECT knob and a reference level reading between **-22dB** and **-10dB** above the VOLUME knob.

The VOLUME control is used to set the reference level, in two dB steps, for monitoring audio.

Rotate the SELECT knob one more step clockwise. The readout will display **Spkr** above the SELECT knob and either **On** or **Off** above the VOLUME knob. Rotating the VOLUME knob in either direction will toggle between **On** and **Off.**

(In Version 1.x.x.x.)
Spkr On means the internal speakers and headset jack are enabled, and enables monitor output.
Spkr Off means the internal speakers and headset jack are disabled, and disables the monitor output.

(In Version 2.x.x.x. and above)
Spkr On means the internal speakers and headset jack are enabled.
Spkr Off means the internal speakers and headset jack are disabled.

Rotate the SELECT knob one more step. The readout now displays **Exit.**

Push the SELECT knob to return to the **System** setup screen. To exit system setup, turn the SELECT knob one step counter clockwise. The readout displays **Exit.** Push the SELECT knob once to exit the system setup procedures.

CHECKING THE FIRMWARE

When the system setup mode has been activated and the readout displays **System**, rotating the SELECT knob clockwise will cycle through the following:

Inputs - This configuration setup allows you to select the input sources that will be enable during monitoring. (See INPUTS SETUP).
Assigns - This configuration setup applies only to units set to operate in Mode 1. (See ASSIGNMENT SETUP).
Firmware - This allows you to check the version of firmware installed in your unit. Press the SELECT knob once and a numeric code will be displayed in the readout window, such as **2.0.0.0.** This is the firmware version identifier and is information that will be helpful if you contact the factory for technical assistance.

To exit the firmware interrogation mode, rotate the SELECT knob one step counter clockwise and push the SELECT knob once when the readout displays **Exit.**

INPUTS SETUP (for all modes)

A fully assembled AMS8 has multiple program inputs (75Ω, 110Ω, Analog, SDI 1 (A) Groups 1 and 2, SDI 1 (A) Groups 3 and 4 and SD1 2 (B) Groups 1 and 2 and SDI 2 (B) Groups 3 and 4. The **Inputs** setup allows an operator to enable or disable the input option during monitoring. When the **System Setup** mode has been activated and the readout displays **System**, rotating the SELECT knob clockwise one step will put the unit in the Inputs mode. Press the SELECT knob once and the 75Ω option will be displayed in the readout window above the SELECT knob. The display above the VOLUME knob will indicate whether the Input option is enabled. If (**Y**) is displayed then the Input option is enabled. If (**N**) is displayed then the input option is disabled. Rotate the SELECT to cycle through the remaining input options. To save the settings Rotate the SELECT knob until the readout displays **Exit** and press the SELECT knob once. This will bring you back to the **System Setup** mode.

(In Version 1.x.x.x. and above)
Enable SDI 1/2 for SDI Groups 1 and 2
Enable SDI 3/4 for SDI Groups 3 and 4

(In Version 06VA0001 and above)
Enable SDI 1/2 for SDI 1 (A) Groups 1 and 2
Enable SDI 3/4 for SDI 1 (A) Groups 3 and 4
Enable SDI 5/6 for SDI 2 (B) Groups 1 and 2
Enable SDI 7/8 for SDI 2 (B) Groups 3 and 4

ASSIGNMENT SETUP (for Mode 1 only)

The AMS8 has the ability to monitor multiple inputs, IN1 to IN4 at 75Ω, 110Ω and Analog, as well as, eight digital programs within one of the two SDI streams. The **Assigns** setup allows an operator to assign any one of these inputs to the four INPUT select pushbutton switches for rapid selection. In the **Assigns** setup procedure, **A1** is the 1/2 button, **A2** is the 3/4 button, **A3** is the 5/6 button and **A4** is the 7/8 button.

When the system setup mode has been activated and the readout displays **System**, rotating the SELECT knob clockwise one step will put the units in the **Assigns** mode. Press the SELECT knob once and the first assignment **A1** will be displayed in the readout window above the SELECT knob. The display above the VOLUME knob will indicate which source is assigned to **A1** or the 1/2 INPUTS button.

Rotate the VOLUME knob in either direction to select the desired input **75 -1** to **4**, **110 -1** to **4, ANL -1** to **4, SD1 -1** to **8** and **SD2 -1** to **8** to assign **A1**. Rotate the SELECT knob through **A2, A3** and **A4** and similarly assign an input source.

NOTE: It is possible to assign the same source to more than one button.

To exit and return to the **System Setup** mode turn the SELECT knob in either direction until **Exit** is displayed in the readout then push the Select knob.

CONFIGURING A PRESET
(Presets can only be configured when operating in MODE 2)

Press and hold a PRESETS button for approximately three seconds.

If preset button A is selected, the readout should display **A L1** above the SELECT knob and either **Off** or a level between **-15** and **+15** above the VOLUME knob. Rotating the SELECT knob in either direction cycles through the eight available sources that are displayed on the LED meters.

The numbers L1 through L8 correspond to the green numbers 1 through 8 below the INPUTS and PRESETS buttons that are assigned to the left channel of the monitor. To assign a source to a preset, rotate the SELECT knob until the source number and status appears in the readout window, and then push the corresponding numbered button. The button will illuminate to indicate that it has been assigned. To remove a source, push the illuminated button. The button LED will extinguish.

When a source is assigned, the **Off** display above the VOLUME knob will change to **0.** This means that the signal is assigned at nominal level.

The level can be adjusted for that signal by +/- 15dB by rotating the VOLUME knob clockwise or counter clockwise. The amount of gain or loss from nominal for the selected signal will be displayed above VOLUME knob in a range from **-15** to **+15**.

Once all the sources are assigned and the mix set for **L1**, the left channel, push the select knob once to enter the setup for **R1**, the right channel. Follow procedures as described above for the left channel. Once all the sources are assigned and the mix set for **R1**, the right channel, push the select knob once to exit the **Preset Setup** mode. The preset **A** switch will be illuminated to indicate that preset **A** is active. To return to normal operation press the preset **A** switch once. Repeat the above procedures for PRESETS **B, C,** and **D**.

OPERATING IN MODE 1 (Default for units with Dolby Decoder installed)

The AMS8 would be set to operate in Mode 1 when dealing with multiple channels PCM or Dolby digital signals. A Dolby decoder must be installed in the unit. Input sources can be either PCM, Dolby AC-3 or Dolby E.

In Mode 1, a source selection is made by pressing any one of the four INPUTS select pushbuttons. The INPUTS select pushbuttons can be assigned to select any one of the unbalanced, 75 Ohm sources, any one of the balanced 110 Ohm sources or any of the four **Assigns**, A1 to A4.
Push and simultaneously turn the SELECT knob to cycle through **75Ω LoRo**, **110ΩLoRo** or the **A1 - 4** assigns. If the Analog and/or Demux boards are available **Analog**, **SDI 1/2**, **SDI 3/4, SDI 5/6** and **SDI 7/8** can also be accessed.

For example, pressing the 1/2 button displays **A1 75-3.** This means that the third unbalanced source was assigned to 1 / 2 button and has now been selected. If the readout displays **75Ω LoRo,** it means that unbalanced input #1 is selected. If the readout displays **110ΩLoRo,** it means balanced input #1 is selected.

NOTE: If the signal is not present or corrupted, the readout will indicate **No Lock**.

If a signal is present, it will be identified, and the type of signal displayed in the readout window. (There is a slight lag while the processor determines the signal status.)

Please refer to the DATA TABLE for the Dolby signal configurations.

If the source is a PCM signal, the level will always be displayed on the CH1 and CH2 LED meters. To increase or decrease the listening level, rotate the VOLUME knob clockwise or counter clockwise. As soon as the VOLUME control is rotated, the gain/loss in dB is displayed in the read out window. The range is from **OFF, -60 dB** to **+15dB**. The speakers and the two monitor outputs on the back of the unit may also be muted by pressing the VOLUME knob, in which case the readout will

display **Mute.**

The two channel PCM signal may also be converted to a ProLogic Surround version by rotating the SELECT knob in either direction. The readout will display **PCM /PL**.

The ProLogic signal comprises Left, Right, Centre, Left rear and Right rear. These signal levels are displayed on the CH1, CH2, CH3, CH5 and CH6 LED bar graphs respectively. To return to the PCM mode, rotate the SELECT knob in either direction.

A copy of the signal that is displayed on the LED bar graph will also appear on the output connectors on the rear of the unit, paired as a discrete AES digital signal.

CH1 and 2 on output #1
CH3 and 4 on output #2 (no program, LFE, on CH4)
CH5 and 6 on output #3
CH7 and 8 on output #4 (no program)

If the source is a Dolby digital signal (AC-3 or E) it will be processed, displayed and assigned to the discrete AES output as follows:

SIGNAL	**OUTPUT#**	**METER**
L (left)	1 (A channel)	CH1
R (right)	1 (B channel)	CH2
C (centre)	2 (A channel)	CH3
LFE (low freq.)	2 (B channel)	CH4
Ls (left surround)	3 (A channel)	CH5
Rs (right surround)	3 (B channel)	CH6
Aux audio	4 (A channel)	CH7
Aux audio	4 (B channel)	CH8

If the signal is lost through interruption or if an internal error occurs and the unit cannot lock to the incoming signal, the readout will indicate **No Lock.**

The four PRESETS pushbuttons may be used to listen to the signals solo, discretely or summed (for phase checking). Button **A** selects channels 1 and 2, button **B** selects channels 3 and 4, button **C** selects channels 5 and 6 and button **D** selects channels 7 and 8.

Pushing the **A** PRESETS button repeatedly cycles through:

In 1	**Ch 1** Signal displayed on CH1 meter is fed to all speakers of the AMS8
In 1	**Ch 2** Signal displayed on CH2 meter is fed to all speakers of the AMS8
In 1	**1 / 2** CH1 and CH2 meter signals are fed to the left and right speakers respectively
In 1	**1 + 2** The summed result of the CH1 and 2 mix is fed to all speakers
In 1	**LoRo** The left and right overall signal is fed to the left and right speakers respectively

Buttons **B, C** and **D** repeat the process for channels 3 / 4, 5 / 6 and 7 / 8.

OPERATING IN MODE 2

In Mode 2, the AMS8 operates as a multi-channel monitor box with the ability to proportionally mix any of the inputs to the left and right monitor channels. All inputs must be PCM. The unit will accept eight inputs; four unbalanced and four balanced sources.

The LED bar graph meters will display the signals consequentially. Input #1 will be selected by the 1/2 INPUTS button and will be displayed on CH1 and CH2. Input #2 will be selected by the 3/4 INPUTS button and will be displayed on CH3 and CH4. Input #3 will be selected by the 5/6 INPUTS button and will be displayed on CH5 and CH6. Input #4 will be selected by the 7/8 INPUTS button and will be displayed on CH7 and CH8.

MAKING A SOURCE SELECTION

Press the appropriate INPUTS button. The readout will display **75Ω L/R** or **110Ω L/R**.

If the unit displays **75Ω L/R,** it means that the bank of four unbalanced inputs is selected. If the unit displays **110Ω L/R,** it means that the bank of balanced inputs is selected. To toggle between the two banks of inputs, press and rotate the SELECT knob.

If the Analog and/or Demux boards are available **Analog**, **SDI 1/2**, **SDI 3/4**, **SDI 5/6** and **SDI 7/8** can also be accessed.

To select a preset mix, press any one of the four PRESETS buttons A, B, C or D.
(In Version 1.x.x.x. and above)
Select SDI 1/2 for SDI Groups 1 and 2
Select SDI 3/4 for SDI Groups 3 and 4

(In Version 06VA0001 and above)

Select SDI 1/2 for SDI 1 (A) Groups 1 and 2
Select SDI 3/4 for SDI 1 (A) Groups 3 and 4
Select SDI 5/6 for SDI 2 (B) Groups 1 and 2
Select SDI 7/8 for SDI 2 (B) Groups 3 and 4

OPERATING IN MODE 4

The AMS8 would be set to operate in Mode 4 for a task specific application. In Mode 4, the types of signals that can be connected to the input source connectors are strictly defined. Inputs 1, 2 and 3 must be PCM and input 4 must be a multi-channel Dolby signal.

As in other modes, to toggle between the unbalanced and balanced sources, push and turn the SELECT knob.

Inputs1, 2 and 3 are simultaneously selected and the INPUTS pushbuttons 1/2, 3/4 and 5/6 will be illuminated. The levels of the three sources will be displayed on the LED bar graph meters CH1 through 6, and the readout will display **PCM**.

When the 7/8 button is pressed, the multi-channel audio levels will be displayed on CH 1 through 8 meters as appropriate, and the readout will indicate the type of signal that is present **E 5.1, E 5.1 +2,** etc. Please refer to the **DATA TABLE** in this manual for the types of Dolby E and AC-3 signal formats.

Under normal conditions, with no PRESETS button pressed and the multi-channel source selected, the speakers will be fed with a Left and Right overall mix (**LoRo**) using the settings of PRESET A as described in the CONFIGURING A PRESET section of the manual for monitoring Inputs 1, 2 and 3. If Input 7/8 is selected and no PRESETS buttons are illuminated the speakers will be fed a Left and Right overall down mix (**LoRo**) not configured by PRESET A. To listen to specific channels in solo, paired or mix mode, please refer to the operation as described under Mode 1 in this manual.

VIEWING THE METADATA OF A MULTI-CHANNEL SIGNAL

The AMS8 is capable of displaying metadata information that has been embedded in the multi-channel signal stream.

It can display the method of encoding used (please refer to the **DATA TABLE** in this manual). It can also display the Dialogue Normalization (Dial Norm) values that are available. To read this data, rotate the SELECT knob one step at a time.

For example, a **5.1 + 2** signal is selected for monitoring. The Dial Norm values displayed are **Dn1 -27**, **Dn2 -31** where **Dn1** refers to the Dial Norm for the 5.1 signal and **Dn2** refers to the +2 portion of the signal.

Mix levels **(Mx 1**, **Mx 2**, etc.) are available only on Dolby AC-3 signals. If a value does not exist, the readout will display **NAN** for the term Not a Number.

The frame rate (**Fr**) is available on Dolby E signals only, e.g. **Fr 29.97.** Lastly is the Data Rate (**Dr**) which is only available on Dolby AC-3 signals. For other signals, the readout will display **NAN**. If the audio is PCM, there will not be any metadata.

THE VOLUME CONTROL

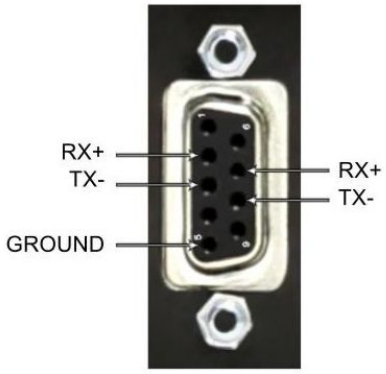
In mode 4, the speaker audio and the rear panel AES outputs have independent volume controls.

The primary function of the VOLUME control is to adjust the listening levels of the speakers. If the unit is not in the system setup mode, as soon as the control is touched it will revert to its primary function. The gain/attenuation, in dB that is applied to the signal being listened to, will be displayed by the readout.

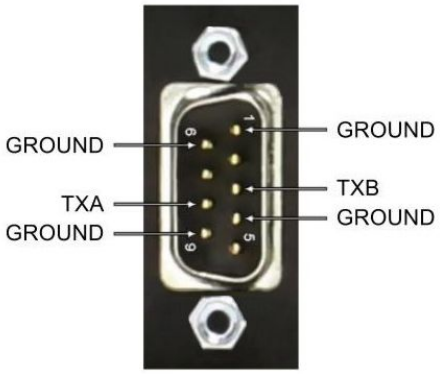
Rotating the knob clockwise increases the listening level. Rotating it counter clockwise lowers the listening level. To control the level from the rear panel AES outputs, push the knob once. An (**X**) will display along with the current gain/attenuation, in dB.

AMS8 CONNECTER LAYOUTS

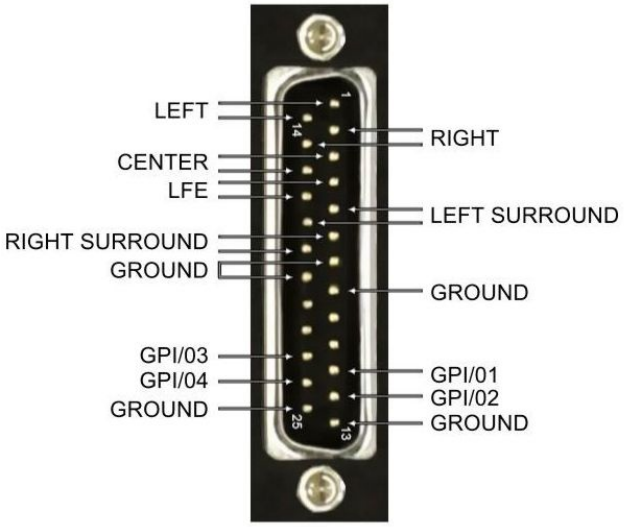
SERIAL COMM



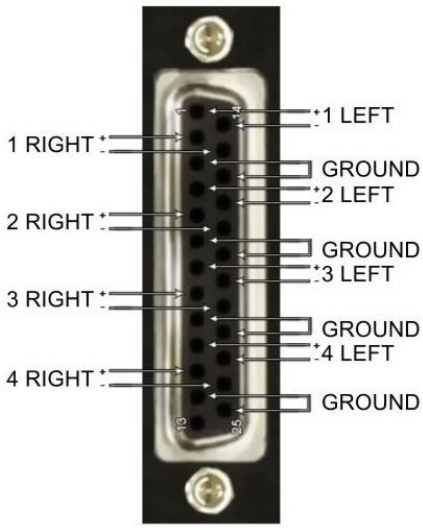
DOLBY METADATA



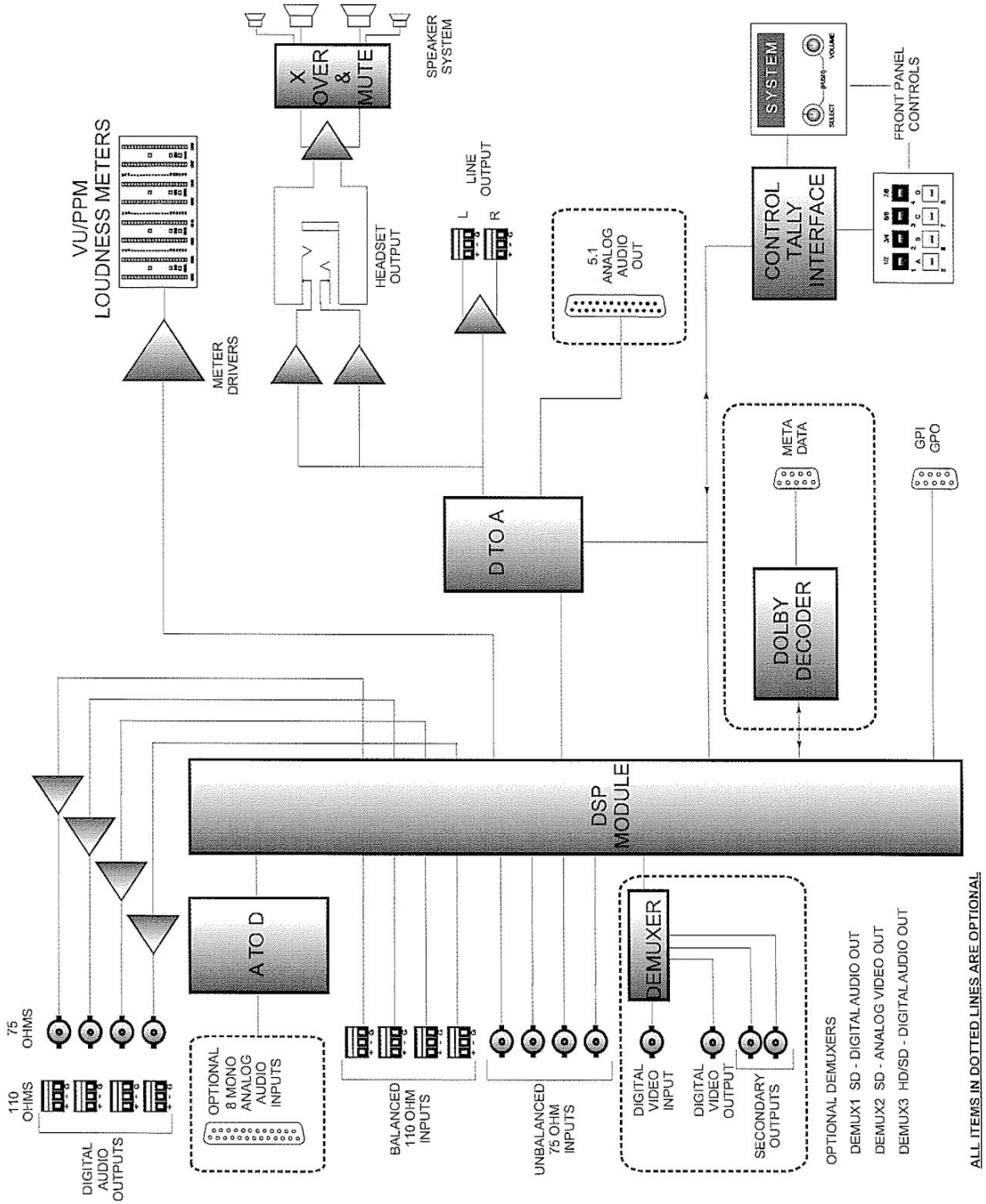
AUX 2
ANALOG AUDIO OUTPUT



AUX 1
ANALOG INPUTS



AMS8-1 FUNCTIONAL DIAGRAM



DATA TABLE

FORMAT
- NO LOCK
- PCM
- DOLBY DIGITAL AC-3 (DD)
- DOLBY E (E)

AUDIO SOURCE TYPE
- ANALOG
- AES 75 (UNBALANCED)
- AES 110 (BALANCED)
- SDI 1 (A) 1/2 (GROUP 1 AND 2)
- SDI 1 (A) 3/4 (GROUP 3 AND 4)
- SDI 2 (B) 5/6 (GROUP 1 AND 2)
- SDI 2 (B) 7/8 (GROUP 3 AND 4)

REFERENCE SOURCE TYPE
- INTERNAL
- AES 75 (UNBALANCED)
- AES 110 (BALANCED)

DOLBY E CONFIGURATION (E)

- 5.1+2
- 5.1+1+1
- 4+4
- 4+2+2
- 4+2+1+1
- 4+4x1
- 4x2
- 3x2+2x1
- 2x2+4x1
- 2+6x1
- 8x1
- 5.1
- 4+2
- 4+1+1
- 3x2
- 2x2+2x1
- 2+4x1
- 6x1
- 4
- 2+2
- 2+2x1
- 4x1
- Non-Dolby E

DOLBY DIGITAL CONFIGURATION (DD)
- 1+1
- 1/0
- 2/0
- 3/0
- 2/1
- 3/1
- 2/2
- 3/2
- 3/2L
- 2/2L
- 3/1L
- 2/1L
- 3/0L
- Non Dolby Digital

DIALOGUE NORMALIZATION (DN)
1-31
>31 = NAN (Not a Number)

MIX LEVEL (MX)
81-111
<81 OR >111 = NAN

BIT DEPTH (BD)

- 32 Bit
- 16 Bit
- 24 Bit
- 20 Bit
- NtInd (Not Indicated)

DOLBY BITSTREAM INFORMATION (BM)
- MnCp (Main Complete)
- McEf (Music and Effects)
- VilP (Visually Impaired)
- HrIp (Hearing Impaired)
- Dlge (Dialogue)
- Cmty (Commentary)
- Ergy (Emergency)
- VCor (Voiceover)
- Krke (Karaoke)
- N/A (Not Applicable)

DOLBY SURROUND INFORMATION (DS)

- Dsrd (Dolby Surround)
- NtDs (Not Dolby Surround)
- NtId (Not Indicated)

DOLBY CENTERMIX (C)

- -3.0 dB
- -4.5 dB
- -6.0 dB
- N/A (Not Applicable)

DOLBY SURROUNDMIX (S)

- -3.0 dB
- -6.0 dB
- -999 dB
- N/A (Not Applicable)

ROOM TYPE (RM)

- Lrge (Large)
- Smll (Small)
- NtInd (Not Indicated)

RF OVERMODULATION PROTECTION (RF)

- Enabled
- Disabled

SAMPLE RATE (SR)

- 48 KHz
- 44.1 KHz
- 32 KHz
- N/A (Not Applicable)

ORIGINAL BITSTREAM (OB)

- Yes
- No

COPYRIGHT (CP)

- Yes
- No

FRAME RATE (FR)

- 23.98 fps
- 24.00
- 25.00
- 29.97
- 30.00
- 50.00
- 59.94
- 60.00
- NAN (Not A Number)

DATA RATE (DR)

- 32 kbps
- 40
- 48
- 56
- 64
- 80
- 96
- 112
- 128
- 160
- 192
- 224
- 256
- 320
- 384
- 448
- 512
- 576
- 640
- NAN (Not A Number)

SPECIFICATIONS

** As of 2014, the SDI Demuxer option has been upgraded from the Demux3 (HD/SD-SDI) to the Demux 4 (Dual In 3G/HD/SD SDI Demuxer)*

ANALOG OUTPUT

Frequency Response	1.5 dBu from 20Hz to 20kHz
Impedance	60Ω Balanced
Max Output	23.5 dBu
Noise	Less than -70 dBu
THD	Less than 0.05%
Connector Type	DB 25 male

AES/EBU INPUTS

Impedance	75Ω unbalanced & 110Ω transformer balanced
Level	0.2 to 7V p-p
Max Input	0 dbfs
Standard	AES31D-1995
Type	BNC Female & 3 Pin Terminal Block

AES/EBU OUTPUTS

Impedance	75Ω Unbalanced & 110Ω transformer balanced
Level	2.5V p-p terminated
Output	0 dbfs
Noise	Less than -100 dbfs
Standard	AES31D-1995
THD	Less than 0.001%
Type	BNC Female & 3 pin Terminal Block

MONITOR OUTPUT

Frequency Response	1.5 dBu from 20Hz to 20kHz
Impedance	60Ω balanced
Max Output	23.5 dBu
Noise	less than -70 dbfs
THD	Less than 0.05%
Connector Type	3 pin Terminal Block

HEADSET JACK

Type	¼ inch TRS jack

POWER

Input	90-230 VAC,50-60 Hz

Ward-Beck Systems Inc. reserves the right to change performance specifications without prior notice.

WARRANTY

All Ward-Beck Systems Inc. products are warranted against defective materials and workmanship for a period of one year from the date of shipment.

Ward-Beck Systems Inc. will repair or replace, at its option and without charge, all said products or parts thereof which upon factory inspection prove to be defective during the warranty period, provided that:

1. The original serial numbers are intact and have not been tampered with.

2. The purchaser shall return any equipment or parts thereof to Ward-Beck Systems Inc. only after obtaining prior authorization and shipping instructions from the factory. (Ward-Beck Systems Inc. reserves the right to inspect or repair equipment on the purchaser's premises).

3. The purchaser assumes the obligation for all expenses in connection with the shipping and return of such goods, once authorization has been obtained.

This warranty does not cover items normally considered expendable, such as fuses and lamps.

This warranty does not cover damages caused by misuse, accident, neglect, unauthorized alteration, repair by unauthorized personnel, or damage caused by an act of God, war, or civil insurrection.

In no event shall Ward-Beck Systems Inc. be liable for consequential damages. Ward-Beck Systems Inc. shall have the rights to final determination as to the application of this warranty.

Ward-Beck Systems Inc. reserves the right, at any time and without notice, to make changes in its equipment, components, specifications or designs, as may be warranted by progress in state-of-the-art technology.

Ward-Beck Systems Inc. reserves the right to make design changes, additions to, and improvements in its products, without obligation to install such revisions in products previously manufactured.

The warranty set forth herein is in lieu of all other warranties expressed or implied, including the warranties of merchantability and fitness.

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