

# 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 GV Orbit compatibility provides an all-inclusive remote configuration, control and monitoring solution
- Comprehensive SNMP support allows easy integration with third-party Network Management Systems

### 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
- GV Orbit 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 mV

Hue adjust:  $\pm 180^\circ$  in steps of  $1^\circ$

Master video gain:  $\pm 6$  dB in steps of 0.1 dB

Y-gain:  $\pm 6$  dB in steps of 0.1 dB

Cb/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

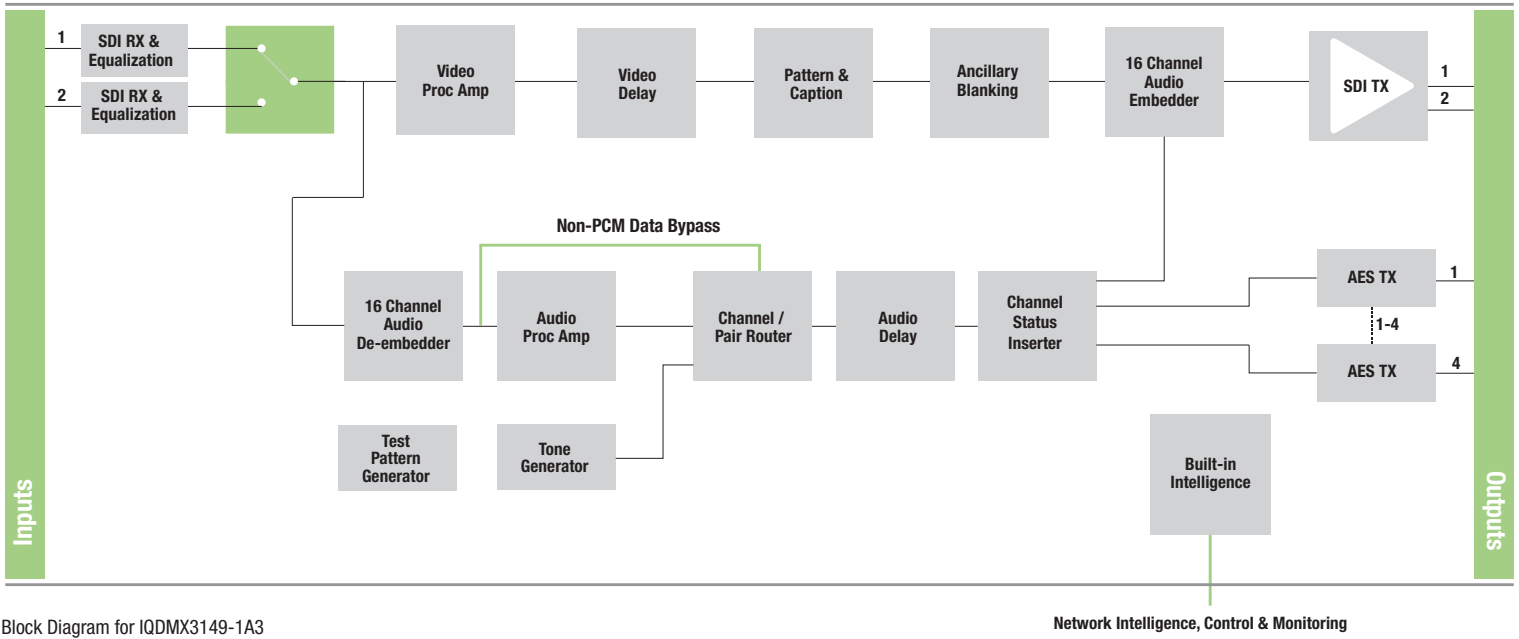
Level: 1 Vp-p typical into 75 $\Omega$

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

Network Intelligence, Control & Monitoring

**ORDERING**

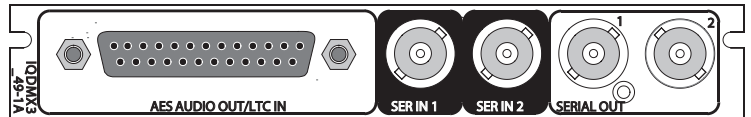
**IQDMX3147-1A3, IQDMX3147-1B3**

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.



WWW.GRASSVALLEY.COM

Join the Conversation at **GrassValleyLive** on Facebook, Twitter, YouTube and **Grass Valley** on LinkedIn.



www.grassvalley.com/blog

This product may be protected by one or more patents. For further information, please visit: [www.grassvalley.com/patents](http://www.grassvalley.com/patents).

Grass Valley®, GV® and the Grass Valley logo are trademarks or registered trademarks of Grass Valley USA, LLC, or its affiliated companies in the United States and other jurisdictions. Grass Valley products listed above are trademarks or registered trademarks of Grass Valley USA, LLC or its affiliated companies, and other parties may also have trademark rights in other terms used herein.

Copyright © 2019, 2021 Grass Valley Canada. All rights reserved. Specifications subject to change without notice.