

IQMUX31

3G/HD/SD-SDI Embedder for Four AES/EBU Audio Streams

Includes audio delay, gain, invert and channel level routing, with video delay and a video proc amp also included.

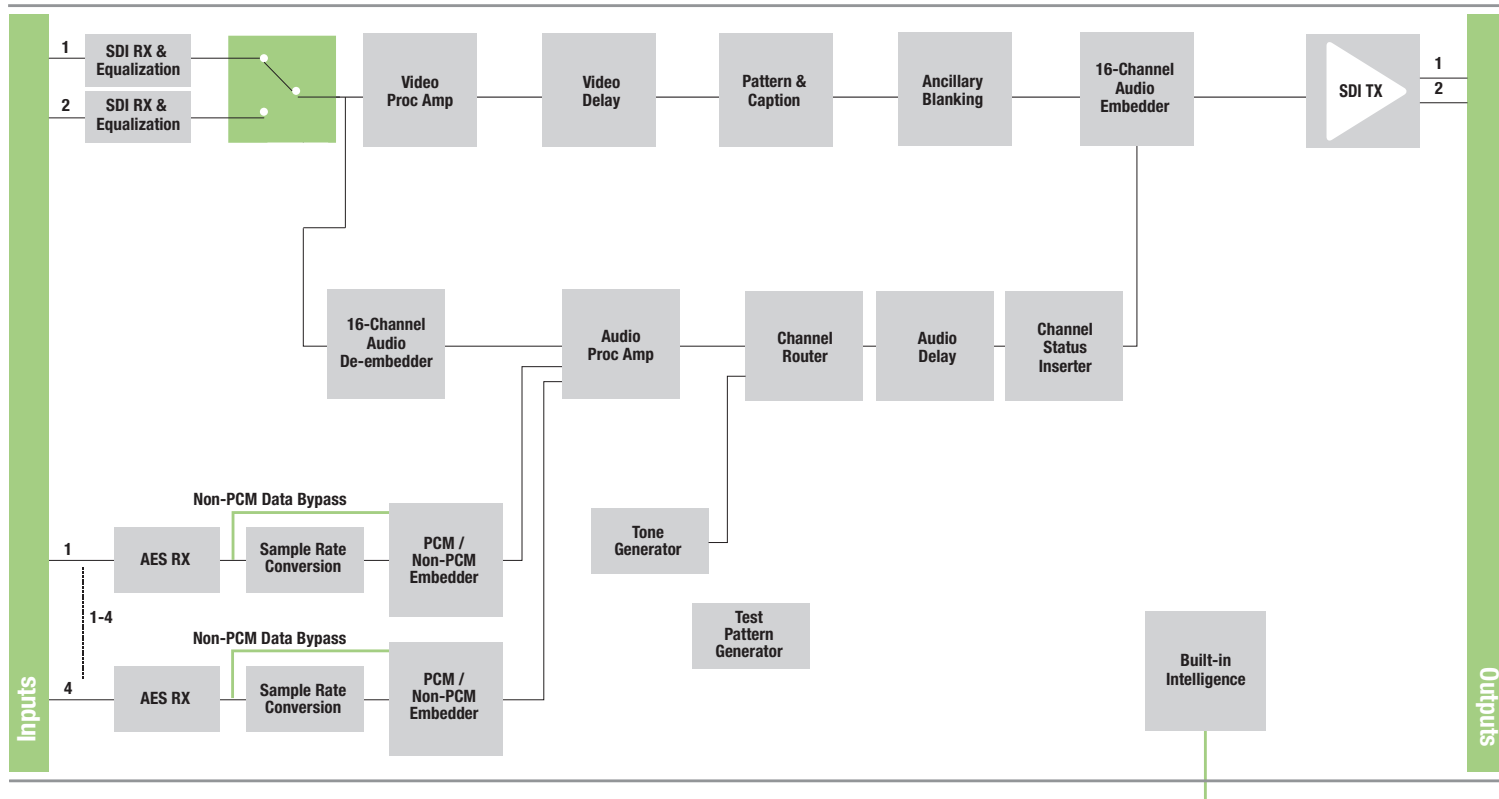
The IQMUX31 from Grass Valley provides 8-channel digital audio embedding for 3 Gb/s SDI, HD-SDI 1.5 Gb/s or SD-SDI 270 Mb/s signals. Audio processing features include audio delay, gain, invert and channel level routing, while video delay and a video proc amp are also included in the feature set. Ideal as a small scale digital ingest module where any digital audio source signal can be catered for, even combinations of embedded and external digital audio.

Why should you choose this module?

- Ideal as a general embedder for stereo, multichannel or Dolby E AES audio applications
- 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
- Available as an SD/HD version with simple software upgrade path to 3G, providing a cost-effective future proof solution

KEY FEATURES

- 8-channel 3G/HD/SD-SDI embedder capable of embedding asynchronous or synchronous AES inputs
- 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
- Handles up to 16 channels of embedded audio present on the incoming SDI stream
- Channel-level (sub-frame) routing
- Audio proc amp features including independent gain, invert and mute control
- Embedding continues on loss of SDI input (silence)
- Auto mute on AES input error
- 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
- PCM and non-PCM detection and reporting
- Handles Dolby E and PCM audio present in the same group
- 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
- Transparent to all ancillary data incl. VANC metadata
- Video controls including video gain and offset
- Built-in test pattern generator and audio tone generator
- Two SDI inputs and two active HD/SD-SDI outputs
- 16x user memories, save/recall/rename
- RollCall control and monitoring compatible



Block diagram for IQMUX3147-1B3

Network Intelligence, Control & Monitoring

SPECIFICATIONS

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

Signal Outputs

SDI outputs: 2x

Controls

Indicators
 Power: OK (Green)
 CPU running: OK (Green flashing)
 FPGA running: OK (Yellow flashing)
 Status:
 OK (Green)
 Warning (Yellow)
 Error (Red)
 Input 1: OK (Green)
 Input 2: OK (Green)

Video Controls

Input standards:
 1125/1080p50 (A & B)
 1125/1080p59.94 (A & B)
 1125/1080i29.97, 1125/1080i25
 750/720p59.94, 750/720p50
 525/480i29.97, 625/576i25
 Default video output type: Pattern, Freeze, Black
 Default video output standards:
 Last Known Good
 1125/1080p50 (A & B)
 1125/1080p59.94 (A & B)
 1125/1080i29.97, 1125/1080i25
 750/720p59.94, 750/720p50
 525/480i29.97, 625/576i25
 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: ±100 mV in steps of 0.8 mV
 Hue adjust: ±180° in steps of 1°
 Master video gain: ±6 dB in steps of 0.1 dB
 Y-Gain: ±6 dB in steps of 0.1 dB
 Cb/Cr gain: ±6 dB in steps of 0.1 dB

Y/C timing:

±8 pixels in 2 pixel steps (SD)
 ±16 pixels in 2 pixel steps (HD/3G)
 Picture position:
 ±8 pixels in 2 pixel steps (SD)
 ±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 4 source L/non-PCM: Dis-embed 1_1 to 8_2, AES 1 to 4, Tone, Silence
 Pair 1 to 4 source R: Dis-embed 1_1 to 8_2, AES 1 to 4, Tone, Silence
 Pair 1 to 4 stereo: Link channel pairs
 Pair 1 to 4 polarity L/R: On/Off
 Pair 1 to 4 Gain L/R: +12 dB to -72 dB in 0.1 dB steps
 Pair 1 to 4 non-PCM: On/Off

Processed Audio Delay Control

Course manual delay: Up to 1.75s in 5 ms steps
 Fine manual delay: ± 0.25s in 0.5 ms steps

Dolby E

Dolby E auto alignment: On/Off

SPECIFICATIONS

Tone

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

Channel ident: On/Off

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

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, AES (Pairs 1-4) PCM, AES (Pairs 1-4) Data, AES (Pairs 1-4) DolbyE, AES (Pairs 1-4) V bit, AES (Pairs 1-4) Loss, 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/75Ω 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:

1125/1080p50 (A & B), 1125/1080p59.94 (A & B)

750/720p50, 750/720p59.94

1125/1080i25, 1125/1080i29.97

625/576i25, 525/480i29.97

Typical video delay:

SD: 70 μs

HD: 38 μs

3G-A: 19 μs

3G-B: 40 μs

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 μs

HD: 28 μs

3G-A: 15 μs

3G-B: 25 μs

Digital Audio Input (Balanced)

Connector/format: 25-way D-type

Sample frequency: 25 – 96 kHz (48 kHz for reference)

Input cable length: >150 m of AES3 cable

Impedance: 110Ω

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

Digital Audio Input (Unbalanced)

Connector/format: BNC

Sample frequency: 25 – 96 kHz (48 kHz for reference)

Input cable length: >500 m of RG59 cable

Impedance: 75Ω

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

Output sampling: 48 kHz frame locked

Power Consumption

Module power consumption: 8 PR (B Frames)

ORDERING

IQMUX3147-1B3

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



IQMUX3149-1B3

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



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

GVB-2-0797A-EN-DS



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