

# IQDMX31

## 3G/HD/SD-SDI De-embedder for Four AES/EBU Audio Streams

The IQDMX31 provides support for all common audio processing features including gain, invert, delay and channel-level routing, making it an ideal de-embedder for all AES applications.

The IQDMX31 from Grass Valley provides 8-channel digital audio de-embedding for 3 Gb/s SDI, HD-SDI 1.5 Gb/s or SD-SDI 270 Mb/s signals. Audio processing features include gain, invert, delay and channel-level routing, while a video proc amp is also included in the feature set.

### Why should you choose this module?

- Ideal as a general de-embedder for AES audio applications
- Video delay feature allows this module to be used where a Dolby E decoder, for example, is to be placed downstream of the AES outputs
- Full RollCall and SNMP compatibility allows easy integration with Grass Valley or third-party network management systems, providing an all-inclusive monitoring and control solution

### KEY FEATURES

- 8-channel 3G/HD/SD-SDI de-embedder with 4 balanced or unbalanced AES outputs
- Handles up to 16 channels of embedded audio present on the incoming SDI stream
- Standards supported:
  - 3G-SDI to SMPTE ST 424/425 level A & B compatible
  - HD-SDI to SMPTE ST 292/274/296
  - SD-SDI to SMPTE ST 259-C
- Channel-level (sub-frame) routing
- Audio proc amp features including independent gain, invert, mute controls and adjustable delay for selected audio channels
- Any group of embedded audio may be passed unchanged, processed or blanked
- Embedded Dolby E support — pair routing, delay and Dolby E header alignment
- Handles Dolby E and PCM audio present in the same group with detection and reporting
- Able to pass all ancillary data without corruption inc. VANC metadata
- Independent HANC and VANC blanking control
- Input loss detection — default output of black/pattern/freeze
- Up to 9 frames of video delay and 2 seconds of audio delay
- Video controls including video gain and offset
- Built-in test pattern generator and audio tone generator
- 2 SDI inputs and 2 active HD/SD-SDI outputs
- 16x user memories, save/recall/rename
- RollCall control and monitoring compatible

**SPECIFICATIONS****Inputs & Outputs****Signal Inputs**

SDI inputs: 2x

Input 1 cable length:

- Up to 70m Belden 1694A @ 3 Gb/s
- Up to 160m Belden 1694A @ 1.5 Gb/s
- >350m Belden 1694A @ 270 Mb/s

Input 2 cable length:

- Up to 60m Belden 1694A @ 3 Gb/s
- Up to 100m Belden 1694A @ 1.5 Gb/s
- Up to 100m Belden 1694A @ 270 Mb/s

**Signal Outputs**

SDI outputs: 2x

Unbalanced digital audio: 4x AES/EBU, AC3, Dolby E (BNC)

Balanced digital audio: 4x AES/EBU, AC3, Dolby E (25-way D-type)

**Controls****Indicators**

Power: OK (Green)

CPU running: OK (Green flashing)

FPGA running: OK (Green flashing)

Status:

- OK (Green)
- Warning (Yellow)
- Error (Red)

Input 1: OK (Green)

Input 2: OK (Green)

**Video Controls**

Input standards:

- 1125(1080)/50P (A & B)
- 1125(1080)/59P (A & B)
- 1125(1080)/29i, 1125(1080)/25i
- 750(720)/59P, 750(720)/50P
- 525(480)/29i, 625(576)/25i

Default video output type: Pattern, Freeze, Black

Default video output standard:

- Last Known Good
- 1125(1080)/50P (A & B)
- 1125(1080)/59P (A & B)
- 1125(1080)/29i, 1125(1080)/25i
- 750(720)/59P, 750(720)/50P
- 525(480)/29i, 625(576)/25i

Input select: Input 1, Input 2

Manual freeze: On/Off

Freeze: Field/frame

Video delay frames: 0 - 9 F

VANC data: Blank VANC

SD VANC data: Line blanking (6 controls)

Proc amp enable: On/Off

Black level:  $\pm 100$  mV in steps of 0.8 mVHue adjust:  $\pm 180^\circ$  in steps of  $1^\circ$ Master video gain:  $\pm 6$  dB in steps of 0.1 dBY-gain:  $\pm 6$  dB in steps of 0.1 dBCb/Cr gain:  $\pm 6$  dB in steps of 0.1 dB

Y/C timing:

- $\pm 8$  pixels in 2 pixel steps (SD)
- $\pm 16$  pixels in 2 pixel steps (HD/3G)

Picture position:

- $\pm 8$  pixels in 2 pixel steps (SD)
- $\pm 16$  pixels in 2 pixel steps (HD/3G)

Pattern on: On/Off

Pattern select: 75% Color Bars, Black

Caption on: On/Off

Edit caption: 19 characters available

**Audio Controls****Embedder Assignment**

Group 1 to 4: Enable On/Off

Pair 1 to 8 Source L/Non-PCM: Dis-embed 1\_1 to 8\_2, Tone, Silence

Pair 1 to 8 Source R: Dis-embed 1\_1 to 8\_2, Tone, Silence

Pair 1 to 8 Stereo: Link channel pairs

Pair 1 to 8 Polarity L/R: On/Off

Pair 1 to 8 Gain L/R: +12 dB to -72 dB in 0.1 dB steps

Pair 1 to 8 Non-PCM: On/Off

**AES Assignment**

AES 1 to 4 Source L/Non-PCM: Dis-embed 1\_1 to 8\_2, Tone, Silence

AES 1 to 4 Source R: Dis-embed 1\_1 to 8\_2, Tone, Silence

AES 1 to 4 Stereo: Link channel pairs

AES 1 to 4 Polarity L/R: On/Off

AES 1 to 4 Gain L/R: +12 dB to -72 dB in 0.1 dB steps

AES 1 to 4 Non-PCM: On/Off

Processed audio delay control:

Coarse manual delay: Up to 1.75s in 5 ms steps

Fine manual delay:  $\pm 0.25$ s in 0.5 ms steps**Tone**

Frequency L/R: 100Hz to 10kHz in 100Hz steps

Channel ident: On/Off

HANC data: Blank HANC (Removes all HANC data. Note audio removed when embedders disabled)

**Dolby-E**

Dolby-E: Auto

Alignment: On/Off

**Audio Monitoring**

Silence detect: 0 to -80 dB in steps of 1 dB

Signal overload detect: 0 to -80 dB in steps of 1 dB

Warning timer: 1 to 20 seconds in steps of 1 second

**Other Controls**

User memories: 16x Save, Recall, Rename

Memory naming: User configurable naming of memories 1 - 16

RollTrack sources: Unused, Video Delay, Input Present, Input 1 Select, Input 2 Select, Input Loss, Output 525, Output 625, Output 720p, Output 1080i, Output 1080p, Output Freeze, Output Unfreeze, Output Pattern on, Output pattern off, Output Caption on, Output Caption off, Disemb (Pairs 1-8) PCM, Disemb (Pairs 1-8) Data, Disemb (Pairs 1-8) Dolby E, Disemb (Pairs 1-8) V bit, Disemb (Pairs 1-8) Loss

Information window: Video input status, audio input status

Factory default: Resets all module settings to factory specified default values and clears memories

Default settings: Resets all module settings to factory specified defaults but does not clear memories

Restart: Software restart of the module

Module information:

Reports following module information: Software version, Serial number, Build number, KOS version, Firmware version, PCB version

**General Specifications**

Electrical:

- 3 Gb/s SDI, SMPTE ST 424
- 1.5 Gb/s HD-SDI, SMPTE ST 292
- 270 Mb/s SDI, SMPTE ST 259-C
- DVB-ASI

Connector/format: BNC/75 $\Omega$  panel jack on standard IQ connector panel

Return loss:

- >-15 dB (270 Mb/s, 1.5 Gb/s)
- >-10 dB (3 Gb/s)

Output jitter:

- SD-SDI 0.2 UI (10 Hz) / 0.2 UI (1 kHz)
- 3G/HD-SDI 1.0 UI (10 Hz) / 0.2 UI (100 kHz)

Video standards:

- 1125(1080)/50p (A & B), 1125(1080)/59p (A & B)
- 750(720)/50p, 750(720)/59p
- 1125(1080)/25i, 1125(1080)/29i
- 625(576)/25i, 525(480)/29i

Typical video delay:

- SD: 70  $\mu$ s
- HD: 38  $\mu$ s
- 3G-A: 19  $\mu$ s
- 3G-B: 40  $\mu$ s

Embedded audio handling:

- HD: 24-bit synchronous 48 kHz to SMPTE ST 299
- SD: 20-bit synchronous 48 kHz to SMPTE ST 272-A

Embedded audio delay:

- Minimum (PCM): 2 ms
- Maximum (non-PCM):
- SD: 67  $\mu$ s
- HD: 28  $\mu$ s
- 3G-A: 15  $\mu$ s
- 3G-B: 25  $\mu$ s

**Digital Audio Output (Balanced)**

Connector/format: 25-way D-type

Level: 3 Vp-p typical into 110 $\Omega$ 

Standard: AES3, SMPTE ST 272-A-1994, SMPTE ST 299

**Digital Audio Output (Unbalanced)**

Connector/format: BNC

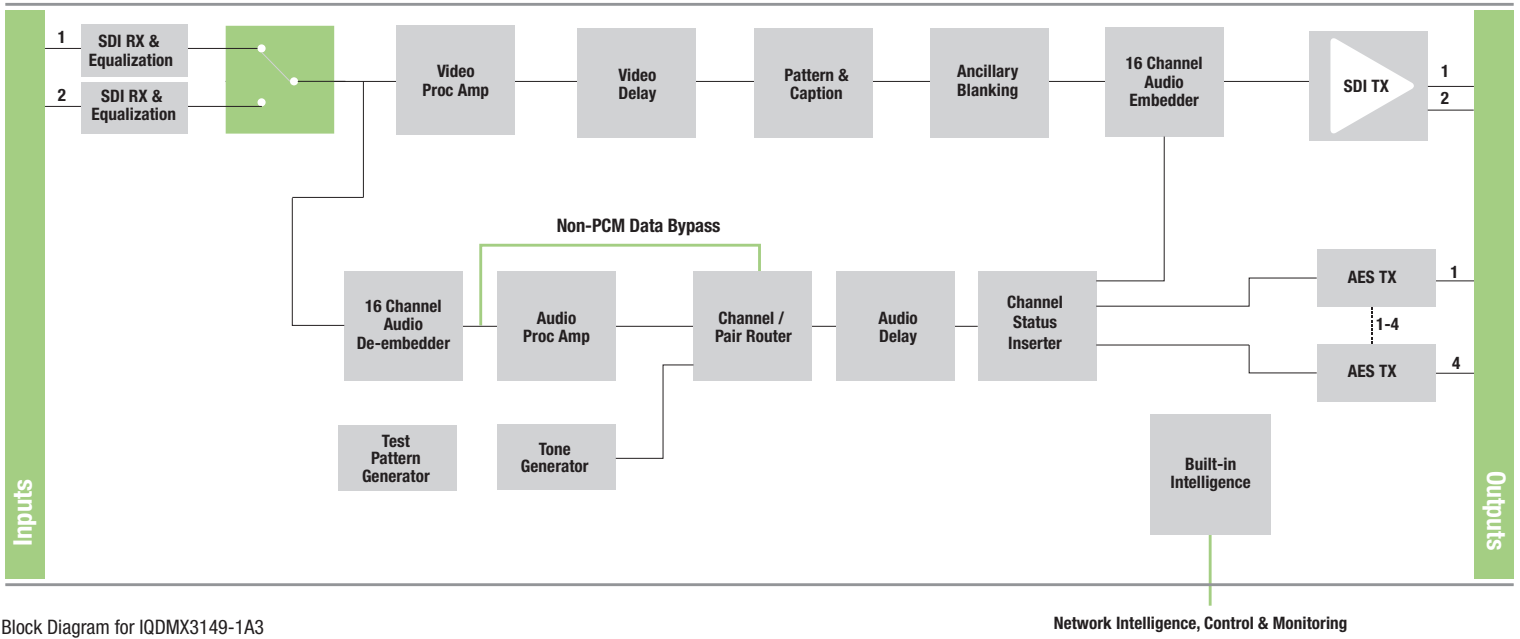
Level: 1 Vp-p typical into 75 $\Omega$ 

Standard: AES3id, SMPTE ST 272-A-1994, SMPTE ST 299

**Power Consumption**

Module power consumption:

- 9.5W Max (A Frames)
- 8.5 PR (B Frames)



Block Diagram for IQDMX3149-1A3

**ORDERING**

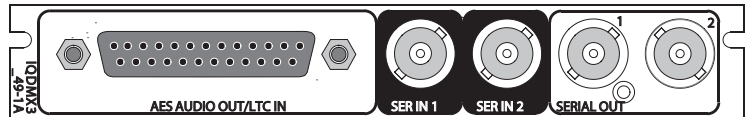
**IQDMX3147-1A3, IQDMX3147-1B3**

3G/HD/SD-SDI 8-channel AES de-embedder. 2 outputs, 4 unbalanced AES outputs.



**IQDMX3149-1A3, IQDMX3149-1B3**

3G/HD/SD-SDI 8-channel AES de-embedder. 2 outputs, 4 balanced AES outputs.



For more details on enclosure types please refer to the IQ Modular Enclosures datasheet.

GVB-2-0852A-EN-DS



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