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REVISION HISTORY

<u>REVISION</u>	<u>DESCRIPTION</u>	<u>DATE</u>
0.1	Original Version	Jul 04
0.2	Updated menu, block diagrams, specifications	Aug 04
1.0	First Release - updated menu, block diagrams, specifications	Feb 05
1.1	Fixed minor typos, added section on termination of metadata input	Jun 05
1.2	Minor Updates	Jun 07
1.3	Fixed formatting and typos	Jul 07

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1. OVERVIEW

The 520AD4-HD series audio and Dolby Metadata de-embedders and re-embedders extract embedded audio from 2 specified groups as defined by SMPTE 299M from a 1.5 Gb/s serial HDTV or as defined by SMPTE 272M from a 270Mb/s serial SDTV video signal. Up to 8 selected channels may be delayed up to 3 sec and re-embedded onto the output video and/or directed to 4 unbalanced AES outputs. The video output may also be delayed up to 5 frames to achieve lip sync with the audio.

On the 520AD4-DD-HD version, one user selectable channel is processed by an on-card Dolby Decoder. If the channel contains Dolby E or Dolby Digital, it will yield up to 8 additional discrete audio channels and the associated Metadata. Dolby-E is capable of carrying LTC data embedded within its stream. This LTC can be selected as an output, instead of the Metadata.

For lip-sync cohesion and ease of editing, Dolby-E data is organized in blocks with lengths matching the associated video frame. The decoder will match the beginning of each output block with the start of video, as provided with the genlock input. An extra AES input is provided that can be configured as a backup channel, in case of the loss of primary, or as the source of voice-over.

The 520AD4-HD series de-embedders also embed Dolby E Metadata in VANC. The module has multiple sources for this metadata including incoming VANC, externally supplied metadata (or decoded Metadata in the 520AD4-DD-HD version). The Decoded or De-embedded Dolby E Metadata can be provided as an output for downstream devices (i.e. Dolby E Encoders etc.).

VistaLINK[®] enables control and configuration capabilities via Simple Network Management Protocol (SNMP). This offers the flexibility to manage the module status monitoring and configuration from SNMP enabled control systems such as Evertz VistaLINK[®] PRO locally or remotely.

Features: (all models)

- Supports SMPTE 292M - (1.5Gb/s) or SMPTE 259M (270 Mb/s) serial digital video signals.
- Video input relay bypass for power failure bypass protection.
- AES input for backup/voice-over source.
- 2 processed video outputs.
- 4 AES de-embedded and processed outputs.
- 1 Dolby Metadata output (RS422/485).
- De-embeds and re-embeds 2 audio groups – user selectable.
- Selectable audio sources for AES and embedded outputs.
- Adjustable video (up to 7 frames) and audio delay (up to 3 seconds) to achieve lip sync at output.
- Headphone jack with monitoring stereo down-mix.
- Card edge LEDs for module status, Video and Audio present.
- Card edge display for card status & audio channel peak levels bar graphs.
- Configurable Dolby meta-data or LTC input and output.
- VistaLINK[®] -enabled for remote monitoring via SNMP (using VistaLINK[®] PRO) when installed in 500FR frame with 500FC VistaLINK[®] Frame Controller.

Additional Features: (520AD4-DD-HD)

- Genlock NTSC-M, PAL-B, and tri-level sync.
- Onboard Dolby Decoder module – input selectable from de-embedders or External AES input.
- Card edge LEDs for Dolby decoder processing status.

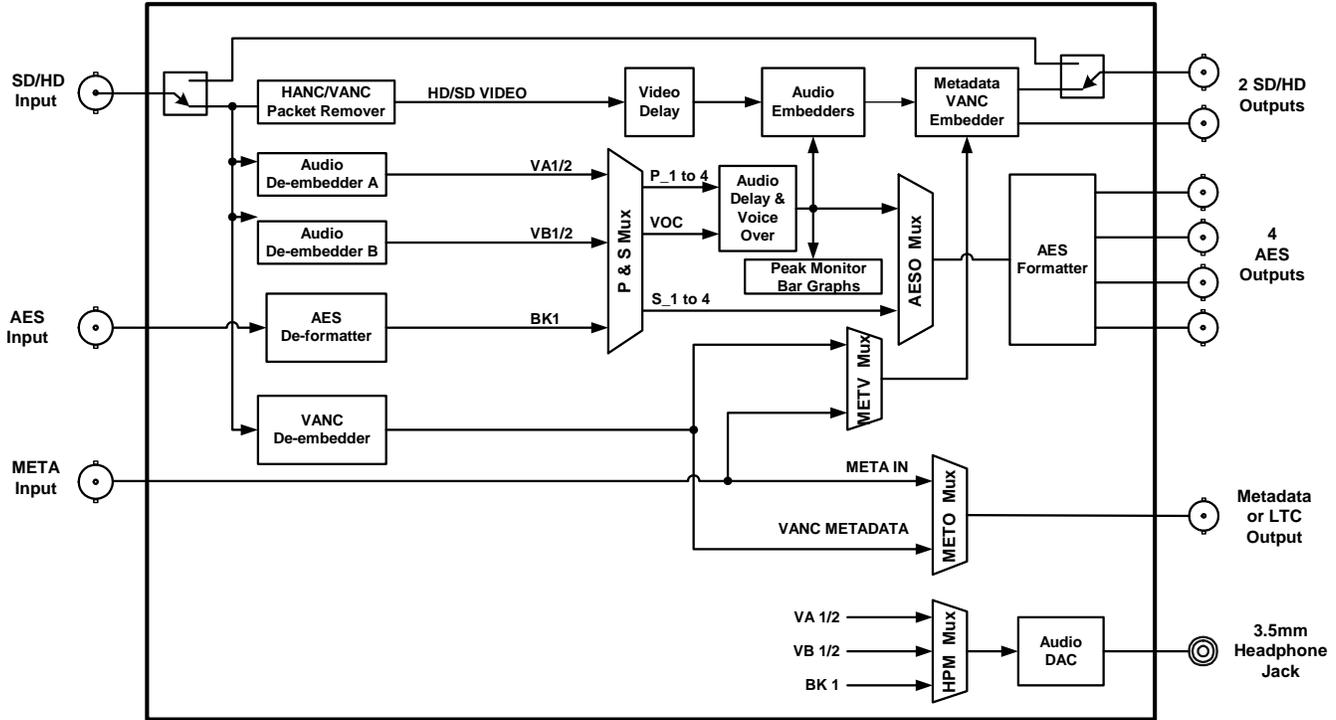


Figure 1-1: 520AD4-HD Block Diagram

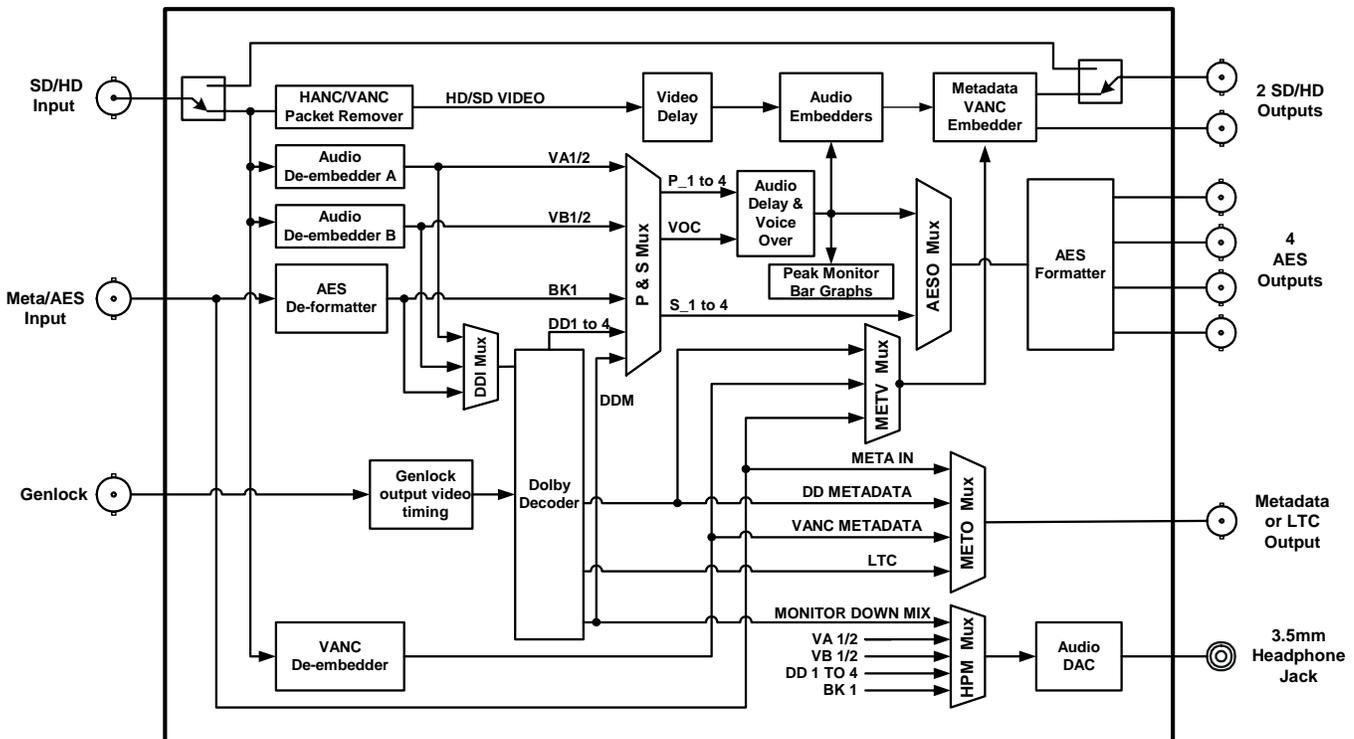


Figure 1-2: 520AD4-DD-HD Block Diagram

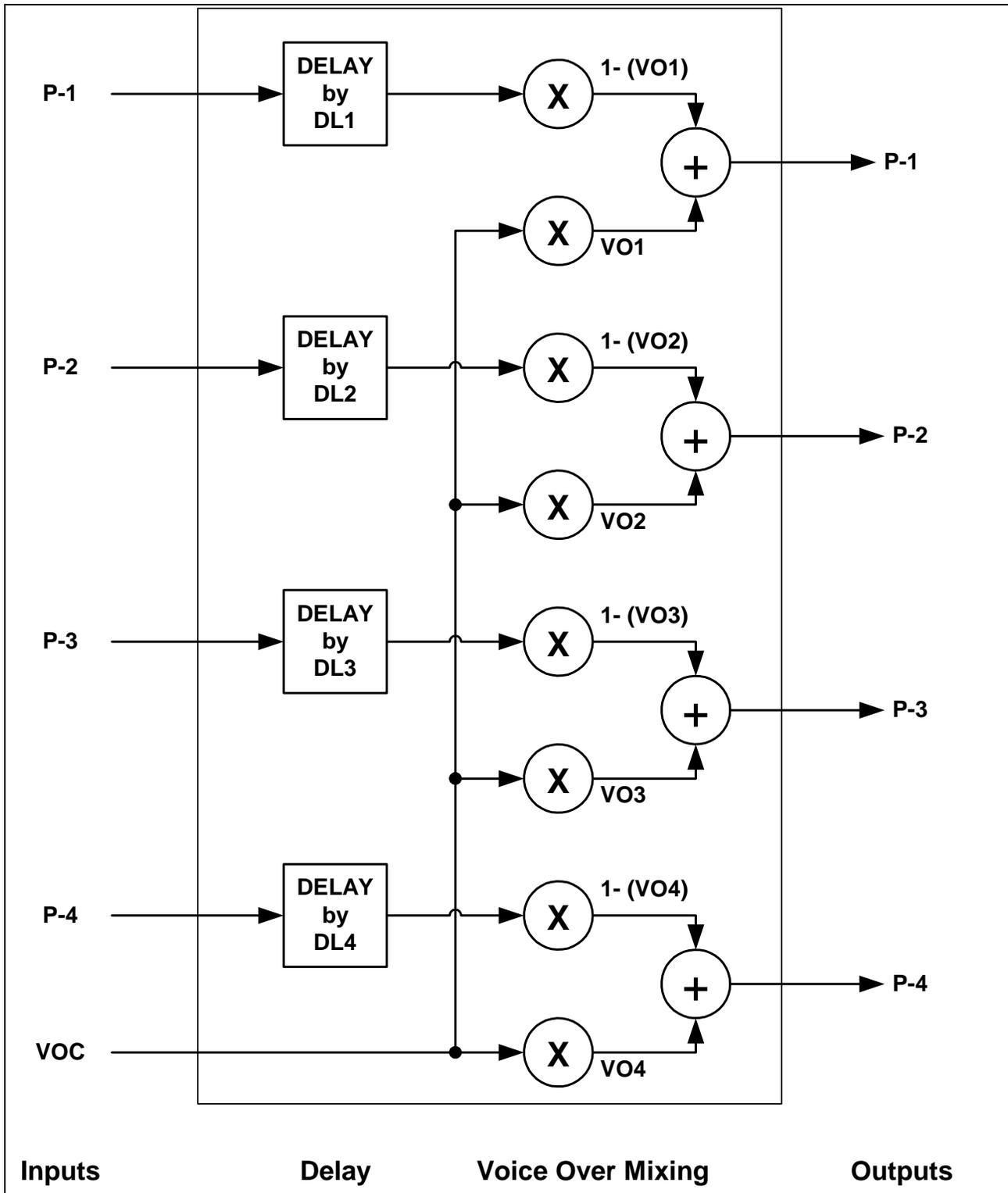


Figure 1-3: Audio Delay and Voiceover Block Diagram

Figure 1-3 shows an expanded view of how the audio delay and voice over mixing occurs when in Pair mode. For Channel mode there are separate delay and voice over mixing controls for each individual channel.

2. INSTALLATION

The 520AD4-DD-HD 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 section 3 of the 500FR chapter.

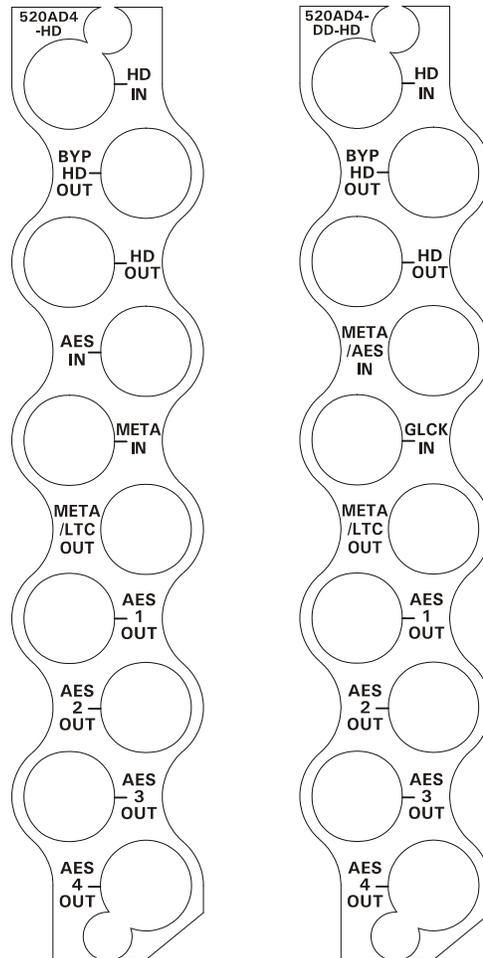


Figure 2-1: Rear Panel Overlays

2.1. VIDEO CONNECTIONS

HD IN

Input BNC connector for 10-bit serial digital video signals compatible with the SMPTE 292M or SMPTE 259M-C standards. The 520AD4-DD-HD automatically selects the video standard. See section 3.1 for a list of the video standards supported.

BYP HD OUT, HD OUT

These output BNC connectors are used to output reclocked serial component video, in the same standard as the video input. These outputs contain the input video with the audio present at AES inputs 1 to 4 embedded in accordance with the SMPTE 272M or SMPTE 299M standards. The **BYP HD OUT** output is protected by a bypass relay, which will activate in the event of power loss to the module. The remaining output is not bypass protected.

2.2. GENLOCK CONNECTIONS (520AD4-DD-HD)

GLCK IN Input BNC connector for a genlock reference signal compatible with the video format in use. This genlock signal is used to reference the Dolby E decoder to the video frames.

2.3. AES AUDIO CONNECTIONS

2.3.1. AES Input (520AD4-HD)

AES IN This BNC is an alternate AES audio input for de-embedded pair 1 (channel 1 and 2), in case of the loss of de-embedded audio, or as the source of voice-over audio.

2.3.2. AES Input (520AD4-DD-HD)

META/AES IN This BNC can be configured as an alternate AES audio input for de-embedded pair 1 (channel 1 and 2), in case of the loss of de-embedded audio, or as the source of voice-over audio. It can also be configured as an input for DOLBY Metadata.

2.3.3. AES Outputs

There are four BNC connectors containing unbalanced AES that has been de-embedded from the input video. The audio sources for the AES1 to AES4 outputs are assigned by using the P1 to P4 sub-menu items on the *AMUX* menu. (See section 5.5.)

2.4. METADATA CONNECTIONS

2.4.1. Metadata Input (520AD4-HD)

META IN This BNC is an input for DOLBY Metadata from upstream Dolby decoders. See section 2.4.4.

The connection from a source of METADATA such as Dolby E Decoder DP572 or Dolby Multi-channel Tool DP570 requires use of DD-DB9-BNC external adaptor (provided). It also requires that on-board jumper J17 be placed in HI-Z position.

2.4.2. Metadata Input (520AD4-DD-HD)

META/AES IN This BNC can be configured as an input for DOLBY Metadata from upstream Dolby decoders. It also can be configured as an alternate AES audio input for AES pair 1 (channel 1 and 2), in case of the loss of audio, or as the source of voice-over audio. See section 2.4.4.

2.4.3. Metadata Output

META/LTC OUT This BNC can be configured as a Dolby Metadata to drive downstream Dolby Encoders. It can also be configured as an LTC output from the Dolby metadata.

2.4.4. Connecting to a Dolby DP570

The 520AD4-HD series modules use BNC Connectors for Metadata inputs and outputs. They are shipped with two adapters (a DD-DB9-BNC and DD-BNC-DB9) that convert the unbalanced signals on the BNCs to so that they are compatible with the DP570 RS-485 signals.

Connect the DD-DB9-BNC adapter to the *METADATA OUTPUT* DB-9 connector on the rear of the DP570. Connect a coaxial cable from the BNC on this connector to the **META/AES IN** BNC on the 520AD4-DD-HD rear panel, or the **META IN** BNC on the 520AD4-HD rear panel (on 520AD4-HD, make sure that J17 is in HI-Z position).

Connect the DD-BNC-DB9 adapter to the *METADATA 1 INPUT* DB-9 connector on the rear of the DP570. Connect a coaxial cable from the BNC on this connector to the **META/LTC OUT IN** BNC on the 520AD4-DD-HD or 520AD4-HD rear panel.

If you wish you may connect a straight through 9 pin cable between the adapters and the DP570. See Figure 2-2 and Figure 2-3 for more information.

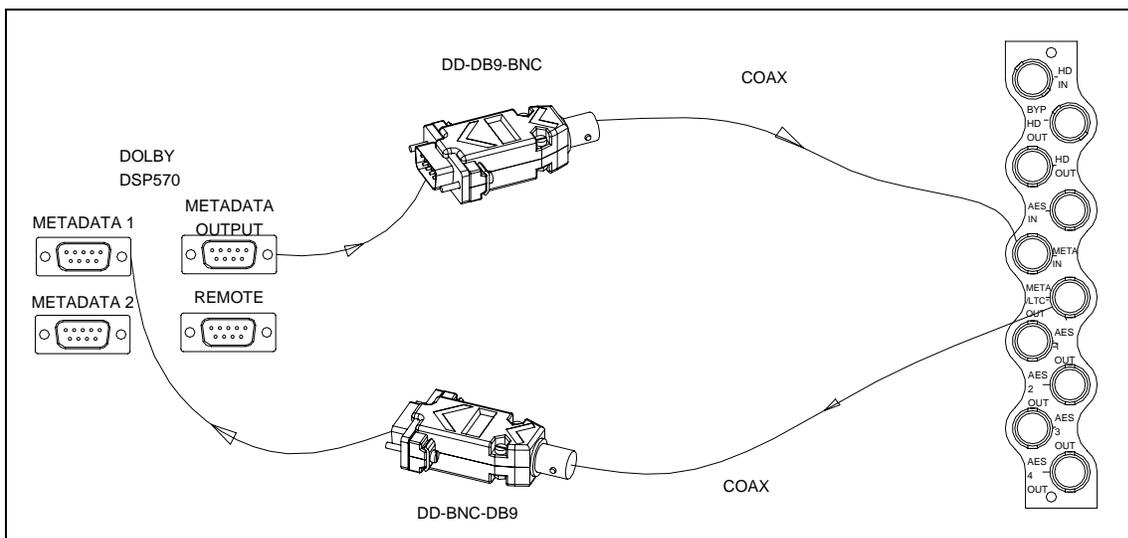


Figure 2-2: Connecting the 520AD4-HD to the Dolby DP570

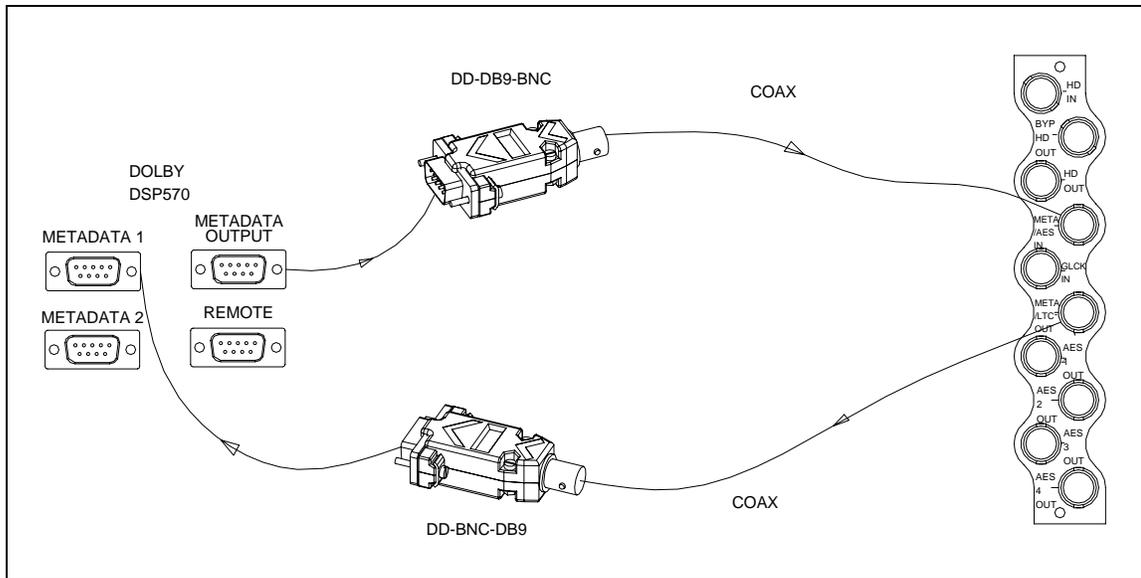


Figure 2-3: Connecting the 520AD4-DD-HD to the Dolby DP570

3. SPECIFICATIONS

3.1. SERIAL VIDEO INPUT

Standard: SMPTE 292M, (1080i/60, 1080i/59.94, 1080i/50, 1080p/30(sF), 1080p/29.97(sF), 1080p/25(sF), 1080/24(sF), 1080/23.98(sF), 720p/60, 720p/59.94, 1035i/60, 1035i/59.94
SMPTE 259M-C (270 Mb/s) 525 or 625 line component

Connector: BNC per IEC 60169-8 Amendment 2

Equalization: Automatic 100m @ 1.5 Gb/s with Belden 1694 (or equivalent)
40m with bypass relay active and card powered up
100m with card powered down

3.2. PROCESSED SERIAL VIDEO OUTPUT

Standard: Same as input or user controlled

Number of Outputs: 2

Connector: BNC per IEC 60169-8 Amendment 2

Signal Level: 800mV nominal

DC Offset: 0V \pm 0.5V

Overshoot: <10% of amplitude

Wide Band Jitter: <0.2 UI

3.3. AES AUDIO INPUT

Standard: SMPTE 276M single ended AES

Number of Inputs: 1

Connector: BNC per IEC 60169-8 Amendment 2

Input Level: 0.2 to 2.5 Vp-p (5 Vp-p tolerant)

Input Impedance: 75 ohm

Return Loss: >25dB 100kHz to 6MHz with external termination

Equalization: Automatic to 1000m with Belden 1694A (or equivalent) @ 48 kHz AES signal

Sample Rate: 48 kHz \pm 100ppm

3.4. AES AUDIO OUTPUT

Standard: SMPTE 276M, single ended AES

Number of Outputs: 4

Connector: BNC per IEC 60169-8 Amendment 2

Sample Rate: 48 kHz

Impedance: 75 ohm

Delay: Up to approx. 3 seconds (user adjustable)

Resolution: Up to 24-bit

3.5. METADATA INPUT AND OUTPUT

Type: DOLBY E Metadata

Connector: 1 BNC per IEC 60169-8 Amendment 2

Baud Rate: 115,200 baud

3.6. GENLOCK INPUT (520AD4-DD-HD)

Type: NTSC, PAL, black or any tri-level, all auto detect
Connector: 1 BNC per IEC 60169-8 Amendment 2
Impedance: hi-Z or 75 ohm jumper configurable
Return Loss: >40dB to 10MHz

3.7. SYSTEM PERFORMANCE

De-embedding Latency:

SD Video: 600 μ sec nominal

HD Video: 140 μ sec nominal

Embedding Latency:

SD Video: not measured

HD Video: 80 μ sec nominal

Audio Delay: 0 to 3 sec

Video Delay: 0 to 7 frames

3.8. ELECTRICAL

Voltage: + 12VDC

Power: 10 Watts

EMI/RFI: Complies with FCC Part 15
Class A and EU EMC directive

3.9. PHYSICAL

Number of slots: 1

4. STATUS INDICATORS AND DISPLAYS

The 520AD4-DD-HD has 11 LED Status indicators on the main circuit board front card edge to show operational status of the card at a glance. Figure 6-1 and Figure 6-2 show the location of the LEDs and card edge controls.

4.1. MODULE STATUS LEDES

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

LOCAL FAULT: This Red LED will be On if a local input power fault exists (i.e.: a blown fuse). The LOCAL FAULT indication can also be reported to the frame through the FRAME STATUS jumper.

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

There are nine small two colour LEDs on the back side of the board that indicate various status conditions of the module. LED 2 is located closest to the two large LEDs.

		LED Function				
	Description	OFF	solid RED	blinking RED	blinking GREEN	solid GREEN
LED2	Ethernet link to frame controller	no network activity			network activity	
LED10	video input		no video in	<i>build 2 h/w:</i> cannot lock to video input	video input does not match selected standard	valid video in
LED9	Audio demux A		no packets in demux A group	audio demux A error		valid demux A packets
LED3	Audio demux B		No packets in demux B group	audio demux B error		valid demux B packets
LED4	ad4-hd: backup AES input		no AES at backup AES input			receiving backup AES
	ad4-dd-hd: backup AES / ext META input		not receiving AES nor Metadata at AES/META input	receiving faulty Metadata at AES/META input		receiving ext meta or backup AES
LED5	output video PLL	<i>build 1 h/w:</i> always OFF	<i>build 2 h/w:</i> output video clock is free run	<i>build 2 h/w:</i> output video clock should, but can't lock	-	<i>build 2 h/w:</i> output video clock is locked
LED8	output audio PLL	<i>build 1 h/w:</i> audio clock has no reference	-	audio clock can not lock	-	internal audio clock is locked
LED7	ad4-hd: ext Metadata reception		no ext metadata	ext meta reception errors		receiving ext Metadata
	ad4-dd-hd: genlock input		no genlock	frame rate is incompatible with received Dolby stream		valid genlock in
LED6	ad4-dd-hd: Cat No 552	-	-	missing decoder, faulty Dolby bit-stream, or unknown decoder error	PCM stream is fed to the decoder	decoder has valid Dolby bit-stream

Table 4-1: Status LED Functions

4.2. DOT-MATRIX DISPLAY

Additional signal and status monitoring and control over the card's parameters is provided via the 4-digit alphanumeric display located on the card edge. The rotary switch is used to select whether you are displaying status from the card (status mode) or setting control parameters for the card (control mode). See section 5 for information on operating the menu system.

5. CARD EDGE MENU SYSTEM

5.1. NAVIGATING THE MENU SYSTEM

The card edge rotary switch, toggle switch and pushbutton are used to navigate through the menu system to monitor or set various parameters for the module. The menu system is organized into ten top level menus. Turn the rotary switch to select one of the top-level menus, then press the pushbutton to enter that menu. You can use the toggle switch to move up and down the list of available sub-menu items. Once the desired sub-menu name is displayed, press the pushbutton to select the bottom menu level. The dot matrix display will be dimmed when you are in the bottom level of the menu tree.

If you are in one of the Status menus the selected parameter value will be displayed. If you are in one of the control menus, use the toggle switch to adjust the parameter to its desired value. If the parameter is a numerical value, the number will increase if you lift the toggle switch and decrease if you push down on the toggle switch. If the parameter contains a list of choices, you can cycle through the list by pressing the toggle switch in either direction.

When you have stopped at the desired value, depress the pushbutton. This will update the parameter to the selected value and return to the sub-menu items (the display shows the menu item names). To change another parameter, use the toggle switch to find another parameter in that menu or turn the rotary knob to select another top level menu and continue selecting and adjusting other parameters.

Throughout the descriptions of the Menu items, default values are shown in underlined text.

5.2. TOP LEVEL MENU STRUCTURE

<i>PEAK</i>	Status displays showing audio signal peak levels.
<i>STAT</i>	Status displays showing signal input status items.
<i>AMUX</i>	Control menu to set parameters relating to the audio channel routing.
<i>ADEL</i>	Control menu to set parameters relating to the audio delay.
<i>VOIC</i>	Control menu to set parameters relating to the audio voice over.
<i>HEAD</i>	Control menu to set the headphone volume.
<i>META</i>	Control menu to set parameters relating to the Metadata and LTC.
<i>EAUD</i>	Control menu to set parameters relating to the audio de-embedder and embedder.
<i>UTIL</i>	Control menu to set miscellaneous parameters.
<i>VIDE</i>	Control menu to set parameters relating to the video.

The above chart provides a brief description of the top level of the menu tree that appears when you turn the rotary knob. Selecting one of these items by pressing the pushbutton will take you down into the next menu level. The details of the each of the menus are described in the sections 5.3 to 5.11.7.

5.3. DISPLAYING THE PEAK AUDIO LEVELS

The *PEAK* menu is used to show the peak values for each of the audio channels. When the *PEAK* menu is entered the active display name will be shown for about 1 second, and then the value will be shown. To display the display name again press the pushbutton. To select other menu items, use the toggle switch. The chart below shows the items available in the *PEAK* menu. Sections 5.3.1 and 5.3.3 give detailed information about the menu items.

<i>PAIR</i>	Displays Bar graphs showing the peak values for pairs 1/2, 3/4, 5/6, and 7/8
1234	Displays Bar graphs showing the peak values for channels 1, 2, 3 and 4
5678	Displays Bar graphs showing the peak values for channels 5, 6, 7 and 8
<i>dB 1</i>	Displays the peak value for channel 1 in dBFS
<i>dB 2</i>	Displays the peak value for channel 2 in dBFS
...	
<i>dB 8</i>	Displays the peak value for channel 1 in dBFS

5.3.1. Displaying the Stereo Pair Peak Audio Values as Bar Graphs

<i>PEAK</i>	With this display you can show the peak values for the stereo pairs as 4 miniature bar graphs.
<i>PAIR</i>	
See Figure 5-1 & Table 5-1	

Each section of the dot matrix display shows a bar graph representation of the peak level for one of the audio pairs. Pair 1 (the sum of channel 1 and 2) is shown on the left (top) section and pair 4 (the sum of channel 7 and 8) is shown on the right (bottom) section. Each section of the display is comprised of a 5 x 5 array of dots. Diagonal rows of dots represent one of 9 different signal peak levels as shown in Figure 5-1 and Table 5-1.

Table 5-1 allows you to correlate the dot matrix display levels to the peak levels in dBFS units. The ballistics of the bar graph display follows the AES/EBU guidelines and have the attack time constant set to 0 seconds, and the decay time constant set to 1.5 seconds / 20 dB.

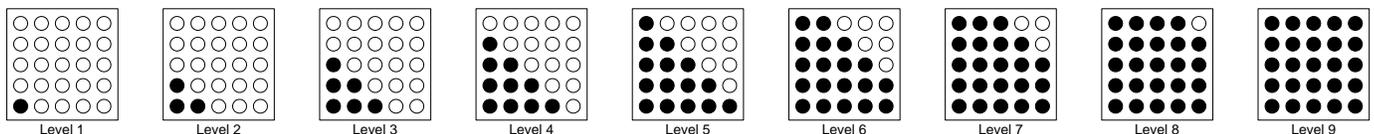


Figure 5-1: Peak Level Bar Graph Displays

Bar Graph Level	dBFS
Level 1	-60
Level 2	-36
Level 3	-30
Level 4	-24
Level 5	-21
Level 6	-18
Level 7	-15
Level 8	-12
Level 9	-6

Table 5-1: Bar Graph Peak Levels

5.3.2. Displaying the Individual Channel Peak Audio Values as Bar Graphs

There are two display items to show the peak values for groups of 4 channels. For the sake of simplicity in the manual, only the display for channels 1 to 4 will be shown.

<i>PEAK</i>
1234
See See Figure 5-1 & Table 5-1

With this display you show the peak values for channels 1 to 4 as 4 miniature bar graphs.

Each section of the dot matrix display shows a bar graph representation of the peak level for one of the audio channels. Channel 1 (Pair 1/2) is shown on the left (top) section and channel 4 is shown on the right (bottom) section. Each section of the display is comprised of a 5 x 5 array of dots. Diagonal rows of dots represent one of 9 different signal peak levels as shown in Figure 5-1 and Table 5-1.

Table 5-1 allows you to correlate the dot matrix display levels to the peak levels in dBFS units. The ballistics of the bar graph display follows the AES/EBU guidelines and have the attack time constant set to 0 seconds, and the decay time constant set to 1.5 seconds / 20 dB.

5.3.3. Displaying the Peak Audio Values as Numerical Values

There are eight display items to show the peak values for each of the 8 audio channels. For the sake of simplicity in the manual, only the display for channel 1 will be shown.

<i>PEAK</i>
dB 1
See See Figure 5-1 & Table 5-1

With this display you show the peak values for channels 1 in dBFS.

5.4. DISPLAYING THE SIGNAL INPUT STATUS

The *STAT* menu is used to show the status of various input signals. When the *STAT* menu is entered the active status display name will be shown for about 1 second, and then the value will be shown. To display the status display name again press the pushbutton. To select other status items, use the toggle switch. The chart below shows the items available in the *STAT* menu. Sections 5.4.1 to 5.4.12 give detailed information about each menu item.

<i>AESB</i>	Displays the AES B Input status
<i>GLCK</i>	Displays the GLCK Input status (520AD4-DD-HD only)
<i>DDPC</i>	Displays the Dolby Decoder Program Config (520AD4-DD-HD only)
<i>DDBF</i>	Displays the Dolby Decoder Bitstream Format (520AD4-DD-HD only)
<i>VIFM</i>	Displays the video input format
<i>IGRP</i>	Displays input embedded audio group status
<i>DXAS</i>	Displays audio de-embedder A status
<i>DXAR</i>	Displays audio de-embedder A rate
<i>DXAC</i>	Displays audio de-embedder A valid channel status
<i>DXBS</i>	Displays audio de-embedder B status
<i>DXBR</i>	Displays audio de-embedder B rate
<i>DXBC</i>	Displays audio de-embedder B valid channel status
<i>EXMT</i>	Displays the externally processed Metadata input status
<i>VAPK</i>	Displays VANC packets status
<i>VAMT</i>	Displays VANC Metadata input status

5.4.1. Displaying the Status of the AES Input

<i>STAT</i>	With this display you show the status of the AES input.
<i>AESB</i>	
OK n/a	

5.4.2. Displaying the Status of the Genlock Input

STAT
GLCK
none
PALB
NTSC
3i59
3i60
1s23
1s24
1i50
1i59
1i60
7p59
7p60
1p23
1p24
1p25
1p29
1p30

With this display you can show the type of the Genlock input.

No genlock present
 PAL-B
 NTSC-M
 1035i/59.94
 1035i/60
 1080p/23.98sF
 1080p/24sF
 1080i/50
 1080i/59.94
 1080i/60
 720p/59.94
 720p/60
 1080p/23.98
 1080p/24
 1080p/25
 1080p/29.97
 1080p/30

5.4.3. Displaying the Program Configuration Detected by the Dolby Decoder

STAT
DDPC
5.1
5.1+2
5.1+1+1
2+2+2+2
2+2+2
8X1
6X1
3/2L
3/2
3/1
2/0+
2/0
1+1
1/0
PCM
OTHR

With this display you can show the program configuration of the Dolby Decoder as shown below.

5.1
 5.1+2
 5.1+1+1
 2+2+2+2
 2+2+2
 1+1+1+1+1+1+1+1+1
 1+1+1+1+1+1
 3/2 L
 3/2
 3/1
 2/0 (dsumod=10)
 2/0 (dsumod=0x)
 1+1
 1/0
 PCM Audio
 other

5.4.4. Displaying the Bitstream Format Detected by the Dolby Decoder

STAT
DDBF
DD32
D16A
D16B
D16
DE24
DE20
DE16
PCM

With this display you can show the bitstream format detected by the Dolby Decoder as shown below.

- Dolby D 32 bit
- Dolby D 16 bit Channel 1
- Dolby D 32 bit Channel 2
- Dolby D 32 bit Channel 1 & 2
- Dolby E 24 bit
- Dolby E 20 bit
- Dolby E 16 bit
- PCM Audio

5.4.5. Displaying the Video Input Format

STAT
VIFM
none
PALB
NTSC
3i59
3i60
1s23
1s24
1i50
1i59
1i60
7p59
7p60
1p23
1p24
1p25
1p29
1p30

With this display you can show the type of the video input.

- No video present
- PAL-B
- NTSC-M
- 1035i/59.94
- 1035i/60
- 1080p/23.98sF
- 1080p/24sF
- 1080i/50
- 1080i/59.94
- 1080i/60
- 720p/59.94
- 720p/60
- 1080p/23.98
- 1080p/24
- 1080p/25
- 1080p/29.97
- 1080p/30

5.4.6. Displaying the Status of the Input Embedded Audio Groups

STAT
IGRP
1234

With this display you can show which embedded audio groups are present on the input video. The corresponding digit is shown for each audio group present.

5.4.7. Displaying the Status of the Audio De-embedders

There are three identical menus for audio De-embedder A and B Status. For the sake of simplicity in the menus, only the status displays for De-embedder A are shown.

STAT
DXAS
PRES
PKER
FFLO
FFHI
SYER

With this display you can show status of audio de-embedder A.

- Audio present – no errors
- Packet error
- FIFO empty error
- FIFO full error
- Sync error
- No packets

5.4.8. Displaying the Sample Clock Rate Detected by the Audio De-embedders

STAT
DXAR
ASYN
UNKN
32K
44K1
48K

With this display you can show sample rate of audio de-embedder A.

- Asynchronous
- Unknown
- 32 kHz
- 44.1 kHz
- 48 kHz

5.4.9. Displaying the Valid Audio Channels Detected by the Audio De-embedders

STAT
DXAC
1234

With this display you can show the valid audio channels detected by audio de-embedder A. When a channel pair contains valid PCM audio it will display a number as shown below.

- 1 corresponds to AES pair 1 channel A is valid PCM
- 2 corresponds to AES pair 1 channel B is valid PCM
- 3 corresponds to AES pair 2 channel A is valid PCM
- 4 corresponds to AES pair 2 channel B is valid PCM

When a channel pair contains Dolby-E or Dolby Digital, it will display DE or DD respectively.

An invalid channel is marked with a dash (-). A channel can be invalid if it is so marked by an upstream HD embedder, or if it's audio group is missing altogether.

5.4.10. Displaying the External Metadata Input Status

STAT
EXMT
OK
n/a

With this display you can show the status of the Externally processed metadata input.

OK = External Metadata present

5.4.11. Displaying the VANC Metadata Packet Status

STAT
VAPK
PRES
n/a

With this display you can show the status of the VANC Metadata packets.

PRES = Metadata packets present with the selected DID and SDID. (This status item will show the presence of packets anywhere in the VANC data space, not just the selected line.)

5.4.12. Displaying the Input VANC Metadata Status

STAT
VAMT
OK
n/a

With this display you can show the status of the VANC Metadata input.

OK = Metadata packets are de-embedding correctly.

5.5. CONFIGURING THE AUDIO CHANNEL ROUTING

The *AMUX* menu is used to control the internal routing of the audio channels shown in Table 5-2. When the *AMUX* menu is entered the active menu item name will be shown. The chart below shows the items available in the *AMUX* menu. Section 5.8.1 gives detailed information about each menu items.

AESO
P-1A, P-1B, etc

Sets whether the processed or unprocessed audio is available on the AES outputs.

Assigns the input source for each output. There are menu items for each output channel (or pair in *PAIR* mode). See Table 5-2 for a list of the outputs.

5.5.1. Configuring the AES Output Source MUX

AMUX
AESO
PRIM
SEC

With this control you can control the AES Output source MUX.

Select *PRIM* to have the processed primary audio outputs (that are embedded into the output video) available on the AES output BNCs.

Select *SEC* to have the unprocessed secondary audio outputs available on the AES output BNCs. The secondary outputs have no user delay or voice over added.

5.5.2. Selecting the Audio Routing

There are identical menu items that control the routing for each channel (when the *2CHA* menu item is set to *CHAN*) or for each stereo pair (when the *2CHA* menu item is set to *PAIR*). Not all of the input sources are available for each output. (e.g. Dolby Inputs are not available on Dolby output menu items). For the sake of simplicity, only the menu item for Primary Output 1A (Primary Output pair 1 in *PAIR* mode) *will* be shown. See Table 5-2 for a list of the output channel names. See the block diagrams in Figure 1-1 and Figure 1-2 to identify where the signals are being used.

Output Name		Display		Default Channel Source	
		Channel	Pair	520AD4-HD	520AD4-DD-HD
Dolby Decoder input (520AD4-DD-HD only)	Left (1A)	DDIA	DDI	----	BK1A
	Right (1B)	DDIB		----	BK1B
Primary Outputs (PRIM sources for AESO mux)	1A	P-1A	P-1	VA1A	DD1A
	1B	P-1B		VA1B	DDIB
	2A	P-2A	P-2	VA2A	DD2A
	2B	P-2B		VA2B	DD2B
	3A	P-3A	P-3	VB1A	DD3A
	3B	P-3B		VB1B	DD3B
	4A	P-4A	P-4	VB2A	DD4A
	4B	P-4B		VB2B	DD4B
Voice-over	Left (A)	VOCA	VOC	BK1A	BK1A
	Right (B)	VOCB		BK1B	BK1B
Secondary Outputs (SEC sources for AESO mux)	1A	S-1A	S-1	VA1A	VA1A
	1B	S-1B		VA1B	VA1B
	2A	S-2A	S-2	VA2A	VA2A
	2B	S-2B		VA2B	VA2B
	3A	S-3A	S-3	VB1A	VB1A
	3B	S-3B		VB1B	VB1B
	4A	S-4A	S-4	VB2A	VB2A
	4B	S-4B		VB2B	VB2B

Table 5-2: Audio Mux Output Channel Names

5.5.2.1. Configuring the Audio Routing – Channel Mode

AMUX
P-1A
DD1A
DD1B
DD2A
DD2B
DD3A
DD3B
DD4A
DD4B
DDMA
DDMB
BK1A
BK1B
VA1A
VA1B
VA2A
VA2B
VB1A
VB1B
VB2A
VB2B

When the *2CHA* menu item is set to *CHAN* this menu item is used to set the input source for the Primary Output channel 1A.

Dolby Decoder Output	1A	(520AD4-DD-HD only)
	1B	(520AD4-DD-HD only)
	2A	(520AD4-DD-HD only)
	2B	(520AD4-DD-HD only)
	3A	(520AD4-DD-HD only)
	3B	(520AD4-DD-HD only)
	4A	(520AD4-DD-HD only)
	4B	(520AD4-DD-HD only)
Dolby Decoder Monitor Downmix	Left (1A)	(520AD4-DD-HD only)
	Right (1B)	(520AD4-DD-HD only)
Backup AES Input	Left (1A)	
	Right (1B)	
Audio De-embedder A	1A	
	1B	
	2A	
	2B	
Audio De-embedder B	1A	
	1B	
	2A	
	2B	

5.5.2.2. Configuring the Audio Routing – Pair Mode

AMUX
P-1
DD1
DD2
DD3
DD4
DDM
BK1
VA1
VA2
VB1
VB2

When the 2CHA menu item is set to PAIR this menu item is used to set the input source for the Primary Output stereo pair 1.

Dolby Decoder Output	1A & 1B	(520AD4-DD-HD only)
	2A & 2B	(520AD4-DD-HD only)
	3A & 3B	(520AD4-DD-HD only)
	4A & 4B	(520AD4-DD-HD only)
Dolby Decoder Monitor Downmix	L(1A) & R(1B) (520AD4-DD-HD only)	
Backup AES Input	Left (1A) & Right (1B)	
Audio De-embedder A	1A & 1B	
	2A & 2B	
Audio De-embedder B	1A & 1B	
	2A & 2B	

5.6. CONFIGURING THE AUDIO DELAY

The *ADEL* menu is used to control the audio channel delays. When the *ADEL* menu is entered the active menu item name will be shown. To select other menu items, use the toggle switch. There are identical menu items for each primary output channel (when the *2CHA* menu item is set to *CHAN*) or for each primary output stereo pair (when the *2CHA* menu item is set to *PAIR*). For the sake of simplicity only the menu item for Primary Output 1A (Primary Output pair 1 in *PAIR* mode) will be shown. See Table 5-2 for a list of the output channel names. See Figure 1-3 for an expanded block diagram of the audio delay processing.

ADEL
DL1A
0sec
0 to 2

With this control you can set the audio delay for Primary Output 1A in seconds, milliseconds and audio samples.

When you first press the pushbutton you will be prompted to enter the whole seconds part of the delay.

ADEL
DL1A
000m
000 to 999

When you press the pushbutton you will be prompted to enter the milliseconds part of the delay. When you increase the value beyond 999 the seconds will automatically increment. When you decrease the value below 000 the seconds will automatically decrement.

ADEL
DL1A
00AS
00 to 47

When you press the pushbutton you will be prompted to enter the audio samples part of the delay. When you increase the value beyond 47 the milliseconds will automatically increment. When you decrease the value below 00 the milliseconds will automatically decrement. Press the pushbutton one more time to complete the delay entry.

5.7. CONFIGURING THE AUDIO VOICE OVER

The *VOIC* menu is used to set the audio voice over gain (amount of voice over to apply) for each audio channel. When the *VOIC* menu is entered the active menu item name will be shown. To select other menu items, use the toggle switch. There are identical menu items for each primary output channel (when the *2CHA* menu item is set to *CHAN*) or for each primary output stereo pair (when the *2CHA* menu item is set to *PAIR*). For the sake of simplicity, only the menu item for Primary Output 1A (Primary Output pair 1 in *PAIR* mode) will be shown. See Table 5-2 for a list of the output channel names. See Figure 1-3 for an expanded block diagram of the voice over processing.

VOIC
VO1A
-0.00 to -50.0
<i>mute</i>

With this control you can set the amount of voice over to add to output Primary Output 1A.

When set to *mute* there will be no voice over on this channel. The gain settings are adjustable in 0.1 dB steps.

5.8. CONFIGURING THE HEADPHONE PARAMETERS

The *HEAD* menu is used to set the headphone parameters. When the *HEAD* menu is entered the active status display name will be shown. To select other menu items, use the toggle switch. The chart below shows the items available in the *HEAD* menu. Section 5.8.1 gives detailed information about each menu item.

HVOL
HPML
HMPR

Sets the headphone volume.

Assigns the channel that will be monitored on the Left headphone.

Assigns the channel that will be monitored on the Right headphone.

5.8.1. Setting the Headphone Volume

HEAD
HVOL
HV00 to HV15

With this control you can set the headphone volume to one of 16 levels.

Total adjustment range is over 50 dB. Level 00 is the lowest volume and is effectively mute.

5.8.2. Selecting the Channels to Monitor with the Headphones

The *HPML* and *HMPR* menu items are used to control which channel will be monitored by the left and right headphones respectively. There are identical menu items for each headset channel (when the *2CHA* menu item is set to *CHAN*). When the *2CHA* menu item is set to *PAIR* there is only one menu item. For the sake of simplicity, only the menu item for the left headphone channel will be shown.

HEAD	
HMPL	
DD1A	Dolby Decoder Output 1A (520AD4-DD-HD only)
DD1B	1B (520AD4-DD-HD only)
DD2A	2A (520AD4-DD-HD only)
DD2B	2B (520AD4-DD-HD only)
DD3A	3A (520AD4-DD-HD only)
DD3B	3B (520AD4-DD-HD only)
DD4A	4A (520AD4-DD-HD only)
DD4B	4B (520AD4-DD-HD only)
DDMA	Dolby Dec Monitor Downmix Left (1A) (520AD4-DD-HD only - default)
DDMB	Right (1B) (520AD4-DD-HD only)
BK1A	Backup AES Input Left (1A)
BK1B	Right (1B)
VA1A	Audio De-embedder A 1A (default for 520AD4-HD)
VA1B	1B
VA2A	2A
VA2B	2B
VB1A	Audio De-embedder B 1A
VB1B	1B
VB2A	2A
VB2B	2B

5.9. CONFIGURING THE METADATA/LTC

The *META* menu is used to configure parameters related to the Dolby Metadata. When the *META* menu is entered the active menu item name will be shown. To select other menu items, use the toggle switch. The chart below shows the items available in the *META* menu. Sections 5.9.1 to 5.9.6 give detailed information about the menu items.

<i>MELT</i>	Selects what is output on the META/LTC output BNC
<i>LTCA</i>	Sets the output level of the LTC
<i>METO</i>	Selects the type of Metadata output on the META/LTC BNC
<i>METV</i>	Selects the type of Metadata output in VANC
<i>VADL</i>	Selects the input VANC line for de-embedding
<i>VADI</i>	Selects the input VANC Data ID (DID)
<i>VADS</i>	Selects the input VANC Secondary Data ID (SDID)
<i>VAKL</i>	Selects whether to delete specified VANC packets
<i>VAEL</i>	Selects the output VANC line for embedding
<i>VAEI</i>	Selects the output VANC Data ID (DID)
<i>VAES</i>	Selects the output VANC Secondary Data ID (SDID)
<i>VAEN</i>	Selects whether VANC will be embedded on the output video

5.9.1. Selecting What Is Output on the META/LTC Output BNC

<i>META</i>	<p>With this control you can select the type of output on the META/LTC BNC.</p> <p><i>META</i> selects Metadata from the Dolby Decoder or VANC packets from the input video.</p> <p><i>LTC</i> selects LTC decoded from the Dolby Decoder.</p>
<i>MELT</i>	
<i>META</i>	
<i>LTC</i>	

5.9.2. Selecting What Is Output on the META/LTC Output BNC

<i>META</i>	<p>With this control you can set the level of the LTC output on the META/LTC BNC when the <i>MELT</i> menu item is set to <i>LTC</i>. The output level can be set to one of 8 levels from 0.4 to 4.0 V p-p.</p> <p>The scale is linear and the AMP1 level corresponds to 0.4 V p-p.</p>
<i>LTC</i>	
<i>AMP5</i>	
<i>AMP1</i>	
...	
<i>AMP8</i>	

5.9.3. Selecting What Type of Metadata is Output on the META/LTC Output BNC

META
METO
DOLB
VANC
EXT

With this control you can set the type of Metadata output on the META/LTC BNC when the *MELT* menu item is set to *META*.

Select *DOLB* to output Metadata from the Dolby Decoder. This menu option is available on the 520AD4-DD-HD only and is the default.

Select *VANC* to output Metadata from the input VANC packets. This menu option is the default on the 520AD4-HD version.

Select *EXT* to output Metadata from the external META input.

5.9.4. Selecting What Type of Metadata is inserted into VANC

META
METV
DOLB
VANC
EXT

With this control you can set the type of Metadata inserted into VANC data by the embedder when the *VAEN* menu item is set to *ENBL*.

Select *DOLB* to insert Metadata from the Dolby Decoder. This menu option is available on the 520AD4-DD-HD only and is the default.

Select *VANC* to insert Metadata from the input VANC packets.

Select *EXT* to insert Metadata from the external META input. This menu option is the default on the 520AD4-HD version.

5.9.5. Configuring the VANC Metadata De-embedder

There are four menu items used to configure the input VANC de-embedder.

META
VADL
DL10
DL1 to DL31

With this control you can set the line for de-embedding VANC Metadata packets from the input video.

META
VADI
DI45
DI50 to DI5F
DIC0 to DICF

With this control you can set the Data ID for de-embedding VANC Metadata packets. Normally you should not have to change this from the default value. The values shown are expressed as hexadecimal numbers. The default value of data ID 45 corresponds to the latest proposals of SMPTE RP291.

META
VADS
DS01
DS01 to DSFF

With this control you can set the Secondary Data ID for de-embedding VANC Metadata packets. Normally you should not have to change this from the default value. The values shown are expressed as hexadecimal numbers. When the *VADI* menu item is set to values in the range of *C0* to *CF*, type 1 metadata packets will be de-embedded and the *VADS* menu item is not relevant as dictated by SMPTE 291M.

<u>META</u>
<u>VAKL</u>
<u>KILL</u>
<u>PASS</u>

With this control you can set whether the VANC packets matching the *VADI* and *VADS* menu item values will be removed from the video or passed through to the output.

Select *KILL* to remove the VANC packets.

Select *PASS* to pass the packets through to the output video.

5.9.6. Configuring the VANC Metadata Embedder

There are four menu items used to configure the output VANC embedder.

<u>META</u>
<u>VAEL</u>
<u>EL10</u>
<u>EL01 to EL31</u>

With this control you can set the line for embedding VANC Metadata packets on the output video.

<u>META</u>
<u>VAEI</u>
<u>EI45</u>
<u>EI50 to EI5F</u>
<u>EIC0 to EICF</u>

With this control you can set the Data ID for embedding VANC Metadata packets. Normally you should not have to change this from the default value. The values shown are expressed as hexadecimal numbers.

<u>META</u>
<u>VAES</u>
<u>ES01</u>
<u>ES01 to ESFF</u>

With this control you can set the Secondary Data ID for embedding VANC Metadata packets. Normally you should not have to change this from the default value. The values shown are expressed as hexadecimal numbers. When the *VAEI* menu item is set to values in the range of *C0* to *CF*, type 1 metadata packets will be generated and the *VADS* menu item is not relevant as dictated by SMPTE 291M.

<u>META</u>
<u>VAEN</u>
<u>ENBL</u>
<u>OFF</u>

With this control you can select whether the VANC packets will be embedded onto the output video or not.

Select *ENBL* to insert VANC Metadata packets on the output video. The source of data for the VANC packets is set by the *METV* menu item. (see section 5.9.4.)

Select *OFF* to disable VANC insertion.

5.10. CONFIGURING THE AUDIO DE-EMBEDDERS AND EMBEDDERS

The *EAUD* menu is used to configure parameters related to the audio embedders and de-embedders. When the *EAUD* menu is entered the active menu item name will be shown. To select other menu items, use the toggle switch. The chart below shows the items available in the *EAUD* menu. Section 5.10.1 and 5.10.2 give detailed information about the menu items.

<i>DXAG</i>	Selects the audio de-embedder A group number
<i>DXAK</i>	Selects whether to delete de-embedder A group from input video
<i>DXBG</i>	Selects the audio embedder B group number
<i>DXBK</i>	Selects whether to delete de-embedder B group from input video
<i>EMAG</i>	Selects the audio embedder A group number
<i>EMAE</i>	Selects whether audio embedder A is enabled
<i>EMBG</i>	Selects the audio embedder B group number
<i>EMBE</i>	Selects whether audio embedder B is enabled
<i>GLOK</i>	Selects whether the audio de-embedders and embedders operate in group lock mode or not

5.10.1. Configuring the Audio De-Embedders

The SMPTE 299M and SMPTE 272M standards permit up to 4 groups of 4 audio channels to be embedded into the 1.5 Gb/s video bitstream. The 520AD4-HD series modules have two de-embedders that each de-embed one group of audio. There are two menu items used to configure each of the audio de-embedders. For simplicity, only the menu items for audio de-embedder A will be shown.

5.10.1.1. Selecting the Audio Group That Will Be De-embedded

<i>EAUD</i>	With this control you can set the group for de-embedder A.
<i>DXAG</i>	
1 1 to 4	

5.10.1.2. Selecting Whether Selected Audio Groups Will Be Deleted Or Passed

<i>EAUD</i>	With this control you can set whether the audio packets in the group matching the <i>DXAG</i> menu item value will be removed from the video or passed through to the output.
<i>DXAK</i>	
<u>KILL</u> PASS	

Select *KILL* to remove the audio packets.

Select *PASS* to pass the packets through to the output video.

5.10.2. Configuring the Audio Embedders

The SMPTE 299M and SMPTE 272M standards permit up to 4 groups of 4 audio channels to be embedded into the 1.5 Gb/s video bitstream. The 520AD4-HD series modules have two embedders that each embed one group of audio. There are two menu items used to configure each of the audio embedders. For simplicity, only the menu items for audio embedder A will be shown.

5.10.2.1. Selecting the Audio Group That Will Be Embedded

EAUD
EMAG
<u>1</u> 1 to 4

With this control you can set the group for embedder A.

5.10.2.2. Selecting Whether the Audio Embedder is Enabled

EAUD
EMAE
<u>ENBL</u> OFF

With this control you can select whether Audio Embedder A will be enabled or not.

Select *ENBL* to enable Embedder A. The audio group for Embedder A is set by the *EMAG* menu item. The source of audio for Embedder A is set by the menu items for Audio Mux controls *P-1A*, *P-1B*, *P-2A* and *P-2B*.

Select *OFF* to disable Embedder A.

5.10.3. Selecting AES Locked Group Mode

For audio that is synchronous to video there is exactly 8008 audio samples (48kHz sampling rate) in 5 frames of 59.94Hz video. Most audio embedders will spread these samples as evenly as possible throughout the 5 frames of video. Because the 8008 samples do not divide evenly into 5 frames of video, there is a sequence that only repeats every 5 frames. In all video standards it is possible for the phase of the audio being embedded by two separate embedders to be out of phase with respect to each other. In order to transport 8 channels of audio (4 AES pairs) through an embedded link with exactly the same delay on each channel, both the embedder and the de-embedder must lock the FIFOs of both groups of audio together. Failing to do so will cause a phase difference between the audio from the two groups.

EAUD
GLOK
<u>LOCK</u> INDP

With this control you can select whether the de-embedders and embedders will be operated separately or locked together for embedding related audio (such as 5.1 surround sound).

Select *LOCK* to enable *Locked group* mode. The De-embedder and Embedder FIFOs are locked together maintaining the phase relationship between all 4 AES channel pairs in the embedded audio.

Select *INDP* to enable *Independent group* mode. De-embedder1/embedder 1 and de-embedder2/embedder2 are operated independently of each other as if two separate devices were used. The FIFOs are not locked together and the output phases of the two groups of embedded audio do not have any specific relationship to each other.

5.11. CONFIGURING MISCELLANEOUS PARAMETERS

The *UTIL* menu is used to configure miscellaneous parameters and to view and upgrade the card firmware. When the *UTIL* menu is entered the active menu item name will be shown. To select other menu items, use the toggle switch. The chart below shows the items available in the *UTIL* menu. Sections 5.11.1 to 5.11.3 give detailed information about the menu items.

<i>DDMD</i>	Selects the Dolby Decoder mode (520AD4-DD-HD only).
<i>DDTM</i>	Selects the video sync source for the Dolby Decoder (520AD4-DD-HD only)
<i>DDLS</i>	Selects the source for the audio mux when there is no signal from the Dolby Decoder (520AD4-DD-HD only).
<i>2CHA</i>	Selects whether audio routing, delay and voice over controls apply to individual channels or stereo pairs.
<i>SRC</i>	Selects whether the sample rate converters are used or not.
<i>DISP</i>	Selects the orientation of the Dot matrix display.
<i>FRST</i>	Resets the card to its factory default condition.
<i>VERS</i>	Displays the firmware version of the card.
<i>UPGR</i>	Initiates firmware upgrade for the card.
<i>DPCL</i>	Selects Dolby Decoder output latency.
<i>DPGP</i>	Configures Dolby Decoder Program Play feature.
<i>DDCM</i>	Configures Dolby Decoder Dynamic Range Processing.

5.11.1. Selecting the Dolby Decoder Mode (520AD4-DD-HD Only)

<i>UTIL</i>	With this control you can select the Dolby Decoder mode.	
<i>DDMD</i>		
<i>ALL</i>		Decodes all Dolby formats and passed PCM inputs.
<i>D-D</i>		Only Dolby Digital is decoded.
<i>D-E</i>		Only Dolby E is decoded.
<i>MUTE</i>	Mutes output regardless of input contents.	

5.11.2. Selecting the Sync Source for the Dolby Decoder (520AD4-DD-HD Only)

<i>UTIL</i>	With this control you can select the source of sync for the Dolby Decoder.	
<i>DDTM</i>		
<i>GL</i>		Select <i>GL</i> to use the GLCK video input as the source of sync.
<i>VIN</i>		Select <i>VIN</i> to use the video input as the source of sync.
<i>VOUT</i>	Select <i>VOUT</i> to use the video output as the source of sync.	

5.11.3. Selecting the Action on Loss of Signal from the Dolby Decoder (520AD4-DD-HD only)

UTIL
DDLS
DMUX
DOLB
AESB

With this control you can select the audio source to use when the input for the Dolby Decoder is not a Dolby encoded stream. This control affects all the sources that are set to take their inputs from the Dolby Decoder (DD1A, DD1B, etc.).

Select *DMUX* to automatically switch the input sources to the de-embedder outputs.

Select *DOLB* to always keep the input sources as the Dolby Decoder. When the Dolby Decoder is given a PCM stream, its output will be the PCM audio on pair 1 and silence on the remaining pairs.

Select *AESB* to automatically switch the input sources to the AES input for pair 1 and silence for pairs 2, 3 and 4.

5.11.4. Configuring the Audio Channel Mode

UTIL
2CHAN
CHAN
PAIR

With this control you can control whether the audio mux, delay and voice over controls operate on individual channels or on stereo pairs.

Select *CHAN* to process the audio as individual channels. (P-1A, P-1B, P-2A, etc.).

Select *PAIR* to process the audio as stereo pairs. (Pair P-1 consisting of channels P-1A and P-1B, etc.)

5.11.5. Controlling the Sample Rate Converters

UTIL
SRC
OFF
AUTO

With this control you can select whether the sample rate converter on the External AES input is enabled or not.

When the Sample Rate converter is set to *OFF* the content of the AES input is preserved without any change. The AES input must be synchronous to the video source. If the input is asynchronous, samples will be dropped or repeated as required by the rate difference.

When the Sample Rate converter is set to *AUTO* the AES input is sample rate converted to 48 kHz that is synchronous to the input video. The AES input can be either synchronous or asynchronous to the video source. The appropriate conversion method is selected based on recognized contents of the AES inputs.



The result of sample rate conversion of an asynchronous AC3 (Dolby Digital) signal is not suitable for direct embedding or AES output, but it can be used with the on board Dolby decoder. The conversion of PCM or Dolby E is always OK and effectively lossless.

5.11.6. Configuring the Dot Matrix Display Orientation

UTIL
DISP
<u>VERT</u>
HOR

With this control you can select a horizontal or vertical orientation for the displays to accommodate mounting the module in the 3RU or 1RU frames.

5.11.7. Displaying the Firmware Version

UTIL
<u>VERS</u>
V 1.3
B236
F365
HW 2

With this control you can display the firmware version and build number.

Firmware version number.
Firmware build number.
FPGA revision.
Hardware build identification number.

5.11.8. Resetting the Module to its Factory Defaults

UTIL
FRST
<u>NO</u>
YES

With this control you can reset the module to its factory default condition.

Select *NO* to return back to the upper menu item without affecting the presets.

Select *YES* to return the module to its factory default condition. Factory defaults are shown underlined in the menu descriptions in section 5.

5.11.9. Upgrading the Module Firmware

UTIL
UPGR
<u>NO</u>
YES

With this control you can initiate and upgrade the module firmware.

Select *NO* to return back to the upper menu item without upgrading.

To upgrade the firmware, install the Upgrade cable provided (located in the vinyl pouch in the front of this manual) onto the COM header J2 at the front edge of the card. Select *YES* to initiate the firmware upgrade. The module application will terminate and the boot monitor will start.

Run the upgrade as described in part 2 and part 3 of the *Upgrading Firmware* chapter in the front of the binder. Once the upgrade is complete, the card will reboot. Remove the upgrade cable. The module is now ready for normal operation.

See section 6.2 for information on upgrading the firmware when the application firmware is not running.



The Upgrade baud rate for the 520AD4-HD series modules is 115,200 baud.

5.11.10. Configuring the Dolby Decoder (520AD4-DD-HD only)

5.11.10.1. Setting up the Dolby Decoder Delay

<u>UTIL</u>
<u>DPCL</u>
<u>MIN</u> <u>1FRM</u>

With this control you can setup the Dolby Decoder decoded outputs latency.

Select *MIN* to configure the Dolby Decoder for the minimum possible decoding delay.

Select *1FRM* to configure the Dolby Decoder for a decoding delay equivalent to 1 frame of video.

5.11.10.2. Setting up the Dolby Decoder Program Play Feature

<u>UTIL</u>
<u>DPGP</u>
<u>NO</u> <u>YES</u>

With this control you can setup the Dolby Decoder “Program Play” feature for Dolby E.

Select *No* to configure the Dolby Decoder Program Play for normal (synchronous) operation.

Select *YES* to configure the Dolby Decoder Program Play to enable proper decoding of Dolby-E stream coming of a VTR that has been sped up by up to 15%. Additional pitch-shift processing is applied and output latency is forced to min. NOTE: The Dolby-E stream has to be input via the external (“backup”) AES input.

5.11.10.3. Setting Up the Dolby Decoder Dynamic Range Compression

<u>UTIL</u>
<u>DDCM</u>
<u>BYPS</u> <u>RF</u> <u>LINE</u>

With this control you can setup the Dolby Decoder dynamic range compression for AC3 (Dolby Digital only).

Select *BYPS* to configure the Dolby Decoder to bypass dynamic range processing. Program levels are unaltered.

Select *RF* to configure the Dolby Decoder to adjust the dynamic range using a RF (or ‘strong’) dynamic range compression profile.

Select *LINE* to configure the Dolby Decoder to adjust the dynamic range using a LINE (or ‘light’) dynamic range compression profile.

5.12. CONFIGURING THE VIDEO PARAMETERS

The *VIDE* menu is used to configure the video parameters. When the *VIDE* menu is entered the active menu item name will be shown. To select other menu items, use the toggle switch. The chart below shows the items available in the *VIDE* menu. Sections 5.12.1 to 5.12.4 give detailed information about the menu items.

VOFM	Selects the video format
VDFR	Sets additional frames of video delay
VDLN	Sets additional lines of video delay
VDSM	Sets additional samples of video delay
COLR	Selects the video output colour to be used when there is no video input
VOUT	Selects the behaviour of the video output when there is no video output

5.12.1. Selecting the Output Video Format

<i>VIDE</i>	With this control you can select the output video format.
VOFM	Select <i>Auto</i> to let the module auto-detect the video format.
Auto	PAL-B
PALB	NTSC-M
NTSC	1035i/59.95
3i59	1035i/60
3i60	1080p/23.98sF
1s23	1080p/24sF
1s24	1080i/50 (1080p/25sF)
1i50	1080i/59.94 (1080p/29.97sF)
1i59	1080i/60 (1080p/30sF)
1i60	720p/59.94
7p59	720p/60
7p60	1080p/23.98
1p23	1080p/24
1p24	1080p/25
1p25	1080p/29.97
1p29	1080p/30
1p30	Note: when the device powers up in Auto mode, the default output format is 720p/59.94 until a valid input signal is applied.

5.12.2. Configuring the Video Delay

<i>VIDE</i>	With this control you can set the video delay in frames.
VDFR	
DFR0 0 to 7	

<i>VIDE</i>
<i>VDLN</i>
<u>0</u> <i>0 to max lines</i>

With this control you can set the video delay in lines.

When you increase the value beyond the maximum line number for the video standard in use, the frames will automatically increment. When you decrease the value below 0 the frames will automatically decrement.

<i>VIDE</i>
<i>VDSM</i>
<u>0</u> <i>0 to max samples</i>

With this control you can set the video delay in samples.

When you increase the value beyond the maximum samples per line of the video standard in use, the lines will automatically increment. When you decrease the value below 0 the lines will automatically decrement.

5.12.3. Configuring the Default Output when there is no Video Input

<i>VIDE</i>
<i>COLR</i>
<u><i>BLUE</i></u> <i>BLAK</i>

With this control you can set the video output when there is no input video and the *VOUT* menu item is set to *AUTO*.

This menu setting is also used when the *VOUT* menu item is set to *COLR*.

5.12.4. Forcing the Video Output to a Default Flat Screen

<i>VIDE</i>
<i>VOUT</i>
<u><i>AUTO</i></u> <i>COLR</i> <i>PASS</i>

With this control you can force the default video output for test purposes.

Select *AUTO* to output the input video when it is present and switch to the default flat screen when there is no video.

Select *COLR* to force the output video to either black or blue screen as configured using the *COLR* menu item.

Select *PASS* to pass the input to the output regardless.

6. JUMPERS

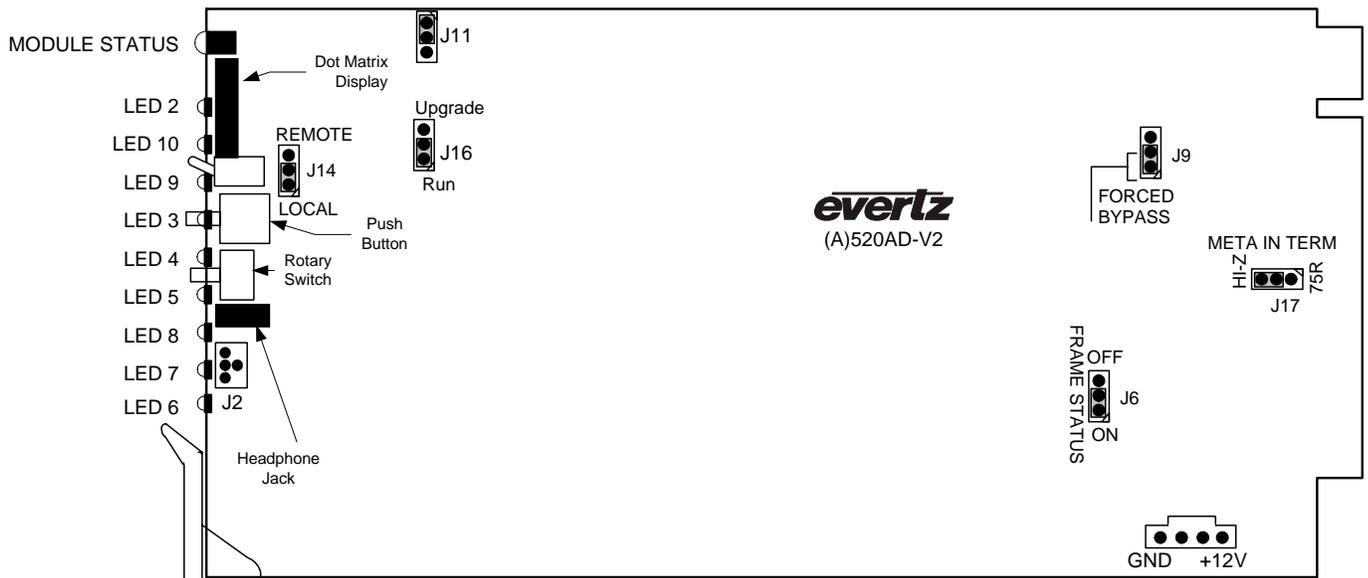


Figure 6-1: 520AD4-HD LED and Jumper Locations

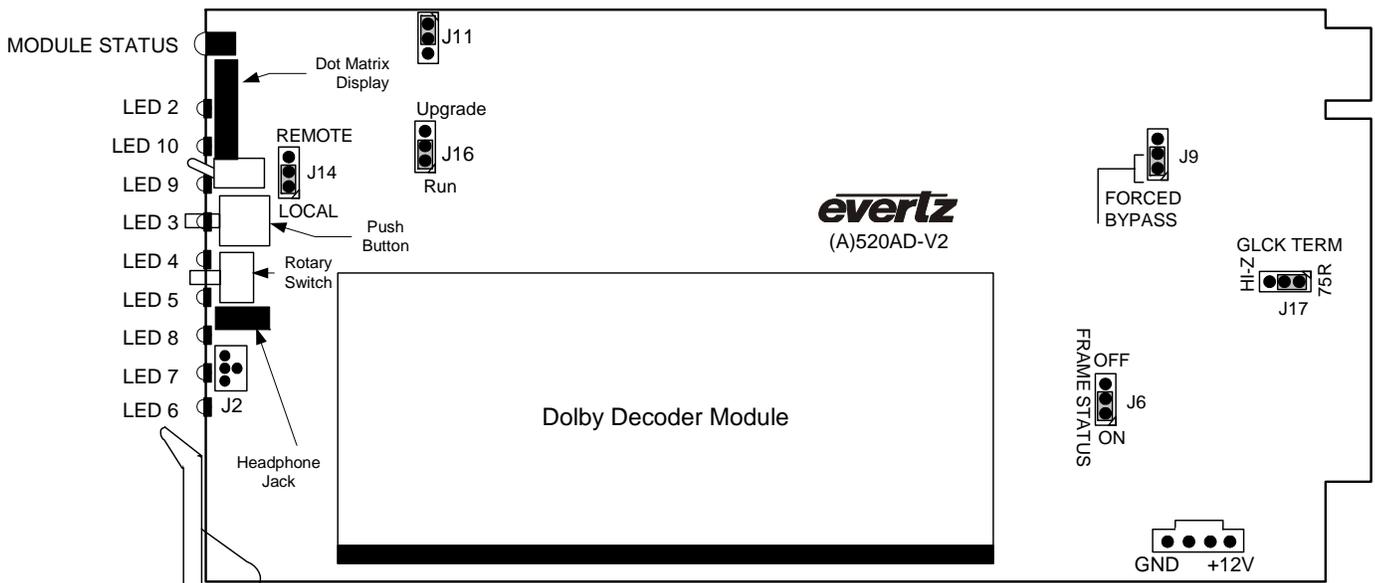


Figure 6-2: 520AD4-DD-HD LED and Jumper Locations

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

The FRAME STATUS jumper J6, located near the rear 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.

6.2. CONFIGURING THE MODULE FOR FIRMWARE UPGRADES

UPGRADE: The UPGRADE jumper J16 is used when firmware upgrades are being done to the module. For normal operation it should be installed in the *RUN* position. See the *Upgrading Firmware* section in the front of the binder for more information.

To upgrade the firmware in the module unit pull it out of the frame. Move Jumper J16 into the *UPG* position. Install the Upgrade cable provided (located in the vinyl pouch in the front of this manual) onto the COM header J2 at the front edge of the card. Re-install the module into the frame. Run the upgrade as described in the *Upgrading Firmware* chapter in the front of the binder. Once the upgrade is completed, remove the module from the frame, move J16 into the *RUN* position, remove the upgrade cable and re-install the module. The module is now ready for normal operation.



The Upgrade baud rate for the 520AD4-HD series modules is 115,200 baud.

6.3. SELECTING WHETHER THE GENLOCK REFERENCE INPUT IS TERMINATED (520AD4-DD-HD VERSION ONLY)

GLCK TERM: The GLCK TERM jumper J17, located at the rear of the module, is used to terminate the genlock input on the 520AD4-DD-HD cards. When it is in the 75R position, a 75 ohm terminating resistor will be connected from the input to ground.

6.4. SELECTING WHETHER THE METADATA INPUT IS TERMINATED (520AD4-HD VERSION ONLY)

META IN TERM: The META IN TERM jumper J17 located at the rear of 520AD4-HD module is used to terminate METADATA input. When the external metadata is driven by a source such as Dolby DP572 or DP570 using the supplied Evertz adaptor DD-DB9-BNC, J17 should be set to HI-Z. The setting 75R can be useful when the driving source is a native coax driver (such as METADATA output of another 520AD4-HD), and the source is located far away (more than 3000 ft).

6.5. SELECTING WHETHER THE BYPASS RELAY IS FORCED TO BYPASS MODE

FORCED BYPASS The FORCED BYPASS jumper J9 located at the rear of the module is used to terminate the genlock input. When it is in the FORCED BYPASS position the bypass relay is activated and the video path through the module is bypassed.

7. VISTALINK[®] REMOTE MONITORING/CONTROL

7.1. WHAT IS VISTALINK[®]?

VistaLINK[®] is Evertz's remote monitoring and configuration platform which operates over an Ethernet network using Simple Network Management Protocol (SNMP). SNMP is a standard computer network protocol that enables different devices sharing the same network to communicate with each other. VistaLINK[®] provides centralized alarm management, which monitors, reports, and logs all incoming alarm events and dispatches alerts to all the VLPro Clients connected to the server. Card configuration through VistaLINK[®] PRO can be performed on an individual or multi-card basis using simple copy and paste routines, which reduces the time to configure each module separately. Finally, VistaLINK[®] enables the user to configure devices in the network from a central station and receive feedback that the configuration has been carried out.

There are 3 components of SNMP:

1. An SNMP manager, also known as a Network Management System (NMS), is a computer running special software that communicates with the devices in the network. Evertz VistaLINK[®] Pro Manager graphical user interface (GUI), third party or custom manager software may be used to monitor and control Evertz VistaLINK[®] enabled products.
2. Managed devices, (such as 520AD4-HD) each with a unique address (OID), communicate with the NMS through an SNMP Agent. Evertz VistaLINK[®] enabled 500 series modules reside in the 3RU 500FR MultiFrame and communicate with the manager via the 500FC VistaLINK[®] frame controller module, which serves as the Agent.
3. A virtual database, known as the Management Information Base (MIB), lists all the variables being monitored, which both the Manager and Agent understand. Please contact Evertz for further information about obtaining a copy of the MIB for interfacing to a third party Manager/NMS.

For more information on connecting and configuring the VistaLINK[®] network, see the 500FC Frame Controller chapter. At the time of writing the VistaLINK[®] features of the 520AD4-HD are not implemented.

8. MENU QUICK REFERENCE

8.1. INDIVIDUAL CHANNEL MODE

PEAK

- PAIR
- 1234
- 5678
- dB1
- dB2
- dB3
- dB4
- dB5
- dB6
- dB7
- dB8

STAT

- AESB
- GLCK
- DDPC
- DDBF
- VIFM
- IGRP
- DXAS
- DXAR
- DXAC
- DXBS
- DXBR
- DXBC
- EXMT
- VAPK
- VAMT

AMUX

- AESO
- DD1A
- DD1B
- P-1A
- P-1B
- P-2A
- P-2B
- P-3A
- P-3B
- P-4A
- P-4B
- VOCA
- VOCB
- S-1A
- S-1B
- S-2A
- S-2B
- S-3A
- S-3B
- S-4A
- S-4B

ADEL

- DL1A
- DL1B
- DL2A
- DL2B
- DL3A
- DL3B
- DL4A
- DL4B

VOIC

- VOC1A
- VOC1B
- VOC2A
- VOC2B
- VOC3A
- VOC3B
- VOC4A
- VOC4B

HEAD

- HVOL
- HPML
- HPMR

META

- MELT
- LTCA
- METO
- METV
- VADL
- VADI
- VADS
- VAKL
- VAEL
- VAEI
- VAES
- VAEN

EAUD

- DXAG
- DXAK
- DXBG
- DXBK
- EMAG
- EMAE
- EMBG
- EMBE
- GLOK

UTIL

- DDMD
- DDTM
- DDLS
- 2CHA
- SRC
- DISP
- VERS
- FRST
- UPGR
- DPCL
- DPGP
- DDCM

VIDE

- VOFM
- VDFR
- VDLN
- VDSM
- COLR
- VOUT

Grayed Items
only available on
520AD4-DD-HD version

8.2. STEREO PAIR MODE

PEAK

- PAIR
- 1234
- 5678
- dB1
- dB2
- dB3
- dB4
- dB5
- dB6
- dB7
- dB8

STAT

- AESB
- GLCK
- DDPC
- DDBF
- VIFM
- IGRP
- DXAS
- DXAR
- DXAC
- DXBS
- DXBR
- DXBC
- EXMT
- VAPK
- VAMT

AMUX

- AESO
- DD1
- P-1
- P-2
- P-3
- P-4
- VOC
- S-1
- S-2
- S-3
- S-4

ADEL

- DL1
- DL2
- DL3
- DL4

VOIC

- VOC1
- VOC2
- VOC3
- VOC4

HEAD

- HVOL
- HPM

META

- MELT
- LTCA
- METO
- METV
- VADL
- VADI
- VADS
- VAKL
- VAEL
- VAEI
- VAES
- VAEN

EAUD

- DXAG
- DXAK
- DXBG
- DXBK
- EMAG
- EMAE
- EMBG
- EMBE
- GLOK

UTIL

- DDMD
- DDTM
- DDLS
- 2CHA
- SRC
- DISP
- VERS
- FRST
- UPGR
- DPCL
- DPGP
- DDCM

VIDE

- VOFM
- VDFR
- VDLN
- VD SM
- COLR
- VOUT

Grayed Items
only available on
520AD4-DD-HD version